

## **Call for inputs: provision of guidance on how TNA results can be developed into projects that can be ultimately implemented**

8 May – 26 June 2015

### **Background**

The Conference of Parties at its twentieth session (COP 20) recognized the need for the technology needs assessment process to be improved in order to facilitate the implementation of the project ideas emanating from it. This can be done through the provision of technical assistance and finance to each technology needs assessment (TNA), which should also aim to integrate economic, environmental and social aspects into the development of the technology needs assessment.

COP 20 requested the Technology Executive Committee (TEC) to provide guidance on how the results of the TNAs, in particular the technology action plans (TAPs), can be developed into projects that can be ultimately implemented, and to provide an interim report on its preliminary findings to the subsidiary bodies at their forty-third sessions (November–December 2015).

The TEC at its 10th meeting considered how to respond to the COP 20 mandate on the provision of guidance on how the results of the TNAs, in particular the TAPs, can be developed into projects that can be ultimately implemented. The TEC requested its task force on TNAs to initiate the work on this matter.

### **Call for inputs**

The TEC agreed to launch a call for inputs on the provision of guidance on how the results of the TNAs, in particular the TAPs, can be developed into projects that can be ultimately implemented. In this regard, the TEC invites stakeholders, including UNFCCC accredited observer organizations, to provide their submission to the UNFCCC secretariat on the following set of questions provided by the TEC. The submissions should be sent to the following e-mail address: [vhecl@unfccc.int](mailto:vhecl@unfccc.int)

The call for inputs was open from 8 May to 26 June 2015 (24:00 GMT).

The inputs from the call for inputs will be considered at the eleventh meeting of the TEC, to take place in September 2015. The inputs will be also displayed on this TT:CLEAR web page.

### **Questions for the call for inputs**

1. Identify what you perceive to be the strengths and deficiencies of the TNA process?

2. Outline what recommendations or solutions would you make to improve the TNA process? Are there process improvements required for accelerating implementation of the TNA results?
3. Are the steps of the TNA process (as developed in the updated UNDP handbook for conducting TNAs for climate change) sufficient and well-targeted to cover all the aspects of the identification and prioritization of technology needs? Are there other steps you would suggest adding to the TNA process?
4. What do you consider the best way of organizing and synchronizing the stakeholders involved in the TNA process? How a formal coordination amongst the stakeholders could be developed, in order to promote a common goal and to organize the information provided?
5. Could you identify appropriate means for TNAs to be conducted whereby project ideas turn into concrete ideas which can be ultimately implemented? How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?
6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas? How can the guidance be improved?
7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?
8. How effectively are the TNA and TAP results used in other processes such as National Communications, NAPAs, NAPs?
9. How successful has the TNA been in the country in terms of increasing awareness on climate change issues, and also in obtaining support? How specifically can the TNA and TAP be supported to facilitate their implementation?

## Inputs received

<b>Date received</b>	<b>Submission</b>
June 2015	Advanced-Manufacturing Coalition for Technology and Innovation
June 2015	Asian Institute of Technology
June 2015	Climate Action Network
June 2015	Climate Change, Agriculture and Food Security, International Centre for Tropical Agriculture, International Institute for Tropical Agriculture, Women in Global Science and Technology
June 2015	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
June 2015	ETH Zurich and Harvard University
June 2015	Global CCS Institute
June 2015	Inter-American Development Bank
June 2015	Notre Dame Global Adaptation Index
June 2015	United Nations Industrial Development Organization
June 2015	World Intellectual Property Organization

## **Response to the Technology Executive Committee (TEC) Call for Inputs:**

### **Work of the Technology Executive Committee on the Guidance of Technology Needs Assessments**

On behalf of the Advanced-Manufacturing Coalition for Technology and Innovation (ACTI), we are pleased to provide brief responses to the questions posed by the Technology Executive Committee (TEC) in relation to the Technology Needs Assessments (TNA) process.<sup>1</sup>

#### **Introduction**

The Technology Mechanism constitutes valuable means of support to developing countries' adaptation, mitigation, and overall sustainable development efforts. In particular, the work of both the Technology Executive Committee (TEC) and the Climate Technology Centers and Network (CTCN) presents a real opportunity to stimulate concrete actions in technology research, development, demonstration, deployment, diffusion and transfer, as well as lower emissions and foster more energy efficient technology adoption and use.

The TEC in particular can play an important role by organizing and conducting assessments and reviews on the effectiveness of UNFCCC policies and national programs. The TEC Briefs and in-session workshops are already meaningful contributions. Providing additional guidance to the Technology Needs Assessment (TNA) and Technology Action Plan (TAP) processes can ensure that they deliver bankable projects that can in turn support climate change mitigation and adaptation.

We are grateful for the continued openness of the TEC and welcome this opportunity to provide input on the TNA process. Below, we provide responses to some of the specific questions listed in TEC Call for Inputs. We also provide some thoughts on the (potential) role of the private sector. We end with some brief conclusions.

#### **Response to Selected Questions**

##### **1. Identify what you perceive to be the strengths and deficiencies of the TNA process?**

The TNA process continues to be central to assisting developing countries in making decisions about their technology choices. The development of and support for TNAs should aim to identify efficient and mutually-beneficial partnerships between countries and technology providers, and help countries and innovators tailor existing innovation to specific local circumstances. It is also still a relatively new process and, in this sense,

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<sup>1</sup> See "Call for inputs on how to respond to the COP 20 mandate: provision of guidance on how the results of the TNAs, in particular the TAPs, can be developed into projects that can be ultimately implemented", May 6, 2015, *accessed at* [http://unfccc.int/ttclear/pages/ttclear/templates/ttclear/templates/render cms\\_page?s=TEM\\_tec\\_cfi\\_tna](http://unfccc.int/ttclear/pages/ttclear/templates/ttclear/templates/render cms_page?s=TEM_tec_cfi_tna).

should be given time to prove its full value and evolve. At the same time, some areas for improvement can clearly be identified.

Placing a greater emphasis on enabling policies that can be put in place in order to mobilize and further encourage private technology investments and innovation within a country would also be helpful. The UNFCCC itself, as well as other intergovernmental organizations, academic institutions, and think tanks, have identified a number of key policies that countries must put in place to create an optimal environment for both homegrown technology investment and innovation, and the transfer and deployment of technology, including adaptation to local or region-specific challenges and needs. Stable and predictable legal and investment environments, including robust IPR protections, and other activities, including training and education of a workforce, have been found to be key enablers of the transfer of technology and know-how.<sup>2</sup> Similarly, eliminating barriers to trade such as tariff and non-tariff barriers for green technology trade would also be helpful.

In addition, it is very difficult to compare TNAs across countries to determine if there are similar needs that may be addressed at a larger scale. While each country must determine its own needs, it would be beneficial to have the same level of detail in each one and a common format.

**2. Outline what recommendations or solutions would you make to improve the TNA process? Are there process improvements required for accelerating implementation of the TNA results?**

Putting together the right combination of stakeholders to provide input into the TNA provides substantial benefits to increasing their impact. For example, engaging the local private sector could provide a better sense of local capabilities and where and how engagement with actors outside the country could be useful. Similarly, a review of the TNA with experts from the financial community could help provide more bankable projects from the outset. Consultation by CTCN staff may also be useful to provide insights into the types of projects that may be further developed through the Technology Mechanism.

In addition and as discussed above, the TEC should seek to achieve greater quality and consistency in TNAs to make them more powerful instruments to solve specific climate related challenges. It is particularly important that TNAs become practical and relevant documents, not general policy briefs that are difficult to translate into solutions to the problems that developing countries face.

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<sup>2</sup> See generally U.N. Framework Convention on Climate Change, *Enabling Environments for Technology Transfer* (June 4, 2003), available at <http://unfccc.int/resource/docs/tp/tp0302.pdf>; Richard Newell, *International Climate Technology Strategies*, 25-27 (Harvard Project on Int'l Climate Agreements, Discussion Paper 08-12) (2008); Osamu Onodera, *Trade and Innovation Project: A Synthesis Paper*, (OECD Trade Committee, Policy Working Paper No. 72) (2008), available at <http://www.oecd.org/tad/benefitlib/41105505.pdf>.

Standardizing the TNA formats would be a particularly positive step. Such an effort would aid in the review by interested parties, making it easier to identify opportunities to positively engage. Further, a more uniform approach would make it easier to aggregate needs on a regional basis and identify common needs. The process today is highly manual. This leads to missed opportunities. Many of the related technologies can become more cost effective through economics of scale. The prospect of providing larger volumes of products and services makes it easier for the private sector to use local resources in the supply chain, manufacture, assembly, and service of equipment. Such a dynamic can accelerate and enhance technology diffusion. It would lead to more people with improved skill sets who can not only operate the related technologies, but build on them. The end result is more tailored solutions to target climate mitigation and adaptation.

In the same regard, it may be useful to retool the synthesis reports or create an additional report that identifies the aggregated needs and projects where engagement from the private sector would be useful.

**3. Are the steps of the TNA process (as developed in the updated UNDP handbook for conducting TNAs for climate change) sufficient and well-targeted to cover all the aspects of the identification and prioritization of technology needs? Are there other steps you would suggest adding to the TNA process?**

To help facilitate more widespread use of the TNAs and TAPs, we suggest including templates and examples of each in the UNDP handbook. While the UNDP handbook currently discusses the report structure, worked examples could be useful in illustrating approaches that are more likely to result in the translation of the identified needs into solutions. In addition, it may be useful to incorporate the CTCN's request form directly into the TNA process.

The UNDP Handbook should also put a stronger emphasis on identifying the enabling environments necessary to mobilize and further encourage private technology investments and innovation. We welcome the UNDP Handbook's references, for example, to the importance of IPR by, for example, noting that "Protection of IPR and cooperation on this issue for the type of transfer envisaged is fundamental for sustainable technology transfer" (p. 154). At the same time, the Handbook also vaguely refers to "Intellectual property rights (IPR) concerns" as a potential "impediment" or "barrier" to technology commercialization (p. 155) and notes that "IPR systems may need to be revised" (p. 76). IPR should be more unambiguously mentioned as a key enabling factor for technology transfer and should be further reinforced through the TNA process.

Both academic literature as well as findings by the UNFCCC itself and a range of other international organizations and others, confirm that IPR enables technology transfer.<sup>3</sup> The

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<sup>3</sup> See generally U.N. Framework Convention on Climate Change, *Enabling Environments for Technology Transfer* (June 4, 2003), available at <http://unfccc.int/resource/docs/tp/tp0302.pdf>; Richard Newell, *International Climate Technology Strategies*, 25-27 (Harvard Project on Int'l Climate Agreements,

related costs are minimal, only accounting for a very small percentage of the cost of climate technology, and most adaptation and mitigation-related technologies are highly competitive, rather than monopoly or otherwise non-commercial markets.<sup>4</sup> Not only is there is no evidence that IPR constitutes a barrier to technology transfer, studies reviewing the economics of clean technology markets in further detail tend to find that the opposite is true. Thus, for example, one recent survey of the relevant literature found that “[i]n the case of developing nations in general, studies find a positive correlation between the strength of intellectual property rights (IPRs) and the domestic development of environmental innovations.”<sup>5</sup>

IPR, in fact, is critical not just to encourage innovation but also to enable companies and give them the assurances they need to share their technologies with others in increasingly global technology value chains. For larger companies, IPR often plays a key role in making an internal business case for investment in a certain category of products or business unit. For smaller and mid-sized companies, including innovative start-ups, IPR is key in attracting outside investment and monetizing on development and innovation that is taking place.

**4. What do you consider the best way of organizing and synchronizing the stakeholders involved in the TNA process? How a formal coordination amongst the stakeholders could be developed, in order to promote a common goal and to organize the information provided?**

We believe that it is critical to enable private sector stakeholders to play a regular role in the TNA process. One similar example is the Private Sector Advisory Group as part of the Green Climate Fund. The Group’s mandate is to make recommendations enabling the Fund to make the best use of current knowledge on how existing efficient and advanced technologies can provide solutions in the area of green technology. In this regard, it is not enough to have one single business representative be part of a committee or process. Rather, real opportunities should be created to allow business to provide effective input, at an early stage in the process and to actually help develop the most effective plans and policy solutions. In particular, we note in this regard the role the business community plays, for example, at the OECD, as well as the International Telecommunications Union, a UN-affiliated body that is based on public-private partnerships and today counts more than 800 private sector entities and 193 countries as members.

In addition, as mentioned above, publishing the synthesis report in a way that aggregates needs and similar projects could improve engagement.

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Discussion Paper 08-12) (2008); Osamu Onodera, *Trade and Innovation Project: A Synthesis Paper*, (OECD Trade Committee, Policy Working Paper No. 72) (2008), available at <http://www.oecd.org/tad/benefitlib/41105505.pdf>.

<sup>4</sup> See, e.g., Copenhagen Economics. Are IPR a Barrier to the Transfer of Climate Change Technology?, 23 (January 19, 2009).

<sup>5</sup> Kristina Lybecker, “Innovation and Technology Dissemination in Clean Technology Markets and the Developing World: The Role of Trade, Intellectual Property Rights, and Uncertainty” *Journal of Entrepreneurship Management and Innovation (JEMI)*, Volume 10, Issue 2, 2014: 7-38.

**5. Could you identify appropriate means for TNAs to be conducted whereby project ideas turn into concrete projects which can be ultimately implemented? How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?**

As indicated above, the best way to ensure TNAs result in concrete projects and solutions is to actively involve the private sector at every stage of the process. TNAs should include private sector stakeholders, such as a Private Sector Advisory Group or its equivalent, throughout the process. Such involvement can ensure that specific project ideas that are clearly not feasible will not be included in the TNAs, while at the same time shaping feasible projects in a manner that will increase the probability of implementation. The private sector brings a wealth of experience in terms of actual implementation of projects and deployment and dissemination of technologies in the real world and in developed, emerging and developing countries alike. Bringing this expertise to the table would, in our view, be a key part of the solution to the problem identified in the question.

**6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas? How can the guidance be improved?**

We recommend including examples, including illustrations of requests, to the CTCN.

**7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?**

Sufficient detail needs to be provided with the TAPs to evaluate the related projects. Today the information provided varies substantially between TAPs. In addition to details concerning the financial risks, it is necessary to provide enough information to determine if the technology is suitable for where it will be deployed. Some elements to consider include:

- An analysis of the existing infrastructure and physical terrain to determine if the technology can be operational;
- Potential participants in the process who will operate the related technology and an assessment of their technical capabilities;
- Identification of skilled personnel who can be leveraged to maintain the desired systems; and
- An analysis of the existing supply chain to provide replacement parts as needed.

Countries may need help in procuring the related information. The CTCN, through its network, could play a significant role in this regard.

## **Involvement of the Private Sector**

We believe that the TNA process should further leverage private sector expertise and experience to foster investments and innovation in the area of clean technology and climate mitigation. The private sector is key to innovation and the development of the advanced technologies that can be used in key climate mitigation strategies. Firms will simply not make the requisite investments in such technologies, which take many years to develop at great cost, without a suitable investment climate and rule-of-law protections. Similarly, close engagement with the private sector in the development and implementation of the TNAs will be key to ensuring that such strategies are feasible and sustainable and supported by the necessary private-public partnerships. We appreciate this opportunity to comment and look forward to engaging with you to improve the TNA process.



# **Call for inputs: provision of guidance on how TNA results can be developed into projects that can be ultimately implemented**

Asian Institute of Technology

25 June 2015

## **1. Identify what you perceive to be the strengths and deficiencies of the TNA process?**

The TNA reports are the outcome of comprehensive stakeholder approach carried out by of national ministries created based on national circumstances. These reports play a key role in providing key inputs in preparing NAMA and NAP. Since, participation of all regional centers will enable sharing cross-country experiences for better policy development at regional level. Similarly, workshops are more valuable in translating experience. The most commonly identified barriers and enabling measures will lead to a greater deployment of technologies in large-scale. However, knowledge management approach for conducting workshop, a comprehensive template for preparing all project documents and handbook on project finance will lead to better outcomes from the TNA.

## **2. Outline what recommendations or solutions would you make to improve the TNA process? Are there process improvements required for accelerating implementation of the TNA results?**

In order to mitigate communication barrier there is necessity for interaction between Regional Centers (RCs) via teleconference once in two months for clarification to bring all RCs for common understanding. Therefore, Interaction between RC's for common capacity building for future projects (to share common answer). Brief internal report on country performance between regional centers could be useful for regional centers for capacity building. Country driven for preparing agenda for workshops will lead to better outcome, so involve participating countries while designing agenda. Commitment from countries to deliver the report on time and the participating countries must deliver reports on time and enough time given to evaluating these reports, since it has to pass all the project principal investigators.

## **3. Are the steps of the TNA process (as developed in the updated UNDP handbook for conducting TNAs for CC)sufficient and well-targeted to cover all the aspects of the identification prioritization of technology needs? are there other steps you would suggest adding to the TNA process?**

Some countries are serious about methodology others don't; therefore methodology should be open for prioritization of technology. Possibility of TNA Handbook made in regional language and handbook for project finance and exercise/workshop for the same.

## **4. What do you consider the best way of organizing and synchronizing the stakeholders involved in the TNA process? How a formal coordination among the stakeholders could be developed, in order to promote a common goal and to organize the information provided?**

Centralization of process with relevant institutes will lead to good understanding and greater stakeholder's engagement. Further, workshops are more valuable in translating experience; therefore engaging stakeholders during workshops through presentations will be helpful.

**5. Could you identify appropriate means for TNAs to be conducted whereby project ideas turn into concrete projects which can be ultimately implemented? How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?**

Participation of donor community and private sector will be helpful in realizing developing project ideas. Therefore, target the right audience while conducting workshops such as project developers, multilateral, regional financial community etc. for project finance session. Further, it is also necessary to include on business plans will be useful. Harmonization approach in preparing documents for all the participating countries must have some common understanding. Countries must engage with RC's on technical mission.

**6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas? How can the guidance be improved?**

Scope of Project Investigators must be improved and provide template for preparing other project reports such TAP and PI. To improve Technology Action Plan (TAP) we need to solve the problem of legitimacy.

**7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?**

TAP must be able to give information on target, budget and actors responsible for the actions and project ideas able to give duration of the project, budget, resource requirement, responsibility and coordination and measurement and evaluation.

**8. How effectively are the TNA and TAP results used in other processes such as National Communications, NAPAs and NAPs?**

The TNA report is useful in planning and developing policy instruments in low emissions development at national level. Further, most importantly TNA report is useful foundation for developing carbon market at national level.

**9. How successful has the TNA been in the country in terms of increasing awareness on CC issues and also in obtaining support? How specifically can the TNA and TAP be supported to facilitate their implementation?**

In mitigation it was difficult to influence participating countries there must not room for outside influence and countries must trust RC's ideas. All in all, there is a wide difference between country approaches in preparing reports such as some countries consists only coordinators and consultants and another set of countries with wide stakeholders process and consultation with centralization of process with relevant institutes.

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# Climate Action Network

## CAN Submission to the TEC on the TNA & TAP Processes

June 2015

*Climate Action Network International (CAN-I) is the world's largest network of civil society organizations working together to promote government action to address the climate crisis, with more than 900 members in over 100 countries. [www.climatenetwork.org](http://www.climatenetwork.org)*

CAN thanks the Secretariat of the UNFCCC and the members of the Technology Executive Committee for the opportunity to comment on the Technology Needs Assessment and the Technology Action Plan processes. In response to the questions posed by the Secretariat on this topic, CAN submits the following responses, on which we would welcome a broader discussion with the TEC.

### **1. Identify what you perceive to be the strengths and deficiencies of the TNA process?**

#### **Strengths:**

**One clear strength of the TNA process is that it is designed to be inclusive and multi-stakeholder in nature, and hence ensure locally appropriate results.** Over the last two decades, the architecture of global cooperation has been moving towards actively involving a greater breadth and depth of stakeholders due to international recognition that global challenges such as climate change cannot be resolved by governments alone, and the TNA guidebook clearly takes this into account.<sup>1</sup>

**Because of its multistakeholder design, the TNA process also has the potential to be a useful awareness-raising mechanism for climate issues and solutions at the national level.**

#### **Deficiencies:**

**Many TNAs/TAPs generally do not live up to their aims or potential as inclusive, multistakeholder processes- hence much potential value-added in TNA/TAP design and dissemination of results has been lost in the processes thus far.** Experience has confirmed that consultations have often been

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<sup>1</sup> World Economic Forum (WEF). 2010. Global Redesign. Geneva: WEF.

only within governments,<sup>2</sup> and while intra-ministerial collaboration is necessary, it is not sufficient to understand what is required or desired by the nation more broadly. In addition to the knowledge and experience deficit presented by not including all relevant actors, the narrow participation in most TNA events has been further detrimental to the TNA/TAP process in that there are fewer stakeholders to create wider buy-in for the process, and to hold decision-makers to account for delivering on, or to follow up on, the TNAs and TAPs.

**In addition to the need to begin formulating clear next steps, roles, responsibilities and timelines for TNAs/TAPs to be successful, funding must be available for these next steps to take place.** It is unclear from our outsider perspective how successful the TAPs have been in attracting funding for the activities they outline as required next steps- but our understanding is that this has been a major hurdle within the process. If this is accurate, there is a clear match-making component of the TAP process that is missing. Donors/funders should be approached to discover what types of projects they are interested in / able to fund, and a database created on this basis that countries can use to better understand who to turn to for funding. This is part of an important wider imperative- that all Parties recognize “the TNA process” as only a small part of an ongoing and broader “climate mitigation/adaptation implementation process”.

**Guidance on what donors/financiers want to see as project proposals is lacking.** Related to the last point, bringing GEF, the GCF, bilaterals, and others together to establish a common template and level of expectation for project proposals would increase both the speed of, and faith in, the TNA/TAPs. (SE4All is wrestling with the same issue, with some work being started on this by the African Development Bank- see next point.)

**There is an apparent lack of coordination with other international organization/process-led planning on similar issues:**

***In the mitigation space:***

The UN Secretary General’s Sustainable Energy for All (SE4ALL) initiative includes Rapid Assessments and Gaps Analyses (RAGAs), Investment Prospectuses, and Action Agendas that are similar to TNAs/TAPs. Other examples include that under the Global Green Growth Institute (GGGI), there are green growth plans (GGPs), and under the International Renewable Energy Agency (IRENA), countries are undertaking Renewables Readiness Assessments (RRAs). By not engaging with these other key institutions and processes, we are forcing countries with very little time, money and human resources to undertake overlapping exercises and processes again and again, which is neither helpful for the countries, nor a good use of scarce resources. Looking forward, engagement with any relevant SDG implementation work will be critical.

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<sup>2</sup> Byrne, R., Smith, A., Watson, J. and Ockwell, D. (2011) Energy Pathways in Low-Carbon Development: From Technology Transfer to Socio-Technical Transformation, STEPS Working Paper 46, Brighton: STEPS Centre.

### ***In the adaptation space:***

The Sendai Framework for Disaster Risk Reduction 2015-2030 has begun a process of encouraging national planning on disaster risk reduction that will be highly relevant for adaptation TNAs and TAPs going forward.

**TNAs are biased towards hard technology** rather than know-how, knowledge absorption, knowledge adaptation and behavior- which are as, or more important, than the hard technologies in many cases for the long-term sustainability of plans and actions. For climate technologies to be part of a longer-term solution, the TNAs and TAPs must focus much more on the indigenization of technological innovation, development, production, and maintenance, and on the soft side of innovation (i.e. capacity building).<sup>3</sup>

## ***2. Outline recommendations or solutions you would make to improve the TNA process?***

See the above points on deficiencies, particularly on: ensuring TNAs and TAPs are part of a truly multi-stakeholder, well-defined and well-funded implementation process; broadening them away from hard technologies and to focus more on the softer side of innovation and technology; and finally on linkages between TNAs/TAPs and NAMAs and (I)NDCs.

### ***2a. Are there process improvements required for accelerating implementation of the TNA results?***

**Part of the TNA/TAP process must be to ensure devolved responsibilities and actions to ensure planning and action do not only happen at the national level.** National level planning is key but activities of course take place at the local level, where understanding of and buy-in to climate policies may be limited.

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<sup>3</sup> See Amber Meikle and Jodi Sugden (2015) *Introducing Technology Justice – A New Paradigm for the SDGs*. Practical Action Publishing. Available online at: [http://infohub.practicalaction.org/oknowledge/bitstream/11283/556995/1/Technology%20Justice%20Briefing%20Paper\\_web.pdf](http://infohub.practicalaction.org/oknowledge/bitstream/11283/556995/1/Technology%20Justice%20Briefing%20Paper_web.pdf)

Also see Anne Olhoff (2015) *Adaptation in the context of technology development and transfer*, *Climate Policy*, 15:1, 163-169, DOI: 10.1080/14693062.2014.873665. See also: Fida, E. (2011). *Assessing technology needs for adaptation under the 'top-up' round*. In L. Christiansen, A. Olhoff, & S. Trærup (Eds.), *Technologies for adaptation. Perspectives and practical experiences* (pp. 45–57). Roskilde: UNEP Risø Centre on Energy, Climate and Sustainable Development.

Finally, see: Vincent, K., Cull, T., & Joubert, A. (2011). *Technology needs assessment in southern Africa: Does operationalization of the UNFCCC and associated finance mechanisms prioritise hardware over software and orgware?*. In L. Christiansen, A. Olhoff, & S. Trærup (Eds.), *Technologies for adaptation. Perspectives and practical experiences* (pp. 69–79). Roskilde: UNEP Risø Centre on Energy, Climate and Sustainable Development.

Ensuring broader stakeholder engagement, responsibilities and pathways to act. This will accelerate action by:

- Improving process sustainability
- Improving targeting of resources
- Strengthening accountability and relationships between all stakeholders<sup>4</sup>

TAPs must include broader, more holistic mapping exercises. Relevant toolkits have been developed, such as the recent EU publication on building pro-poor energy markets, which are directly relevant to the TNA/TAP processes, and illustrate how to make interventions more viable/sustainable in the long term. This illustration provides an overview of what this particular holistic approach would encompass:

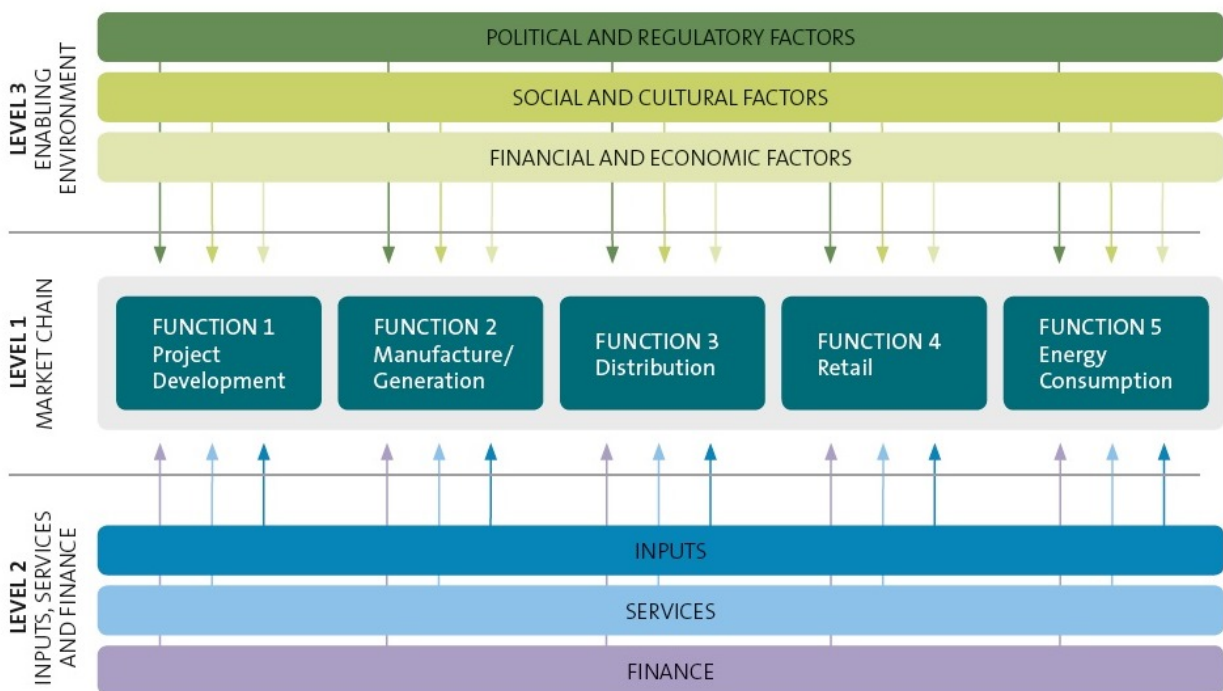


Figure 1: Example of energy market system mapping framework which TNAs/TAPs could utilize<sup>5</sup>

<sup>4</sup> UNDP (2006) MULTI-STAKEHOLDER ENGAGEMENT PROCESSES: A UNDP CAPACITY DEVELOPMENT RESOURCE. Available online at: <http://www.undp.org/content/dam/aplaws/publication/en/publications/capacity-development/drivers-of-change/accountability/multi-stakeholder-engagement-processes/Engagement-Processes-cp7.pdf>

See also: Save the Children (2010). Consultation & Participation for Local Ownership. What? Why? How? Online at: <http://www.savethechildren.org/atf/cf/%7B9DEF2EBE-10AE-432C-9BD0-DF91D2EBA74A%7D/consultation-local-ownership.pdf>

<sup>5</sup> EUEI-PDF and Practical Action (2015) Building Energy Access Markets: A Value Chain Analysis of Key Energy Market Systems. Online at: [http://www.euei-pdf.org/sites/default/files/files/field\\_pblctn\\_file/euei\\_value-chain\\_rz\\_01\\_web\\_1.pdf](http://www.euei-pdf.org/sites/default/files/files/field_pblctn_file/euei_value-chain_rz_01_web_1.pdf)

**3. Are the steps of the TNA process sufficient and well-targeted to cover all the aspects of the identification and prioritization of technology needs?**

The TNA sector guidebooks are excellent technical guides for technical problems. What most lack however, are descriptions of meaningful implementation pathways.<sup>6</sup> Clear suggestions/guidance for specific actors to undertake specific activities to implement technological and systemic changes are necessary to speed TNA and TAP follow-through. For readers of many of the TNA guidebooks, it is mostly unclear to whom they should turn to begin work on these issues.

UNEP and the UNFCCC should work to create actionable pathways for TNA guidance and the TNA processes more broadly to be implemented, as well as pathways for accountability and capacity building, which will be required for most developing countries to carry out the activities called for in the TNAs/TAPs.

**3a. Are there other steps you would suggest adding to the TNA process?**

Needs assessments and action plans for building skills, knowledge, local training/education opportunities for carrying out activities outlined in the TNAs/TAPs are required. To accomplish TNAs' aims, there are clear needs for significant local university and vocational training institutions to build national knowledge-bases and workforces in TNA-relevant sectors, yet as we understand it, no attention is paid to this soft side of technology in the current process.

An advocacy/influencing component is needed. TNAs and TAPs can only ever be as successful as the level of political buy-in and political will that they have at home - which may not be high upon the completion of the TNA and TAP reports. A key component of a successful TNA/TAP process therefore is having a clear plan for gaining and strategically using support at home over time. This must be more than holding internal workshops, and should include training of key supporters//champions on how to gain further internal and political support and how to turn that support into action. This is particularly important in the context of facilitating technology and knowledge transfer, which can involve important and sometimes difficult domestic political changes (standards creation, procurement issues, tariffs and taxes, etc.).

Quality control mechanisms are needed at the scoping and activity planning stages of TNA and TAP preparation, and monitoring and evaluation tools are needed during the action phase. These additions are the only way to ensure multilateral funding is being spent the way it should be - i.e. on a TNA/TAP process that closes follows that outlined in the TNA guidebooks/handbooks, based on broad, inclusive stakeholder engagement, and targeted actions outlined within the resulting documents.

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<sup>6</sup> Water adaptation, and buildings and transport for mitigation are welcome exceptions that provide the type of guidance needed to turn these papers into progress.

**4. What do you consider the best way of organizing and synchronizing the stakeholders involved in the TNA process? How could a formal coordination amongst the stakeholders be developed, in order to promote a common goal and to organize the information provided?**

There are generally agreed upon universal criteria for minimum standards in multi-stakeholder processes, regardless of who is participating.<sup>7</sup> These are:

- i. **Communication:** Establish a clear, accessible and reliable lead/focal point for each stakeholder group (government, CSOs [may need to differentiate between types of organization], businesses (again, may need to differentiate between sectors), donors, etc.).
- ii. **Representation:** Consultation/event/process design should be participatory and inclusive to ensure all relevant perspectives from stakeholders across the energy value chain will be represented.
- iii. **Timeliness:** Opportunities for stakeholders to engage should be offered in a timely manner to ensure informed participation, which greatly improves outcomes.
- iv. **Information:** Access to information/documentation should be ensured as early as possible to enable informed participation, follow-up, implementation and monitoring (i.e. information should flow at all stages in a process, including records of all stakeholder consultations being shared with relevant stakeholders).
- v. **Gender-awareness & inclusion of marginalized groups:** All aspects of the process should be gender aware and include vulnerable and excluded groups. This should include ensuring active participation by women's and marginalized groups in all components of the process listed here.
- vi. **Ensuring quality:** Provide basic capacity building for stakeholders who are relevant but may not be familiar with the issues.
- vii. **Decision-making:** Participation in decision-making should be as broad and inclusive as appropriate.
- viii. **Follow-up:** Clear action plan with roles/responsibilities should result from any event/milestone in process to ensure progress. It is extremely important that stakeholder engagement be seen as an ongoing process and not a one-time event.
- ix. **Implementation/monitoring:** A broad set of stakeholders should be involved in implementation/monitoring to ensure buy-in and support of the process, and accountability and transparency.

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<sup>7</sup> These principles have been adopted by the UN Secretary-General's SE4ALL Initiative as their official criteria for multistakeholder processes: <http://www.se4all.org/wp-content/uploads/2014/02/Stakeholder-Guidelines-final-draft.pdf> These criteria are based on Gallagher and Wykes (2014). Opportunities for Civil Society Participation in the Sustainable Energy for All Initiative. Practical Action Publishing. Online at: <http://cdn1.practicalaction.org/p/p/547c7f57-836c-4741-915a-3dfb0a000047.pdf>



These nine principles help establish a functioning, trusted process that improves outcomes.

***5. Could you identify appropriate means for TNAs to be conducted whereby project ideas turn into concrete projects which can be ultimately implemented?***

Project developers in relevant sectors should be brought into the TNA/TAP creation process to facilitate translation of sector needs into real-world actions. Having the previously suggested donor project proposal expectations/format/template would help improve understanding of what planners should be considering when working on translating ideas into projects.

***5a. How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?***

We do not have the insight into current processes to answer this question adequately.

***6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas?***

As mentioned previously, guidance on the soft-side (skills/education) of technology, development, production, and maintenance would be extremely helpful.

***7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?***

The TNA outputs and formation into TAPs are meant to be useful signals but need to be formulated into investment portfolios that meet the needs of private and public sector investors. What is clear is that the TNAs and TAPs do not provide such information and therefore, the utility of TNAs remains limited. Both sector investment portfolios and individual project funding proposals are needed as a result of the TNA and TAP processes, each of which will have different target audiences and therefore require different types of information.

***For sectoral planning:***

Aside from specific project ideas, TNAs should outline sector and governance reforms necessary to achieve TNA/TAP goals in a similar way to what treasuries and finance ministries do in designing investment frameworks for particular sectors. This would mean that in addition to the money required, funding partners will want to see planned governance reforms, incentives for private sector engagement, clear articulation of entry points for investors, identification of the cost of

funding incentives, (i.e. subsidies and other measures). For funders, evaluation criteria would have to be different for mitigation technology vs adaptation technology but could be drawn from existing GCF<sup>8</sup> and Adaptation Fund assessment criteria. However, it should be noted again that the UNFCCC should engage as many funders as possible to coordinate expectations and requirements.

***For individual project planning:***

Financiers will need to know the standard information required for any business/development project type investment. This list is based on the excellent planning tool [MyBusinessPlan](#)<sup>9</sup> for energy entrepreneurs in developing countries. The tool takes the entrepreneur through a step by step business and financial planning process that results in a business plan and investment prospectus fit for submission to a funder, and is a valuable tool for project and business developers in this space. Information submitted to funders based on this tool, should include:

- 1) What is the project idea,
- 2) Who will be the beneficiary/customer,
- 3) How you plan to deliver results (i.e. which technology, supplied how?),
- 4) What is the broader context in which this project is being developed (i.e. what is the market like)?
- 5) Who specifically will be carrying out the work?
- 6) What is the activity timeline?
- 7) What is the financial plan?
- 8) What are the planned impacts/outcomes
- 9) What are the risks and how will they be mitigated?
- 10) What is the long term plan for maintaining and monitoring results?

***8. How effectively are the TNA and TAP results used in other processes such as National Communications, NAPAs, NAPs?***

This is best left to national level stakeholders to answer.

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<sup>8</sup>GCF Investment Framework, Annex III, p24.

[http://www.gcfund.org/fileadmin/00\\_customer/documents/MOB201503-9th/23 - Decisions of the Board - Ninth Meeting of the Board 24 - 26 March 2015 20150416 fin.pdf](http://www.gcfund.org/fileadmin/00_customer/documents/MOB201503-9th/23_-_Decisions_of_the_Board_-_Ninth_Meeting_of_the_Board_24_-_26_March_2015_20150416_fin.pdf)

<sup>9</sup><http://embarkenergy.com/mybusinessplan-2/>

**9. How successful has the TNA been in the country in terms of increasing awareness on climate change issues, and also in obtaining support?**

This is best left to national level stakeholders to answer.

**9a. How specifically can the TNA and TAP be supported to facilitate their implementation?**

By ensuring TNAs and TAPs are understood by the broad and inclusive group of stakeholders planning them and carrying them out, that they are parts of long-term adaptation and mitigation activities that require ongoing effort and resources.



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## **TEC Call for inputs**

**Provision of guidance on how the results of the TNAs, in particular the TAPs, can be developed into projects that can be ultimately implemented (COP-20 mandate)**

### **Submission by:**

**Climate Change, Agriculture and Food Security (CCAFS)**

**International Centre for Tropical Agriculture (CIAT)**

**International Institute for Tropical Agriculture (IITA)**

**Women in Global Science and Technology - WISAT**

1. Identify what you perceive to be the strengths and deficiencies of the Technology Needs Assessment (TNA) process?

The strengths of the TNA process lie in that it involves, for each country, a national team as well as key stakeholders who participate in the entire process and define development priorities. The idea that the coordinating entity should be inter-ministerial ensures that there will be harmony in the implementation of variable mandates. We would like to note that the coordinating entity should include representatives of Ministries of Women and / or Social Protection. Additionally, subsectors are chosen and within these, priorities are defined with respect to mitigation, adaptation and development. This signifies that there is a significant effort to promote the participation of various actors in decision-making.

The principal weakness of the TNA process is that it does not take into account gender considerations in any of its stages. There are no steps that identify differences in men's and women's situations and priorities in relation to technological processes for adaptation and mitigation. Similar gaps exist in existing development plans and policy documents, which new strategies should try to address. In addition, the TNA is largely top-bottom, leaving out the participation of the grassroots, which will result in lack of ownership of the process and products. Finally, its technical approach underplays the role of small-scale farmers. Considering that the use and impacts of technologies are situated in the local socio-economic and gender context, the ability of small-scale farmers to benefit from technologies needs to be integrated into technology needs assessments from the start.

2. Outline what recommendations or solutions you would make to improve the TNA process? Are there process improvements required for accelerating implementation of the TNA results?

It is critical that men's and women's distinct roles, experiences, and contributions to technology use and adoption be recognized throughout the TNA process, for more effective needs assessment planning and policymaking. Furthermore, this requires consideration of women's technology needs and preferences, which can be obtained from the grassroots. Gender gaps in access to resources, trainings, education, and participation in decision-making contribute to differences in men's and women's vulnerabilities to climate change

and, correspondingly, to variations in their technology needs and need to be systematically taken into account throughout the design, implementation and monitoring of benefits of technology use and adoption.

National teams should be mandated to include gender and youth experts, to ensure that the priorities and situations of less-represented groups are included in national planning and implementation. National stakeholder groups should include women's groups in all sectors involved in the technology being assessed, including users, NGOs, and technology professionals. From the start, men and women farmer association representatives should be part of the national team and across levels.

3. Are the steps of the TNA process (as developed in the updated UNDP handbook for conducting TNAs for climate change) sufficient and well-targeted to cover all the aspects of the identification and prioritization of technology needs? Are there other steps you would suggest adding to the TNA process?

The steps of the TNA process are insufficient for the identification and prioritization of men's and women's technology needs. The following additions are suggested, for the respective steps:

- a. Organization of assessment
  - i. A gender expert should be considered when defining the national team. The expert should have practical gender experience with the local context to be able to guide appropriate gender analysis.
  - ii. Women's, youth, and ethnic group organizations should be included when identifying stakeholder groups
  - iii. Criteria of which groups in (ii) to be included should be set to ensure inclusion of all groups affected
- b. Development priorities
  - i. Women's and men's needs and interests should be consulted when discussing country development and climate change priorities. For this, sex-disaggregated data are essential (obtained through consultation with national departments of statistics and research centers). It is also important to take into account women's and men's needs beyond the practical level and support their priorities for increasing their access to and control of resources and participation in decision making that affects their lives.
- c. Prioritizing subsectors
  - i. Organizations of men and women producers should be taken into account when selecting subsectors
  - ii. The development, mitigation, and adaptation priorities used to assess subsectors should have incorporated the considerations discussed with women's, youth, and ethnic group organizations
- d. Technology prioritization
  - i. Men's and women's perspectives, priorities, and preferences should be considered, based on consultation, gender and participatory processes already



- realized, during technology identification and assessment and upon making final decisions
- ii. It should not be assumed that all members of a household will be affected in the same way by technology or have the same technology priorities. A technology will not benefit all members of a household automatically. Intra-household decision making, access to and control of assets, distribution of labour and gender priorities need to be taken into account in technology assessment processes.
  - e. Constructing a national strategy and national adaptation plan
    - i. Gender equality should be considered as an integral aspect of strategies and plans, and not just a cross-cutting issue, when defining objectives.
    - ii. Assessment of implications of climate change on national development priorities should include socioeconomic effects on women, youth, the elderly and ethnic groups, as well as their role in adapting and responding to climate induced changes.
    - iii. Strategies and plans should take a strategic approach to empower both women and men to gain access to and control of resources, participate in decision making at family and community levels, and decrease the work burden of all members of the household. They should do more than meet the basic needs of women and children.
    - iv. Men's and women's local knowledge should be taken into account when identifying measures for capacity development and innovation
    - v. The tasks, budgets and milestones should sufficiently reflect demands for gender inclusion
4. What do you consider the best way of organizing and synchronizing the stakeholders involved in the TNA process? How could a formal coordination amongst the stakeholders be developed, in order to promote a common goal and to organize the information provided?

It is important to ensure that gender aspects are taken into consideration throughout the process of stakeholder engagement. This implies that women are acknowledged as a primary stakeholder group, with contributions equally valuable to those of men. Women's groups should be identified at the local level. Furthermore, engagement processes should meet women in those spaces that are easily accessible by women and should be planned for times of the day when women are available. This type of consultation helps motivate local level acceptance of policies and plan implementation. Institutional actors to include in consultation, from a gender perspective, should include community-based organizations and both government and civil society organizations working on gender equality from various sectors, including agriculture and food security.

5. Experts on gender and climate change adaptation and mitigation at national and international levels should be brought into the process at key points and as part of the decision making structure of the process, to ensure that expert knowledge of these issues influences decision making. Could you identify appropriate means for TNAs to be conducted



whereby project ideas turn into concrete projects which can be ultimately implemented? How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?

Incorporating the contexts, necessities, and interests of men, women, and youth and ethnic groups in TNAs promotes the development of concrete projects and their successful implementation. Building in context specific gender issues helps to visualize the success of the projects at planning stage. Gendered participatory strategies can engender more accurate and effective TNA results and consequently, be more attractive to funding entities.

Working with farmers groups, producers' organizations and civil society groups that prioritize women, youth and gender issues at the local and national level will ensure participatory gender-equal approaches.

6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas? How can the guidance be improved?

Existing guidance is insufficient for drafting technology action plans and project ideas due to its lack of consideration of gender and social inclusion aspects. Guidance materials are not inclusive and, consequently, can lack legitimacy as a result of their disregard of women's, men's, and ethnic groups' distinct necessities and interests.

7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?

Investors and funding entities should understand that TAPs and project ideas emanating from TNAs can constitute efficient development strategies in as much as these account for the contexts, needs, and interests of those who benefit from them. Additionally, information on the inclusion of sex disaggregated data and indicators in TNA/project monitoring and evaluation is essential.

TAPS and project ideas should include a clear articulation of gender and social inclusion goals in the objectives and mission statement, identification of partners for implementation, and implementation strategy. They also need to include clear deliverables and indicators to monitor the delivery of benefits to and participation of women.

Guidelines on gender and social inclusion for climate change technology assessment should be developed to inform funding and investment decisions. Liaison with groups and researchers already in the process of gender and technology assessment for climate change adaptation and mitigation will help to ensure that funding decisions result in leading edge, successful projects.

8. How effectively are the TNA and TAP results used in other processes such as National Communications, NAPAs, NAPs?



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TNA and TAP results have not been effective in promoting gender-sensitive consideration of technology needs in National Communications, NAPA, and NAP processes. Additionally, a document review carried out by the CIAT Gender and Climate Change Group of the above mentioned processes in seven Latin American countries found that none consider gender aspects in relation to technology. In East Africa, technology is developed based on agro-ecological zones, thus disregarding the gender differentiated needs.

Analysis of national stakeholders in planning National Communications needs to take into account the differing situations, access to information, and access to resources of groups in the country, including women, youth, the elderly, people in rural areas, and ethnic groups.

9. How successful has the TNA been in the country in terms of increasing awareness on climate change issues, and also in obtaining support? How specifically can the TNA and TAP be supported to facilitate their implementation?

It is critical that policymakers and funding entities are aware that women's, men's, youth, and ethnic group participation in TNA and TAP development is strategic in so much as it allows for incorporation of the needs and interests of initiative beneficiaries and for consideration of territorial customs and characteristics.

June 23, 2015



# Call for inputs: provision of guidance on how TNA results can be developed into projects that can be ultimately implemented

Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ) GmbH

31 July 2015

## 1. Identify what you perceive to be the strengths and deficiencies of the TNA process?

TNAs offer an opportunity for a country to develop a national technology policy for climate change. It is a holistic approach in as far as it intends to cover all climate relevant sectors for mitigation and adaptation. At the same time this strength becomes a weakness. TNAs as well as TAPs, particularly for larger countries, don't allow to discuss specific technologies for individual sectors in any detail, let alone to develop implementable and bankable projects. Our impression is that TNAs are too much hardware biased and are not taken into account sufficiently the software side of technologies, which are essentially key for a successful technology implementation, use and its further development.

We learnt from colleagues (partly) involved in TNA processes that the process is often perceived as an academic exercise without a clear objective (lack of implementation). Furthermore it is felt to be detrimental that partners are not required to contribute with own resources, as the costs are fully covered from outside, therefore the ownership and commitment is often not strong enough. In addition, it was perceived that many of the discussed technology needs are cross-sectoral, which makes classification into sector/ technology categories difficult.

## 2. Outline what recommendations or solutions would you make to improve the TNA process?

In principle, the TNA process is well thought through, but needs to be properly managed. Whether this is always the case, is beyond our knowledge but worth to look into. Specific support might be required if there are deficiencies. But foremost, the TNA process needs to be top down driven to be relevant for a countries climate policy. It must be coordinated and synchronized with other development plans and, moreover, with climate relevant sector planning and consequential investment decisions. Are there process improvements required for accelerating implementation of the TNA results? The involvement of stakeholders, which are key for possible implementation of TNA and TAP ideas, suggestions, technology road maps and the like need carefully planned and managed. The respective calling power should be at the hand of those responsible for TNA processes – if not change the responsibility.

## 3. Are the steps of the TNA process (as developed in the updated UNDP handbook for conducting TNAs for climate change) sufficient and well-targeted to cover all the aspects of the identification and prioritization of technology needs? Are there other steps you would suggest adding to the TNA process?

As above and this: It is always questionable to suggest a planning and policy instrument, which is good for China and Chile, Mexico and Maldives. TNA should be used as flexible as possible in countries. It should be possible to cover only part of the relevant sectors to become more focused, particularly in larger

countries. A greater focus would allow to be closer to specific sectors and the relevant stakeholders in these sectors. 2

**4. What do you consider the best way of organizing and synchronizing the stakeholders involved in the TNA process? How a formal coordination amongst the stakeholders could be developed, in order to promote a common goal and to organize the information provided?**

Our experience has shown that stakeholders must have the understanding and be convinced that their involvement has real impacts and is not only requested to meet TNA guidelines. As always, a thoughtful outreach towards and selection of stakeholders is required which may take time and considerable efforts. Private sector involvement: YES, to any extent possible, but always be clear of their interest. One need to understand or find out how their interest can be best used to reach climate change challenges. We feel that particularly the CAN answer to this question is very useful. We also welcome the reference to tools used in other UN-promoted processes.

**5. Could you identify appropriate means for TNAs to be conducted whereby project ideas turn into concrete ideas, which can be ultimately implemented? How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?**

If TNA suggestions should be implemented one needs to be as close as possible to what investors and their financier require, their type to feasibility study, investment plan, business plan and the like according to their criteria. TNA, TAP and CTCN supported activities will be successful in terms of implementation if close links are establishment at least with those international and as well as bilateral organisations, banks, initiatives which support climate change investment where technologies play a key role.

**6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas? How can the guidance be improved?**

All aspects of technological development must be addressed hardware, software, orgware and financing.

**7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?**

As mentioned above: Orientation of their guidelines and rules.

**8. How effectively are the TNA and TAP results used in other processes such as National Communications, NAPAs, NAPs?**

**9. How successful has the TNA been in the country in terms of increasing awareness on climate change issues, and also in obtaining support? How specifically can the TNA and TAP be supported to facilitate their implementation?**

The answers is left to the countries who have worked on TNAs.

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# Call for inputs: provision of guidance on how TNA results can be developed into projects that can be ultimately implemented

ETH Zurich and Harvard University

12 May 2015

My colleague Dr. Joern Huenteler of Harvard University's Kennedy School and I have had a look at the current TNA guidance. Based on this and our research experience we would like to provide the following input:

- a) We believe the current TNA guidance is very much focused on emissions abatement but does not reflect enough the economic development/green growth perspective. This perspective is especially important under a NAMA-centered agreement. In our experience, the design of NAMAs is based on the expectation of not only reducing GHG emissions but also of building a green industry and creating green jobs.
- b) We therefore propose that the TNA process should also consider the green industrialization perspective. Technologies differ strongly regarding their ability to be scaled up and the underlying industry to be localized. These differences also interact with a country's technological capabilities. The TNA and the TEC should therefore support countries also in estimating these potentials, in selecting technologies which are realistic to be localized to a certain extent, and in providing recommendations on policies that foster the building up of low-carbon technology industries or specific value chain steps of these industries.

To support our argument we would like to point you to the attached paper, which suggests a heuristic for technology selection in NAMAs that aim at building local industries (the paper is also available for free here: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2583225](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2583225)).

Should you have any comments or questions regarding our input, please do not hesitate to contact us.

In case this is of relevance: we are both working at organizations officially registered as RINGOs under the UNFCCC.

With our best regards,  
Joern Huenteler & Tobias Schmidt

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SUBMISSION TO THE TECHNOLOGY  
EXECUTIVE COMMITTEE (TEC):  
CONSULTATION ON TECHNOLOGY  
NEEDS ASSESSMENTS (TNA)

JUNE 2015

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# 1. THE GLOBAL CCS INSTITUTE

The Global CCS Institute (the Institute) is pleased to submit its views to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat, in response to the Technology Executive Committee's (TEC) taskforce on Technology Needs Assessments (TNAs) call for stakeholder submissions on TNA related matters. The Institute supports all efforts by the TEC and related UN bodies to strengthen the current TNA process.

As a not-for-profit international membership organisation, the Institute brings together the public and private sectors to build and share the know-how and expertise necessary to ensure that carbon dioxide capture and storage (CCS) and carbon dioxide capture, usage and storage (CCUS) can make a significant impact on reducing the world's greenhouse gas emissions. The Institute also connects various parties around the world to help solve problems, address issues and learn from each other to accelerate the deployment of CCS projects. It does this by:

- Sharing knowledge (collecting information to create a central repository for CCS knowledge; and creating and sharing information to fill knowledge gaps and build capacity),
- Fact based advocacy (informing and shaping domestic and international low carbon energy policies; increasing the awareness of the benefits of CCS and the role it plays within a portfolio of low carbon technologies), and
- Assisting projects (tackling specific barriers, particularly amongst early movers; bridging knowledge gaps between demonstration efforts).

The Institute is well placed to provide advice on technology assessments to the TEC due to its extensive project experiences, policy and regulatory expertise, development of case studies, and input into international standardisation efforts. It contributes across a broad range of CCS related scientific, economic and technical matters. It is an Accredited Observer to the UNFCCC, the Green Climate Fund (GCF) Board as well as the Intergovernmental Panel on Climate Change (IPCC). It is a long-time and active observer of TEC business and a member of the Climate Technology Centre's Network (CTCN).

The Institute tracks all CCS related activities globally, as updated annually in its publication *Global Status of CCS*. It is actively engaged in many government, intergovernmental, multi and bilateral initiatives. Such engagements provide the Institute with a deep global reach into CCS policy, program, project and regulatory developments. Please refer to the following website (<http://www.globalccsinstitute.com/institute>) for further information on the Institute, or contact the Institute's Principal Manager International Climate Change (mark.bonner@globalccsinstitute.com).

# 2. ENERGY OPTIONS FOR LOWER EMISSIONS

There are four key mitigation options to reducing emissions from the energy sector:

1. CCS/CCUS
2. Energy efficiency
3. Renewable Energies
4. Nuclear.

It is clear that none of these options are singularly sufficient to close the mitigation gap. CCS has the benefit of being able to mitigate at scale the emissions associated with fossil energy use in the stationary energy as well as the industrial sectors (steel, iron, chemical, fertilisers, and cement).

In positioning the global economy to meet the challenges of climate change, it is widely recognised that fundamental long-term decarbonisation of global energy supply is needed. The recently released report by the Intergovernmental Panel on Climate Change (IPCC) states that to contain average

temperature rise within 2°C from pre-industrial times, a reduction in global emissions of between 40-70% on 2010 levels by 2050 is needed, and to near zero by the end of this century.<sup>1</sup>

Such a transformation cannot be achieved rapidly. The decarbonisation of energy systems needs to take place at as fast a pace as is feasible, while avoiding any abrupt dislocation of economic activity. Given the inherent complexity of energy supply systems (linked sectors, transmission networks, markets and actors; large scale, long-lived capital intensive infrastructure) the speed of change will be largely determined by the potential of new technologies to be cost effective and deployable at an appropriate time. Another key determinate will be a technology's environmental credentials (eg the UNFCCC adopts a principle of 'environmentally sound technologies').

As of mid 2015, the Institute identified 55 large scale CCS projects in planning, under construction or operating. The current fleet of CCS demonstration projects continue to show high commerciality and emission abatement potentials, as well as generating substantial positive knowledge spillovers that continue to better inform governments, investors and civil society. The spillovers being created today will benefit future CCS projects.

As with many other large-scale clean energy technologies (concentrated solar power and storage, geothermal, offshore wind), CCS is tracking along a pre-commercial demonstration pathway. The Institute considers that the early stages of development for all of these technologies requires strong government policy intervention, for which there are a number of justifications including:

- Addressing market failures,
- Generation of positive spillovers (ie. learning-by-doing),
- Addressing inherent non-market barriers in the technology innovation lifecycle, and
- Building institutional capacity (skills, systems, institutions).

There are three main issues (listed below) that continue to stifle the development, deployment and diffusion of large-scale clean energy technologies, resulting in an under-investment in these options:

- Lack of policy drivers,
- Relative cost compared to higher emitting and more conventional solutions, and
- Long project lead times.

Such issues are clearly manageable as evidenced by many governments who are providing targeted and substantive incentives to many smaller-scale distributed renewable technologies (eg feed in tariffs, mandated obligations).<sup>2</sup>

### 3. TNA PROCESS

The Institute recognises the valuable contribution that TNAs can make to the identification of mitigation technology priorities for developing countries. It is clear that TNAs, as a country driven process, is highly regarded by Parties to the UNFCCC and remains central to giving effect to the Convention's Article 4.5<sup>3</sup> (the technology transfer framework). TNA development is a key component of the Poznan Strategic Programme on Technology Transfer supported by the Global Environment Facility (GEF) and implemented by the United Nations Environment Programme (UNEP).

TNAs typically identify a portfolio of environmentally sound and nationally relevant technologies (ESTs), projects and programmes to support the transfer of, and access to these ESTs. TNAs also provide a common focus in which relevant stakeholders can be brought together at a national level to

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<sup>1</sup> <http://mitigation2014.org/report/summary-for-policy-makers> (Page 10)

<sup>2</sup> The Economist cited in February 2014 over 130 countries have such measures in place (<http://geloookahead.economist.com/ga/its-all-about-economics/>)

<sup>3</sup> Article 4.5 The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties. Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies.



develop Technology Action Plans (TAPs) and Intended Nationally Determined Contributions (INDCs) and share good practices and lessons learned. TAPs prioritise ESTs as well as identifies enabling frameworks and potential projects with links to financing sources.

In 2010, the United Nations Development Programme (UNDP) released a 176 page *Handbook for Conducting Technology Needs Assessments*<sup>4</sup>. Chapter 5 contains guidance on how to prioritise mitigation technologies, suggesting that "new" technologies should also be considered (ie. technologies or measures that country stakeholders are not yet familiar with). The handbook, which the Institute considers as being highly relevant, indicates that to assist stakeholders to become more knowledgeable about previously unfamiliar technologies, a technology familiarisation process is envisaged, consisting of workshops on technologies, expert lectures, and visiting demonstration projects.

The Institute strongly supports both a formal and informal coordination approach to facilitate a better understanding of the mitigation potential of (what may be) unfamiliar technologies including CCS/CCUS. Although for illustrative purposes the UNDP's handbook seems to rely extensively on renewable energy examples and it might also be useful to diversify the handbook's examples by including CCS. One example of a formal approach currently adopted by the UNFCCC is the Technical Expert Meetings hosted under the Ad-hoc Working Group on the Durban Platform for Enhanced Action (ADP). Closer linkages between the development of TNAs/TAPs and the TEM process might assist in the identification of innovative sources of project support.

## 4. NEED FOR TNA IMPROVEMENTS

The Institute's analysis of existing TNAs reveals an under-representation in the identification of CCS and CCUS as a core technology to addressing developing country fossil-energy related emissions in both the industrial (steel, cement, iron, fertilisers) and power sectors. The Institute's own tracking of substantive CCS related capacity building efforts spans across at least 22 developing countries<sup>5</sup> to date. This is within a context of only seven published TNA's specifically refer to CCS, including:

1. Bangladesh (mentions CCS linked to an Integrated Gas Combined Cycle project),
2. Kazakhstan (mentions CCS briefly as an option for cement industry),
3. Morocco (planned a pilot project proposed using a solar tower to generate energy to capture CO<sub>2</sub> and then geologically store),
4. Mongolia (assessed CCS in energy sector – but did not identify it as a short term priority),
5. Rwanda (identified a CCS project using 10MW post combustion capture system separation on a combined cycle gas turbine plant with geological storage),
6. Republic of Moldova (mentions CCS), and
7. Thailand (CCS identified as a high priority technology, but with low 'readiness' in Thailand).

This suggests that many developing countries remain unfamiliar with the critical role that CCS mitigation can play at a national level to significantly reduce emissions over the medium term, as well as allow for a continued and more environmentally responsible use of low-cost fossil energy. This was certainly case in point for an Institute discussion with one developing country representative at a CTCN workshop in Bangkok (April 2015) charged with managing his country's imminent and inaugural TNA process. It is also evident from the above listed TNAs that CCS is not a very well understood technology. Often countries have not considered the role CCS can play in enhancing energy access<sup>6</sup> and energy security<sup>7</sup>, or its role in complementing other national strategies to transition to alternate low emissions energy sources.

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[http://unfccc.int/ttclear/misc/\\_StaticFiles/gnwoerk\\_static/TNR\\_HAB/b87e917d96e94034bd7ec936e9c6a97a/1529e639caec4b53a4945ce009921053.pdf](http://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/TNR_HAB/b87e917d96e94034bd7ec936e9c6a97a/1529e639caec4b53a4945ce009921053.pdf)

<sup>5</sup> Algeria, Botswana, Brazil, Cambodia, China, Egypt, India, Indonesia, Jordan, Kenya, Kosovo, Lao PDR, Mexico, Maghreb, Malaysia, Philippines, South Africa, Trinidad and Tobago, Thailand, UAE, Venezuela and Viet Nam.

<sup>6</sup> CCS can contribute to energy access via provision of 'climate friendly' base-load power, reaching significant numbers of people.

<sup>7</sup> CCS can contribute to energy security via continued use of indigenous fossil fuel supplies.

A direct consequence of countries unconsciously omitting CCS as an option in TNAs is that it may exclude CCS project opportunities in TAPs, and potentially in INDCs, Nationally Appropriate Mitigation Action (NAMAs) and national Low Emission Development Strategy (LEDS). Such unfamiliarity with the technological possibilities and applications of CCS serves to undermine the extent to which the CTCN can assist developing countries further examine the applicability of CCS to national circumstances (project and policy) as well as future claims on the GCF to support CCS projects in developing countries.

The Institute strongly supports the role of the UNFCCC's Technology Mechanism and its related institutions (TEC and CTCN) to help developing countries further identify and better understand the potential of large-scale centralised energy mitigation technology solutions such as CCS/CCUS, as well as concentrated solar thermal with storage (CSP) and geothermal.

## 5. FUNDING LOW EMISSIONS TECHNOLOGY PROJECTS

While the absolute volume of funds available is critical, so too are other elements of any funding package that can help reduce the overall project financing costs as well as:

- attract other financiers,
- facilitate the creation of market capacity,
- support public policies that address market failures,
- support innovation and demonstration, and
- help accelerate project delivery.

In addition to energy security and enhanced energy access, CCS can deliver co-benefits (such as energy access, energy security and sustainable development aspects) to developing countries, which can serve to increase its attractiveness to financiers as well.

It is important that financing criteria adopt a principle of technology neutrality to help support the mitigation potential of as broad a range of technologies as possible to address climate change. It is likely that the world, including many developing countries, will continue to use fossil energy in large quantities at least in the medium term – and it is this period in which the atmosphere must see dramatic reductions in emissions if it is to avoid exceeding the 2°C target. It is apparent from the IPCC's 5<sup>th</sup> Assessment Report that focussing on renewables and energy efficiency alone will be insufficient to curtail global emissions at least-cost within the necessary time frame and that CCS is also required. The IPCC report also identified that without CCS, the average cost of achieving global emission reduction targets will increase 138%.

The Institute acknowledges that for large-scale clean energy projects (including CCS), multi-development bank financing alone will likely be insufficient. The GCF is therefore encouraged to innovatively leverage its funding resources with additional sources of public/private funding. This may assist in:

- improving the financial viability of commercial-scale low-emissions technology projects,
- further de-risking project financing structures,
- reducing the impact of market failure especially in capital markets, which in turn can further catalyse private sector flows, and
- provision of additional advisory services that can help with the design of investment programmes, as well as with building administrative and project management capacity to reduce the risks associated with project delivery.

The Institute also supports strengthening the nexus between the Technology Mechanism, including the CTCN and TNA/TAP process, and the future roles of accredited intermediaries of the GCF who will be tasked to manage GCF loans and grants. Of critical significance will be the GCF's Private Sector Facility (PSF) that has been charged to engage the private sector to encourage contributions – in addition to public, MDB, bilateral and multilateral sources – to the US\$100 billion target per year of climate finance by 2020.

Within this context, the Institute considers the TNA/TAP process, the CTCN and the GCF to be very well positioned to champion a CCS project in a developing country through the prioritisation of national resources, provision of technical and project management assistance, as well as support from the GCF's mitigation investment window.

Finance blending and innovative financial instruments such as 'green bonds' (especially their issuance to institutional investors who are interested in supporting climate related projects) may be two examples that the GCF could further consider leveraging.

## 6. NEED TO ESTABLISH A VIABLE BUSINESS CASE

Business cases are inevitably heterogeneous regardless of technology, location or proponent. The business case for CCS projects can vary across different actors depending on how it aligns with their respective organisational objectives. For example, in addition to simply achieving a targeted return on investment (ROI), a number of other objectives should be considered including:

- protecting the economic value of localised resource endowments and/or asset portfolios,
- optimising the value of resource endowment exploitation in an environmentally responsible manner,
- technology development,
- commercialisation opportunities (e.g. technology licensing or diversification),
- market leadership,
- compliance with expected future regulatory changes, and
- sustainable development and low emissions economic growth.

Different objectives are often linked to different types of financial risks. Project proponents focused on commercialisation opportunities tend to rely more on ROIs, whereas more public interest focused projects may be willing to accept lower ROIs and/or even a neutral or negative net present value (NPV) to ensure that the technology objectives are achieved.

Private sector financing tends to rely on equity or debt contributions from key project sponsors. Such balance sheet financing is inevitably limited by the risk appetite and ability of project sponsors to contribute a significant proportion of their capital budgets to activities that may not deliver a financial return commensurate with the risks of project development. In many situations, a CCS project's financial position can be improved through exploiting additional revenue streams to cover costs. This can include the sale of captured CO<sub>2</sub> for enhanced hydrocarbon recovery as well as other offtakes (H<sub>2</sub>SO<sub>4</sub> etc). In 2014, some 55% of all identified large-scale CCS projects included the planned use of captured CO<sub>2</sub>. Similarly, a number of projects surveyed by the Institute are poly-generation projects that integrate upstream and/or downstream processes with their primary industrial process, in order to maximise the value of their industrial offtakes.

The Institute also supports the adoption of a 'meaningful' shadow carbon price in all benefit-cost assessments of projects. As the emissions externalities associated with fossil fuel use are generally not adequately priced into investment decisions, this is a prime example of a market failure. Adoption of a carbon price is economically justifiable as it reflects the expected marginal damage of each unit of harmful emissions.

## 7. STAKEHOLDER MANAGEMENT

The Institute considers the formal coordination of a broad range of stakeholders (internal and external to the UN system) as being critical to supporting the TNA process. The Institute (either in its capacity as a member of the CTCN and/or through the GEF/UNEP's implementation) would welcome any opportunity to assist in the development of TNAs for developing countries, specifically in relation to ensuring CCS is better understood and considered. The Institute sees great value in external specialist stakeholders such as itself being invited to participate in TNA related workshops, especially those focusing perhaps on unfamiliar clean energy solutions like CCS, and as early in the TNA cycle as possible.

# Call for inputs: provision of guidance on how TNA results can be developed into projects that can be ultimately implemented

The Inter-American Development Bank

16 June 2015

Please find my answers to your question 7. Please note that I'm not an expert in the TNA process nor TAP development, but could make a comment on what funding entities, in particular multilateral development banks (MDBs), would require to support TAPs and project ideas emanating from TNAs.

In general, MDBs such as The World Bank, The Inter-American Development Bank, The Andean Development Corporation (CAF) and the Asian Development Bank work in similar ways (although the internal process for approval might vary). We have basically two financing products for two clearly differentiated sectors: non-reimbursable technical cooperation and investment grants; and loans, for both the sovereign and non-sovereign sector. Please note that sometimes, public entities might receive non-sovereign loans.

All the MDBs prioritize climate change financing: from infrastructure investment in adaptation and mitigation to institutional strengthening of relevant agencies (e.g., Environmental, Energy, Transport, Water and Wastewater, Agriculture, etc.) For sovereign loans (loans guaranteed or repaid by countries), financing can be provided to either investment programs (where specific investments are not individually identified but a set of parameters for inclusion are defined, e.g., rural electrification for regions with HDI<X) or specific investments (e.g., a water treatment plant).

Financing, however, is also constrained by other parameters: they need to demonstrate economic and financial viability. For sovereign sector infrastructure loans, IDB requires that financial sustainability is clearly identified: either through self-generating funds or through sustainable subsidies focalized on disadvantaged populations. IDB performs impact evaluations on gender and the environment.

There are restrictions, limits and standard term sheets that also apply. I'd be glad to expand into any of these topics. If you'd like, we could schedule a phone call to have a conversation.

My very best regards,

Alberto Levy, Ph.D.

Lead Regional Energy Specialist  
The Energy Division  
The Inter-American Development Bank

[www.iadb.org](http://www.iadb.org)

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## INTRODUCTION

The present document seeks to answer the questions stated in the page entitled "**Call for inputs on how to respond to the COP 20 mandate: provision of guidance on how the results of the TNAs, in particular the TAPs, can be developed into projects that can be ultimately implemented.**"

### 1. Identify what you perceive to be the strengths and deficiencies of the TNA process?

#### **Strengths:**

##### Framework:

- Technology for climate change is dealt in the context of national needs and priorities.
- The introduction of short, medium, and long perspectives makes the approach realistic and objective, particularly when urbanization and other forces influence technology needs over time.
- The encouragement of the participation of different stakeholders is an important strength. Adequate emphasis on administrative issues is an important enabler.
- Attention to time-varying nature of needs and the interrelationship among various factors for producing plans and strategies.
- A good degree of rigor is given to the dealing with uncertainties through robustness tests and sensitivity analyses.

##### Resources:

- Handbook is comprehensive and goes into detail in each stage, including administrative components
- Supporting tools facilitate the various processes.
- National TNAs and other material available online for further consultation.

#### **Deficiencies:**

- Handbook is available in English only. It is important to make it available in other languages. Depending on the nations, language could be an important impediment in following the TNA process, particularly if the government (i.e. ministry) is leading the process. This could also unbalance empowerment of the different stakeholders. The



handbook makes explicit this need: "It is important that people in rural communities are provided with the necessary resources and infrastructure to access and use this Handbook." However it does not elaborate further nor delegates responsibilities.

- A structured and prescribed approach for implementing the TNA process is very adequate. However, stakeholders that are knowledgeable of similar processes might find the process too prescriptive and not provide adequate and explicit flexibilities for the identification of critical sectors and technologies. This might be particularly relevant to nations that have mature NAMAs, NAPAs and NAPs. National administrative circumstances might be relevant in this regard. Most of the Parties reported that they did not consider the TNA process to be a stand-alone process. Thus a more flexible option (i.e. a 'express' option) that explicitly taps into other processes might be necessary. Alternatively "entry" points could be made explicit in the handbook. Then time might be better spent in the elaboration of TAPs and project identification and planning.
- The Excel tool could be inefficient and it is proprietary. An open source version needs to be available, preferably on the form on an online/offline app that can run in small devices and several languages.
- The rigor of a required vulnerability assessment is not adequately discussed. While Annex 3 favors sectors whose data can be obtained through model projections or GIS-based approaches, other sectors seem to be largely excluded. Similarly, no mention of comprehensiveness is mentioned; this relevant as some nations present stark contrasts among regions and further among sectors. IPCC sector-based (categorization) vulnerability assessment of a nation generally includes the evaluation of exposure, sensitivity and adaptive capacity.

## **2. Outline what recommendations or solutions would you make to improve the TNA process? Are there process improvements required for accelerating implementation of the TNA results?**

- Appropriate tools such as real-life videos of a TNA process in appropriate languages could complement the handbook, further accelerating a nation's process. The showcasing of the dynamics of successfully implemented TNAs might also be relevant.
- ICT and non-ICT-based social networks could be instruments that reinforce and better current processes.



- Some stakeholders (NGOs and rural stakeholders) may become disconnected with the process because of the lack of adequate terminology that fits their area. Terms such "appropriate technology", "empowerment" and others are largely absent in the process. These are also important for connecting to already existing national processes. As climate change adaptation and mitigation is expected to be streamed into development, a change in tone might be necessary. While the TNA process taps very well into national development plans, appropriate terminologies and allusion to global goals might be relevant.
- Because stakeholders of the finance community were largely absent in the process of most nations, adequate emphasis to their inclusion must be done in the handbook. This can be accompanied with descriptions of the types of entities that compose the "finance community." Furthermore, the fact that the main barriers and key enablers were identified as "economic", highlights the necessity of making sure the finance community is appropriately represented. Similarly, the small participation of NGOs in the case of Latin American nations might imply that some geographical areas (i.e. rural regions) are not adequately represented, for example. The participation of local authorities might also need to be encouraged.

### **3. Are the steps of the TNA process (as developed in the updated UNDP handbook for conducting TNAs for climate change) sufficient and well-targeted to cover all the aspects of the identification and prioritization of technology needs? Are there other steps you would suggest adding to the TNA process?**

The process, as outlined in the handbook and assisted with tools, is very comprehensive. Because technologies might be used to benefit some stakeholders rather than others or some regions rather than others, some sort of "ground truthing" might be appropriate. This might include the creation of a national committee composed of experts and other stakeholders that create consultations with the citizenry. In a final report, concurring and dissenting opinions might provide transparency and ensure that all stakeholders are listened to. If carried out with the utmost transparency, these grievances might indeed reflect important concerns of the stakeholders.



The fact that the budget of some nations (Cuba, Argentina, Morocco, Bangladesh) are almost entirely allocated to mitigation or adaptation might reflect the need of adequate handbook emphasis.

#### **4. What do you consider the best way of organizing and synchronizing the stakeholders involved in the TNA process? How a formal coordination amongst the stakeholders could be developed, in order to promote a common goal and to organize the information provided?**

The handbook allows all stakeholders to have a similar vision of what is required at each stage. However there does not exist detailed examples of how stakeholders follow processes. Real-life videos of these processes along successful showcasing of interaction between stakeholders might catalyze a more unified vision and highlight the importance of their work. Information and communication technologies (i.e. social networks) might be important tools for organizing and synchronizing.

The ultimate question that each stakeholder poses is: "what is it for me"?. Incentives depending on the stakeholder's interests might be important, particularly if such would enhance the support of their organization. Adequate public acknowledgements, mentions, or other incentives might be adequate.

#### **5. Could you identify appropriate means for TNAs to be conducted whereby project ideas turn into concrete ideas which can be ultimately implemented? How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?**

The technological needs identified for specific sector or subsector might have already been identified in a project, initiative, process, or program. This can be an opportunity to tap into already existing projects that would welcome continuity, thus leveraging knowledge acquisition and socialization processes.

The acquisition of knowledge through appropriate literature review and connection to the reality of the nation is very important, particularly for the process of turning ideas into implementation. The participation of relevant NGOs is very relevant in this regard. In the case of Latin America, it is encouraged to determine the reason of the minimum NGO participation. Development equity, one of the goals of the TNA process, is dependent on the participation of informed stakeholders.





## **6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas? How can the guidance be improved?**

Existing guidance is sufficient and appropriate, given that the right mix of stakeholders are part of the process. Appropriateness could be enhanced by highlighting the importance of partnerships between academia, industry and beneficiaries in the context of a need-solution framework. Several nations have prioritized research; the putting together of a research plan can be quite different to a mainstream development project idea. Appropriate international enabling might be necessary in some cases.

## **7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?**

Assurance that the priorities and needs are indeed real. And assurance that national policies will be adequate and enabling for the context.

## **8. How effectively are the TNA and TAP results used in other processes such as National Communications, NAPAs, NAPs?**

Ideally these should provide mutual feedback and reinforce each other. Evidence indicates that stakeholders utilize the outputs of NAPAs and NAPs as inputs to various stages of TNAs. The opposite also needs to happen, particularly when priorities seem to change over time.

The TNA process is well thought and offers a very effective way to identify technologies and sectors. A second look at nations that have not provided TNAs might be important in order to identify the barriers.

A relevant question could also be: How effectively are NAPAs and NAPs used for the provision of more appropriate TNAs and TAPs? or could TNAs and TAPs be streamlined in NAPAs and NAPs? (for example).



## 9. How successful has the TNA been in the country in terms of increasing awareness on climate change issues, and also in obtaining support? How specifically can the TNA and TAP be supported to facilitate their implementation?

- Citizen consultation can raise awareness and facilitate eventual implementation. The utilization of adequate terminology and appropriate discourses could also help gain support.
- TNA's inclusion or compatibility with NAPAs, NAPs and NAMAs might increase awareness on climate change issues and further obtain support for implementation of projects at wider scales.
- Most of the population live in cities. Terms such as "smart cities" and "sustainable cities" might take priority in future reports. Thus it is important to establish bridges between subjects at early stages. The use of several technologies might not present a dead zone.
- The latest Synthesis Report indicates a change on priorities in some nation. The workbook could be enhanced with a section where stakeholders justify reasons why their priorities have changed from previous TNAs and TAPs. This could ensure that such changes are due to actual need and not because other reasons.

### **About ND-GAIN**

The Notre Dame Global Adaptation Index (ND-GAIN) is the leading index that annually ranks more than 175 countries and geographical areas based on their vulnerability to climate change and their readiness to adapt to the droughts, superstorms and natural disasters that climate change can cause. The Index is open, transparent, actionable and is enhanced with open-source, state-of-the-art data and analysis tools. The ND-GAIN team is starting to evaluate vulnerabilities of cities and rural areas in an effort to downscale the country index.

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# **Call for inputs: provision of guidance on how TNA results can be developed into projects that can be ultimately implemented**

United Nations Industrial Development Organization

29 June 2015

## **1. Identify what you perceive to be the strengths and deficiencies of the TNA process?**

The fact that the TNA is country-driven a process in nature is a strength. It provides the beneficiary country with strong ownership and control over the process. It has the value of fostering a multi-stakeholder dialog, with is not always to be taken for granted in the definition of technology priorities otherwise. Also, the process leads to considerable capacity building side-effect amongst various stakeholders, and also has undeniable benefits with regard to spurring networking and peer-learning.

The TNA process is a useful first-level assessment on technology priorities in a country. It informs strategic decisions. The process benefits from significant experience and the methodology applied is well established and tested. On the down side, the TNA is commonly producing a list of desired technologies, but remains far away from their actual implementation. Indeed, key barriers to deployment are not addressed in the process, and there is no provision to move those ideas and graduate them to 'bankable projects'. Also, TNA are typically run in parallel in several countries, and are disconnected from major national planning exercises (e.g. sectoral development plans). Finally, because TNA process often raise expectations without being able to trigger concrete changes in the ground, some stakeholders disengage as disillusioned.

## **2. Outline what recommendations or solutions would you make to improve the TNA process? Are there process improvements required for accelerating implementation of the TNA results?**

TNA should be embedded into the articulation of national priorities and development plans, as opposed to run isolated. TNA should be integrated into a broader effort to facilitate technology deployment. Along those lines, TNA should at least involve stakeholders able and willing to follow-up on priority identification with further technical assistance and eventually financing.

## **3. Are the steps of the TNA process (as developed in the updated UNDP handbook for conducting TNAs for climate change) sufficient and well-targeted to cover all the aspects of the identification and prioritization of technology needs? Are there other steps you would suggest adding to the TNA process?**

Again, to be successful in spurring technology adoption, the process ought to integrate those that can work on the actual deployment of the technology identified.

## **4. What do you consider the best way of organizing and synchronizing the stakeholders involved in the TNA process? How a formal coordination amongst the stakeholders could be developed, in order to promote a common goal and to organize the information provided?**

The involvement of various stakeholders during the TNA is one strength of the process. When it comes to synchronizing, it should be ensured that the outcome of the TNA serves to inform and influence

development planning at large. As for the second part of the question, I am unsure as to the value of promoting a common goal. Various stakeholders have different driving factors, and it is precisely the orchestration of those that will allow to ensure that the TNA process produces more than useful reports.

**5. Could you identify appropriate means for TNAs to be conducted whereby project ideas turn into concrete projects which can be ultimately implemented? How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?**

There is no point in developing a wish-list of technologies, to only at that point seeking partners to implement them. Those that work on piloting, demonstrating, a market development for technologies should be involved in the TNA process from the onset.

**6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas? How can the guidance be improved?**

**7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?**

Investors and funding entities require a very different set of information than what is provided in TAPs. In essence, they will look for ways of mitigating the risk associated with the investment, and ensure the return. Those financiers should be actively involved throughout the process to ensure that the outcome of the TNA/TAP is palatable to them.

**8. How effectively are the TNA and TAP results used in other processes such as National Communications, NAPAs, NAPs?**

**9. How successful has the TNA been in the country in terms of increasing awareness on climate change issues, and also in obtaining support? How specifically can the TNA and TAP be supported to facilitate their implementation?**

It would be useful to coordinate and integrate the TNA process closely with the so-called means of implementation under the Convention.

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**Call for inputs - work of the Technology Executive Committee on the Guidance of Technology Needs Assessments, in particular the Technology Action Plans**

**Inputs from the World Intellectual Property Organization (WIPO)**

1. Identify what you perceive to be the strengths and deficiencies of the TNA process?

Strengths:

- If managed properly, the TNA can be an important process allowing developing countries to conduct a large and deep consultation with several stakeholders to establish a national strategy to face climate change.
- Very valuable country-driven process.
- Very detailed guidelines on how to conduct this assessment, while giving a lot of flexibilities to States.

Deficiencies:

- As this consultation shows, there may still be a gap between the adoption of a national strategy in terms of technology needs, project development and its realization.
- Rather than dividing sectors into adaptation and mitigation and only then assessing technology needs, it should be the other way around. The former could create a bias in explicitly looking for adaptation and/or mitigation needs, leading to weakened identification of real needs.

2. Outline what recommendations or solutions would you make to improve the TNA process? Are there process improvements required for accelerating implementation of the TNA results?

Take the perspective of entities that will implement the action plans and project ideas into consideration earlier on. The same is true for potential investors (see questions 6 and 7 below).

3. Are the steps of the TNA process (as developed in the updated UNDP handbook for conducting TNAs for climate change) sufficient and well-targeted to cover all the aspects of the identification and prioritization of technology needs? Are there other steps you would suggest adding to the TNA process?

The book covers all necessary steps. It could benefit from adding more explicit guidance on how to elaborate market research for a comparative study of different technology providers. In addition, it could be complemented in the following way:

- Support tools available for technology needs assessments (Page 20, 21): In addition to ClimateTechWiki, [WIPO GREEN](#) could be listed as one of the platforms for sourcing technology options.
- Priority technologies for climate change mitigation and adaptation (Page 38): Step 1.1: Identify possible technology options for prioritized (sub) sectors from online databases, networks, and country documents: WIPO GREEN could be listed as one of the platforms.

- Load available database, e.g., i) ClimateTechWiki database, (ii) other online databases, networks and country documents (Page 42): WIPO GREEN as one of them

5. Could you identify appropriate means for TNAs to be conducted whereby project ideas turn into concrete projects which can be ultimately implemented? How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?

Whereas access to the project ideas has improved in the Technology Portal in TTClear, it is not yet possible to fully search them due to a lack of consistency in the format. Project ideas could be also more aligned with information required by investors or technology providers to facilitate implementation. Advertising technology needs more broadly could help identifying different technology alternatives.

WIPO GREEN provides a platform to identify and enter into contact with potential technology providers and investors. Its "Need form" has been developed in collaboration with different user groups taking into consideration diverse information needs in order to facilitate interaction.

In addition to TTClear, certain project ideas around "hard technologies" resulting from the TNA process could be advertised via WIPO GREEN to enter into a dialogue with potential providers and investors.

WIPO GREEN has recently organized a matchmaking event for seekers of wastewater technologies, providers and investors in Manila. The process has shown the importance of a detailed description of technology needs in order to identify corresponding technology solutions. Similar events are foreseen in the future.

6. Do you consider existing guidance sufficient and appropriate to draft technology action plans and project ideas? How can the guidance be improved?

Guidance to draft project ideas is not easily accessible, if it exists. It should include guidance on elements that are important from an investor's perspective (see question 7).

7. What information would be needed for investors and funding entities to make well informed investment decisions about TAPs and project ideas emanating from TNAs?

- Detailed project plans;
- Comparison of solution providers (credibility; cost; market size; localized knowledge; etc.);
- Support of both central and local government.

## Additional feedback

- Regardless of the sector you choose in the current TNA database (<http://www.database.tech-action.org>), the same list of technology class is displayed (please see below). This could be improved by assigning some technology classes to specific sectors (some will belong to multiple sectors).

Item Name	Action	Sector	Technology			
Land-use planning	Adaptation	Forest and agriculture	Land use p			
Training on improved farming practices	Adaptation	Forest and agriculture	Institution for a adaptation te dessemin			
Establishment of climate-smart Agricultural Technology Dissemination Center	Adaptation	Forest and agriculture	Institution for agricultural adaptation technology dessemination	Yes	Bangladesh	<a href="#">Download</a>
Establishment of special agricultural R & D centre	Adaptation	Forest and agriculture	Institution for agricultural adaptation technology R&D	Yes	Bangladesh	<a href="#">Download</a>
Development of short-maturing rice varieties	Adaptation	Forest and agriculture	Improved crop varieties	Yes	Bangladesh	<a href="#">Download</a>
Development of drought-tolerant rice varieties	Adaptation	Forest and agriculture	Improved crop varieties	Yes	Bangladesh	<a href="#">Download</a>
Development of salinity-tolerant rice varieties	Adaptation	Forest and agriculture	Improved crop varieties	Yes	Bangladesh	<a href="#">Download</a>