



Technology Executive Committee

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Draft policy brief on innovative approaches to accelerating and scaling up implementation of mature climate technologies

Cover note

I. Introduction

1. As per activity 4 of the thematic area of Implementation of its workplan for 2019–2022, the TEC is to prepare a policy brief on innovative approaches to stimulate the uptake of existing climate technologies.
2. This policy brief draws upon information contained in the paper on innovative approaches to accelerating and scaling up climate technology implementation for mitigation and adaptation, developed by the TEC in 2020.
3. At TEC 22, the taskforce on Implementation will be invited to present the draft policy brief.

II. Scope of the note

4. The annex to this note contains the draft policy brief on innovative approaches for accelerating and scaling up implementation of mature climate technologies, as prepared by the task force on Implementation.

III. Possible action by the Technology Executive Committee

5. The TEC will be invited to consider the policy brief and provide guidance to the implementation task force for further improvement and finalization of the brief after TEC 22

Annex

Draft policy brief on innovative approaches for accelerating and scaling up implementation of mature climate technologies

I. Why this TEC Brief?

1. In order to meet the goals of the Paris Agreement a wide range of technical solutions exist or are being developed. Yet, it is highly uncertain to what extent this technical potential becomes economically feasible and socially acceptable. How can we replicate successfully applied climate solutions in multiple countries? Why is a climate technology widely accepted in one society, but not well received in another? What can we learn from success stories on blending funding sources for lower investment risks? This TEC Brief looks into innovative ways for scaling up promising climate solutions in developing country markets for meeting national and international climate ambitions. It focuses on innovations in planning climate actions, ways to engage stakeholders in that process, attracting funding and collaboration between private and public sector parties. This Brief is part of a long-running series of policy briefs on innovation produced by the Technology Executive Committee.

II. Highlights

2. Successful entry of technologies for climate change mitigation and adaptation into developing country markets is supported by a range of innovations in different areas. Not only do innovations take place in the technicalities of climate solutions, they are also prominent in the way we plan actions, how market actors collaborate, and how we attract funding. This Brief highlights innovative approaches from existing good practice examples around the World. These innovations enable markets to *pull* technologies forward alongside government actions *pushing* technologies, especially in the least developed countries.

3. For scaling up technology implementation, it is imperative that they are co-designed. Through participatory co-design processes, stakeholders have a key role in ensuring that technologies not only deliver climate benefits, but also help to meet countries' national sustainable development objectives. Technology implementation is further supported by 'technology champions', including youth, who propel the development of prioritized technologies, lending support to the policies already in place for technology diffusion. Champions also support technology-neutral and demand-driven decision making, both in the least developed and higher-income developing countries.

4. Important innovations to attract private sector funding for mature climate technologies in developing country markets have taken place both in terms of increasing revenues and reducing investment risks. Green or climate bonds as well as climate-related investment criteria have increased opportunities for climate-friendly investments. Risk sharing innovations take place, among others, via the blending of private and public funds. The latter includes capital provided by national or international funds, such as the Green Climate Fund, which enable private funding to become available under more favourable conditions.

5. Public-private partnerships make actions on technology diffusion more effective as governments can focus on their key roles, such as: providing financial instruments, stronger enforcement of policies and measures, and enhancing access to international climate funding programmes. Private entities, in their turn, step in to leverage public funding and make technologies market-ready.

6. International institutions, including multilateral development organisations, support this by incubation and acceleration actions for proven climate technologies, as they:

(a) Provide efficient linkages between complementary institutions and stakeholders of different countries;

(b) Enhance access (especially to least developed countries) to international funding programmes through technical or resource assistance; and

(c) Facilitate alliances and partnerships to leverage resources for scaled-up projects and foster the development of start-ups through global incubation and acceleration programmes.

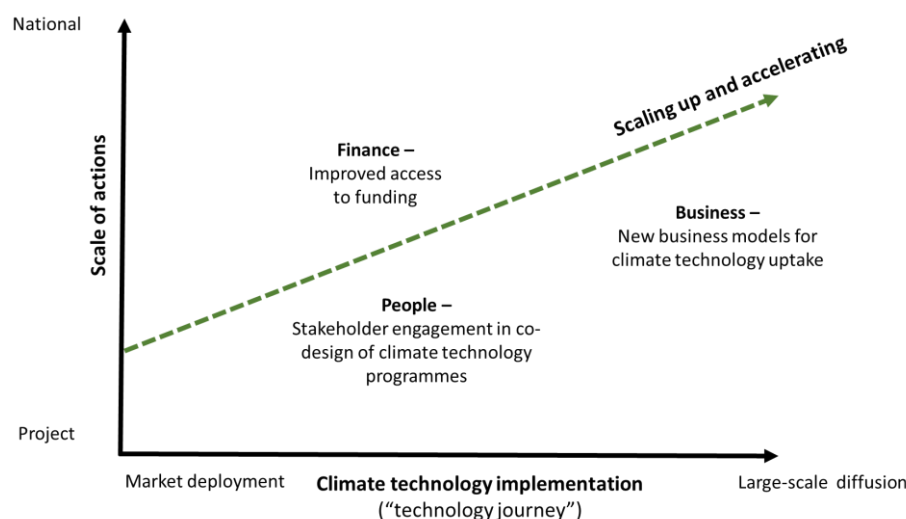
III. What do we mean by innovative approaches?

7. When choosing technologies for climate change mitigation and adaptation, it is crucial to know how well they work for meeting the goals of the Paris Agreement. However, processes such as technology needs assessments (TNA), nationally appropriate mitigation actions (NAMA) and national adaptation plans (NAP) have shown that climate technologies also need to fit within countries' sustainable development agendas. This is why the Paris Agreement calls for 'nationally determined contributions' (NDC).

8. Realising this 'socially acceptable' potential requires that countries' implementation conditions are sufficiently enabling (Waisman, et al., 2019). It is this system-level perspective that is underpinned by this Brief. Building further on insights from Grubb, et al. (2017), Bergek, et al. (2008), Bößner, et al. (2018), this Brief describes innovations in engaging stakeholders in climate decisions, attracting private sector climate funding and public-private collaboration for accelerated and scaled up implementation of mature climate technologies in developing country markets (see Figure 1).

9. While innovative approaches refers to something new, it can also mean adaptation or change of something existing to make it more efficient or better, and thus more widely adopted (Ockwell & Byrne, 2016). The latter is precisely the scope of this Brief as it focuses on how mature technologies will benefit from new ideas and approaches to support their market uptake in developing countries.

Figure 1. **The scope for innovative approaches in scaling up and accelerating climate technology implementation** (source: authors)



IV. People

Innovative ways to support stakeholders' ownership of climate solutions

10. Processes under the Convention, such as NAMA, NAP and TNA, have demonstrated the value of engaging stakeholders in prioritising technologies for climate and development. This provides the local perspective, ensures equity, efficiency, effectiveness and sustainability (Williges & et al., 2018) (Bößner & Coninck, 2018). It also helps to look at informal rules in societies, as these may be applicable in specific country situations such as informal settlements (Kaika, 2017) (McGranahan & et al., 2016) (Simone & Pieterse, 2017). As found in Spiesberger, et al. (2018), engagement of stakeholders can be seen as a good example of social innovation.

11. In research projects such as LANDMARC,¹ with case studies in Burkina Faso, Indonesia, Kenya, Nepal, South Africa, Venezuela, and Vietnam, country stakeholders partake in the co-design of scenarios for land-based mitigation options for inclusion in countries' NDCs. Enabling people to actively become engaged in the co-design of a technology project or programme increases its social acceptance (Coninck, et al., 2018).
12. An example of this is Plantwise² which helps smallholder farmers in developing countries to improve their production yield, not by 'confronting' them with new solutions for sustainable farming, but by facilitating knowledge exchange at the community level. Eventually, it remains up to the farmers to decide whether or not to change.
13. A particular example of the role of stakeholders as drivers for change is that of 'champions' helping to accelerate climate technology implementation within developing countries (TEC, 2019). For example, in 2018, Lebanon introduced a tax incentive for hybrid and electric vehicles. This had been championed by an 'informal transport group', which had emerged from the Lebanese TNA project.
14. Finally, the role of youth is highlighted for their potential role as actors for change. For example, this year, the Global Center on Adaptation, in partnership with the African Development Bank will launch an Adaptation Solution Challenge and Incubator Fund, promoting innovation and entrepreneurial capacity of 1000 youth businesses across Africa (GCA, 2021).

Empowering Farmers in Bangladesh through the dissemination of information

(Rajendran & Islam, 2017)

Agriculture accounts for nearly one-third of Bangladesh's GDP. The country's major crop is rice, planted on 75% of farmland, with the remainder including high-value vegetables, fruits, and spices. Pests destroy between 10% and 25% of harvests, despite the estimated 49,000 tonnes of pesticides used by farmers every year.

The Plantwise programme led by CABI aims to contribute to minimising crop losses, increasing food security and alleviating poverty. They work closely with national agricultural advisory services and have established a global plant clinic network, run by trained plant doctors, where farmers can find practical plant health advice and solutions. Currently, in 10 of Bangladesh's 64 districts, plant clinics help the farmers to identify and manage crop problems, as well as increase crop yields and profitability. With increased knowledge of improved farm practices, plant clinic users can rely less on chemical fertilisers to manage pests and diseases.

The information on crop health is disseminated through the plant clinics. A comparison survey between plant clinic users and non-users in Bangladesh revealed that the former's ability to identify and address crop problems increased significantly (83 per cent in users as compared to 13 per cent in non-users). They also showed a greater ability to apply a range of good farm management practices.

The concept of plant clinics has proven to be more appealing to the smallholder farmers as it disregards the approach of imposing new farming practices/techniques over their traditional knowledge. Instead, it takes a more ambivalent approach by providing the farmers with the right to engage with the plant clinics. This puts the onus on the farmers to approach the clinics making the process of achieving resilience more inclusive (stakeholder-oriented) and provides a token of good entrepreneurship. These innovative approaches have caused interest by the country's Ministry of Agriculture in mainstreaming the plant clinics into their national extension operations to cover the entire country.

¹ <https://www.landmarc2020.eu/>.

² CABI is an inter-governmental, not-for-profit organisation aimed at improving people's lives worldwide by providing information and applying scientific expertise to solve problems in agriculture and the environment. CABI has 49 member countries.

Actions

15. In order to enhance stakeholder ownership in climate technology planning and implementation, it is recommended that:

(a) National governments and international cooperation programmes encourage social and economic actors to actively partake in the processes of identifying and prioritising climate technologies, so that climate planning results from co-design rather than theoretical assessments of technical and economic potentials;

(b) Technology champions, including youth, are motivated to inspire and inform other stakeholders in support of wider scale climate technology implementation;

(c) National research groups, NGOs and other private entities are encouraged to partake in international research programmes for enhanced skills and knowledge gathering and case study research within developing countries on technical and economic potentials for climate technologies and how acceptable, and therefore realistic, these are from a social perspective.

V. Finance

Innovative ways for enhanced mobilisation of climate funding

16. While technology R&D and demonstration are generally ‘pushed’ by public capital and action (Grubb & et al., 2017), the private sector has a key role in ‘pulling’ a technology into the markets. It is thus crucial to manage and utilise local private resources in developing countries parallel to financial support for climate technologies. The first aspect is the topic of next section, while this section highlights innovations in attracting climate funding from private sources.

17. A key condition for mobilising private capital is risk management. Good practice on that exists through ‘blending’ of private and public funds. For instance, the blending of public and private funding streams unlocked debt capital for the Indian off-grid energy sector (OGE) (GGGI, 2016). XacBank developed a USD 60 million loan programme for the revitalisation of the energy sector in Mongolia (TEC, 2019). GCF’s contribution of USD 20 million enabled XacBank to negotiate more favourable loan conditions from other funding providers.

18. Next to risks, innovations have emerged to increase yields of climate investments. The issuing of climate bonds (since 2014), to give an example, has now attracted USD 150 billion of investment capital worldwide (Jones, 2020). Climate bonds support so-called ‘late stage’ finance as they help to (re)finance mature climate technology projects. The Inter-American Development Bank developed a green bond facility to provide capital towards energy efficiency projects (Humphreys, 2019). Specifically for adaptation solutions, Catastrophe Bonds (or CAT Bonds) have emerged in the market, which offer a high yield to build in-house resilience for insurance companies in the event of natural disasters.

19. There have been recent examples of ‘institutional’ interventions in financial systems via benchmarks for financial products that incorporate climate change considerations. These help institutional investors with sustainability mandates to allocate capital to climate-friendly economic activities. For example, in November 2019 the EU adopted a Regulation creating harmonized, minimum standards for ‘Paris-aligned benchmarks’ (more ambitious) and ‘climate transition benchmarks’ (less ambitious) (European Commission, 2019).

20. In a similar vein, classification schemes are being created, by regulators or private standardisation organizations, which classify an investment as climate-friendly. For example, the Climate Bonds Standard and Certification Scheme applies criteria to ensure that climate bond investments support emission reductions to support the implementation of the Paris Agreement (Climate Bond Standard, 2021).

Fiji’s Sovereign Green Bond to Secure a Greener Future

(Government of Fiji, 2017)

As one of the Small Island Developing States (SIDS) in the Pacific, Fiji is in the front lines when combating climate change. The damage done by 2016’s Tropical Cyclone Winston, which caused economic losses that amounted to almost one-third of the country’s GDP, hinted at the potential for even greater damage and displacement in the future. As with all

Pacific Island states, close to 20 per cent of the region's 10 million people is projected to be displaced due to climate change by 2050.

To safeguard its 900,000 citizens and their livelihoods, Fiji has developed and launched a sovereign green bond, making it the first developing nation to do so. The effort was supported by the International Finance Cooperation (IFC) and the World Bank. The first tranche, which floated 40 million Fijian dollars (about \$20 million), drew unprecedented demand from investors and was oversubscribed by more than double that amount. The bond helped Fiji create a new way to mobilise finance for development and a market for private sector capital seeking investment opportunities that support climate resilience and adaptation.

Likely projects to be financed with proceeds from the green bond include investments in crop resilience, flood management in sugarcane fields, reforestation, and rebuilding schools to better withstand challenging weather conditions. They will all follow the internationally developed Green Bond Principles. Fiji also aims to use bond proceeds for projects supporting its commitment to achieve 100 per cent renewable energy and reduce its carbon emissions in the energy sector by 30 per cent by 2030.

Fiji's sovereign green bond marks the first with a special emphasis on adaptation, building up the country's resilience to climate change. To become sovereign green bond issuers, countries must have a green bond policy framework in place that reflects international guidelines for use of proceeds, disclosure, and reporting.

At the request of the Reserve Bank of Fiji, the IFC and the World Bank provided technical assistance to the government to develop the sovereign green bond in just four months. This collaboration took place under a broader, three-year Capital Markets Development Project supported by the Australian Government. Through this partnership, Australia and the IFC are helping to stimulate private sector investment, promote sustainable economic growth, and reduce poverty in the Pacific.

Actions

21. Access of developing countries to (international) private sector funding is enhanced through:
 - (a) Risk sharing such as blending private with public capital, including multilateral funds, so that private investors can negotiate favourable financial conditions;
 - (b) Predictable yields on climate investments by labelling these as 'climate' or 'green', such as climate bonds, so that investors can clearly distinguish between climate-beneficial and other investments. This is supported by national and international classification schemes and benchmarks for financial products that incorporate climate change considerations;
 - (c) Training of market actors in developing countries to formulate funding proposals according to investors' requirements for risk management and in line with (inter)national funding criteria for 'green' or 'climate' recognition.

VI. Business

Innovative approaches for private sector engagement and accelerators

22. Technology development towards market diffusion goes alongside an increasing role for the private sector (Grubb & et al., 2017). As described in section V above, this is true for finance, but also for other aspects of technology implementation. Through a range of initiatives the private sector is supported in building a business case for climate technology investments in developing countries.
23. Often, these initiatives focus on local actors, such as small and medium-sized enterprises (SMEs), by helping them to build a business case for climate technology investments. For example, UNDP (2021), through its framework of 'Convening, Catalyzing & Capitalizing' ('3Cs'), aims to work with the private sector on business solutions for adaptation.

24. Momentum for private sector engagement is growing through the establishment of Multi-Stakeholder Partnerships/Initiatives. For instance, the Farm to Market Alliance (GrowAfrica, 2021), established by the UN's World Food Programme (2015), creates efficient value chains to enhance farmers' income. It has forged partnerships with Bayer, Syngenta and Yara International (international fertilizer and agribusiness companies), AGRA (Alliance for a Green Revolution in Africa), International Finance Corporation and local members of value chains in Kenya, Rwanda, Tanzania, and Zambia (Farm to Market Alliance, 2021). An important success factor is that the partnerships allow partners to align their interests, share risks and combine their resources and competencies to maximise value.

25. The Global Innovation Lab for Climate Finance (2021) enables a dialogue between public and private sector representatives for a shared understanding of goals and perspectives. Participants jointly identify barriers to and solutions for mobilising investments and the Lab can serve as an incubator for identified solutions. Elsewhere in this brief, the launch of the Adaptation Solution Challenge and Incubator Fund has already been highlighted (GCA, 2021).

26. Similarly, accelerators (TEC, 2018) such as the Climate Innovation Centers (CICs) support private sector engagement for accelerated development and transfer of locally relevant climate technologies. CICs are currently active or planned in Brazil, Kenya, Ghana, Ethiopia, South Africa, Morocco, Vietnam, and the Caribbean. For example, the Caribbean CIC offers idea generation sessions for entrepreneurs with intense Boot Camp sessions to turn ideas into concrete business plans, followed by a six-month accelerator programme for identified solutions.

27. The private sector increasingly takes corporate social responsibility. Rather than only looking at short-term profit, shareholders increasingly demand better performance on environmental, social and governance (ESG) criteria (Boston Consultancy Group, 2021). This led a company like Blackrock to commit to net zero emissions by 2050 and calling for similar actions, driven by ESG metrics, by other companies and their clients (Fink, 2021). Yet, progress needs to be made on standardising ESG assessment methodologies for a better comparison of ESG scores (Dye & et al., 2021).

Digitalisation of agriculture for smallholder farmers in Zimbabwe

(FAO, 2018)

There has been significant growth in digitalisation for agriculture in Africa over the last 10 years. In 2019, both the EU-African Union Task Force Rural Africa Report (TFRA) and the Communiqué from the Global Forum for Food and Agriculture (GFFA) highlighted the power of digitalisation in transforming agriculture. The solutions offered through digitalisation include among other advisory services, market linkages, financial access, supply chain management, and macro agricultural intelligence. Private sector companies have been the pioneers in leading the movement towards digitalisation in Africa.

For example, AgriFin Mobile, a programme implemented by Mercy Corps, facilitated the partnership between Econet, the largest Mobile Network Operator in Zimbabwe, and the Zimbabwe Farmers Union (ZFU) to develop a bundled product for smallholder farmers. Currently, farmers who are signed up to Econet can contact a toll-free call centre to learn more about agriculture inputs and market prices. Farmers can also subscribe to EcoFarmer, a service set up by Econet, to receive agronomic SMS messages, and eventually access additional mobile-based financial services. Building on these services, a bundled product of a subscription to the farmers union and the services provided by Econet (ZFU Combo) has led to a total increase of both, paying users of EcoFarmer and ZFU members.

The innovation in Zimbabwe is a business model built off the commercial agreement between Econet and ZFU. The partnership between Econet and ZFU succeeded because the partners' financial and social goals were aligned and the organisations were able to complement each other: ZFU by providing on the ground access and coaching to farmers, and Econet providing farmers access to a series of services needed by farmers to improve their activities.

The ZFU Combo model is an example of a farmer's organisation and the private sector partnering successfully. It departs from traditional approaches where large companies often try to reach farmers through their existing network of agents with high costs and low returns.

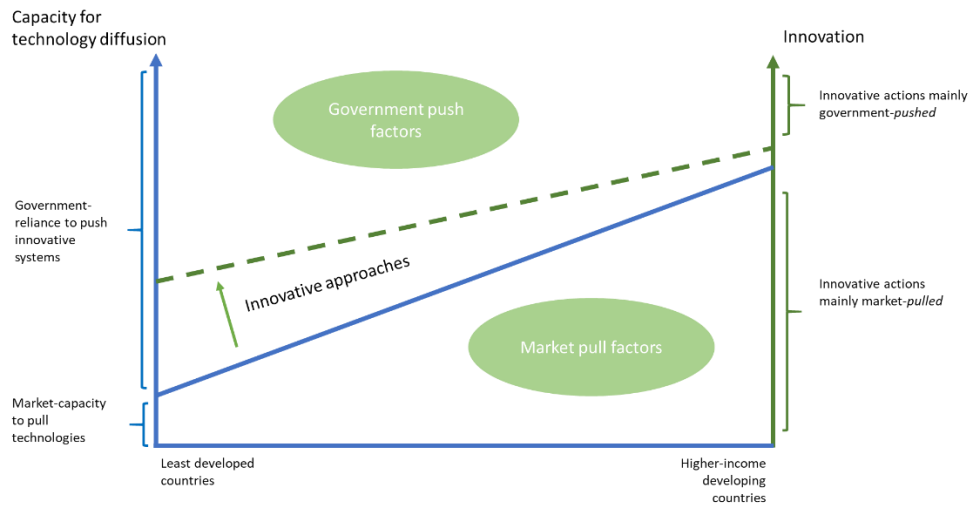
Actions

28. Local resource mobilisation is a key component in supporting climate-friendly economic activities. In that respect, support for SMEs to build small and medium-scale businesses remains important. This includes vocational training of SMEs and the young workforce to work with climate friendly technologies and develop solid business models for these.
29. This support can be solicited from Multi-Stakeholder Partnership initiatives in developing countries which help to leverage resources for climate technology programmes, with local private sector engagement.
30. Furthermore, climate innovation centres, in their role of national or regional knowledge hubs, support entrepreneurs in exploring the market potential of climate technologies in their countries, as well as identifying solutions for accessing markets. Incubation and acceleration programmes foster the development of start-ups and young entrepreneur for better utilisation of local resources for climate technology implementation.
31. Further progress is needed with standardising ESG assessment criteria for a better comparison of ESG scores by investors. This enables investors to target their funds to ESG-responsible investments, including climate technologies.

VII. Balancing public-private engagement for scaled up mature technology implementation

32. The role of technology is crucial for meeting the goals of the Paris Agreement as climate technologies embody solutions for climate change mitigation and adaptation (TEC, 2018). This Brief has therefore highlighted innovative approaches for scaling up the implementation of mature climate technologies in developing countries, in support of countries' NDCs and implementation of the Paris Agreement. A key focus has been on the role of the public and private sector in this process.
33. Usually, when a technology is matured, i.e. it has successfully completed research, development and demonstration (RD&D) stages, the private sectors takes the lead in pulling the technology into the market (Grubb & et al., 2017). In that stage of development, the role of governments, usually the key driver for technology RD&D, decreases. However, while this may be true for industrialised and higher-income developing countries, in least develop countries, mature climate technologies often rely strongly on governments taking the lead. This is illustrated by Figure 2.
34. For example, while unlocking debt capital for India's off-grid energy sector has been based on a balanced involvement of public and private sector companies, the sovereign bonds in Fiji fully rely on governmental actions. Hence, it is presumed that a country with a relatively highly developed capacity for technology diffusion can benefit more from market-based *pull* conditions.
35. With innovations in planning, funding and public-private partnerships developing countries can strengthen their capacity for private sector engagement alongside the public sector's role in *pushing* climate technologies. As shown in Figure 2, this supports developing countries, especially least-developed countries, in mobilising and leveraging resources for investments in mature climate technologies that contribute to national development objectives and implementation of the Paris Agreement.
36. Countries where innovation relies mainly on government action, would benefit more strongly from government-to-government collaboration, receiving capacity building support from multilateral (financial) organisations and UN bodies, such as CTCN. Developing countries with more mature and efficient market systems for climate technology uptake would benefit more from multi-stakeholder partnerships, such as multinational enterprise collaboration through which an existing mature technology in one country is transferred to another country.

Figure 2.
Division of roles between public and private sector in scaling up mature technologies in least-developed and higher-income developing countries (*source: authors*)



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