

Item 8 (a) of the provisional agenda Development and transfer of technologies Matters relating to the implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention

Initial report on the pilot project on networking between the UNFCCC technology information clearing house (TT:CLEAR) and regional and national technology information centres

Note by the secretariat

Summany

This note contains information on ongoing activities of the secretariat in 2005 relating to the pilot project on networking technology information centres. It describes the concept of this information sharing network, some of the initial lessons learned from the pilot project and the activities envisaged to extend the network to cover three national/regional centres in developing countries.

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I. Introduction

A. Mandate

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its twentieth session, requested the secretariat to continue its work on maintaining and improving the UNFCCC technology information clearing house (TT:CLEAR), taking into account the report on the survey on the effectiveness of the use of the system and the recommendation of the Expert Group on Technology Transfer (EGTT) at its fifth meeting, including by enhancing networking between national and regional centres working on the dissemination of technology information, and by encouraging the use of TT:CLEAR.¹

2. The Conference of the Parties (COP), by its decision 6/CP.10,² encouraged the secretariat to continue its work on a pilot project on networking between TT:CLEAR and national and regional technology information centres that would provide Parties with a clear understanding of the technical feasibility and cost implications of the strengthening of technology centres in developing countries and to report on the outcome to the SBSTA at its twenty-third session.

3. The SBSTA, at its twenty-second session, noted the oral report by the secretariat on progress of the above-mentioned pilot project. It considered this work to be a constructive step forward in linking external resources to TT:CLEAR, noting that the greater reliance on other established portals will facilitate work by the secretariat while providing an enriched set of information and services.³

B. Scope of the note

4. This note contains information on ongoing activities of the secretariat in 2005 relating to networking between TT:CLEAR and international technology clearing houses and networks of regional and national technology centres. It describes the concept of this information sharing network, referred to hereinafter as the pilot network.⁴ It outlines the scope of the work for continuing the pilot network, which in particular is being extended to cover three selected national/regional centres in developing countries, and describes the process for selecting cooperating centres.

C. Possible action by the Subsidiary Body for Scientific and Technological Advice

5. The SBSTA may wish to take note of the information contained in this document and, where necessary, provide further guidance to the secretariat with regard to its efforts to facilitate the work of Parties on sharing information on development, deployment, diffusion and transfer of climate-friendly technologies.

II. Networking technology centres

6. Information on climate-friendly technologies is available at numerous clearing houses, specialized web sites and technology centres around the world.⁵ One way to share this expertise, as discussed in this document, is to improve on line links and networking between institutions to create an information sharing network of technology centres. The Internet itself is a "linking" system. Any

¹ FCCC/SBSTA/2004/6, paragraph 81 (d) (iii).

² FCCC/CP/2004/10/Add.1, paragraph 4.

³ FCCC/SBSTA/2005/4, paragraph 56.

⁴ Additional information on networking technology information centres can be found in the previous documents prepared by the secretariat: FCCC/SBSTA/2004/INF.8 and Add.1 and Corr.1; and FCCC/SBSTA/2004/10.

⁵ Private enterprises also hold much scientific and empirical knowledge. However, as mandated, this document only refers to knowledge available in technology information centres.

information put on the Internet can easily be linked through hyperlinks to other sites, allowing providers to focus on their area of expertise while offering high quality services to many users.

7. In this document, when referring to technology centres, although many types of such centres exist (e.g. international technology information centre, national technology information centre, national technology centre, network),⁶ only their activities relating to collection, cataloguing, synthesis and dissemination of information on environmentally sound technologies and the sharing/exchanging of this information online are addressed.

A. Needs for networking

8. Currently, international, national, regional and local clearing houses and centres gather and provide information about climate-friendly technologies and know-how pertaining to the environment and to the energy, agriculture and other sectors.⁷ They are often hosted by, or form part of, larger organizations that are supported by the private sector and/or governments or international organizations. Linking these centres in a network could reduce gaps in the abilities of technology users, intermediaries and providers. Technology users and intermediaries could do a better job in selecting environmentally sound technologies (ESTs) by having access to the range of information systems available and the good quality and relevant information they contain. And technology providers could do a better job of promoting their ESTs by being more familiar with their target audiences and their needs for technology information.

9. The main purpose of networking technology centres would be to share information about technologies and facilitate synergy between the existing information systems so that available resources could be used more efficiently and the systems more effectively. The network could provide a coherent, coordinated approach for finding, accessing, synthesizing and visualizing technology information. It could provide users with a pool of validated data, information, assessments, reports and expertise tailored to their needs.

10. Technology centres and institutions in Parties included in Annex I to the Convention (Annex I Parties) and Parties not included in the Annex I to the Convention (non-Annex I Parties) would benefit from networking in many ways. Sharing online information in real time will minimize duplication and reduce the costs of developing and maintaining the web sites of the network's nodes. National and regional technology centres, through the network, would be able to provide new services to their clients (e.g. help match projects with project developers). The need for cooperation in technology transfer and technology development would be important drivers of the network.

B. Concepts and structure

11. The pilot network could bring together existing clearing houses, specialized web sites, portals and information networks maintained by various technology centres, and make them nodes of the network. The pilot network would be guided by the following principles:

(a) **Participation is voluntary**. The participants would become nodes within the network and share information specific to their area of expertise. The network would seek to engage any organization that has existing human and institutional capacity and expertise in specific/priority technologies for mitigation of, and adaptation to, climate change, and to have a good sectoral and regional coverage.

⁶ Details on these types of centres can be found in FCCC/SBSTA/1997/10.

⁷ Some international centres operate in climate change relevant sectors, performing various functions and supplying some services. At the national level, numerous entities conduct activities in climate-relevant sectors with different levels of service.

- (b) **All nodes would have similar roles** in the network. They would retain ownership and full control over their information.⁸ When displaying information received from other nodes, proper disclaimers and credits would be given to users.
- (c) **Sharing and exchanging of information** over the network would be done in real time over the Internet. Efforts would be made to increase visits to each node in two ways: approaches would be sought that would maintain the volume of visits or hits⁹ to a web site regardless of the way users are searching for information on a node of the network, directly on it or through the other nodes of the network; and users would be redirected to the originating node for detailed information.
- (d) Users would be able to **access information from, and provide feedback to, any node** in the network. Similar design concepts will be followed as much as possible at each node to develop intuitive user interfaces capable of identifying the needs and determining the profile of each user, so that the network could disseminate tailored information from any node.
- (e) An important feature of the network would be its ability to tap into information contained in national and international patent databases (in collaboration with important partners such as the World Intellectual Property Organization, the United Nations Conference on Trade and Development, and the European Union).¹⁰ It should be noted that TT:CLEAR includes already a link to the European patent office databases.

C. Options for efficient sharing and exchange of information

12. There are several ways information sharing could be improved. This document covers three options.

1. Maintaining links to external sources of data and information

13. The simplest option is to establish and maintain, on each node, a **database of links** (hyperlinks) to relevant international sources of information available on the other nodes and elsewhere on the Internet. The links could be grouped by different categories, according to the needs of each node. Visitors would be able to search the links by category and keywords. The database may include an abstract describing the link and a data-quality indicator.¹¹ Publishing such a catalogue of links on the Internet might have legal implications which would have to be considered (vis-à-vis links to nodes participating in the network and web sites external to the network).

14. Experience with TT:CLEAR has shown that links break quite frequently and a substantial effort is required to keep them up-to-date. A possible solution is to develop automated procedures, which would run from time to time, to check that links are valid. Other issues to be considered include criteria for selecting links, where to make the link (to a site's home page or to the relevant web page), and how to distinguish between different types of links (e.g. Internet pages, documents, presentations, spreadsheets).

15. This is a relatively low-cost option that offers limited search capabilities and is difficult to maintain. Furthermore, a network established using this option would have very limited functionality and would not permit a real exchange of information between its nodes.

⁸ This reflects the decentralized nature of the network.

⁹ Each time a web server sends a file to a browser, this action is recorded in the server log file as a "hit". Numbers of hits are used as a guide for traffic measurement on web sites.

¹⁰ These organizations will be invited to participate in the expert meeting described in paragraph 45 below and to join the pilot network.

¹¹ TT:CLEAR maintains such a database containing more than 850 links to other web sites.

2. Specialized search engines and data interfaces

16. TT:CLEAR has a **search engine** that searches in real time a limited number of external data sources over the Internet, harvests data from those sources and presents consolidated results to users.

17. This option allows for simple access to up-to-date data using search capabilities developed by the data providers. No additional work is needed at the web site providing the data. External data can be supplemented with local data. For example, for a Global Environment Facility (GEF) project, a network node could have a local set of data (e.g. categories and data fields specific to its users' needs) and access a remote set of data on GEF databases linked through the Internet and the search engine. In this way, a node of the network could construct search engines that use more search criteria than do the node(s) from where the information is retrieved.

18. Such search engines are very sensitive to modifications on the web pages of the external data sources, and because these modifications are frequent, they are difficult to maintain. A special interface is required for each data source. Although agreements can be made between the participants in the network to inform each other about modifications of their web sites, this may constitute an additional burden that would limit nodes from responding quickly to new demands from their clients.

3. Web services

19. **Web services** are the next generation of web-based technology for exchanging information (figure 1). A "service requestor" locates a service published by a "service provider" through a "discovery agency(ies)". The requestor can then interact with the provider to use the service. Service providers publish their services with discovery agencies.





20. The advantages of web services include independence from modification on external web sites; a standard data exchange protocol, data format and service description; and independence from software platforms and programming language, service discovery protocols and inventories of services and providers.

21. Using web services, the resources of one web site can be made available over the Internet. Developers of other relevant web sites can compose a custom, client-side solution to integrate useful resources into their services by simply combining the web services that they require. As long as they adhere to the standards of the web services, they can share resources across the Internet without knowledge of the environment of their target system and limitations of specific formats of information.

4. Conclusion

22. Of the three options for information sharing presented above, web services were selected to implement a two-way information exchange mechanism between the nodes of the pilot network.

D. Limitations associated with sharing information online

23. A multitude of technology data sources are available on the Internet.¹² The quality of the data available, however, varies, from peer-reviewed data with well-established collection processes involving Parties, to data with limited or no review. Some data sources compile and reproduce data from "original/primary" sources. Therefore, guidelines and criteria for selecting a data source may need to be developed. Possible criteria may include the type of organization providing the data (e.g. international, regional, national and sectoral institutions, technology institutions, non-governmental organizations), the quality of the data and the data review process.

24. There are limitations associated with sharing information online and additional work may be needed to harmonize data sets. Some of these limitations are summarized below:

- (a) **Data accessibility**: Typically, only limited amounts of data are available online free of charge. Some members of the network may have agreements to access the full set of the data, but they would not be allowed to make the data available to third parties.
- (b) **Data quality**: There is no guarantee regarding the quality of data, but having a good selection of centres and web portals may be sufficient to ensure an acceptable quality. In any case, proper disclaimers and credits should be given to the users when they access data external to the node.
- (c) **Data coverage**: Limited and/or different geographical and temporal coverage of data is a common problem. Different assumptions may also be used to derive the data, which makes them difficult to combine or compare. Agreement(s) should be reached on, for example, a core set of data to describe an international cooperation project.¹³
- (d) Data classification: The classifications used by different data providers are often inconsistent. For example the sectors used by the Organisation for Economic Co-operation and Development (OECD) in its Creditor Reporting System are different from those used by the UNFCCC common reporting format. Therefore, classifications should be harmonized to make information sharing/exchange more efficient.

25. Provision of information online will not remove all of the barriers to sharing information with centres in developing countries. First, most of the information is available only in English. Second, a lack of training in the use of electronic databases may hinder or even prevent some users from accessing appropriate data. Third, a lack of expertise in developing web systems capable of sharing information online or poor connections to the Internet could prevent centres in developing countries from sharing their information with the network.

III. The pilot network

26. Following a request by the SBSTA at its seventeenth session, the secretariat and the United Nations Environment Programme (UNEP) established a link between TT:CLEAR and the Sustainable

¹² Other electronic media, such as CD-ROMs and tapes, can be used to share information by importing and storing locally data sets that are not modified too often (e.g. United Nations statistics).

¹³ International Development Markup Language (IDML) is one such initiative to standardize information on development activities.

Alternatives Network (SANet)¹⁴ using web services. Based on this experience, similar links were also established between the Clean Energy Portal (CEP),¹⁵ Canada, and the Climate Technology Cooperation Gateway (US-CTC Gateway),¹⁶ United States of America, to explore opportunities for cost-effective sharing of electronic information between TT:CLEAR and their web portals. This is referred to as the pilot network.

27. The pilot network was initiated to assess the feasibility of linking technology centres; to elaborate on the scope of information exchange; to assess the impact of networking on the costs of searching for information on technology transfer opportunities by prospective users and providers; and to test technical solutions for information sharing and identify possible functions of the network and potential users.

A. Information sharing and exchange

28. Exchange of information in the pilot network could cover, inter alia, technology cooperation projects and programmes; mitigation and adaptation technologies; contacts/experts and organizations; case studies of successful technology transfer; a calendar of events; methods, models and tools specific to assessing, financing and transferring technologies; and resource libraries.

1. Information sharing between TT:CLEAR and US-CTC Gateway

29. Figure 2 illustrates possible areas for sharing information between TT:CLEAR and the US-CTC Gateway web portal and the Climate Technology Initiative (CTI) web site. Technology cooperation projects on TT:CLEAR could be searched by other nodes in the network and then displayed on their web portals and/or forwarded to their clients, including financial institutions, donors and businesses. A two-phase approach was used by the US-CTC Gateway to share information relating to technology cooperation projects, programmes and case studies in the pilot network. Information searches can now be performed from TT:CLEAR and SANet web sites on technology cooperation programmes and case studies from US-CTC Gateway. TT:CLEAR projects can also be searched from US-CTC Gateway web site.

2. Information sharing between TT:CLEAR and SANet

30. Figure 3 illustrates similar scope for information exchange with the UNEP SANet web portal. The secretariat developed a web service that allows access to technology cooperation projects and programmes stored in the databases of TT:CLEAR. The service, available to any node in the pilot network, can be used to showcase technology cooperation projects and technology needs of developing country Parties to potential investors and interested businesses. Searches can be performed through the network using criteria such as the project's donor or host country and keywords in the project name or project summary.

31. The SANet developed a web client that allows it to search TT:CLEAR's database of technology cooperation projects and programmes. Projects from TT:CLEAR are then displayed on SANet web pages together with case studies stored in the SANet's databases.

 ¹⁴ The UNEP SANet provides advisory services for the early stages of decision-making. With a global network of information resources, local experts and financing options, it helps businesses innovate with cleaner technologies.
¹⁵ An internationally renowned site for clean energy technology information exchange.

¹⁶ The US-CTC Gateway provides information to facilitate climate technology cooperation with developing countries and countries with economies in transition (EIT countries), including on climate programmes and projects sponsored by the United States of America, climate technology tools, resources and technical experts, and information on technology market opportunities in developing countries and EIT countries.



Figure 2. Possible information exchange with US-CTC Gateway and CTI

Figure 3. Possible support for matchmaking with UNEP SANet



3. Information sharing between TT:CLEAR and Canada's Clean Energy Portal

32. A web-services-based pilot project to test the feasibility of information exchange between Canada's CEP and TT:CLEAR was initiated in 2004. The pilot project was implemented in two phases:

(a) CEP developed a web-service client to search technology cooperation projects available on TT:CLEAR. A user-friendly interface, with many explanatory messages, was developed to guide users through this process (b) CEP developed a web-service to allow TT:CLEAR to search and display information on Canadian companies stored in CEP databases. UNFCCC developed a web service client to access that service.

B. Possible functional integration: matchmaking projects for project developers

33. Network nodes function largely in isolation, performing specialized tasks as needed by their clients. An analysis of the feasibility and convenience of how these nodes can be functionally integrated, while maintaining the flexibility and independence needed by each node could further clarify and establish their roles in the network, enhance their usefulness and increase the value of the network. Proposed integration would go beyond a simple exchange of information and would allow the network to perform specific functions.

34. SANet can match project proposals/concepts from TT:CLEAR to experts/project developers with relevant experience in similar projects in a given region of the world. These project developers can provide support in developing a project through the investment decision process, from a concept (or technology need as listed in TT:CLEAR) to a concrete project proposal (pre-feasibility and feasibility study) ready for submission to financing sources identified in the financing directory of SANet. During the project development phases, project developers may be able to use a number of project development services and tools offered by SANet.

35. In order to identify the best available financing sources for the particular needs and setting of the project, project developers will be guided by the SANet financing directory. Through the information services provided by TT:CLEAR and SANet, suppliers of funds/finance will be able to identify project concepts and proposals that complement their objectives.

36. The matchmaking service described above could also be implemented with other sites, such as the US-CTC Gateway and CTI.

C. Initial lessons learned

37. The pilot network proved to be a useful exercise for assessing the feasibility of the network of technology information centres. The following are some of the lessons learned:

- Web services are a good option for establishing an information sharing network. This technology is mature and flexible and permits an effective exchange of information over the Internet with acceptable delays for search engines and other applications. Nevertheless, the response time should be tested with a node in a developing country where the Internet bandwidth is smaller.
- (b) Web services are relatively easy to develop and only modest financial resources are needed to implement a network of technology centres using them.¹⁷ Intuitive user interfaces can be developed to allow advanced searches between the participating nodes in the network.
- (c) Web services and clients should be developed by each node. Close cooperation is needed between the nodes in the development phase to fine-tune the services according to different needs.
- (d) It is expected that the network would increase utilization in each node. However, this may not always be the case and a mechanism is needed to prevent nodes from copying

¹⁷ The effort needed for developing a client or a server is relatively low (2–3 days of work).

information from other nodes and making it available directly to their users, and to ensure that proper credits to the node providing the information are given to users.

(e) Exchanging information between the centres could contribute to harmonization of templates used for projects and expert databases, help develop a mechanism to share this type of information, and ensure an appropriate quality control system. It could also harmonize the terminology used. The proposed functional integration for matchmaking presented above may increase funding to developing countries for technology transfer projects and increase the use of local project developers and experts. A network may also allow for better tracking of successful projects and their contribution to mitigation of, and adaptation to, climate change.

IV. Extending the pilot network

A. Scope of work

38. As requested by decision 6/CP.10, in 2005 the secretariat initiated work to extend the pilot network to technology centres in developing countries. The objectives of this work are to test the feasibility of networking between national and regional centres in developing countries working on the dissemination of technology information and to provide Parties with a clear understanding of the technical feasibility and cost implications of strengthening technology centres in developing countries by enhancing their capabilities to access and exchange information on climate-friendly technologies.

39. In order to meet these objectives, three tasks are envisaged, as described below. They would be implemented in close collaboration with representatives of the organizations and regional and national centres participating in the network. A number of specific activities under these tasks are linked and may have to be developed in parallel.

1. Extend the pilot network to cover three selected national/regional technology information centres in developing countries

40. The objective of this task would be to test the technical feasibility of the network, as a pilot phase, and assess the resources required for centres in developing countries to join the network. Specific activities under this task would include:

- (a) Extending the pilot network to include three existing national and regional technology centres (one each in Africa, Latin America and the Caribbean, and Asia and the Pacific), to link them with national and regional centres in developed countries, TT:CLEAR, and UNEP SANet;
- (b) Based on the work carried out under paragraph 40 (a) above, estimating the resource requirements for networking and assessing the impact of networking on the costs of searching for information on technology transfer opportunities by prospective users and providers.

41. The UNFCCC secretariat will provide financial and technical support for undertaking this task to three selected centres from developing countries (see paragraphs 47 to 50 below).

42. The expected outcome of this task is an extended pilot network of technology transfer centres, including centres in developing countries, linking individual nodes that can make context-specific information available to their local audience groups.

2. <u>Exchange views among centres on technical, organizational and financial aspects</u> relating to the networking of technology information centres

43. The objective of this task would be to discuss the lessons learned from the pilot exercise, to address issues relating to organizing and managing the network, and to discuss resource requirements and options for further development of the pilot network. The main activity would be to convene a meeting of experts to exchange views and do the following:

- (a) Elaborate on the scope of information exchange and functional integration between the nodes of the network and discuss technical standards and good practices for data exchange
- (b) Draft a partnership document (e.g. memorandum of understanding) between all the nodes of the network, preferably supported by the national governments, which might increase local support of such centres and therefore contribute to their sustainability
- (c) Discuss the need to establish a loose informal management group composed of one representative from each node in the network. The tasks of this group could include:
 - Reaching agreement(s) on, for example, a core set of data to describe an international cooperation project, classifications, the scope of the information exchange, and the exchange of users' profiles in order to provide them with tailored information, users' comments and feedback, etc.;
 - (ii) Discussing sectoral and regional coverage of the network and seeking to engage relevant technology centres;
 - (iii) Reviewing the web services developed and discussing needs, gaps, priorities, lessons learned and best practices.
- (d) Assess the outcomes of the pilot project and prepare a proposal for a global network.

44. The meeting would be organized by the secretariat. In addition to representatives of technology information centres, representatives of relevant international and regional organizations such as the GEF, OECD,¹⁸ and the International Energy Agency¹⁹ could be invited to attend the meeting and to consider joining the pilot network.

3. <u>Assess the outcomes of the pilot project on networking between the UNFCCC</u> <u>technology information clearing house (TT:CLEAR) and regional and</u> <u>national technology information centres and report its findings</u>

45. This task would deal with the preparation of a report on the outcomes of the pilot project to be submitted to the SBSTA for its consideration. Specific activities would include:

- (a) Assessing the outcomes of the pilot project in terms of technical feasibility;
- (b) Assessing the cost implications of networking technology centres in developing countries;

¹⁸ Relevant web sites include the Creditor Reporting System (CRS) that contains information on financial flows for official development assistance.

¹⁹ Relevant web sites include CADDET (web site providing information on commercial energy-saving and renewable energy technologies) and GREENTIE (an international directory of suppliers whose technologies and services help to reduce greenhouse gas emissions).

(c) Preparing the report for the SBSTA, taking into consideration the findings of the pilot project and recommendations of the above-mentioned meetings of experts and the EGTT.

46. The section on TT:CLEAR on networking technology centres will be updated to include information on this pilot project. Interim reports presenting the status of the work and the final report may be made available in hard copy and on the web site to facilitate consultations and comments. The report of the above-mentioned expert meeting (task 2) would be posted on TT:CLEAR.

B. Selection of national technology centres from developing countries

47. The selection of three existing national and/or regional technology centres in developing countries in Africa, Latin America and the Caribbean, and Asia and the Pacific (one in each region) that would receive financial support to join the network was carried out by the secretariat in accordance with the United Nations practices and standards.

48. The secretariat prepared the terms of reference for the work to be performed by the centres and requested 28 existing technology centres from the three regions to submit proposals for joining the pilot network.

49. The list of criteria prepared for the selection of the technology centres is presented in the annex. Preference was given to centres actively involved in the transfer of climate-friendly technologies that have the technical infrastructure and knowledge required to participate in the pilot network. The centres were selected bearing in mind the need for sectoral coverage, possibly from centres belonging to existing networks such as the United Nations Industrial Development Organization network of national cleaner production centres. Each centre was requested to submit a report summarizing its work.

50. The selection process is under way and it is anticipated that the secretariat will be able to finalize it and initiate the work on extending the pilot network before the twenty-third session of the SBSTA. The secretariat will provide an update on the status of this work in its oral report at the session.

V. Next steps

51. The secretariat would provide, upon request, guidance to national experts on enhancing their national technology information clearing houses or web sites by developing the information exchange web services needed to participate in the network.

52. The secretariat will provide regular updates to the SBSTA and the EGTT on the implementation of this activity.

Annex

Criteria for the evaluation of proposals from centres wishing to participate in the UNFCCC pilot network of technology information centres

- 1. The centre should have the following:
 - (a) Expertise, active involvement and experience in issues relating to climate change, in particular on developing and transferring technologies conducive to mitigation of and adaptation to climate change;
 - (b) An extensive web presence and local audience on issues relating to the development and transfer of climate-friendly technologies and experience in developing and maintaining a technology web page;
 - (c) Knowledge and understanding of the proposal and its requirements, adequate computer hardware infrastructure in place, reliable and stable connection to the Internet, knowledge of relevant software;
 - (d) Knowledge of the UNFCCC process and the mandate for this work;
 - (e) Participation in other relevant networks, such as United Nations Industrial Development Organization network of cleaner production centres and the United Nations Environment Programme network of international technology centres.
- 2. The proposal should be:
 - (a) Complete and include a clear description of necessary activities, deliverables and timelines for performing this work;
 - (b) Consistent with the terms of reference provided in the request for proposals.

3. The management approach should be appropriate, clear, and in accordance with the terms of reference, and should include:

- (a) Measures to ensure the high quality of deliverables and to ensure a sustainable participation in the network after the contract is completed;
- (b) Clear descriptions of required involvement of the secretariat and other nodes in the network;
- (c) A clear and well defined role for the project manager, and curricula vitae of the manager and principal team members;
- (d) Measures to ensure the timely provision of deliverables;
- (e) Measures to ensure adequate communication and consultation with the secretariat and effective resolution of issues that may arise.
- 4. The overall costs and costs to the UNFCCC should be kept to a minimum.

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