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DEVELOPMENT AND TRANSFER OF TECHNOLOGIES

STATUS OF THE CONSULTATIVE PROCESS (DECISION 4/CP.4)

Possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention

Note by the Chairman

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I. INTRODUCTION

A. Mandate

1. At its eleventh session, the Subsidiary Body for Scientific and Technological Advice (SBSTA) requested the Chairman, with the assistance of the secretariat, to make every effort, before the twelfth session of the SBSTA, to identify possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention (FCCC/SBSTA/1999/14, paragraph 75 (g)).

2. It further requested the Chairman to take into account the results of the three regional workshops on the consultative process on transfer of technology (FCCC/SBSTA/1999/11, FCCC/SBSTA/2000/INF.2 and FCCC/SBSTA/2000/INF.6), submissions by Parties on how issues and questions listed in the annex to decision 4/CP.4 (FCCC/CP/1998/16/Add.1) should be addressed, and the special report of the Intergovernmental Panel on Climate Change (IPCC) on methodological and technological issues in technology transfer.

B. Scope of the note

3. This note responds to the above mandates. It reflects the evolution of the overall discussions within the consultative process. It also contains a synthesis of views submitted by Parties and identifies possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention. It does not contain information on the special report of the IPCC noted in paragraph 2. A copy of the special report will be made available to Parties at the twelfth session of the SBSTA by the IPCC.

C. Possible action by the SBSTA

4. The SBSTA may wish to consider, prioritize and develop a more focused list of possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention. It may wish to provide guidance to the Chairman and the secretariat on further activities under the transfer of technology consultative process.

II. POSSIBLE ELEMENTS OF A FRAMEWORK FOR MEANINGFUL AND EFFECTIVE ACTIONS TO ENHANCE THE IMPLEMENTATION OF ARTICLE 4.5 OF THE CONVENTION

A. Introduction

5. The secretariat organized three regional workshops, one for Africa, held in Arusha, United Republic of Tanzania, from 16 to 18 August 1999, one for Asia and the Pacific, held in Cebu, the Philippines, from 17 to 19 January 2000, and one for Latin America and the Caribbean, held in San Salvador, El Salvador, from 29 to 31 March 2000. The agenda of each regional

workshop was designed to correspond to the issues and questions contained in the annex to decision 4/CP.4, taking into account the regional and global perspectives of the transfer of technology. The workshops promoted the sharing of information and ideas on the special situations and needs of countries and regions with respect to technology transfer and the discussion of possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention.

6. The workshops were made possible through the financial and/or in-kind support of the governments of Australia, Austria, Canada, Finland, France, Germany, Japan, the Netherlands and the United States of America, as well as the support of the United Nations Environment Programme. The workshops were organized by the secretariat with the kind assistance of the governments of the United Republic of Tanzania, the Philippines and El Salvador.

7. The two last mentioned regional workshops were conducted in cooperation with two regional industry seminars on technology diffusion organized by the Climate Technology Initiative (CTI). This cooperation was of significant assistance to the consultative process. In particular, using its regional network and capacities, the CTI industry seminars helped obtain a broad range of inputs from the private sector in these regions. A further industry seminar on technology diffusion in Eastern Europe was also organized by the CTI in cooperation with the UNFCCC secretariat in Bratislava, Slovakia, from 14 to 17 July 1999. This seminar provided valuable inputs to the process from the perspectives of the Eastern European countries in transition.

8. The results of the three regional workshops demonstrate a process of evolution. At the first regional workshop, held in Africa (FCCC/SBSTA/1999/11), participants were able to exchange their views and experience regarding technology cooperation programmes and projects, as well as to identify key barriers to the transfer of environmentally-sound technologies in the African context. The Chairman said he considered this workshop a good start to the consultative process and noted that the experience gained from this workshop would be very useful for the preparation of the next two regional workshops.

9. The discussion in this workshop focused largely on issues and concerns of “the <u>what</u>” (what are the technology needs, what are the barriers, what are the roles of different stakeholders, etc.?).

10. The second regional workshop, held in Asia and the Pacific (FCCC/SBSTA/2000/INF.2), began to address questions of “the <u>how</u>” (e.g., how can technology needs be identified and assessed, how can barriers be identified and addressed, how can different stakeholders participate, and how can these ideas be brought together in a framework for action under the UNFCCC. Based on experience gained from the first regional workshop, the Chairman, with the assistance of the secretariat, initiated a new approach by establishing three working groups. The three working groups considered identical sets of issues and questions based on the annex to decision 4/CP.4. In the working groups and the final session of the workshop, the participants

were able to discuss and provide specific ideas on possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention.

11. At the third regional workshop, held in Latin America and the Caribbean (FCCC/SBSTA/2000/INF.6), the discussions continued on "how" technology transfer under the Convention could be sustainable and effectively carried out between Parties. Particular attention was paid to the role and function of the private sector in technology transfer for the region.

12. During all the workshops, including working groups and plenary sessions, the Chairman did not attempt to hold a debate or to reach agreement among participants on the appropriateness, practicability or acceptability of the ideas emerging from the working groups or the final session or how such ideas relate to a framework.

13. This note summarizes the progress of the consultative process, taking into account the regional workshops, submissions from Parties and the IPCC special report on methodological and technological issues in technology transfer. It comprises the following four sections:

- The general approach to technology transfer under the Convention;
- Issues of scope and accountability related to a framework for action;
- Possible objectives of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention;
- Possible elements of such a framework.

B. The general approach to technology transfer under the Convention

14. A broad consensus emerged among workshop participants on the essential building blocks of a framework. These shared views relate to a wide range of issues and questions raised in the context of decision 4/CP.4. Most participants appeared to agree that:

- The development and transfer of adaptation and greenhouse gas abatement technologies is a concern of many countries;
- The term "technology transfer" includes both "soft" and "hard" elements of technology;
- The role of governments is crucial, even though the transfer of technology usually involves many stakeholders and is a complex process;
- Most bilateral and multilateral projects and programmes in developing countries, including technology transfer activities, are undertaken primarily to alleviate poverty, stimulate economic and social development, reduce environmental pollution and improve public health. Integrating climate change into existing projects and programmes is a way of ensuring long-term climate-related benefits, whilst capturing near-term economic, social and environmental benefits. In turn, technology cooperation should be consistent with sustainable development priorities, should build on local knowledge and expertise, and should take into account the synergies between local environmental concerns and climate change objectives;

- For all governments, there should be firm linkage between overall development plans, commitments under the Convention, and a strategy to enhance the transfer of technology;
- Capacity-building is an important aspect of technology transfer;
- Country-specific, market-based technology transfer programmes are an effective way of enhancing the implementation of Article 4.5.

C. Issues of scope and accountability related to a framework for action

15. Central to the discussions throughout the regional workshops are uncertainties regarding issues of scope and accountability in relation to Article 4.5. One key question related to scope is, "Which actions should be recognized as fulfilling a Party's commitments under the Convention?" Another key question relates to accountability, " How can technology transfer be measured and reported upon under the UNFCCC?"

(a) Which actions should be recognized as fulfilling the commitments of Annex I Parties under Article 4.5?

16. Participants in the workshops expressed different views on what activities could or should be recognized as fulfilling commitments related to technology transfer under the Convention. Some participants from developing countries summed this up by asking the question, "What is the difference between technology transfer under the Convention and technology transfer outside the Convention?" At least two distinct views were presented.

17. One view is that any framework should deliver an outcome which is distinctly identified as responding to Article 4.5 of the Convention. This view places the onus on the governments of developed countries to take actions to fulfil their responsibilities under Article 4.5 and report upon activities undertaken and the outcome of these activities. Under this view, the technologies transferred under the Convention by government action would be distinct from those transferred by the private sector outside the Convention.

18. Several participants linked the scope of a framework to Article 11.1 of the Convention, which pertains to the provision of financial resources for technology transfer on a grant or concessional basis. These participants noted that technology transfer on such a basis requires an active government role in transferring technologies rather than reliance on the private sector.

19. An alternative perspective is that a framework should take a broader view of technology transfer, in light of the many changes and developments which have occurred since the Convention was drafted. An effective and sustainable framework to enhance technology transfer under the Convention must recognize and take into account these developments, including effective bilateral and multilateral technology transfer programmes. The proponents of this view believed that sustainable transfer of technology can only occur when there is a partnership between stakeholders in developed and developing countries. This view recognizes private sector actions, including those facilitated by government activity, as contributing towards meeting and commitments under the Convention.

(b) How can technology transfer under the UNFCCC be reported upon and measured?

20. In general, participants agreed that for all Parties to the Convention any framework should improve measuring, reporting and accounting procedures for technology transfer. There was, however, no common view of how best to measure technology transfer under the Convention and by which metric to evaluate these efforts (e.g., using financial indicators, technology indicators or market impact indicators). Further, there was a divergence of views on whether or not meaningful technology transfer goals could even be set.

21. It was suggested that one possible way to address this issue would be to revise the UNFCCC guidelines for Annex I Party national communications (decision 9/CP.2). However, Parties would need to consider the schedule for reporting and the level of detail.

22. It was noted that much more information on technology-related activities and projects exists than is reported in national communications and submissions. This information is available, or could readily be made available at the national level. Any framework should attempt to incorporate such information as it would be useful to Parties. Several participants suggested that a database of relevant projects be constructed and maintained to help stakeholders to learn from the experience of others. Such a database could be maintained by the secretariat and could contain a register of technology transfer projects recognized under the Convention.

D. Possible objectives of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention

23. While participants at the regional workshops did not reach agreement upon what constitutes a framework, they made significant progress in identifying objectives of a framework. Possible objectives could be:

- To enhance the coordination of the full range of stakeholders in different countries and regions and to engage them in cooperative efforts to accelerate the development and diffusion, including transfer, of environmentally-sound technologies (ESTs), know-how and practices to and between developing countries through technology cooperation and partnerships (public/public, private/public, private/private);

- To improve the flow of, access to, and quality and comparability of information relating to the development and transfer of ESTs under the Convention, including, for example, the systematic screening and dissemination of information on relevant technology research, development and demonstration projects;

- To build specific capacities relating to the development and transfer of technology including, for example, greater involvement of developing countries in research and development of climate-related ESTs, and to build capacities to fill any gaps in the coordination of national technology needs assessments (including prioritization exercises, training, institutional strengthening and financing);

- To improve the effectiveness of donor assistance to Parties in their efforts to achieve the objectives of the Convention; in particular, to integrate developing country technology priorities into the research and development, and technology demonstration activities of the Annex I Parties and to improve donor coordination on technology-related issues under the Convention;

- To assist Parties in distinguishing between Parties' efforts specifically related to technology transfer under Article 4.5 of the Convention and other activities not directly related to Article 4.5 commitments.

- To remove barriers to the development and transfer of ESTs, wherever they exist.

E. Possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention

24. There are at least two ways of presenting the large and diverse number of ideas and suggestions related to elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention as generated during the regional workshops. One approach is to compile all the various ideas for possible actions by various stakeholder, for example: All Parties, Annex II Parties; non-Annex I Parties; joint activities and partnerships; and intergovernmental actions. Such a compilation is contained in Annex I.

25. Another approach is to highlight a small number of ideas that received considerable attention at each workshop, particularly the last two workshops. The ideas presented below are those that received such attention. No priority is suggested by the order in which they are presented. They are presented to help Parties focus the consideration of a framework for meaningful and effective actions that might be agreed upon by COP 6.

26. The strengths and weaknesses of the ideas listed in Annex I or those described below have not been identified.

Technology needs and technology needs assessments

27. Technology needs assessments were discussed extensively at the workshops. It was suggested that Parties could consider developing cooperative programmes through which financial and technical assistance could be provided to developing countries to conduct technology needs assessments. Technology needs assessments could include technology impact analysis, identifying and prioritizing technology needs, and building appropriate institutional and human capacity for sustainable technology transfer. Such programmes could coordinate stakeholders from both donors and developing countries in the technology transfer process. The programmes could evaluate local EST needs and barriers to technology transfer by providing for processes that include all stakeholders, for example, government, business, technical institutions, and NGOs. The outcome of these needs assessments could be a prioritized set of technology needs and a portfolio of climate technology activities for both mitigation and adaptation.

28. It was noted that some developing countries, in particular those in the Asia and Pacific region, have completed needs assessments and/or compiled a list of technology needs. These countries suggested it is more important for them to move forward by developing and implementing action to respond to identified needs. Thus, this element would need to be flexible, allowing for the specific differences among regions and countries. The needs assessments was, however, of considerable interest to many African countries.

Technology information

29. The participants at the three regional workshops highlighted the central importance of access to, and the dissemination of, technology information. There were a number of suggestions for possible actions; two of these are as follows:

- Establish, in each developed country, a one-stop technology transfer “shop” to coordinate and implement technology transfer programs. These “shops” could assist with the preparation of projects and programmes to respond to priority needs for mitigation and adaptation;

- Develop inventories of available environmentally-sound technologies including those in the public domain as well as past and present technology transfer activities;

Capacity-building for technology transfer

30. Throughout the regional workshops and in particular the one in Africa, many suggestions on practical steps to build capacity for technology transfer were presented or discussed. Many of the ideas for possible elements of a framework for actions suggested at the regional workshops refer to capacity-building activities. Frequently, the purpose of such activities is to remove various kinds of barriers to the transfer of technologies, where they exist.

31. Discussions at the regional workshops frequently concerned various aspects of how to build the capacities of developing countries to enhance the transfer of technology. The following five key messages were particularly endorsed by participants at each of the workshops:

- Capacity-building activities which can most successfully help achieve and sustain effective technology transfer are those which measurably utilize and enhance existing endogenous capacities and technologies;

- Technology transfer does not solely concern so-called "hard technologies" but is almost always also about so-called "soft technologies" (e.g. know-how and practices). Indeed, sometimes it is exclusively about soft technologies. Transferring experience, knowledge, skills, know-how and practices is capacity-building;

- The assessment of existing capacities and the identification of gaps where capacity-building activities can be targeted is a critical step which must be incorporated

into the design of any framework. Existing projects incorporating country-driven, multi-stakeholder assessments of technology needs provide a useful model in relation to the assessment of capacity-building needs, especially those closely linked to technology transfer;

- Capacity-building through international bilateral or multilateral activities is usually a two-way process resulting in the building of capacities on both sides, i.e. the host country as well as the donor countries or organizations themselves. Greater efforts are needed to raise awareness of the many ways in which donor countries could support and channel resources to effectively build capacities. Any framework should also assist in building the capacities of the donor countries to make their contributions more effective;

- In practical terms, often the best way to build capacity is through demonstration or pilot projects. There are many good reasons for this, including: the simple benefits of learning by doing; the vertical coordination of a large number of decision makers and stakeholders which project experience brings about; creation and support for necessary "intermediaries"; the use of local consultants and contractors to enhance capacities; and the positive effect that projects have on the broader enabling environment.

32. Several suggestions for building various kinds of capacities to enhance technology transfer under the Convention are noted in the reports of the regional workshops and also in the compilation of submissions from Parties in annex II to this document.

33. The building of capacities to enhance technology transfer and to achieve other objectives of the Convention (e.g. greenhouse gas emission reductions, adaptation) are intricately interlinked. In other words, actions that would enhance the transfer of technologies are likely also to enhance the attainment of other goals under the Convention, and vice versa. Throughout the consultative process, participants were aware that issues relating to capacity-building are being considered in an integrated manner by the SBI and the SBSTA.

34. Capacity-building elements related to technology transfer that could be considered either under the technology transfer consultation process or in an “integrated capacity-building process” include assisting developing countries to:

- Identify technology needs;
- Address economic and financial barriers;
- Improve organizations and institutions;
- Strengthen human resources;
- Overcome technological barriers; and
- Access to technology information.

Transfer of technology mechanisms

35. Discussions at the workshops were predominantly oriented towards presentation and discussion of possible elements of a framework, rather than on the strengths and weaknesses of existing or possible new transfer of technology mechanisms. The Global Environment Facility made presentations at each workshop and participants had a chance to exchange views and share information on relevant projects in each region.

36. During the course of the workshops, a number of ideas were presented which some participants referred to explicitly as mechanisms or in other cases compared them to existing mechanisms. Examples can be found in the various background papers prepared for each of the three regional workshops. These are available on the secretariat web pages.

37. One theme which emerged at the workshops was that of "review bodies" or processes to facilitate the reporting and accounting of information relating to technology transfer projects. It was suggested that an *ad hoc* panel of experts be established possibly from the roster of experts. The panel or review bodies could monitor and review activities on technology transfer at the country level and help improve the international technology transfer process.

38. Several Parties referred to transfer of technology mechanisms in their submissions. Paragraphs 5-11 of annex II to this document summarizes the relevant views of Parties views. There is a wide divergence of opinion on what mechanisms are appropriate for technology transfer under the convention. Parties may wish to provide the Chairman with guidance on which suggestions on existing or new mechanisms, possible elements may potentially form an acceptable framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the convention.

Annex I

COMPILATION OF POSSIBLE ACTIONS BY DIFFERENT STAKEHOLDERS

Suggestions for possible actions by all Parties

1. The regional workshop participants generated several proposals regarding possible actions which could be undertaken by all Parties to enhance the transfer of technologies. These potential actions included the following:

- Governments should consider implementing legal, institutional and policy reforms as they relate to the transfer of technology. Parties should consider actions to make the above-mentioned systems more transparent and efficient;

- There is a need for financial reforms to improve the availability and accessibility of capital and financing for technology projects. In developed countries, reform could include enhanced promotion of foreign direct investment whereas in developing countries, reforms could include promotion of access to financing for ESTs. In general, the provision of increased financial support specifically to assist the development and transfer of ESTs to the region was noted as a key role for both developed and developing countries;

- Complex and overly bureaucratic procurement procedures are often cited as a significant barrier to private sector participation in technology projects in developing countries. Simplifying and streamlining these procedures would encourage greater private sector involvement in technology transfer projects which could result in higher quality and lower cost outcomes;

- The promotion of competitive globally-oriented markets is fundamental to increasing flows of high quality technologies and information. However, care must be taken to ensure sustainable development goals are not compromised;

- There is a need to link national policy actions with global issues. For example, countries should consider policies to influence the business practices of multinational enterprises through policies and programmes to encourage these entities to apply best practice standards in all countries where they operate;

- Sustainable technology transfer requires the establishment of proper enabling environments which are defined by stable, clear and coherent market signals including the clear protection of intellectual property rights;

- Information exchange is important for facilitating the transfer of technology. Both developed and developing country Parties should encourage the open exchange of information on technology and technology-related activities. These information

exchanges should also include information on adaptation technologies and on the social, environmental and human health impacts of climate technology programmes.

Suggestions for possible actions led by Annex II Parties

2. The regional workshop participants also suggested possible actions which could be undertaken by Annex II Parties to enhance the transfer of technologies to the region. These actions included the following:

- Develop and implement domestic programmes which discourage industries in Annex II countries from utilizing restrictive business practices. These efforts could also include reassessment of national development assistance programmes which promote tied aid;

- Enhance export credits and other instruments which provide incentives for the private sector to participate in the transfer of ESTs. These efforts should be targeted particularly at countries with low flows of foreign direct investment;

- Provide financial and technical assistance for developing countries to carry out needs assessments, including technology impact analysis, to identify and prioritize technology needs and develop a portfolio of climate technology actions for mitigation and adaptation;

- Develop and implement domestic actions and incentives in Annex II countries to promote the transfer of ESTs by the private sector;

- Enhance or develop linkages between the climate technology related research and development communities and the official development assistance communities within donor countries with a view to delivering support more efficiently to developing countries;

- Make available information on financing sources for ESTs and provide assistance to developing countries in accessing these resources;

- Examine options to boost the effectiveness of the private sector as an important and successful delivery vehicle for transferring technology for mitigation and adaptation technologies.

Possible actions led by non-Annex I Parties

3. The regional workshop participants also drew up a number of suggestions related to possible actions which could be undertaken by non-Annex I Parties to enhance the transfer of technologies to the region. These actions included the following:

- Identify and establish "focal points" to coordinate domestic technology transfer activities and actions related to the transfer of ESTs and develop a portfolio of climate technology actions (strategies) for mitigation and adaptation;

- Conduct technology needs assessments, including technology impact assessments, and ensure fair and equitable evaluation of local EST needs and of barriers to technology transfer by development and implementation of a transparent process with broad stakeholder consultation (government, business, technical institutions, NGOs). The outcome of these needs assessments should be a limited, prioritized set of technology needs and portfolio of climate technology actions;

- Build public awareness and support for development and adoption of ESTs through development of effective standards and labelling programmes, consumer education, as well as documentation of the social, environmental and human health related benefits of ESTs;

- Develop regional and South-South technology transfer initiatives;

- Enhance, develop and strengthen research and development programmes for ESTs and promote complementary policies for their diffusion;

- Develop the in-country enabling conditions and capacities to support, maintain and adopt technology transfer. These enabling conditions should also include the enhancement of physical and communication infrastructure;

- Integrate the reporting of technology transfer needs, including mitigation and adaptation technology transfer strategies, with national communications. Consider implementing a separate activity in coordination with development of national plans to routinely update the needs and strategies;

- Improve macroeconomic stability and maintain a stable legal structure to facilitate transfer of ESTs.

Suggestions for possible joint activities and partnerships

4. The regional workshop participants also formulated a number of suggestions related to activities that could be undertaken jointly or in partnership between developed and developing countries to enhance the transfer of technologies to the region. These actions included the following:

- Conduct joint research and development programmes through bilateral and multilateral research and development initiatives. Technology partnerships could be formed among institutions supporting research and development activities. These efforts could be focused on the development of priority indigenous technologies identified by the

developing country needs assessments. Research and development activities could be conducted on these priority technologies jointly with the development of appropriate technologies and development of supporting human capacities, to successfully integrate these technologies into developing country markets;

- Develop technology demonstration centres, including in-field technology demonstrations, in developing countries. This idea was similar to the expressed need to develop or enhance cleaner production centres in the region and to link these centres with activities involving the transfer of technology under the UNFCCC;

- Form technology units in developing countries with technical and financial assistance of Annex II Parties. These units could conduct and coordinate technology transfer activities and actions in collaboration with similar units (one stop technology shops) established in the developed countries. Appropriate activities may include the following:

  - Conduct technology needs assessments to identify technology-related priorities;

  - Serve as focal points for stakeholder participation;

  - Conduct analysis of technology impacts;

  - Analyse anticipatory adaptation technologies and measures to promote their use;

  - Plan, coordinate and implement a portfolio of priority climate technology actions for mitigation and adaptation;

  - Coordinate project identification, financing, and design, including joint ventures and project implementation and management;

  - Develop, enhance and expand multilateral technology programmes, one example of which is the Cooperative Technology Implementation Plan (CTIP) programme of the Climate Technology Initiative. A multilateral technology programme could assist with coordinating donor responses to technology needs and develop a portfolio of priority climate technology actions for mitigation and adaptation. Further, this programme could assist with developing country needs

    assessments, identify technology priorities and actions, and build institutional and human capacity to facilitate sustainable transfer of technology;

  - Strengthen regional and subregional integration activities, including technology activities of regional and subregional bodies and institutions. These institutions could serve as technology information centres and clearing houses and provide informational databases of regional technology needs and projects. Further,

such existing bodies could become enhanced centres of excellence that could carry out technology-based training programmes;

- These centres could also be a focal point for networking between stakeholders, especially educational and research institutions, and information collection and dissemination to stakeholders for technology development;

- Develop, with the assistance of Annex II countries, greater awareness and better understanding among decision makers in developing countries of issues related to patents, intellectual property rights and equipment standards and certification.

Suggestions for possible intergovernmental actions

5. The regional workshop participants also formulated a number of suggestions for intergovernmental actions. These actions included the following:

- Establish a separate process under the Convention, apart from initial national communications, for non-Annex I Parties to communicate results of national technology needs assessments, including elaboration of technology priority needs, key barriers, priority programmes and projects;

- Establish a separate process under the Convention, apart from national communications, for Annex I Parties to report on technology transfer activities. While revised guidelines for Annex I national communications were also suggested, several participants noted that the relevant time scales and level of detail may still be insufficient to satisfy all Parties;

- Make better use of existing institutions for the transfer of technologies - UNDP, UNIDO, other multilateral institutions, bilateral institutions, etc.;

- Establish a process for multilateral coordination of donor assistance to target the priority needs of developing countries;

- Consider establishing a system to assist with the comparison of various ESTs. Such a system could include the development of performance ratings and technology performance standards;

- Establish a technology information clearing house to facilitate technology information collection, analysis, and dissemination;

- Develop international technology demonstration centres to demonstrate and commercialize viable ESTs in developing countries;

- Measuring the achievements of technology transfer actions was recognized as desirable, but it was clearly recognized that the development of specific indicators for gauging

progress would require further study and work. However, voluntary industry reporting of project activities and best practices should be encouraged;

- A range of other possible future activities to be undertaken by the UNFCCC secretariat, which would include:

  - Collecting, synthesizing and disseminating information on case studies, best practices, innovative technology transfer approaches, and practical technology transfer experiences;

  - Compiling technology performance standards;

  - Identifying and developing inventories of publicly-owned technologies;

  - Synthesizing and assessing information on emerging technologies;

  - Maintaining a register (database) of technology transfer projects.

Annex II

SYNTHESIS OF SUBMISSIONS BY PARTIES ON HOW ISSUES AND QUESTIONS LISTED IN THE ANNEX TO DECISION 4/CP.4 SHOULD BE ADDRESSED

1. At its tenth session, the SBSTA invited Parties to provide submissions to the secretariat by 30 November 1999, on how the issues and questions in the annex to decision 4/CP.4 should be addressed. It requested the Chairman, with the assistance of the secretariat to identify common elements and areas of divergence based on these submissions (FCCC/SBSTA/1999/6, paragraph 69 (b)).

2. This annex compiles and synthesizes common elements and areas of divergence based on the 15 submissions contained in documents FCCC/SBSTA/1999/MISC.5 and Add 1-3, and FCCC/SBSTA/2000/MISC.1).

3. To facilitate the identification of common elements and areas of divergence in the submissions, the compilation and synthesis is presented in terms of the following five questions:

- What mechanisms are appropriate for technology transfer under the Convention?
- What actions should different stakeholders take to enhance implementation of Article 4.5?
- What capacities and information do different technology transfer stakeholders need?
- Who owns technology?
- Can Parties set technology transfer goals and track progress?

4. In each case, these questions are taken from, or closely relate to, specific questions listed in the annex to decision 4/CP.4. All responses to each of the questions listed in decision 4/CP.4 have been taken into account within the above framework.

1. What mechanisms are appropriate for technology transfer under the Convention?

5. Most Parties expressed support for existing mechanisms or for the Kyoto Protocol flexibility mechanisms under discussion. Developed country Parties stressed the strategies employed in their own bilateral assistance programmes that are relevant to climate. Divergence exists on the adequacy of existing mechanisms, on the roles of the private sector and the Global Environment Facility (GEF), and on concessional versus commercial financing of technology transfer. Parties also proposed a variety of mechanisms related to information collection, synthesis, and dissemination. Other institutions were also proposed, such as clearing houses and centres of expertise.

6. Are existing mechanisms adequate? All four non-Annex I Parties said no. Seven Annex I Parties said yes - although some emphasized the need for improved interlinkages and coordination among different donors, and the need for identifying and correcting deficiencies in existing mechanisms. Two Annex II Parties supported the GEF as the primary means of meeting

Annex II Party technology transfer financing obligations under the Convention, while two others cautioned that the GEF is only one of several mechanisms.

7. The importance of the private sector for providing the bulk of technology transfers was stressed by Annex I Parties. Conversely, non-Annex I Parties responded that the private sector is but one of many mechanisms. One non-Annex I Party drew an even narrower scope for the private sector *in the context of the Convention* by pointing out Article 11.1 of the Convention, which defines a mechanism for technology transfer, on a grant or concessional basis - namely on non-commercial terms.

8. Two non-Annex I Parties suggested new mechanisms for technology transfer. China proposed a mechanism with five types of interlinked institutions: national technology transfer agencies for Annex II Parties and also for non-Annex I Parties; an intergovernmental technology advisory panel; a trust fund for technology transfer; and a unit in the UNFCCC secretariat to oversee the mechanism. South Africa proposed that non-Annex I countries create national strategies for development and transfer of technologies, including generic identification of technologies, national technology needs assessments and prioritization, and conducive policy environments.

9. Several developed country Parties highlighted specific "flagship" approaches they are using to promote technology transfer. For example, the United States said its TCAPP programme was an effective model for technology transfer under the Convention because it is country-driven, facilitates private investment, coordinates donor programmes, and engages senior climate and energy officials. Norway stressed the experience from 15 UNIDO-UNEP cleaner production centres in 12 developing countries and 3 countries in transition. Japan discussed its Kyoto initiative for capacity-building, concessional finance and technology transfers. A variety of other existing initiatives from the United States, Japan and South Africa offering experience relevant to technology transfer mechanisms were also mentioned.

10. Four Parties mentioned and were supportive of the IEA Climate Technology Initiative (CTI). CTI primary focus areas are: (1) capacity-building; (2) technology assessment, analysis and strategy; and (3) research and development. Specific activities stressing near-term results include: technology training courses; joint seminars with industry on technology diffusion; and the development of technology implementation plans that develop, through "bottom-up" participatory processes, sector-specific technologies and practices consistent with development goals.

11. Parties expressed a common desire for a technology information dissemination system and for collection, synthesis and dissemination of experiences, lessons learned, and best practices. Information should be specific, case-study oriented, and targeted to real-world problems with lessons learned. Parties also stressed the need to improve existing information centres and networks, but only after evaluating their performance. Parties supported the idea of a clearing house under either the UNFCCC secretariat or an existing information centre.

Barriers to technology transfer

12. Parties provided long lists of barriers to technology transfer. Four Parties referred to the technical paper on terms of transfer of technology and know-how (FCCC/TP/1998/1) and suggested it be used as the basis for further work on barriers and measures. They echoed the conclusions of this paper that barriers vary from country to country, are specific to particular technology applications, and require a variety of policies in combination to remove them, including policy reform, institutional strengthening, capacity-building, information dissemination, technology assessment, technology demonstration and research. One Party said that the SBSTA should identify gaps in this study.

13. Norway took a demand approach and said that the two main barriers are a lack of policy instruments that would increase demand for ESTs and the lack of institutional capacity to put these instruments in place. The main ways to remove barriers, in Norway's view, are to transfer experience through institutional cooperation (i.e. twinning), establishing regulatory frameworks, strengthening government institutions, and capacity-building (of plant-level personnel).

14. The European Union (EU) said that the barriers deserving the most attention were insufficient local capacity to adequately absorb and manage imported technology, the lack of an adequate policy framework capable of giving incentives for long-term private sector involvement in environmentally-sound technologies, and social and cultural barriers.

2. What actions should different stakeholders take to enhance implementation of Article 4.5?

15. UNFCCC secretariat. A common response was that the UNFCCC secretariat should collect and disseminate information, particularly case studies on innovative technology cooperation approaches, best practices, and practical experience and lessons. Parties also recommended that the secretariat collect, synthesize and disseminate information on sector-specific technology applications, including performance standards ("benchmarks") and economic and managerial parameters. The private sector should contribute to the secretariat's information database.

16. Other suggestions for secretariat activities included:

- Conducting technology assessments (including financial analysis);
- Researching technology applications;
- Identifying publicly-owned technologies (with near-commercial potential;.
- Synthesizing and assessing information on emerging technologies (building on current technical papers on coastal zone and other adaptation technologies);
- Using experts from the SBSTA roster of experts to provide expertise to Parties;
- Implementing capacity-building elements of decisions of the Group of G77.

17. Bilateral and multilateral Agencies. A common response was that bilateral and multilateral agencies should emphasize capacity-building. Beyond capacity-building, one Party

said agencies should support preparation and implementation of national technology transfer strategies. Two Parties said that agencies should focus on strengthening environmentally-sound policy frameworks. A divergence of views emerged on whether agencies should undertake specialized climate-technology projects: one Party said no - policy frameworks were most important - while another said yes, provided agencies respond to climate technology needs based on recipient-driven priorities.

18. Global Environment Facility. Parties' responses regarding the GEF showed little commonality, but instead reflected a catalogue of additional suggestions, such as: capacity-building that leads to more enabling environments, support for country-specific technology transfer strategies, outreach on the mechanisms the GEF uses to remove barriers and on emerging experiences and lessons with these mechanisms, and financing and capacity-building for indigenous technology transfer centres.

19. Annex II Parties.[1] Again, Parties' responses provided a catalogue of suggestions, notably that Annex II Parties should describe active bilateral assistance programmes that they consider effective for technology transfer, said Parties. One Party emphasised that Annex II Parties should follow the stipulations of Chapter 34 of Agenda 21,[2] particularly paragraph 34.18, to promote transfer of technologies that are privately owned. It was also suggested that Annex II Parties should create stronger enabling environments for technology transfer in developed countries; enact policies and programmes for the effective transfer of publicly-owned or public-domain technologies, and negotiate with private-sector owners of technologies for intellectual property rights.

20. Other specific suggestions for Annex II Party actions included:

- Creating and enhancing appropriate incentives for private firms;
- Enhancing access to and transfer of patent-protected ESTs;
- Purchasing patents and licences on commercial terms for transfer to developing countries on non-commercial terms;
- Providing financial resources for purchasing ESTs;
- Fostering an enabling environment for technology transfer in developed countries through capacity-building and effective engagement of the private sector;
- Developing, designing and implementing an appropriate mix of instruments for promoting cleaner production, including legislation, financial instruments, information and education;
- Formulating policies and programmes for the effective transfer of publicly-owned or public-domain technologies;
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[1] Some responses referred to Annex I and non-Annex I Parties, others to Annex II and non-Annex II Parties. The distinction between Annex II and non-Annex II is used here to facilitate this summary.

[2] A/CONF.151/26/Rev.1(Vol.I).

- Reviewing subsidy and tax policies and other regulations to determine whether they encourage or impede EST technology transfer;
- Providing a list of ESTs and know-how that are publicly-owned; and
- Negotiating with private-sector owners of technologies for intellectual property rights

21. Non-Annex II Parties. Almost all Parties talked about strengthening *enabling environments.* Views on the important elements of these enabling environments are generally consistent such as policies that promote private sector investment; domestic awareness of technologies; capacities to choose, innovate and adapt technologies; and actively enforced environmental regulations and legal frameworks. Parties acknowledged that the term *enabling environment* does not refer only to the private sector, but to the broader range of parameters that surround technology transfer.

22. Other specific suggestions for non-Annex-II Parties activities included:

- Developing a national technology transfer strategy, including technology needs, feasibility studies, pilot plants required, capacity-building requirements, time-frames, costs, and financing mechanisms;
- Identifying priority technologies and communicating these for joint action by government agencies, the private sector and international donors;
- Taking advantage of assistance currently available for technology transfer through existing mechanisms, especially when concessional finance is unavoidable - World Bank, regional development banks, United Nations, GEF, bilateral aid, clean develoment mechanism, etc;
- Making requests for information from local embassies of Annex II Parties or bilateral or multilateral donors;
- Specifying technology and information needs through their national communications;
- establishing stable macroeconomic and budgetary frameworks and adopting market-oriented policies;
- Reducing trade and investment barriers;
- Rromoting appropriate institutional frameworks for intellectual property rights, banking and customs; and
- Engaging in a “transparent, decentralized and participatory [technology selection] decision making process…to [ensure] that the best choices are made”.

3. What capacities and information do different technology transfer stakeholders need?

23. Some Parties noted that capacity-building should be the first step in the technology transfer process because it is a prerequisite for success. They said that capacity-building should cover the whole process - identification of technology needs, personnel training, understanding and know-how, technology choice, design, installation, operation, management, and equipment

production. capacity-building should target a wide range of actors; create lasting relationships, institutions and networks across countries; promote financial support from the private sector; focus on host country institutions and public awareness; and employ case studies as the basis for technical advice.

24. A common response was that Parties need specific information about technologies and successful experiences, such as equipment specifications, suppliers, technical benchmarks, prices, financial parameters, lifetimes, efficiencies, and other data from pilot demonstration projects. Information databases should include quantitative data about economic, environmental and social impacts; costs; ownership; skill and infrastructure requirements; and intellectual property issues. The credibility and quality of information was also stressed by one Party; both technology users and information intermediaries need capacity to distinguish the quality and credibility of information received.

25. The role of the industrial sector was particularly emphasized by one Party, which said that industrial plant managers and operators need training in conducting cleaner production assessments, in which they learn to evaluate the costs and benefits of production process changes and management techniques for cleaner production. Capacity-building for the financial sector and for enforcement of existing environmental regulations is needed for the industrial sector as well.

26. According to another developing country Party, capacity-building should initially be based on specific industrial sectors with specific needs for changing their current technology to environmentally-sound technologies. Various other suggestions for capacity-building activities included:

- Training of personnel from specific public sector departments (environment, industry, etc.) on technology transfer mechanisms so as to prepare them for their role in getting their industries to change to environmentally-sound technologies;
- Assessing of environmental soundness of existing technologies in various sectors/ sub-sectors;
- Organization of awareness workshops and seminars for industry executives and policy makers from developing countries;
- Factory training of technical personnel before dispatch of procured technology;
- On-site training after installation;
- Enhancing business advisory services and technology information for existing companies;
- Training in advanced methods and practices (e.g., in agriculture, forestry, renewable energy, coastal adaptation technologies);
- Training and equipment for research and development institutions;
- Targeting a wide range of actors, including members of the regulatory, financial, technical, business and non-governmental organization communities;

- Creating lasting relationships, institutions and networks between and across countries, along with meaningful financial support by the private sector;
- Focusing on host country institutions and public awareness, and training indigenous staff; and
- Employing case studies as the basis for technical advice.

4. Who owns technology?

27. Several Parties stressed the fact that technology transfer should include both hard and soft technologies and that the UNFCCC definition of technology transfer explicitly includes soft technologies. One Party quoted from Chapter 34 of Agenda 21 when elaborating on the types of technologies to be transferred, including both "hard" and "soft" technologies: "environmentally-sound technologies are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures….[T]he human resources development and local capacity-building aspects of technology choices, including gender-relevant aspects, should also be addressed (Agenda 21, paragraph 34.4)".

28. Parties mentioned several examples of potential public-domain technologies, such as techniques for monitoring and assessment, environmental management, energy conservation, meteorological observation, waste disposal and management, forestry, transport, and agriculture. Soft technologies are more likely to be publicly-owned and transferred, implied one Party.

29. The question of publicly-owned technologies brought perhaps the greatest diversity of responses. One Annex II Party said that limited transfer was possible from publicly funded research and development institutions. But even technologies owned by public research organiyations and universities are commercialized by the private sector at an early stage, said two other Annex II Parties. One also said that transfers of publicly-owned technology are unlikely because that Party's policy is not to compete with the private sector; public technologies are transferred to private companies for marketing. On the other hand, two non-Annex I Parties said that transfer of publicly-owned technologies should be the first priority. Both Parties noted that there has apparently been no follow-up to the recommendations for facilitating transfer of publicly-owned technology that were made by an inter-sessional expert meeting of the Commission on Sustainable Development hosted by the Republic of Korea in Kyong Ju in February 1998.

30. There was also a divergence of views on the origin of transferred technologies. One Party said that the Convention referred to North-South transfer, while another Party said the South-South transfer is critical in the adoption of technologies that are suitable for local conditions and cultures.

5. Can Parties set technology transfer goals and track progress?

31. There was a divergence of views as to whether technology transfer goals could be set. One Party said yes, with full involvement of the private sector. Another Party said no, it was not possible. Another said it was possible, but only at the national level. Two others said it was possible only if sector-specific goals were set or if it was only for publicly-owned technologies. Three Parties felt that monitoring progress was possible and important; one felt it was premature to monitor progress; and another felt that progress could be monitored only with specific but low-level output indicators, such as the number of demonstration projects initiated or number of people trained.

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