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2 *FINLAND'S NATIONAL REGISTRY UNDER ARTICLE 7*
3 *OF THE KYOTO PROTOCOL*

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11 *Draft Report to the European Commission*
12 *15 January 2006*

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PREFACE

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3 This report describes the national registry in Finland. The national registry under Article 7 of the Kyoto protocol
4 has not been established to date. However, the GRETA registry system used in Finland has been developed for
5 the EU Emissions Trading Scheme. This scheme requires its Member States' registries to be compliant with the
6 UN Data Exchange Standards specified for the Kyoto Protocol. Currently, the development adheres to the stan-
7 dards specified in Draft #7 of the UN DES document. Finland has had the Registry systems tested successfully
8 with the EU Commission and the Registry has since gone live.
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10 The ministries participating in the contact network on climate policy issues have reviewed the report and it has
11 been approved by the Cabinet Committee on European Union Affairs meeting on 14 December 2005.
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15 Statistics Finland
16 Kaija Hovi
17 Director, Business Structures
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1 Introduction

The National Registry under Article 7 of the Kyoto Protocol performs the functions defined in the annex to decision -/CMP.1 (Modalities for the accounting of assigned amount) and the annex to decision 1/CMP.1 (Afforestation and reforestation project activities under the CDM), and complies with the requirements of the technical standards for data exchange between registry systems as adopted by the COP/MOP. In the Government resolution of 30 January 2003 on the organisation of climate policy activities of Government authorities in Finland the Energy Market Authority has been assigned with the responsibility to develop and administer the National Registry.

The National Registry under Article 7 of the Kyoto Protocol is not functional yet and the national as well EU decisions on how it will be implemented are not taken yet. However, Finland is participating in the EU Emission Trading, and has developed its national registry under this scheme. The National Registry under the Kyoto Protocol will build on the registry developed for the EU Emission Trading. In this description, the technical information on the National Registry required in the Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol builds on the performance and technical properties of the registry developed for the EU Emission Trading, complemented with information available on issues specific to the registry under the Kyoto Protocol.

2 Description of the National Registry

The registry administrator designated by Finland to maintain the national registry is:

Energy Market Authority

Address: Lintulahdenkatu 10, FIN-00500 Helsinki, Tel.: +358 9 6220 360

Contact person: Mr. Jukka Moisanen, Tel.: +358 9 6220 360

The names of the other Parties with which the Finland will cooperates by maintaining their national registries in a consolidated system under the Kyoto Protocol has not been decided when writing this description. In the EU Emission Trading scheme all Member States are included in the common system.

The database structure and capacity of the national registry is the following:

1. The GRETA registry system used in Finland is implemented using a Microsoft SQL Server relational database management system with a dedicated data model for supporting registry operations.
2. The absolute maximum size of a SQL Server 2000 database is 1,048,516 Terabytes or 50 Terabytes per single file entry. A Terabyte is equivalent to 10^{12} bytes.
3. SQL Server database model is also scalable up to 32 processors with 64 gigabytes of memory

The national registry conforms to the technical standards for data exchange between registry systems for the purpose of ensuring the accurate, transparent and efficient exchange of data between national registries, the clean development mechanism registry and the transaction log (decision 19/CP.7, paragraph 1)¹ as follows:

1. The GRETA registry system used in Finland has been developed for the EU Emissions Trading Scheme. This scheme requires its Member States' registries to be compliant with the UN Data Exchange Standards specified for the Kyoto Protocol. Currently, the development adheres to the standards specified in Draft #7 of the UN DES document. Finland has had the Registry systems tested successfully with the EU Commission and the Registry has since gone live.
2. As part of the GRETA Registry development, a functionality has been developed to perform issuance, conversion, external transfer, (voluntary) cancellation, retirement and reconciliation processes using XML messages and web-services as specified in draft #7 of the UN Data Exchange Standards document.
3. In addition, 24 Hour Clean-up, Transaction Status enquiry, Time Synchronisation, Data Logging requirements (including, Transaction Log, Reconciliation Log, Internal Audit Log and Message Archive) and the

¹ See decision 24/CP.8.

1 different identifier formats as specified in the UN DES document have been implemented. Extensive tests
 2 on these functionalities can therefore be arranged with the ITL test system once it becomes available.

- 3 4. With regards to performing tests with the CDM Registry (external transfer for example) this can also be
 4 performed once the ITL test system becomes available.
- 5 5. The following additional Kyoto functionalities have been identified by Greta that would need to be devel-
 6 oped for our Registry and tested against the ITL test system:
 - 7 a. Replacement of t-CER or l-CER,
 - 8 b. Carry-Over,
 - 9 c. Expiry Date Change (for t-CER and l-CER), and
 - 10 d. The whole area of functionality for ITL Notices (and the Notification Log)

11 Greta intends to schedule the development of these functionalities in their future releases in order to meet
 12 with the timetable required for Kyoto.

13 In order to minimise discrepancies between the Registry and the Transaction Log, the following approach has
 14 been adopted for the Registry system development for the EU Emissions Trading Scheme. The same approach
 15 would be adopted for the development of the remaining Kyoto functionality for Greta's Registry software:

- 16 1. Communication between the National Registry and the ITL would be via web-services using XML messages
 17 – as specified in the UN DES document. These web-services, XML message format and the processing se-
 18 quence would be as specified in the UN DES document;
- 19 2. As far as possible, the Registry shall validate data entries against the list of checks that are performed by the
 20 ITL – as documented in Annex E of the UN DES Annexes document – before forwarding the request to the
 21 ITL for processing. This would help to minimise sending incorrect information to the ITL for approval;
- 22 3. All units that are involved in a transaction shall be earmarked internally within the Registry; thereby pre-
 23 venting the units from being involved in another transaction until a response has been received from the ITL
 24 and the current transaction has been completed;
- 25 4. The web-service that sends the message to the ITL for processing will ensure that a message acknowledge-
 26 ment is received from the ITL before completing the submission of the message. Where no acknowledge-
 27 ment message has been received following a number of retries, the web-service would terminate the submis-
 28 sion and roll-back any changes made to the unit blocks that were involved;
- 29 5. Where a 24 hour clean-up message is received from the ITL, the existing web-service would roll back any
 30 pending transactions and the units that were involved, thereby preventing any discrepancies in the unit
 31 blocks between the Registry and the ITL; and
- 32 6. Finally, if an unforeseen failure were to occur, the data discrepancies between our Registry and the ITL can
 33 be corrected via a manual intervention function within our registry. Following this, reconciliation will be
 34 performed to validate that the data is in sync between the Registry and the ITL.

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 36 The security measures employed in the national registry of Finland are described at the attached document “In-
 37 formation Security Description”. For the Greta Registry the following security measures have been taken:

- 38 1. By default, access to the Registry is via Username and Password – though a different authentication module
 39 can be added locally, if required;
- 40 2. For the FI, authentication is further strengthened by digital certificate access;
- 41 3. The actions that a user can perform is controlled by a permissions system, hence preventing unauthorised
 42 access to restricted actions;
- 43 4. All actions performed are recorded by audit;
- 44 5. Database manipulations are only carried out by protected, internal stored procedures which are not accessible
 45 directly from the user interface and can only be invoked by our internal web-services;
- 46 6. And a dedicated Greta development team is available to make any further security enhancements as and
 47 when required.

48 In order to preventing operator errors, our Registry software incorporates the following design:

- 1 1. Applies validation on all user inputs to ensure that only valid details are submitted for processing;
- 2 2. Displays confirmation of user input to help the user to spot any errors that had been made;
- 3 3. Implements an internal approval process for secondary approval for relevant operations before submitting the
- 4 details to the ITL for processing.

5 The information publicly available is maintained in accordance with the Commission Regulation of 21 December
6 2004 for a standardized and secured system of registries pursuant to Directive 2003/87/EC of the European Par-
7 liament and of the Council and Decision 280/2004/EC of the European Parliament and of the Council.

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9 The internet address to the interface of the Finnish national registry is <http://www.paastokaupparekisteri.fi>

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11 In the event of a disaster the following **recovery procedures** have been incorporated in the design of the Regis-
12 try system:

- 13 1. Locally information in the database is held over a raid-array structure with automatic error detection and
14 recovery. Therefore, any single database failure would be alerted and the Registry would automatically
15 switch over to use information from the remaining 'correct' databases;
- 16 2. Data is also archived every 24 hours to an off-site disaster recovery site that can be used to take over as the
17 live registry in case that the main site has become un-operable. This will then be followed by the reconcilia-
18 tion (with the ITL) and manual intervention processes in order to check and restore data inconsistency that
19 may exist in the Registry.

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21 Procedures for testing the performance, procedures and security measures of the national registry are still largely
22 under development:

- 23 1. Currently, the Greta registry system for the EU Emissions Trading Scheme uses the security mechanism as
24 specified within the EU Regulation; (Annex XV); that is, it uses basic authentication and SSL.
- 25 2. For Kyoto, digital cert and VPN will be used when the ITL becomes available. This will be included in fu-
26 ture phase of the Greta registry development project.
- 27 3. No existing performance data or test procedure is currently available.

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