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Item 4 of the provisional agenda
Development and transfer of technologies

SUBSIDIARY BODY FOR IMPLEMENTATION
Thirty-first session
Copenhagen, 7–18 December 2009[*]

Item 7 of the provisional agenda
Development and transfer of technologies

Performance indicators to monitor and evaluate the effectiveness of the implementation of the technology transfer framework

Final report by the Chair of the Expert Group on Technology Transfer

Summary

This document contains the final report of the Expert Group on Technology Transfer (EGTT) on its work on performance indicators. By decision 3/CP.13, the EGTT was requested to develop a set of performance indicators that could be used by the Subsidiary Body for Implementation to regularly monitor and evaluate the effectiveness of the implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention (the technology transfer framework).

The report presents a set of 40 performance indicators, an overview of the selection and testing process, and an indication of the resources involved in gathering the data required for each indicator. It also contains recommendations for using the indicators and possible steps for obtaining the data. The indicators cover both the overall vision of the technology transfer framework, as synthesized into concrete objectives, and the financial flows provided for technology transfer.

The executive summary of this report is contained in document FCCC/SB/2009/4/Summary.

[*] Exact dates within the sessional period are subject to confirmation.

CONTENTS

Annexes

I. Introduction

A. Mandate

1. The Conference of the Parties (COP), by its decision 3/CP.13, annex II, requested the Expert Group on Technology Transfer (EGTT) to develop, as part of its future programme of work, a set of performance indicators that could be used by the Subsidiary Body for Implementation (SBI) to regularly monitor and evaluate the effectiveness of the implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention (the technology transfer framework[1]), taking into consideration related work under the Convention.

2. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its twenty-eighth session, endorsed the terms of reference for this work.[2,3] As specified by the terms of reference, a first interim report[4] with an initial selection of performance indicators was made available to the SBSTA and the SBI for consideration at their twenty-ninth sessions, followed by an advance report[5] to the fifth session of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), and a second interim report[6] with information on the testing phase for consideration by the SBSTA and the SBI at their thirtieth sessions. The terms of reference, as well as the rolling programme of work of the EGTT for 2008–2009, requested a final report containing recommendations for using the performance indicators to be made available to the COP at its fifteenth session.[7]

B. Scope of the note

3. This document contains the final report of the EGTT on its work on performance indicators. The report presents a set of 40 performance indicators, an overview of the selection and testing process, and an indication of the resources involved in gathering the data required for each indicator. It also contains recommendations for using the indicators and possible steps for obtaining the data. The indicators cover both the overall vision of the technology transfer framework, as synthesized into concrete objectives, and the financial flows provided for technology transfer.

C. Possible action by the subsidiary bodies

4. The SBSTA and the SBI may wish to consider the recommendations of the EGTT on a set of performance indicators, as contained in chapter III of this report, to be used by the SBI in accordance with the mandate referred to in paragraph 1 above. The SBSTA and the SBI may also wish to provide guidance to the EGTT on its possible future tasks arising from this report, as appropriate.

II. Objectives and scope of the work

5. The technology transfer framework was adopted by the COP in its decision 4/CP.7. The purpose of the framework is to develop meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention by increasing and improving the transfer of and access to environmentally sound technologies (ESTs) and know-how. This should involve cooperation among various stakeholders, including activities on technology needs assessments (TNAs), technology information, enabling environments, capacity-building and mechanisms for technology transfer.

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[1] Contained in decision 4/CP.7, annex, complemented with the set of actions set out in decision 3/CP.13, annex I.
[2] FCCC/SBSTA/2008/6, paragraph 82.
[3] FCCC/SBSTA/2008/INF.2, annex I.
[4] FCCC/SB/2008/INF.6.
[5] FCCC/SB/2009/INF.3.
[6] FCCC/SB/2009/1.
[7] FCCC/SBSTA/2008/INF.2, annex I, table 2, and FCCC/SB/2008/INF.1, annex I, activity 1.5.

6. The overall objective of the work summarized in this report was to develop and test a balanced and robust set of performance indicators that could be used by the SBI to monitor and evaluate the effectiveness of the implementation of the technology transfer framework.

7. As indicated in the terms of reference, the outcome of this work could provide inputs to:

(a) The work of the SBI on reviewing and assessing the effectiveness of the implementation of Article 4, paragraphs 1(c) and 5, of the Convention, in accordance with decision 13/CP.3;

(b) The work of the SBI on considering the role of new financing mechanisms and tools for scaling up development and transfer of technology;

(c) Negotiations under the AWG-LCA, particularly on the activities mentioned in paragraph 2 (c) of the terms of reference.

8. The work was divided into three tasks:

(a) Task I: develop a set of candidate performance indicators (June to October 2008);

(b) Task II: test the set of performance indicators (December 2008 to May 2009);

(c) Task III: prepare recommendations for using the indicators (June to December 2009).

9. Task I started with a concise background paper that set out the approach and focused on the issues and practicalities of identifying, developing and applying various indicators, and sharing the existing body of work in this field. The EGTT considered this background paper at its special meeting held in Accra, Ghana, on 28–29 August 2008.

10. An early exercise was to translate the broad vision of the technology transfer framework into less abstract objectives for each of the framework's five key themes: technology needs and needs assessments, technology information, enabling environments, capacity-building, and mechanisms for technology transfer. It was then possible to draw up a list of 161 candidate performance indicators that could be used to measure progress towards these objectives, and group them under the five key themes.

11. At its second regular meeting held in Dublin, Ireland, on 21–23 October 2008, the EGTT selected an initial set of 32 performance indicators from the 161 identified for the five key themes of the technology transfer framework. These were presented in the first interim report of the EGTT to the SBSTA and the SBI at their twenty-ninth sessions. The participative design process that was followed by the EGTT in its work of developing, selecting and later testing the performance indicators is explained in chapter IV below.

12. In accordance with the terms of reference, task I also involved the development of performance indicators that could be used to measure financial flows that support the development and transfer of technologies, and to analyse the factors that may influence these financial flows. The approach taken to undertake this task is elaborated in chapter VI.

13. Task II aimed to test the use of the proposed set of performance indicators developed during task I. In addition, eight financial flows indicators were tested. As part of the testing stage, a standard methodological sheet was used as a tool to address, inter alia, the extent to which the performance indicator is specific, measurable, achievable, relevant and time-bound (SMART). The testing process is described in chapter VII.

14. The EGTT considered the results of the testing stage at its special and third regular meetings held in Bonn, Germany, on 24–26 February and 13–14 May 2009, respectively. Individual indicators were

modified where necessary in the light of the tests. The EGTT made its second interim report available to the SBSTA and the SBI at their thirtieth sessions.

15. This final report presents a set of 40 performance indicators, the results of their testing and the results of task III, including:

(a) Recommendations based on the outcomes of tasks I and II and the consideration of the outcomes of other relevant activities (including a list of indicators, the methodology and data sheets used and examples of how the indicators are used);

(b) Analysis of possible linkages of this work with other relevant work under the SBSTA, the SBI and the AWG-LCA.

III. Major findings and recommendations

A. General observations

16. The participative design process that was used for developing and testing the performance indicators resulted in the following major findings, which confirm the findings of similar activities undertaken within and outside the Convention (see annex V):

(a) The process of developing and testing performance indicators is on a learning curve;

(b) It is important that any performance indicators used to monitor and evaluate the effectiveness of the implementation of the technology transfer framework are designed to analyse causal relationships – in other words, to what extent observed changes can be attributed to technology transfer policies or measures;

(c) The performance indicators need to be formulated in a SMART manner;

(d) The major constraint in using performance indicators is the availability of data;

(e) The involvement of stakeholders[8] in the process of developing and testing indicators is important for creating a sense of ownership in the final result among those who are involved in carrying out activities and actions under the technology transfer framework;

(f) Capacity-building is needed at both the national and the international level for operating a monitoring and evaluation system, including data systems and procedures for sharing and reporting information.

17. Although the formulation of the performance indicators was relatively easy for some key themes (technology needs, technology information and mechanisms) of the technology transfer framework, it could be observed that other key themes (enabling environments and capacity-building) are vast, essentially encompassing every other theme of the technology transfer framework and beyond, which resulted in the formulation of either a large number of indicators (in the case of enabling environments) or indicators that are highly aggregated (in the case of capacity-building).

18. During task I, a set of 161 possible performance indicators was identified. From this, 40 indicators were identified as a possible subset to measure the implementation of the technology transfer framework under the Convention (see box I). Within this group, indicators were assessed according to the feasibility of collecting the required data and to their relevance to the synthesized objectives of the technology transfer framework, as presented in table 2 in chapter VII below.

[8] Within the context of the Convention, this includes Parties and admitted organizations.

19. The integrity of the technology transfer framework, as reflected by the synthesized objectives, has been respected in identifying this limited set of performance indicators. It should be noted that the selection is indicative and does not prejudge any post-2012 arrangement.

B. Data availability

20. In order to set up a system for monitoring and evaluating the effectiveness of the implementation of the technology transfer framework, the data required for quantifying specific performance indicators will need to be obtained. Preparatory work undertaken during the testing period indicated that many of the data required for the initially selected indicators are currently not available, and that further work on data collection may be needed (the sources of data required for each indicator are given in table 3 within annex I). This may require coordination between the secretariat and relevant intergovernmental organizations (IGOs) and other international organizations to ensure that data are provided regularly to support the monitoring and evaluation.

21. Furthermore, lessons learned from the work of the EGTT suggest that a template may be needed to facilitate reporting in national communications so that the data required from Parties for specific performance indicators are received.

22. The timeline for obtaining data for the different performance indicators could range from one to three years or more (the provision of data by Parties not included in Annex I to the Convention (non-Annex I Parties) may depend on the timing of their national communications).

23. Considering that many of the data required are currently not available, that substantial effort and resources would probably be needed to obtain the data and that developing templates to facilitate reporting in national communications has proved challenging in the past, it might be an option to reduce the number of performance indicators to include only those that can be easily determined with the data available. This could be done through further testing of the indicators. It would mean, however, that only part of the technology transfer framework would be covered by performance indicators.

C. Financial flows

24. Country-level data are very useful for understanding the national distribution of financing for climate-friendly technologies. These data may indicate where the barriers to financing are most pronounced and may help focus capacity-building efforts and support for the creation of enabling environments. Such information is important for national policy planning (e.g. TNAs and national adaptation programmes of action (NAPAs)) and may assist countries in maximizing the potential for investment in climate-friendly technologies.

25. Each source of finance may be influenced by many different factors and if indicators are developed to monitor these influences, the number of performance indicators required may grow significantly. Some of the main influencing factors may be suited to the use of indicators, but there is a range of alternative evaluation techniques that may be better suited to this task. The evaluation methodologies used by the Global Environment Facility (GEF) and the World Bank may provide examples to draw upon.

26. The EGTT recommends that the SBSTA and the SBI draw upon the advice within this report and the lessons learned to inform future consideration on this matter at subsequent sessions.

Box 1. Set of performance indicators for the technology transfer framework

The Expert Group on Technology Transfer initially identified the following set of 40 indicators to measure the effectiveness of the implementation of the technology transfer framework. The indicators have been grouped under the five key themes of the framework; the sixth group would be used to assess trends in financial flows for technology transfer. The indicators are described in chapter V.

Technology needs and needs assessments

1. Amount of financial resources provided for the TNA process (PI-TNA-01)[a]
2. Number of programmes/projects for capacity-building on TNAs in non-Annex I Parties (including percentage of least developed countries) (PI-TNA-02)
3. Number of targeted non-Annex I Parties to build capacity on TNAs (including percentage of least developed countries) (PI-TNA-03)
4. Number of published TNAs completed or updated by non-Annex I Parties (PI-TNA-04)
5. Synthesis report on technology needs made available by the secretariat and considered by the subsidiary bodies (PI-TNA-05)
6. Number of technology programmes/projects from TNAs implemented by non-Annex I Parties (PI-TNA-06)

Technology information

1. Number of training programmes and workshops for building capacity in technology information (PI-TI-01)
2. Number of national communications with information on technology transfer activities (PI-TI-02)
3. Synthesis report with information on maintaining, updating and developing TT:CLEAR, addressing gaps and user needs made available by the secretariat and considered by the subsidiary bodies (PI-TI-03)
4. Number of technology information centres and networks connected to TT:CLEAR (PI-TI-04)
5. Number of users of TT:CLEAR from developing countries (PI-TI-05)

Enabling environments

1. Performance against each of the six World Bank governance indicators (PI-EE-01)
2. Total volume of joint R&D opportunities for ESTs provided by (primarily developed country) governments (PI-EE-02)
3. Presence of clear policy guidelines for the recipients of public funding on how to move from the research stage to the commercialization stage of the technology transfer process (PI-EE-03)
4. Number of bilateral and multilateral programmes that have helped developing countries in developing and implementing regulations that promote the use and transfer of and access to ESTs (PI-EE-04)
5. Presence of tax preferences and incentives for imports/exports of ESTs (PI-EE-05)
6. Volume of export credits to encourage the transfer of ESTs (PI-EE-06)
7. Whether mention of transfer of ESTs is made in national sustainable development strategies (PI-EE-07)
8. Rating of investment climate according to World Bank business indicators (PI-EE-08)
9. Proportion of budget for public procurement of ESTs (PI-EE-09)
10. Degree of disclosure and transparency regarding the approval processes of technology transfer projects (PI-EE-10)
11. Number of technical studies that explore barriers, good practices and recommendations for enhancing enabling environments (PI-EE-11)
12. Percentage of partnerships with thematic foci on climate change and sustainable development with meaningful participation by developing country Parties (PI-EE-12)

Capacity-building

1. Amount of financial resources provided for capacity-building in the development and transfer of technology (PI-CB-01)
2. Synthesis report on national capacity needs and priorities for capacity-building for development and transfer of technologies in line with the technology transfer framework (PI-CB-02)
3. Number of participants/experts in training programmes on the development and transfer of technologies, in particular on EST-related activities (PI-CB-03)
4. Number of new and existing national and regional institutions operating as centres of excellence in the development and transfer of technology (PI-CB-04)

Box 1 (continued)

Mechanisms for technology transfer

1. Number and volume of reported innovative public–private financing mechanisms and instruments (PI-MECH-01)
2. Report on possible ways to enhance cooperation between the Convention and other multilateral environmental agreements (PI-MECH-02)
3. Report on references made in national communications to objectives of other multilateral environmental agreements (PI-MECH-03)
4. Number of reported barriers to, and good experiences in, the development of endogenous technologies (PI-MECH-04)
5. Report with guidance for reporting on joint R&D needs (PI-MECH-05)

Indicators for financial flows

1. Total annual global investment and financial flows in climate change mitigation technologies (PI-FIN-01)
2. Total annual global investment and financial flows in climate change adaptation technologies (PI-FIN-02)
3. Total annual investment and financial flows in climate change technologies – Convention financial mechanism (PI-FIN-03)
4. Total annual investment and financial flows in climate change technologies – Kyoto Protocol flexibility mechanisms (PI-FIN-04)
5. Total annual investment and financial flows in climate change technologies – bilateral sources (PI-FIN-05)
6. Total annual investment and financial flows in climate change technologies – national sources (PI-FIN-06)
7. Total annual investment and financial flows in climate change technologies – multilateral sources (PI-FIN-07)
8. Total annual investment and financial flows in climate change technologies – private sources (PI-FIN-08)

Key: COP = Conference of the Parties, ESTs = environmentally sound technologies, non-Annex I Parties = Parties not included in Annex I to the Convention, R&D = research and development, TNAs = technology needs assessments, SBI = Subsidiary Body for Implementation, SBSTA = Subsidiary Body for Scientific and Technological Advice, TT:CLEAR = the technology information clearing house.

[a] This is a unique code given to each performance indicator. PI = performance indicator; XXX = key theme of the

D. Potential linkages of this work with other relevant work under the subsidiary bodies

27. The SBSTA and the SBI, at their thirtieth sessions,[9] concluded that the set of indicators to be presented in this final report of the EGTT could be used by the SBI as one of the tools to conduct the review and assessment of the effectiveness of the implementation of Article 4, paragraphs 1(c) and 5, of the Convention, as well as to regularly monitor and evaluate the effectiveness of the implementation of the technology transfer framework.[10]

28. The experiences and lessons learned from the development of performance indicators by the EGTT may also contribute to the ongoing deliberations among Parties under the AWG-LCA on matters relating to the concept of 'measurable, reportable and verifiable' as referred to in paragraph 1 (b) (ii) of the Bali Action Plan (decision 1/CP.13). The SBSTA and the SBI invited the AWG-LCA to consider, as appropriate, the report once it is finalized.[11]

29. Taking into account the methodological approach described in this report, the following points from the work of the EGTT may be relevant to the deliberations by the AWG-LCA:

[9] FCCC/SBSTA/2009/3, paragraph 24, and FCCC/SBI/2009/8, paragraph 68.

[10] To support this review and assessment, the SBI requested the secretariat to prepare a list of data gaps relative to the performance indicators once they are finalized (FCCC/SBI/2009/8, para. 74).

[11] FCCC/SBSTA/2009/3, paragraph 25, and FCCC/SBI/2009/8, paragraph 69.

(a) The performance indicators were developed as a participative design process involving key stakeholders;

(b) The performance indicators have been formulated in a SMART manner;

(c) A methodological sheet was developed for each performance indicator in order to ensure that any use of the indicator could be reported and verified;

(d) The performance indicators related to finance and capacity-building might be relevant for operationalizing paragraph 1 (b) (ii) of the Bali Action Plan;

(e) The indicator PI-TNA-06, "Number of technology programmes/projects from TNAs implemented by non-Annex I Parties", may be relevant to nationally appropriate mitigation actions (NAMAs).

30. Once the outcomes of the discussions on the concept of 'measurable, reportable and verifiable' under the AWG-LCA are known, the EGTT could further explore how experiences and lessons learned from developing performance indicators could contribute or relate to discussions on this matter in the future.

IV. Methodological approach

A. Developing and testing indicators: a participative design process

31. Performance indicators are among the most commonly used methods, tools or approaches to monitor progress. Based on different definitions and descriptions in the literature,[12] performance indicators can be defined as a set of measures that enable monitoring of performance and tracking of progress towards the achievement of objectives, in order to demonstrate results and inform corrective action. They can be expressed as qualitative or quantitative measures and as financial or non-financial metrics, and should be formulated, as discussed, in a SMART manner.

32. For the task of monitoring and evaluating past and present performance in the implementation of the technology transfer framework, it is essential to develop a set of performance indicators that are aligned with the framework's defined objectives. A systematic and coherent approach to linking objectives and indicators has been taken, so that decision makers can consider the relevance and appropriateness of the objectives and the related activities being monitored and evaluated.

33. In 1997, the International Institute for Sustainable Development organized a meeting in Bellagio, Italy, of an international group of measurement practitioners and researchers. The group reviewed best practice in the development and use of performance indicators and developed a set of principles to guide future work on performance indicators, the so-called Bellagio Principles for Assessment.[13] The EGTT has applied these principles in its work.

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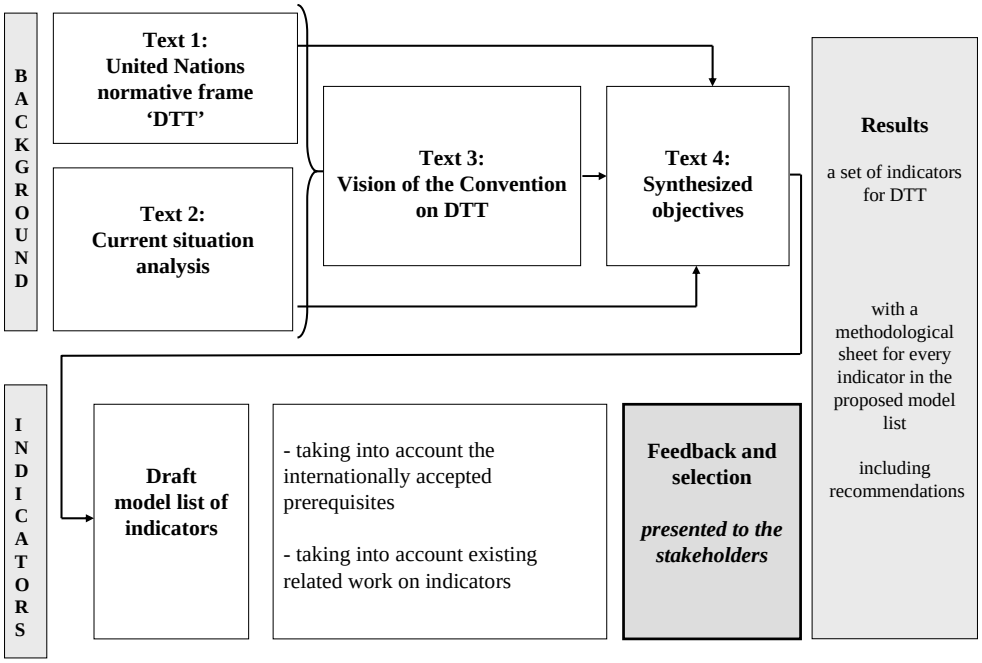
[12] Particularly the following three sources: (1) Hardy P and Zdan T (eds.). 1997. *Assessing Sustainable Development: Principles in Practice*. Winnipeg: International Institute for Sustainable Development; (2) Parmenter D. 2007. *Key Performance Indicators: Developing, Implementing, and Using Winning KPIs*. Hoboken: John Wiley & Sons; and (3) Nichols D and Martinot E. 2000. *Measuring Results from Climate Change Programs: Performance Indicators for GEF*. Washington, D.C.: Global Environment Facility.

[13] According to Hardy and Zdan in Assessing Sustainable Development: "These principles deal with four aspects of assessing progress toward sustainable development. Principle 1 deals with the starting point of any assessment establishing a vision of sustainable development and clear goals that provide a practical definition of that vision in terms that are meaningful for the decision-maker. Principles 2 through 5 deal with the content of any assessment and the need to merge a sense of the overall system with a practical focus on current priority issues. Principles 6 through 8 deal with key issues of the process of assessment, while Principles 9 and 10 focus on the necessity for establishing a continuing capacity for assessment."

34. In figure 1 the Bellagio Principles have been translated into a model, which represents the participatory design process followed by the EGTT.

Figure 1. A participative design process for developing a list of performance indicators



Source: Adapted from the methodological framework developed at the Centre for Sustainable Development (Ghent University) during the multiyear project "A city monitor for liveable and sustainable cities in the Flemish region".
Abbreviation: DTT = development and transfer of technologies.
Note: "Text" refers to a document which is available at each step from 1 to 4. The format may vary.

35. Similar processes aimed at developing and testing indicators usually start by discussing with stakeholders the values and objectives that provide the context for performance evaluation and an analysis of the current situation, leading to agreement on a vision for the subject of the evaluation exercise. This is not the case here, because information about the values and objectives for the development and transfer of technologies (text 1 in figure 1), an analysis of the current situation (text 2) and the vision enshrined in the Convention for the development and transfer of technologies (text 3) are already available.

36. In paragraphs 37–45 below, the model presented in figure 1 and the practical steps in the participative design process are explained.

1. Normative frame[14]

37. The Rio Declaration on Environment and Development, Agenda 21 (particularly its chapter 34 on transfer of environmentally sound technology, cooperation and capacity-building) and the Convention (particularly the Convention provisions and COP decisions related to the development and transfer of technologies within the context of sustainable development) together provide the framework of values and objectives that should guide the development and testing of a set of performance indicators to monitor and evaluate the effectiveness of the implementation of the technology transfer framework (in figure 1 this framework of values and objectives is referred to as text 1).

2. Current situation analysis

[14] Within this context "normative" refers to the overall set of principles, goals and definitions that have been accepted by the international community to frame sustainable development.

38. Several decisions, reports and technical papers on the development and transfer of technologies have been published under the Convention. Most publications focus on one of the key themes of the technology transfer framework listed in paragraph 10 above. Some provide a general overview while others provide an in-depth analysis to explain the current situation in the development and transfer of technologies under the Convention. The analysis of the current situation is referred to in figure 1 as text 2.

3. Vision for the development and transfer of technologies

39. The technology transfer framework expresses the guiding vision for technology development and transfer as defined by the COP: from 'means' (methods to achieve objectives) to 'ends' (achievement of objectives) at any point along the continuum. It consists of the framework, set out in the annex to decision 4/CP.7, complemented with the set of actions contained in annex I to decision 3/CP.13. The two annexes together form text 3 as referred to in figure 1.

4. Synthesized objectives leading to a draft model list of indicators

40. With texts 1–3 already available, the next stage of the process was to consult the stakeholders of the framework, the constituent groups of the COP, in order to select a list of candidate indicators.

41. In order to design metrics and performance indicators that will measure the implementation of the technology transfer framework, the vision text needed to be translated into more concrete objectives. The next step was to identify overlaps and to combine – if possible – similar objectives in the different parts of the framework. This resulted in a shorter list of 'synthesized objectives' (see box 2).

42. These synthesized objectives were linked to 161 potential indicators[15] without prejudging the ultimate selection. This extensive list of indicators formed the basis for a discussion with stakeholders in order to ascertain that it covered all important elements of the technology transfer framework.

43. At this stage the EGTT made its initial selection of 32 indicators at its meeting in Dublin. The selection was guided by the following two aims:

(a) To ensure that the final set of indicators covers the relevant synthesized objectives of the technology transfer framework, which means that from the long list of indicators at least one indicator for nearly all of the synthesized objectives was selected;

(b) To prioritize internationally accepted[16] indicators that correspond as closely as possible to the synthesized objective.

44. During the next phase a methodological sheet was prepared for each of the selected indicators to test the feasibility of collecting the required data and their relevance to the synthesized objectives.

45. Based on this process, a set of indicators was determined along with recommendations on how to develop a strategy to collect the required data (see chapter VII B below).

Box 2. List of the synthesized objectives derived from the technology transfer framework

The synthesized objectives derived from the technology transfer framework are listed below for each key theme except 'Mechanisms for technology transfer'.[a]

Technology needs and needs assessments

[15] The 161 candidate performance indicators are listed in the annex to the first interim report (FCCC/SB/2008/INF.6).

[16] It is common practice when developing performance indicators to double check final proposals of indicators against internationally developed indicators that are broadly accepted.

1. To undertake technology needs assessments (TNAs);
2. To provide resources;
3. To build capacity;
4. To update and to disseminate the TNA handbook;[b]
5. To make available information on TNAs;
6. To implement the results of technology needs (identified in TNAs);
7. To share lessons learned, success stories and good practices;
8. To consider the synthesis report;
9. To organize a meeting to identify TNA methodologies;
10. To ensure that Expert Group on Technology Transfer cooperates with the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention.

Technology information

1. To establish a technology transfer information clearing house (TT:CLEAR);
2. To maintain, update and further develop TT:CLEAR;
3. To network with technology information centres;
4. To increase the number of users (of TT:CLEAR);
5. To build capacity;
6. To make available information through national communications.

Enabling environments

1. To enhance legal systems (including those related to trade and intellectual property rights);
2. To promote joint research and development;
3. To promote transfer of publicly owned technologies;
4. To strengthen regulatory frameworks;
5. To utilize tax preferences;
6. To integrate technology transfer into national policies;
7. To create an environment conducive to investment;
8. To explore preferential government procurement;
9. To explore transparent and efficient approval procedures;
10. To prepare technical studies on developing enhanced enabling environments;
11. To cooperate closely with public and private partnerships.

Capacity-building

1. To report on capacity-building needs and experiences of developing country Parties relating to the development, deployment, diffusion and transfer of technologies;
2. To implement or support capacity-building activities for the development and transfer of technologies (DTT) in developing country Parties;

Box 2 (continued)

3. To establish or strengthen capacity for DTT in institutions of developing country Parties;
4. To increase, enhance or improve awareness and knowledge of environmentally sound technologies (ESTs) in developing country Parties;
5. To provide training on ESTs in developing country Parties;
6. To develop and implement standards and regulations for ESTs.

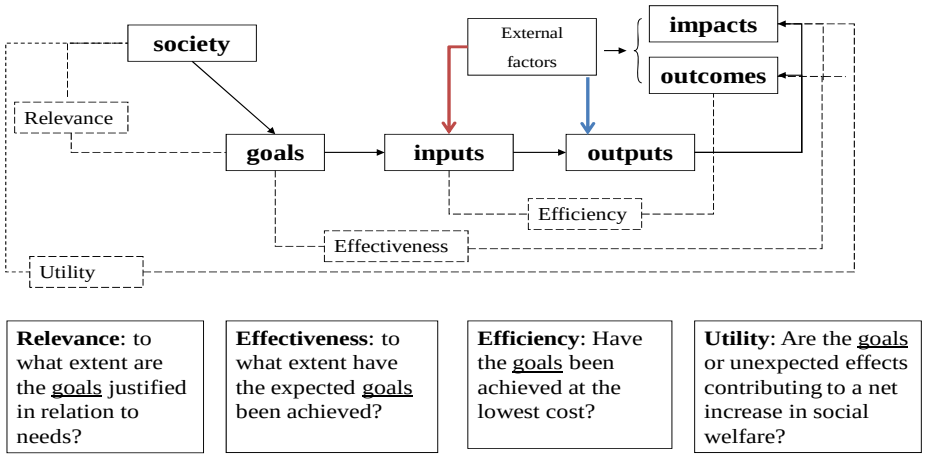
[a] Regarding this key theme, except for the establishment of the Expert Group on Technology Transfer itself there are no other activities or actions for implementation included in the annex to decision 4/CP.7. There are four sub-themes in annex I to decision 3/CP.13.

[b] Updated as: United Nations Development Programme. 2009. *Handbook for Conducting Technology Needs Assessments for Climate Change*. Available at <http://unfccc.int/ttclear/pdf/TNAHandbook_9-15-2009.pdf>.

B. Indicators for monitoring and evaluating the effects of policymaking

46. Figure 2 presents a model of the causal relationships that need to be taken into account when designing a set of performance indicators. It illustrates the relationships between the needs of society, the policymaking process, the evaluation of the policy and the effects of policy on society.

Figure 2. Framework for monitoring and evaluating the effects of policies



Source: Adapted from figure 6 in European Environment Agency. 2001. *Reporting on Environmental Measures: Are We Being Effective?* Environmental issue report no. 25. Copenhagen: EEA.
Note: The "goals" in this figure are equal to the vision, including the objectives, expressed in the technology transfer framework.

47. First, policymaking aims to create change, based on the needs of society. Starting from a vision, objectives are formulated. The inputs that are required to reach expected outputs are decided upon. Despite the influence of positive and negative external factors, policymaking results in outcomes (effects on target groups) and impacts (regarding social welfare). As a feedback mechanism, evaluation of the policy should influence and adjust further policymaking.

48. This model can be applied to activities and actions carried out as part of the technology transfer framework. The aim of monitoring and evaluating the effectiveness of the implementation of the technology transfer framework is to understand the extent to which the expected objectives have been achieved. Thus a chain of causality needed to be developed that links objectives of the framework with impacts, outcomes and outputs. The performance indicators will measure means (i.e. methods to achieve objectives), ends (i.e. achievement of objectives) or a combination at any point along the continuum (inputs, processes, outputs, outcomes and impacts).

49. The set of indicators will target priorities as expressed by the existing vision and the formulated objectives. When the causal relationship is not clear, this should be clarified to assist the SBI in evaluating the effectiveness of the technology transfer framework. When there is no clear causal relationship, feedback could be given for adjusting the vision and objectives for the long term.

50. In this way, the process for developing and testing performance indicators could allow an audit of the whole chain, from decisions made by the COP up to the expected sustainable development outcomes and impacts in countries, with recommendations for redefining the vision for the development and

transfer of technologies and the necessary ingredients (capacity, continuity, etc.). Therefore it is crucial that the Parties to the Convention participate in defining indicators, because they are then more likely to use the indicators for future decision-making, including decisions on corrective action towards achieving the objectives of the technology transfer framework.

51. Further detail about the work on the causal relationship chain is provided in annex II.

V. Initial selection of performance indicators

52. This chapter provides a description of the 32 performance indicators initially selected by the EGTT for the five key themes, following the approach described in chapter IV above. A more detailed description of each indicator is contained in the methodological sheets.[17] Results of testing of the indicators using these sheets are given in chapter VII below. Each performance indicator was linked to one of the synthesized objectives of the technology transfer framework, and the breakdown by theme is as follows:

(a) Six indicators for the key theme technology needs and needs assessments;

(b) Five indicators for the key theme technology information;

(c) Twelve indicators for the key theme enabling environments;

(d) Four indicators for the key theme capacity-building;

(e) Five indicators for the key theme mechanisms for technology transfer.

A. Technology needs and needs assessments

Amount of financial resources provided for the TNA process (PI-TNA-01)[18]

53. This indicator reflects the amount of financial resources provided for the TNA process in line with the United Nations Development Programme (UNDP) handbook *Conducting Technology Needs Assessments for Climate Change* (hereinafter referred to as the TNA handbook).[19] The GEF, for instance, under the enabling activities top-up fund and the Poznan strategic programme on technology transfer, has provided support to non-Annex I Parties to conduct TNAs.

Number of programmes/projects for capacity-building on TNAs in non-Annex I Parties (including percentage of least developed countries) (PI-TNA-02)

54. This indicator reflects the number of programmes and projects for building capacity in non-Annex I Parties to conduct, report and use TNAs, recognizing the special circumstances of the least developed countries (LDCs). The EGTT, the Climate Technology Initiative (CTI) and others have all organized such programmes and projects.

55. To facilitate data collection for this indicator, there may be a need to find ways to address the variation in technology typologies used by the secretariat, IGOs and international organizations.

Number of targeted non-Annex I Parties to build capacity on TNAs (including percentage of least developed countries) (PI-TNA-03)

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[17] <http://unfccc.int/ttclear/jsp/EGTTDoc/sheets.pdf>.

[18] This is a unique code given to each performance indicator. PI = performance indicator; XXX = key theme of the technology transfer framework; YY = number of the performance indicator.

[19] Updated as: United Nations Development Programme. 2009. *Handbook for Conducting Technology Needs Assessments for Climate Change*. Available at <http://unfccc.int/ttclear/pdf/TNAHandbook_9-15-2009.pdf>.

56. This indicator assesses the number of non-Annex I Parties that have received capacity-building support for conducting, reporting and using TNAs, recognizing the special circumstances of LDCs. UNDP and the United Nations Environment Programme (UNEP) have been targeting non-Annex I Parties for such capacity-building activities. The EGTT recommends that this indicator focus on financial support provided in order to make the data collection more feasible.

Number of published TNAs completed or updated by non-Annex I Parties (PI-TNA-04)

57. This indicator provides an overview of the number of TNAs completed or updated by non-Annex I Parties. The TNA should be the result of a process following the (updated) TNA handbook. This indicator does not reflect on the quality of TNAs. Therefore it is recommended that qualitative aspects of TNAs be considered in the synthesis report on technology needs to be measured by the indicator PI-TNA-05.

Synthesis report on technology needs made available by the secretariat and considered by the subsidiary bodies (PI-TNA-05)

58. This indicator ascertains whether a synthesis report of the available information on technology needs has been made available by the secretariat for consideration by the SBSTA and the SBI. A first synthesis report was provided by the secretariat in 2006 and a second one in 2009.[20] The data for the synthesis reports can be collected from TNAs, national communications and NAPAs.

Number of technology programmes/projects from TNAs implemented by non-Annex I Parties (PI-TNA-06)

59. This indicator assesses the number of technology programmes and projects for mitigation or adaptation that have been implemented by non-Annex I Parties in response to particular needs identified in their TNAs. As a follow-up to its work on innovative financing, the EGTT developed a process to support the financial closure of projects identified from TNAs. This process has been supported by, inter alia, the Private Financing Advisory Network of CTI. In addition, the Poznan strategic programme on technology transfer has a funding window to provide financial support for projects identified from TNAs.

60. There are different options for collecting data for this indicator:

(a) Option 1 – top-down approach: the secretariat, in collaboration with relevant IGOs (the GEF, the International Energy Agency (IEA), the Organisation for Economic Co-operation and Development (OECD), etc.), could compare the results of TNAs in terms of needs identified with existing programme and project databases. These databases are not suited to this exercise, however, and it is likely to prove difficult to collect the data in the corresponding format used in the TNAs;

(b) Option 2 – bottom-up approach. There are two possibilities:

(i) The secretariat could conduct a survey at regular intervals among non-Annex I Parties that have published a TNA to collect data about the implementation of projects and programmes;

(ii) A database (as part of the TT:CLEAR technology information clearing house, a possible future NAMA registry or similar) could be created in which non-Annex I Parties could report on the implementation of projects and programmes developed in response to needs identified in their TNAs.

[20] FCCC/SBSTA/2006/INF.1 and FCCC/SBSTA/2009/INF.1.

B. Technology information

Number of training programmes and workshops for building capacity in technology information (PI-TI-01)

61. This indicator reflects the number of training programmes and workshops organized for building the capacity of experts in technology information to create national technology information databases. The EGTT has established capacity-building programmes and projects in this area in the past. Through bilateral cooperation, it might be expected that Parties included in Annex I to the Convention (Annex I Parties) have also been contributing to activities in this area.

62. To facilitate data collection for this indicator, there may be a need to find ways to address differences in technology typologies used by the secretariat and IGOs.

Number of national communications with information on technology transfer activities (PI-TI-02)

63. This indicator assesses the number of national communications submitted to the secretariat by all Parties that contain information on technology transfer activities. National communications are an important source of information in the UNFCCC process.

Synthesis report with information on maintaining, updating and developing TT:CLEAR, addressing gaps and user needs made available by the secretariat and considered by the subsidiary bodies (PI-TI-03)

64. This indicator ascertains whether a report synthesizing information on maintaining, updating and developing TT:CLEAR, addressing gaps and user needs, has been made available by the secretariat and considered by the SBSTA and the SBI. The secretariat has prepared some reports on certain aspects of TT:CLEAR in the past, including a report on its effectiveness.[21]

Number of technology information centres and networks connected to TT:CLEAR (PI-TI-04)

65. This indicator reflects the number of technology information centres and networks that are connected to TT:CLEAR. The secretariat has implemented a pilot project on networking between TT:CLEAR and national and regional technology information centres. These centres and networks need to meet certain minimum standards in order to be connected to TT:CLEAR.

Number of users of TT:CLEAR from developing countries (PI-TI-05)

66. This indicator measures the number of registered users of TT:CLEAR from developing countries. The secretariat has been requested by the COP to enhance outreach activities in this area.

C. Enabling environments

Performance against each of the six World Bank governance indicators (PI-EE-01)

67. This indicator is intended to measure the performance of each country, a selection of countries, or an entire region against the six governance indicators developed by the World Bank.[22] "Governance" consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them.

[21] FCCC/SBSTA/2004/INF.8.
[22] Further detail about these six indicators is available at <http://info.worldbank.org/governance/wgi/index.asp>.

68. However, during testing it was realized that the related synthesized objective ('to enhance legal systems (including those related to trade and intellectual property rights)') is not reflected well by this indicator. Further consultations on this subject with the World Intellectual Property Organization (WIPO) revealed that it is not easy to find a single indicator reflecting the synthesized objective, owing to its wide scope. The EGTT proposes to continue its consultations with WIPO.

Total volume of joint R&D opportunities for ESTs provided by (primarily developed country) governments (PI-EE-02)

69. This indicator assesses the total volume (by number and USD value) of joint research and development (R&D) opportunities for ESTs provided by (primarily developed country) governments. "Joint R&D opportunities" refers to collaborative efforts primarily between developed and developing country governments, as well as between governments and private firms, to research, develop and disseminate mitigation and adaptation technologies. It has been suggested that the data for this indicator could be collected from IEA and the Consultative Group on International Agricultural Research (CGIAR), but following consultations with both organizations the EGTT learned that that this would be difficult or impossible. An alternative means to collect the data required could be to invite government agencies to post information on joint R&D opportunities on TT:CLEAR.

Presence of clear policy guidelines for the recipients of public funding on how to move from the research stage to the commercialization stage of the technology transfer process (PI-EE-03)

70. This indicator ascertains whether the recipients of public funding have been provided with clear policy guidelines on how to move from the research stage to the commercialization stage of the technology transfer process.

Number of bilateral and multilateral programmes that have helped developing countries in developing and implementing regulations that promote the use and transfer of and access to ESTs (PI-EE-04)

71. This indicator reflects the number of bilateral and multilateral programmes that have assisted developing countries in developing and implementing regulations that promote the use and transfer of and access to ESTs. This would comprise the various programmes related to climate technology cooperation, and in particular, those that have a capacity-building component related to improving knowledge of regulations.

Presence of tax preferences and incentives for imports/exports of ESTs (PI-EE-05)

72. This indicator ascertains if tax preferences and incentives for imports and exports for ESTs have been put in place. Preferential taxes (or preferential "tariffs") are usually applied to imported goods. They encompass a range of policies, from reduced import duties to lower sales taxes.

Volume of export credits to encourage the transfer of ESTs (PI-EE-06)

73. This indicator assesses the volume (in USD) of export credits to encourage the transfer of ESTs. The data for this indicator, which could be collected from national communications, are the amount of financial resources provided by developed countries devoted to export credit programmes for adaptation and mitigation technologies.

Whether mention of transfer of ESTs is made in national sustainable development strategies (PI-EE-07)

74. This indicator ascertains whether countries have mentioned transfer of ESTs in their national sustainable development strategies (NSDS) submitted to the United Nations Commission for Sustainable Development (UNCSD). NSDS are comprehensive strategies that help countries achieve their economic,

environmental and social objectives in an integrative way. Their development typically involves consultations with a range of stakeholders. The data could be collected from the NSDS themselves.

Rating of investment climate according to World Bank business indicators (PI-EE-08)

75. This indicator addresses how feasible it is to do business in countries or regions of the world. A healthy business environment depends on a number of factors, including the state of financial development, behaviour and performance of businesses, the legal system, public policy and regulation. The EGTT originally considered using the World Bank's World Business Environment Survey,[23] which has evolved over the past 10 years to become the Enterprise Surveys. A more up-to-date indicator would be the investment climate as measured by the Doing Business indicators of the World Bank or the results of its Enterprise Surveys. These are also indicators of the quality of the business environment in different countries.

Proportion of budget for public procurement of ESTs (PI-EE-09)

76. This indicator reflects the proportion of the government budget allocated to public procurement of ESTs. This may be broken down into the budgets at federal, state and municipal levels for the procurement of equipment, technology, materials and other supplies related to ESTs.

Degree of disclosure and transparency regarding the approval processes of technology transfer projects (PI-EE-10)

77. This indicator reflects the degree of disclosure and transparency in the approval processes of technology transfer projects. The approval process, time frame and project life cycle would depend on the type of project and how it is supported (e.g. bilateral or multilateral assistance, private-sector investment or government support). For the purposes of this indicator, "approval processes" refers to a broad range of steps that must be taken, from conception to execution, in order for a technology transfer project to take place.

Number of technical studies that explore barriers, good practices and recommendations for enhancing enabling environments (PI-EE-11)

78. This indicator assesses the number of technical studies published that explore barriers to, good practices in and recommendations for enhancing enabling environments.

Percentage of partnerships with thematic foci on climate change and sustainable development with meaningful participation by developing country Parties (PI-EE-12)

79. This indicator reflects the participation of developing country Parties in partnerships that are focused on climate change and sustainable development. The indicator intends to measure the extent to which cooperation in public and private partnerships is taking place. UNCSD routinely counts and tracks partnerships related to sustainable development through its partnership database launched in 2004.

D. Capacity-building

80. To facilitate data collection for all of the capacity-building indicators, there may be a need to find ways to address the variation in technology typologies used by the secretariat, IGOs and international organizations.

Amount of financial resources provided for capacity-building in the development and transfer of technology (PI-CB-01)

[23] <http://info.worldbank.org/governance/wbes/index.html>.

81. This indicator reflects the amount of financial resources provided for capacity-building in the development and transfer of technology. This includes scholarships, technical assistance, and support for workshops and seminars provided under the technology transfer framework. It could include capacity-building resources committed by developed countries, the GEF, UNEP, UNDP, the World Bank, CTI, the Global Energy Efficiency and Renewable Energy Fund, the clean development mechanism and the Adaptation Fund.

Synthesis report on national capacity needs and priorities for capacity building for development and transfer of technologies in line with the technology transfer framework (PI-CB-02)

82. This indicator ascertains whether reports synthesizing national capacity needs and priorities for capacity-building for development and transfer of technologies in line with the technology transfer framework have been made available by the secretariat. These needs and priorities encompass those stipulated by non-Annex I Parties in their national capacity self-assessment reports, national communications and NAPAs.

Number of participants/experts in training programmes on the development and transfer of technologies, in particular on EST-related activities (PI-CB-03)

83. This indicator would provide an idea of the number of experts from developing country Parties that are qualified to adapt, install, manage, operate and maintain ESTs, or to develop standards and regulations related to ESTs.

Number of new and existing national and regional institutions operating as centres of excellence in the development and transfer of technology (PI-CB-04)

84. This indicator provides the number of new and existing national and regional institutions that are qualified to undertake research, development, technological innovation, adoption, adaptation and transfer of ESTs, EST operation and maintenance and climate change observation.

E. Mechanisms for technology transfer

Number and volume of reported innovative public−private financing mechanisms and instruments (PI-MECH-01)

85. This indicator concerns innovative public−private financing mechanisms and instruments that increase access to funding by developing country project and business developers that play a role in the transfer, development and/or deployment of ESTs. The data could be obtained from national communications within the context of the Convention.

Report on possible ways to enhance cooperation between the Convention and other multilateral environmental agreements (PI-MECH-02)

86. This indicator ascertains whether a report on enhancing cooperation between the Convention and other multilateral environmental agreements (MEAs) has been made available. The EGTT was requested to explore ways to enhance such cooperation as part of its work under the mechanisms theme of the technology transfer framework.[24]

Report on references made in national communications to objectives of other multilateral environmental agreements (PI-MECH-03)

87. This indicator ascertains whether a report on references made in national communications to objectives of other MEAs has been made available. Under the mechanisms theme of the technology

[24] Decision 3/CP.13, paragraph 19 (a).

transfer framework Parties are encouraged to take into consideration objectives of other MEAs when formulating climate change strategies, programmes and projects in order to enhance cooperation.[25]

Number of reported barriers to, and good experiences in, the development of endogenous technologies (PI-MECH-04)

88. This indicator gives an overview of barriers encountered by non-Annex I Parties during the development of endogenous technologies, and positive experiences in promoting endogenous technologies in those Parties. The data for this indicator could be obtained from national communications, NAPAs and TNAs.

Report with guidance for reporting on joint R&D needs (PI-MECH-05)

89. This indicator ascertains if guidance on reporting in TNAs and in national communications on identifying needs and opportunities for joint R&D has been provided by the EGTT.

VI. Selecting indicators for financial flows

A. Candidate indicators for financial flows

90. As discussed in chapter II above, the EGTT was requested in the terms of reference to develop performance indicators of financial flows to support the development and transfer of technologies, and analyse the factors that may influence these financial flows. Sources of finance for technology transfer had been identified as part of a more comprehensive effort to document financial flows for technology development and transfer and to identify future financing options. The results of this work were published by the EGTT in June 2009, and reported to the SBSTA, the SBI and the AWG-LCA.[26]

91. The sources of finance identified in that report were aggregated into the following so as to reduce the number of potential indicators:

(a) The financial mechanism and funds under the Convention (including the Kyoto Protocol Adaptation Fund);

(b) The Kyoto Protocol flexibility mechanisms;

[25] Decision 3/CP.13, paragraph 19 (c).
[26] FCCC/SB/2009/2 and Summary.

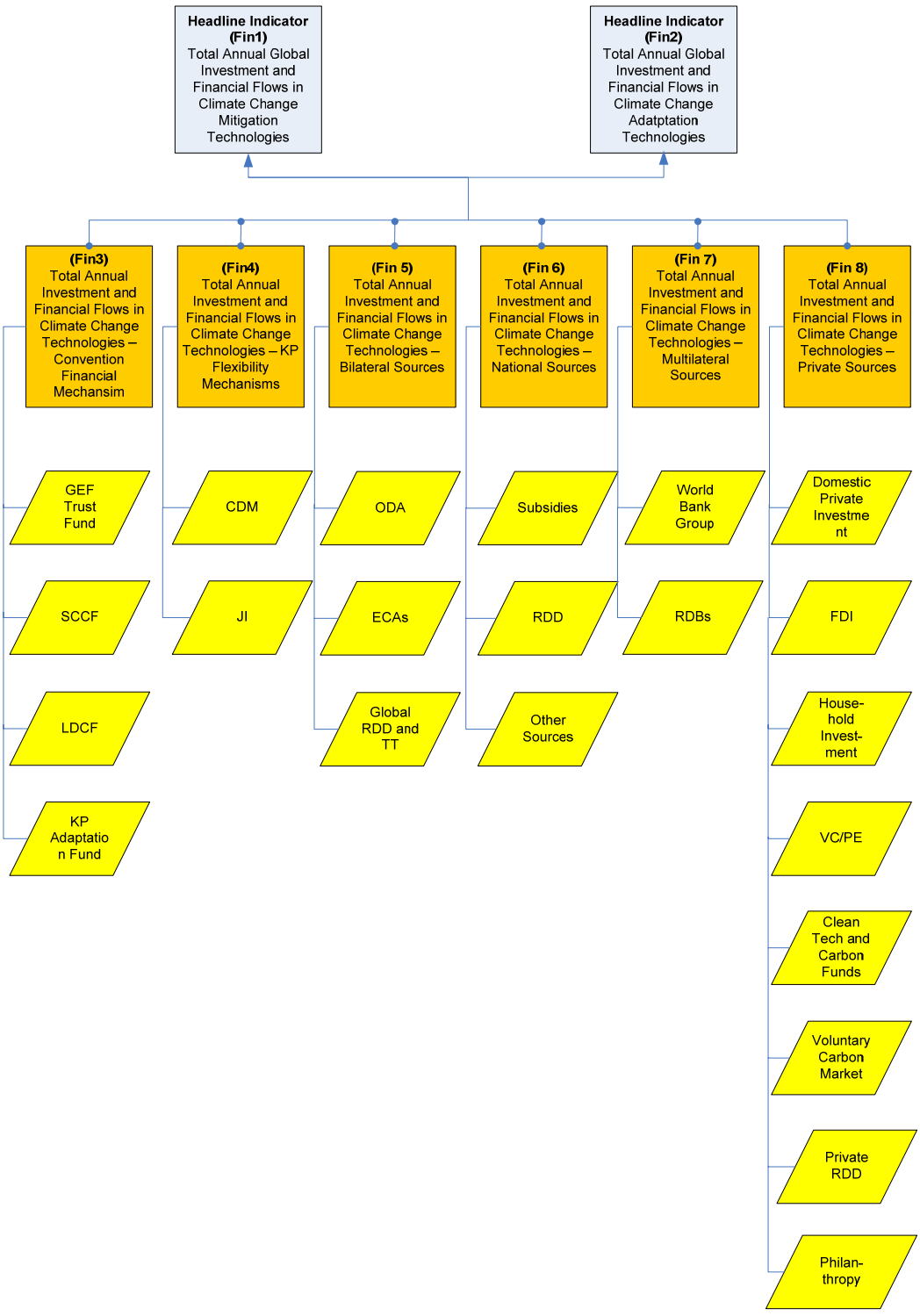
(c) Bilateral sources (including export credit agencies);

(d) National sources;

(e) Multilateral sources;

(f) Private financing sources.

Figure 3. Proposed hierarchy of nested financing indicators and sources of finance



Abbreviations: CDM = clean development mechanism, ECAs = export credit agencies, FDI = foreign direct investment, GEF = Global Environment Facility, JI = joint implementation, KP = Kyoto Protocol, LDCF = Least Developed Countries Fund, ODA = official development assistance, RDBs = regional development banks, RDD = research, development and deployment, SCCF = Special Climate Change Fund, TT = technology transfer, VC/PE = venture capital/private equity.

92. Candidate indicators were then developed for each aggregated source of finance, drawing directly from the financing information contained in the EGTT report on future financing options (the conceptual framework used to select the indicators is contained in annex IV). The set of candidate indicators for financial flows are:

(a) Total annual global investment and financial flows in climate change mitigation technologies (PI-FIN-01);

(b) Total annual global investment and financial flows in climate change adaptation technologies (PI-FIN-02);

(c) Total annual investment and financial flows in climate change technologies – Convention financial mechanism (PI-FIN-03);

(d) Total annual investment and financial flows in climate change technologies – Kyoto Protocol flexibility mechanisms (PI-FIN-04);

(e) Total annual investment and financial flows in climate change technologies – bilateral sources (PI-FIN-05);

(f) Total annual investment and financial flows in climate change technologies – national sources (PI-FIN-06);

(g) Total annual investment in climate change technologies – multilateral sources (PI-FIN-07);

(h) Total annual investment and financial flows in climate change technologies – private sources (PI-FIN-08).

93. Figure 3 presents a proposed hierarchy of nested financing indicators and sources of finance. As illustrated in the figure, indicators of financial flows can be aggregated so that information on financing can be presented for mitigation technologies and technologies for adaptation.

B. Identifying influencing factors on financial flows

94. The causal relationship model illustrated in figure 2 in chapter IV above provides a useful framework for structuring performance indicators. However, it does not show the influences on investment and financial flows, which are usually presented as input indicators (but are sometimes presented as output indicators). For this reason, a clear link needed to be made showing that external factors influence the financing inputs and outputs to technology development and transfer. As noted in paragraph 90 above, the terms of reference call for not only indicators of financial sources (e.g. how much finance is available), but also indicators that reliably reflect what could be influencing these patterns of investment.

95. The major influencing factors on financial flows at the R&D, demonstration, deployment and diffusion stages of the technology cycle were therefore identified, as well as the influencing factors for each source of finance. The factors identified are listed in the first column of table 1.

96. Regarding the influences on individual sources of finance: there may be numerous factors involved, and if indicators are developed to monitor them, the number of performance indicators required would grow significantly. Some of the main influencing factors may be suited to the use of indicators; however, there is a range of alternative evaluation techniques that may be better suited to analysing the influencing factors on sources of finance. The GEF and World Bank evaluation methodologies may provide examples to draw upon.

C. Linking influencing factors for financial flows to performance indicators

97. Once identified, the influencing factors were mapped against the set of 32 performance indicators that had been selected for the five key themes of the framework to determine whether they could be monitored in this way. The different influencing factors for the R&D, demonstration, and deployment stages were able to be linked to several performance indicators, as is shown in table 1. From the overview provided in this table, it can be concluded that most of the influencing factors can be (partially) monitored and evaluated by at least one performance indicator of the technology transfer framework.

98. The following five factors that influence the flow of financing during these three stages are not covered by a performance indicator:

(a) Additionality of private and public R&D efforts (R&D and demonstration);

(b) Social acceptance of new technologies (deployment);

(c) Government budgetary situation (R&D, demonstration and deployment);

(d) Availability of physical resources (demonstration and deployment);

(e) Access to finance for actors in non-Annex I Parties (R&D, demonstration and deployment).

99. For financing available for technologies at the diffusion stage, it was more difficult to link the influencing factors with the performance indicators selected. These factors are:

(a) Price developments of inputs and outputs;

(b) Technological stage of maturity and potential for cost and risk reduction;

(c) Trends in, and potential for, market development;

(d) Institutional situation and level of transparency;

(e) Government policy stability and policy clarity;

(f) Competitiveness against alternatives and incumbent technologies;

(g) Government support for low-carbon technology;

(h) General macroeconomic and investment climate;

(i) Availability of objective and reliable information on potential investments;

(j) Public awareness and acceptability of certain technologies.

100. The difficulty in linking these factors with performance indicators can be explained by the fact that the business community has a bigger impact than governments on the provision of finance during the diffusion stage of technology maturity. However, the objectives of the technology transfer framework, and thus the initial selection of performance indicators, focus on the role of the public sector and of IGOs.

101. From this work, it can be concluded that none of the performance indicators selected for the key themes of technology needs and needs assessments and technology information could be used to monitor influences on financial flows. In contrast, with the exception of one performance indicator (PI-EE-07, “Whether mention of transfer of ESTs is made in national sustainable development strategies”), all of the performance indicators for the key theme enabling environments are important in this regard. Two of the

four performance indicators for the capacity-building theme, and three of the five indicators for mechanisms for technology transfer, (partly) cover influencing factors for financial flows.[27]

Table 1. Influencing factors on financial flows, linked to the performance indicators[a] of the technology transfer framework

Influencing factors	Technology stage			Indicators
	Research and development	Demonstration	Deployment	
Skill and existing infrastructure capacity of public research and development institutions	✓	✓	✓	PI-CB-03/04 PI-MECH-05
Additionality of private and public research and development efforts	✓	✓		/
Social acceptance of new technologies			✓	/
Technical risks and barriers		✓	✓	PI-EE-11 PI-MECH-04
Government and private economic development strategies	✓	✓	✓	PI-EE-09
Regulatory frameworks and infrastructure restrictions and interdependencies		✓	✓	PI-EE-04
Government budgetary situation	✓	✓	✓	/
Legal framework for intellectual property and mechanisms for reducing the risk for private-sector investors	✓	✓	✓	PI-EE-01
Government incentives for private investment in research and development	✓	✓	✓	PI-EE-02/03/05/06
Availability of physical resources		✓	✓	/
Market potential for climate-friendly technologies	✓	✓	✓	PI-EE-08/10
General health of the economy; business capacity for investment	✓	✓	✓	PI-EE-08/10
Information asymmetry (presence of measures that connect financiers with technology developers and potential demonstration projects)		✓	✓	PI-EE-12 PI-MECH-01
Access to finance for actors in non-Annex I Parties	✓	✓	✓	/

[a] This refers to the 32 initially selected performance indicators for the five key themes of the framework.

[27] The performance indicators PI-CB-01/02 and PI-MECH-02/03 seem not to reflect any influencing factor.

VII. Testing the set of performance indicators

102. This chapter describes the testing process of the initial selection of 40 performance indicators described in chapters V and VI above.

A. Description of the testing process

103. A standard methodological sheet for testing the indicators was developed (see annex III). It is composed of several fields, such as "Data availability" and "Relevance to sustainable development", for building up a profile of each indicator and assessing, inter alia, the extent to which it is SMART. Similar methodological sheets have been used for other work on performance indicators at the international level.

104. The following points were addressed for each indicator when developing the methodological sheet:

(a) The possibility of subdividing the indicator by targeting mitigation and adaptation, and different sectors;

(b) The possibility of suggesting another performance indicator if it is not feasible to continue with the performance indicator that had been initially selected (e.g. owing to a lack of data);

(c) The importance of being clear about the stakeholders that are to be involved and targeted;

(d) The possibility of going back to the technology transfer framework to see how the objective was phrased and going back to decision 3/CP.13 for an analysis of the current situation when carrying out the evaluation of the performance indicators;

(e) The need to state in the methodological sheet if data that are not publicly available but could be obtained from an IGO or another stakeholder, or data that need to be obtained from national communications, are required during the course of the work.

105. By filling in the fields, the EGTT was able to evaluate the viability of the indicator and identify any potential limitations or challenges for gathering data. The EGTT also considered the relevance of each indicator: whether it clearly represents achievement of the synthesized objective.

B. Results of the testing process

106. The results of the testing process, including the feasibility and relevance of each indicator and an overview of the resource requirements, are summarized in table 3 within annex I. The methodological sheets completed for all of the performance indicators are available on TT:CLEAR and should be read in conjunction with this report.[28]

107. As a result of the testing, the EGTT made some modifications to the initially selected set of performance indicators, as described in chapter V above and highlighted in table 3.

[28] <http://unfccc.int/ttclear/jsp/EGTTDoc/sheets.pdf>. The information contained in the sheets will need to be regularly updated.

1. Conclusions on data gathering and availability

108. To operationalize a monitoring and evaluation system using the performance indicators, the following practical steps could be taken:

(a) The following arrangements could be made (e.g. via a memorandum of understanding), in order to deliver in a SMART manner the data for specific performance indicators:[29,30]

(i) Arrangements between the secretariat and the GEF, UNDP, UNEP and relevant IGOs to obtain data for nine indicators, in particular for those monitoring and evaluating the key themes technology needs and needs assessments and technology information;[31]

(ii) Arrangements with relevant international organizations and bodies (IEA, CGIAR, etc.) to obtain information needed to document six indicators for monitoring and evaluating the implementation of the key theme enabling environments and assessing financial flows;[32]

(b) The SBSTA and the SBI could consider the possibility of developing templates to facilitate reporting in national communications[33] in order to receive the data needed from Parties for specific key performance indicators. This applies to 14 of the 40 performance indicators, mainly those for monitoring and evaluating the key themes enabling environments and capacity-building.[34] Data for the remaining indicators could be obtained from the secretariat.

109. In order to determine the overall time frame for monitoring and evaluation, it is important to consider the time sensitivity of different sources of information, as follows:

(a) Regarding national communications:

(i) All Parties agreed to report on the steps they are taking to implement the Convention (Article 4, para. 1, and Article 12). Annex I Parties are requested to submit their fifth national communication by 1 January 2010. The compilation and synthesis of this information is normally completed by the secretariat within two years of the date of submission;

(ii) Non-Annex I Parties have a different timetable for the submission of national communications, which has yet to be decided;

(b) National capacity self-assessments (NCSAs) and NAPAs are not time-bound, but related databases are updated on a regular basis;

[29] In the past, the COP requested IGOs and international organizations to report on specific issues. It should be made clear that existing COP decisions should be taken into account when preparing agreements with these organizations.

[30] Within this context, there may be a need to find a common technology typology between the secretariat and IGOs and international organizations, for example, to define programmes and/or projects for capacity-building (see PI-TNA-02, PI-TI-01 and PI-CB-03).

[31] The nine indicators are PI-TNA-01/02/03/04/06, PI-TI-01, PI-CB-01 and PI-FIN-07/08.

[32] These six indicators are PI-EE-02/07/12 and PI-FIN-05/07/08.

[33] In the past there have been efforts to give specific guidance to Parties to facilitate the reporting of information in national communications, such as the template on cross-cutting themes developed by the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention.

[34] These 14 indicators are PI-TI-02, PI-EE-03/04/05/06/09/10, PI-CB-02/03/04, PI-MECH-01/03/04 and PI-FIN-06.

(c) Synthesis reports on technology needs were published in 2006 and 2009;

(d) Other synthesis reports on, for example, capacity-building needs for development, deployment, diffusion and transfer of technologies could be published at similar intervals (i.e. every three years);

(e) NSDS are not time-bound, but the national reports to UNCSD are submitted every two years (i.e. 2008, 2010, 2012 and so on);

(f) The data needed for the other performance indicators that are mostly available from the IGOs, international organizations or the secretariat seem to be available annually.

110. Particular challenges with data collection for each key theme of the technology transfer framework are discussed in paragraphs 111–120 below.

2. Findings on data requirements for each performance indicator

Technology needs and needs assessments

111. For the six selected performance indicators for the key theme technology needs and needs assessments, the focus for monitoring and evaluation could be placed on the efforts made within various organizations, bodies and partnerships (the GEF, UNDP, UNEP, etc.). This applies to PI-TNA-01, PI-TNA-02 and PI-TNA-03 in particular. To enable the secretariat to obtain the data needed in time, a special arrangement could be made between the secretariat and relevant IGOs. This would mean that the six performance indicators could be used to track in a SMART manner the effectiveness of the implementation for this key theme of the technology transfer framework.

Technology information

112. Focusing on efforts made within various organizations, as proposed in paragraph 111 above for the TNA performance indicators, could help move the testing process forward in the short term for PI-TI-01. The information for PI-TI-02 is obviously available in national communications, and for the other indicators information resides within the secretariat. This means that the five performance indicators can track in a SMART manner the effectiveness of the implementation for the key theme technology information.

Enabling environments

113. The enabling environment theme is vast, essentially encompassing every other theme of the technology transfer framework (and beyond). This resulted in the formulation of many performance indicators for this key theme.

114. To be able to interpret the actions and activities carried out under the enabling environments theme as part of a causal relationship chain, with goals, inputs, outputs, impacts and outcomes, the EGTT identified a goal, as it did for all of the key themes, derived from the definition and purpose set out in the annex to decision 4/CP.7 for each one (see box 3 within annex II). This goal focuses on government actions, but indicators based purely on these kind of actions would not be sufficient for monitoring and evaluating within this context; the technology transfer framework is more nuanced than that, assigning specific roles to particular governments, as well as leaving room for private-sector actions. Thus, a balanced set of indicators needed to be identified that could capture these complex relationships.

115. In all, 12 indicators for this key theme of the technology transfer framework were selected. For six[35] out of 12 performance indicators, information needs to be obtained from national communications

[35] PI-EE-03/04/05/06/09/10.

(see para. 108 above). The data for most of the other indicators can be derived from other sources (the World Bank, WIPO, IEA, CGIAR and UNCSD). One of the indicators (PI-EE-11) can be documented with information obtained from TNAs.

Capacity-building

116. Monitoring and evaluation of capacity-building is also being considered under the Convention, consistent with the framework for capacity-building in developing countries (the capacity-building framework). The second comprehensive review of the capacity-building framework involved the development of performance indicators to assess human, institutional and systemic capacity, drawing on information submitted by Parties and IGOs on their experiences in using performance indicators to monitor and evaluate capacity-building.[36] The EGTT took the capacity-building framework into account when selecting the initial list of indicators (technology transfer is part of the scope of the capacity-building framework).

117. Focusing on efforts made within various organizations, as suggested for the technology needs and needs assessments indicators, could help move the process forward in the short term for the performance indicator PI-CB-01. For the other indicators, information would need to be obtained from national communications, NCSAs, NAPAs and TNAs (see para. 108 above).

Mechanisms for technology transfer

118. The same approach has been followed to present an initial list of performance indicators for the sub-themes of the mechanisms key theme, which are contained in the annex to decision 3/CP.13. Two of the performance indicators[37] can be documented by the secretariat. For the other indicators, information would need to be obtained from national communications and NAPAs (see para. 108 above).

Financial flows

119. The eight indicators of investment and financing of climate change technologies were examined through the use of the standard methodological sheet: two headline indicators (total global annual investment in climate change mitigation technologies and adaptation technologies), both of which aggregate the six remaining indicators, which monitor each major source of finance.

120. Data for most of the financial flow indicators can be derived from the United Nations Conference on Trade and Development, UNEP, OECD, the World Bank and regional development banks, and the secretariat.

3. Feasibility and relevance of the indicators

121. Table 2 gives a overview of the different options for ranking the performance indicators according to their feasibility and relevance, as presented in annex I.

122. It can be observed that the majority of indicators have a medium to high feasibility and medium to high relevance. A minority of the indicators have a low feasibility or low relevance, in particular indicators under the enabling environments theme.

[36] Details are available in documents FCCC/SBI/2009/4, FCCC/SBI/2009/5, FCCC/SBI/2009/MISC.1 and FCCC/SBI/2009/MISC.2.
[37] PI-MECH-02/05.

Table 2. Ranking the performance indicators according to feasibility and relevance

	High relevance	Medium relevance	Low relevance
High feasibility	Financial resources for TNAs (PI-TNA-01) Non-Annex I Parties targeted through financial support (PI-TNA-03) Published TNAs completed or updated (PI-TNA-04) Synthesis report on technology needs (PI-TNA-05) National communications containing information on technology transfer activities (PI-TI-02) Information on maintaining, updating and developing TT:CLEAR (PI-TI-03) Technology information centres and networks connected to TT:CLEAR (PI-TI-04) Users of TT:CLEAR from developing countries (PI-TI-05) Report on cooperation between Convention and other MEAs (PI-MECH-02) Report on guidance for reporting on joint R&D needs (PI-MECH-05) Total annual investment and financial flows in climate change technologies – Convention financial mechanisms (PI-FIN-03)	Mention of EST transfer in NSDS (PI-EE-07) Rating of investment climate according to World Bank business indicators (PI-EE-08) Percentage of participation in partnerships (PI-EE-12) Total annual investment and financial flows in climate change technologies – Kyoto Protocol flexibility mechanisms (PI-FIN-04)	
Medium feasibility	Technologies from TNAs implemented (PI-TNA-06) Volume of joint R&D opportunities (PI-EE-02) Financial resources for capacity-building (PI-CB-01) Report on references to objectives of other MEAs (PI-MECH-03) Barriers to and good experiences in the development of endogenous technologies (PI-MECH-04) Total annual global investment and financial flows in climate change mitigation technologies (PI-FIN-01) Total annual global investment and financial flows in climate change adaptation technologies (PI-FIN-02)	Programmes/projects for capacity-building on TNAs (PI-TNA-02) Training programmes and workshops for building capacity in technology information (PI-TI-01) Total annual investment and financial flows in climate change technologies – bilateral sources (PI-FIN-05) Total annual investment and financial flows in climate change technologies – national sources (PI-FIN-06) Total annual investment in climate change technologies – multilateral sources (PI-FIN-07) Total annual investment and financial flows in climate change technologies – private sources (PI-FIN-08)	Studies that explore barriers, good practices and recommendations for ESTs (PI-EE-11)
Low feasibility	Performance against World Bank governance indicators (PI-EE-01) Participants and experts in training prograames for DTT (PI-CB-03) National and regional institutions operating as centres of excellence in DTT (PI-CB-04) Innovative public–private financing mechanisms and instruments (PI-MECH-01) Volume of export credits (PI-EE-06) Percentage of government procurement budget allocated to ESTs (PI-EE-09)	Bilateral and multilateral programmes that have helped developing countries develop and implement regulations for promoting ESTs (PI-EE-04) Presence of tax preferences and incentives on imports/exports of ESTs (PI-EE-05) Degree of disclosure and transparency in the approval process (PI-EE-10) Report on needs and priorities for capacity-building (PI-CB-02)	Presence of clear policy guidelines on how to move from R&D to commercialization of ESTs (PI-EE-03)

Abbreviations: DTT = development and transfer of technology, ESTs = environmentally sound technologies, MEAs = multilateral environmental agreements, NSDS = national sustainable development strategies, R&D = research and development, TNAs = technology needs assessments, TT:CLEAR = technology information clearing house.
Note: A short name has been used for each indicator.

VIII. Final remarks

123. This final report presents a set of performance indicators, the results of their testing and the results of task III, including:

(a) Recommendations based on the outcomes of tasks I and II and the consideration of the outcomes of other relevant activities (including a list of indicators, the methodology and data sheets used and examples of how the indicators are used);

(b) Analysis of possible linkages of this work with other relevant work under the SBSTA, the SBI and the AWG-LCA.

124. The major findings and recommendations are presented in chapter III.

Annex I

Overview of the results of the testing process for the performance indicators

With reference to document FCCC/SB/2009/1, a draft methodological sheet was developed for each of the 40 performance indicators in order to test their feasibility. A summary of the testing results is provided in table 3. The columns should be understood as follows:

(a) Code (ID): a unique code given to each performance indicator;

(b) Performance indicator – name (in short): the short name of the performance indicator. If the name has been changed or could be changed to reflect modifications made after testing, this is indicated in a note;

(c) Performance indicator category: the indicators have been categorized in accordance with the types of indicator identified in figure 2 of this document: input, process, output, outcome or impact;

(d) Data sources: an indication of who should provide the data for calculating the performance indicator or from where the data should be collected;

(e) Resource requirements for data collection: an estimate of the resources required;

(f) Parties' direct involvement in providing data: an indication of which Parties, if any, would be directly involved in providing data;

(g) Feasibility and Relevance to synthesized objective:

(i) Feasibility refers to:

– Whether sufficient data can be made available to calculate the indicator;

– Whether the indicator can be uniquely compiled;

– Whether it is it possible to calculate the performance indicator completely;

(ii) Relevance refers to:

– Whether the indicator clearly represents achievement of the objective (synthesized and its original objectives);

– Whether the indicator is technically and politically convincing – that is, whether the indicator conveys the necessary message.

Table 3. Summary of the testing process for the performance indicators

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
Technology needs and needs assessments							
PI-TNA-01	Financial resources for TNAs	Input	'to provide resources'	Multilateral: GEF, UNDP, UNEP	No additional resource requirements	None	High feasibility High relevance
PI-TNA-02	Programmes/projects capacity-building on TNAs	Input	'to build capacity'	Multilateral: GEF, UNDP, UNEP	Depending on common capacity-building typology[a]	None	Medium feasibility Medium relevance
PI-TNA-03	Targeted non-Annex I Parties through financial support	Input	'to build capacity'	Multilateral: GEF, UNDP, UNEP	No additional resource requirements[b]	None	High feasibility High relevance
PI-TNA-04	Published TNAs completed or updated	Output	'to make available information on TNAs'	Secretariat, GEF, UNDP, UNEP	No additional resource requirements	None	High feasibility High relevance
PI-TNA-05	Synthesis report on technology needs	Output	'to consider the synthesis report'	Secretariat	No additional resource requirements	None	High feasibility High relevance
PI-TNA-06	Technologies from TNAs implemented	Outcome	'to implement the results of technology needs (identified in TNAs)'	Secretariat, GEF and implementing agencies	If combination of top-down and bottom-up approaches, four months' FTE time investment at the appropriate level, guided by a senior staff member[c]	Non-Annex I Parties	Medium feasibility High relevance

[a] This is related to the recommendation of looking for a common capacity-building typology with relevant IGOs.

[b] Following the recommendation to focus on financial forms of support.

[c] There are different options for collecting data for this indicator. Top-down approach: the secretariat, in collaboration with relevant IGOs (the GEF, IEA, OECD, etc.), could compare the results of TNAs in terms of needs identified with existing programme and project databases. These databases are not suited to this exercise, however, and it is likely to prove difficult to collect the data in the corresponding format used in the TNAs. Bottom-up approach: (a) The secretariat could conduct a survey at regular intervals among non-Annex I Parties that have published a TNA to collect data about the implementation of projects and programmes; (b) A database could be created in which non-Annex I Parties could report on the implementation of projects and programmes developed in response to needs identified in their TNAs.

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
Technology information							
PI-TI-01	Training programmes and workshops for building capacity in technology information	Input	'to build capacity'	Multilateral: GEF, UNDP, UNEP, UNIDO	Depending on common capacity-building typology[a]	None	Medium feasibility Medium relevance
PI-TI-02	National communications containing information on technology transfer activities	Input	'to make available information through national communications'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	All Parties	High feasibility High relevance
PI-TI-03	Information on maintaining, updating and developing TT:CLEAR	Process	'to maintain, update and further develop TT:CLEAR'	Secretariat	No additional resource requirements	None	High feasibility High relevance
PI-TI-04	Technology information centres and networks connected to TT:CLEAR	Output	'to network with technology information centres'	Secretariat	No additional resource requirements	None	High feasibility High relevance

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-TI-05	Users of TT:CLEAR from developing countries	Outcome	'to increase the number of users (of TT:CLEAR)'	Secretariat	No additional resource requirements	None	High feasibility High relevance
Enabling environments							
PI-EE-01	Performance against World Bank governance indicators	Input	'to enhance legal systems (including those related to trade and intellectual property rights)'	World Bank and/or WIPO	Pending information from WIPO[d]	None	Low feasibility High relevance
PI-EE-02	Volume of joint R&D opportunities	Input	'to promote joint research and development'	Mitigation: IEA (or consolidated via TT:CLEAR) Adaptation: CGIAR (or consolidated via TT:CLEAR)	Pending information from IEA and CGIAR and/or a decision to use an alternative indicator concerned with information posted by government agencies on TT:CLEAR[e]	All Parties	Medium feasibility High relevance

[d] During testing it was realized that the related synthesized objective is not reflected well by this indicator. Further consultations on this subject with WIPO revealed that it is not easy to find a single indicator reflecting the synthesized objective, owing to its wide scope. The Expert Group on Technology Transfer (EGTT) proposes to continue its consultations with WIPO. While an outcome is pending, the EGTT judges the feasibility to be low.

[e] Consultation with IEA and CGIAR suggests that it would be difficult or impossible to collect the data required. The indicator could be reformulated as 'Volume of joint R&D opportunities for ESTs posted by government agencies on TT:CLEAR'. The secretariat could develop a data sheet for it. The feasibility of this alternative indicator would be medium.

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-EE-03	Presence of clear policy guidelines on how to move from R&D to commercialization of ESTs	Input	'to promote transfer of publicly owned technologies'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	Non-Annex I Parties	Low feasibility Low relevance
PI-EE-04	Bilateral and multilateral programmes that have helped developing countries develop and implement regulations for promoting ESTs	Input	'to strengthen regulatory frameworks'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	All Parties	Low feasibility Medium relevance
PI-EE-05	Presence of tax preferences and incentives on imports/exports of ESTs	Output	'to utilize tax preferences'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	All Parties	Low feasibility Medium relevance

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-EE-06	Volume of export credits	Output	'to utilize tax preferences'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	Annex I Parties	Low feasibility High relevance
PI-EE-07	Mention of transfer of EST in NSDS	Output	'to integrate technology transfer into national policies'	UN-DESA or secretariat	One month's FTE time investment at the appropriate level, guided by a senior staff member	None	High feasibility Medium relevance
PI-EE-08	Rating of investment climate according to World Bank business indicators	Output	'to create an environment conducive to investment'	World Bank	No additional resource requirements[f]	None	High feasibility Medium relevance
PI-EE-09	Percentage of government procurement budget allocated to ESTs	Output	'to explore preferential government procurement'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	Non-Annex I Parties	Low feasibility High relevance

[f] The EGTT originally considered using the World Bank's World Business Environment Survey, which has evolved over the past 10 years. A more up-to-date indicator would be the investment climate as measured by the Doing Business indicators of the World Bank or the results of its Enterprise Surveys. These are also indicators of the quality of the business environment in different countries. In either case, the feasibility would be high.

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-EE-10	Degree of disclosure and transparency in the approval process	Process	'to explore transparent and efficient approval procedures'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	Non-Annex I Parties	Low feasibility Medium relevance
PI-EE-11	Studies that explore barriers, good practices and recommendations for ESTs	Output	'to prepare technical studies on developing enhanced enabling environments'	Secretariat	No additional resource requirements	None	Medium feasibility Low relevance
PI-EE-12	Percentage of participation in partnerships	Input	'to cooperate closely with public and private partnerships'	UN-DESA or secretariat	One month's FTE time investment at the appropriate level, guided by a senior staff member	None	High feasibility Medium relevance
Capacity-building							
PI-CB-01	Financial resources for capacity-building	Input	'to implement or support capacity-building activities for the development and transfer of technologies in developing country Parties'	Multilateral: IGOs	Depending on common capacity-building typology,[a] but preparatory work by a consultant is estimated at 20 days	None	Medium feasibility High relevance

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-CB-02	Report on needs and priorities for capacity-building	Process	'to report on capacity-building needs and experiences of developing country Parties relating to the development, deployment, diffusion and transfer of technologies'	NCSAs, NCs, NAPAs, TNAs	Depending on common capacity-building typology,[a] but preparatory work by a consultant is estimated at 20 days	Non-Annex I Parties, LDCs	Low feasibility Medium relevance
PI-CB-03	Participants and experts in training programmes for the development and transfer of technologies	Output	'to provide training on ESTs in developing country Parties' and 'to develop and implement standards and regulations for ESTs'	NCSAs, NCs	Depending on common capacity-building typology,[a] but preparatory work by a consultant is estimated at 30 days	Non-Annex I Parties	Low feasibility High relevance

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-CB-04	National and regional institutions operating as centres of excellence for the development and transfer of technologies	Output	'to establish or strengthen capacity for the development and transfer of technologies in institutions of developing country Parties'	NCs	Depending on common capacity-building typology,[a] but preparatory work by a consultant is estimated at 30 days	Non-Annex I Parties	Low feasibility High relevance
Mechanisms for technology transfer[g]							
PI-MECH-01	Innovative public–private financing mechanisms and instruments	Output	NA, but the sub-theme[h] is labelled 'Innovative options for financing the development and transfer of technologies'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	All Parties	Low feasibility High relevance
PI-MECH-02	Report on cooperation between the Convention and other multilateral environmental agreements	Output	NA, but the sub-theme is labelled 'Possible ways and means to enhance cooperation with relevant conventions and intergovernmental processes'	Secretariat	No additional resource requirements	None	High feasibility High relevance

Table 3 (continued)

[g] It was not possible to develop synthesized objectives for the sub-themes under this key theme, hence the use of the abbreviation NA (not applicable).
[h] Four sub-themes under the mechanisms for technology transfer theme of the framework are included in decision 3/CP.13, annex II.

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-MECH-03	Report on references to objectives of other multilateral environmental agreements	Output	NA, but the sub-theme is labelled 'Possible ways and means to enhance cooperation with relevant conventions and intergovernmental processes'	NCs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	All Parties	Medium feasibility High relevance
PI-MECH-04	Barriers to and good experiences in the development of endogenous technologies	Output	NA, but the sub-theme is labelled 'Promotion of endogenous development of technology through the provision of financial resources and joint research and development'	NCs, NAPAs	Part of the time investment needed to collect data for all relevant performance indicators from national communications through the preparation of a synthesis report	Non-Annex I Parties, LDCs	Medium feasibility High relevance
PI-MECH-05	Report on guidance for reporting on joint R&D needs	Input	NA, but the sub-theme is labelled 'Promotion of collaborative research and development on technologies'	Secretariat	No additional resource requirements	None	High feasibility High relevance

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
Financial flows[i]							
PI-FIN-01	Total annual global investment and financial flows in climate change mitigation technologies	Input	NA	Secretariat	Preparatory work by a consultant: 10–15 days	All Parties	Medium feasibility High relevance
PI-FIN-02	Total annual global investment and financial flows in climate change adaptation technologies	Input	NA	Secretariat	Preparatory work by a consultant: 10–15 days	All Parties	Medium feasibility High relevance
PI-FIN-03	Total annual investment and financial flows in climate change technologies – Convention financial mechanisms	Input	NA	GEF, secretariat	Preparatory work by a consultant: 20–30 days	All Parties	High feasibility High relevance

[i] Objectives have never been set within the technology transfer framework for activities and actions relating to financial flows, hence the use of the abbreviation NA (not applicable) for this theme.

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-FIN-04	Total annual investment and financial flows in climate change technologies – Kyoto Protocol flexibility mechanisms	Input	NA	UNEP, secretariat	Preparatory work by a consultant: 10–20 days	All Parties	High feasibility Medium relevance
PI-FIN-05	Total annual investment and financial flows in climate change technologies – bilateral sources	Input	NA	OECD	Preparatory work by a consultant: 10–20 days (up to 30–45 days)	All Parties	Medium feasibility Medium relevance
PI-FIN-06	Total annual investment and financial flows in climate change technologies – national sources	Input	NA	NCs	Preparatory work by a consultant: 40 days (up to 100 days)	All Parties	Medium feasibility Medium relevance
PI-FIN-07	Total annual investment in climate change technologies – multilateral sources	Input	NA	World Bank, regional development banks, OECD	Preparatory work by a consultant: 40–60 days	All Parties	Medium feasibility Medium relevance

Table 3 (continued)

Code (ID)	Performance indicator – name (in short)	Performance indicator category	Related synthesized objective	Data sources	Resource requirements for data collection	Parties' direct involvement in providing data	Feasibility (high, medium or low) Relevance to synthesized objective (high, medium or low)
PI-FIN-08	Total annual investment and financial flows in climate change technologies – private sources	Input	NA	UNCTAD, OECD, UNEP	Preparatory work by a consultant: 100–150 days	All Parties	Medium feasibility Medium relevance

Abbreviations: CGIAR = Consultative Group on International Agricultural Research, ESTs = environmentally sound technologies, FTE = full-time equivalent, GEF = Global Environment Facility, IEA = International Energy Agency, IGOs = intergovernmental organizations, LDCs = least developed countries, NA = not applicable, NAPAs = national adaptation programmes of action, NCs = national communications, NCSAs = national capacity self-assessments, non-Annex I Parties = Parties not included in Annex I to the Convention, NSDS = national sustainable development strategies, OECD = Organisation for Economic Co-operation and Development, R&D = research and development, TNAs = technology needs assessments, TT:CLEAR = technology information clearing house, UNCTAD = United Nations Conference on Trade and Development, UN-DESA = United Nations Department of Economic and Social Affairs, UNDP = United Nations Development Programme, UNEP = United Nations Environment Programme, UNIDO = United Nations Industrial Development Organization, WIPO = World Intellectual Property Organization

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Annex II

The technology transfer framework in detail: relating a set of candidate performance indicators to clear objectives

1. The Expert Group on Technology Transfer (EGTT) has followed the approach described in chapter IV A of this document to develop a set of possible performance indicators to monitor and evaluate the effectiveness of the implementation of the technology transfer framework. The results are presented below.

1. Synthesized objectives of the technology transfer framework

2. The technology transfer framework consists of the following elements:

(a) Key themes and areas for meaningful and effective actions, each of which is divided into definition, purpose and implementation (decision 4/CP.7, annex, paras. 3–28);

(b) The set of actions set out in decision 3/CP.13, annex I (paras. 8–24).

3. Taken together they express the vision of the Conference of the Parties (COP) regarding the key themes, from means (methods to achieve objectives) to ends (achievement of objectives) or a combination at any point along the continuum (impacts, outcomes, outputs, processes and inputs). This vision needed to be rendered in less abstract intentions and objectives, in order to create a proposed list of objectives indicating the Parties, organization or group responsible for the objective and the characteristics of the time frame of the objective.

4. The next step was to identify overlaps in the objectives and to combine similar intentions or objectives of the different parts of the technology transfer framework, in order to produce synthesized objectives (see box 2 of this document). For each of the synthesized objectives one or more indicators were suggested at this stage.

2. Regrouping candidate performance indicators by stakeholder and indicator category

5. In theory, each key stakeholder of the Convention (Parties, intergovernmental organizations (IGOs), etc.) could have a similar policy vision for the development and transfer of technologies (with related strategic and operational goals, supported by policy instruments). Therefore the selected indicators within the context of this work would be in line with the vision and goals of each of these key stakeholders. If a key stakeholder goes beyond this common vision under the Convention, it might be necessary to use additional performance indicators to monitor and evaluate the effectiveness of its related policymaking.

6. For the institutions and bodies within the framework of the Convention (the COP, the subsidiary bodies, the EGTT, etc.) it was taken for granted that the objectives and indicators were in line with what is or was feasible in terms of vision and goals at the time.

7. It was important to regroup the suggested indicators by stakeholder, in order to identify what would be expected from each stakeholder according to the technology transfer framework. To complete the overview of performance indicators, another regrouping by indicator category (input, process, output, outcome, impact) was made. It was then possible to observe where the emphasis has been put within the technology transfer framework, from means (input, process) to ends (output, outcome, impact).

8. These steps in the process – regrouping performance indicators by stakeholder and indicator category – resulted in the following number of indicators derived from the objectives as outlined by the technology transfer framework:

(a) Twenty indicators for the key theme technology needs and needs assessments;

(b) Nine indicators for the key theme technology information;

(c) Seventy-five indicators for the key theme enabling environments;

(d) Thirty-four indicators for the key theme capacity-building;

(e) Twenty-three indicators for the key theme mechanisms for technology transfer.

9. Some of these indicators were no longer relevant (e.g. whether a workshop on technology needs assessments (TNAs) was organized in 2002). Furthermore, at a later stage, it remained to be seen if it would be possible to formulate the indicators in a specific, measurable, achievable, relevant and time-bound manner.

10. Table 4 provides an overview of the number of indicators by category for each key theme of the technology transfer framework; it is evident that the number of indicators varies widely across the key themes.

11. The input indicators column shows a large number of indicators for the key theme enabling environments. It is not surprising that there are so many potential indicators, since this theme is vast and covers several arenas of regulatory enforcement, trade, law, governance, and economic and fiscal policymaking. It is also related to the fact that enabling environments are inputs into and provide the impetus for technology transfer. In that sense, several of the output indicators can also be considered input indicators or process indicators, depending on how these terms are defined. Regarding the outcome indicators, it can be observed that there are no, or almost no, outcome indicators for the key themes technology needs and needs assessments, technology information and mechanisms for technology transfer.

Table 4. An overview of the number of indicators by category for each key theme of the technology transfer framework

	Input indicators	**Process indicators**	**Output indicators**	**Outcome indicators**
Technology needs and needs assessments	7	3	9	1
Technology information	2	4	2	1
Enabling environments	30	3	28	14
Capacity-building	6	7	11	10
Mechanisms for technology transfer	3	1	19	-

12. Regrouping the indicators by stakeholder was more difficult, because the identification of stakeholders under the different key themes in the technology transfer framework is diverse. There was a need to assign responsibilities in a unique way.

3. Considerations about the causal relationship chain, as set out in decision 4/CP.7

13. The annex to decision 4/CP.7 provides a definition and a purpose for each of the key themes of the technology transfer framework. It was useful to reflect on this initial overall vision for each of the key themes of the technology transfer framework, as it was a starting point for looking at the causal relationship chain.

14. The final set of key indicators needed to target priorities as expressed by the existing vision and the actual formulated objectives. A chain of causality needed to be developed and discussed, linking impacts, outcome and output with objectives.

15. Taking these considerations into account, goals were derived from the definition and the purpose set out in decision 4/CP.7 (box 3).

Box 3. Goals derived from the annex to decision 4/CP.7

Technology needs and needs assessments
A set of country-driven activities to identify and determine the mitigation and adaptation technology priorities of Parties not included in Annex II to the Convention (non-Annex II Parties).

Technology information
Generation and flow of, access to and quality of technical, economic, environmental and regulatory information.

Enabling environments
Government actions, such as fair trade policies, removal of technical, legal and administrative barriers to technology transfer, sound economic policy, regulatory frameworks and transparency, to create an environment conducive to private- and public-sector technology transfer.

Identification and removal of barriers at each stage of the process.

Capacity-building
Process to build, develop, strengthen, enhance and improve existing scientific and technical skills, capabilities and institutions in non-Annex II Parties, to enable them to assess, adapt, manage and develop environmentally sound technologies.

To strengthen capacities of non-Annex II Parties to promote the widespread dissemination, application and development of environmentally sound technologies.

Mechanisms for technology transfer
To facilitate the support of financial, institutional and methodological activities.

Technology needs and needs assessments

16. It can be observed that in the definition in the annex to decision 4/CP.7 the focus is mainly on Parties not included in Annex II to the Convention (non-Annex II Parties), with input from Annex II Parties, IGOs and the secretariat. A causal relationship chain from this input through process to output and outcome could be envisaged.

17. However, the link between output (a TNA) and outcome (technologies from TNAs implemented) is rather weak. This is one of the reasons why in annex I to decision 3/CP.13 under the key theme mechanisms for technology transfer, the sub-theme innovative options for financing the development and transfer of technologies was formulated.

Technology information

18. From the definition in the annex to decision 4/CP.7 it is clear that the focus is on the means that serve to establish an efficient information system. Furthermore, it can be concluded from the objectives in the technology transfer framework that the main responsibility is with the secretariat to operationalize the information system, and not directly with the Parties, IGOs or other stakeholders. However, since

Parties direct the actions and activities of the secretariat, there is a necessary interrelationship. Therefore, it presents a challenge to see whether a system for monitoring and evaluating the performance of the technology information component can be set up without targeting the stakeholders. It is from these stakeholders (Parties and IGOs) that the institutions and bodies within the framework of the Convention (the COP, subsidiary bodies, the EGTT and the secretariat) expect input.

19. Taking these considerations into account, a causal relationship chain could be envisaged with related indicators for the stakeholders within the framework of the Convention (the COP, subsidiary bodies, the EGTT and the secretariat) and for the stakeholder IGOs and Parties.

20. The quality and efficiency of the information system, as reflected in the purpose set out in paragraph 9 of the annex to decision 4/CP.7, could be monitored and evaluated through the indicator P1-T1-03, "Synthesis report with information on maintaining, updating and developing TT:CLEAR, addressing gaps and user needs made available by the secretariat and considered by the subsidiary bodies".

Enabling environments

21. From the goal formulated in box 3, it is clear that the focus is on government actions, which create an environment conducive to private- and public-sector technology transfer. Furthermore, it can be concluded from the objectives in the technology transfer framework that the main responsibility is with the Parties and not with the IGOs, the secretariat or the other stakeholders. A long list of indicators could be identified and linked to a complex causal relationship web. It remains to be seen if and how a simple system for monitoring and evaluating activities and actions carried out under the enabling environments theme can be set up.

22. This long list of indicators needed to be narrowed down to a smaller subset of useful and measurable indicators. Most of the outcome indicators measure volume of technology transfer, either in terms of numbers of technologies or United States dollar value. It may not always have been feasible or possible to separate out the various modes of technology transfer.

Capacity-building

23. From the goal formulated in box 3, it is clear that the focus is on strengthening capabilities in non-Annex II Parties, by developing scientific and technical skills, capabilities and institutions. Furthermore, it can be concluded from the objectives in the technology transfer framework that the responsibility for this work lies with various stakeholders.

24. Regarding the preliminary set of indicators derived from the objectives in the technology transfer framework, the following remarks can be made:

(a) There are objectives which could have been moved to other key themes;

(b) There are various outcome indicators relating to the improved adoption of energy efficiency and renewable energy technologies, and to adaptation projects or the adoption of development and transfer technologies in general, that could be merged into one indicator.

Mechanisms for technology transfer

25. From decision 4/CP.7 and decision 3/CP.13, it is clear that the objective of the mechanisms theme and its four sub-themes[1] is to operationalize the framework by facilitating the support of financial, institutional and methodological activities. The annex to decision 4/CP.7 refers to the establishment of the EGTT as an institutional arrangement for technology transfer.

4. Check against earlier proposals

26. Proposals from Parties of possible performance indicators are contained in document FCCC/SBI/2008/MISC.1 and Add.1 and summarized in document FCCC/SBI/2008/7. A review of these performance indicators revealed that they:

(a) Are included in the list of candidate performance indicators;

(b) Target the very short term;

(c) Emphasize a number of (new) objectives;

(d) Need to be rendered in clearly formulated separate objectives.

[1] Innovative options for financing the development and transfer of technologies; possible ways and means to enhance cooperation with relevant conventions and intergovernmental processes; promotion of endogenous development of technology through provision of financial resources and joint research and development; and promotion of collaborative research and development on technologies.

Annex III

Standard methodological sheet

Description of the performance indicator

Name	Brief title
Brief definition	Short and unique definition of what will be measured.
Detailed description	An elaboration of the brief definition, in which notions and concepts are explained so that the performance indicator cannot be interpreted ambiguously.
Unit of measurement	Unit or dimension of the data (abbreviation and in full) that make up the performance indicator, such as number, percentage, currency, etc.
Classification	Place in the framework for monitoring and evaluating the effects of policies: input, process, output, outcome or impact.
Key theme	In relation to which key theme of the technology transfer framework (technology needs and needs assessments, technology information, enabling environments, capacity-building or mechanisms for technology transfer) the performance indicator has been formulated.
Code (ID)	This code is an identification number used during follow-up, for example in a database.

Policy relevance

Purpose	What is the policy relevance of the performance indicator? In other words, to which goal/objective/intention/activity/action of the technology transfer framework is the performance indicator related?
Relevance to sustainable development	Performance indicators for measuring and evaluating the effectiveness of the technology transfer framework should take into account the contribution to sustainable development of the performance indicator in question. This needs to be mentioned explicitly in the methodological sheet.
International conventions and agreements	References to international conventions and/or agreements, if any.
International targets and recommended standards	If available, this information should be provided so that the differences between the targets/standards can be understood.
Linkages to other performance indicators	For a better understanding of the cross-linkages within and between the key themes of the technology transfer framework.

Methodological description

Underlying definitions and concepts	The description of the performance indicator may need further clarification with regard to underlying definitions and concepts.
Limitations of the performance indicator	In addition to defining what a performance indicator is measuring, the limitations of the performance indicator also have to be explained. For example, how do external effects influence outcome and impact indicators? Is it possible to assess the efficiency or effectiveness with the indicator?
Status of the methodology	This box needs to address whether the performance indicator is 'common', in other words if the methodology is well developed.

Assessment of data

Monitoring of data	Detailed description of which data are needed and how they can be collected.
Data availability	Where and when are the data available? Would a comparison in terms of time and between countries/regions be useful?
Data collection limitations	For example, scale, actualization, accuracy, periodicity, validity, privacy regulations, costs, etc.
References	Data source
Development of new data	If the data required for the performance indicator are not available, what steps could be taken to develop new data in the future?

Alternative definition(s) or performance indicator(s)

Second-best performance indicator	A performance indicator is formulated from a vision and objectives. If there are limitations in methodology, data collection, etc., it might not be possible to continue with this conceptual performance indicator. Therefore, it is advisable to formulate a second-best performance indicator.

References

Readings	References to related background information (books, journals, etc.).
Internet sites	References to Internet sites.

Factual data and evaluation

Factual data represented in a table	Reference to an annex containing the data, for example in an Excel file.

Factual data represented in a graph	Reference to an annex containing a representation of the data, for example in a graph.
Discussion	The factual data are discussed objectively. The discussion is a description of what is contained in the table and/or graph. When rendering the objectives less abstract, it needs to be reported if wording such as "in a position to do so", "as appropriate", "encouraged", has been omitted at an early stage in the 'unravel' exercise.[1]
Evaluation	This is an evaluation of the evolution of the performance indicator with regard to what can be expected, for example in relation to targets or standards.

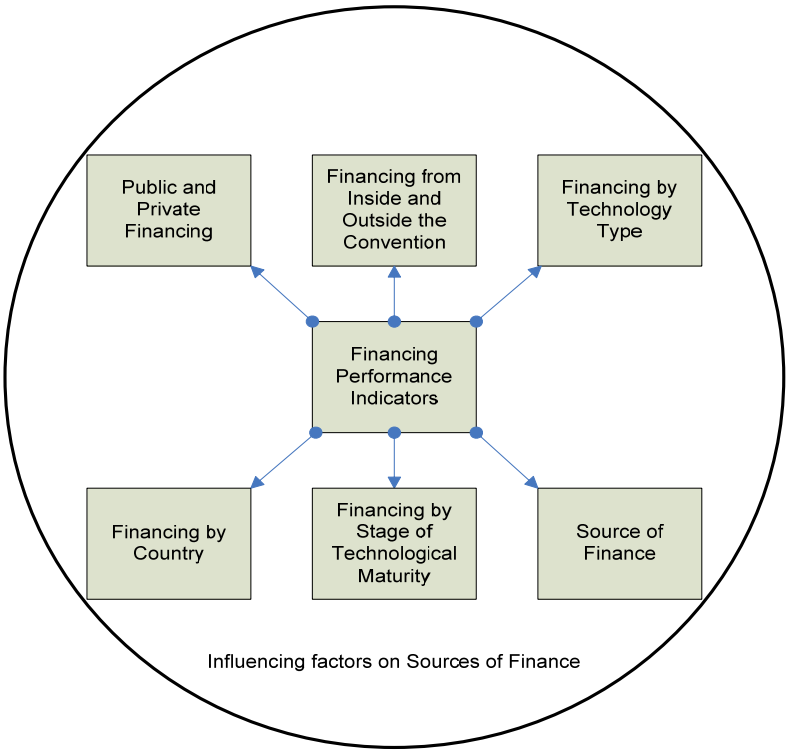
[1] An exercise where the components of a vision are made less abstract in order to design metrics and performance indicators that best reflect the intentions of the technology transfer framework.

Annex IV

Conceptual framework for selecting indicators for financial flows

1. There were several options available to the Expert Group on Technology Transfer (EGTT) for formulating indicators for financial flows for climate friendly technologies. Each option has particular benefits and allows for the evaluation of financing from a different perspective. Figure 4 illustrates some of the options that were considered.

Figure 4. Options for characterizing indicators for financial flows



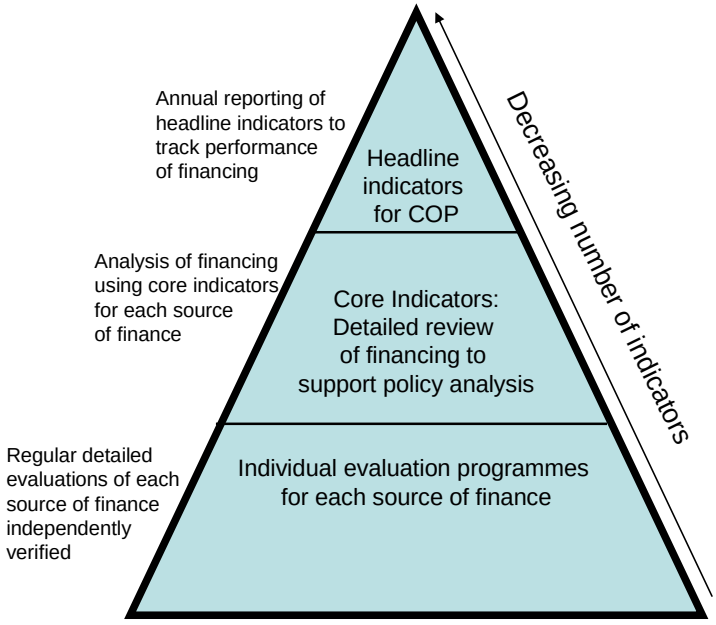
2. Figure 4 shows that all sources of finance (and therefore the indicators that monitor the performance of that source of finance) are set within a context of influencing factors, of which there may be many (see chapter VI of this document).

3. The split between public and private sources of financing is an important attribute to capture in a set of performance indicators because it allows policymakers to determine the overall effectiveness of public investment in mobilizing (or leveraging) private-sector investment. Similarly, the extent to which financing is occurring within and outside the Convention can provide useful information for policymakers on the role of the Convention as a catalyst for financing climate-friendly technologies.

4. Information on financing by technology type can be useful for exploring the extent to which least cost abatement is occurring in the economy and can be compared with estimates of future financing needs for key technologies. Similarly, by tracking the level of investment by stage of technological maturity, it is possible to evaluate whether there is under- or over-investment at particular technology stages and if policies and measures are facilitating technology development across the technology innovation chain.

5. Country-level data are very useful for understanding the national distribution of financing. These data may indicate where the barriers to financing are most pronounced and may help focus capacity-building efforts and support for the creation of enabling environments. Such information is important for national policy planning (e.g. technology needs assessments, national adaptation programmes of action) and may assist countries in maximizing the potential for investment in climate friendly technologies.

Figure 5. A possible system of nested indicators for sources of finance



Abbreviation: COP = Conference of the Parties.

6. The EGTT considered that indicators of individual sources of finance may allow for a more complete picture of financing. However, this was likely to result in a large number of indicators. The EGTT noted that it may be possible to nest indicators so that they could be aggregated and disaggregated to provide analysts, negotiators and decision makers at various levels with information on financial sources that is most suited to their needs. This would reduce the overall reporting burden and the number of indicators to be considered by the COP, while maintaining the ability to obtain a more detailed picture of the performance of financing for climate-friendly technologies. Figure 5 presents a potential model for nested indicators for sources of finance.

7. For these reasons, the EGTT decided to develop the indicators of financial flows in the first instance from a source of finance perspective rather than the other perspectives shown in figure 4.

Identifying influencing factors

8. The EGTT has adopted a widely used and accepted model of the relationship between performance indicators, which creates a framework for evaluating the causal chain of actions taken to implement the technology transfer framework. Under this model, society sets goals and allocates certain inputs (e.g. financial resources) that are used to create outputs (e.g. a business plan for technology deployment), which in turn lead to outcomes (e.g. installed capacity of the technology) and impacts (e.g. climate change impacts avoided, emission reductions) that should be consistent with the goals set by society.

9. These indicators are defined as direct indicators, but as the arrows in figure 2 in this document also illustrate, there is scope to create additional efficacy indicators that measure the relative performance across the whole chain. Performance may be measured in terms of efficiency, a function of inputs/outputs or outcomes; effectiveness, a function of the extent to which outcomes and impacts are consistent with societal goals; and relevance, a measure of the extent to which goals continue to reflect societal expectations.

10. The terms of reference for the work of the EGTT on performance indicators[1] call for not only indicators of financial sources (e.g. how much finance is available), but also indicators that reliably reflect what could be influencing these patterns of investment. This aspect of the terms of reference is interpreted as meaning that the EGTT was requested to seek indicators of factors that influence sources of finance. The major influencing factors on investment in research and development, demonstration, and deployment stage technologies were therefore mapped, as well as the influencing factors for each source of finance.

[1] FCCC/SBSTA/2008/INF.2, annex I.

Annex V

Experiences and lessons learned from monitoring and evaluating effectiveness outside the Convention: summary of the major findings

1. Experiences with performance indicators under the Convention are rather limited. Outside the Convention, there are several approaches for defining and structuring performance indicators, with differing points of emphasis (e.g. the emphasis placed by organizations on measuring outcomes and impacts). Many organizations (international organizations, donors and governments) have developed their performance indicators around similar general structures, but terminology often differs; thus the development of performance indicators for the development and transfer of technologies needs to be streamlined across countries and stakeholders.

2. The general framework that most organizations use as a basis for developing their performance indicators is similar to that shown in figure 2 of this document. Performance indicators are seen as measures of project or programme impacts, outcomes, outputs and inputs that are monitored during and after implementation to assess progress towards or achievement of project or programme objectives. Most of the tools, methods and approaches present variations of this format.

3. Some organizations favour a broad suite of monitoring and evaluation tools and methods, depending on the emphasis (e.g. performance indicators, rapid reviews, impact evaluations, performance audits).[1] Some countries focus on public service wide or sectoral monitoring and evaluation systems, while others have developed performance indicators for international initiatives, such as poverty reduction strategy papers and the United Nations Millennium Development Goals.

4. Some donors and agencies, for example the European Union and the Global Environment Facility, base their evaluation on so-called efficacy indicators that include relevance (alignment with the development objective), significance (of issues addressed and lessons derived), efficiency (ratio of outputs/inputs), effectiveness (outputs per outcome) and/or sustainability (persistence of benefits over time after the end of the project or programme).

Learning curve

5. Developing and testing performance indicators can be a long process; based on experience gained, the set of performance indicators can then be improved. This can be seen as a continuous feedback loop. It could also be seen as a participative design process involving key stakeholders, taking into account the Bellagio Principles.[2]

6. However, simply creating monitoring and evaluation systems with a set of performance indicators is not enough; they must become established, through, for example, government involvement. This is necessary to ensure the sustainability of the performance measurements at all levels, in particular at national level.

Framework with causal relationship

7. It is important not to lose the causal relationship when monitoring and evaluating the effects of policies. Sometimes performance indicators do not follow the logical framework and there is a tendency to proliferate indicators that may not eventually be measured. Therefore there is a need for a comprehensive structure for presenting the performance indicators.

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[1] Mackay K. 2006. *Institutionalization of Monitoring and Evaluation Systems to Improve Public Sector Management*. Washington, D.C.: World Bank.

[2] The Bellagio Principles for Assessment were developed by the International Institute for Sustainable Development to guide work on performance indicators. They are available at <http://www.iisd.org/measure/principles/progress/bellagio_full.asp>.

Performance indicators

8. Most experiences are related to input, processes or activities, output, some outcome, little impact, and quantitative as well as qualitative indicators. Attention should be paid to the measurement of outcomes and impacts, but performance indicators related to sustainable development should also be guided by well-structured objectives.

9. The outcomes of the implementation of the technology transfer framework should reflect the effects on the target groups (Parties included in Annex II to the Convention (Annex II Parties), Parties not included in Annex I to the Convention (non-Annex I Parties), intergovernmental organizations (IGOs) and the secretariat) and (the change in) their behaviour should be reflected in the performance indicators. For example, based on preliminary findings of the 'unravel' exercise,[3] an outcome indicator for technology needs assessments (TNAs) could be the number of identified technology needs implemented in a country (Party) or by a programme (IGO).

10. Impact indicators to monitor and evaluate the effectiveness of the implementation of the technology transfer framework should cover the three pillars of sustainable development (environmental, social and economic), in addition to reflecting the institutional dimension. Impact indicators should reflect the contribution made to social welfare.

11. The 'unravel' exercise might benefit from regrouping the performance indicators by category (input, process, output, outcome or impact indicator), which would enable an overview to be given, demonstrating to which category of indicators the agreed objectives can be related.

12. One of the lessons learned from the experiences with performance indicators is that an indicator might have different meanings in different countries, as the meaning will depend on the state of development of a country, the nature of the economy, its geography and resource base, etc. Hence it is important to take disparity into account when dealing with cross-country comparisons.

13. There should be an emphasis on making indicators specific, measurable, achievable, relevant and time-bound.

Data availability

14. The final selection of the set of performance indicators depends on data availability, time constraints and cost–benefit considerations. Attention should be paid to arrangements for data collection and monitoring and evaluation capacity that match demand for the development and use of the indicators.

15. The use of baseline data, the setting of targets, data collection systems and quantitative and qualitative analysis should be included in performance measurements. The resulting monitoring plan should include information on data sources, the method of data collection, the frequency of data collection and analysis, who is responsible for the data collection and analysis and who will use the information.

Stakeholders

16. The exercise might benefit from regrouping the performance indicators by stakeholder (Annex II Parties, non-Annex I Parties and IGOs). An overview could thus be given that demonstrates the expectations towards the stakeholders, according to the objectives. A rating or weighting system could help to compare results across stakeholders, but a balance would be needed between indicators that target specific stakeholders and indicators that are generic enough to be effective at various levels.

17. Lack of appreciation of the usefulness of monitoring and evaluation results leads to low demand, so awareness becomes crucial. While the supply side (e.g. training, manuals, etc.) is necessary, the demand side for results will ensure that the performance indicators are used. Monitoring and evaluation

[3] An exercise where the components of a vision are made less abstract in order to design metrics and performance indicators that best reflect the intentions of the technology transfer framework.

should then link up with the budget process, national planning, the management of institutions and the programmes to be appreciated, supported and sustained.

Capacity-building

18. Ensuring continuity requires capacity to be built for undertaking monitoring and evaluation and utilizing results. The creation of robust data systems and procedures for sharing information and reporting involves capacity-building and the institutionalization of monitoring and evaluation systems.

19. In introducing performance indicators, it is best to start with what is available by building on current monitoring and evaluation practices and capacities. Developing countries might experience specific challenges in implementing monitoring and evaluation systems, in terms of both creating data systems and utilizing results, which would have resource implications for setting up and maintaining monitoring and evaluation systems. Development associations – national and regional – are known to be useful vehicles for creating awareness and sharing knowledge of monitoring and evaluation. Country ownership is crucial for sustainability.

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