



SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE

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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

In response to the request by the Subsidiary Body for Scientific and Technological Advice (SBSTA), at its twentieth session, this note provides a progress report on the work of the secretariat to develop and implement the functional and technical specifications of the data exchange standards, the international transaction log (ITL) and the registry for the clean development mechanism.

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.

The SBSTA may wish to consider the information in this note and prepare a draft decision, for consideration by the COP at its tenth session, relating to:

- (a) The conformity of the specifications of the data exchange standards with the general design requirements of these standards contained in decision 24/CP.8
- (b) Modalities for effective, long-term cooperation among registry system administrators
- (c) Modalities for the functioning of the administrator of the ITL, including funding arrangements for the long-term operation of the ITL.

^{*} This document has been submitted late in order to include information on the latest progress in this work and as a result of limited resources available to undertake its preparation.

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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 develop functional and technical specifications of the standards for data exchange between national registries, the clean development mechanism (CDM) registry and the international transaction log (ITL), in close collaboration with technical experts. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its twentieth session, stressed the need to ensure that, by its twenty-first session, version 1.0 of these specifications is in accordance with the general design requirements of the data exchange standards recommended by decision 24/CP.8 for adoption by the Conference of the Parties serving as the meeting of the Parties of the Kyoto Protocol (COP/MOP).
2. The SBSTA, at its twentieth session, stressed the need to ensure effective, long-term cooperation among administrators of national registries, the CDM registry, the ITL and any supplementary transaction logs established by Parties,¹ for the purpose of facilitating and promoting accuracy, efficiency and transparency in the operation of registry systems. The SBSTA agreed to prepare a draft decision at its twenty-first session, with a view to the COP, at its tenth session, taking a decision on, inter alia, the structure of cooperation among administrators, the facilitation of such cooperation by the ITL administrator, and the manner of reporting to the appropriate subsidiary body.
3. The SBSTA, at its twentieth session, also reaffirmed the importance of making progress on the development of the ITL and noted that it is expected to be established in mid-2005, subject to the timely availability of funding and the extent of modification required to the programme code provided as an in-kind contribution to the secretariat. The SBSTA requested the secretariat to report to its twenty-first session on the progress made with the development and establishment of the ITL and to make proposals on operational issues, including reporting, guidance and resource implications.
4. At the same session, the SBSTA further requested its Chair, in conducting the intersessional consultations with Parties and experts in accordance with decision 19/CP.7, to consider the conformity of version 1.0 of the technical specifications of the data exchange standards with decision 24/CP.8, to facilitate dialogue among administrators, to prepare proposals for the twenty-first session of the SBSTA on the structure and procedures for cooperation among administrators in the long term, and to exchange information and experience relating to registry systems.

B. Scope of the note

5. This note reports on progress made by the secretariat in the work relating to the development and implementation of:
 - (a) The functional and technical specifications of the data exchange standards
 - (b) The international transaction log
 - (c) The CDM registry.
6. Information on the intersessional consultations on registry system, held on 8–10 November 2004 in Bonn, Germany, is contained in the report on these consultations (FCCC/SBSTA/2004/INF.18).

¹ These systems are known collectively as registry systems.

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

7. The SBSTA may wish to consider the information in this note and prepare a draft decision, for consideration by the COP at its tenth session, relating to:

- (a) The conformity of the specifications of the data exchange standards with the general design requirements of these standards contained in decision 24/CP.8
- (b) Modalities for effective, long-term cooperation among registry systems administrators
- (c) Modalities for the functioning of the administrator of the ITL, including funding arrangements for the long-term operation of the ITL.

II. Background

8. The provisions contained in decisions 15/CP.7, 16/CP, 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**, to be established and maintained by Parties included in Annex I to the Convention with a commitment inscribed in Annex B to the Kyoto Protocol (hereinafter referred to as Annex I Parties) to manage accounts for the Party and entities participating in the mechanisms under the Kyoto Protocol
- (b) The **CDM registry**, to be established and maintained by the secretariat under the authority of the Executive Board of the CDM, to manage accounts for Parties not included in Annex I to the Convention (non-Annex I Parties) and entities which receive credits from CDM projects (temporary accounts for Annex I Parties and entities are to be maintained to receive and hold such credits until national registries become operational)
- (c) The **international transaction log**, to be established and maintained by the secretariat, to monitor registry transactions and verify that they conform with the modalities, rules and limits established under the Kyoto Protocol and are in accordance with the specifications of the data exchange standards.

9. These registry systems are to facilitate emissions trading, including of units generated by CDM project activities and projects under Article 6² (joint implementation projects). 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 (ICERs).

10. In addition, supplementary transaction logs (STLs) may be established to monitor transactions by registries under regional trading schemes and verify that they conform with rules under those schemes. The only example of a STL currently under development is the Community Independent Transaction Log (CITL) under the European Union emissions trading scheme.

III. Progress with the data exchange standards

A. Content

11. The registries and the ITL require a minimum level of compatibility with each other in transaction processing and electronic communications. This need was foreseen in decision 19/CP.7,

² "Article" in this document refers to an article of the Kyoto Protocol, unless otherwise specified.

which established work to develop data exchange standards to be implemented in all registries and in the ITL. Decision 24/CP.8 subsequently established the general design requirements of the data exchange standards and requested the secretariat, in collaboration with registry experts, to develop detailed specifications of these standards which would contain sufficient technical information to enable all registries and the ITL to implement the standards in a consistent manner. In accordance with decisions 19/CP.7 and 24/CP.8, each registry system is to fully implement these specifications.

12. In effect, the data exchange standards define a network of registry systems in which all national registries and the CDM registry are connected directly to the communications hub of the ITL, via secure Internet channels. Any transaction which affects the overall balance of units available in a registry for compliance with Article 3, paragraph 1, is to be monitored and verified by the ITL and coordinated through defined sequences of processing steps and electronic messages with the ITL.

13. This monitoring and verification of transactions by the ITL takes place during their proposal stages. It is achieved through registries sending proposal messages to the ITL before they make any changes to their records of units held in accounts. The ITL checks the proposals against the modalities, rules and limits established under the Kyoto Protocol and ensures that the messages conform to the data exchange standards. Registries may complete their transactions, by updating their records of unit holdings, only if they receive a message from the ITL indicating that its checks identified no discrepancies from the modalities of the Kyoto Protocol in the transaction proposals. The registries then confirm the actions they have taken by transmitting confirmation messages back to the ITL.

14. Where transactions are also subject to rules under regional trading schemes, the proposed transactions are checked by the ITL and forwarded to the relevant STL for further supplementary checking.

15. The specifications of the data exchange standards cover all units established under the Kyoto Protocol, including those established by decision 19/CP.9 for afforestation and reforestation activities under the CDM. They further cover all transactions defined for registries, including the initial issuance of units, the conversion of units on the basis of joint implementation projects, the external transfer of units to other registries, the cancellation, retirement and replacement of units within registries, the carry-over of units to subsequent commitment periods, and the extension of unit expiry dates (in particular for renewals of crediting periods under afforestation and reforestation project activities under the CDM).

16. The processing and communications defined by the data exchange standards are designed to ensure that all registries and the ITL maintain consistent sets of data on the unit holdings in each registry. Furthermore, this consistency is periodically checked, and corrected where necessary, through the reconciliation process defined by the data exchange standards.

17. In addition to defining sequences for processing transactions and reconciliation, the data exchange standards define the detailed mechanisms for secure communications over the Internet, data and identifier formats, codes to identify the results of ITL checks, administrative processes for the ITL within the network, data records to be stored by each system, test protocols, and processes for initializing registry communications with the ITL.

B. Progress and next steps

18. Version 1.0 of the functional specifications of the data exchange standards was finalized in 2003 and presented at the pre-session consultations on registry systems held on 28 and 29 November 2003 in Milan, Italy, prior to the nineteenth session of the SBSTA. It outlines the specific functions to be fulfilled by the data exchange standards.

19. Version 1.0 of the technical specifications of the data exchange standards was recently completed and was discussed during the intersessional consultations on registry systems on 8–10 November 2004.³ It contains sufficient technical detail to enable the administrator of each registry system to implement these standards in full.

20. The functional and technical specifications of the data exchange standards were developed by the secretariat in close collaboration with technical experts involved in developing national registries. Since decision 24/CP.8 was adopted, four informal meetings of technical expert have been held and seven drafts have been circulated for comment. In addition, four intersessional consultations on registry systems have been held in 2003 and 2004. These consultations have provided an opportunity to present drafts of the specifications and to seek feedback from Parties on their development. Earlier drafts of version 1.0 of the technical specifications have also been implemented by many registries and the CITL, providing further concrete testing of the data exchange standards and suggestions for improvement.

21. Every effort has been made during the development of these specifications to ensure that they conform with all previous decisions by the COP relating to the mechanisms under Articles 6, 12 and 17 (including the inclusion of afforestation and reforestation activities under the CDM), land use, land-use change and forestry activities under Article 3, paragraphs 3 and 4, the modalities for the accounting of assigned amounts under Article 7, paragraph 4, the reporting by Parties under Article 7, the review process under Article 8, and the procedures and mechanisms relating to compliance under Article 18.

22. The completed specifications were presented to Parties and discussed during the most recent intersessional consultations on registry systems (8–10 November 2004). In accordance with the request of the SBSTA at its twentieth session, these consultations discussed the conformity of the specifications with the general design requirements of the data exchange standards set out in decision 24/CP.8. Further information on these discussions is contained in the report on the consultations.

23. It is expected that the specifications will require modification over time in order to incorporate improvements and technological advances. Provision for managing such modifications has been incorporated into the design of the standards. It is envisaged that procedures to coordinate the development and implementation of these changes will be established through further cooperation among administrators of registry systems.

24. At the twenty-first session of the SBSTA, Parties may wish to confirm the conformity of the specifications of the data exchange standards with previous decisions by the COP. Parties may further wish to consider how the current and future versions of these specifications should be communicated to the administrators of registry systems. The discussions during the intersessional consultations highlighted the possibility of the ITL administrator being responsible for the release of relevant versions of the specifications that have been agreed through the cooperation among registry system administrators.

IV. Progress with the international transaction log

A. Content

25. The ITL is to monitor registry transactions and verify that they conform with the modalities, rules and limits established under the Kyoto Protocol and the specifications of the data exchange standards. The ITL thus ensures the integrity of the unit holdings in registries and of the accounting procedures upon which the compliance of Annex I Parties with their Kyoto Protocol targets will subsequently be assessed.

³ Version 1.0 of the functional specifications (40 pages) and the technical specifications (350 pages) of the data exchange standards may be found at <http://unfccc.int/meetings/workshops/other_meetings/items/3167.php>.

26. The technical specifications for the ITL 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 registries
- (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 electronic messaging and the processing and validation of transactions
- (d) The processing of reconciliation actions and the management of the periodic reconciliation of data on registry unit holdings in registries and the ITL
- (e) The sending of notifications to registries informing them of specific actions they are required to take in accordance with decisions by the COP
- (f) The provision of administrator interfaces for the management of the ITL by its administrator and for allowing public access to selected information.

27. The technical specifications contain lists of automated checks to be performed by the ITL when validating the transactions proposed by registries. About 140 automated checks have been defined for the ITL and may be classified into two types:

- (a) Checks of a primarily technical nature that have been defined to ensure that registry systems communicate in accordance with the data exchange standards and can therefore be read and processed by the ITL. Such checks therefore focus on authenticating the communicating registry system and ensuring that the message sequence, format and content are in accordance with the data exchange standards
- (b) Checks of a primarily policy-related nature that have been defined to monitor the validity of transactions in relation to the modalities, rules and limits that Annex I Parties are to apply under the Kyoto Protocol. For example, some checks are to ensure that Parties are eligible to participate in the mechanisms and to verify that limits on the issuance of units are not exceeded. Some more general checks are to be applied to all transaction proposals whereas others are to apply to specific transaction types.

28. In the event that no discrepancy is identified by the automated checks in a transaction proposal, the ITL will send a positive message to the registry, which may then continue with its processing of the transaction. In the event that a discrepancy is identified, the ITL will send a message to the registry concerned with a response code indicating the specific check that failed and the reason for this failure. The ITL processes for conducting these checks are detailed in the ITL technical specifications and the codes and check descriptions are reproduced in the data exchange standards.

29. The ITL checks are mostly conducted with reference to data stored in the ITL. For example, the ITL keeps records of all the serial numbers and the account types (holding, cancellation, retirement, etc.) in which the units are located.⁴ The consistency of these ITL records with those of registries is ensured through the regular reconciliation of data with registries.

⁴ The ITL does not maintain records of the individual account in which units are held by registries.

30. Some ITL checks are made with reference to data drawn from processes and sources outside the ITL which have been given the authority, under the Kyoto Protocol, to define or store such data. This is the case for limits on the issuance, conversion and carry-over of units. For example, in checking if the issuance of AAUs exceeds the assigned amount of the Party (pursuant to Article 3, paragraphs 7 and 8), the ITL draws upon the assigned amount data established through the reporting, review and compliance procedures under the Kyoto Protocol and stored in the compilation and accounting database defined under Article 7, paragraph 4. This approach therefore takes account of the limits on the mandate given to the ITL.

B. Progress and next steps

31. The functions to be provided by the ITL were identified by the secretariat in early 2003 and presented to Parties at the pre-session 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.

32. As a result of pledges of contributions by Parties to the UNFCCC Trust Fund for Supplementary Activities during the ninth session of the COP, and in accordance with the request of the nineteenth session of the SBSTA, the secretariat resumed its work on the ITL development in 2004. The design of the ITL has since taken place in parallel with the development of the data exchange standards. Version 1.0 of the technical specifications for the ITL are nearing completion and were discussed during the intersessional consultations on registry systems on 8–10 November 2004.⁵ These specifications form the basis for the construction and implementation of the ITL.

33. The current draft (draft 6) of version 1.0 of these specifications is consistent with the completed specifications for the data exchange standards. The remaining work relates to completing the specifications of the application through which the ITL is administered.

34. The specifications of the ITL have been developed by the secretariat. In conducting this work in parallel with the development of the data exchange standards, the technical compatibility of the two work streams is maintained. Furthermore, the technical expert meetings and intersessional consultations, as well as the circulation of drafts to experts, have provided an opportunity to present and discuss these specifications with the developers of registries with which the ITL will need to interact. As with the data exchange standards, every effort has been made to ensure that the ITL specifications are in conformity with all previous decisions by the COP.

35. As reported to the SBSTA at its nineteenth session, the secretariat has held discussions with the European Commission, which is responsible for the establishment of the CITL. An informal arrangement has been established under which the European Commission has used the specifications of the ITL as the basis for its development of the CITL. Drafts of the ITL specifications were provided throughout 2004 and their review and implementation within the CITL has provided a further means to improve them. In return, the European Commission has undertaken to provide the secretariat, as an in-kind contribution, with the programme code for elements of the CITL which are common to the ITL.

36. The secretariat expects that this programme code will provide a well-advanced basis on which it may develop the ITL. Components of the CITL which sufficiently resemble those of the ITL include the technical architecture, database structure, processing and validation of transactions, processing of reconciliation actions, and provision of interfaces for the management of the application by its

⁵ Version 1.0 (draft #6) of the technical specifications of the ITL may be found at <http://unfccc.int/meetings/workshops/other_meetings/items/3167.php>

administrator and for allowing public access to selected information. Although some modification of these components will be necessary, this arrangement has allowed considerable savings in time and costs.

37. Importantly, the arrangement with the European Commission has also assisted in ensuring the technical compatibility of the CITL with the ITL. The modular structure of the ITL specifications and the CITL design allows for the supplementary processing and checks of the CITL to be developed as additional and separable elements, such that they may subsequently be separated from those system components which are required by the ITL.

38. The programme code for the CITL to be received from the European Commission will need to be thoroughly evaluated to assess which components of code need to be removed, added or adapted. The secretariat currently expects that the following modifications will be needed to ensure that the programme code fully meets the specifications of the ITL:

- (a) Add or adapt database tables required for the ITL and remove those that are not required
- (b) Add functions relating to CDM and joint implementation projects, including transaction processes for the replacement of afforestation and reforestation units under the CDM and changes in the expiry dates of these units
- (c) Add or adapt functions relating to notifications to be processed and sent to registries by the ITL
- (d) Remove functions relating to transaction processes specific to the European Union emissions trading scheme and the account management performed by the CITL
- (e) Add or adapt check functions required for the ITL and remove check functions specific to checks performed by the CITL
- (f) Update the message formats in accordance with the final version of the specifications of the data exchange standards
- (g) Add architecture and functions to route messages to and from, and share data with, STLs
- (h) Further develop the administrative application through which the ITL is administered.

39. The secretariat intends to contract the technical operation of the ITL to a suitable external service provider, while maintaining the responsibility for the operation as administrator of the ITL. The provider of ITL hosting services is expected to perform the following roles:

- (a) Technical support roles, including the provision and maintenance of hardware, the management of the communications infrastructure (such as connections to registries), 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
- (b) Application-related roles, including day-to-day activities such as the administration of the system, 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 system continuity and system upgrades.

40. In addition, the service provider would be expected to assist the ITL administrator in policy-related roles, including the overall management of the ITL, liaison with registry administrators and

Parties, consultation with other stakeholders, the definition of business rules, the reaching of agreements with other registry systems, and facilitation of the cooperation with other administrators.

41. The secretariat is currently preparing a Request for Proposal document, with which it will seek proposals from companies and organizations interested in providing services for the development and hosting of the ITL, in accordance with United Nations rules and regulations. Subject to the timely availability of funding and the extent of modification required to be made to the programme code provided as an in-kind contribution, the secretariat aims to make the ITL available for initialization activities with registries in mid-2005. A more precise timetable and estimate of resource requirements is to be defined once the programme code has been evaluated and the service provider has been selected.

V. Progress with the clean development mechanism registry

42. The CDM registry is, in accordance with decision 17/CP.7, to be established and maintained by the Executive Board of the CDM. At its thirteenth meeting (24–26 March 2004, Bonn, Germany), the Board agreed that the secretariat is to be the CDM registry administrator, with responsibility under the Board for implementing and operating the registry. It further agreed that the secretariat was to proceed with the selection, development and implementation of the CDM registry.

43. The secretariat has since defined the specifications of the CDM registry and contracted, in accordance with United Nations rules and regulations, Perrin Quarles Associates (Virginia, USA) to develop and deploy the CDM registry. This work is proceeding in two phases:

- (a) Version 1 of the CDM registry was deployed in the secretariat in November 2004. This version is not linked to the ITL but is ready to issue and distribute the first credits for CDM projects, on an interim basis, upon a request for issuance being received by the Executive Board and being forwarded to the CDM registry administrator in the form of an issuance instruction. Holding accounts for participants in projects for which issuance instructions are received will be established by the administrator
- (b) Version 2 of the CDM registry is to be further developed in the first half of 2005 in order for it to initialize its communications with the ITL when this becomes operational. At that point, the interim issuance and distribution of CDM credits is to be confirmed by the ITL and the CDM registry will be able to forward credits to accounts of project participants in national registries. At that stage the registry will also allow secure access for account holders to access their accounts.

44. The contractor has also been engaged to assist with procedural planning and documentation, to provide training to administrator staff, and to provide, as required, operational support services to the CDM administrator for a period of three years (2005–2007), including advice and technical services.

45. In accordance with the agreement of the Executive Board at its twelfth meeting (27–28 November 2003), the CDM registry may include temporary accounts for Annex I Parties, and project participants from such Parties, until national registries for such Parties and entities are operational, for the purpose of receiving credits forwarded to them from the pending account of the CDM registry and for transferring such credits to accounts in national registries.
