Eleventh meeting of the Technology Executive Committee
AHH, Bonn, Germany
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Draft interim report

Guidance on enhanced implementation of the results of technology needs assessments: draft interim report by the Technology Executive Committee

I. Background

1. In December 2014, COP 20 requested the Technology Executive Committee (TEC) to provide guidance on how the results of the technology needs assessments (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 SB 43.

2. In response to that invitation, the TEC requested its task force on TNAs to prepare a draft interim report, including preliminary findings, on guidance on enhanced implementation of the results of TNAs.

II. Scope of the note

3. This draft interim report provides in its annex, a preliminary findings on guidance on enhanced implementation of the results of TNAs.

III. Possible action by the Technology Executive Committee

4. The TEC will be invited to agree on the draft interim report on guidance on enhanced implementation of the results of TNAs for SB 43.

Annex

Enhancing implementation of TNA results: from priorities to implementation

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Executive Summary

1. The core objective of this paper is to recommend improvements in the existing TNA-TAP-Project Idea guidance for enhanced implementation of priority technologies for development and climate change mitigation and adaptation.

2. For that, the paper reviews:

   (a) Existing climate-related, but non-TNA guidance for preparing prioritised (technology) options for implementation;

   (b) Existing guidance in the global TNA project for formulating technology action plans (TAPs) and project ideas for implementation of prioritised technologies;

   (c) TAPs and project ideas in the global TNA project with a specific focus on how and to what extent these contain information that is required for successfully preparing for implementation.

3. From the review of **existing, non-TNA guidance** it is concluded that guidance documents *intend* to present a balanced approach to setting priorities and linking these priorities to action-oriented transactions (programmes, projects and activities). However, most guidance documents fail to define the requirements of transactions that execute these priorities. A contributing reason for this failure is that the guidance insufficiently address the professional differences between policy makers and priority setting processes on the one hand, and the requirements of specific transaction formulation, on the other hand.

4. Therefore, no model 'guidance document' can be recommended for supporting the TNA stage of implementing prioritised technologies for mitigation and adaptation at a desired scale within a country. Instead, it is recommended to consider some of the processes, content, examples and good practices from the reviewed guidance be incorporated or referenced in the revised guidance for implementation of TNA results.

5. Moreover, from the review of non-TNA guidance it is also recommended to keep guidance for TNA result implementation as streamlined as possible by it being supplemented with more detailed guidance, training materials and actively managed web-based resources that expand on and connect directly to a revised TNA document.

6. The following sources of **guidance for implementation of TNA prioritised technologies** have been reviewed:

   (a) Process - Chapter 6 of the Handbook for Conducting Technology Needs Assessment for Climate Change (TNA Handbook);

   (b) Barriers and enabling actions - Guidebook "Overcoming Barriers to the Transfer and Diffusion of Climate Technologies";

   (c) Finance:

   - UNFCCC Guidebook on preparing and presenting technology transfer projects for financing (2006);
   - UDP[1] Guidebook on accessing international financing for climate change mitigation (2012);
   - UDP Guidebook on accessing international funding for climate change adaptation (2012).

   (d) Reporting - TNA and TAP Report Template for mitigation and adaptation.

7. From the review of current TNA guidance it is concluded that existing guidance(s)

   (a) Provide substantial instruction and are superior to other available guidance documents reviewed;

[1] UNEP DTU Partnership.

(b) Do not lend themselves to the ready conversion of technology priorities into project ideas and action-oriented transactions for implementation of technology strategies (programmes, projects and supporting activities); and,

(c) Could and should be streamlined, made more user-friendly and supplemented with clearly introduced 'fill-in-the-blank' templates for formulation and presentation of technology implementation support actions and project ideas.

8. From the **review of TAPs and project ideas** in the global TNA project the paper concludes that countries have struggled with formulating TAPs and project ideas on the basis of their priority technology options. Moreover, most TAPs and project ideas are incomplete with respect to information about timelines of actions, costs, and identified funding options.

9. Among the reasons identified for that is the limited involvement of practitioners with a finance and investment background in the full TNA process, so that TNA decisions are often insufficiently checked against criteria for feasible technology investments. Involvement of finance practitioners, both during the technology prioritization and TAP/project ideas formulation steps, however, requires that TNAs and their outputs generate sufficient interest for them. On the one hand, this can be done by making their participation only 'part-time' (*e.g.* check technology choice against financial feasibility criteria) and enhancing the (political) profile of TNAs as processes to support countries' development in a climate-friendly way and for which resources are available.

10. Based on the review of TAPs and projects in the global TNA project, existing non-TNA and existing TNA guidance, it is recommended to prepare a slim guidance document[2] for accelerating implementation of priority technologies in a TNA with:

(a) **a focus on 'people' rather than on 'process',** which includes identification of actors and specification of their roles, as 'champions' or 'enablers', in implementing enabling actions for mitigation and adaptation and examining what can be funded by whom;

(b) three **key steps:** identification of barriers to technology implementation at desired scale, actions to address these and plans for implementation of identified actions (TAPs);

(c) **enhanced guidance on how to estimate costs of actions in a TAP,** so that potential funding providers know the cost items to be considered when implementing a priority technology at the desired scale and obtain a first indication of approximate cost levels (*e.g.*, with help of standardised cost tables using Technology Roadmaps or other sources); and

(d) an elaboration on the **potential role of and capacity needs for NDEs,** as a contact or focal point in a country, and of the CTCN for supporting implementation of priority technologies in the countries concerned.

11. In order to enhance learning from TNA implementation experience, it is recommended that the secretariat's Technology Portal or UDP's Tech-Action portal is extended with lessons from implementation of TAPs and project ideas, success stories and factors for success.

12. These improvements are recommended based on a critical review of myriad data and documents, including:

(a) TNA reports prepared during 2009-2013, including TAPs and project ideas;

(b) Good practice examples of progressing from national priorities to implementation of priority technologies within a country at a desired scale;

(c) Available guidance for preparing technologies for implementation in a TNA, including the TNA handbook (chapter 6), UDP Guidebooks on barrier assessment and accessing finance for technology options for mitigation and adaptation;

(d) Available guidance under the Convention for preparing proposals for funding of technologies;

[2] This document uses elements from the current TNA Handbook Chapter 6 and uses the above mentioned guidebooks on barrier identification and accessing international funding, for a streamlined guidance on preparing priority technologies for implementation at the desired scale.

(e) Other guidebooks, outside the context of TNAs, which aim at identifying options in light of national priorities and supporting their implementation at desired scales within a country.

I. Introduction

A. Mandate

13. 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, which should also aim to integrate economic, environmental and social aspects into the development of the technology needs assessment.

14. COP 20 requested the TEC to provide guidance on how the results of the TNAs, in particular the TAPs, can be developed into projects that can be ultimately implemented, and to provide an interim report on its preliminary findings to SB-43.

B. Objectives, scope and approach

15. In line with the COP mandate, the objectives of this paper are to:

(a) Review existing guidance within the TNA programme (chapter 6 of the Handbook for Conducting Technology Needs Assessment for Climate Change and additional guidance provided by UDP) for countries to formulate TAPs and project ideas for the technologies which they have selected as delivering the strongest combined climate and development benefits within their country contexts;

(b) Review TAPs and project ideas formulated by developing countries in their TNAs during 2009-2013;

(c) Identify gaps and challenges in the current TNA guidance with a view to implementation of prioritised technologies;

(d) Review comparable guidance for implementation which exists outside the TNA programme, but within the Convention, as well as successful guidance applied for implementation outside the Convention;

(e) Recommend, based on a-d above, improvements for guidance on TAP and project ideas with respect to:

- What: what content and process improvements are required for accelerating implementation?
- Who: which public and private sector 'enabling' entities should play a role in this (e.g. CTCN, NDE, MDBs, GEF, DFIs, local FIs, specialized funds, donors)?
- How: how can these entities be involved most effectively and efficiently?
- When: when in the TNA process should the above aspects be considered for high-quality TAPs and project ideas?

16. The paper will to a large extent build further on insights gained from:

(a) The third synthesis report on technology needs identified by 31 Parties not included in Annex I to the Convention;[3]

(b) The TEC briefs on Results and success factors of TNAs and on Possible integration of the TNA process with NAMA and NAP processes;[4]

[3] <http://unfccc.int/resource/docs/2013/sbsta/eng/inf07.pdf>.

[4] <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM_TEC_meetings/d8024d9b950f43d594fc17fd22b5477a/b7b44ddccd6543309b6bdbfccb79a513.pdf>; <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM_TEC_meetings/d8024d9b950f43d594fc17fd22b5477a/cf60a5aa61d64146998b91eabd2dabfd.pdf>.

(c) The background paper for the fifth meeting of the TEC on the Current status of the implementation of the results of TNAs including success stories;[5]

(d) The background note for the eight meeting of the TEC on project ideas identified from TNAs;[6]

(e) The paper on good practices with TNAs,[7] conducted in 2014;

(f) Handbook for conducting Technology Needs Assessment for Climate Change (UNDP and UNFCCC), November 2010;[8]

(g) The UNFCCC guidebook on preparing technology transfer projects for financing;[9]

(h) UDP guidebook on "Overcoming Barriers to the Transfer and Diffusion of Climate Technologies";[10]

(i) UDP guidebook on "Accessing International Funding for Climate Change Mitigation";[11]

(j) UDP guidebook on "Accessing International Funding for Climate Change Adaptation";[12]

(k) An experience-sharing workshop on TNAs[13] organized by the UDP, in collaboration with the UNFCCC, held in Bangkok, Thailand in May 201;

(l) The findings of the in-session TNA workshop organized in conjunction with the TEC-7, in Bonn.[14]

17. Finally, the recommendations in this paper are to a large extent based on analysis of the experience with formulating TAPs and project ideas in the Global TNA Project Phase 1 (2009-2013). While the recommended revision of TNA guidance would benefit TAP and project idea formulation in TNA Phase II and III, it could also support implementation of TAPs and project ideas formulated in Phase I. For instance, this could be organised with help of CTCN TIP.

C. Possible action by the SBSTA and SBI

18. The SBSTA and the SBI will be invited to take note of this interim report with a view to considering a final report at SB 44.

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[5] <http://unfccc.int/ttclear/sunsetcms/storage/contents/stored-file-20130320120234893/TNA%20implementation%20success%20stories%202013.pdf>.

[6] <http://unfccc.int/ttclear/templates/ttclear/sunsetcms/storage/contents/stored-file-20140219163230898/Background%20note%20on%20project%20ideas%20from%20TNAs.pdf>.

[7] <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM_TEC_meetings/d8024d9b950f43d594fc17fd22b5477a/6d4c53c874c74baab1ee4b287ec9292e.pdf>.

[8] <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNR_HAB/b87e917d96e94034bd7ec936e9c6a97a/1529e639caec4b53a4945ce009921053.pdf>.

[9] <http://unfccc.int/ttclear/templates/render_cms_page?s=IMS_trm>.

[10] Boldt, J., I. Nygaard, U. E. Hansen, S. Trærup (2012). Overcoming Barriers to the Transfer and Diffusion of Climate Technologies. UNEP Risø Centre, Roskilde, Denmark, 2012, http://tech-action.org/

[11] <http://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_AdaptationFinancing.ashx?la=dahttp://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_MitigationFinancing.ashx?la=da>.

[12] <http://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_AdaptationFinancing.ashx?la=dahttp://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_MitigationFinancing.ashx?la=da>.

[13] <http://www.tech-action.org/Events/Global-Experience-Sharing-Workshop-Bangkok>.

[14]<http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM_TEC_meetings/d8024d9b950f43d594fc17fd22b5477a/bd106ec7d228408497310329c977143f.pdf>.

II. Background and status of TNAs

A. TAPs and project ideas as an output of TNAs during 2009-2013

19. A TNA is a set of country-driven, participatory activities leading to the identification, prioritisation and implementation of environmentally sound technologies to decrease GHG emissions (mitigation) and to decrease vulnerability to climate change (adaptation).[15] The country-driven nature of a TNA is based on its link with a country's development priorities. In light of these priorities, technologies are selected with the highest combined development and climate benefits.

20. A next step in a TNA is to identify barriers to successful implementation of prioritised technologies in the country and to assess how these barriers can be addressed, so that an enabling framework results within the country for technology development and transfer. The barrier analysis and enabling framework report form the second deliverable of a TNA.

21. Measures identified for addressing technology barriers are subsequently described in Technology Action Plans (TAPs), which form the third deliverable of a TNA. Actions included in TAPs could be specific for each priority technology or identified across technologies at the sector level.

22. Finally, in their TNAs, countries formulate project ideas as concrete actions for the implementation of their prioritised technologies, for instance to demonstrated the first few applications of a technology within the country. The project ideas are the fourth deliverable of a TNA (see Figure 5).

23. During the second round of TNAs (between 2009 and 2013) over 90 per cent of the countries prepared TAPs for their prioritised technologies for mitigation and adaptation. In line with the prioritised technologies, most of the Parties prioritised mitigation TAPs for the energy industries and transport subsectors, and adaptation taps for the agriculture and water sectors.

24. The total accumulative estimated budget needed by Parties for their TAPs was USD 5.2 billion for mitigation, and USD 2.4 billion for adaptation. However, as the budget descriptions differed significantly between the TAPs in terms of their magnitude and level of detail, these numbers are difficult to be used for identification of precise funding needs.

25. 87 per cent of the Parties developed project ideas in their TNAs. The estimated accumulative total budget required for the more than 250 project ideas identified by Parties amounted to approximately USD 24.7 billion. However, as the estimated budgets differed significantly between different Parties, the resulting median budget for a project idea equals only USD 2 million.

26. A survey undertaken by the secretariat in 2013[16] shows that several project proposals from the TNA reports have been implemented. Out of 40 project ideas (in 6 countries) analysed (based on inputs provided by TNA countries in response to a questionnaire), 32 were claimed to be implemented. In addition, some of the policy and programme related TNA results, such as TAPs, facilitated the creation of new energy policies on the national level.

27. An earlier survey by the secretariat, in 2010, analysed project ideas prepared in 11 countries in an earlier round of TNAs (before 2009). Of these, four countries provided information on several projects that had been implemented or were under implementation, while five countries admitted that none of the projects had been implemented. Two countries were still considering future implementation. Most of the countries identified the lack of financing opportunities as the main barrier to implementation.

B. Review of TAPs and project ideas prepared by developing countries in their TNAs

28. From the analysis done in the TNA Good Practice report, based on TNAs conducted between 2009 and 2013, it was concluded that countries were well able to prioritise technologies for mitigation and adaptation against country development criteria. TNA reports showed that prioritization processes had generally been participatory with involvement of country stakeholders. In support of that, countries had

[15] Subash Dhar, 2014. ClimateTechWiki Webinar, 25 February, 2014
[16] See footnote 6.

spent time to familiarize stakeholders with potential technologies and used tools such as multi criteria decision analysis.

29. The paper also noticed good practice lessons in terms of TNAs considering costs and benefits of larger scale introduction of technologies within a sector, instead of at the level of a project only.

30. The TNA reports furthermore showed that Parties have often conducted detailed analysis of identified barriers to technology implementation. For that, systems were described for technology implementation at a desired scale, thereby using tools such as market or system mapping. Identified barriers were subsequently analysed with help of, for instance, root-cause analysis, so that the deeper reasons for a barrier could be identified. Barriers were also categorized in terms of, among others, economic, legal, technical barriers, and ranked so that the most important barriers can be addressed first.

31. However, as concluded by the TNA Good Practice report, while the TAPs and project ideas are generally based on actions identified to address barriers, TNAs generally lack information about the business case of technology implementation. For instance, for a government to decide on how to allocate resources for technology implementation, information is needed about the benefit-to-cost ratio of a technology-related programme and/or project.

32. Technology transfer practitioners interviewed (for the TNA Good Practice report) identified, based on TNAs conducted between 2009 and 2013, the following areas for improvement of guidance for enhancing implementation of priority technologies within the TNA project, given the time and resources available for TNAs:

(a) **Cost information:** Generally, the cost information provided in action plans, if included at all,[17] is limited to a rough estimate of costs of actions for technology implementation. Practitioners recommended more active involvement of financial specialists to help the TNA-TAP-Project idea process with identifying cost items and making cost estimates. Realising that detailed cost estimates can be very data and resource intensive, it has been argued by practitioners to keep cost estimates in a TAP and project idea simple (e.g., limit to identification of cost items and estimations of order of magnitude of cost levels);

(b) Closer comparison of benefits of a technologies to estimated costs, e.g. through **benefit-to cost ratios** of technology-related programmes and/or projects: TNAs prioritise technologies on the basis of economic, social and environmental benefits for a country. These benefits can be compared with the basic estimates of costs of technologies and actions in a TNA (as described above). With such information, technology investments can be screened for prioritization and allocation of resources in countries;

(c) **Clarity about funding sources:** Most action plans do not make clear how estimated costs are foreseen to be covered. Identification of potential funders depends on the type of action to be funded: some actions in a TAP are more suitable for private funding sources, while policy or programmatic actions are more likely to be funded by public funding sources (incl. for instance, multilateral funds);

(d) **Measure success:** Although TAPs clearly identify actions and characterize these, only a few TNAs include in their action plans indicators to measure future success after implementation. Inclusion of such indicators enables measuring the impact of an action or project after its implementation. (see Chapter VI below for specific guidance on tracking the results of TNAs).

33. Practitioners interviewed for the TNA Good Practice report specifically emphasised the important role **roles that professionals** could play in the preparation of actions plans, such as technology owners/developers, sector experts in the countries, finance experts, representatives of bilateral or multilateral organisation, etc. It was acknowledged that this requires that the TNA and its results are sufficiently attractive for these professionals.

34. For the latter, the TNA Good Practice report recommended that TNA results can meet reality checks (i.e. are the proposed plans feasible in the longer term?) and are considered by key ministries in

[17] 19 countries included budget estimates for actions specified in TAPs for adaptation and 18 countries specified costs for TAPs for mitigation.

national development planning processes. However, it was also argued by practitioners, that due to the **limited resources available for a TNA,** stakeholders' awareness of opportunities and benefits of well elaborated TNAs has been relatively low, resulting in too little interest in the TNA/TAP process by key decision makers.

III. Review of TAPs and project ideas of global TNA project phase I – comparison with implemented non-TNA climate actions

35. The above review of TNAs has shown that with the current TNA guidance, countries have been well able to prioritise technologies in light of their national development plans, but it has also become clear that countries struggle with formulating TAPs and project ideas on the basis of these priority technology options. While countries' TNA teams have mostly been able to specify barriers to implementation of technologies (also at larger scales) with possible actions to overcome these, formulation of 'implementable' action plans and project ideas has been a difficult step in the TNA process.

36. Possible reasons for this can be that practitioners with a finance and investment background were often not involved in the full TNA process, and that both the technology prioritisation and action plan formulation stages were conducted by the same stakeholder groups, even though both stage usually require different expertise.

37. As a result, the information provided in action plans, including information about the (types of) costs of an action, responsibilities, monitoring and verification aspects is generally insufficient for attracting funders and investors.

38. In order to address this gap and recommend improved guidance for successfully moving from TNA climate and development priorities to low emission and climate resilient technology transactions, this section:

(a) Reviews existing or past programmes focussing on climate technology transfers to developing countries, and identifies factors for successful implementation of these technologies;

(b) Reviews TAPs and project ideas formulated during the second generation of the TNA project – Phase I (2009-2013) with a view to whether similar success factors have been considered and, if so, how detailed they have been assessed.

39. This review of TAPs and project ideas enables learning of lessons on requirements for successful implementation of technologies, based on action plans which allow for technology implementation at desired (larger) scales within a countries. These lessons will form input for recommendations on improving guidance for successful implementation of TNA results.

40. Annex I examines three examples of transfer of low emission and climate resilient technologies to developing countries, with the objective to distil lessons for supporting implementation of prioritised technologies in a TNA.

Review of TAPs and project ideas of the global TNA project

41. The examples examined above have resulted in a list of common factors for successful transactions based on prioritised actions. In this section, it is examined how and to what extent the TAPs and project ideas prepared during the TNA project of 2009-2013 have considered these factors. For that it will be asked:

(a) Whether the factors for success have been included in TAPs and project ideas;

(b) How detailed the factors have been specified.

42. It must be noted that this analysis should not lead to a conclusion that TAPs and project ideas which do not consider and specify all identified success factors can by definition not lead to successful transactions. Rather does the analysis indicate how and to what extent the formulation of current TAPs

and project ideas reflect the above success factors or deviate from these. This will provide further input for suggesting improvements to the guidance for TAP formulation.

1. TAPs – success factors for implementation

43. During the latest round of TNAs (2009-2013), 29 countries have together developed 328 TAPs, of which 142 for mitigation and 186 for adaptation. The above-mentioned success factors can be applied as criteria to the TAPs in order to identify the likelihood of TAPs leading to successful implementation. Figure 1 below shows to what extent the TAPs have adhered to the success factors (for a quick interpretation: the lighter the bars, the lower the level of detail in TAPs). It is noted that none of the countries covered all success factors in their TAPs in detail.

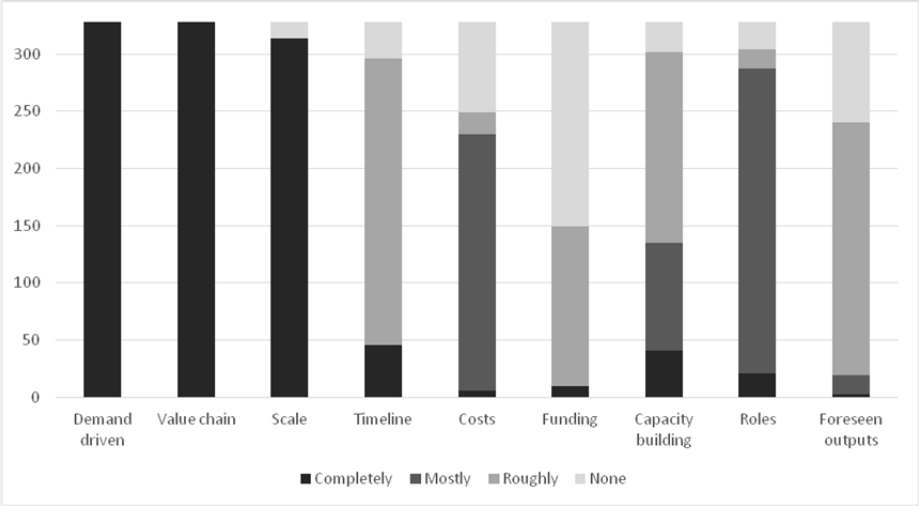

Figure 1. Extent to which TAPs consider factors for implementation success (ranging from complete analysis to rough or zero consideration of success factor in TAP)

44. As all TAPs are based on the technology prioritisation in the TNA process, all TAPs are **driven by demand based on country priorities,** as revisited by domestic stakeholders (which differs from the concept of demand driven by market forces, see Section IV-A). All countries also performed an analysis of the **value chain** for the implementation of the technologies, and all TAPs followed on the analysis of market barriers and enablers.

45. 96 per cent of the TAPs aimed at deployment and diffusion of priority technologies at a larger scale within the countries, while the remaining TAPs were merely designed to prepare for the implementation of a single project.[18]

46. 14 per cent of the TAPs included a detailed overview of the planned **timeline for implementation,** including the order of required activities and the number of months needed. 10 per cent of the TAPs did not include any information on the timelines, while the remainder of the TAPs merely indicated whether activities would need to be implemented on the shorter or longer term.

47. With respect to **costs of actions in a TAP,** only 2 per cent of the TAPs included detailed information about costs, including benefit-to-cost ratios. The majority of TAPs (68 per cent) did include a cost indication per activity, however without justifying the cost indication, and without specifying whether these costs relate to for example upfront investment costs or exploitation costs. 6 per cent of the TAPs only provided such a cost indication for the programme as a whole (not broken down per activity), and the remaining 24 per cent did not include cost information at all.

48. This finding is in line with the TNA Good Practice paper which explains that providing detailed cost information is often a challenge as it requires specific expertise, analysis and data, which adds to TNA process costs and which may in some country cases, such as least developed countries, not be feasible without additional support.

[18] Due to lack of data on actual implementation of TAP, it cannot be analysed, at this stage, whether the 'single technology project oriented TAPs' lead to less or more successful implementation results.

49. Only 3 per cent of the TAPs included a detailed specification of what type of **funding** is suitable for the various activities, and which potential investors may be involved. An additional 42 per cent of TAPs give a rough indication of potential funding sources, such as "international donors". The remainder of TAPs did not indicate potential funding sources altogether. Similar to the observation on costs above, also a detailed specification of funding options requires additional sources and capacity, which in some TNA countries may not be available.

50. As **capacity building** is a critical success factor of action plans, most of the TAPs (92 per cent) have included some form of capacity building. Capacity building activities ideally include (1) a capacity needs assessment, (2) the actual implementation of capacity building through *e.g.* education, training courses, and information campaigns, and (3) a plan for longer-term continuation of capacity building, for example through the 'training of trainers' and the development of a related education programme in universities. 12 per cent of the TAPs included all of these aspects, while 29 per cent included implementation and one of the other two aspects, and 51 per cent included only implementation.

51. A clear view on the **roles and responsibilities** of stakeholders during the implementation of the TAP is needed. 6 per cent of TAPs provided such a clear overview, while the majority (82 per cent) merely indicated which actors will be involved for each of the activities, without clarifying the exact roles and responsibilities of these actors. 5 percent of TAPs just provided a rough overview of related organisations, while 7 did not mention the involved stakeholders at all.

52. With respect to observing whether **foreseen results** are met, out of the 328 TAPs analysed, only 3 included a plan for that. Most of the TAPs (72 per cent) merely included indicators for monitoring success, of which a small part also added which organisation would be responsible for this monitoring. However, all of these TAPs did not include a contingency plan. 27 per cent of the TAPs did not include any monitoring indicators.

2. Project ideas – success factors for implementation

53. During the latest round of TNAs (2009-2013), 26 countries have together developed 262 project ideas, of which 105 for mitigation and 157 for adaptation. Although not all success factors as identified above can be applied as criteria to the project ideas (as these factors are more applicable for larger-scale programmes), some of them can be used in order to identify the likelihood the project ideas will lead to successful implementation. Figure 2 below shows to what extent the project ideas have adhered to these success factors. Similar to the discussion on TAPs above, none of the countries covered all success factors in their project ideas in detail. [19]

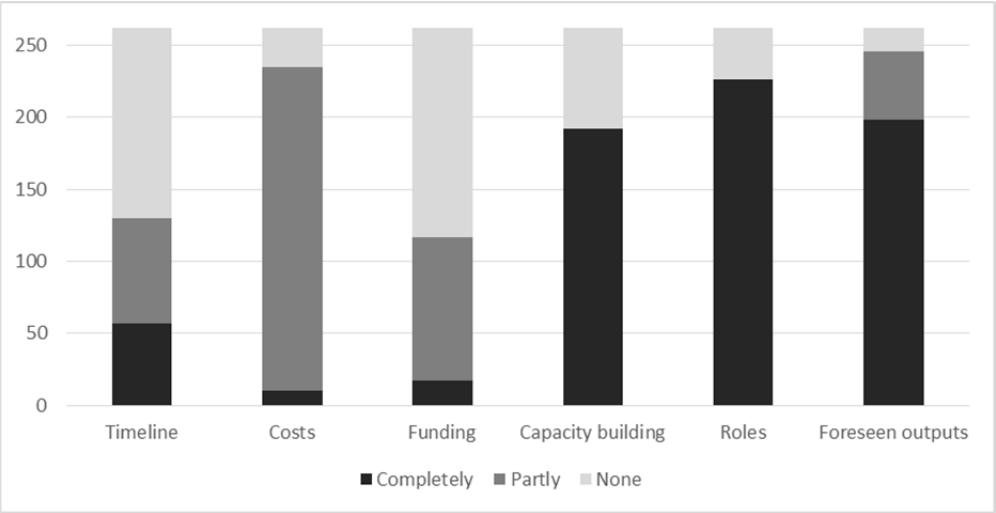

Figure 2. Extent to which project ideas consider factors for implementation success (ranging from complete analysis to rough or zero consideration of success factor in project ideas)

[19] Due to lack of data on actual implementation of project ideas, it cannot be analysed, at this stage, how successful project idea implementation has been.

54. Out of the 262 project ideas, 22 per cent included a detailed timeline for project implementation, such as a Gantt chart. On the other hand, half of the project ideas did not include information on the planned timeline at all. The remaining 28 per cent of project ideas included some rough information on the project timing, without specifying the exact durations per activity and temporal relationships between tasks.

55. Although most of the project ideas (90 per cent) included information on the foreseen costs of the projects, only a very small share (4 per cent) included detailed figures with regard to for example the internal rate of return.

56. For 6 per cent of the project ideas it has been indicated how the project will be financed, and which financiers will be involved. An additional 38 per cent of project ideas give a rough indication of potential funding sources, such as "international donors". 55 per cent of project ideas provide no indication of funders altogether.

57. Some sort of capacity building and training activities are included in most (73 per cent) of the project ideas. The roles and responsibilities of actors involved in the foreseen projects are described in 86 per cent of the project idea reports.

58. About 76 per cent of the project ideas include information on foreseen outputs. A further 18 per cent of the project ideas merely stated objectives, without indicating measurable outputs. 6 per cent of project ideas did not include output indicators at all.

IV. Review of non-TNA guidance from priorities to implementation

59. The above analysis has indicated whether and to what extent TAPs and project ideas contain information about factors for implementation success as identified from a detailed analysis of climate-related 'priority-to-action' programmes. Before examining how to improve existing guidance for TAPs and project ideas in a TNA to address these shortcomings, in this section a set of (six) non-TNA guidance documents are examined from the perspective of identifying and translating priorities into projects, programmes or activities.

60. In examining these examples the focus is on the following questions:

(a) Does the guidance directly attempt the make the connection between priorities and specific actions?

(b) How well or detailed is the guidance with respect to the preparation of transactions, whether these are programmes, projects or activities?

61. In addition to these two questions, in the next section, a critical analysis is presented of guidance documents that are available to support TNAs, based on the following key question: How does the non-TNA guidance discussed in this section compare with a set of (UNEP, UNDP and UNFCCC prepared) benchmark guidance documents which are available for supporting implementation of actions and projects in a TNA?

62. For the review on non-TNA guidance, the following six guidance documents have been examined (a detailed review can be found in Annex I):

(a) **Green Climate Fund (GCF)**: Green Climate Fund approval process, including funding criteria (2014-draft);

(b) **Asian Development Bank (ADB)**: Asian Development Bank framework for sustainable energy access planning (2015-draft);

(c) **Department for International Development (DFID) / Swiss Agency for Development and Cooperation (SDC)**: Operational guide on making markets work for the poor (2008);

(d) **United Nations Development Programme (UNDP)**: Inclusive Markets Development Handbook (2010);

(e) **Sustainable Energy for All (SE4ALL)**: Africa Strategy for Decentralized Energy Services Delivery (2013);

(f) **Global Environment Facility (GEF)**: Rules, Procedures and Objective Criteria for Project Selection, Pipeline Management, Approval of Sub-Projects, and Cancellation Policy (2006).

63. The sampled non-TNA guidance documents all indicate the importance of converting goals, objectives, and priorities into action-oriented transactions.

(a) Some of the documents, especially those by **GCF, GEF and UNDP**, are more focussed on meeting specific *internal* programme criteria and process requirements;

(b) Other guidebooks (esp. **DFID / SDC**) are more outward looking at the same time. While these too are tailored to specific programmatic interests, they offer a more widely applicable approach to transaction preparation from a well-rounded perspective. As a result, the latter guidance has more general applicability;

(c) The guidance documents from the **ADB** and from **SE4All** emphasize the importance of getting from a macro (policy) level ('priorities') to a sectoral or more micro level ('implementation'). However, they come up short in offering specific guidance on "how to" make that implementation;

(d) While informative, the **DFID /SDC** guidance (especially in its "Good Practice Notes" Chapter 5) is very detailed and dense and may be difficult for the average reader and "layperson" decision-maker to absorb and use.

64. From the review, it can be concluded that the non-TNA guidance documents *intend* to present a balanced approach to setting priorities and linking these priorities to action-oriented transactions (programmes, projects and activities). However, most guidance documents attempting to reach this dual objective (of setting priorities *and* defining transactions for implementation) fail to define the requirements of transactions that execute these priorities. A contributing reason for this failure is that the guidance documents reviewed in this section insufficiently address the professional differences between policy makers and priority setting processes on the one hand, and the requirements of specific transaction formulation, on the other hand.

65. In order to correct this disconnection, interaction of representatives from both the 'world' of policy and priority setting (largely public sector) and the world of transaction 'champions' (largely private sector and civil society) is recommended, in combination with professional editing to ensure that 'language gaps' can be avoided. It is thereby acknowledged that getting from a macro (policy) to implementation level requires continued engagement, greater definition of the connecting activities with the highest potential, perseverance and persistence, with corresponding demand for time and resources.

66. This is illustrated in Figure 3, which provides examples of the "connecting activities" that can link the macro and the micro levels, within the narrower scope of low carbon energy initiatives.

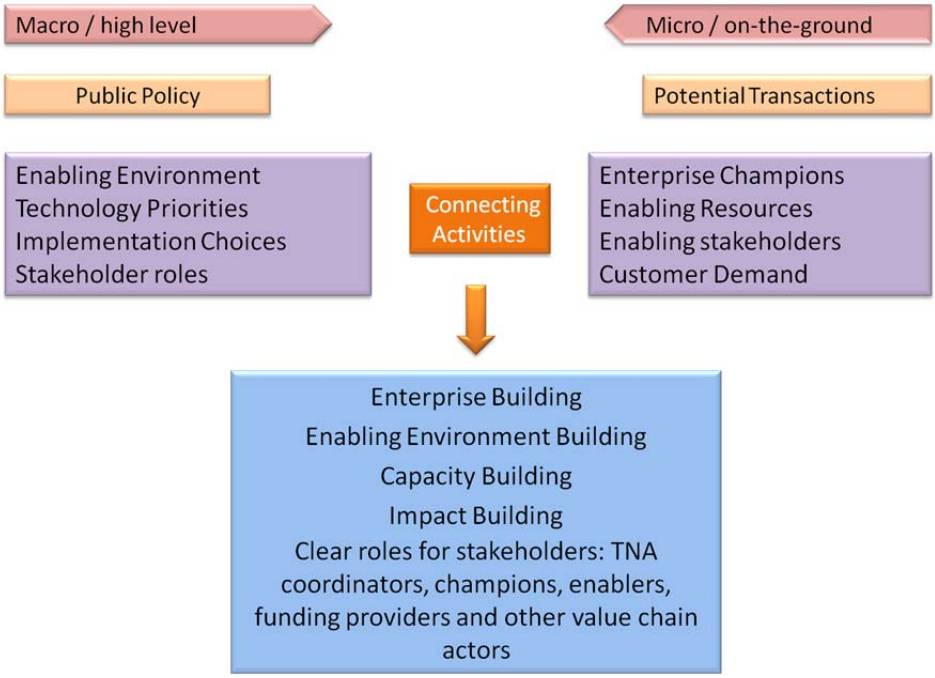

Figure 3. Framework for identifying common activities at policy and on-the-ground level

67. From the preceding review, no model "guidance document" can be recommended for supporting the TNA stage of implementing prioritized technologies for mitigation and adaptation at a desired scale within a country. Instead, it is recommended to consider some of the processes, content, examples and good practices from the reviewed DFID /SDC and UNDP guidance to be incorporated or referenced in the revised guidance for implementation of TNA results, such as, for example: effective mission building, market mapping, logical framework use, "Developing the Offer", Developing Business Membership Organizations and "Making a Deal with Lead Firms", value chains, understanding incentives, "giving grants to business", and "simulating demand".

68. Moreover, from the review of non-TNA guidance in this section it is also recommended to keep guidance for TNA result implementation as streamlined as possible by developing process guidance for TAP and project idea preparation, which is supplemented with more detailed guidance, training materials and actively managed web-based resources.

V. Review of guidance for TAPs and project ideas in global TNA project

69. The Handbook for Conducting Technology Needs Assessment for Climate Change offers guidance for each step of the TNA process: organising the process, prioritising technologies for mitigation and adaptation in light of a country's development priorities, and preparing for technology implementation.[20] In addition to the handbook, a set of other guidance documents have been made available to support: overcoming barriers to technology transfer, assessing international funding sources for priority technologies, and reporting on TNAs, TAPs and project ideas.[21]

70. This chapter reviews existing guidance for supporting implementation of priority technologies in a TNA, especially for preparing TAPs and project ideas. From a review of good practice of TNAs conducted between 2009 and 2013,[22] as well as the discussion in Chapter III above, it has become clear that information in TAPs and project ideas is often insufficient for successful implementation of priority technologies. Based on this recommendations for improving the guidance will be made in the next chapter.

[20] <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_HAB_infobox_1/3a34f12bf10d4b7bae791d0d7ad572eb/c29096556b034760b94273b0124039ac.pdf>.
[21] <http://tech-action.org>.
[22] <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM_TEC_meetings/d8024d9b950f43d594fc17fd22b5477a/6d4c53c874c74baab1ee4b287ec9292e.pdf>.

71. The following sources of guidance are available for preparing for implementation of TNA prioritised technologies (see Figure 4):

(a) **Process** - Chapter 6 of the Handbook for Conducting Technology Needs Assessment for Climate Change (TNA Handbook);

(b) **Barriers and enabling actions** - Guidebook "Overcoming Barriers to the Transfer and Diffusion of Climate Technologies";[23]

(c) **Finance** –

- UNFCCC Guidebook on preparing and presenting technology transfer projects for financing (2006);[24]
- UDP Guidebook on accessing international financing for climate change mitigation (2012);[25]
- UDP Guidebook on accessing international funding for climate change adaptation (2012);[26]

(d) **Reporting** - TNA and TAP Report Template for mitigation and adaptation.

72. Concurrently, these documents are reviewed in the sections A-D below from the perspective of how they could be improved in a way that would ease the transition from priority setting in a TNA into the creation of improved TAPs and project ideas. For that, the findings from chapter III and IV will be considered with respect to current shortcomings in TAPs and project ideas in TNAs, as well as good practice with climate-relevant investments and guidance. As some guidebooks were made available at a later stage during the global TNA project, the review also considers harmonising the guidebooks.

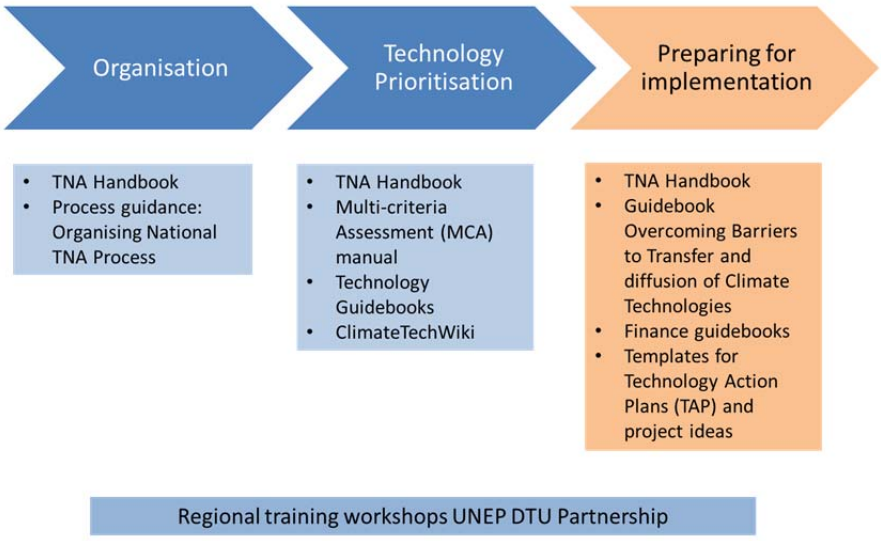

Figure 4. Main TNA stages and guidance available for each stage

[23] <http://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_OvercomingBarriersTechTransfer_10.ashx?la=da>.

[24] <http://unfccc.int/resource/docs/publications/pract_guide_06_en.pdf>. This guidebook has not been part of the TNA Guidebooks package available on the TNA Project website (http://tech-action.org), but it is nevertheless considered in this review for enhanced guidance on TNA result implementation, with a particular focus on its description of the role of key players, such as 'champions' and 'enablers'.

[25] <http://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_AdaptationFinancing.ashx?la=dahttp://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_MitigationFinancing.ashx?la=da>.

[26] <http://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_AdaptationFinancing.ashx?la=dahttp://www.tech-action.org/~/media/Sites/Uneprisoe/Publications%20(Pdfs)/TNA%20Guidebooks/TNA_Guidebook_MitigationFinancing.ashx?la=da>.

Box. 1 Process of updating TNA Handbook during 2008-2010

At its thirteenth session (2007), the COP requested the UNFCCC secretariat "…in collaboration with the EGTT, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP) and Climate Technology Initiative (CTI), to update the handbook for conducting technology needs assessments".[27] The updating work had two main components.

1. The process of prioritising technologies was further specified in more detailed steps, so that all TNAs would follow a similar process, which would also facilitate synthesising TNA results, across TNA countries. Moreover, stakeholders are further supported in considering technology options for mitigation and adaptation in light of countries' national environmental, social and economic development planning. The update guidance contained steps to make TNA stakeholders familiar with possible technology options. TNA handbook chapters 1-5 are the reflection of that update.
2. The updated TNA handbook contains a new chapter (chapter 6) on formulating national strategies on the basis of prioritised technologies for mitigation and adaptation: how can development and transfer of prioritised technologies within a country be accelerated at a scale required or desired for achieving a country's climate and development benefits.

An important consideration during the updating process of the TNA Handbook during 2008-2010 was to make it applicable for other national policy making processes in developing countries. A limitation during that process was that relevant processes under the Convention were being negotiated and that it was unclear what possible interlinkages between TNAs and these processes could look like.

Therefore, the TNA handbook took the position that: "the national strategy and action plan [resulting from a TNA] may best be conceived as part of the country's overall development and climate change strategy (e.g., Nationally Appropriate Mitigation Actions (NAMA) and National Adaptation Plans of Actions (NAPA))."[28] As a result, chapter 6 of the handbook was prepared as a comprehensive guidance considering a high level of detail and addressing a high policy making level, so that its relevance for NAMA and NAP would become more likely.

A. Process – review of guidance on preparing strategy and action plans for prioritised technologies (TNA handbook chapter 6)

73. Chapter 6 of the TNA handbook contains three main steps towards strategies and action plans for technology implementation:

(a) Clarifying priorities and establishing key milestones;

(b) Identifying measures to develop capacities and enabling frameworks;

(c) Compiling an overall national strategy and action plan.

74. The first step takes the portfolios of prioritised technologies as a starting point and asks the question at what scale these need to be implemented in order to meet sector goals (milestones). Chapter 6 suggests specifying the scale of technology implementation by first revisiting the goals of a sector or country in line with development and climate priorities (such as 30% share of renewable energy in the energy mix), followed by specification of how the technology concerned can contribute to these (e.g. solar energy can provide one-third of all renewable energy to the country).

75. In the second step, the handbook recommends a system level approach by mapping out, during a participatory process (such as a workshop), the existing environment for each priority technology in the country concerned. Such a system or market map helps stakeholders gain insights on the barriers in a system for technology development and implementation. Subsequently, solutions can be identified for these.

76. A particular aspect of this step is that the handbook recommends that solutions are categorised under 'core elements for a technology innovation strategy'. Examples of these core elements are: stakeholder networks, policies and measures, organisation/behavioural change, market/ system support, trainings and awareness raising programmes.

[27] Decision 3/CP.13
[28] UNDP (2010), p. 66.

77. The third step in chapter 6 of the handbook consists of compiling a technology strategy with an action plan, combining the elements collected in the first two steps. It takes the sector and/or national goals defined in step 1 as a future reference point and aims at formulating a pathway towards these goals, in the form of a strategy. The TNA handbook recommends that actions identified for multiple technology strategies are compared, in order to identify overlaps and to explore whether the technology strategies can be combined into sector or national technology strategies.

78. Implementation guidance for projects and programmes is limited to a text box with recommended steps for identifying barriers and system blockages. Most of the guidance in chapter 6 is focussed on scaling up technology implementation and motivating stakeholders to go beyond single technology projects.

79. As such, chapter 6 could be interpreted as a step before a decision on implementation of technologies. The handbook's intention to consider the national strategy and action plan as part of a country's overall development and climate change strategy (e.g. NAMA or NAP, see box 1) has resulted in a relatively high-level guidance chapter, with limited concrete guidance on actual implementation of priority technologies.

80. An overview of the strengths and weaknesses of chapter 6 of the TNA handbook, based on the above review, is shown in Table 1.

Table 1. Strengths and weaknesses of chapter 6 of the TNA Handbook

Strengths	Weaknesses
- Connects the **scale** at which technology development and transfer take place with a country's longer term development **vision** and **milestones**. - Stimulates **system** thinking: Successful larger scale development and transfer of prioritised technologies require efficient systems or markets. Chapter 6 provides detailed guidance for that. - Supports a country in formulating **strategies** for technology development and transfer, which can be at the level of a technology, a sector or area and for an entire country. - Aims at connecting TNA results with **NAMAs** and **NAPs**, so that TNA outputs can be linked to these processes - Underlines the need for **rationalising** actions for technology development and transfer across multiple sectors within a sector or nationally, in order to avoid gaps and overlaps. - Stimulates TNA countries to present TAP and project ideas in a **common format** (in combination with TAP and project template prepared by UDP)	- The chapter is rather '**packed'** with multiple steps and details and which makes it difficult to read. - The link with **underlying guidance materia**l, such as the finance guidebook and barrier analysis guidebook is rather weak, which is partly caused by the later availability of the latter. - The **link between TAPs and project ideas** is not fully clear: e.g. whether project ideas originate from TAPs or can also be formulated independently of TAPs. - The proposed process from technologies to strategies is recommended to be participatory, but, during TNA Phase I, the possible **role of stakeholders** in implementation preparation is not specifically highlighted (e.g. role of 'developers', 'champions', 'enablers'). In order to address this aspect, UNEP/UDP are developing a specific guidebook for stakeholder mapping and engagement under TNA Phase II' [29] - While countries in their TNAs present their TAPs and project ideas in a common format, the **level of specification** of identified actions differs between countries

[29] 'Stakeholders Guide note: Identification and Engagement of Stakeholders in the TNA Process' which is available at: http://www.tech-action.org/Publications/TNA-Guidebooks.

B. Barriers and enabling actions – review of UNEP's guidebook on overcoming barriers to the transfer and diffusion of climate technologies

81. In order to support the barrier identification and analysis, UDP prepared a specific guidebook on "Overcoming Barriers to the Transfer and Diffusion of Climate Technologies."[30]

82. The aim of the guidebook is to provide guidance on how to assess, address and overcome barriers to prioritised technologies in a TNA in the countries concerned. In this respect the guidebook complements the TNA Handbook which provides general guidance on barrier assessment (in chapter 6). At the same time, the guidebook is not a manual or blueprint for elaborating measures for technology transfer. Its aim is to identify options and tool for analysis on barriers and solutions.

83. The focus of the guidebook is on prioritised technologies, not a whole sector (e.g. transport) or a group of technologies (e.g. energy efficiency options). For prioritised technologies, barriers are analysed with a view to the objective of their larger scale deployment and diffusion. The guidebook specifically focuses on the role of governments in accelerating technology transfer and thus addressing barriers.

84. The guidebook distinguishes between technologies as market goods (consumer goods and capital goods) and those that are in the categories of 'publicly provided goods' and 'other non-market goods.' For market goods, the main tool recommended is that of market mapping, which is a participatory process with stakeholders in a country to prepare a 'snapshot' of the market system for a technology, including its value chain, enabling environment and supporting services. Based on this picture, market inefficiencies or barriers can be identified and solutions to address these recommended.

85. With the addition of publicly provided and non-market goods the guidebook aims to address barriers that are specifically related to mitigation and adaptation technologies such as large-scale hydropower schemes, sea dikes, flood defence, infrastructure such as roads, bridges, freshwater and sewage systems, and mass transport systems such as metros.[31]

86. In terms of method, the guidebook for overcoming barriers recommends the following steps:

(a) Identification and categorisation of barriers in: economic and financial barriers; market failures; policy, legal and regulatory barriers; network failures; institutional and organisational capacity limitations; lack of human skills; social, cultural and behavioural barriers; lack information and awareness; technical barriers; and other barriers such as lack of physical infrastructure;

(b) Screening of barriers according to their significance, whereby the long list of identified barriers is sorted into key and non-key barriers;

(c) Decomposition of barriers in terms of category of barrier (e.g. economic and financial), barrier within the category (e.g. high cost of capital), elements of the barrier (e.g. high interest rate), dimension of the barrier element (e.g. 15% interest per year);

(d) Causal relations between barriers are explored in order to learn what is the 'true problem' or root cause of barriers, so that solutions for addressing barriers are focussed on the symptom but on solving the fundamental problem.

87. Once barriers have been identified and analysed, the guidebook explains how measures can be identified to address the barriers. Also this process is proposed to be participatory. Identified measures are recommended to be categorized similarly to the categorization of barriers (see above). A tool recommended for that is Logical Problem Analysis, which helps to formulate a barrier problem into a solution and identifies steps towards realizing that solution.

[30] See footnote 23.

[31] The distinction between market and non-market goods in the guidebook does not mean that technologies in the non-market category may not be traded in a market place like consumer goods and capital goods. The guidebook, in fact, acknowledges that these technologies are purchased by public entities from private constructors and manufacturers, but explains that their market is often not as liquid the markets for market goods, as the public entities purchase their goods through a tendering process, which may be restricted to a limited number of invited national and international construction companies.

88. After an initial prioritization of measures, in terms of which measures are essential for addressing barriers, the guidebook recommends that measures may be grouped for several technologies. The latter enables that measures identified for a single technology and which also apply to other technologies can be organized such that they benefit transfer and diffusion of multiple technologies.

89. From the Third Synthesis report on TNAs[32] it can be concluded that Parties generally have followed this guidance on barrier identification and solution formulation, as they categorised barriers and prioritised these, as well as formulated enablers as solutions for the barriers. Most TAPs contained solutions for specific technologies, rather than cross-technology solutions.

Table 2. Strengths and weaknesses of Guidebook on barrier analysis

Strengths	Weaknesses
- It supports screening of barriers, which goes beyond 'simply' categorising them, as it support analysing the root cause of barriers and prioritising barriers in terms of which ones are essential for technology implementation success. - It enables identifying solutions by formulating objectives: what should the situation look once the barrier has been removed? - It distinguishes market from no-market, public good, technologies thereby acknowledging that some technology options (such as many options for adaptation) are not easily transferred through a market and may require different value-chain analysis. - It suggest participatory processes for barrier assessment.	- It is not a step-wise guidebook, which complicated its usability. TNA teams may need a decision help on when to use what section of the guidebook. - The barriers guidebook has mainly technology focus and is not specific about scale of technology implementation. This seems to disconnect from the TNA handbook which suggests that TNA stakeholders first determine a desired scale of technology implementation, and to identify barriers at that implementation scale. The guidebook implicitly addresses up scaling, but is not specific on that.

C. Funding – review of guidance on preparing for financing priority options for mitigation and adaptation

1. UNFCCC's guidebook on preparing and presenting proposals for technology transfer projects for financing

90. The UNFCCC Guidebook on Preparing and Presenting Proposals for Technology Transfer Projects for Financing[33] can specifically support the implementation of project ideas (Deliverable IV in Figure 5). It includes guidance on skills and tools needed before proposal (transaction) preparation, including an introduction to basic accounting and financial analysis.

91. The guidebook contains seven steps for preparing proposals in the form of the following questions:[34]

(a) WHAT is being proposed?

(b) WHERE will the proposal be implemented?

(c) WHO will champion the proposal and see it to completion, and who else will be involved?

[32] Third synthesis report on technology needs identified by Parties not included in Annex I to the Convention, FCCC/SBSTA/2013/INF.7 <http://unfccc.int/resource/docs/2013/sbsta/eng/inf07.pdf>.
[33] <http://unfccc.int/resource/docs/publications/pract_guide_06_en.pdf>.
[34] This question approach also appears in the UNEP Guidebook on Accessing Finance. In recommending its continued application in Annex 3, the key questions in both the UNFCCC and UNEP guidances have been used and edited.

(d) HOW will the proposal be implemented?

(e) WHY is the proposal important and Why should it be supported?

(f) WHAT IF things do not go as planned?

(g) TO WHOM is the proposal addressed?

92. Once these questions are addressed, the guidebook provides directions on and templates for preparing a "Base Case" set of financial data, as well as guidance on presenting proposals to different funding interests in both the public and private sectors depending on the project risk-return potential and stage of development. For donors, carbon monetization resources, lenders and investors, the guidance offers customization instructions.

93. In support of the above, the guidebook contains various documents and resources related to transaction completion, such as:

(a) Manual and Excel input templates for proposal preparation;

(b) A detailed proposal sample following the question approach and provided templates;

(c) Glossary;

(d) An annex of web and other resources, including organizations offering funding as well as programmatic (activity) support;

(e) Illustrative (algebraic) calculations of financial measures; and

(f) Illustrative term sheet and due diligence checklist to inform how financiers (investors and lenders examine proposals).

2. UNEP's guidebook accessing international funding for climate change - adaptation and mitigation

94. The Guidebook "Accessing International Funding for Climate Change Mitigation"[35] has been prepared by UDP in support of implementation of TNA results and made available during the TNA Project of 2009-2013. It includes:

(a) Introduction to financing sources with particular emphasis on the requirements of the GEF, multilateral, bilateral and private sources, especially climate funds;

(b) Description of the types of finance available and its requirements;

(c) Differentiation of projects and programmes;

(d) Review of multilateral, bilateral and carbon finance resources.

95. It contains a set of *eight introductory (general and informational) criteria* to be met for successfully attracting financial support for priority technology options. These criteria are in the following categories:

(a) Programme design, including Programme objectives and target markets;

(b) Implementation plan and partners;

(c) Technical assistance and capacity building needs;

(d) Budget and use of funds;

(e) Expected results, evaluation plan and impact metrics;

(f) Direct results and indirect effects (including market transformation effects);

(g) Pathway to sustainability and replication;

(h) Programme implementation risks and risk mitigation.

[35] See footnote 23.

96. In order to support TNA teams in preparing proposals based on priority technologies, a specific chapter has been dedicated to proposal preparation, which is supported by a detailed appendix.

97. Similar to 2006 UNFCCC Finance guidebook discussed above, the guidebook embraces the 'Who-What-Why Question Approach question approach' in providing guidance. Also consistent with the 2006 UNFCCC Finance guidebook are the risk assessment criteria presented, although the UNEP guidebook places greater emphasis on non-revenue aspects given the emphasis on public financing resources.

98. UNEP's TNA guidance on "Accessing International Funding for Climate Change Adaptation"[36] includes an overview of adaptation financing option with a good level of detail on financial flows. It follows a similar structure as the guidance on accessing funding for mitigation options, but puts, where needed, specific emphasis is put on adaptation related aspects.

99. For instance, the guidebook contains seven eligibility-information criteria for accessing international funding for adaptation options, which are elaborated on with help of the 'who-what-why' question approach:

(a) Adaptation rationale and additional cost argument: What is the business-as-usual development for the targeted sector? What are the projected climate change impacts? What are the specific adaptation activities to be implemented to reduce the climate change vulnerability compared to the business-as-usual situation?

(b) Urgency and prioritisation: How and why was this particular project idea identified among the many alternatives that could have been addressed with the same funding?

(c) Weighting of project activities: How much funding will be allocated to 'investment activities', 'capacity building activities' and 'project management activities' respectively?

(d) Sustainability of intervention: How will the project assure that the benefits achieved through its investments are sustained beyond the lifetime of the project?

(e) Cost effectiveness: A qualitative discussion of how the principle of cost effectiveness has been applied in the selection of the specific project activities among alternative options to achieve the same objective(s);

(f) Institutional setup and comparative advantage of implementing institution: Who will implement the project and what are their comparative advantages and capacity compared to other potential implementing institutions? How will the project be coordinated with (and/or mainstreamed into) related development activities of the targeted sector?

(g) Results-based management and logical framework: Presenting the project in a way that is consistent with principles of results-based management, which implies a strong focus on directly linking all project activities to clear 'measurable' adaptation 'outputs', 'outcomes', and 'impacts'.

100. Based on these criteria, the guidebook contains a template and an example for funding request proposals for adaptation options.

101. Finally, the guidebook contains a high level overview of critical concepts and requirements for accessing private financing for adaptation and a number of case studies, with numerous cross-references to CTI-PFAN.[37]

[36] See footnote 26.

[37] Need to add separate adaptation references here.

Table 3. Strengths and weaknesses of guidebooks on funding acquisition	
Strengths	**Weaknesses**
- Comprehensive documents with detailed background information, explaining how funding requirements and supply depend on the nature of project or action, and whether a technology is in development or (nearly) ready for commercial application. - The UDP guidebooks contain a detailed overview of possible funding sources, including types of activities they aim, which could possibly form the starting point for an electronic database as foreseen in CTCN-TIP (see chapter VI). - The UDP guidebooks make an explicit distinction between funding requirement for options for mitigation and adaptation, thereby acknowledging that funding requirements between both types of options can differ considerably. - The guidebooks contain an excellent elaboration on general criteria for successfully attracting funding and on information requirements for that. - The guidebook elaborate on the distinction between projects, programmes and activities (though not perfect and not always consistent).	- In general, the guidance documents contain much reading material with a risk that they try to do too much under one set of "roofs", which makes the content dense and less user friendly - The guidebooks on accessing international funding for climate change mitigation and adaptation, as well as the 2006 UNFCCC Finance guidebook, while instructive on basic concepts, inventory of funding sources, flows of resources and reconciliation of private and public sector differences and interests, contain the risk that these become quickly outdated. - The finance guidebooks also focus more on "why this is important" or reflecting "cut and paste" sections from the main body of the report rather than showing "here's what you need to know to get a quick start" - Moreover, at times the documents are too introverted: focused on one or another funding priority (e.g., GEF) rather than on general guidance.

D. Reporting templates for TAPs and project ideas

102. In order to support reporting on TAPs and project ideas, reporting templates have been made available by UDP for the TNA Project.[38] These templates suggest the structure for the following four reports (see Figure 5):

(a) Content of the TNA and TAP Report for Mitigation / Adaptation (Report I);

(b) Report on Barrier Analysis and Enabling Framework (Report II);

(c) Technology Action Plan Report (Report III); and

(d) Project Idea Report (Report IV).

[38] <http://orbit.dtu.dk/ws/files/52417708/ReportingTemplates_Zhu.pdf>.

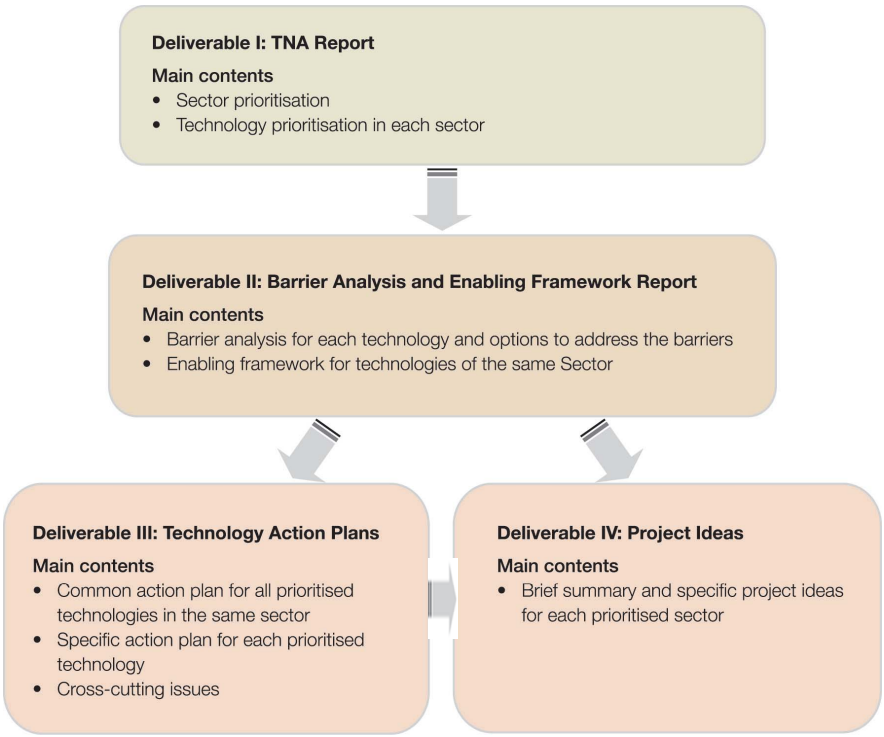

Figure 5. Overview of four TNA reports[39]

103. The reports are structured in such a way that they can be read independently from the TNA report (which could be over 200 pages long). According to the templates, the TAP reports need to be short as they are meant to be disseminated to policy / decision makers. The templates also explain that as GEF and other donors are interested in the project ideas from the TNA project, project ideas are prepared in separate reports.

104. For each report, the templates contain annotated outlines, explaining the type of information to be included in each section, suggesting the length of the texts, and referring to possible background documents (e.g. TNA Handbook and UDP guidebooks). Basically, the report structures for TNAs, TAPs and project ideas are similar mitigation and adaptation, but in case of differences, these are specified. The reports are recommended to have relatively short main texts, with further details in Annexes.[40]

105. The templates are more detailed than the suggested reporting structure in the TNA handbook (Chapter 7- Synthesise technology needs assessment process in a report). A particular difference is that the templates recommend that each report contains separate chapters for each prioritised sector. As a result, readers can easily turn to their sector of interest and in each report find priority technologies, barriers, enabling actions and project ideas for that sector.

[39] UNFCCC (2013), TEC brief on TNAs; or TNA good practice report.
[40] Examples of annexes are: technology factsheets (Report 1), market maps and policy factsheets (Report 2) and list of stakeholders engaged in the TNA (all reports).

106. Table 4 summarises the strengths and weaknesses of the templates for TNA project reporting.

Table 4. Strengths and weaknesses of templates for TAP and project ideas used during TNA Phase I[41]

Strengths	Weaknesses
- Templates provide practical reporting guidance in the form of an annotated outline, with suggested content, references and text length. - The reports can be read as stand-alone documents by different audience groups (funders, policy/decision makers), in particular TAP and project idea reports. - The reports contain individual chapters for each prioritised sector, so that sector experts can easily find sector information in the report	- The link with the TNA Handbook structure, especially chapter 6, can be strengthened, so that the suggested templates become an integrated part of the handbook and each step in handbook chapter 6 coincides with a chapter or section in the reporting template. - As a result, in the current situation, users need to go back and forth between the TNA handbook and the reporting templates.

E. Summary

107. From the review in this chapter of existing TNA guidance for TAPs and project ideas for implementation of prioritised technologies for mitigation and adaptation it is concluded that available TNA guidance documents:

(a) While they provide substantial instruction and are in several ways better than other available guidance documents reviewed;

(b) Do not lend themselves to the ready conversion of technology priorities into project ideas and action-oriented transactions for implementation of technology strategies (programmes, projects and supporting activities);

(c) Need to reflect the engagement of finance and project professionals earlier and more deeply;

(d) Should therefore be streamlined to form a coherent whole with user-friendly main steps, with clearly introduced "fill-in-the-blank" templates for TAP and project idea formulation and presentation, with clear references to underlying training or supporting material.

VI. Way forward

A. TAPs as technology implementation plans for delivery of development and climate benefits

108. Based on the above analysis of available guidance on TAPs and project ideas, this chapter suggests ways forward towards improved TAP guidance, with a view to enhance implementation of TNA results, including TAPs and project ideas.

109. The work on TAPs and project ideas usually starts with the output of the technology prioritisation process (TNA handbook chapters 1-5): portfolios of technologies which have been prioritised for their social, environmental and economic benefits and contribution to climate mitigation or adaptation.

110. TAP are subsequently developed for these prioritized technologies by:

(a) considering the **scale** of implementation, given the costs;

[41] This guidance is currently being revised by UDP for use during TNA Phase II.

(b) developing an idea of the **type of transfer** required to deliver the benefits, such as for example: turnkey imported technology options, joint venture technology acquisition, local supply chain development *etc.*;

(c) identifying **barriers** and system-level inefficiencies which prevent technology implementation at the desired scale in a country;

(d) identifying **actions** that need to be taken to address those barriers;

(e) formulating a **plan** on how each action will be implemented, including who will be responsible, when the actions is planned to start and conclude, how the success of action will be measured, what are the cost items to be covered; and

(f) **Monitoring** whether the plan covers all factors for success.

111. TAP may result in development of national policy and programme, development of laws and regulations, implementing financial and fiscal incentives on a sectorial level, training programmes, and demonstration of a new technology.

112. Projects can also result from project idea reports, such as realization of a micro-hydro power plant, and transfer and deployment of drip irrigation and rainwater harvesting technologies (see Table 5). However, projects alone are unlikely to bring into motion the wheel of achieving development and climate goals in a country at a desired larger scale, as this often requires system improvements (incl. removing value chain inefficiencies) which go beyond the usual project scales.

113. Table 5 shows examples of how project ideas can differ from TAPs in terms of focus, implementation timeframe and scale.

Table 5. Examples of how project ideas and TAPs can differ in a TNA

Project ideas	Technology Action Plans
- A project idea can be the installation of a single unit of a priority technology, for the operation of which engineers in the country receive training from colleagues from abroad.	- For this priority technology, the TAP contains a plan to develop a national level education plan (with universities and other schools) to train a future generation of engineers in operating and maintaining the technology (on a larger scale).
- A project based on a priority technology can received upfront funding from an investor in the carbon credits that the project generates.	- A TAP focuses on improving the country's financial system so that project investments can more reliably be made.
- A project can be the installation of a small-scale hydro unit in a mountainous area, including addressing local barriers and arranging a power purchase agreement.	- A TAP can focus on larger scale diffusion of small-scale hydro units in the regions where potential for that exists. The TAP addresses power network stability aspects and proposes required investments.
- A project can be a programme of, e.g., 500 small scale biogas cook stoves to be implemented in a targeted region within 2 years.	- A TAP can contain a 20 year plan for rolling out over 100,000 cook stoves across the country's rural areas, in multiple stages, including an education programme with maintenance instructions.

114. Formulation of a TAP takes place in two main stages. While the first stage is about **WHAT** to do (see above), the second part of the process is about **HOW** the required transfers of technologies or measures for mitigation and adaptation can be effectively implemented. The following are the major parts of the process to be facilitated:

(a) How to tailor the process to achieve the type of transfers required e.g. Joint venture, local supply chains;

(b) How to ensure the benefits are delivered;

(c) How to ensure the identified actions are carried out to time and budget;

(d) How to ensure that the range of stakeholders are involved throughout the process;

(e) How to ensure that appropriate measuring and reporting procedures are used and learning feedbacks are in place for a flexible responsive process;

(f) How to assemble a suitable financial package to deliver not only the technology hardware but also the benefits expected and the accelerating strategy activities to facilitate long term successful roll out; and

(g) How to ensure strong overall management of all the parallel activities in all parts of the whole process to time and budget.

115. It is acknowledged that since TNA time and resources are limited, very detailed characterisation of actions (*e.g.* detailed cost estimates) may not always be feasible. It is therefore proposed to **focus on information that potential funders** (ranging from commercial finance institutes to multilateral development organisations) **will need at minimum to consider funding an action**, so that more detailed information can be provided after that (beyond the TNA and in collaboration with the potential funders).

116. While a clear process for formulating TAPs and project ideas is necessary, a too strong focus on processes and process steps **may imply the risk** that the main goal is to complete each step, while the end result may be a TAP which is not ready for consideration by potential funders and investors.

117. Therefore, it is recommended to clearly describe in a TAP **the role of stakeholders in the implementation of technologies and accelerating actions.** This includes identification of actors and specification of their role: *e.g.* intermediary agents or companies (for addressing investment risks in a country), brokers with good understanding of the banking sectors, technology 'champions' (who will see a technology action plan through to completion, by a.o. lining up resource providers), and enablers (who actually supply resources to champions).

118. Especially, **TNA coordinators can be important champions** in this respect as they have detailed knowledge of how technologies have been prioritised and what are important bottlenecks for technology implementation within a country. They can also advice on the roles of different ministries in considering TNA results as part of national planning processes, and who are key stakeholders for successful technology implementation.

119. To facilitate funding for implementation of the actions identified in TAPs, **allocation of a part of the budget to support implementation**, already at the beginning of the TNA project could be an option. The China TNA may serve as an example of the latter, which has a budget of USD 6.7 million, of which USD 0.8 million was allocated for implementation supporting activities. Among the stages of the project (which was GEF granted by USD 5 million for a 3-year programme)[42] are capacity building and pilot project support, which together represent between 25 and 30% of the total project budget.

[42] <http://www.worldbank.org/projects/P120932/china-technology-needs-assessment-tna?lang=en>.

B. Recommendations for improved guidance on TAPs and project ideas

120. In terms of focus and presentation, it is recommended to prepare **a "new guidance document"**, which may take the **output of TNA Handbook chapters 1-5** as starting point (i.e. priority technologies for climate and development benefits) and which **may integrate the current guidance materials** for TAP and project ideas (as discussed in chapter V):

(a) The first step in the "new guidance document" would focus on identification of actions for technology implementation and delivering its benefits, including actions to address barriers;

(b) The second step in the "new guidance document" would focus on **preparing for implementation** of identified actions, including description of: what are benefits to be achieved (why), stakeholder roles (who), time frame for technology implementation (when), costs items and estimates (how much), measuring and evaluation needs (how to measure) and possible funding/financiers (how to fund).

121. These two steps will result in a list of action-able items with a plan for their implementation in a period of time:

(a) Action items would include **commercial and non-commercial investment**, as well as activities aimed at information dissemination, capacity building and the improvement of the "ecosystem" that enables implementations at the country level, *i.e.*, both soft and hard actions;

(b) These action items need to be collected in a somewhat centralised manner. **From a "centralised point" the actions will need to be made available to a universe of funders.** An on-line platform with controls would be simple enough to organize, possibly in collaboration with the knowledge platform developed by CTCN;

(c) An action implementation **checklist is recommended to be added** to ensure that information needed for implementation is prepared and available (see Annex 2 for an example, which can be simplified).

122. An important challenge in the improved guidance, therefore, is **to establish, a connection** between the higher-level 'public purpose' actions, and actions and project ideas identified at the micro level/'on the ground'.

123. This is done by considering **what are key factors at the 'macro' and 'micro' level and how these can be connected**. For example, while the larger **enabling environment** for wider-scale technology implementation is an important 'macro factor', identification of **technology champions** within this 'environment' is an important 'micro factor' (see for examples, Figure 3 and Annex 2 with a ten item roster of elements to assess).

124. **The following suggestions are aimed at improving guidance for proposals for implementation of TAP actions and project ideas:**

(a) **Streamline the guidance to a minimum** level of "Here is what you, the *user*, need to know in order for this guidance to be meaningful." This implies that the "user" needs to be carefully described and differentiated from the broader range of "readers" of guidance. The user in this case is the *in-country generalist* (usually within a broader purpose organization and usually having multiple responsibilities) *who must organize an action or a project idea as it evolves*);

(b) **Provide this targeted user with support** along the lines of: "If you want deeper background or information on A, B and C, here are web-based or other existing resources to keep up to date". It is not recommended to try to put all the easily out-of-date information on sources of funding and support under one roof. Instead, a readily accessible website is recommended solely for the TAP-Project Idea formulation and presentation, such as the current TNA project website;[43]

[43] <http://tech-action.org>.

(c) **Focus on basic requirements of multi-purpose 'good quality' action proposals and project ideas** (these are described in Annex 3), instead of focusing on proposals to targeted financing sources. This guidance places a premium on in-country generalists and organizations being the first audience for ideas. In other words, **countries need to satisfy themselves (and their country's priorities as identified by the TNA) first before tackling one or another resource provider's requirements**. Then, these good quality actions and ideas can be customized as needed;

(d) **Improve the terminology**, reduce the jargon and acronyms and emphasize neutral terms (e.g. 'equity' and 'sponsor' means many things to different people). Carefully edit guidance so there is clarity that actions and project ideas refer to all manner of programmes, projects and activities;

(e) **Downplay the distinction between public sector and private sector ideas**, specialized funds and such conventions as public-private partnerships. **The elements of good quality proposals for TAP actions and project ideas are universal** and should not be skewed by a grant, loan, concessionary finance, financial engineering or commercial equity investor perspective;

(f) **Emphasize that complete and balanced mitigation and adaptation action and project proposals share certain qualities**, which need to be explained. **Meeting this entry level quality will allow proposals to be easily customized for specific audiences**.

125. A specific element in TAPs and project ideas which was mentioned by most of the interviewed practitioners in the TNA Good Practice report is that of **costs**. As explained elsewhere in this paper, cost information is important for potential financiers to assess the feasibility of technology within their programmes. However, it has also been indicated that **detailed cost estimates may be complex, given the limited resources for a TNA**.

126. Where cost information is lacking but technology priorities and the "broad strokes" of project ideas exist, it may be practical to **provide "benchmark" ranges** that could be used for a first approximation and to determine the required next steps:

(a) For example, a capital cost range of USD1,500 to USD3,000 per kW might be suggested for hydroelectricity projects in the 10 to 30 MW range;

(b) Output estimates can be made of high, medium and low output conditions supplied with a corresponding "all-in" tariff (based on levelized costs), which is needed to recover capital and operating expenses over the life of the facility;

(c) Countries would use these simple data points to present "illustrative action or project ideas" by describing the selected technology, its approximate size or scale, capital costs, levelized "tariff", and, most important, the next planning steps and resources needed to convert this illustrative action or project idea into more concrete details (along the lines of the information shown in Annex 3);

(d) Though speculative, full capital costs for a project idea or action can be approximated in order to estimate the "pre-construction" costs (feasibility analysis, siting, geotechnical, design, procurement and finance planning) as a percentage of the expected capital cost;

(e) Benchmark data for low emission energy projects and mitigation activities could be assembled from existing resources (see REN21 annual report on renewable energy, for example)[44] and centers of excellence;

(f) Comparable benchmark resources would be required for adaptation projects, programmes and support activities.

[44] <http://www.ren21.net/about-ren21/annual-reports/>.

127. Finally, **with respect to 'presentation' of the guidance and "templates," the following recommendations are made**:

(a) **Revisit general criteria for successful TAP action and project idea proposals** as the first level of instruction and guidance. (A list of criteria for consideration in proposals for TAP actions and project ideas for mitigation and adaptation will be Annexed to the "**new guidance document**");

(b) **Elaborate on these general criteria** with a limited number of specific 'What-Where-How' questions (see the discussion on non-TNA guidance in chapter IV) that are targeted to the general criteria *and* a starting list of what constitutes good proposal for TAP actions and project idea quality. In this elaboration it is important to keep the proposals realistic and avoid an impulse 'to please everyone and all the institutions';

(c) **Employ 'fill in the blank' answers** that allow for general narrative and quantitative answers (e.g. total cost of the action or project is ~USD 1.3 million) *and* optional details *only* if available (Technical Assistance is $125,000; Design, Construction & Pre-Commissioning Costs total $875,000; Capacity Building is $50,000; $250,000 has been estimated for contingencies, financing and legal expenses);

(d) **Provide on-call, or distance-learning, 'coaching'** as action proposals and project ideas evolve. This coaching and assistance should be user-driven one-on-one to avoid the formalities of 'Here are my comments on your draft document.'

128. Figure 6 summarizes the above recommendations for revised guidance for accelerated technology implementation.

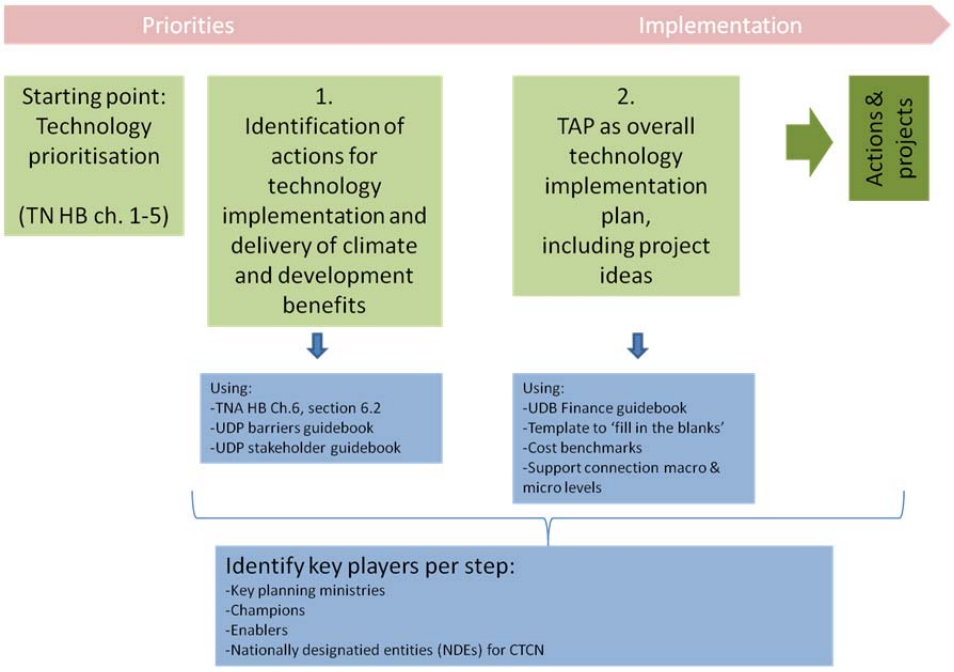

Figure 6. Overview of steps in revised guidance

C. Tracking lessons from TNA result implementation

129. In earlier reports, the secretariat reported on the outcomes of surveys that were conducted among TNA national coordinators about the implementation of the TNA results. In chapter II above, a short overview of these surveys has been provided.

130. In order to enhance the learning potential from experience with implementing TNA prioritized technologies, it is recommended that the secretariat's Technology Portal[45] or UDP's TNA Project portal[46] is extended with information on:

(a) The status of implementation of actions in a TAP and project ideas;

(b) Progress with implementation of actions and projects, including the time frame and criteria for checking progress with implementation of actions;

(c) How funding for implementation has become available (and by whom);

(d) How enabling support (e.g. training, capacity building) has been made available (and by whom);

(e) What have been decisive incentives or factors for success.

131. Such information, which TNA countries are requested to make available, possibly through NDEs allows for generation of success stories and factors for implementation success. More importantly, sharing information about implementation practice can help TNA countries and practitioners to improve their action and project proposals.

132. Moreover, TNA implementation practices mixed pictures may be emerging, in terms of implementation aspects which have been, and have not been, successful. Such mixed pictures could emerge as countries differ in terms of, e.g., context, institutions, available capacity to prepare TAPs and project ideas, and capacity to attract funding, With respect to the latter aspects, through the Technology Portal, TNA practitioners can learn from experiences of their colleagues so that they can enhance their success rate, and report on that. For example, this could contribute to identification of minimum requirements for implementing a new priority technology.

133. Growing experience with implementation of TNA priority technologies may lead to 'larger pictures' with, for instance, region-specific implementation bottlenecks (e.g. funding limitations or lack of institutional capacity). This type of information can be instructive for international or multilateral organisations to organize their potential support according to these region-specific needs.

134. It is acknowledged that the above suggestions for tracking lessons from TAP and project idea implementation will require additional actions, which may put pressure on available resources for TNAs.

D. Role of CTCN in catalyzing TAP implementation

135. At the time the TNA Handbook was developed and introduced, the UNFCCC Technology Mechanism did not yet exist. Nowadays, implementation of TNA results may benefit from the existence of the CTCN, as the operational arm of the Technology Mechanism, providing technical assistance to countries towards implementation of their nationally endorsed actions.

136. An important task of the CTCN, as indicated in the note 'TNA/TAP Implementation Support Programme (TIP)',[47] is "to provide support to developing countries in conducting TNAs and enhancing implementation of TNA outputs in the form of technology projects, programmes or strategies." Possible areas indicated by the CTCN where it could help countries to move from TAPs to implementation of technologies are: making a stronger business case of technology implementation, strengthening information on benefit-to-cost ratios, and making available to TNA countries required expertise upon their request.

137. The link between CTCN and TNA, with a view to technology implementation, will be organized through the TNA/TAP Implementation Support Programme (TIP), which is coordinated by UNEP's Technology Unit. With a view to TIP, two important considerations are highlighted here:

(a) Recommended updates of TNA guidance for enhanced implementation of priority technologies through improved formulation and implementation of TAPs and project ideas should be aligned with the key activities foreseen in TIP, so that TNA guidance and TIP activities remain complementary and harmonized for TNA countries and their stakeholders;

[45] <http://unfccc.int/ttclear/pages/tech_portal.html>.
[46] See footnote 43.
[47] AB/2015/5/17, Advisory Board to the CTCN, 14-16 April 2015.

(b) As TIP envisages key activities for implementation of TAPs and project ideas from TNA Phase I, II and III, this creates an opportunity to use the recommended revision on the TAP guidance also for implementation of TNA results in all three TNA phases. Specific activities foreseen in TIP and which align with the recommended guidance revision are to: provide coaching services to countries, 'selling' of prioritized technologies to decision makers, private sector, donors and financiers, adding multi-country or regional capacity building and training support, provide regular updates on TNA progress and findings, networking of TNA practitioners/experts, technology compendiums for common technologies and a database of funding opportunities.

138. The above elaboration on links between CTCN-TIP and TNAs has not considered financial aspects. As explained elsewhere in this paper (and in the TNA Good Practice paper), resources for TNAs are generally limited, which implies that after prioritisation of technologies for mitigation and adaptation, relatively few resources remain for formulation of TAPs and project ideas (including assessment of barriers and enabling actions). A link with CTCN-TIP could relieve the TNA process as it supports availability of external resources for TAP and project idea formulation. At the same, however, this implies that additional resources may be required for the CTCN for effectively responding to TNA country request for additional support.

139. The active participation of Nationally Designated Entities (NDEs) as key player in the implementation of nationally prioritized technologies can facilitate CTCN support for implementation of TNA results. However, being able to perform a function of tracking implementation actions endorsed by TNA countries and submit them to the CTCN, may require a capacity building support to NDEs (to be able to inventory a country's endorsed actions, technologies, capacity, knowledge, training and finance needs, and fulfill the requirements of the CTCN).

140. The above considerations show that while improvements can be made in terms of streamlining TNA guidance, additional financial and human resources are likely to be needed for availability of support, e.g., through CTCN-TIP, for enhanced implementation of TNA results.

VII. Key findings

141. From a **review of existing, non-TNA project/programme experience and related guidance**, for action plans and project ideas to become better 'action-able', it is concluded that:

(a) **Guidance needs to be streamlined** to a minimum level of "Here is what you, the *user*, need to know in order for this guidance to be meaningful";

(b) **It should not be tried to put** all the (easily out-of-date) **information** on sources of funding and support **under one roof**;

(c) **The focus should be on basic requirements** of multi-purpose 'good quality' action proposals and project ideas, instead of on proposals to targeted financing sources;

(d) In the absence of detailed cost and performance data consideration should be given **to providing TNA practitioners with ranges of "benchmark data"** to allow preliminary estimating and, more important, to describe the next steps envisioned to develop these preliminary estimates further;

(e) **Terminology used in guidance should be neutral**, easy to understand, with limited use of jargon and acronyms;

(f) **The distinction between public sector and private sector ideas should be downplayed**;

(g) **Complete and balanced mitigation and adaptation proposals share certain qualities**, which need to be explained.

142. Based on a review of TAPs and project ideas (chapter III B1 and III B2 of this report), prepared during the global TNA project of 2009-2013, it is concluded **that most TAPs and project ideas are incomplete with respect to information about timelines of actions, costs, identified funding options**. This lack of information makes implementation of priority technologies for mitigation and

adaptation difficult as potential funders have difficulties with, for instance, assessments of costs against benefits and type of costs for which funding is needed.

143. From the **review of existing TNA guidance for TAPs and project ideas**[48] for implementation of prioritised technologies for mitigation and adaptation it is concluded that **available TNA guidance documents:**

(a) **Provide substantial instruction and are better than other available guidance documents reviewed**;

(b) **Do not lend themselves to the ready conversion of technology priorities into project ideas and action-oriented implementations of technology strategies** (policies, programmes, projects and supporting activities);

(c) **Need to reflect the engagement of finance and project professionals earlier and more deeply**; and,

(d) **Should be streamlined**, made more user-friendly and supplemented with clearly introduced "fill-in-the-blank" templates for project idea formulation and presentation.

144. Based on the conducted review of non-TNA guidance documents, existing TNA guidance and TAPs and project ideas from the global TNA project, the **following recommendations** for improved guidance are made:

(a) **Specify the role of key stakeholders**, which includes identification of actors and specification of their roles (stakeholder mapping), as 'champions' or 'enablers', in implementing enabling actions for mitigation and adaptation and examining what can be funded by whom;

(b) **Develop a slim guidance document** to identify actions for implementation of priority technologies at a scale for delivering desired social, environmental and economic benefits and formulate a TAP to manage these actions;

(c) **Enhance guidance on minimum requirements for determining costs** of actions in a TAP, so that potential funding providers can assess what are the cost items related to TAP actions, when are costs estimated to be made, and what are the estimated amounts;

(d) **Elaborate on the potential role of and capacity needs for NDEs**, as a contact or focal point in a country, and of the CTCN for supporting implementation of priority technologies in the countries concerned.

145. In order to **enhance the learning potential from experience with implementing TNA prioritised technologies**, it is recommended that the secretariat's Technology Portal[49] or UDP's TNA Project portal[50] is extended with information on:

(a) **The status of implementation of actions** in a TAP and project ideas;

(b) **Progress with implementation** of actions and projects, including the time frame and criteria for checking progress with implementation of actions;

(c) **How funding for implementation has become available** (and by whom);

(d) **How enabling support** (e.g. training, capacity building) **has been made available** (and by whom);

(e) **What have been decisive incentives or factors for success**.

[48] TNA Handbook, especially Chapter 6; Financing Handbooks on Financing Mitigation and Adaptation Projects UNEP; Guidebook on Preparing and Presenting Proposals for Financing (UNFCCC), and Reporting templates for TNA, TAPs and Project ideas.
[49] <http://unfccc.int/ttclear/pages/tech_portal.html>.
[50] See footnote 43.

Annex I

Review of performance of climate technology transfer programmes focussing on developing countries

146. This annex examines three examples of transfer of low emission and climate resilient technologies to developing countries, with the objective to distil lessons for supporting implementation of prioritised technologies in a TNA.

147. Before selecting the examples, a distinction has been made between supply-driven and demand-driven transactions. Supply-driven transactions usually result from contractors responding to a supply of resources (for instance, a request for proposal by a public body) or a (market) opportunity.

148. Demand-driven transactions, instead, are often the result of entrepreneurial initiatives of individuals and organizations that identify problems and opportunities and only then bring together the resources and commitments to respond.

149. In essence, a TNA process could be considered demand-driven as it prioritises technologies on the basis of a country's development needs. However, most TNAs have not necessarily been driven by a bottom-up demand by country stakeholders to utilise the opportunities of a low emission and climate resilient development for their country. Therefore, TNAs have thus far also relied on a supply-push provided by the international TNA project.

150. For TNAs and TAPs to become demand-driven, it is important that the underlying conditions for success in meeting this high-level demand are met, i.e. robust enabling environment (policy, regulatory, "doing business" conditions and targeted incentives), supply chains for finance, services and products, product and service "last mile" enterprises and end-user demand, knowledge and affordability.

151. The three examples in this section help to illustrate what demand driven processes for climate and development may look like and how these have built on stakeholders' awareness of and familiarity with corresponding opportunities. The examples are all public purpose in nature and originate primarily in the public and civil society (NGO) sectors. They illustrate some of the wide possibilities country planners and sustainable development professionals should consider when prioritising technologies:

(a) The first example (BSP Nepal) illustrates a tightly organized, long-term 'fit-for-purpose' example to reach substantial scale in a particular technology;

(b) The second example (AREED) is a more collaborative and cooperative ('loose') approach to deploy multiple technologies via a single (energy through enterprise) philosophy;

(c) The third example (IDCOL) shows a tightly focused renewable energy diffusion project within a larger institution.

152. Although the range of examples is small, they have been chosen from multiple continents and with a focus on different (though energy-related) technologies and instruments for public-private collaboration. As a result, the examples enable identifying a set of common factors for success for transactions of prioritised technologies in different implementation contexts.

153. The examples all involve low-emission technologies. The paths from origin to implementation of each were quite different, but it is noteworthy that the determination of specific individuals and organizations (*champions*) to develop and follow through on implementation of the project, programme or activity was clear (demand-driven). It is such champions who bring together the resource providers essential to success (*enablers*) as well as the many *stakeholders* with myriad interests in the transaction. This differs noticeably from the process as in supply-driven transactions which is often based on impersonal priority setting, resource allocation and call for proposals.

154. It is acknowledged that each example is more focussed than a TNA (with a minimum of four sectors and at least two technologies per sector). In fact, the examples are not meant to be compared with an entire TNA process, but with the stage of TAP and Project idea formulation for individual priority technologies in a TNA at a desired scale.

155. Finally, specific costs for preparing for implementation are often not straightforward to distil from reported budget information, as the reported figures could cover more aspects than 'just' preparing

for implementation of a technology. However, based on personal communication with a practitioner involved in the AREED programme (see below), as an indication, costs for preparing for implementation of the selected technology options at the desired scale have been estimated at approximately USD 30,000 for five countries. These costs correspond with around 480 hours of work by programme practitioners (20 days or 160 hours for basic programme organisation with UN organisations and consultants and 40 days or 320 hours for actual implementation planning with NGOs involved).

1. Biomass Support Programme (BSP) - Nepal[51]

156. BSP Nepal, a programme to transform the rural cooking and household lighting sub-sector through the substitution of biogas for wood, represents a specific technology deployment and market transformation programme that originated via the cooperation of an international NGO, numerous in-country actors and international funders.

157. The programme is large-scale and long-term, deploying a low emission technology directed at improved cooking, fuel wood reduction and natural resource protection. This is done through the installation of hundreds of thousands of household bio-digesters across rural Nepal. The approach appears readily adaptable to many different national priorities.

158. BSP is highly structured and in some ways organizationally complex but it offers clearly defined and differentiated roles among participating actors in the public and private sectors. It is value chain oriented, holistic and *focused* to an extraordinary degree. It uses the private sector as the implementing actor, i.e. the interface with the end-user customer, and is largely performance based.

159. With respect to funding, BSP has successfully generated long-term funding and co-funding, so that it can have a long term and sustainable impact in Nepal. It integrates third-party customer finance with calculated subsidies and incentives, so that it leverages private financing as well as uses subsidy funds.

160. The programme's contributions to development and environmental goals and objectives have been assessed using professional standards and independent assessments. These include economic and financial rates of return as well as indicators to value the programme's development and environmental contributions.

161. BSP Nepal could be criticized as overly regimented (command and control) but its long-term progress and adaptability (to, for example, the emergence of carbon monetization) shows that such regimentation is not just a feature of the model but an important and essential long-term characteristic for this type of mixed-market technology deployment initiative.

162. Within a narrow consensus regarding a particular technology, BSP created a transparent deployment structure:

(a) Subsidies focused on first cost and differences in distances (and remained simple);

(b) Clear "rules of engagement" and long-term commitments characterized participation;

(c) Market driven and private sector implemented at the last mile;

(d) Technical standards and training emphasized and revised;

(e) Slow, steady management evolution with "fit for purpose" procedures, standards and incentives;

(f) This fit for purpose approach suggests *not* trying to graft something so specific onto existing missions and organizations.

[51] Biomass Support Programme (and Partnership, an NGO established in 2003)-Nepal / Thanpathali, Kathmandu, Nepal, PO Box 9741 / +977.1.4240434 / 4224383 / bspnepal@wlink.com.np / www.bspnepal.org.np / See BSP Yearbook, 2012 /The Nepal Biogas Support Program, S. Bajgain, I. Shakta; M.Mendes, ed (2005) /Ashden Awards Case Study 2005 / YouTube video "Dungbusters".

163. From BSP Nepal the following lesson for implementation of TNA-identified priority technologies can be derived:

(a) BSP can inform how the process from technology prioritisation in a TNA towards transactions (with help of TAPs and project ideas) can be translated into a long-term programme of public-private implementation involving information dissemination, capacity building, and access to technology, products, services, customer finance (including subsidy and third-party capital), as well as enterprise building and job creation;

(b) BSP provides a good practice example of how a TAP can be formulated as numerous small scale projects to be implemented under the umbrella of a large scale programme. Although implementation of each biogas project can be done relatively quickly, the long-term scope of the programme allows for the larger scale diffusion of the technology;

(c) Had the transformation triggered by BSP in Nepal's rural cooking and household lighting sub-sector originated in a country TNA, it would have demonstrated the coming together of national priority setting and a demand-driven, champion-led transaction;

(d) Finally, BSP's successful attraction of long-term funding, co-funding and implementation has been impactful and sustainable in much the way the TNA-TAP-Project Ideas wish to be.

2. African Rural (Renewable) Energy Enterprise Development (AREED)[52]

164. The African Rural (Renewable) Energy Enterprise Development (AREED) programme creates energy enterprises providing clean energy goods and services in five sub-Saharan countries. As such it involves the deployment of multiple clean energy technologies, capacity building and an "energy through enterprise" implementation philosophy, which is relatively new to these markets. It has originated through the cooperation of an international NGO, a UN agency, a US charitable foundation and five local NGOs. The prime movers in this cooperation were the international NGO and the UN agency.

165. AREED provided early-stage funding and enterprise development services to entrepreneurs interested in building successful businesses to supply clean energy technologies and services to rural African customers. Services include training, hands-on business development as well as early-stage investment and assistance securing financing. Entrepreneurs were recruited through training workshops in-country.

166. In addition, AREED built the capacity of local NGOs to introduce and work with clean energy enterprises. The learning curve in this process revealed the difficulty of "grafting" a novel approach onto existing organizations. Phase 1 of AREED supported over 30 energy enterprises in 5 African countries (Senegal, Ghana, Mali, Zambia and Tanzania) between 2001-2006 (Phase II is on-going and provides business development services through local partner institutions and finance).

167. The first phase of AREED (which ended in 2005) has shown that an appropriate combination of enterprise development support (practical advisory services) and seed financing can be effective at expanding energy access. It also demonstrated that a service-oriented approach can be used to assist multiple technologies. Further, it has shown that it is impractical to supply business ideas and plans to entrepreneurs. They must "champion" their own ideas; otherwise commitment is fleeting.

168. In terms of lessons for accelerating implementation of TNA results through TAPs and project ideas, AREED has shown that within a consensus on an approach (energy through enterprise) it was possible to reach into a variety of technological niches *provided* the willing local entrepreneur-champion existed and some conditions were met:

(a) Capacity (skills and logistic resources) and focus of a local country organization;

[52] AREED Phase I Final Report, 2005 / AREED activities report, 2012 / <http://www.areed.org/index.php/en/About/lessons-learned.html> / African Rural (Renewable) Energy Enterprise Development Program, www.AREED.org. /Program Manager, + (33) 1 44 371450.

(b) High quality business development services and basic guidelines / toolkits before, during and after investment;

(c) Government intervention and support to improve the policy environment, disseminate information, promote technologies and open avenues for markets;

(d) Linkage, networking and donor coordination;

(e) Strong programme management and organization can improve results;

(f) Loose "coordination" is no substitute for strong management;

(g) Monitoring and evaluating enterprise performance;

(h) Dependency on grant funds is a given for both capacity building and initial start-up enterprise investments.

3. Infrastructure Development Company Limited (IDCOL) – Bangladesh[53]

169. The Infrastructure Development Company Limited (IDCOL) project (re)finances solar home systems in Bangladesh, thereby creating liquidity for sellers and re-sellers in a growing market for solar electricity devices. It represents a specific technology deployment technique and institutional arrangement to accelerate technology diffusion and market maturity built within a specific pre-existing institution.

170. The project, established in 1997, is a government-owned, privately managed, non-bank financial institution in Bangladesh typically engaged in developing and financing large scale infrastructure projects. As such it represents an institutional imperative of policy-makers that was transformed into an instrument to implement market transformation (as a counter-point to the lesson of "fit for purpose" presented earlier in the BSP Nepal example).

171. In 2002, working with small and medium enterprise partners, IDCOL began financing solar home systems (SHS) which those partners sold, installed and maintained. At the end of 2013, it had financed 2.7 million SHS. There are other small scale RE initiatives at IDCOL, like biogas, mini-grids, stoves and solar pumping, but none appear as successful as the solar energy program. In the solar energy program, IDCOL serves as a re-financier of SHS sold to households. This permits retailers to offer more generous credit terms to their customers. Risk is shared from the customer all the way up to the government and international finance institutions that capitalize IDCOL.

172. IDCOL plays other roles in the market, including quality control (for technology and lending practices), provision of technical assistance, marketing support, and ensuring transparent market pricing.

173. At the end of 2013, 38 partner organizations were participating in the IDCOL solar energy program along with nine qualified equipment suppliers. IDCOL selects each organization and supplier according to strict criteria and then follows up with periodic technical and financial audits. The partner organizations include such well-known players as Grameen Shakti and BRAC Foundation, but also a number of much smaller entities, all functioning in a market-based fashion regardless of their formal legal structure.

174. IDCOL has invested about half a billion USD, with another half billion USD projected by 2016. It offers low-cost (6-9%) financing to partner organizations, amounting to about 65-70% of the retail price, allowing them to sell products on credit. Progressive subsidies, averaging 12% of the system price, are also passed through to the customer via partner organizations. The construction with customers paying approximately 15% down and the partner organizations having to front another 15%, keeps everyone engaged and committed throughout the loan repayment period.

[53] www.idcol.org / Mohmood Malik, CEO ; Nazmul Haque Faisal (faisal@idcol.org) / + 880-2-9102171 / Haque, Nazmul. "*IDCOL Renewable Energy Initiatives.*" Presentation from Meeting of SREP Pilot Countries, Nairobi Kenya, March 5th, 2012.

175. From the practices of IDCOL the following specific values and practices can be derived for formulation and implementation of TAPs and project ideas resulting from a TNA:

(a) *Efficient intermediation* – This program has reached milestones well ahead of schedule and significantly under budget, a fact that was critical for attracting future support;

(b) *Public-private partnership* – It provides an example of the way that public finance can be deployed to unleash market activity in a way that involves private sector actors, donors, the government, and local SMEs;

(c) *Provide more than just loans* – IDCOL's success is partly due to intervening in numerous, important ways to improve market conditions beyond simply offering loans to solar retailers. They were involved in selecting partner organization and suppliers, building those players' capacity to deliver high quality products, encouraging competition to drive down prices, and stimulating consumer demand;

(d) *Use smart subsidies* – Buy-down grants were small, progressive, and decreased over time as the market matured. Their effect was thus not market distorting. The buy-down grants were also combined with what in effect was an interest rate subsidy that separately addressed another barrier to adoption. Both subsidies were passed indirectly to the customer via the retailer, making them easier to implement and monitor. However, this indirect pass-through succeeded in part because the high level of competition and uniform pricing discouraged companies from retaining much of the subsidy for themselves;

(e) *Demand-driven* – IDCOL's solar energy program was a response to a documented need among the country's population and responded with an appropriate, proven technology solution. Households, once aware of solar technology, desired it and could afford it, if allowed to spread payments out over time. The program responded to customers' needs first and its other agendas (e.g. environmental sustainability, job creation, rural development) second;

(f) *Enterprise-based delivery* – The solar program was built around the idea of using small and medium-sized, local companies to sell a popular product. The enterprises were already close to the target communities and performed well given the right combination of market-based incentives and programmatic support;

(g) *Risk sharing* – The customer, the partner organization, IDCOL, and IDCOL's backers all shared substantially in the risk for each transaction. This kept everyone aligned and committed to a successful outcome, from the micro to the macro level;

(h) *Independent management* – Though a government institution, IDCOL is privately managed. Furthermore the operating and technical committees that played such a vital role in the solar program were almost entirely independent. This largely prevented vested interests from capturing pieces (and payouts) from the program;

(i) *Level playing field* – Once meeting the minimum threshold for eligibility, all partner organizations are treated the same. Though the benefits they enjoy vary depending on their size and experience in the sector, these gradations apply to everyone equally, with more favourable terms offered to the smaller and/or earlier stage organizations. This approach, what we might term "seeding the field," can be contrasted to "picking winners." In both cases, stronger market players emerge over time, but it can be argued IDCOL's approach created a vibrant, competitive marketplace faster, ultimately benefiting consumers;

(j) *Clear, predictable rules of engagement* – Partner organizations generally knew what was expected of them and what they could expect from the program. As the program entered new phases with different partners, slight modifications were made but always in gradual, incremental fashion. This permitted partner organizations to made sound business expansion decisions. They also knew the manner by which they would be held accountable and could prepare appropriately for technical and financial audits.

4. Lessons for enhanced implementation of TNA prioritised technologies

176. The three examples examined in this section illustrate that technology programmes or action plans that meet top-down priorities and for which committed public and private sector implementing entities have been lined up will likely prove more effective, require less time and money, and entail lower risks than programmes for which these conditions do not exist. This places a premium on a thorough understanding of the specialized actors and activities in a particular setting (a country) and the motivation of these actors to act before selecting priority technologies.

177. While acknowledging that the set of examples discussed has been small, the detailed analysis of enables distilling some common factors that have contributed to the success of the programmes in terms of progressing prioritised actions into transactions and which can be useful for consideration when formulating TAPs and project ideas in a TNA:

(a) **Demand-driven:** the technologies that form the core of the programmes are chosen on the basis of priorities of domestic public and private stakeholders, which has the benefit that technology acceptance by stakeholders may be stronger. It is acknowledged though that it is important that technology choices are not determined by business-as-usual consideration, but clearly go beyond that;

(b) **Value chain:** the programmes have examined the value chain for technology implementation, including: barriers to be overcome, market enablers, enabling environment, technology suppliers, finance providers, supporting services and technology users;

(c) **Scale:** the programmes aim at deployment (in a market) and diffusion (to commercial application) of prioritised technologies and actions at a larger scale (e.g. hundreds of thousands of biogas units or wide-spread distribution of SHS in a country);

(d) **Costs:** in their cost estimates, programmes have specified whether costs relate to upfront investments and to exploitation of the programme, thereby applying net present value and/or internal rate of return techniques;

(e) **Funding:** the programmes examined have specified what type of funding is suitable for financing deployment and diffusion of the priority technologies, as well as in what form this funding should be made available in order to make it affordable for the country stakeholders: *e.g.* subsidies, co-funding, long-term finance schemes, etc.;

(f) **Capacity building:** within each programme, capacity building requirements have been identified and addressed, such as knowledge sharing, awareness raising, training, etc.;

(g) **Clear view on role of people, institutions and different types of funding in different programme stages,** such as public-private collaboration, role of technology champions, rules of engagement, sharing of risks, and use of grants, subsidies, loans at different times;

(h) **Clear view on foreseen results of programmes or projects:** the programmes examined contain steps for achieving programme results and contingency plans in case deviations occur between plan and realisation.

Annex II

Representative sample of non-TNA documents focussing on processes from priority setting towards implementation

Six non-TNA guidance documents were examined for this paper. Below follows a review of each document with notes and comments.

Example 1 - GCF: "Initial Proposal Approval Process, Including the Criteria for Programme and Project Funding (Progress Report), February 2014" of the *Green Climate Fund*"

The broad purpose of this guidance is to provide resources to fund programmes and projects for climate mitigation and adaptation in developing countries. It differentiates projects (time-bound and specific) from programmes (portfolio of projects). This guidance divides the **project cycle** into four blocks: 1/ Concept Development / Preparation and Appraisal; 2/ Decision to Proceed / Implementation; 3/ Commissioning & Launch / Impact Period; and, 4/ Closing. This four-part cycle is then elaborated into 23 steps in Annex I of the sample document.

The major frame of reference is the GCF's six "activity-specific decision criteria": 1/Impact Potential; 2/ Transformational Potential; 3/ Country and Region Needs; 4/ Institutional Capacity of Beneficiary (to implement); 5/ Economic Efficiency; and, 6/ Financial Viability (if revenue generating). NOTE - Item 3/ Country and Region Needs could be interpreted as "priorities". These criteria are spelled out (generally) in Table 1 (page 6), of this sample guidance document.

Economic efficiency and financial viability are very broad and vague: economic efficiency relates to the benefit-cost per implementation unit (e.g., hectares of forest) and financial viability equals "covers its costs net of grants over its lifetime". NOTE - In a related document – "initial results framework of the fund"[54] – project proposal and due diligence categories can be inferred: at the highest level *mitigation* is to be measured in cost per tonne of avoided CO2e and financial leverage. At this high level, *adaptation* is to be measured by actions taken and convergence between vulnerabilities and actions.[55]

NOTES AND COMMENTS:

Does the guidance directly attempt the make the connection between priorities and specific actions? *It shows numerous examples of projects, programmes and activities, and sets as a criteria "country and region needs", but cannot be said to explicitly focus on a set of priorities as implied by the TNA-TAP-Project Idea process.*

How well or detailed is the guidance with respect to the preparation of transactions, whether these are programmes, projects or activities? *The guidance is broad from a narrative perspective. It is possible to "reverse engineer" and infer from a related "results framework" document more detailed expectations and from that, proposal and due diligence criteria.*

How does this non-TNA guidance compare with a set of UNFCCC and UNEP "benchmark" guidance documents? *This non-TNA guidance reads more like the "underwriting criteria" of a fund trying to keep its mandate (appropriately) broad rather than offering instructions on how to examine competing ideas and priorities.*

[54] GCF "Initial Results Framework of the Fund (Progress Report), B06/04 February 2014"

[55] Annex I shows a mitigation logic model that highlights the linkage between policy, regulatory environment and doing business conditions with ministry capacity and civil society demands. This is presented in parallel with transactional requirements such as private sector risk assessments (see page 9, two right hand columns and rows)…the result is rather opaque but can be inferred with a careful reading. In contrast, Annex II, Mitigation, does *not* make the link between policy and transactions. Annex III presents multiple types of results – something of a "catch-all" menu – by which to measure performance in mitigation and adaptation projects … as noted these could be reverse engineered into transaction criteria.

Example 2 - ADB: "Sustainable Energy Access Planning: A Framework", January 2015 of the *Asian Development Bank*

This document divides the issues needing attention into seven areas that, taken together, represent an *almost* complete roster of the issues needing attention to bridge from priority setting to transaction formulation. These areas: 1/ Energy poverty (i.e., scale of problem and opportunity if generalized); 2/ Demand; 3/ Resources; 4/ Cost; 5/ Benefit; 6/ Sustainability; and, 7/ Affordability These seven areas, built out, would constitute much of the requirements for defining transactions in much the way the TNA process would. Missing, however, is the detail on the commercial, near-commercial and civil society infrastructure (hard and soft) that are keys to building a sustainable, value chain driven set of initiatives (rather than a one-off project). This lack of focus on commercial, near-commercial and civil society infrastructure appears to originate in the central station utility point of view that permeates the report; as such, pipes and wires equal infrastructure rather than distributors, last mile enterprises and multiple transactions with a heterogeneous mix of customers.

The document is service rather than technology focused, which is useful and instructive to areas beyond energy poverty and energy access: the measures should be the different levels (tiers) of service delivered to end-users and beneficiaries, not just the projects or hardware put in place. The methodology within this guidance is heavily utility oriented: least cost and levelized costs, which fails to take into account the time urgency of solutions (doing something now may be more expensive than doing something later but "now" matters in both mitigation and adaptation initiatives).

The document is excessively detailed and repetitive (it could have been condensed to one-third its size with careful editing), elaborating on formulae by which to measure activities and results rather than the variables needed to effect transactions once the seven basic conditions (above) are evaluated.

NOTES AND COMMENTS:

Does the guidance directly attempt the make the connection between priorities and specific actions? *This guidance is heavily weighted to "how to" implement, primarily at the project level, and how to sort through competing proposals by applying the seven described criteria and the formulae described in the guidance. It is unclear as to the source of priorities.*

How well or detailed is the guidance with respect to the preparation of transactions, whether these are programmes, projects or activities? *With adjustment for the missing "market mapping" exercise to identify hard and soft infrastructure, the seven offered criteria provide guidance on what to present and highlight in a transaction.*

How does this non-TNA guidance compare with a set of UNFCCC and UNEP "benchmark" guidance documents? *This non-TNA guidance document's emphasis on seven criteria compares favorably with the UNEP separate guidance documents on mitigation and adaptation, which each reflect comparable sets of criteria. This guidance does not provide the more detailed guidance within both the UNFCCC's guidebook and UNEP TNA guidance on mitigation, both of which employ the more "Question" approach (What?, Who? To Whom?) to introduce the information requirements expected in a project, programme or activity proposal.*

Example 3 - DFID / SDC: "An Operational Guide for the Making Markets Work for the Poor Approach", 2008 (?) of the UK Department for International Development (DFID) and the Swiss Agency for Development and Cooperation (SDC)

This lengthy (122 page) and detailed document focuses on creating systemic change, through a five part process of: 1/ Setting the strategic framework; 2/ Understanding the appropriate market system; 3/ Defining sustainable outcomes; 4/ Facilitating systemic change; and, 5/ Assessing change. As such it is very comprehensive from the perspective of a "change cycle". Separately it provides eighteen "good practice" sections, which serve as a menu of different guidance. Concentrating on its Chapter 3 – Components of … Intervention Process[56]—as well as its eighteen good practice notes – reveals a great deal of useful material.

This guidance's presentation of "intervention components" sets the strategic framework well, with good emphasis on the regulatory conditions and the overall ecosystem. It could stress more that it is not simply

[56] Chapter 4, Managing… Programmes, provides some useful insight on "Do's and Don'ts" especially in partner selection and engagement; quite practical though likely not relevant to TNA guidance improvement. Also includes a useful distinction between projects and programmes.

"supply and demand" at the core of change but the quality of the human infrastructure (enterprise-based, regardless of institutional form) that dictates "supply" and consumer readiness that dictates "demand".

One of the strongest (and informative to the TNA process) parts of this Chapter 3 is its guidance on understanding market systems. This is as well-rounded a discussion of "market mapping" as is generally available. NOTE- It references the good practices note on logical framework, which is also focused on as one of four customizations in the previously mentioned UNFCCC guidebook. This appears to be good input for the TNA process to consider as it incorporates "market drivers" into its own processes. This guidance also provides a welcomed discussion of the need for flexibility despite the desire to set rigid priorities, echoing the UNFCCC guidebook's guidance that "nothing goes as planned".

As strong as the preceding section on understanding market systems, the section that follows it is disappointing. It concentrates on "defining sustainable outcomes" but gives short attention to the actual transactions essential to realize such outcomes (going so far as to state in a footnote that its emphasis is on the supply – actors – side of the equation rather than the consumer or "action" side of the formula). This section is too high level and misses the opportunity to be more detailed on the nature of transactions. Editorially, it appears that there should have been a "shaping transactions" section between the market mapping and defining sustainable outcomes, a section akin to what is being considered as a bridge between a revised Chapter 6 and a new Chapter 7 in the TNA guidance.

The next section, "facilitating systemic change" is more transaction focused than the one that precedes it, which suggests an editorial and narrative flow issue. Unfortunately, it is also quite densely written and jargon-filled ("crowding in" is one of the terms it uses). NOTE-If subjected to a rigorous editing, however, this could serve as a useful "500 meter" introduction to a more "on the ground" description of transactions. Very useful (if opaque) diagrams appear in this section.

The section on "assessing change" is informative, reflecting principles generally shared within the public sector on monitoring and evaluation. It could be improved by emphasizing that a feedback loop to interventions is an important step: that is, consider increasing the resource allocation to increase the impact of transactions (projects, programmes and activities) that already provide success *and* offer promise of "scale" increases.

The "Good Practices" section contains some useful content: Its "Mission Building" note is more informative than its title might suggest, placing an emphasis on getting the right parties around the table and making the connection between the general and more public sector and the specific and more transaction-oriented. The "Demand Side Surveys" note is too light on the importance of connecting the dots between end-user / customers and the "last mile" supplier of goods and services. This could easily be improved (see *AREED Toolkit* for sample demand side survey relevant to energy access but easily modified to mitigation or adaptation transactions). Its "Access Frontier" note has excellent "market mapping" concepts but is too jargon filled and brief to do this topic justice. Much more is needed here and better editing would have paid excellent dividends in bridging the gap between priorities and transactions.

The good practices note titled "Logical Framework" section is clear and consistent with the literature. NOTE: as "Log Frames" are known to the public sector perhaps an expansion of this particular type of guidance to embrace various transaction requirements would be an "easy" transition for connecting the priority setting (public sector) with the transactional (private and civil society sector)?

The "Developing the Offer" good practice note could be very useful, because in essence it is here that a multi-dimensional transaction or transactions are formulated. This section gives some guidance but veers too far from what it characterizes (in quotes) as a "simple commercial" transaction. This section represents another place, if expanded, which would have been very useful in bridging the gap between priorities and transactions.

"Developing Business Membership Organizations (BMO)" is a note title that might (unfortunately) be glossed over as something "useful" but not necessarily important or essential to success. Experience suggests otherwise, with the following caveat: you need trail-blazing transactions (see next item) before you build a business constituency. The transaction becomes the introduction to the BMO and the floor on which a mission can be built; without a transaction the BMO is just a club of vaguely connected interests. Strengthened (and following rather than preceding the next item) this BMO description could be very useful within a menu of guidance.

The "Making a Deal with Lead Firms" section is useful at 500 (or even 1000) meters but is an opportunity lost, as the importance of this or that "deal" or transaction as *the* lever that the public sector puts under "business as usual" to change the market doesn't come across to the reader. Devoting two pages of 122 to this topic is a huge missed opportunity. Even the references (to a maize market case study) are unclear. The subsequent note on

"Value Chain Development" is a good overview section (that should *also* have preceded the lead transaction section) with useful illustrations to convey the concept of bringing goods and services to end-users through a series of steps.

The two notes on "Understanding Incentives" and "Giving Grants to Business" represent an excellent orientation on these related and essential topics to transforming markets via transactions in order to meet public sector priorities. **These materials could and should be used (in either TNA guidance or training materials)** and improved if possible by adding more emphasis on what *not* to do, for example, in designing subsidies (general, badly targeted subsidies that create free riders) as well as offering case studies of what works (for example, Thailand's SPPA policy). These two sections (probably for reasons of giving editorial balance to all eighteen good practices notes) needed to be fuller and richer.

The "Guiding Participation" section reflects generally used insights on a multi-step process for engagement. As is fairly common in these descriptions, there is excellent emphasis on end-users and too little emphasis on the interaction between end-user and goods / services providers. "Livelihood Analysis" is useful as a broad introduction to the subject (and its reference documents) but would be better served if combined as part of "demand analysis" so that demands are comprised of not just incremental "needs" (clean water, improved toilets) but also "wants" and "income enhancement".

The good practice note on "Knowledge Management" is long on the underlying systems approach to capturing and recording what is learned but short on the practical requirements of dissemination, adaptation and use of what is learned in one setting to other settings. In particular areas (e.g., energy efficiency) knowledge transfer is an enormous, short-term and easily levered resource. More emphasis is needed on what to do with what is learned rather than capturing the knowledge in a system.

"Intervention Impacts Logic" is a badly named topic, because it contains a very useful introduction of a topic that should be incorporated into both M&E good practices and into numerous parts of Chapter 3. Whether dealing with logical frameworks or "lead" transactions or increasing impact, the content of this section should *not* stand alone but be repeated a number of times throughout Chapters 3 and 5.

The "Interconnected Markets" note section is relevant to the TNA-TAP discussion of deployment followed by diffusion. This section could be improved by editing and by illustrating that markets can be "deepened" as well as "widened" through expansion of product and service offerings.

Sadly we are at good practice #16 before the essential topic of "Stimulating Demand" gets its own space (the authors would argue appropriately that this is a reference guide not a building block text). This section represents an excellent introduction to a topic that needs to be more prominent and focused. Increased demand is *the* driver to increased transactions. End-user / customer needs and wants, knowledge, support and incentives, and affordability combine to create this market pull. While a well done introduction, this section needed to also be a separate part of Chapter 3, given a more prominent place and cross referenced throughout the good practice discussions.

The "Anatomy of a Transaction" note is too narrowly focused on specific types of SME transactions and improving these. What about large utility or finance institution transactions (see IDCOL)? What about multi-market product or service suppliers such as d-Light or Toyola (West Africa improved cook stoves). What about business-like NGOs? While this section has some useful content, its entire focus is a distraction from its title and too narrow to be useful.

While the "Rapid Market Assessment" treatment is well documented and presented, it belongs under the broader umbrella of market assessment and market mapping, and should be considered under that topic within improved TNA guidance.

NOTES AND COMMENTS:

Does the guidance directly attempt the make the connection between priorities and specific actions? *Yes.*

How well or detailed is the guidance with respect to the preparation of transactions, whether these are programmes, projects or activities? "Yes, but…" *Had specific templates for each (programmes, projects or activities) been outlined more explicitly the myriad "guidance" and "good practices" notes would have combined with such an outline to provide a well-rounded, detailed though overly long guidance to users willing to navigate the length and complexity of the document.*

How does this non-TNA guidance compare with a set of UNFCCC and UNEP "benchmark" guidance documents? *Compares favourably and provides excellent ideas on editorial material. Its major strength vis-à-vis TNA guidance is that both aim to change business as usual.*

Example 4 - UNDP: "Inclusive Markets Development Handbook", 2010 of the United Nations Development Programme

This is one of a set four UNDP guidance documents. The others include markets, business models and partnerships. Taken together these are quite comprehensive but dense and at times opaque. A sixteen page "brochure" (or equivalent home page design) would have made these useful materials more accessible.

The Handbook (and related documents) is extremely "introverted": directed at instructing UNDP country staff. The guidance focuses on pro-poor value chain development and "brokering" (an ambiguous term at best) market changing transactions, even though these represent just two of their five "inclusive markets" objectives. The document is quite general on the link between "strategy and action", but includes useful side-bars (e.g., definition of a value chain) and mostly useful (though expectedly self-serving) UNDP case studies. There is excellent emphasis on both the roles of the private sector and the importance of a lead enterprise in changing markets (through pilots etc.), echoing good practice guidance from DFID / SDC.

Chapter 3, Section 1 has this elaborate chart showing the project cycle as perceived by UNDP (keeping in mind the audience is country staff) but this chart (unintentionally) serves to highlight the small role assigned to *actual transactions* and the importance of project champions. Chapter 4, Selecting Markets, is a good introduction that places disproportionate emphasis on stakeholders to the minimization of actual transaction participants. NOTE- as TNA guidance evolves it is essential to distinguish *Customers* from *Champions* (goods and service providers) from *Enabling Organizations* from the more general *Stakeholders*, who are neither Champions nor Enablers.

Chapter 5, Project Formulation, is strong on diagramming (mapping) the project formulation process and on defining "Who" engages in "What", reflecting the question approach more elaborately used in the UNFCCC and UNEP guidance document. As does Chapter 4, it places too much emphasis on stakeholder engagement and too little emphasis on market driven transactions. Chapters 5 and 6 are both too introverted (UNDP focused) to facilitate a broad range of interventions.

While Chapter 6 gives brief mention to "lead" firms this chapter is largely guidance on "how UNDP does projects" rather than "how to enable change" or "influence markets". For experience-based reference to this approach in action see the Multifunction Platform Programme in West Africa, which is still (after a decade plus) struggling for a market-driven solution rather than a donor and subsidy one. Chapter 7 provides a useful (though standard) discussion of indicators. Both it and Chapter 8 (Conclusion) exhibit a clear disconnection between the overarching goal of building markets and the document's orientation to creating projects. Though eclectic, the case studies offered appear to offer relevance to adaptation versus mitigation.

NOTES AND COMMENTS:

Does the guidance directly attempt the make the connection between priorities and specific actions? *The document appears to assume UNDP priorities as established by some other cycle or process; country priorities external to UNDP are not mentioned (or perhaps are assumed to be consistent through the consultation process).*

How well or detailed is the guidance with respect to the preparation of transactions, whether these are programmes, projects or activities? *The document, as noted, is oriented to creating UNDP projects; as such, it provides useful guidance to UNDP country officers.*

How does this non-TNA guidance compare with a set of UNFCCC and UNEP "benchmark" guidance documents? *Benchmark documents, taken together, set priorities and provide more detailed instructions on transaction formulation, but the instructions are dispersed. Given its clearly targeted audience (UNDP Country Officers), the UNDP guidance is likely quite useful within the UNDP cycle of project formulation.*

Example 5 - SE4ALL: "Africa Strategy for Decentralized Energy Services Delivery", August 2013 by *Sustainable Energy for All*

The document provides a useful overview of looking at an issue (energy access) across multiple countries and markets. As such it follows a diplomatic and respectful path of opening such an issue to a diverse audience, and may be instructional in positioning TNA-TAP-Project Idea guidance in this respect.

It defers heavily and appropriately in the energy access context to country level decision-making, and is thus akin to the TNA priority setting approach. However, the majority of this 35 page guidance document explores the

problem and the various *options and opportunities* to address this problem (energy poverty). It does not set priorities or describe a process to do so.

The document has been heavily weighted to a few specific issues (e.g., gender balance), which distracts in many places due to unneeded repetition of points already well made. The guidance sets the stage (much as the TNA guidance does) for creating Action Plans and (implicitly) transactions but comes to a halt when specifying the requirements of such actions, defaulting to a recommendation that action plans should be "framed within an investment prospectus", an excellent opportunity to specify the broad strokes of such an investment plan-proposal-prospectus.

While professing to be a strategy document, this guidance can be criticized as nothing more than a menu of issues for decision-makers to consider. A *strategy* for energy access (and other mitigation and adaptation priorities) needs to differentiate itself by focusing on key leverage points not reciting all the possibilities; for example, an energy enterprise strategy says "focus on last mile delivery and improve value chain to these enterprises… combine targeted capacity building, finance provision, market improvement and impact enhancement to achieve the following gains…" Even with the correct intention of not prescribing what countries should emphasize, the document should have offered examples of strategic and tactical choices. While informative (in a "do no harm" menu approach to readers) this document is more informative as guidance on what to include in an "Issues to Consider" appendix to an authentic "Strategy and Tactic Report".

NOTES AND COMMENTS:

Does the guidance directly attempt the make the connection between priorities and specific actions? *The document makes a narrative but not a substantive connection.*

How well or detailed is the guidance with respect to the preparation of transactions, whether these are programmes, projects or activities? *Choices and options are offered; no real instructions or examples are offered to inform decision-making.*

How does this non-TNA guidance compare with a set of UNFCCC and UNEP "benchmark" guidance documents? *Very different, one (non-TNA) is general, menu-oriented and problem descriptive, whereas benchmark documents build to a set of priorities, general assessment criteria and various levels of detailed transaction preparation.*

Example 6 GEF: "Rules, Procedures and Objective Criteria for Project Selection, Pipeline Management, Approval of Sub-Projects, and Cancellation Policy", November 2006, of the Global Environment Facility

This is process dominated guidance and redundant to the preceding GCF documents (even though much older and more "operationalized" than GCF) . It offers a five step project formulation process: 1/ Identification; 2/ Concept Review; 3/ Preliminary Approval; 4/ Proposal Review; and, 5/Final (Agency) Review. Proposals are differentiated by dollar amount of proposals: $500,000, $500k to $3 million and >$3 million.

Annex 1 provides some procedural differentiation on the requirements of each step vis-à-vis the size of the proposal. These procedures are built around five broad criteria *as long as* the proposal fits within GEF Strategic Objectives (pre-supposed from other processes): 1/ Country "ownership"; 2/ Program and policy conformity; 3/ Financing (including administrative costs); 4/ Institutional coordination and support; 5/ Monitoring and evaluation; and, 6/ Responsiveness to reviews.

There is little emphasis on market transformation or mapping (although experience shows that actual project documents to varying degrees emphasize these considerations). Guidance is very capital focused to the detriment of ongoing net revenue potential (although varying degrees of detailed "additonality" presentations have addressed this in actual practice). This guidance is very high level and flexible, in much the same way as the "broad mandate" criteria of investment funds (and the Green Climate Fund).

NOTES AND COMMENTS:

Does the guidance directly attempt the make the connection between priorities and specific actions? *This guidance assumes conformance with GEF strategic objectives, so the higher order question is: do these objectives conform to country priorities? Country sign-off and ownership as criteria for approval appear to* assume *a relationship between the transaction at hand and country priorities.*

How well or detailed is the guidance with respect to the preparation of transactions, whether these are programmes, projects or activities? Instructions are sufficiently broad to permit flexibility and sufficiently useful to provide high level guidance. In actual practice, GEF documents are very detailed.

How does this non-TNA guidance compare with a set of UNFCCC and UNEP "benchmark" guidance documents? *This non-TNA guidance reads more like the "underwriting criteria" of a fund trying to keep its mandate (appropriately) broad rather than offering instructions on how to examine competing ideas and priorities. At the same time, in practice, the GEF process has developed a lengthy set of instructions and templates, as well as many examples to emulate.*

Annex III

Checklist for an action proposal or project idea & items for macro-micro connections for accelerated transactions

Proposal Content Checklist

- Date
- Name of Project, Programme or Activity
- Location
- Champion's Contact Information (Champion to be defined as the entity responsible for implementing the project, programme or Activity, not simply the organization who thinks it is a good idea)
- Product or Service being Provided
- Technology to Deliver Product or Service
- Customers and Clients
- Current Status of Project, Programme or Activity
- Project Cost, separated between: Planning, Construction, Pre-operation or Pre-Implementation, Operation or Implementation;
- Expected Schedule
- Current Needs and Request for Resources: Funding, Technical Assistance, Planning, Other
- Market Conditions**
- Operating Conditions**
- Regulatory Conditions, including required approvals**
- Team
- Stakeholders**
- Decision-making Structure, Governance **
- Revenues from Customers, Pricing and Volumes **
- Implementation Steps
- Cash Flow and Schedule Projections **
- Impacts and Returns
- Sensitivity Analysis**
- Risks and Risk Management Measures
- Monitoring, reporting and verification actions.

See "Preparing and Presenting Proposals" guidebook
(** = optional initially… needed before serious progress is made)

Ten item roster to connect public policy side with the transaction side[57]

MACRO FACTORS

1 **Enabling Environment** – the underlying conditions that characterize a particular (country) market.
(i) Policy and Regulations
(ii) Doing Business Conditions
(iii) Incentives and Disincentives
(iv) Actors and Activities
(v) Dominant Issues

2 **Technology Priorities** – the technologies and techniques receiving or needing the broadest attention and support in a particular (country) market.
(i) Economic and Social
(ii) Environmental
(iii) Financial
(iv) Special (e.g., NAMA, TNA, GEF driven)

3 **Implementation Priorities –** the implementation approaches that characterize the way this market implements public purpose or related initiatives.
(i) Private Sector Only
(ii) Public Sector (e.g., IDCOL)
(iii) Mixed or PPP (e.g. BSP-Nepal)

MICRO FACTORS

4 **Enterprise Champion –** the individuals and organization that will actually implement a specific transaction (distinct from those promoting a particular approach or technology)
(i) Public Sector
(ii) Private Sector
(iii) Civil Society (NGO) Sector

5 **Enabling Resources** – the organizations providing resources needed for the Champion to succeed (distinct from Stakeholders)
(i) Return oriented capital
(ii) Grant based capital
(iii) Technical assistance
(iv) Support services

6 **Customer Demand** – the unmet need being met
(i) Customer (beneficiary) Preference for technology, product or service
(ii) Information and knowledge base
(iii) Support services
(iv) Financing

CONNECTING OR MESO FACTORS

7 **Enterprise Building** – activities aimed at improving the ability of delivery enterprise Champions to provide demand driven goods and services
(i) Market Information
(ii) Business Advisory
(iii) Technical Assistance

8 **Enabling Environment Building** – activities aimed at improving underlying market conditions
(i) Regulations and Policy reform
(ii) Improved Doing Business Conditions
(iii) Targeted and Smart Subsidies and Incentives

[57] This roster could be considered a checklist for activities which need to be undertaken in order to work in a TNA from prioritising technologies for higher-level development and climate purposes towards `on-the-ground` implementation of actions for accelerating technology development and transfer.

9	**Capacity Building** – activities aimed at improving the knowledge and skills of all the actors within an enabling environment
(i)	Financial Institutions
(ii)	Development Professionals
(iii)	Environmental and Civil Society Organizations
(iv)	Policy Makers
10	**Impact Building** – activities aimed at following up on initial deployment to enhance results
(i)	Monitoring, Evaluation and Reporting
(ii)	Lessons Learned and Course Corrections
(iii)	Follow-on Investment and Service