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Item 3 (f) of the provisional agenda
Methodological issues
Issues relating to registry systems under Article 7, paragraph 4, of the Kyoto Protocol

Progress report on work relating to registry systems

Note by the secretariat[*]

Summary

The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its nineteenth session, requested the secretariat, subject to the availability of resources, to consider possible ways of facilitating ongoing cooperation among administrators of registries and the transaction log and to provide a progress report on its work on registry systems to the SBSTA at its twentieth session. These registry systems are to facilitate the mechanisms under Articles 6, 12 and 17 and the accounting of assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol.

This note outlines possible forms of cooperation among administrators of registries and the transaction log. It also describes progress in elaborating the specifications of the data exchange standards and in developing and implementing the transaction log, including measures taken to reduce the resources required to develop the transaction log.

The SBSTA may wish to consider the information in this note and prepare a draft decision for consideration by the Conference of the Parties, at its tenth session, in relation to the specifications of the data exchange standards and the establishment of measures to facilitate cooperation among administrators of registries and the transaction log.

[*] This document has been submitted after the original date to include information on the latest progress in this work.

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I. Introduction

A. Mandate

1. The Conference of the Parties (COP), by its decision 24/CP.8, requested the secretariat to undertake work to develop the detailed functional and technical specifications of the data exchange standards for registry systems (national registries, the clean development mechanism (CDM) registry and the independent transaction log (ITL)), in close collaboration with technical experts. These specifications are to be in accordance with the general design requirements recommended by the COP, in its decision 24/CP.8, for adoption by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) at its first session (FCCC/CP/2002/7/Add.3).

2. The Subsidiary Body for Scientific and Technological Advice, at its nineteenth session, stressed the need for the secretariat to focus attention henceforth on the development of the independent transaction log (ITL) and requested the secretariat to continue pursuing means to reduce the funding requirements associated with its development, in particular by sharing specifications and software (FCCC/SBSTA/2003/15, para 30 (c)).

3. The COP, by its decision 24/CP.8, recognized that there was a need for cooperation to facilitate and promote accuracy, efficiency and transparency in the design and operation of registry systems. It requested the SBSTA to make recommendations to the COP, at its ninth session, for additional actions to establish and maintain registry systems. The SBSTA, at its nineteenth session, did not forward any such recommendations, but instead requested the secretariat, subject to the availability of resources, to consider possible ways of facilitating ongoing cooperation among administrators of registries and the ITL and to provide a progress report on its work on registry systems to the SBSTA at its twentieth session (FCCC/SBSTA/2003/15, para 30 (e)).

B. Scope of the note

4. This note outlines possible forms of cooperation among administrators of registries and the ITL and describes progress in developing the specifications of the data exchange standards and in developing and implementing the ITL, including measures taken to reduce the resources required to develop the ITL.

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

5. The SBSTA may wish to prepare a draft decision relating to the specifications of the data exchange standards and the establishment of measures to facilitate cooperation among administrators of registries and the ITL, for consideration by the COP at its tenth session.

II. Background

6. The provisions contained in decisions 15/CP.7, 16/CP.7, 17/CP.7, 18/CP.7, 19/CP.7, 24/CP.8 and 19/CP.9, and their annexes, define the following registry systems:

(a) **National registries**, with accounts of Parties included in Annex I to the Convention (Annex I Parties) with a commitment inscribed in Annex B to the Kyoto Protocol

(b) **The clean development mechanism (CDM) registry**, with accounts of Parties not included in Annex I to the Convention (non-Annex I Parties) and temporary accounts of Annex I Parties (to be established and maintained by the CDM Executive Board)

(c) **The independent transaction log**, to verify the validity of transactions (to be established and maintained by the secretariat).

7. These registry systems are to facilitate emissions trading, CDM project activities and Article 6 "joint implementation" projects under the Kyoto Protocol. In doing so, they are to ensure the accurate accounting of holdings, and transactions under the mechanisms of, assigned amount units (AAUs), removal units (RMUs), emission reduction units (ERUs), certified emission reductions (CERs), temporary certified emission reductions (tCERs) and long-term certified emission reductions (lCERs).

8. Registries and the ITL are to conform to the general design requirements of the data exchange standards, as foreseen to be adopted by COP/MOP 1, and the following detailed specifications being further elaborated to facilitate their compatible implementation in all registry systems:

(a) **Functional specifications**, containing requirements relating to the data exchange standards that registries and the ITL are to fulfil;

(b) **Technical specifications**, detailing how the requirements set out in the functional specifications are to be implemented.

III. Progress on the data exchange standards

9. The secretariat has been developing the specifications of the data exchange standards since early 2003, in collaboration with technical registry experts involved in the development of national registries. Draft functional specifications and draft technical specifications of the data exchange standards were presented at the pre-sessional consultations on registry systems held on 28 and 29 November 2003, in Milan, Italy, prior to the nineteenth session of the SBSTA. These documents are available to Parties on the secretariat website at <http://unfccc.int/sessions/workshop/281103/documents>.

10. The work of the secretariat in 2004 has included a thorough updating of the technical specifications of the data exchange standards consistent with work carried out on the development of the ITL and comments received from experts involved in the development of national registries. Progress has been made in further developing the messaging services and formats for exchanging communications. Drafts have been refined based on comments made by technical registry experts on draft material circulated and during an informal technical meeting held on 27 and 28 April 2004 in Brussels, Belgium.

11. A revised version of the technical specifications of the data exchange standards is to be presented to Parties at the twentieth session of the SBSTA. This draft will be available at the beginning of June 2004 at <http://unfccc.int/sessions/workshops.html> and will be further commented on during a technical meeting to be held on 11 June 2004 in Bonn, Germany. It defines technical detail for the implementation of secure communications over the Internet, transaction and reconciliation sequences, message and identifier formats, ITL response codes, the recording of data, change management procedures, and processes for initializing registries with the ITL.

12. Work yet to be undertaken includes the development of common test protocols for registry systems, the further elaboration of registry initialization processes for activating communications with the ITL, and the preparation of a complete checklist of the specifications against the provisions of the decisions mentioned in paragraph 6 above.

13. The technical specifications (version 1.0) of the data exchange standards are to be completed by July 2004. The SBSTA, at its twenty-first session, may wish to take note of their completion and their conformity to the general design requirements of the data exchange standards, as contained in the annex to decision 24/CP.8. This version 1.0 will require modification over time to incorporate improvements and technological advances. Procedures are envisaged to manage these changes to the data exchange standards (see chapter V).

IV. Progress on the independent transaction log

A. Requirements and technical design specifications

14. The functions to be provided by the ITL were identified by the secretariat in early 2003 and presented to Parties at the pre-sessional consultations on registry systems held on 2 June 2003 in Bonn, Germany, prior to the eighteenth session of the SBSTA. Because of funding constraints, work on the development of the ITL had to be postponed to 2004 as Parties urged that priority be given to the elaboration of the specifications of the data exchange standards.

15. As a result of contributions by Parties to the UNFCCC Trust Fund for Supplementary Activities made during and after the ninth session of the COP, and in accordance with the request of the SBSTA at its nineteenth session, the secretariat was able to resume its work on the development of the ITL. Good progress has been made in the first half of 2004 to identify the requirements for the ITL arising from relevant decisions of the COP and the specifications of the data exchange standards. Work on the development of the technical design specifications of the ITL has also advanced well during this period.

16. Draft versions of the requirements and technical design specifications for the ITL will be available at <http://unfccc.int/sessions/workshops.html> at the beginning of June 2004. The document containing the draft requirements provides an overview of the ITL functions. The document on the design specifications is highly technical in nature.

17. The development work on the ITL is taking account of supplementary checks that groups of Parties may wish to apply to transactions carried out in the context of regional emissions trading programmes. These additional checks are to be undertaken by supplementary transaction logs (STLs) developed by such groups of Parties, in a manner that does not affect the checks to be performed by the ITL. Currently, the only STL under development is the Community Independent Transaction Log (CITL) of the European Union emissions trading scheme.

18. The draft requirements and technical design specifications define, inter alia, how the following aspects of the ITL are to be implemented:

(a) The technical architecture of the ITL, including the integration of the communications hub, the relationship of the ITL to registries and STLs, hardware specifications, a dedicated testing environment, back-up and disaster recovery procedures, and specifications of the virtual private network, encryption and authentication required for secure communications to and from the ITL

(b) The database structure, containing tables to hold all the data for supporting record logs, registry holdings, transaction history and reconciliation history

(c) The processing of transactions, including all functions and components required to support the messaging and processing defined by the data exchange standards, as well as the validation of transactions (issuance, conversion, external transfers, cancellation, retirement, replacement and carry-over)

(d) The processing of reconciliation actions, to manage the periodic reconciliation of data on registry unit holdings in registries and the ITL

(e) The provision of interfaces for the management of the ITL by its administrator and for allowing public access to selected information.

19. The draft requirements and technical design specifications contain complete lists of automated transaction validation checks to be performed by the ITL to identify, on the basis of provisions in the decisions in paragraph 6, any discrepancies associated with proposed transactions. They are divided into:

(a) Version checks, to ensure that the correct version of the data exchange standards is used

(b) Registry validation checks, to authenticate the registry

(c) Data integrity checks, to ensure that data comply with the data exchange standards

(d) Message sequence checks, to ensure the communication is consistent with the sequence and status codes defined by the data exchange standards

(e) Transaction checks, to ensure that any proposed transaction is consistent with rules defined under the Kyoto Protocol.

B. Means to reduce resource requirements

20. Four options to reduce the resource requirements associated with the development of the ITL were discussed during the pre-sessional consultation prior to the nineteenth session of the SBSTA:

(a) In-kind contributions of programme code for the communications module of the ITL to handle the transmission and receipt of electronic messages. This module, as implemented by registries, is likely to be very similar to that of the ITL

(b) In-kind contributions of programme code for a registry. This code was considered to have limited overlap with the ITL in terms of database structure and internal checks

(c) In-kind contributions of programme code for another transaction log application. This programme code was considered to have greater overlap with the ITL in terms of the database structure, technical architecture and transaction processing and checks

(d) Hosting of the ITL by a Party, through which hosting costs could be reduced or absorbed by the Party. However, this would not reduce development costs.

21. Three of the options involved the sharing of programme code for areas of registries or transaction log applications which are sufficiently similar to the ITL. Software development is labour-intensive and its costs typically exceed hardware costs. However, in order to avoid expensive compatibility issues arising during the implementation of the ITL, it is important that the development of the shared programme code be coordinated with the development of individually developed elements of code.

22. In view of the extent of generic functions common to transaction log applications, the discussions at the pre-sessional consultations focused on the third of the above options. In particular, participants considered whether programme code elements of the European Union CITL could be used within the ITL development. Preliminary estimates indicated that this could reduce the funding needs of the ITL development, estimated to be USD 1.2–1.8 million, by about half.

23. In accordance with the request of the SBSTA at its nineteenth session, the secretariat has continued to pursue means to reduce the resource requirements associated with the development of the ITL, in particular through the option making use of programme code developed for the CITL. The feasibility of this approach arises from the basic functions of the CITL having been derived from the concept of the ITL under the Kyoto Protocol; similar to the ITL, the CITL is to be integrated within the communications network between registries of European Union Member States and is to undertake automated checks on transactions proposed in relation to them.

24. Elements and characteristics of the CITL which sufficiently resemble the ITL and allow the use of programme code in the ITL include the technical architecture, database structure, processing and validation of transactions, processing of reconciliation actions, secure communications across the Internet, and provision of interfaces for the management of the application by its administrator and for allowing public access to selected information.

25. There are also differences between the ITL and the CITL. They lie primarily in the different sets of transaction validation checks that need to be applied to transactions involving European Union Member States. Being supplemental to the base checks of the ITL, these checks position the CITL behind the ITL (as one of the STLs referred to in paragraph 17 above) and require a different set of data. It is important that data and checks are not duplicated between the ITL and the CITL, as this could result in inconsistencies. This positioning of the CITL behind the ITL also implies the different routing of electronic messages, as the CITL receives and transmits messages only through the ITL. This position is foreseen for any additional STLs which may be formulated by groups of Parties and ensures that the transaction validation checks performed by the ITL remain unaffected by any checks applied by an STL.

26. On the basis of the request of the SBSTA at its nineteenth session, and of feedback from Parties at the pre-sessional consultations prior to that session of the SBSTA, the secretariat has held discussions with the European Commission, which is responsible for the establishment of the CITL. An informal arrangement has been established by which the programme code for elements of the CITL which are similar to the ITL will be provided by the European Commission to the secretariat as an in-kind contribution. The secretariat may make use of this programme code in its development of the ITL.

27. In order to ensure that the programme code it receives meets ITL requirements, the secretariat is providing the technical design specifications of the ITL to the European Commission as the basis for its CITL development. This also helps to ensure the technical compatibility of the CITL with the ITL and allows for the supplementary processing and checks of the CITL to be developed as additional and separable elements. Such supplemental elements are not required by the ITL and may be separated from the bulk of the programme code when this is provided to the secretariat.

C. Implementation of the transaction log

28. Several key issues remain to be clarified in relation to the implementation of the ITL. These are currently being considered by the secretariat in its further implementation planning and include:

(a) Timing of implementation**.** The COP at its eighth session requested that the secretariat undertake work, subject to the availability of resources, with a view to implementing the ITL by the tenth session of the COP. As a result of resource constraints in 2003, which delayed work, and the extent of development and testing work still to be done, the implementation schedule for the of the ITL needs to be adjusted. The launch of the ITL is currently anticipated for about the middle of 2005. As the European Union trading scheme is to begin operation on 1 January 2005, the CITL will need to conduct the base validation checks, as well as its supplementary checks, until the ITL becomes operational

(b) Initialization of registry connections to the ITL**.** This process includes the technical networking and testing of transaction and reconciliation processes, the identification of staff, communication of reference information and evaluation of registry documentation and procedures. As the ITL would begin operations after the CITL, this initialization process will need to carefully manage the migration of European Union registry connections from the CITL to the ITL

(c) Legal arrangements**.** Such arrangements need to be established between the ITL and any STL that is set up (such as the CITL) in order to define the rights and obligations of each

system. It may also be necessary to establish such arrangements between the ITL and each of the registries

(d) Hosting of the ITL**.** The annex to decision 19/CP.7 states that the secretariat is to establish and maintain the ITL. Hosting the ITL includes a number of specialized technical tasks relating, for example, to the 24 hour operation and maintenance of the system and its periodic upgrade. The secretariat, in exercising its overall responsibility to establish and maintain the ITL, is therefore considering the contracting of at least some of these functions to a suitable external organization. Such an organization would be identified in accordance with United Nations rules and procedures

(e) Funding of the ongoing activities of the ITL**.** In order to secure the long-term operation of the ITL, it will be necessary to guarantee the provision of sufficient resources to fund the operational, maintenance and upgrade activities of the ITL. Options for covering such resources requirements include their inclusion in the programme budget of the UNFCCC and the establishment of an ITL fee structure. The payment of fees under the latter of these options could, for example, be based upon the level of ITL traffic and processing attributable to individual registries and STLs.

V. Cooperation among administrators

A. Possible areas of cooperation

29. The need for cooperation to facilitate accuracy, efficiency and transparency in the design and operation of registries has been recognized by both the SBSTA and the COP. This cooperation relates both to the ongoing management of modifications to the data exchange standards, on the basis of technological or policy-level changes, and to issues outside the scope of the data exchange standards.

30. In view of the progress made on registry systems up to November 2003, the SBSTA, at its nineteenth session, did not make recommendations to the ninth session of the COP for additional actions to establish and maintain registry systems. The SBSTA instead encouraged each Annex I Party with a commitment inscribed in Annex B to the Kyoto Protocol to designate its registry administrator, with a view to facilitating early cooperation on the development of registries and the ITL.

31. The pre-sessional consultations prior to the nineteenth session of the SBSTA identified several areas of possible cooperation among administrators that are particularly relevant to the development of registries. These focused on a need to increase the exchange of information and experience, particularly in clarifying the roles of administrators and in sharing approaches and specifications relating to the implementation of the data exchange standards. It was recognized that such sharing of information could help those Parties which are well advanced in the development of national registries, as well as Parties which are still in the early stages of their work.

32. The secretariat has made progress, through the collaboration with technical registry experts, to clarify the roles of administrators of registries and the ITL. The following three types of role have been identified and are being further elaborated through this collaboration with experts:

(a) **Policy-related roles,** including the overall management of the registry or the ITL, liaison with policy makers and definition of business rules, consultation with stakeholders, the definition of service level agreements, the reaching of agreements with other registry systems and management of the cooperation with other administrators

(b) **Application-related roles,** including day-to-day activities such as the management of accounts and account access, the provision of user support and training, the monitoring

of record logs, the review of transactions, the resolution of inconsistencies discovered through reconciliation processes, the publication of selected information, and the coordination of business continuity and system upgrades

(c) **Technical support roles,** including the provision and maintenance of hardware, the management of the communications infrastructure, such as registry connections to the ITL, database management, the archiving and backing-up of data, the implementation of disaster recovery procedures, the performance of technical upgrades and the resolution of day-to-day issues and problems as they arise.

33. The pre-sessional consultations prior to the nineteenth session of the SBSTA stressed the need to move quickly to a structured form of cooperation among administrators, and their developers in the period before registry administrators are designated, in support of registries and the ITL. Possible areas of cooperation have been elaborated through the collaboration with technical registry experts. In particular, it was considered that common practices in the following areas needed to be developed and adopted by all administrators in order to ensure the effective operation of registries and the ITL:

(a) Coordination in managing changes to the data exchange standards, including the determination of modifications and the timing with which they should be effected

(b) Coordination on the type and frequency of reconciliation processes

(c) Testing of registry systems, as an ongoing exercise, which could be taken into account in the review process under Article 8 of the Kyoto Protocol

(d) Resolution of problems and inconsistencies between registry systems, especially in relation to reconciliation processes

(e) Suspension of registry services in the event of persistent problems and inconsistencies.

34. The technical registry experts further considered that a structured form of cooperation would be useful for developing recommended practices, particularly in relation to the recovery of systems and data, the management of user access and agreements with users, system availability, and technical improvements. Such cooperation would also allow for sharing information and experience, for example in relation to legal issues and purchases of hardware and software.

B. Possible forms of cooperation

35. At the pre-sessional consultations prior to the nineteenth session of the SBSTA it was felt that an immediate and informal means of exchanging information and experience would be the posting of information on the secretariat web site. The secretariat has therefore established a module on its web site to which experts involved in national registry development are given access.

36. Participants at the consultations further considered the form that longer-term, structured cooperation could take. Options for such cooperative structures, arranged according to the level of institutional complexity in their relationship to the intergovernmental bodies of the UNFCCC, include:

(a) A registry systems administrators forum, as an autonomous and self-organizing technical group independent of a subsidiary body or the COP (COP/MOP)

(b) A registry systems administrators forum facilitated by the administrator of the ITL. This would take advantage of the facilitative role of the secretariat, as the administrator of the ITL, including the technical capacity of an operator contracted by the secretariat to conduct the technical operations of the ITL

(c) A registry systems administrators forum convened by the Chair of one of the subsidiary bodies, with the assistance of the secretariat. This would also take advantage of the facilitative role of the secretariat, which would be able to call upon the technical capacity of the ITL operator. As the forum would operate under the authority of the Chair of one of the subsidiary bodies, its reports would be submitted to that body for consideration

(d) An expert group or other constituted body under one of the subsidiary bodies or directly under the COP (COP/MOP). This body could be modelled after existing bodies under the intergovernmental process and could have similar reporting channels.

37. In considering the appropriate form of structured cooperation, issues such as the following may need to be addressed:

(a) Purpose. The primary purpose of the cooperation would be to facilitate and promote accuracy, efficiency and transparency in the operation of registries and the ITL through a coordinated approach to technical issues

(b) Participation. Representatives of the organizations designated as administrators of national registries, the CDM registry and the ITL would be expected to participate

(c) Decisions to be taken. Decisions by the cooperative structure could be limited to issues for which coordination of technical activities and practices is essential

(d) Reporting on activities. Activities of administrators under this cooperation would need to be reported to an intergovernmental body for its endorsement

(e) Relation of the activities to the review under Article 8 of the Kyoto Protocol. In particular, the technical testing of registries could be taken into account by review teams.

38. Meetings of all administrators could be limited to one or two per year (initially perhaps three or four times per year). Smaller groups of administrator representatives could meet to prepare material to facilitate decision-making by all administrators. In addition, it may be possible for the administrators to designate representatives to take decisions on their behalf.

39. The scope of reporting to an intergovernmental body would depend on the form of cooperative structure implemented. For example, an independent forum may not be expected to report to either one of the subsidiary bodies or the COP (COP/MOP). A forum facilitated by the ITL administrator could report through the secretariat and a forum convened by the Chair of one of the subsidiary bodies could report through the Chair to that subsidiary body. An expert group or other constituted body under one of the subsidiary bodies or the COP (COP/MOP) would report directly to that body.

40. Means of financing the cooperation among administrators and, where appropriate, the facilitation provided by the secretariat or the ITL operator need to be agreed upon. Options range from direct contributions made by each Party or administrator, to the inclusion of resources in the programme budget or coverage by participants through fees relating to the use of the ITL, or a mix thereof.

41. Finally, depending on the timing and modalities for establishing a cooperative structure among administrators, it may be necessary to consider modalities for facilitating cooperation during an interim period prior to the tenth session of the COP.

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