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Item 6(b) of the provisional agenda

Development and transfer of technologies

Technology framework under Article 10, paragraph 4, of the Paris Agreement

Elaboration of the technology framework

Submissions from Parties

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its forty-fourth session, invited Parties to submit their views by 15 September 2016 on the elaboration of the technology framework established under Article 10, paragraph 4, of the Paris Agreement, including the content, features and characteristics, the purpose and the themes of the technology framework in order for the secretariat to prepare a compilation of Parties' submissions for consideration at SBSTA 45.¹
2. The secretariat has received nine such submissions. In accordance with the procedure for miscellaneous documents, these submissions are attached and reproduced* in the language in which they were received and without formal editing.²

¹ FCCC/SBSTA/2016/2, paragraph 26.

* These submissions have been electronically imported in order to make them available on electronic systems, including the World Wide Web. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

² Also available on the submission portal at <www.unfccc.int/5900> (click on "Submissions from Parties" under the SBSTA header, then select "SBSTA 45").

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** This submission is supported by Bosnia and Herzegovina and Serbia.

Paper no. 1: Brazil

**VIEWS OF BRAZIL ON THE ELABORATION OF THE TECHNOLOGY FRAMEWORK
UNDER ARTICLE 10, PARAGRAPH 4,
OF THE PARIS AGREEMENT**

The Government of Brazil welcomes the opportunity to provide its views on the elaboration of the technology framework established under Article 10 of the Paris Agreement, including the content, features and characteristics, the purpose and the themes of the technology framework.³

Features and Characteristics

Brazil is of the view that the technology framework should be concise, balanced and flexible to respond to changes over time.

The technology framework should add value and avoid duplication of work, by building upon the work developed by the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), and being informed by experiences and lessons learned from the implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention.⁴

It should also be comprehensive so as to foster engagement and collaboration with stakeholders, taking into consideration work under and outside the Convention related to climate technologies as well as ongoing work on the linkages between the Technology Mechanism and the Financial Mechanism.

Purpose

As outlined in Article 10 of the Paris Agreement, the purpose of the technology framework is to provide overarching guidance to the work of the Technology Mechanism in promoting and facilitating enhanced action on technology development and transfer in order to support the implementation of the Paris Agreement, in pursuit of the long-term vision referred to in its Article 10, paragraph 1.

The Government of Brazil believes that the technology framework should play a strategic role in improving the effectiveness and efficiency of the work of the Technology Mechanism.

Key themes

Clusters of key themes can be derived from Article 10 of the Paris Agreement and decision 1/CP.21, paragraph 67, without prejudice to other themes raised in discussions among Parties (Annex to SBSTA 44 conclusion).

1. Strengthening cooperative action on technology development and transfer (Article 10.2)
 - a. The undertaking and updating of technology needs assessments (TNAs), as well as the enhanced implementation of their results (67a);
 - b. Enhancing coherence between TNAs, Technology Action Plans (TAPs) and the implementation of nationally determined contributions (NDCs);
 - c. Strengthening National Designated Entities (NDE)s;
 - d. Collaborating with other thematic bodies under the Convention;
 - e. Leveraging activities outside UNFCCC;
 - f. Involving the private sector and civil society;
 - g. Enhancing engagement of and coordination with stakeholders in technology issues;
 - The Technology Mechanism should be attributed the responsibility of assessing and promoting the key technologies for mitigation and adaptation, by:
 - i. Serving as a formal, universal and integrated organization for climate technologies;
 - ii. Establishing procedures and opening up channels for accrediting technology holders and developers;
 - iii. Encouraging the widespread use of renewable energy technologies.

³ FCCC/SBSTA/2016/L.8, paragraph 4.

⁴ As adopted by decision 4/CP.7 and enhanced by decision 3/CP.13.

- h. Private sector involvement and how this can link with public sector efforts;
 - Enabling the establishment of links between innovation environments (such as startups), the private sector and the implementation of NDCs.
- 2. Accelerating, encouraging and enabling innovation (Article 10.5)
 - a. Enhancing enabling environments for the development and transfer of technologies (67d);
 - b. Addressing barriers to the development and transfer of technologies (67d);
 - Privileging technologies that can be widespread and addressing barriers to such dissemination.
 - c. Collaborative approaches to research and development (10.5);
 - The Framework should enable the channeling of resources so as to leverage local capacity-building as well as the creation of laboratories for development and testing of climate technologies in developing country Parties. Moreover, it shall promote opportunities for exchange among specialists.
 - d. Enabling and facilitating access to technology, in particular for early stages of the technology cycle, to developing countries;
 - Promoting specific channels for putting forward information exchange and competitive tests of climate technologies.
 - Considering the creation of platform(s) or hub(s) to connect technology producers and consumers, so as to promote the sharing of experiences and best practices, capacity building and the development of technology roadmaps, thus fostering the local development of climate technologies and engaging stakeholders from the private sector, governments, academic institutions, NGOs and citizens.
 - Ensuring facilitated access to technologies by small and medium-size companies.
 - e. Harnessing indigenous knowledge and enhancing endogenous capacities;
 - Harnessing social technologies and local knowledge in order to enhance endogenous capacities. The TEC could have an essential role in mapping and sharing traditional knowledge found in local solutions to specific climate conditions in order to promote adaptation in other places where such conditions are new due to climate change (eg., maximizing water use for irrigation in dry regions, floating houses in flooded regions). Moreover, they could be offered by the CTCN as technical solutions to requests for technical assistance, which would have to be adapted or enhanced in accordance with national circumstances.
 - f. Improving national systems of innovation;
- 3. Supporting the implementation of Article 10 – fully realizing technology development and transfer to improve resilience and reduce GHG emissions (Article 10.6)
 - a. The provision of enhanced financial and technical support for the implementation of the results of technology needs assessments (Para 67b);
 - b. Supporting developing countries at different stages of the technology cycle (10.6);
 - It is worth noting the aspect of transparency of support under the CTCN, regarding how requests for assistance are forwarded by the Centre and provided by Network members in response to requests of technical assistance by countries through their National Designated Entities (NDEs).
 - Support to developing countries should take into account the needs and gaps identified in Biennial Update Reports.
 - Prioritizing technology needs which are reiterated through requests for technical assistance.
 - c. Linkages between the Technology Mechanism and the Financial Mechanism (67b);
 - d. Encouraging the development and diffusion of technologies that allow for co-benefits between mitigation and adaptation(Article 10.6)
 - e. Informing the global stocktake on efforts related to support for developing countries (10.6).

Paper no. 2: Canada on behalf of Australia, Japan, New Zealand, Norway and the
United States of America

Submission on the Technology Framework

Australia, Canada, Japan, New Zealand, Norway and the United States of America, in response to the invitation by the Subsidiary Body for Scientific and Technological Advice at its 44th session (SBSTA-44), make the following submission “... on the elaboration of the technology framework, including the content, features and characteristics, the purpose and the themes of the technology framework...”

Our views on the context, features and characteristics of the technology framework are accurately and sufficiently captured within the Annex to the SBSTA-44 conclusions. Furthermore, we wish to reiterate our position that we see great value in having a concise document – putting forth an efficient and focused framework - that provides high-level strategic guidance to the Technology Mechanism for the coming years. We, therefore, focus here on: (a) Purpose, and (b) Key themes of the new Technology Framework.

Purpose

- Facilitate the pursuit of the long-term vision in Article 10 of the Paris Agreement (*Article 10.1*)
- Provide overarching strategic guidance to the work of the Technology Mechanism (*Article 10.4*)

Key Themes

In light of Article 10 of the Paris Agreement, the relevant decision text in 1/CP.21, and recent discussions among Parties, four thematic areas emerge as encompassing the vision and intent of what the new Technology Framework can facilitate and deliver.

1. Strengthening cooperative action (*Article 10.2*)

- a. Involving private sector (*Annex to SBSTA-44 conclusion*)
- b. Involving civil society (*Annex to SBSTA-44 conclusion*)
- c. Collaborating with other thematic bodies under the Convention (*Annex to SBSTA-44 conclusion*)
- d. Leveraging activities outside UNFCCC (*Annex to SBSTA-44 conclusion*)
- e. Knowledge exchange on technology information (*1/CP.21, para 67c*)

2. Accelerating, encouraging and enabling innovation (*Article 10.5*)

- a. Improving national systems of innovation (*previous Technology Executive Committee work*)
- b. Coordinating with private sector stakeholders (*Annex to SBSTA-44 conclusion*)
- c. Advancing collaborative approaches to R&D (*Article 10.5; 1/CP.21, para 66a*)

3. Building capacity for climate-related technologies (*1/CP.21 para 66b, 67d*)

- a. Developing and enhancing endogenous capacities for climate-related technologies (*1/CP.21, para 66b*)
- b. Providing technical assistance and capacity building through the work of Technology Executive Committee and Climate Technology Centre & Network (*1/CP.21 para 67b; Annex to SBSTA-44 conclusion*)

4. Technology Needs Assessment (TNA)/ Paris implementation

- a. Undertaking and updating TNAs and technology action plans (TAPs) and using them to inform ambitious mitigation contributions, undertakings in adaptation and, ultimately, bankable projects and project proposals, with priority to be given to TNAs and TAPs that are designed to help a Party implement its contributions and undertakings (*1/CP.21, para 67a*)
- b. Enhancing enabling environments (*1/CP.21, para 67d*)
- c. Facilitating access to public sector finance and continuing to build and improve linkages between the Financial Mechanism and the Technology Mechanism (*Article 10.6; 1/CP.21, para 67b*)
- d. Mobilizing and accessing private sector investment (*1/CP.21, para 67b, Annex to SBSTA-44 conclusion*)

Paper no. 3: Costa Rica on behalf of the Independent Association for
Latin America and the Caribbean

Submission on the Technology Framework

September 2016

A. Introduction

1. The Paris Agreement, in its Article 10, acknowledges the importance and relevance of the development and transfer of technology and urges developed countries to strengthen their cooperation with developing countries in this matter. Article 10.4 establishes the technology framework to provide overarching guidance to the work of the technology mechanism in promoting and facilitating enhanced action on technology development and transfer in order to support the implementation of the Paris Agreement, in pursuit of the long-term vision referred to in Article 10.1.

B. Mandate

2. Decision 1/CP.21, paragraph 67, requested, in accordance with Article 10.4, that the Subsidiary Body for Scientific and Technological Advice initiate at its 44th session (May 2016) the elaboration of the technology framework, with a view to report on its findings to the Conference of the Parties.

C. Purpose of the submission

3. This submission of AILAC will focus on the proposed objective, characteristics and key areas of work of the technology framework. This proposal has been developed bearing in mind the objective of accelerating and making more effective the innovation that will enable economic growth and sustainable development, while strengthening the cooperation for the development and transfer of scalable and replicable technology, respecting human rights and promoting gender equality and intercultural exchange.

D. Areas of work of the technology framework

4. AILAC is of the view that in developing the technology framework we should take as a starting point the four areas identified in paragraph 67 of decision 1/CP.21:
 - (a) The undertaking and updating of technology needs assessments, as well as the enhanced implementation of their results, particularly technology action plans and project ideas, through the preparation of bankable projects;
 - (b) The provision of enhanced financial and technical support for the implementation of the results of the technology needs assessments;
 - (c) The assessment of technologies that are ready for transfer;
 - (d) The enhancement of enabling environments to the development and transfer of socially and environmentally sound technologies.
5. In addition, other areas of work to be included are:
 - Fostering and triggering innovation, through new collaborative approaches for research and development, as well as for demonstration, promotion and deployment of new technologies;
 - The promotion of inventories and databases of local, national and regional technologies that enable the sharing of best practices and experiences among developing countries (south-south cooperation) and from developing to developed countries;
 - The promotion of relevant technologies for adaptation, taking into account the vulnerability analysis and assessments, as well as other relevant experiences;
 - The most effective use of National Designated Entities for the CTCN activities and to create synergies with other UNFCCC focal points in order to trigger better national/local coordination;
 - The engagement of all relevant stakeholders such as academia, research centres, private sector, civil society, and indigenous peoples in the decision-making process related to the development and transfer of technology that is environmentally sound;

- The enhancement of technology transfer and innovation through the financial mechanism;
- The improvement of well-timed technology transfer in line with the needs of developing countries;
- The enhancement of capacities for domestic technology development in developing countries;
- The strategic linkage between innovation for climate change and economic growth and sustainable development.

E. Considerations

6. In enhancing the technology mechanism and providing overarching guidance, the technology framework must consider:
 - Ways to improve the coordination among relevant bodies under the Convention in order to create synergies and avoid duplicated work;
 - Options to better balance the development and transfer of technologies for mitigation and adaptation;
 - Experiences and lessons learned in relation to the implementation of Article 4.5 of the Convention and decisions 4/CP.7, 3/CP.13 and 4/CP.13;
 - The work already undertaken by the Technology Executive Committee and the Climate Technology Centre and Network and how to further improve it;
 - Options to link current and future technology needs with the implementation of NDCs;
 - To link the TNA process to national sustainable development plans;
 - To link more effectively the work and progress of the three components of the means of implementation;
 - Ways to harness indigenous knowledge and enhance endogenous capacities;
 - Other relevant work done under and outside the Convention.

F. Concluding remarks

7. In elaborating the technology framework, Parties should consider the progress achieved so far in the activities related to the development and transfer of technology while taking into account the challenges ahead of us for the implementation of the Paris Agreement such as the need to accelerate the pace of deployment of new technologies and the importance of developing endogenous technologies. The technology framework must add value through high-level guidance to the existing institutions and promote a strategic approach for the compliance of the Paris Agreement, with a long-term vision, be dynamic and innovative, as well as support the implementation of NDCs.

Paper no. 4: Democratic Republic of the Congo on behalf of the least developed countries

**Submission by the Democratic Republic of Congo on behalf of the Least Developed Countries Group
on**

The Technology Framework under Article 10, paragraph 4 of the Paris Agreement

In 2015, 196 parties to the Convention came together for the UN Climate Change Conference in Paris 30 November - 12 December and adopted by consensus the Paris Agreement, aimed at holding the increase in global average temperature to well below two degrees Celsius, and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels. Among others, one of the key factors in achieving this is the effective implementation of the Technology Mechanism that was established by COP16 in Cancun, Mexico in 2010. However, it was observed that the technology mechanism was not effective in delivering expected results hence the proposal to have it enhanced.

The Paris Agreement established a Technology Framework to provide overarching guidance to the work of the Technology Mechanism in promoting and facilitating enhanced action on technology development and transfer. This Framework is meant to support the implementation of the Paris Agreement, in pursuit of the long-term vision on the importance of fully realising technology development and transfer, in order to improve resilience to climate change and to reduce greenhouse gas emissions.

The Technology Mechanism which was established by COP16 in Cancun, Mexico was meant to improve on progress in delivery of environmentally sound technology to developing countries in accordance with the provisions of the Convention.

Most of the technologies required by the developing countries are in the hands of the private sector of the developed countries. Acquiring these technologies one requires providing incentives to the patent owners or procuring technology on market terms and conditions from the owners. It is clear that the Least Developed Countries have neither the resources nor the capacity to acquire these technologies at market terms and therefore the provision of the technologies to the Least Developed Countries should be in accordance with articles 4.3, 4.5 of the Convention guided by Article 4.9.

In the course of implementation of the COP decisions guided by existing documents and provisions, parties feel that there are some gaps concerning the implementation of the Technology Mechanism that need to be fixed. To address these gaps parties agreed to have the Technology Framework to provide overarching guidance to the work of the Technology Mechanism in promoting and facilitating enhanced action on technology development and transfer. Parties observed that there is need for further elaboration of the content, features, characteristics and the purpose of the Technology Framework, to enable it to realise its intended objectives.

Purpose of the Technology Framework:

- To provide overarching guidance to the work of the Technology Mechanism in promoting and facilitating enhanced actions on technology development and transfer
- To play a strategic role in improving the effectiveness and efficiency of the work of the Technology Mechanism by bringing on board all key players (financiers, technology owners, governments, businessmen and users) to ensure that climate technology needs of developing countries are met, taking into account the specific situation of LDCs.
- To improve access to technology and relevant finances including capacity building needs for LDCs
- To strengthen synergies and linkages with the key institutions, both within and outside the Convention, for effective delivery

Contents of technology framework

Technology Framework should encompass:

- Components of the Technology Mechanism with their respective mandates and functions
- Available climate change related financial institutions/sources within and outside the convention and their areas of funding preference (adaptation, mitigation and capacity building)

- Map and records of existing climate technologies including owners and producers, from both the South and the North, including conditions for accessibility.
- Mechanism and guidelines for operation
- Inventories of technology needs of developing countries including LDCs
- Enhanced support for the outcomes for technology need assessments (TNAs). Such as dedicated financial resources and technical capacity for transfer of identified technologies
- Terms and conditions for accessing existing technologies including the respective costs
- Documented experiences and best practices in implementing climate technologies in developing countries
- Plan and work programme for addressing climate needs of developing countries, including financial implications

Features

- It is not a physical institution or place, but an arrangement to enhance delivery of social and environmentally sound technologies.
- It is not a stand-alone but an establishment that builds on the existing Technology Mechanism
- It should be clear and easy to understand and apply.

Characteristics

- It should create an enabling environment for enhanced access to and implementation of environmentally sound technologies, including relevant financial and capacity building support
- It should build on and enhance the gains already made by the Climate Technology Center and the Technology Executive Committee (value addition and improvement)
- It should cater to the interests of all stakeholders, taking into account specific needs of LDCs (inclusive)
- It should be country-driven, gender responsive and consider differentiated vulnerability of parties
- Simplified and fast mechanism for accessing relevant climate technology

SUBMISSION BY INDIA**Views from the Government of India on SBSTA Agenda Item No 4: Technology Framework under 10 (4) of the Paris Agreement****Background of the submission**

The Twenty-First Conference of Parties (COP 21) in its decision 67, requested the Subsidiary Body for Scientific and Technological Advice (SBSTA) to initiate, at its forty-fourth session the elaboration of the Technology Framework (TF) established under Article 10, paragraph 4, of the Agreement. Decision 1/CP.21, paragraph 67 provides a basis to define the key themes of the technology framework. In addition, the FCCC/SBSTA/2016/L.8, containing a compilation of the Parties' initial views on the TF, based on the discussions during SBSTA on Agenda 4, defined additional areas that may be explored as possible key themes of the technology framework. The SBSTA further invited Parties to submit their views on the elaboration of the TF, including its content, features and characteristic, the purpose and themes.

Our submission to the same is as follows:

Guiding Vision

The Paris Agreement acknowledges the importance of financial and technological support for achieving the outcomes therein. However, the Parties to the convention are all at varying stages of economic, social and technological development. Thus, they contribute differentially to the global GHG emissions (present and future scenarios), have different development priorities, and are differentially vulnerable to climate impacts. Most notably for vulnerable communities, there is a disparity between the high cost of climate technologies and their economic level. Further, while the existing Intellectual Property Right (IPR) framework encourages Research and Development, it tends to limit 'spillovers' of technology to communities/ countries where finance is a constraint.

Thus, it is necessary to implement an integrated approach between technology and climate finance so as to support the development and transfer of socially and environmentally sound technologies. The *Technology Framework* that is established in paragraph 4, Article 10 of the Paris Agreement to provide an overarching guidance to the Technology Mechanism (TM) with the aim to enhance action on technology development and transfer, should be practical and result-oriented in order to be able to realize the long-term vision referred in paragraph 1, Article 10 of the Paris Agreement.

The structure and guiding principles of the *Technology Framework* are discussed below:

A. Context/ Features/Characteristics**Context**

The technology framework has been established to facilitate the transformational change envisioned in the Paris Agreement. It needs to provide a strategic direction to achieving enhanced action on technology development and transfer as set out in Article 10 of the Paris Agreement.

The framework should support a long-term strategic link with the Nationally Determined Contributions. The framework should take cognizance of the lessons learnt through implementation of the technology transfer framework, and the work already done by the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN).

Features / Characteristics

The framework should be broad based and promote an integrated (co-address technology, finance, capacity-building, enabling environments in developed countries), inclusive (promote citizen-involvement and stakeholder consultations), result-oriented and comprehensive (covers sustainable development, gender issues, global action, etc.) approach to facilitate development and access to technology. Where relevant, the framework could explore and establish synergies

with other multi-lateral / bilateral mechanisms and domestic policies related to trade and investment with the objective to enhance technology development and transfer objective of the Paris Agreement under the Convention.

The framework should also allow for flexibility to respond to changes over time. The databases generated and the networks/ institutions already established through the TEC and CTCN should be recognized and carried forward to the technology framework with up-grades, wherever required.

B. Purpose

The framework should facilitate realization of the Nationally Determined Contributions in line with the national developmental priorities. In doing so, the framework would provide over-arching guidance to enhance the effectiveness and efficacy of the technology mechanism in facilitating enhanced actions on technology development and transfer by:

- Supporting identification of priority technology needs
- Development of endogenous capacities for technology development
- Facilitating access to climate technologies, including those at the early stages of development
- Establishing linkages with the Financial Mechanism.

C. Themes

Based on decision 67/CP.21 and the conclusions adopted by SBSTA Plenary held on 26th May 2016, the following are identified as the key themes of the technology framework. An elaboration of these themes has also been provided.

I. Technology Needs Assessments (TNAs) and their translation to Technology Action Plans (TAPs) and bankable projects

- Though some TNAs have already guided project implementation through CTCN, there is a need to scale-up (both in terms of number as well as nature of projects) the process of translating Technology Needs Assessments (TNAs) into requirement for implementation, through a strengthened CTCN.
- It has already been acknowledged that technology needs of each country are different than the other, and this varies depending upon its present stage of industrial, economic and human development, as well as its developmental priorities. The objectives of the TF and TM should be guided to address this variation. There is greater acknowledgement that technology transfer should be tailored to the specific needs of the recipient country and that the TM should support developing countries leap-frog to the use of low-carbon best available technology for mitigation and adaptation. Therefore, the TM must evolve to enhance action in relation to the enhanced ambitions of the developing countries in response to the Paris Agreement. The TM must work to cater to the heightened technology needs of the developing countries in response to their enhanced climate change ambitions and developmental aspirations.
- CTCN may evolve to assume a more empowered and active role in translating TNAs/ TAPs into bankable projects. The CTCN may be equipped to assess the bankability of a project and suggest the most suitable financial instrument (eg. soft loans, risk guarantee funds, viability gap funds) and the financing party/agency (if not already identified) to address the financial viability gap in the projects seeking funding agencies/partners. The CTCN may facilitate access (including information and affordability) to proprietary technologies. In doing so, the CTCN may also create incentives for the countries/ private parties to share their technologies by encouraging commercial benefits arising out of transferring out of the technology.
- For assessment of bankability of project ideas, the horizon considered by the CTCN for assessment of a project's technical and financial viability should be long enough to allow for market maturation. Where projects are financially viable in the long-term, but are faced with barriers to implementation in the short-term, the framework could also equip the TM to address any short-term financial viability gap that may act as a barrier to project implementation and/or technology dissemination.

- TEC could play a supporting role to CTCN in facilitating developing countries access proprietary climate friendly technologies (especially those which are held by the private sector) and to engage the companies holding proprietary technologies in a practical operationalization mechanism in order to facilitate their participation in the TM.
- Where project activities do not accrue any (or direct) quantifiable returns, the TF may guide the TM to be perceptive to the nationally determined un-quantifiable benefits to communities, livelihoods, global/local environments and economies.

II. Enhancing financial and technical support for implementation of TNAs and facilitating access to climate technologies

- Access (IPR) and Affordability (finance) are the two key issues limiting transfer of technology, especially to the developing countries. While other challenges like system constraints, inadequate standards, codes and certifications in the host countries can be addressed through capacity building (either as a stand-alone theme or as a component of other themes), addressing the access and affordability challenge requires establishment of a strong linkage between the Financial Mechanism and the Technology Mechanism.
- Acknowledging the obligations under the TRIPS agreement, and the role of IPRs in promoting investments in Research and Development, the TF should recognize the financial implications that may result from transfer of technology from one member state to another. The framework should further address the financial constraint of the developing country Parties in being able to access and afford such technologies.
- The framework should include provisions to provide financial and/or technical assistance to developing country Parties for project/ programme implementation, in addition to:
 - identification of innovation needs for specific applications;
 - technology innovations, including basic and/or applied research;
 - technology development, early product prototyping, early deployment and commercialization, and first few pilot projects utilizing climate friendly technologies; and replication of successful technology transfer models
 - market-focused product development or market creation activities
 - capacity building of all stakeholders including private sector involved in innovation
- In doing so, the framework:
 - Should acknowledge that lack of access to viable financial options is a barrier for implementation and adoption of climate friendly technologies in developing countries, and that a financial shortfall could affect adoption of best available technologies in developing countries
 - Should acknowledge that technology transfer occurs through a number of pathways⁵ depending upon the developmental stage of the technology and its market; and that all such pathways may need to be supported through the TM
 - Should ensure that the financing needs of the technology mechanism are catered to adequately.
 - Could establish a clear linkage between the Technology Mechanism and the operating entities of the Finance Mechanism (GFF/GCF) and others; and leverage them to promote investments in projects that lead to transfer of technology
 - May facilitate a mechanism of accessing proprietary technologies – in such a way that innovation is fostered, but does not impede diffusion of climate friendly technologies
 - May promote project prototypes which are replicable and sustainable, while allowing the developing parties to customize the technologies as per their specific needs and circumstances

⁵ eg. Direct purchase, Foreign Direct Investments, Joint Ventures, Co-production Agreements etc.

- Should safeguard the sovereign rights of a country over its activity data, including limiting the MRV, if any, only to the projects implemented with support from the TM/FM.
- Apart from supporting individual projects and programmes through the CTCN, the financial mechanism could provide for a special (annual) fund to (each) developing country Party which would be ear-marked for disbursement as soft loans to climate friendly projects through a domestically established National Designated Entities. This would off-load the burden from CTCN to evaluate each individual project, and will also enable country ownership of the finance provided. This would be especially advantageous in cases where project developers may not be willing for MRV by a foreign party, and where CTCN's services (match-making to technology provider and/or financial advisory) may not be required. This would also help in shortening the project timeline.
- The funds released as soft loan through the above mechanism may use criteria to establish the debt equity ratio of the project. For projects supported by the CTCN, the financial mechanism could be leveraged to (fully) finance access to the proprietary technologies (either as a soft loan or a grant). For projects supported by the CTCN, but not involving access to proprietary technologies, the quantum of financial support provided should be adequate to make the project bankable, and, terms and conditions of the financial support should be framed in consultation with the project developer such that it enables the project to access alternative financing sources in the long-term.
- Further, the TF should continue to work on the principles adopted by the CTCN, i.e. it should enable provision of technical assistance free of charge to developing countries via request sent through (or approved by) National Designated Entities, for adaptation/ mitigation initiatives implemented by Public/ Private/ Academic/NGO sector at national/ regional/ local level involving technologies at all stages of technology cycle.
- The *Technology Framework* could also provide for the FM to be able to provide risk cover to financial institutions (eg. rural banks) that extend credit to end-users for uptake of certain TM empaneled technologies) in certain local/ regional markets. (eg. The FM could provide risk cover to a rural bank for extending credit to rural households for installation of solar home systems).

III. Assessment of technologies that are ready for transfer

- Recognizing that access to information is the first step in any programme for technology development/ transfer, the *Technology framework* should ensure all stakeholders have access to information relating to climate friendly technologies. This may include information on performance, efficacy, reliability and developmental stage of the technology; and cost implications of technology development, transfer and deployment. Additionally, case studies for successful technology implementation and transfer, may be documented and methods/ models / tools to assess mitigation and adaptation may be shared. In this regard, Parties may be encouraged to make their contributions to enhance information regarding such technologies.
- The framework should encourage capacity-building initiatives. Sectoral capacity-building workshops that showcase best available technologies in the sector could be one of the means for knowledge sharing and capacity building on available technologies. This could be particularly helpful for countries where technological development has been slow and decision makers are not aware of the best available technologies.

IV. Enhancement of enabling environments in developed countries for and the addressing barriers to the development and transfer of socially and environmentally sound technologies and Intellectual Property Rights

- In order to provide an enabling environment for transfer of technologies, the framework may:
 - Provide regulatory framework that fosters long-term capital intensive investments in technologies in developed countries.
 - Be stable and sustained – ensure consistency with the long financing horizons typical of climate change projects
 - Be clear and robust to attract developers and financiers.

V. Enhancing endogenous capacities and capacity-building related to climate technology development and technology transfer

- Endogenous capacity building needs to be acknowledged and addressed simultaneously with “hard” technology transfer. It should be recognized as a cross-cutting issue and should be a component of other themes of the *Technology Framework* by default.
- The framework should explicitly characterize capacity-building as referring to:
 - Knowledge and skill sharing on developing new technologies, adapting the transferred technologies to their own needs, and managing technologies (implementation, maintenance, monitoring aspects)
 - Financing technologies
 - Strengthening of institutional capacities
- Financing institutions could be capacitated to evaluate climate friendly technologies on an equal footing with other technological options.
- Additionally, the entitlement and role of recipient Parties in modifying, adapting and improving the transferred technologies in their endogenous capacities should be recognized.

VI. Private sector involvement and link with public sector efforts

- It has been recognized that public sources of financing are not adequate to pursue the long term vision envisaged in paragraph 4, Article 10 of the Paris Agreement. It is thus necessary that the framework should work to enhance access to finance not only from Public sector, but also from Private sector sources and through Public-Private engagements.
- The framework should take cognizance of the fact that most technologies are privately held, and therefore, private sector contribution to improving affordability of such technologies must complement public sector efforts in achieving the desired outcomes of the Paris Agreement.
- Developing innovative means of engaging the private sector in technology transfer could help enhance finance channels for climate change technologies. Some of the means that could be leveraged for financing technology transfer include:
 - Linking climate change technology transfer programmes with other priority areas to increase access to financing options, seed financing, concessional loans.
 - Credit enhancement programmes like guarantees, temporary interest subsidies, tax holidays, tax subsidies etc.
 - Build-Operate-Transfer Model, Public-Private-Partnership, Export Credit Guarantees

The framework may encapsulate all such means of financing.
- Developed country Parties may encourage their private sector players to participate in technical co-operation with their counter-parts/ subsidiaries in developing countries under the umbrella of TF.

VII. Harnessing indigenous knowledge

- Recognizing that indigenous communities hold traditional knowledge, particularly in areas of ecosystem conservation, health, agriculture and water conservation, the framework should enhance documentation and registration of traditional knowledge.
- *Technology framework* should enhance exploration of interface between science and indigenous knowledge, and may provide a legal framework for development, protection and commercialization of technology based projects such that it allows for:
 - Empowering communities
 - Improving livelihoods

- Accruing benefits to national economy

VIII. Citizen involvement and enhancing engagement of and co-ordination with stakeholders in technology issues

- The framework should acknowledge that community has a role to play in the formulation of project proposals and requests for assistance, and therefore broad local participation in planning, design and decision making may be encouraged in line with various ecological, social and economic linkages.
- The *Technology Framework* should encourage involvement of stakeholders during the complete project cycle.

VIII. Accelerating, encouraging and enabling innovation, collaborative approaches to RD&D, and the provision of support

- Technology partnerships, technology co-operation and co-ordination between stakeholders could form an effective mechanism for enabling technology development and access. The framework should encourage multi-lateral research, development and dissemination under its umbrella.
- The framework could encourage Parties to organize regional workshops for identification of common regional priorities, with regard to the intra-regional variation in the level of economic development of each country. This would be particularly helpful in knowledge sharing and in subsequent negotiations defining the scope and priority areas for the TM.
- The framework should enhance flow of funding into developing country Parties for research and development of new climate friendly technologies – both for adaptation and mitigation. The framework may also promote developed Parties to provide technical resources to engage in joint R&D projects. The framework may also promote enhanced private funding from Annex 1 Parties to developing country Parties for clean energy R&D projects.
- The framework may support international exchange programmes between educational institutions, research agencies, corporate organizations and State-run facilities. The framework could promote identification and establishment of linkages between TM and '*Mission Innovation*'.

IX. Development and Implementation of NDCs, noting that the TF should link and enhance coherence between the TNA and the development and implementation of NDCs and climate resilient and low-emission development strategies

- The *Technology Framework* should enable the TM to support the implementation of the NDCs. Further, the information networks established through the TM should feed into the Parties' TAPs, thereby enabling them to further enhance their NDCs in response to increased access to technology.

X. Possible ways and means to enhance cooperation with relevant conventions and intergovernmental processes

- Multi-lateral / Bilateral treaties and domestic policies related to trade and investment and IPRs need to be assessed for their impact on transfer of technologies for climate change mitigation and adaptation. The lacunae thus identified may be taken up for consideration at an appropriate fora.
- The *Technology Framework* has a direct synergy with SDG #13. Article 13 a. explicitly discusses provision of climate finance to developed country parties. Enhancing international cooperation for enhancing access to clean energy technologies and mitigation & adaptation to climate change is discussed in SDG #7 and 2 & 11 respectively. Promotion of development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favorable terms and establishment of a global technology facilitation mechanism is discussed in SDG#17.

➤ D. Updates

- A review of the *Technology Framework* should be a part of the global stocktake defined under Article 14 of the Paris Agreement. The updates/ revision to the TF would address the gap in efforts related to support on technology development and transfer for developing country Parties.
- Periodic assessment of TM, particularly on its adequacy in supporting implementation of the Paris Agreement on matters relating to technology development and transfer may also be considered for defining the scope of periodic update of the *Technology Framework*.

India reserves the right to make additional submissions and present further views on the relevant issues connected to the Technology Framework under the Paris Agreement

➤ E. References

- Popp, D., 2008. Policy Brief: International Technology Transfer for Climate Policy. , No. 39/2008. Centre for Policy Research, Maxwell School of Citizenship and Public Affairs, Syracuse University.
- UNFCCC, Conclusions on Enabling Environments: A Technical Paper prepared under the auspices of the UNFCCC Expert Group on Technology Transfer by Richard Bradley, EGTT member
- UNFCCC, 2006. Innovative options for financing the development and transfer of technologies, Technical paper UNFCCC FCCC/TP/2006/1, 28 August 2006.
- UNFCCC, 2006. Recommendations of the Expert Group on Technology Transfer for enhancing the implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention: Note by the Chair of the Expert Group on Technology Transfer. Subsidiary Body for Scientific And Technological Advice, Twenty-fourth session, Bonn, 18–26 May 2006
- Murphy, D., Ham, J.V., Drexhage, J., 2005. Climate Change and Technology: Summary. Published by the International Institute for Sustainable Development, August 2005.
- UNFCCC. TEC Brief #6: Enhancing Access to Climate Technology Financing, Technology Executive Committee.
- IPCC. Summary for Policymakers: Methodological and Technological Issues in Technology Transfer. A Special Report of IPCC Working Group III, Intergovernmental Panel on Climate Change
- UNFCCC, 2016. Summary of the thematic dialogue on enablers and barriers to South-south cooperation on technologies for adaptation, United Nations Campus, Bonn, Germany held on 6th April 2016. Technology Executive Committee, May 2016.
- Vazquez, K. C., 2016. Background paper prepared for the Technology Executive Committee; South-South Cooperation in Technologies for Adaptation for Water and Agriculture. United Nations Framework Convention on Climate Change, 18 March 2016.

Paper no. 6: Indonesia

SUBMISSION BY INDONESIA

Pursuant to the conclusion adopted by the Subsidiary Body for Scientific and Technological Advice at its forty-fourth session in May 2016 particularly agenda item 4, the Government of the Republic of Indonesia herewith submits its views on **The elaboration of the technology framework, including the content, features and characteristics, the purpose and the themes of the technology framework in order for the secretariat to prepare a compilation of Parties' submissions for consideration at SBSTA 45.**

I. CONTENT, FEATURES AND CHARACTERISTICS

- Technology framework should cover objectives of the supports to the developing country Parties, as follows: a) enhance technology development, research and development activities; b) provision of financial and technical assistance; c) update of the technology development and transfer needs; and d) enabling environment for technology transfer and development.
- Stressing the importance of the linkages between technology mechanism and financial mechanism in which technology mechanism under UNFCCC (i.e CTCN) provides active facilitation to developing countries in need of financial support from the financial mechanism.

II. PURPOSE AND THEMES

- Technology framework should guide the identification of innovative technology, financing mechanism and financial resources

Paper no. 7: Mali on behalf of the African Group

**Submission by the Republic of Mali on behalf of the African Group of
Negotiators
on
The Technology Framework
15 September 2016**

The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its 44th session, in response to decision 1/CP.21, paragraph 67, and in accordance with Article 10.4 of the Paris Agreement, invited Parties to submit an “elaboration of the technology framework, including the content, features and characteristics, the purpose and the themes of the technology framework”. In response to this call the African Group submits as follows:

1. Long-term Vision

The long-term vision is as outlined in Article 10.1 of the Paris Agreement, which is to improve resilience to climate change and to reduce greenhouse gas emissions.

2. Purpose

In accordance with Article 10.4 of the Paris Agreement, the purpose of the technology framework is to provide overarching guidance to the work of the Technology Mechanism in promoting and facilitating enhanced action on technology development and transfer. In this regard, Parties would also need to be conscious of the framework when providing guidance to, giving mandate to and evaluating the Technology Mechanism.

3. Principles/Values

Some of the principles that should govern the technology framework are:

Effective

Allows for the Technology Mechanism to be more effective in delivering its mandate in line with the long-term vision.

Efficient

Provides for efficient technology development and transfer of climate technologies.

Forward-looking

Durable and be able to support the implementation of the Paris Agreement over time.

Responsive

Able to respond to the priorities of climate technology development and transfer needs of Parties, which may change over time.

Transformational

Able to deliver transformational deliverables which will result in a more resilient global community and carbon neutral global economy. In this regard, the technology framework should be able to provide for progressive NDCs of Parties to the Paris Agreement.

4. Themes for the Technology Framework

All themes/strategic areas of the technology framework shall be guided by Article 10.2 of the Paris Agreement that is the strengthening of cooperative action on technology development and transfer.

Research, Development, Demonstration and Diffusion, and Innovation

- **Identification of technology gaps:** this should, inter alia, identify suitable technologies, including through indigenous knowledge, to meet countries’ needs for building resilience and/or reducing of their emissions in a manner that supports sustainable economic development.
- Support for National and Regional Centres of Innovation for:
 - Promotion and facilitation of collaborative research; and
 - Development, demonstration and diffusion (deployment and dissemination) of new technologies.

Technology Information

- **Technology Needs Assessments and Action Plans:** these should support the implementation and periodic resubmission of NDCs that are progressive in nature, for both adaptation and mitigation.
- **Technology Assessments:** this is suitable for ensuring that technologies, whether newly developed or transferred, are suitable for society and environment, thereby supporting climate change action and sustainable development (environment, economic and social pillars).

Support for Implementation

- Facilitate the provision of adequate, reliable financial support for the Technology Mechanism
- Strengthening the Technological Mechanism for support of the Paris Agreement (enhanced technology development and transfer)
- Support National Designated Entities (NDEs) to effectively and efficiently support climate technology development and transfer in/to/from their countries
- Address barriers and create appropriate enabling environments for technology development and transfer
- Facilitate financing for the implementation of technology needs of developing countries

Monitoring and Evaluation

- Provide guidance to the reporting of the Technology Mechanism to the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA).
- Provide for the periodic assessment of the effectiveness and adequacy of the support provided to the Technology Mechanism in supporting the implementation of the Agreement on matters relating to technology development and transfer. There may be a need to set the frequency of the periodic assessment, wherein the African Group sees the need for this assessment to be synchronised with the global stocktake process.
- Provide for the systematic monitoring (and evaluation) of the implementation of technology development and transfer by Parties, including for the reporting thereof (which may be synchronised with other reporting processes) and for a global synthesis/assessment thereof. This may feed into the global stocktake process.

Paper no. 8: Republic of Korea

The Republic of Korea Submission on the technology framework under Article 10, paragraph 4 of the Paris Agreement

September 2016

The Republic of Korea welcomes the opportunity, at the invitation of the SBSTA, to submit its views on the elaboration of the technology framework, including on content, features and characteristics, purpose and themes of the technology framework, which was established under Article 10, paragraph 4, of the Paris Agreement (FCCC/SBSTA/2016/L.8).

Korea believes that the design of the technology framework is a key stepping stone to linking the long-term vision of technology development and transfer of the Paris Agreement (article 10.4) and the Technology Mechanism serving the Paris Agreement (article 10.3) and to drawing out the direction, work scope, and the depth of the coordinating role of Parties' strengthened cooperative actions under the Technology Mechanism, which serves the Paris Agreement.

With this belief, and on the grounds of the compilation of Parties' initial views on the elaboration of the technology framework as contained in the annex of the FCCC/SBSTA/2016/L.8, Korea presents its views in the three following sections: 1) background (context/references/relation to existing institutions/characteristics), 2) purpose, position and role of the technology framework, and 3) key themes of the technology framework.

1 Background (context/features/characteristics)**1.1 Context**

Korea shares the parties' compiled view that the technology framework should be designed in consideration of the transformational changes that the Paris Agreement intends to bring into fruition and its long-term vision on technology development and transfer.

1.2 References

Korea is of the parties' compiled view that the content of the technology framework should be informed by the list of references enumerated in the annex, and in addition:

- The UNFCCC, the Paris Agreement, and major Conference of Parties (COP) decisions on technology development and transfer;
- Experiences and activities undertaken under the Technology Transfer Framework (TTF);
- Past, ongoing and future work of the Technology Executive Committee (TEC) and the Climate Technology Center and Network (CTCN);
- Work under and outside the UNFCCC related to climate technology, particularly regarding the technology cycle and research development and demonstration (RD&D);
- Discussion on linkages between the Technology Mechanism and Financial Mechanism, and
- Other relevant work.

1.3 Characteristics of the technology framework

The technology framework should be short and concise to work as a lighthouse to the Technology Mechanism in terms of work scope and depth in post-2020 climate governance, in order to be complementary to the TTF. Yet, its elaboration should also be output/outcome/impact-oriented in consideration of the fact that assessment of the effectiveness of the Technology Mechanism will be carried out under the guidance of the technology framework. Also, the elaboration of the technology framework should be inclusive of such issues and concepts as sustainable development, gender issues, and global action for a comprehensive and unbiased approach. In addition, Korea is of the view that flexibility should be allowed to respond to future developments.

1.4 Relation between the technology transfer framework (TTF) and the technology framework

Korea is of the view that the newly established technology framework should add value into the TTF. The TTF was established to enhance the implementation of Article 4, paragraph 5, of the Convention in 2011 (Decision 4/CP.7, para 1). The TTF's five key technology themes of i) technology needs and needs assessments, ii) technology information, iii)

enabling environments for technology transfer, iv) capacity-building for technology transfer, and v) mechanisms for technology transfer have guided the Technology Mechanism. In 2007, four sub-themes were added to the fifth thematic pillar of mechanisms for technology transfer, these are i) innovative financing, ii) international cooperation, iii) endogenous development of technologies, and iv) collaborative research and development. Korea believes that the TTF has been and will continue working as a lighthouse to the Technology Mechanism in terms of work scope and implementing activities. Yet, Korea would like to recall that the establishment of the technology framework came from the recognition of both the limitations of and the aspiration for the enhanced implementation of the TTF to enhance implementation of article 4, paragraph 5 of the Convention. Accordingly, Korea is of the view that value addition by the technology framework should be intended in consideration of the current implemented initiatives, actions, and activities and the effectiveness of technology development and transfer of the Technology Mechanism in each of constituting themes of the TTF. Therefore, differentiation between the TTF and the technology framework can be devised as follows;

- The technology framework should promote and facilitate enhanced action on technology development and transfer in pursuit of the long-term vision of the Paris Agreement. Thus, the elaboration of the technology framework should consider the role of the Technology Mechanism in supporting the entire technology cycle, not only transfer and diffusion but also earlier stages, in contrast to the TTF whose focus has been laid on the transfer and diffusion stages.
- The themes of the technology framework should be elaborated upon in relation to the existing themes of the TTF in a comprehensive and balanced manner. This means that the themes of the technology framework should correspond to those of the TTF.
- The technology framework should avoid duplication of work with the TTF through the addition of new themes for new functions and through further specified elaboration of existing themes for specially focused, extended, or deepened functions, by which ongoing work can continue through this new framework.
- The technology framework should be complementary to the TTF by focusing on those activities that were indicated and suggested but not implemented under the TTF. The current level of implementation of the TTF is listed in the box on the next page.

Item	Summary of the TTF established in 2001 & Further recommendations made in 2007 (4/CP.7 Annex, 3/CP.13 Annex)	Item	TF themes suggestions by Korea
Technology Needs Assessments	<p>(Definition) Development of the basis for a set of country-driven activities/projects and programs to identify and determine the mitigation and adaptation technology priorities of Parties</p> <ul style="list-style-type: none"> - To encourage to undertake and update the TNA - To prepare a TNA synthesis report and post on the TT:CLEAR - To regularly share the results of TNAs and progress of the result implementation - To build capacities related to TNA completion 	Technology Needs Assessments	<ul style="list-style-type: none"> - To undertake and update TNAs - To enhance the implementation of TNA results, particularly Technology Action Plans (TAPs) and project ideas, through the preparation of bankable projects - To provide enhanced financial and technical support for the implementation of TNA results - To provide support for the linkage between TNA and Nationally Determined Contributions (NDCs) and the development of linkage methodology
Technology information	<p>(Definition) The means, including hardware, software and networking, to facilitate the flow of information between the different stakeholders to enhance the development and transfer of environmentally sound technologies</p> <ul style="list-style-type: none"> - To provide information on technical parameters, economic and environmental aspects of environmentally sound technologies - To provide information on the availability of environmentally sound technologies from developed countries - To maintain, update and further develop TT:CLEAR - To share experiences and lessons learned from utilizing TT:CLEAR - To share technical information - To link between TT:CLEAR and technical information providers, and the private sector - To offer training programs for the creation of national technology information databases - To provide information related to technology transfer in National Communications(NC) 	Technology information	<ul style="list-style-type: none"> - To assess technologies that are ready for transfer - To provide tailor-made information on climate technologies
Enabling environments	<p>(Definition) Government actions to create an enabling environment conducive to private and public sector technology transfer such as fair trade policies, removal of technical, legal and administrative barriers to technology transfer, sound economic policy, regulatory frameworks and transparency</p> <ul style="list-style-type: none"> - To prepare the technical study regarding trade issues, technology development endogenous technology development, barriers including market factors, successful cases, and the consideration by the SBSTA - To avoid trade and intellectual property rights 	Enabling environments	<ul style="list-style-type: none"> - To enhance enabling environments for and to address barriers to the development and transfer of socially and environmentally sound technologies

Item	Summary of the TTF established in 2001 & Further recommendations made in 2007 (4/CP.7 Annex, 3/CP.13 Annex)	Item	TF themes suggestions by Korea
	<p>polices restricting transfer of technology</p> <ul style="list-style-type: none"> - To share information on ongoing and planned publicly funded R&D activities, in which non-Annex I Parties can participate, through TT: CLEAR - To closely cooperate with public and/or private partnerships that focus on improving enabling environments - To integrate the objective of technology transfer into national policies and to enhance the interaction between governments and the private sector 		
Capacity building	<p>(Definition) A process which seeks to build, develop, enhance and improve existing scientific and technical skills, capabilities and institutions in Parties, addressing specific needs and conditions of developing countries and reflecting their national sustainable development strategies, priorities and initiatives</p> <ul style="list-style-type: none"> - To encourage capacity-building activities of other institutions to respond to needs identified by non-Annex I Parties in their TNA and NC - To request the secretariat to prepare periodic reports on capacity-building - To encourage Parties to establish/strengthen training organizations relevant to management and operation of climate technologies 	Capacity building	<ul style="list-style-type: none"> - To formulate and analyze comprehensive information on capacity-building activities on climate technology development and transfer - To collaborate with existing capacity-building organizations, institutions, and initiatives
Mechanisms for technology transfer	<p>(Definition) The mechanisms to facilitate the support of financial, institutional and methodological activities so as to enhance the coordination of the full range of stakeholders in different countries and regions, and to engage them in cooperative efforts to accelerate the development and diffusion, including transfer of environmentally sound technologies, and to facilitate the development projects and programs to support such ends</p> <ul style="list-style-type: none"> - Innovative financing - International Cooperation - Endogenous development of technology - Collaborative R&D 	<p>Innovative financing</p> <p>International cooperation</p> <p>Endogenous development and cooperative R&D</p>	<ul style="list-style-type: none"> - To consider the private sector participation, the linkage between the private and the public sector, and the linkage between the Technology Mechanism and the Financial Mechanism for enhanced financial support towards technology development and transfer - To increase synergistic collaboration with international organizations, mechanisms, initiatives in climate technology under and outside the Convention - To support RD&D information and endogenous capacity-building for an accelerative, innovative and cooperative intermediary role in international climate technology RD&D

Item	Summary of the TTF established in 2001 & Further recommendations made in 2007 <i>(4/CP.7 Annex, 3/CP.13 Annex)</i>		Item	TF themes suggestions by Korea
			Reporting of support	- To develop and update systematic reporting methodology on support provided and received on technology development and transfer
			Stakeholder	- To enhance engagement of stakeholders and support for stakeholders in the development and transfer of climate technologies

* *The words highlighted in red indicate the activities that the Technology Mechanism has not yet delivered strongly.*

2. Purpose, position and role of the technology framework

2.1 Purpose of the technology framework

Korea shares the parties' compiled view that the purpose of the technology framework is to provide overarching guidance to the work of the Technology Mechanism in promoting and facilitating enhanced action on technology development and transfer in order to support the implementation of this Agreement, in pursuit of the long-term vision referred to in Article 10, paragraph 4 of the Paris Agreement.

2.2 Positional relation of the technology framework

Korea shares its thoughts that the long-term vision stands as a fundamental layer, as referred to in Article 10, paragraph 1 of the Paris Agreement, and that the Technology Mechanism exists as an implementing and organizational layer in order to turn the long-term vision into reality. Here, Korea is of the view that the technology framework should steer the Technology Mechanism towards the long-term vision as a strategic layer and that must consider the improvement of effectiveness and efficiency of the work of the Technology Mechanism in the pursuit of this long term vision.

2.3 Role of the technology framework

Korea is of the view that the role of Technology Framework is to define 'where' the Technology Mechanism should work and 'what' should be undertaken by the Technology Mechanism. More specified explanation on this is as follows:

- Where : This relates to the technology framework's guidance on work scope (thematic areas of work) that draw the boundaries of the policy and implementing activities of the Technology Mechanism.
- What: This relates to the technology framework's guidance on the degree of the coordinating role (degree of cooperation in each thematic area) of the Technology Mechanism.

Regarding the creation of additional institutions besides the Technology Mechanism or additional organizations within the Technology Mechanism, Korea is of the same view as indicated in the annex that the determination of creating additional institutions or organizations exceeds the role of the technology framework. The authority to determine the creation of additional institutions resides with the COP to the UNFCCC or the COP serving as the meeting of the Parties to the Paris Agreement (CMA). Yet, Korea is open to the possibility that a new organization within the Technology Mechanism could be created as an implementing body assigned with new functions that the existing organizations of the TEC and the CTCN could not deliver through the widening or deepening of their current capacities. Thus, Korea is of the view that we should not preemptively include the stipulation of "no creation of additional institutions" in the technology framework. Of course, the establishment of a new organization should be under strict conditionality.

** The Technology Mechanism was established by the decision of the COP.*

3. Key themes of the technology framework

Korea shares the parties' compiled view that the four areas indicated by decision 1/CP.21, paragraph 67, provide a basis to define the key themes of the technology framework. On this ground, Korea suggests an array of themes that can constitute the technology framework under the existing themes of the TTF.

3.1 Technology Needs Assessments

- Theme **The undertaking and updating of TNAs**
Explanation: This is one of four areas stated by decision 1/CP.21, paragraph 67. There are countries who have not yet undertaken TNA process and the updating of the TNAs varies across countries. Korea is of the view that the undertaking and updating of TNAs is of importance for developing countries to fittingly implement their most needed technologies in changing circumstances related to national development and climate change.
- Theme **Enhanced implementation of TNA results, particularly technology action plans (TAPs) and project ideas, through the preparation of bankable projects**
Explanation: This is also one of four areas stated by decision 1/CP.21, paragraph 67. TNA results implementation is already an important issue that the Technology Mechanism has been considering

undertaking. The TEC has been preparing for the guidance to monitor and evaluate the implementation of TNA results and to diffuse success stories of TNA results. The CTCN is dedicating efforts to guide developing countries to make technical assistance (TA) requests on the basis of their TNA results. Korea is of the view that including this theme will galvanize implementation of TNA results.

- Theme **The provision of enhanced financial and technical support for the implementation of TNA results**
Explanation: Korea is of the view that it is time for developing countries to undertake the implementation of TNA results in a country-driven manner, assisted by the provision of enhanced financial and technical support as developing countries have undertaken TNA process and built up their capacity to do so in a country-driven manner through external financial and technical support. Such support will seed transformative change through technology development and transfer.
- Theme **The provision of support for the linkage between TNA and Nationally Determined Contributions (NDCs) and development of linkage methodology**
Explanation: Both the development and implementation of developing countries' NDCs are associated with technology development and transfer. Korea is of the view that the alignment of TNA and NDC processes and the linkage between TNA results and NDC implementation will trigger the accomplishment of mitigation and adaptation objectives and that for this TNA-NDC alignment methodology and actual implementation need to be considered.

3.2 Technology Information

- Theme **The assessment of technologies that are ready for transfer**
Explanation: Korea is of the view that Parties, regardless of whether they are from developed and developing countries, can voluntarily conduct assessments of climate technologies that are ready for transfer. The assessment results can work as a good source of North-South-South technology cooperation.
- Theme **The provision of tailor-made information on climate technologies**
Explanation: Korea is of the view that technology information has been well shared through means including, hardware, software and networking. As a step forward, Korea is of the view that a comprehensive information can be formulated and shared such the typology (classification system) of climate technologies, reports on successful TNA cases, and national climate technology policies. To date, the International Energy Agency (IEA) has been working as an integrated information provider in the area of energy technologies. Furthermore, under the UNFCCC, National Communications (NCs)* encourage developing country Parties and request developed country Parties to provide information on technology activities and relevant information respectively. Korea is of the view that tailor-made technology information can be produced by use of existing information available under the UNFCCC.

* The information to be provided through NCs is shown in the box below.

Developed country parties	<ul style="list-style-type: none"> ① Information provision regarding technology transfer related to environmentally sound technologies. Differentiation between public and private sector activities, sharing of success and failure cases of technology transfer, reporting the roles of developed countries in respect to financial support for endogenous capacity/technology development/technology transfer ② Inclusion of information on activities, innovation, efforts with regard to R&D in mitigation and adaptation
Developing country parties	<ul style="list-style-type: none"> ① Information on activities of access to and transfer of environmentally sound technologies, development and enhancement of endogenous capacity/technology/know-how, and information on improving enabling environment ② Information on limitations and gaps depending on financial, technological and capacity needs

3.3 Enabling Environment

- Theme **The enhancement of enabling environments for and the addressing of barriers to the development and transfer of socially and environmentally sound technologies**
Explanation: This is also one of four areas stated by decision 1/CP.21, paragraph 67. Under the TTF, reference to enabling environment is included to forge an environment which is conducive to private and public sector technology transfer, and efforts to improve the effectiveness of the transfer of environmentally sound technologies have been taken into consideration through government actions such as fair trade policies, removal of technical/legal/administrative barriers to technology, sound economic policies, regulatory frameworks and transparency. Yet, Korea is of the view that support on government actions should continue to enhance an enabling environment and that, in particular, the support should be more focused on addressing technical, legal, administrative barriers. Currently, in relation to TAPs of the TNA process, barriers in terms of technology development and transfer have been categorized, including economic and financial aspects, market conditions, legal and regulatory frameworks, network structures, institutional and organizational capacity, human resource capacities, as well as social, cultural and behavioral aspects. Korea is of the view that technology-specific guidelines to address barriers and to support government actions are necessary. Given that the scope of these barriers is wide and that the Technology Mechanism cannot cover them all, Korea recommends that the barrier-addressing approach be within a technology-related scope.

3.4 Capacity Building

- Theme **The formulation and analysis of comprehensive information on capacity-building activities on climate technology development and transfer.**
Explanation: Capacity-building activities have been undertaken through the support of the CTCN through stakeholder work and forums to enhance the capacity of nationally designated entities (NDEs). Aside from this, unilateral and bilateral capacity-building activities and support activities to support capacity-building for technology development and transfer in developing countries are already being undertaken. Yet, capacity-building is highly comprehensive. Therefore, Korea is of the view that the formulation and analysis of a comprehensive report on capacity-building activities for technology development and transfer in technology cycle is of necessity.
- Theme **Collaboration with existing capacity-building organizations, institutions, and initiatives**
Explanation: Capacity-building activities have been undertaken by various international and regional organizations, institutions, and initiatives. The demand for capacity-building for technology development and transfer seems to be increasing, but any single organization cannot cover this global-level demand. Therefore, the Technology Mechanism should devise the capacity-building training items and roadmap and play an intermediary role to form a linkage between the recipients and suppliers of capacity-building by utilizing existing organizations, institutions, and initiatives for efficient capacity building
** For example, the United Nations Institute for Training and Research (UNITAR) provides offline and online training and capacity-building activities, targeting the delegate to UN, government officials, and key national change agents. Also, the United Nations University (UNU) offers education programs and conducts research for developing countries while bridging between the international academic community and the UN system.*

3.5 Innovative Financing

- Theme **Private sector participation, the linkage between the private and the public sector, and the linkage between the Technology Mechanism and the Financial Mechanism for enhanced financial support for technology development and transfer**
Explanation: Korea is of the view that the need for increased climate technology financing necessitates the participation of private sector holders of technologies and financial resources, and that the public sector needs to give a clear signal to the private sector for the mobilization of their investment. Therefore, the linkage between the public and the private sector is of importance. Also,

developing countries lacking public funding for climate technology development and transfer are in need of technical and financial support from the Technology Mechanism. Korea is of the view that the enhanced linkage between the Technology Mechanism and the Financial Mechanism is necessary for the enhanced support activities of the Technology Mechanism.

3.6 International cooperation

- Theme **Increased synergistic collaboration with international organizations, mechanisms, initiatives in climate technology both under and outside of the Convention**

Explanation: Considering the current situation that various international mechanisms and partnerships (Technology Facilitation Mechanism, World Intellectual Property Organization, World Trade Organization, International Energy Agency and Asia-Pacific Economic Cooperation etc.) are in place and that the Technology Mechanism's interaction with them has increased, Korea is of the view that institutional approach for synergistic interactive results is of importance. The Technology Mechanism can share and diffuse the international policy and implementation direction for climate technology development and transfer.

3.7 Endogenous development and cooperative R&D

- Theme **Support on RD&D information and endogenous capacity-building for an accelerative, innovative and cooperative intermediary role in international climate technology RD&D**

Explanation: Korea is of the view that the Technology Mechanism should provide a platform that information on each country's climate technology R&D policies and activities and the activities of international RD&D partnerships/initiatives can be provided and shared. Also, Korea is of the view that the information on capacity-building programs on RD&D conducted at country and international level can be also provided and shared. The Technology Mechanism can work as an accelerative, innovative and cooperative intermediary by helping to initiate joint RD&D initiatives on climate technologies and, in advance, linking developing countries to existing or future RD&D initiatives. The Technology Mechanism can benchmark the activities the IEA*.

* *The Committee on Energy Research and Technology (CERT) under the IEA conducts various activities to establish a joint research development system regarding renewable energy and future energy. It serves as a linkage between energy technology and basic science technology. It offers IEA Technology Collaboration Programs for Research, Development, Demonstration and Deployment (RDD&D) and knowledge transfer. Relevant experts discuss various themes and issues on energy technology. Thematic projects are implemented by interested member countries, allowing flexibility on the determination of countries participating in the projects, their level of participation, and details of activities.*

3.8 Reporting of support

- Theme **The development and update of systematic reporting methodology on support provided and received for technology development and transfer**

Explanation: Korea is of the view that enhanced cooperative action by Parties can be made possible and stimulated by the establishment of systematic reporting methodology and the provision of guidelines on the support provided and received on technology development and transfer under the UNFCCC. Korea is of the view that the Technology Mechanism should initiate this activity.

* *The purpose of a framework for transparency of support is to provide clarity on support provided and received by relevant individual Parties in the context of climate change actions.*

3.9 Encouraging the participation of stakeholders

- Theme **Enhanced engagement and support of stakeholders in the development and transfer of climate technologies**

Explanation: Currently, many stakeholders are already engaged in technology development and transfer. Yet, Korea is of the view that enhanced engagement of stakeholders at the local/regional/national/global levels will be of benefit and that more systematic efforts on this by the Technology Mechanism is of necessity.

Paper no. 9: Slovakia and the European Commission on behalf of
the European Union and its member States

**SUBMISSION BY THE SLOVAK REPUBLIC AND THE EUROPEAN COMMISSION ON BEHALF OF
THE EUROPEAN UNION AND ITS MEMBER STATES**

This submission is supported by Bosnia and Herzegovina and Serbia.

Bratislava, 5 September 2016

Subject: Technology framework under Article 10, paragraph 4, of the Paris Agreement

General remarks

In line with the conclusions by SBSTA⁶ the EU welcomes the opportunity to provide views on the following topic:

Elaboration of the technology framework, including the content, features and characteristics, the purpose and the themes of the technology framework in order for the secretariat to prepare a compilation of Parties' submissions for consideration at SBSTA 45.

The Paris Agreement established a new technology framework to provide overarching, strategic guidance to the work of the Technology Mechanism (TM). The European Union was among the early supporters of the new Technology Framework, in particular to enhance the coherence of the Technology Mechanism with ongoing work under and outside the Convention. For the EU, the technology framework is an important step towards integrating between the different means of implementation and the cross-cutting role of technology development and transfer to reach the mitigation and adaptation objectives of the Paris Agreement. The EU shares with other Parties the intention to elaborate the framework's characteristics towards a short and concise as well as balanced document which would respond to changes over time.

For the EU, the strategic guidance provided by the framework can help to improve the effectiveness and efficiency of technology development and transfer under the UNFCCC. The framework provides an opportunity to address the existing fragmentation in the UNFCCC technology development and transfer institutions, in particular between the TM, the processes around Technology Needs Assessments (TNAs), Technology Action Plans (TAPs) and the implementation of technology components in NDCs.

With this submission, the EU tries to structure the initial views. The submission is also used to elaborate further on elements considered as important to agree on an effective and efficient Framework.

EU views on the features and characteristics of the framework

The technology framework should be short and concise, flexible enough to allow the Technology Mechanism to respond to emerging issues and to respond to changes over time. Its characteristics should help to reflect 'real' experiences made with global cooperation and international innovation systems. This forward looking approach would reflect the Paris Agreement's long-term vision.

The EU agrees with initial Parties' views that the technology framework should add value, not create additional institutions, and avoid duplication of work, while recognizing that some ongoing work may continue through this new framework. This might recognise and build on the work by existing bodies such as the TEC (Technology Executive Committee) and Climate Technology Centre and Network (CTCN), whereby the role of National Designated Entities (NDEs) might need some strengthening. More than 150 countries have established an NDE. They are key to accelerate international technology cooperation and integrate national planning processes under and outside the Convention. The NDEs can also facilitate private sector involvement.

EU views on the purpose of the Framework

The purpose of the framework is already outlined in Article 10 of the Paris Agreement: provide overarching guidance

⁶ FCCC/SBSTA/2016/L.8.

to the work of the Technology Mechanism in promoting and facilitating enhanced action on technology development and transfer in order to support the implementation of the Agreement, in pursuit of the long-term vision referred to in Article 10.1.

The framework can play a strategic role in improving the effectiveness and efficiency of the work of the Technology Mechanism.

The framework should consider the broader context: the transformational changes as envisioned by the Paris Agreement and the long-term vision on technology development and transfer as set out in its Article 10. The framework should also take into account climate technology related aspects of NDC implementation, including the engagement of the private sector.

EU views on the updating of the Framework

The EU is open to discuss further a possible periodic update of the framework with other Parties, also in the context of the periodic assessment of the Technology Mechanism as well as the global stocktake and work on transparency. When the Technology Mechanism is assessed, its organisational structure as well as the process oriented-structure should be considered.

EU views on the key themes of the Framework

The EU suggests that key themes shall follow the balanced structure provided in the Paris Agreement's Article 10 and capture the forward-looking elements of the existing framework.

As outlined in Article 10.4., the purpose of the framework is to provide overarching guidance to the work of the Technology Mechanism. Hence, topics of overarching guidance should be derived from the Technology Mechanism itself, especially its organisational and process-orientated structure. Optimizing cooperation and synergies is a success-factor in achieving the goals of the Technology Mechanism. A strong framework is needed to support and foster collaboration between the existing institutions.

The four areas as identified by decision 1/CP.21, paragraph 67, provide a basis, but should not necessarily be seen as already agreed or the only key themes of the framework.

The key themes could be structured to reflect 'real' experiences made with global cooperation and international innovation systems and to help to build a common understanding on enabling factors for climate technology development and transfer. The structure could reflect the technology cycle and mention cross-cutting aspects.

Possible key themes:

Strengthening cooperative action (10.2)

- Technology Needs Assessments, in particular implementation of their results (TAPs, project ideas and preparation of bankable projects) (67a)
- Strengthening the NDE (National Designated Entities) network and enhancing support for NDEs
- Cooperative action on demonstration and market take-up of technology
- Cooperative action on up-scaling and enabling transformational change through climate technology (deployment and dissemination)
- Support upscaling of voluntary private sector involvement
- Citizens' involvement on political level or on project basis where useful

Accelerating, encouraging and enabling innovation (10.5)

- Enhancing enabling environments (para 67d)
- Private sector involvement
- National systems of innovation
- Collaborative approaches to R&D (10.5; para 67a)

Supporting the implementation (10.6)

- Linkages between the Financial Mechanism and the Technology Mechanism (67b)

- Accessing private sector investment (enabling environments)
- Converting TNAs and TAPs into NDCs and, ultimately, bankable project proposals (para 67a)
- Capacity building
- Enhancement of enabling environments (para 67d)
- Private sector involvement

Possible structure based on the technology cycle:

Technology cycle	Cross-cutting aspects
<p>Cooperative action to promote climate technologies at early stages of technology cycle</p> <ul style="list-style-type: none"> • This theme would look into tertiary education and research cooperation. Applied research and learning from working with climate technologies enhances national capabilities and widens the global availability of products and services. • Guiding question: Is there an enabling environment for innovation in a country (national systems of innovation) and opportunities for exchange and participation in international programmes? 	<p>Supporting the implementation</p> <ul style="list-style-type: none"> • This theme would address the cross-cutting aspects of technology development and transfer and the need to integrate existing provisions under the UNFCCC • Guiding questions: <ul style="list-style-type: none"> ○ Are Technology Needs Assessments considered and the implementation of their results supported? ○ Are the pragmatic linkages between the Financial Mechanism and the Technology Mechanism established and used? ○ Is technology transfer embedded in an education and capacity building context? ○ Is there a sufficient recognition of the private sector's role and citizen's involvement ○ Is the environmental, social and economic integrity ensured?
<p>Demonstration and the market take-up of technology</p> <ul style="list-style-type: none"> • This theme would look into piloting and testing applications of climate technologies. At this phase of the technology cycle, the operational costs and institutional factors shall be addressed to prepare the market penetration of products and services. • Guiding question: Is there an enabling environment in a country? What is needed to support the market up-take? 	
<p>Up-scaling and enabling transformational changes through climate technology</p> <ul style="list-style-type: none"> • This theme would look into the conditions for deployment and dissemination of climate technologies. At this phase of the technology cycle, institutional factors shall allow public and private actors to access services and products (both hard and soft technologies) which have a significant contribution to mitigate greenhouse gas emissions and/or to enhance the resilience to climate change. • Guiding question: Is there an enabling environment in a country and opportunities for private sector investment? 	

EU views on the consideration of the private sector in the key themes of the Framework

The EU sees the private sector as one of the crucial players which can contribute to the objectives of the Paris Agreement with active political support. The facilitation of climate action needs to reflect the heterogeneity of the private sector. Companies and entrepreneurs are working along the technology cycle (research→demonstration→deployment→diffusion) in different markets, offering products, knowledge or services. Business-relevant strategies can center, in line with markets, on:

- Promoting development of and creating demand for low-emission and climate-resilient alternatives to products that increase emissions or vulnerability
- Reducing products’ impact on climate change and providing better resilience against climate change
- Reducing emissions and higher resilience of the production processes

Only a differentiated perspective on the enabling framework for investments can help to use the Framework to upscale climate action. NDEs can play a major role in engagement with the private sector.

Voluntary Private Sector Engagement

Technology cycle	Cross-cutting aspects
<p>Cooperative action to promote climate technologies at early stages of the technology cycle</p> <ul style="list-style-type: none"> • Companies are engaged in applied research and support the tertiary education system by providing training opportunities. • Universities and research centres have a strategy to transfer research results to the private sector, i.e. through promoting spin-off companies or licencing. • Public support is stimulating climate-related applied research and training activities. 	<p>Information systems for climate relevant knowledge and products made available</p> <ul style="list-style-type: none"> • Tertiary education and education cooperation • Reliable system to develop, protect and share knowledge. <p>Business engagement depends on clear policy and market signals, for instance a global CO2 price may provide information about cost-efficient technologies (offer incentives, help assessing market-risks, provide regulatory stability and help with internalizing external costs).</p>
<p>Demonstration and the market take-up of technology</p> <ul style="list-style-type: none"> • Companies and entrepreneurs get economic or regulatory incentives to use innovative technology • Market risks and technology failures are reduced through public measures. 	
<p>Up-scaling and enabling transformational change through climate technology</p> <ul style="list-style-type: none"> • Internalisation of environmental costs and risks of climate change • Regulatory certainty for climate-related investments. 	

EU views on the consideration of the citizens’s involvement in the key themes of the Framework

The involvement of citizens is vital for the transformation towards and the achievement of the objectives of the Paris Agreement. Experience has shown that public acceptance is often linked to participatory processes and local economic ownership. Citizen's involvement can center on:

- Integration into public decision making related to climate policy or project development.
- Changing individual behavior, lifestyle and consumption decisions.
- Creating change through coordination of citizens in engaging with local, national and international public actors and the private sector.

- Climate action as source of income, employment and local identity.

Only a differentiated perspective on the enabling framework for citizen's involvement can help the Framework to be used to upscale climate action.

Citizen's Involvement at political level or on project basis where useful

Technology cycle	Cross-cutting aspects
Cooperative action to promote climate technologies at early stages of technology cycle <ul style="list-style-type: none"> • Citizens are involved in research projects (citizen's science) • Secondary and tertiary education includes climate change aspects. • Frugal innovation • Vertical and horizontal innovation 	Information systems for climate relevant knowledge and products made available <ul style="list-style-type: none"> • Tertiary education and education cooperation • Reliable systems to develop, protect and share knowledge.
Demonstration and the market take-up of technology <ul style="list-style-type: none"> • Involvement of citizens in impact assessments • Citizen and user-centred assessment of technology pilots • Training measures • Developing environmental leaders, such as ecovillages etc. • Participatory policy making 	
Up-scaling and enabling transformational change through climate technology <ul style="list-style-type: none"> • Local investment and employment through mitigation and resilience projects • Involvement of citizens in local planning processes 	

EU views on incorporating the transformational role of climate technology development and transfer into the Framework

Accelerating the development and deployment of climate technologies, alongside finance and capacity building-related actions, helps achieve the ultimate objective of the Convention, with a view to reducing global greenhouse gas emissions so as to hold the increase in global average temperature to well below 2°C above preindustrial levels and to pursue efforts to limit the temperature increase to 1.5°C. This will require further efforts to assess potentials and needs, create transparent market conditions for climate technologies where not yet established, to accelerate innovation and to leverage public finance with private sector engagement into the development and deployment of climate technologies in both developed and developing countries, and enhance research, development and deployment of new breakthrough technology solutions.

Before looking at individual technology cycles, it is necessary to consider the technological implications on today's research funding priorities of the Paris Agreement's aim of holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C world above pre-industrial levels. As a result, a strong focus of support on 1.5 °C-compatible, transformational technologies is necessary. Based on this prioritisation, technology transfer and innovation push and pull factors in a country should be coordinated. Cooperation with international technology transfer and clean energy initiatives, such as Mission Innovation, could be strengthened.