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International Technology Cooperation: Lessons for the Upcoming Technology Mechanism of the United Nations Framework Convention on Climate Change

Summary

Despite concerted efforts made by various countries in the past decades to mitigate climate change, the world is getting warmer. Research estimates that current ambitions to mitigate climate change are a far cry from the levels of green-house gas (GHG) emission reductions required to limit global warming to a two-degree target, set as the tipping point if catastrophic impacts of climate change are to be avoided. Widespread mitigation and adaptation efforts are and will be required. Amongst different actions, international technological cooperation must be maximised in order to decarbonise the global economy, and reduce anticipated green-house gas (GHG) emissions.

As a central pillar of the international climate regime, the United Nations Framework Convention on Climate Change (UNFCCC) has power much beyond its material significance, which is considerable given the pooling of financial, knowledge and political power. Through its emerging Technology Mechanism (TM), the UNFCCC can frame global norms and procedures for facilitating international technology cooperation in low-carbon sectors.

For this to happen, there are certain critical aspects that it must tackle. Based on research and consultations with over 50 stakeholders, we identify three issues that the TM should take cognisance of in order to realise its potential in unleashing international technology cooperation.

First, facilitate low-carbon development. While the UNFCCC mandate primarily deals with climate change, the inability to simultaneously tackle development challenges blocks effective responses and commitment to low-carbon development. In order to effectively create low-carbon technology transitions, the TM needs to incorporate socio-economic aspects of sustainable development in its mandate. Moreover, as a global umbrella spearheading low-carbon technology development and deployment, the TM should systematically seek to balance activities and programmes within the larger spectrum of developing countries so that it is not only a particular few that gain from it.

Second, engage with the business community. The private sector must be integrated in the TM from the start in order to facilitate and undertake international technology cooperation. As predominant owners of knowledge and financial assets, innovative mechanisms to directly engage with the private sector must be adopted.

Third, bridge gaps between intellectual property rights (IPR) regimes and low-carbon technology development. In order to effectively aide technology cooperation in developing countries the TM will have to incorporate systematic solutions that encourage technology development and diffusion, while simultaneously respecting the established IPR regime.

Technology Mechanism: going beyond the rhetoric of technology transfers

National capacities for technology development in developing economies are weak and need to be strengthened if they are to move towards sustainable low-carbon development pathways. In addition to firm capacity to adapt low-carbon technologies to local contexts, there is a need to create networks of local suppliers, users, and research institutions to enable dynamic growth and improvements in technological learning. Thus, development and transition to low-carbon technologies are dependent on more than access to intellectual property and technology imports.

The rationale for the Technology Mechanism (TM) rests on the recognition that technology development and transfer entails not just technology diffusion, but also research and development, demonstration and deployment (UNFCCC 2010). This implies that, for an entire technology cycle to be developed, there needs to be a focus on capacity building along the value chain, incentives for market creation and penetration, mechanisms for international research and development and technology sharing – all of which ultimately depend on interactions between a range of different actors, institutions, and national framework conditions. In brief, a key role of the TM is to enable innovation capabilities within developing countries so they may be more resilient in mitigating climate change. While there is consensus within the TM's mandate to do so, the instruments that will enable this broader understanding of technology cooperation to be realised in practice are yet to be discussed and defined within the TM.

In the following sections, we suggest ways to aide UNFCCC's TM to realise its potential in supporting developing countries to engage in low-carbon development pathways.

Ensure the TM facilitates low-carbon development

Globally there is agreement on undertaking large-scale transitions towards low-carbon technologies; however current reality does not reflect this at a rate that is needed to avoid catastrophic climate change. In order to adopt, develop and sustain low-carbon technologies, a greater buy-in is needed from developed and developing countries (labelled as 'Annex I' and 'non-Annex I' countries respectively, the former were responsible for over 70% of emissions by 1990 when the UNFCCC Kyoto Protocol was established). However, most low-carbon technologies come at additional costs and require a systematic shift away from current path-dependencies compared to their polluting counterparts. Therefore, the financial and political burden of undertaking technology cooperation will need to be shared.

In responding to the above as a facilitating entity of technology cooperation, the TM could garner greater commitment from countries towards technology cooperation by endeavouring to include a *development* priority in its work. This could benefit its **mandate of facilitating the reduction of green-house gases (GHG) emissions while simultane-**

ously benefiting economic development, thereby leveraging greater political buy-in for technological cooperation.

With this broader agenda that supports development within less-developed countries, the TM must also seek to balance the twinned goal of low-carbon sustainable development amongst less-developed non-Annex I countries as well. Investments and cooperation partnerships aimed primarily towards emerging economies will come at a cost of the most vulnerable less-developed countries. For example, the Clean Development Mechanism of the UNFCCC ultimately largely benefited only a select few emerging economies rather than acting as an enabler for low-carbon development in the least-developed and most vulnerable countries. In order for the *development* potential to be realised, the most vulnerable and least-developed countries should be encouraged to seek technology and capacity-building support through the TM.

To accelerate and encourage countries across the developing and emerging country spectrum to take benefit from technology cooperation through the TM, we suggest the following:

1. As a first, the TM needs an **evaluation format that assesses the low-carbon or GHG emission mitigation potential as well as the pro-poor development impact** which a technology sector could enable in a country. This could serve as a transparent basis on which it would directly undertake or facilitate technology cooperation. For example, TM could choose to facilitate the use and development of off-grid renewable energy resources that in rural parts of India could potentially lower GHG emissions by 99% in a business-as-usual scenario by 2030, while simultaneously raising the development bar of the country as a whole by giving access to 40% of the population who live without modern electricity.
2. Furthermore, provisions for **financing innovation and deployment** should be discussed within the TM. Given the socio-economic development potential of low-carbon technology cooperation initiatives, the TM could do so in association with other **multilateral development agencies**, as well as climate-change mitigation financing bodies such as the Green Climate Fund.
3. One of the stated functions of the TM is to identify technology needs in developing countries. In order to encourage a range of developing countries to engage and partake in the TM, it is important that a banded **study be undertaken based on differing national indicators**. Such a study should suggest initiatives for a wider spectrum of countries weaning away from the current non-Annex I labelling that puts China in the same cohort as Ghana, for instance. The study could be done through a nexus of low-carbon and economic indicators, based on submissions already made by non-Annex I parties and an evaluation of the development and emissions potential of such technologies. This would enable the TM to identify and suggest different formats for implementing

technology cooperation projects, encouraging a wide range of non-Annex I parties to submit requests to the implementing arm of the TM, namely the Climate Technology Centre and Network (CTCN).

4. The long-term development potential of developing countries could be enhanced if the TM could also **highlight areas for building innovation capabilities** for these technologies. Capacity building could then be taken up as an area of added concern and impetus when the CTCN facilitates partnerships, programmes and technology cooperation for these countries/technology cases. This would also allow Annex I countries to **ascertain areas of cooperation with developing country partners at a bilateral level**. Moreover, this may also benefit industrial development within developing countries, by **highlighting space for 'win-win' industrial and technical cooperation efforts** across national borders.

Engage with the business community

If the TM is to succeed in bringing technology cooperation to the fore in the development and climate change agenda, the private sector needs to be made a part of the TM from the onset. Over two-thirds of low-carbon investments and technology stem from the private sector of developed Annex I countries (OECD 2013). Yet, the TM has negligible buy-in from the private sector so far. While the advisory board of the CTCN has one BINGO (Business-NGOs) as a non-voting member and several BINGO observers and contributors, their roles need to be defined – interviewees stated that there is no clarity on how they could move forward in helping to operationalise the TM. We suggest the TM could engage with the private sector in the following ways:

1. **Create public-private alliances for specific technologies'** development across the developed and developing country divide geared towards testing and R&D. In addition, to support dissemination and enable technology adaptation to the local environment, the TM should seek to foster linkages with local supplier networks. The private sector has shown interest in such an alliance approach as it lowers technological uncertainties in developing countries and assures IPR protection due to the presence of multilateral and government agencies in such cooperation initiatives. Moreover, it helps generate market familiarity in new technological sectors in less developed economies.
2. **Create space for companies/Chief Executive Officers (CEOs) to come on board the CTCN.** The TM would benefit by engaging with the private sector more directly by bringing on board certain firms who already have extensive experience in undertaking technology development in non-Annex I countries, as members to the CTC network for example. This could be a platform to share best practices and suggest innovative ways of creating enabling environments for technology devel-

opment in non-Annex I nations, as well as to prominently publicise the socially-responsible work that these companies have led. The CTCN, in its mandate, is open to private sector organisations as members. However, no systematic steps to inform or include firms have been taken so far.

3. **Play an integrating role with regard to standards and norms, establishing the environmental benefits of these technologies as a benchmark.** Standardisation is a key area of concern for the private sector in upcoming low-carbon technologies. This is particularly due to uncertainty related to these technologies and competing global manufacturing and distribution networks. Having a voluntary benchmark in the absence of undefined standards would enable an open market approach to trade and commerce, as different countries may adopt these into laws and regulations. Although the TM would not take on the role of a standardisation and certification authority, it could transparently highlight the best environmental norm or standard from an emissions-mitigation perspective.
4. **Encourage enabling environments in developing countries to attract foreign technical and financial engagement.** The most common hurdle cited by Annex-I firms and countries against engaging in technology cooperation is the lack of an enabling environment in developing countries. This includes the regulatory framework that encourages foreign investments, and collaborations; as well as the local capacities to adapt and adopt new technologies. It is well accepted that policy coordination amongst different agencies and authorities within a country can positively impact the enabling environment for new technologies. Thus, the TM should help build capacity within the nationally designated agencies of developing countries to enable a bridging between various ministries within a non-Annex I country looking to build a particular low-carbon industry. By doing so, a balance can be struck between the 'performance requirements' from international firms (for example, local content, employment generation, etc.) and policies that attract business investments (such as feed-in-tariffs, tax breaks, etc.). This would lower the bureaucratic hurdles that international firms face in developing countries; as well as help guide domestic agencies to identify gaps in the domestic capacities required to successfully adopt and adapt to these new technologies.

Bridge gaps between international property rights regimes and low-carbon technology development

Although not included in the mandate of the TM, the issue of International Property Rights (IPR) has been raised by non-Annex I parties consistently within the UNFCCC framework as a hurdle to low-carbon development. Some options for the TM to address these concerns, and encourage technology development, diffusion and cooperation are:

1. **The TM could help promote and utilise a number of patented technologies that are officially made available through 'patent pools', open access, patent information databases etc.** The TM could bridge the gap between developing countries and these licensing mechanisms by building capacity within national agencies. Such efforts should be geared towards understanding the legal nuances of using these pools, negotiating for access to patented technologies, technology management and familiarising scientists and lawyers in developing countries with patent drafting; as well as identifying projects that can utilise these open-access technologies.
2. **The TM could attempt to apportion funds towards IPR sales and usage rights from the global pool of 100 billion dollars per year,** agreed to be pledged towards climate mitigation by Annex I countries after 2020. The CTCN could create larger technology projects using these technology patent sales to help develop the technological sector, and associated capacity and employment in non-Annex I parties.
3. **Using its CTC Network, the TM could facilitate the setting up of a multilateral research body,** akin to CGIAR Research Programmes and Funds (established as

the Consultative Group on International Agricultural Research). These would work towards strategic outcomes that are accessible and available for public use, and involve R&D of low-carbon technologies cutting across national borders based on global public goods concerns relating to climate change. This would also enable a shift away from the dominant research institutes of Annex I countries by globally encouraging scientific innovations and boosting innovation capacities of developing countries.

Conclusion

Since the Technology Mechanism is still emerging, there is scope for influencing its operationalisation, as well as its priority actions. This briefing paper has highlighted three critical areas that need greater discussion within the TM in order for it to become a transformational body that facilitates an accelerated pace of technology development and deployment. By creating and adapting instruments that garner buy-in from a range of developing countries and the private sector and tackle issues around the IPR regime, the UNFCCC's TM could play a pivotal role in creating sustainable innovation capacity for low-carbon technology development and deployment, enabling stronger mitigation strategies and economic development globally.

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