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## HUB USER COMPLIANCE DOCUMENT (HUBCOM)

### EECS RULES Subsidiary Document

### AIB-EECS-SD03: EECS Registration Databases

**Version:** 8.2

**Date:** 8 November 2022

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**Status of this document**

This document, the Hub User Compliance Document (HubCom) is also known as AIB-EECS-SD03: EECS Registration Databases, which is a subsidiary document to the EECS Principles and Rules of Operation (the EECS Rules) of the Association of Issuing Bodies (AIB) for The European Energy Certification System.

In the event of conflict between the text of the EECS Rules and the text of this document, the EECS Rules shall always take precedence.

The latest changes to this document were formally approved on 8 November 2022. The effective date of this EECS Rules subsidiary document is 9 November 2022.

Signed by the General Secretary:



Liesbeth Switten 8 November 2022

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**Document History**

Version	Issue Date	Reason for Issue
Draft 0d1	29 April 2005	Initial version
Draft 0d2	14 June 2005	Prepared for General Meeting
Release 1.0	22 September 2005	Release
Draft 1.1	23 September 2005	Revised to reflect format of other SDs
Release 2.0	20 January 2006	Revised to adopt similar format to other SDs
Release 3.0	22 September 2006	Revised to support disclosure certificates
Draft 3.1	10 November 2006	<ul style="list-style-type: none"> <li>• Revised to support the hub</li> <li>• Annex A3 and B5 are updated and moved to chapter 5.2.</li> <li>• Annex D has gone through a complete recast.</li> <li>• Old Annex D moved to Annex E</li> <li>• Changed EAN to GS1</li> </ul>
Release 4.0	1 January 2008	Revised to align CHP and Disclosure chapters; change the limit on exported GO; and clarify the position of AIB Test Manager
Release 5.0	1 January 2009	Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• CR0714 - SD03 GS1/email encoding</li> <li>• CR0806 - FS5 Technology code 95.</li> </ul>
Release 5.1	1 January 2009	Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• PRO-CR0801: Inclusion of capacity into EECS certificates</li> </ul>



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Version	Issue Date	Reason for Issue
Release 5.2	1 June 2009	Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• PRO-CR0901: Implementation Chapter 5 Multi-certificates in SD03</li> <li>• PRO-CR0903: removal of exportenv34.xsd, original RECS, from SD03</li> </ul>
Release 5.3	29 July 2009	Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• PRO-CR0902: Changes in SD03 according to CR0812 (earmarks) and correction of reference to PRO-FS06</li> </ul>
Release 5.4	27 November 2009	Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• PRO-CR0908: Handling of SD03 Incompliance issues</li> <li>• PRO-CR0909: "Generation period" and "Issue date"</li> </ul>
Release 5.5	7 July 2010	Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• PRO-CR1002: Implementation of new export format exportenv67</li> </ul>
Release 5.6	12 October 2010	Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• PRO-CR0909: "Generation period" and "Issue date"</li> <li>• PRO-CR0922: Start and end date of production and date of issue</li> <li>• PRO-CR0927: Use of single format for representing a certificate issuer</li> </ul>
Release 5.7	1 January 2011	Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• PRO-CR1031: Corrections to the new export format exportenv67</li> </ul>
Release 5.8		Revised to incorporate the following changes: <ul style="list-style-type: none"> <li>• PRO-CR1103: New export format exportenv70</li> </ul>
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Release 6.1	23 September 2011	<ul style="list-style-type: none"> <li>• Revised in accordance with wishes of Amsterdam GM on 23 September 2011</li> </ul>
Release 6.2	23 November 2011	<ul style="list-style-type: none"> <li>• Addition of index in B1</li> </ul>
Release 6.2 v2	2 February 2012	New AIB logo
Release 6.2 v3	22 March 2012	Corrections to indexes and error code in B3.5.2
Release 6.2 v4	31 May 2012	Error correction in exportenv70 XML schema Location. B3.2.1
Release 6.3	26 February 2013	Revised to be a document independent of the EECS Rules, to enable it to be used as part of the Hub Participant Agreement document set
Release 6.3.1	15 March 2013	Softening of "binding" requirement in art.2.4.1.3
Release 6.4	13 March 2014	ACK changed in AK; Use of heat parameter values referral to EECS Rules Fact Sheet; " <i>Member and Competent Authority Codes</i> "; update fact sheet names; Formal link with document 'Specifications Hub Webservice'. (Changes in 3.2.1.14; 3.2.1.17;6.1; B5.4.27; C2.1.8; C2.1.9; D2.2.2; D2.2.3; D2.5.1; D3.3.4.; B5.5.1)
Release 6.5	08 May 2015	Immutability of data on a certificate, update of Directive references, Product Type Technology means HEC GO, How to mark the product Type for Combined HEC-RES-E GO, extra explanation on Product Status NGC/ICS, allow the mandatory fields for HEC also as optional for other GOs



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Version	Issue Date	Reason for Issue
Release 6.6	20 July 2015	4 extra fields on HEC GOs, new xsd v71, new class diagram v71, maximum number of certificate blocks in a transfer, recommendation issuing certificates by bundles. The Sender should validate the message toward the schema (xsd) before sending.
Release 6.7	24 September 2015	Adjustments of Note 3 of B5.2.1 and Note 4 of B5.2.1
Release 6.8	2 October 2015	<ul style="list-style-type: none"> <li>Corrected the “Figure 3 Basic Data Transmission Protocol – format errors rejection by recipient”.</li> <li>Corrected the schema V71 validation problems.</li> <li>Adjusted the text in 2.3.5.4.</li> <li>Clarified the B5.5.3 and B5.5.4.</li> </ul>
Release 6.9	4 December 2015	Correction of differences identified between the EECS Rules and Subsidiary Document SD03 (“EECS Registration Databases”). Update of table B5.2 Optional and Mandatory Elements
Release 7	23 February 2016	Schema correction for Purpose and note on mandatory message id
Release 7.1	13 <sup>th</sup> June 2017	<ul style="list-style-type: none"> <li>Add webservice description</li> <li>End of mailbox support added (ref. AIB-2016-GM04-12)</li> <li>Set the deadline for V71 schema implementation (ref. AIB-2017-GM02-19)</li> <li>The validity of V70 and V71 schemas have been clarified and the conversion rules added</li> <li>Change to V71 to allow 0 values for CO2EmissionProduced and AbsoluteCO2EmissionSaved for Res-GOs (ref. AIB-2017-GM01-17)</li> <li>Technical Audit added (ref. AIB-2016-GM-03-19)</li> <li>Removed “&lt;/xs:element&gt;” in V71 schema in below location: &lt;xs:element name="Purpose" type="xs:token"/&gt; &lt;/xs:element&gt; (error correction)</li> <li>B5 chapter tables were unified such that each of those specifies Unit, Length and Occurrence.</li> <li>Pending status handling has been added as recommended option and diagrams updated accordingly</li> <li>Smaller adjustments introduced in AIB-2017-GM01-20</li> <li>Added definition for “AIB Hub”</li> <li>Updated schema diagrams for V70 and V71</li> </ul>
Release 7.2	12 <sup>th</sup> March 2018	<ul style="list-style-type: none"> <li>Ref: EECS-CR1705, AIB-2017-GM05-23: The description of the Capacity fields updated to support maximum 3 decimals (“Up to a total of 11 characters, including the decimal point and up to a maximum of 3 decimal places”)</li> </ul>
Release 7.3	8 <sup>th</sup> June 2018	<ul style="list-style-type: none"> <li>Ref: AIB-2018-GM02-23a-b, AIB-2018-GM02-30</li> <li>Account Holder database related changes/additions</li> <li>The relationship between Account Holder, Issuing Body, Registry and Domain is clarified in chapter 1.1.1.1 by adding a diagram to reflect the current situation</li> <li>Minimum date for Date Operational, Issuing date and Production period</li> <li>B5.2.1 – Clarified the immutability of optional fields</li> </ul>



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Release 7.4	14 <sup>th</sup> June 2019	<ul style="list-style-type: none"> <li>• Integration of the technical audit and the member audit in Annex D</li> <li>• Modify the text to replace CMO by Registry where appropriate.</li> <li>• Deleted V70 schema</li> </ul>
Release 7.5	10 July 2020	<p>Ref: AIB-2020-GM-04-12</p> <ul style="list-style-type: none"> <li>• Deleted mailbox registry description (The AIB Hub provided a way to send and receive transfer messages/-acknowledgements via Email (SMTP). The AIB Hub supported the mailbox facility until 1st July 2019 for the registries connected with mailbox before end of year 2016. All the new registries were required to use web service connection from 1st January 2017.)</li> <li>• Added statistics schema definition</li> <li>• Added the validation of the combination of the Energy Source and Type of Installation</li> <li>• Clarified the Data Exchange Models (Chapter 4 and C4)</li> <li>• Updated Glossary</li> </ul> <p>AIB-2020-GM-04-10: Addition of 2.3.1.10</p> <p>AIB-2019-GM-04 24: Replace “Energy Medium” by “Energy Carrier” except XML</p>
Release 8.0	25 April 2022	<ol style="list-style-type: none"> <li>1) V80 schema and end date for V71 schema including transformation rules.</li> <li>2) Statistics Schema: introducing certificatecount datatype for improving schema validation.</li> <li>3) Adding new Statistics types for Energy Carriers: “EnergyGas” and “Hydrogen”</li> </ol>
Release 8.1	7 June 2022	<ol style="list-style-type: none"> <li>1) Composition Purity               <ol style="list-style-type: none"> <li>a. Correct the length of the token from four to five.</li> </ol> </li> <li>2) Storage tag:               <ol style="list-style-type: none"> <li>a. Set to compulsory for all Energy Carriers in v80 with default value on it.</li> <li>b. The tag length change from 3 to 5.</li> </ol> </li> <li>3) Removing empty chapter B7.2</li> <li>4) In XML examples corrected attribute name for Conversion element from “type” to “tag” according to the schema</li> <li>5) Minor wording changes</li> </ol>
Release 8.2	8 November 2022	<ol style="list-style-type: none"> <li>1) Adding recommended maximum number of transactions per minute in Chapter 2.3.5 Performance</li> <li>2) Clarification of ProductionPeriod start and end description</li> <li>3) Calculation method of ‘GHGEmissionsProduced’ and ‘GHGEmissionsSaved’ length fixed to 9 characters</li> <li>4) GHGEmissionProduced datatype changed to Integer</li> <li>5) Adding Fact sheet numbers for the element descriptions</li> <li>6) In v80 made below elements optional for also for HEC: AmountPrimaryEnergySaved, OverallPrimaryEnergySavings, GHGEmissionProduced and AbsoluteGHGEmissionSaved</li> <li>7) In v80 made below optional also for Fossil energy source: GHGEmissionProduced</li> <li>8) In v80, made below optional also for nuclear energy source: RadioactiveWasteProduced</li> <li>9) Unified the decimals and all the Decimal(10,3) were changed to Decimal(11,3)</li> <li>10) Incorporating the above-mentioned changes to v80 Schema and renaming of decimal types</li> <li>11) Small error corrections of examples, description and xsd related to v80</li> </ol>



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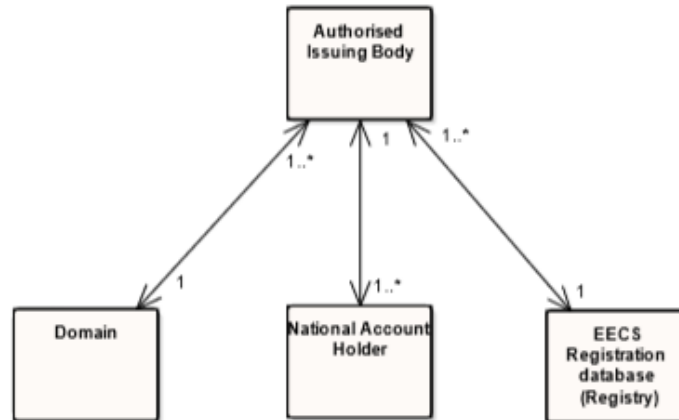
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# 1 Introduction and purpose

## 1.1 Purpose and Scope

1.1.1.1 This document addresses the technical and operational requirements for a Registration Database (“Registry”) according to The European Energy Certification System (EECS).



**Legend**

**Authorised Issuing Body**  
 An Authorised Issuing Body can have only one Domain  
 An Authorised Issuing Body can have one or many National Account Holders  
 An Authorised Issuing Body can have only one EECS Registration Database

**National Account Holder**  
 A National Account Holder can have only one Authorised Issuing Body

**Domain**  
 A domain can have one or many Authorised Issuing Bodies  
 There might be several Issuing Bodies for a Domain e.g. due to a transition period between two Issuing Bodies, or due different Issuing Bodies assigned for different types of certificates.

**EECS Registration Database (registry)**  
 An EECS Registration Database can have one or many Authorised Issuing Bodies.

- 1.1.1.2 It specifically addresses
- (a) the transfer of information from or to an EECS Registration Database;
  - (b) file formats and transport protocols;
  - (c) common identifiers; and
  - (d) the testing of interfaces.

1.1.1.3 This document deals with electronic interfaces only.

1.1.1.4 This document is subject to the change management procedures set out in the EECS Rules and related subsidiary documents.





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- 1.1.1.5 Unless specifically stated otherwise, the terms applied in this document shall have the meaning assigned to them in the EECS Rules; if a specific term is not defined in the EECS Rules, but has been defined in the Hub Participant Agreement, the term shall have the meaning defined therein.
- 1.2 Approach**
- 1.2.1 General**
- 1.2.1.1 The approach to the interface definition process adopted in this document is to partition the specification into stand-alone units that may, if required, be changed without affecting any other unit. A description of the business process follows and provides a contextual background.
- 1.2.2 Principles and rules of operation to be observed by Hub Users**
- 1.2.2.1 Section 2 describes the principles which Hub Users are required to support, and the rules of operation that apply to them, in particular those relating to:
- (a) The allocation of responsibilities for handling and transmitting data;
  - (b) Security;
  - (c) The obligations and warranties of Hub Users, including those relating to certificates, error handling, contingency and performance; and
  - (d) The consequences of data transfer.
- 1.2.3 Definition of the content of certificates according to the EECS standard**
- 1.2.3.1 Section 3 defines the information to be held on certificates from a business perspective.
- 1.2.4 Data Exchange Process and Requirements**
- 1.2.4.1 A business process can be represented by a 'transaction', which can be a message (or sequence of messages) that fulfils a business function. For example: 'submit report request' leads to 'report sent' or 'error message - not available'. Each of these messages can be defined as a logical 'flow' meeting a specific requirement, and which can be classified by its business characteristics:
- (a) Originating Party;
  - (b) Receiving Party;
  - (c) Initiating event (e.g. user request, another flow, timer expires);
  - (d) Processing requirements
  - (e) Data content at the business level;
  - (f) Mechanism (whether this is Manual, or Electronic Data File Transfer); and
  - (g) Validation rules.
- 1.2.4.2 Sections 4 and 5 cover these issues.
- 1.2.5 Identifier Standards**
- 1.2.5.1 The data that is exchanged between EECS Registration Databases includes information relating to Accounts and Production Devices. It is important that these entities are uniquely identified, and that the identification should remain unique even after a series of transactions. The scope of these identifiers must therefore include at least the whole



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EECS community, irrespective of the particular scheme or schemes that any particular Registration Database supports.

- 1.2.5.2 These matters are addressed in ANNEX A - EECS Identifiers
- 1.2.5.3 This defines what the data flow contains in terms of fields, their attributes and how the fields are grouped within the flow. At the same time, the rules for which fields and groups are optional or mandatory and whether and how often groups can be repeated are specified.
- 1.2.5.4 This logical message definition encompasses all the data visible at the user level and is closely aligned to the database design, since the flows are used to populate the database and/or are derived from their contents. The physical file format defines the data representation and control information. Similarly to the logical definition, a naming convention and layout standards are set out so that the information can be exchanged and validated in a consistent and unambiguous form.
- 1.2.5.5 These matters are addressed in: ANNEX B - EECS Transfer Interface File Specification

**1.2.6 Data Transfer Protocols**

- 1.2.6.1 The data transfer mechanism for electronic data interchange is considered to be separate from the format of the data file. The mechanism provides for secure and reliable exchange of data that is appropriate for the maintenance of a clear audit trail of certificate transfer and the avoidance of double counting.
- 1.2.6.2 To the extent required by the AIB Hub Participant Agreement, all certificate transfers between two Registries should be transferred via the AIB Hub.
- 1.2.6.3 These matters are addressed in: ANNEX C -EECS Transfer and Account Holders Interface Transport Specification

**1.2.7 Interface Testing**

- 1.2.7.1 In order to ensure that each EECS Registration Database is able to transfer via the AIB Hub information in a form that complies with the requirements identified above it is necessary to test each instance of such a database. The specification addresses the basic test process and the tests that are to be performed and does not cover the reporting of tests for the purposes of assessment or the process for qualifying and EECS Registration Database for the purposes of certificate storage.
- 1.2.7.2 The tests are addressed in: ANNEX D - EECS Transfer Interface Test Specification for the Hub.

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## **2 Principles and rules of operation to be observed by Hub Users**

### **2.1 Responsibilities in the framework of handling and transmission of data**

2.1.1.1 A successful and reliable messaging and transaction system requires:

- (a) That each Message is assumed to be transferred from the Registry of the Sender to the Registry of the Recipient through the Hub;
- (b) That every failure of delivery must be discovered by the sending registry in cooperation with receiving registry and where applicable with Superuser;
- (c) That the relevant Message is clearly identifiable as coming from the intended Sender;
- (d) That the relevant Message must be assumed to have been sent and arrived without alteration of any of its data (“integrity”);
- (e) That the Messages are sent with a high confidence that they will not be understood and/or used by any reasonably equipped third party.
- (f) That the Registries keeps their master data up to date including changes to Fact Sheets and that Registries keep their Account Holders list up to date in Central Account Holder Database in AIB Hub.

The Hub has implemented reasonable solutions to deal with the requirements set out both in this document, and in the documents to which it refers.

The Hub User acknowledges the importance of these principles; it acknowledges that the solutions must be regarded as reasonably sufficient in order to safeguard the operational and regulatory requirements, and that it will respect the requirements in order to safeguard the operation and the credibility of the Hub service.

2.1.1.2 The Hub User acknowledges that it has read and understood the process descriptions, including the expected tasks, roles and responsibilities of the Hub User and the AIB in that respect and the requirements set forth in this document including its Annexes.

2.1.1.3 The Hub User acknowledges that the requirements set forth in this document and every update thereof must be at all times respected in order to safeguard:

- (a) the correct and smooth operation of the Hub;
- (b) the security of the transactions via the Hub; and
- (c) the avoidance of risks, disputes and claims between Hub users, the AIB and other Participants.

2.1.1.4 Any exports of Certificates via the Hub require that all mandatory data, codes and identifiers that are required to be included in a Certificate, must be provided, in accordance with the mandatory specifications set forth in this document. The Hub Users will have no obligation to provide the data that is mentioned in this document as “optional” in order to be compliant with the system. However, Hub Users shall assess whether the provision of such optional data will be necessary for their business purposes. However, all data received shall be maintained (2.2.1.3).

2.1.1.5 The Hub User who sends data via the Hub (“the Sender”) is responsible for the accurate creation of Messages, the application of appropriate security measures, the transmission of Messages and the monitoring of responses from the Hub and the Recipient of the data. The Sender will apply the rules agreed between him and the Recipient in relation



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- to the validity, meaning and interpretation of the transferred Transaction Data. The Sender should validate the message toward the schema (xsd) before sending.
- 2.1.1.6 The Hub User acting as Sender shall only accept a Transfer Request from the duly authorized personnel of an Account Holder with respect to a Certificate held on that Account Holder's Transferrable Account on that Hub User's Registry.
- 2.1.1.7 The operator of the Hub is responsible for the distribution of the data messages and the acknowledgements between the Registries of the Sender and the Recipient. The Hub will validate the formal compliance of the data. However, the AIB Hub will not systematically verify the content of the transferred data. The acknowledgement of a Message will not imply that the content of the transferred data must be deemed correct, valid or even validly existing.
- 2.1.1.8 The Recipient of transferred data is responsible for the verification, correct handling and processing of received data.
- 2.1.1.9 Each Hub User must manage the files, the security, availability, capacity and the performance of its own server locations. Each Hub User is responsible for monitoring the contents of its specified receipt container on its own server location, and for initiating the processing operation when an incoming file is detected.
- 2.2 Security**
- 2.2.1.1 A sufficient level of security is a crucial requirement for the operation of the Hub and the operation of a Registry.
- 2.2.1.2 The messages must be digitally signed and encrypted the way it is described in C1.4 Protocol Specification
- 2.2.1.3 All data included in a Certificate must be maintained by a receiving Hub User, where this data includes but is not limited to the ICS, Label, Purpose information and optional fields. Each Domain may at its sole discretion decide which items of certificate information that it wishes to display. The data incorporated in a Certificate may not be modified or deleted after it has been transferred outside of the Domain in which it has been issued.
- 2.2.1.4 The Hub Users and/or Registry Operators are responsible for the configuration and maintenance of firewalls to manage the allowed connections from and to the Hub and to monitor unusual access to their systems, and they shall provide and maintain sufficient protection against harmful software and unwanted access through state of the art protective software and policies.
- 2.2.1.5 The access to the Hub is restricted to the Hub User and/or Registry Operator, and its personnel that require access in the normal course of the Hub User's or Registry Operator's business. The Hub User will take reasonable security precautions to prevent unauthorized persons from gaining access to the Hub and the data stored in and transmitted through the Hub, the Hub User's Registry and any connected Registry, using authorization policies and password protection.
- 2.3 Hub User's obligations and warranties**
- 2.3.1 General**
- 2.3.1.1 The Hub User may not sell, lease, license, furnish, or otherwise provide or permit access to the Hub to any other person or entity. The Hub User will not engage in the operation of any illegal business use or permit anyone else to use the Hub or the data transferred via the Hub, or any part thereof, for any illegal purpose or any purpose not agreed under the Agreement.
- 2.3.1.2 The Hub User shall ensure that Transactions are only executed upon instructions of Account holders that are issued by persons that are authorized to give such instructions.



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- 2.3.1.3 The Hub User acknowledges that Messages contain confidential information, and it will ensure that Messages sent by him as Sender or received by it as Recipient will be maintained in confidence and are not disclosed to any unauthorized person, nor used by any unauthorized person other than for the purposes of the intended transaction. Any authorized disclosure to a third party shall be done on the same terms.
- 2.3.1.4 The Hub User shall not disrupt or try to gain unauthorized access to any account, computer, hardware, or network related to the Hub's services or other user's services.
- 2.3.1.5 The Hub User shall not (try to) obtain any data from the Hub service or related hardware, except data that is intended to be provided or made available to the Hub User.
- 2.3.1.6 The Hub User shall not damage, disable, overburden, or impair the Hub service (or the hardware and/or network(s) connected to the service) or interfere with anyone else's ability to access or use the service.
- 2.3.1.7 The Hub User shall in general not violate any regulations, legal provisions, codes of conduct or guidelines that may be applicable to the transfer of Transaction Data via the Hub, including any specific rules applicable to a particular Certification Scheme or specific category of Certificates.
- 2.3.1.8 It is the responsibility of a Hub User to verify whether the applications of Registrants for the registration of Production Devices in its Domain are compliant with applicable legal provisions and Domain Protocols and other agreed criteria. The Hub User will notify the AIB of any material breach of regulations or agreements by a Registrant or Participant if it is of the reasonable opinion that such breach could affect the transfer of Certificates out of its Registry into the Registry of another Hub user.
- 2.3.1.9 In the event of any misappropriation or misuse by the Hub User or anyone who is accessing the Hub or the data contained therein or transmitted through the Hub, AIB shall have the right to obtain injunctive relief for its data and materials and/or the data and materials of other users or other third parties.
- 2.3.1.10 The Hub User acknowledges that the AIB shall be entitled to disconnect the Hub User's Registry from the Hub, or limit its usage, in case of urgent circumstances or reasonable indications of such circumstances, as established by the Hub Participant Agreement. Urgent problems may require an interruption of the service without timely notification as established by the Emergency Plan.
- 2.3.2 Specific rules in relation to Certificates**
- 2.3.2.1 The Hub User (and/or, where relevant, the Registry Operator), shall hold Certificates only within the framework of the normal operations of Competent Bodies in accordance with the purpose and scope of the Hub Participant Agreement and the applicable legislation, and they shall not hold Certificates for purposes of personal trade or financial gain or any other purpose that is not compatible with the function and role of Competent Bodies. Exceptionally, the Hub User may (i) purchase and own a Certificate for the sole purpose of (a) proving the nature of the Output that it has consumed; or (b) testing the system under the conditions set forth in this document, or (ii) hold a Certificate if the holder of the Certificate has defaulted on an undisputed payment to the Hub User, in which case the Hub User may hold the Certificate in order to take appropriate actions in accordance with national law to minimize its losses.
- 2.3.2.2 The Hub User and the Registry Operator shall ensure that Certificates are as far as practicable, protected against claims of the Hub User's or Registry Operator's creditors.
- 2.3.2.3 The Certificates transferred via the Hub must specify at least the data required by national legislation and the mandatory data required by this document Subject to that requirement Certificates transferred by non-AIB Members need not be compliant with the EECS Rules including the subsets thereof unless and insofar referred to in the Hub Participant Agreement.



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- 2.3.2.4 The Hub User shall not present any data rendered in any misleading or incorrect format.
  - 2.3.2.5 The Cancellation and Withdrawal of Certificates will occur in accordance with the applicable legal provisions, the relevant Domain Protocol and agreements between the Competent Bodies and Participants in that respect.
  - 2.3.2.6 The Hub User shall ensure that no Certificate will be cancelled for use in another Domain than the Domain wherein it is held, unless transfer is not possible for technical reasons and an ex-domain cancellation agreement has been agreed between the relevant Hub Users. Furthermore, the Hub User shall report the statistic information in relation to the ex-domain cancellations to the AIB.

**2.3.3 Error handling**

- 2.3.3.1 The Hub User shall ensure that any inaccurate information in its Registry, e.g. (but not limited to) inaccuracies due to erroneous information submitted by Registrants or Participants or changes regarding Production Devices, will be corrected as soon as practicable and that all relevant Participants will be informed.
- 2.3.3.2 In case an error has been introduced into, or with respect to, a Certificate held in an Account Holder's Account in the Hub User's Registry, in the course of its transfer into that Account or afterwards, the Hub User shall correct the error in or with respect to that Certificate and any errors that may have been replicated in Certificates split from it, or withdraw the Certificate. In case such error is noticed after a transfer of the relevant Certificate to or from the Registry of another Competent Body, the Hub User will immediately inform that Competent Body.
- 2.3.3.3 Where there is evidence that a Message has been corrupted or if any Message is identified or reasonably capable of being identified as incorrect, it shall be re-transmitted by the Sender as soon as practicable with a clear indication that it is a corrected Message.
- 2.3.3.4 Notwithstanding that the Sender is responsible and liable for the completeness and accuracy of a Message, the Sender shall not be liable for the consequences of an incomplete or incorrect transmission if the error is or should in all circumstances be reasonably obvious to the Recipient. In such event the Recipient must immediately inform the Sender thereof.
- 2.3.3.5 If the Recipient has a reason to believe that a Message is not intended for him, he shall take reasonable action to inform the Sender. He shall ensure the confidentiality of the information.

**2.3.4 Contingency**

- 2.3.4.1 The Hub User shall operate reliable and secure systems, which will have adequate capacity. The Hub User shall apply state of the art back-up and recovery procedures (DRP) in order to safeguard the Market Participants and the users of the Hub against the loss of data in the Registry and the loss of Transaction Data and to allow timely recovery.

**2.3.5 Performance**

- 2.3.5.1 The transfer time of data between the initiation of the transfer by the Sender and the receipt of the data by the Recipient can be expected to take:
  - (a) 4 minutes for the synchronous transfers (if Receiving Registry (web service) have not implemented PENDING status).
  - (b) 3 business days for transfers where manual approval is needed. However, a Receiving Hub User is entitled to hold the transaction until the Receiving Account Holder confirms that it accepts the Certificate, in which case the transfer time will



be calculated as from the moment that the Receiving Hub User receives such confirmation.

- (c) Otherwise, a transfer time of more than 1 and half hour must be considered as inadequate.

If the above-mentioned expectations are not met, corrective measures shall be taken in order to find out the reason for delay and to approve the performance.

- 2.3.5.2 The total time between the receipt of a Message by a Recipient and the receipt of the acknowledgement of that receipt, sent by the Recipient to the original Sender of the Message, will depend on the service provided by AIB's service provider as well as the performance of the registries that are involved. The applicable guidelines are set forth in the SLA which is part of the Hub Participant Agreement and is added as an Annex to that agreement.
- 2.3.5.3 The AIB shall be entitled to interrupt the service of the Hub in case of urgent circumstances or reasonable indications of such circumstances, such as irregularities, errors, issues of security, damage control and/or protection of intellectual property rights. Urgent problems may require an interruption of the service without timely notification.
- 2.3.5.4 To ensure the performance of the AIB Hub a transfer may not contain more certificate bundles than a cap configured in the AIB Hub. This limit is initially set to 5000. A certificate bundle starts with the tag `<r:Certificates>` and ends with the tag `</r:Certificates>`. More details about a certificate bundle can be found in paragraph B3.4.7.
- 2.3.5.5 To avoid transfers with a high number of records and to ensure the performance of the AIB Hub and Registries, it is highly recommended to issue and exchange certificates which contain the same information in bundles. These bundles can contain more than 1 MWh.
- 2.3.5.6 To ensure the performance of the AIB Hub and Receiving Registry, a Sender or Sender Registry is highly recommended to send maximum of ten transfers per one minute.
- 2.3.5.7 To ensure the smooth functioning of the services, it is highly recommended to ensure that a Registry has capacity of handling at least ten transfer requests per one minute from AIB Hub.
- 2.3.6 Miscellany**
- 2.3.6.1 The Hub User and where relevant the Registry Operator must produce and publish regular statistical reports and must accept the use of this data by the AIB for statistical purposes. The Hub Participant Agreement contains the detailed requirements regarding this information. The AIB shall only disclose the reported data as statistical data. Refer to B6 Statistics Elements Description for details of the required Statistics.
- 2.3.6.2 The obligations of the Hub User and/or Registry operator stated herein must be respected by all of the Hub User's and/or Registry Operator's personnel and/or agents or service providers and their personnel. The Hub User or Registry Operator will duly inform its personnel, agents or service providers having access to the Hub of these obligations and will reasonably ensure that its personnel, agents and/or service providers will respect these obligations.
- 2.3.6.3 The Hub User will operate with properly trained and reliable personnel.
- 2.3.6.4 Where a Registry Operator operates, or shall operate, the Registry of the Hub User, this operator shall comply with all obligations set forth in this document as obligations of the Hub User.



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**2.4 Consequences of data transfer - Evidence**

- 2.4.1.1 The Hub User accepts the Integrity of all Messages transmitted in accordance with the applicable Messaging Protocol and confirmed by an acknowledgement message, unless such Messages can be proven to have been corrupted as a result of technical failure on the part of hardware, system or transmission line.
- 2.4.1.2 The Hub User shall keep reliable electronic records of all material communications and transactions between Hub Users and/or Participants regarding the registration of Production Devices and the Issue, Transfer and Cancellation of Certificates. The retention period shall be 10 years as a minimum, but not less than the minimum retention period required by national law applicable to the Hub User.
- 2.4.1.3 In case of disputes between the Hub User and any other user, or between the Hub User and any Participant, the AIB may act as a trusted third party and upon request, it may prove by means of its relevant logs that certain data has passed or not passed the Hub at a certain point in time, and that an acknowledgement message was sent or not sent with a limitation in time of one year after the alleged transmission. In that case, the Hub User must accept the statement of the AIB as a presumption, which is considered valid evidence unless the Hub User can provide evidence of the contrary, and the Hub User will ensure that his customers will accept the same.



## 3 Certificate Information

3.1.1.1 This section describes the information to be held at a certificate according to the EECS standard. Technical details of identifiers, field definitions and valid values can be found in: ANNEX A -EECS Identifiers and ANNEX B -EECS Transfer Interface File Specification. The arrangements for transfer and retention of EECS Certificates shall be such that the data associated with an EECS Certificate shall not change in any way once it has been properly issued, except to indicate that it has expired, cancelled or withdrawn.

### 3.2 General information

#### 3.2.1 Each EECS Certificate shall contain the information as instructed in the EECS Rules

3.2.1.1 v71 schema - valid until end of February 2024

- (a) Refer to EECS Rules Release 7v15.
- (b) Supported Energy Carrier: "Electricity"
- (c) Relevant EECS Rules chapters for requirements for certificate information:
  - (i) EECS Rules C3.5.4 Each EECS Certificate shall contain the following information
  - (ii) EECS Rules Section PART IV:
    - (1) N6.5 Information on EECS Certificates
    - (2) N6.6 Additional Information in Certificates

3.2.1.2 v80 schema - valid from the date it is implemented in the AIB Hub until further specified

- (a) Refer to EECS Rules Release 8 v1.
- (b) Support Energy Carriers: "Electricity", "EnergyGas" and "Hydrogen"
- (c) Relevant EECS Rules chapters for requirements for certificate information:
  - (i) EECS Rules C3.5.4 Each EECS Certificate shall contain the following information
  - (ii) EECS Rules Section PART IV: N ELECTRICITY SCHEME RULES:
    - (1) N6.5 Information on EECS Certificates
    - (2) N6.6 Additional Information in Certificates
  - (iii) EECS Rules Section PART IV: O GAS SCHEME RULES:
    - (1) O7 Information on EECS Gas Certificates
    - (2) O8 Additional information on EECS Gas Certificates

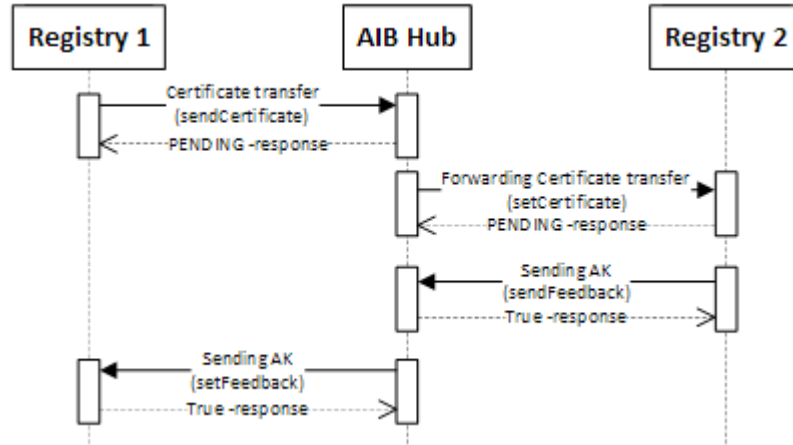
#### 3.2.2 Format of the information fields is given in this document in Section B4.6 Data Field Definitions – Certificate Transfer File Certificates

## 4 Data Exchange Processes

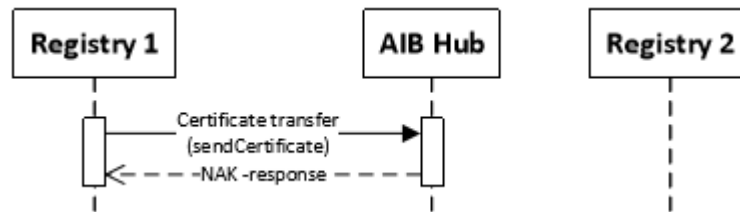
### 4.1 Basic Model

4.1.1.1 The following diagram represents the basic data exchange models. The model is based on data flows and authorisation routes.

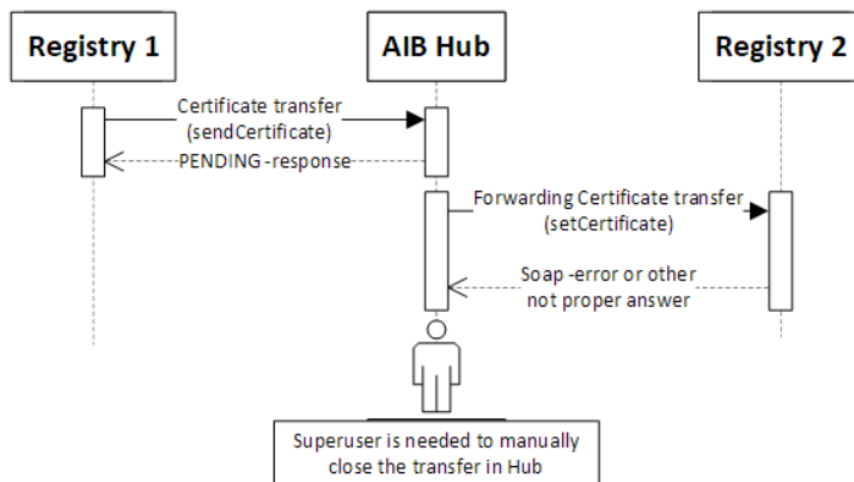
- (a) The process described does not show all scenarios but it is intended to provide a basis for describing business requirements. See more examples in C2 AIB HUB Web Service Interface Description.



**Figure 1 Basic Data Transmission Protocol – asynchronous AK**



**Figure 2 Basic Data Transmission Protocol – format or data errors detected by the Hub**



**Figure 6 Basic Data Transmission Protocol – There are cases when Superuser (user role in AIB Hub) manual action is needed to close a transfer. E.g. if Recipient Registry does not give expected response for the setCertificate call**

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## **4.2 Basic Data Transmission Protocol**

### **4.2.1 Responsibilities of Sender**

4.2.1.1 The Sender is responsible for the accurate creation of messages, the application of appropriate security measures, the transmission of messages and the monitoring of responses from the AIB Hub and Recipient(s). The Sender:

- (a) Creates a transfer message;
- (b) Checks the syntax of the message before sending;
- (c) Applies appropriate message security measures;
- (d) Sends the message to the Recipient via the AIB Hub;
- (e) Checks if an acknowledgement is received within the appropriate timescale;
- (f) In case the acknowledgement has not been received within the appropriate timescale, keep the status of the transfer open and check the status of the transfer from the AIB Hub:
  - (i) If the transfer is not found from the AIB Hub:
    - (1) Reinitiate the transfer (with new MessageId).
  - (ii) If the transfer is found from the AIB Hub but the status is unclear (e.g. timeout):
    - (1) Sender contacts the Recipient and Superuser by email / phone or other agreed way.
- (g) In case an acknowledgement is received:
  - (i) positive: logs the message as received and takes appropriate action;
  - (ii) negative: checks for software or message errors, repairs errors and resends data as a new file using a new Message ID;
  - (iii) Pending: keep the transfer open until either positive or negative answer is received. Cooperate with Superuser and Recipient if questions arise.

### **4.2.2 Responsibilities of the AIB Hub**

4.2.2.1 The AIB Hub is responsible for distribution of messages and acknowledgements between registries. The AIB Hub shall retain a continuous thread of activity for the messages. That is, the Hub recognises that a certificate transfer is in progress so that the returning AK/NAK can be matched with the original transfer. The AIB Hub:

- (a) Checks for incoming messages in a manner that ensures a timely response;
- (b) Verifies the message due to errors in the XML, unrecognised values in any of the routing fields, or invalid content in any other field;
- (c) In case the message is correct:
  - (i) sends Pending to Sender
  - (ii) sends the message to the Recipient;
- (d) In case the message is not correct:
  - (i) sends a negative acknowledgement to the Sender which is either:
    - (1) negative on the message (e.g. failure on check sum or format); or
    - (2) negative on the content (e.g. sending or receiving Trader Account ID does not exist or is not valid in the Account Holder database of the AIB Hub).

- 
- (e) In case the message or answer delivery to registry is not clear or if there is found possible double counting situation or the same transfer is being send several times, the AIB Hub keeps the transfer in Waiting status to manually handle it after coordinating with registries.
  - (f) Pass on positive or negative acknowledgements from the Recipient to the Sender.

#### **4.2.3 Responsibilities of Recipient**

4.2.3.1 The Recipient is responsible for the monitoring of all configured data submission ports and the correct handling and processing of data received. The Recipient:

- (a) Checks for incoming messages in a manner that ensures a timely response; On receiving of an import and after minimum validations it is recommended to answer with Pending status before further processing the file to avoid timeouts.
- (b) Extracts and validates message source from message;
- (c) Verifies the correctness of message contents within the appropriate timescale;
- (d) In case the message is correct:
  - (i) sends a positive acknowledgement to the Sender via the AIB Hub;
- (e) In case the message is not correct:
  - (i) sends a negative acknowledgement to the Sender via the AIB Hub which is either:
    - (1) negative on the message (e.g. failure on check sum or format); or
    - (2) negative on the content (e.g. the Sending or Receiving Trader Account ID does not exist or is not valid in the Account Holder database of the Recipient registry).

### **4.3 Export and Import of Certificates**

#### **4.3.1 Introduction**

4.3.1.1 Data exchange between EECS Registration Databases takes place based on the following procedures. The interface is designed for operation within an automated environment but may be implemented manually should circumstances dictate. Compliance with this specification does not depend upon a fully automated solution being used.

4.3.1.2 Some actions are not relevant to the operation of this interface and are included only for completeness of process.

#### **4.3.2 Responsibilities of Sending Account Holder**

4.3.2.1 The Sending Account Holder is responsible for the correct submission of a trade notification to the Issuing Body operating the Sending Account Holder's account. The Sending Account Holder:

- (a) Specifies a transfer order which contains:
  - (i) the number of certificates;
  - (ii) which certificates; and
  - (iii) the Receiving Account Holder of the certificates (by his Trader Account ID number).
- (b) Is responsible for the correct content of the transfer order.

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### **4.3.3 Responsibilities of Exporting Issuing Body**

- 4.3.3.1 The Exporting Issuing Body is responsible for the correct handling of the order and submission of these details to the Importing Issuing Body. The Exporting Issuing Body:
- (a) Validates the details submitted by the Sending Account Holder;
  - (b) Detects which Issuing Body will import the certificates;
  - (c) Creates a transfer message conforming to the specification in ANNEX B - EECS Transfer Interface File Specification;
  - (d) Sends the message to the Importing Issuing Body using the secure transport mechanism defined ANNEX C -EECS Transfer and Account Holders Interface Transport Specification
  - (e) Sets the status of the certificates to “exported”;
  - (f) Waits for acknowledgement;
  - (g) If a Pending acknowledgement is received, keep the status of the certificates as “exported”;
  - (h) If a positive acknowledgement is received, record that the export has been completed;
  - (i) If a negative acknowledgement is received:
    - (i) negative on content: contacts Sending Account Holder and rectifies issue as appropriate. Resends data as a new file using a new Message ID as appropriate;
    - (ii) negative on message: review message generation process and rectify issues as appropriate. Resends data as a new file using a new Message ID as appropriate.

### **4.3.4 Responsibilities of the Importing Issuing Body**

- 4.3.4.1 The Importing Issuing Body is responsible for the correct handling of the order, processing of these details and Acknowledgement to the Exporting Issuing Body. The Importing Issuing Body:
- (a) On receiving of an import and after minimum validations it is recommended to answer with Pending status before further processing the file to avoid timeouts.
  - (b) In case the message is correct:
    - (i) sends a positive acknowledgement (using required security measures) to Exporting Issuing Body (see: ANNEX B - EECS Transfer Interface File Specification); and
    - (ii) stores certificates on the account of the Receiving Account Holder.
  - (c) In case the message is not correct:
    - (i) sends a negative acknowledgement (using required security measures) to exporting Issuing Body (see: ANNEX B - EECS Transfer Interface File Specification);  

which is either:

      - (1) negative on the message (e.g. failure on check sum or format); or
      - (2) negative on the content (e.g. Receiving Account Holder ID does not exist).

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## 5 Requirements

### 5.1 Functional requirements

5.1.1.1 These requirements identify what the mechanism is to do:

- (a) **Transfer:** Each message is assumed to be transported from sender to recipient via the AIB Hub;
- (b) **Transparency:** Any failure of delivery must be discovered;
- (c) **Attributable:** The message must be clearly identifiable as having come from the intended sender;
- (d) **Accurate:** The message must arrive with a high confidence that it has not been altered in transit;
- (e) **Private:** The message must arrive with a high confidence that it will not be understood by any reasonably equipped third party.

5.1.1.2 The business process shows an acknowledgement activity. This is part of the solution to the transparency requirement and should be considered a mandatory solution. The requirements transport and attributable apply to the acknowledgement.

5.1.1.3 The security related requirements (accurate and private) have been written as functional requirements even though they contain potentially quantitative concepts ('high confidence', and 'reasonably equipped'). This has been done because these concepts are expensive to measure, and the available solutions do not support the kind of variation which would be needed to properly address a quantitative analysis. In effect, solutions will be chosen on the basis of an investigation of risk.

### 5.2 Process requirements

5.2.1.1 These are quantitative requirements:

- (a) **REGISTRY-time:** transfer time between initiation of transfer by sending registry to receipt of message in receiving registry: expected 10 minutes: maximum defined as 'less than AK-time';
- (b) **AK-time:** total time from receipt of message by recipient to receipt of acknowledgement by sender: minimum not applicable: expected 20 minutes: maximum 3 business days (24 business hours).
- (c) The timeout for Web Service connection gives requirements for giving a response for the requests, when Pending status is being implemented by Receiving Registry there would be more time to process the transfer.

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## 6 Definitions

### 6.1 Glossary

AIB Hub	@The AIB Hub” as “The AIB Communications Hub, as defined in the EECS Rules”.
AIB Test Manager	The person appointed to be responsible for providing systems test reports required under SD07 Review Procedures and to carry out the tasks so described in this document.
Certificate Authority (CA)	<p>An organisation that produces Digital Certificates. The CA must be trusted by all parties involved.</p> <p>The CA will sign Digital Certificates using its own private key, and those who use the certificates must have a trusted copy of the CA’s own public key. In some cases, this trusted copy will be provided by another CA, creating a hierarchy of trust. This hierarchy normally terminates with a self-signed Digital Certificate.</p>
Digital Certificate	<p>A signed copy of someone’s public key and associated identification information. The key is normally signed by a Certificate Authority who warrants that the public key does indeed belong to the person identified in the certificate.</p> <p>A self-signed Digital Certificate is one which has been digitally signed by the person identified in the certificate.</p>
Digital Signature	A process of encrypting a message or document with a private key so that the recipient can verify that the message was sent by the owner of the private key and that the message has not been changed. The message may be sent in plain text with the digital signature attached as an extra data block.
EECS Certificate	a A unique electronic Certificate specifying and representing the quality and method of production of a specific quantity of Output, which is maintained on a EECS Registration Database and Issued in accordance with the provisions of the EECS Rules;
EECS Identifiers	Refer to EECS rules/AIB HPA
EECS Product	A Product supported by EECS.
EECS Registration Databases (Registry)	<p>A database operated by a Member, or operated by a CMO on behalf of a Member, for the purposes of EECS, comprising:</p> <p>(a) Transferable and Cancellation Accounts and the EECS Certificates in those Accounts;</p> <p>(b) details of Production Devices and information provided to the Member or its CMO in connection with the registration of those Production Devices with that Member or CMO; and</p> <p>(c) details of EECS Certificates which have been transferred out of that EECS Registration Database;</p>
EECS Scheme	Arrangements established by a Section of PART IV of the EECS Rules for the acceptance of Products in relation to a type of Output into EECS;





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Hub Web Service	This facility supports communication with the Hub via web services and enables energy certificates to be transferred to a recipient, returning a message detailing the success of the transfer.
PKI (Public Key Infrastructure)	The set of processes and systems used to manage a set of public keys. The term may apply to a single organisation, to a closed group of organisations, or to an open market. The term does not cover any specific technology or process.
Public Key Cryptography	<p>A set of encryption algorithms which support the use of two keys, one public and one private. One key, the public key, can be issued widely and used by any sender to encrypt a message. The message can only be decrypted by the matching private key.</p> <p>The process is symmetrical in that the private key can be used to encrypt messages which only the public key can decrypt. This form is used to support a Digital Signature.</p>
Receiving Account Holder	The Receiving Account Holder to whom the transfer is sent, also referred as Transferee.
Recipient	The Hub User who receives a transfer via the Hub
Sender	The Hub User who sends the transfer data via the Hub
Sending Account Holder	The Account Holder who initiates the transfer, also referred as Transferor

**6.2 Abbreviations**

AIB	Association of Issuing Bodies
CMO	Central Monitoring Office
EECS	European Energy Certificate Scheme
GIAI	Global Individual Asset Identifier
GO	Guarantee of Origin
GS1	Earlier EAN (International Article Numbering Association) and UCC (Uniform Code Council)
GSRN	Global Service Relation Number
IB	Issuing Body
UTC	Universal Coordinated Time



## ANNEX A - EECS Identifiers

### A1.1.1 Introduction

### A1.1 Purpose

A1.1.2 The scope of this Interface Specification document is the definition of allowed identifiers for key entities used in the transfer of data between EECS Registration Databases.

## A2 Coding Structures

### A2.1 Introduction

A2.1.1 In order to ensure uniqueness of all data identifiers a methodology of coding has been implemented. The coding structure is based on the GS1 numbering structure.

A2.1.2 Alternative codes are supported by the data file structure so that, in principle, a trading account could be represented by some other suitably unique code. However, the use of alternative codes is not necessarily supported by all registries. Accordingly, all EECS Registration Databases must support at least the set of codes specified here.

### A2.2 Coding of Registries

A2.2.1 Each registry must maintain at least one GS1 prefix to be used in accordance with the GS1 numbering structure. The registry Prefix forms an essential part of the coding for Production Devices and Certificates. A Company Prefix is a numeric identifier of between 6 and 13 digits in length.

A2.2.2 The Company Prefix is used as the registry ID. Where a registry maintains more than one prefix, one prefix may be chosen as the registry ID. The Company prefix can be retrieved by contacting to a local GS1 office.

*Example Registry Company Prefixes are:*

*51234567 (8-digit Company Prefix)*

*598765432 (9-digit company prefix)*

*5425011229014 (13-digit company prefix)*

### A2.3 Coding of Certificates

A2.3.1 Certificates will be coded in accordance with Global Individual Asset Identifier (GIAI) (AI 8004), an element of the GS1 numbering structure. The certificate number is always exactly 30 digits long.

Format of the Element String				
	Global Individual Asset Identifier			
	GS1 Company Prefix for the registry	assigned by the registry	Individual Asset Reference	
	N <sub>1</sub> ...	N <sub>i</sub>	N <sub>i+1</sub> ...	variable length N <sub>30</sub>

A2.3.2 *i* represents the length of the Company Prefix for the registry.

A2.3.3 The GIAI uses the GS1 Company Prefix of the registry assigning the Asset Reference. The structure and numbering of the Individual Asset Reference is determined by the relevant registry. Registries may adopt any numbering methodology appropriate to the coding structure, although it is recommended that sequential Individual Asset Reference numbers be assigned.

A2.3.4 Although the GS1 specification for GIAI allows the Individual Asset Reference to contain all characters contained in Table 1 of the International Standard ISO/IEC 646, for the purposes of Certificate coding only numeric characters are permitted.

*Example GIAI-based Certificate Number:*

**51234567000000000000000000001234** (8-digit Company Prefix with 22-digit Individual Asset Reference)

**A2.4 Coding of Production Devices**

A2.4.1 Production Devices will be coded in accordance with Global Service Relation Number (GSRN) (AI 8018), an element of the GS1 numbering structure.

Format of the Element String																	
Global Service Relation Number																	
GS1 Company Prefix For the registry												Service Reference				Check Digit	
N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N <sub>9</sub>	N <sub>10</sub>	N <sub>11</sub>	N <sub>12</sub>	N <sub>13</sub>	N <sub>14</sub>	N <sub>15</sub>	N <sub>16</sub>	N <sub>17</sub>	N <sub>18</sub>

A2.4.2 The GSRN uses the GS1 Company Prefix of the registry assigning the Service Reference. The Service Reference is assigned by the registry and relates to an individual Production Device. The structure and content of the Service Reference number is at the discretion of the registry.

A2.4.3 The Check Digit is calculated as shown below. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Check Digit Calculation																	
Global Service Relation Number																	
GS1 Company Prefix For the registry												Service Reference				Check Digit	
N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N <sub>9</sub>	N <sub>10</sub>	N <sub>11</sub>	N <sub>12</sub>	N <sub>13</sub>	N <sub>14</sub>	N <sub>15</sub>	N <sub>16</sub>	N <sub>17</sub>	N <sub>18</sub>
Multiply value of each position by																	
x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1
Accumulated results = 'sum'																	
Check digit = (nearest multiple of 10 ≥ 'sum') – 'sum'																	

Example Check Digit Calculation																	
Global Service Relation Number																	
GS1 Company Prefix For the registry												Service Reference				Check Digit	
Start number	3	7	6	1	0	4	2	5	0	0	2	1	2	3	4	5	6
Multiply value of each position by																	
Interim	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3
Interim	9	7	18	1	0	4	6	5	0	0	6	1	6	3	12	5	18
Accumulated results = 'sum'																	101
Check digit = (nearest multiple of 10 ≥ 'sum') – 'sum'																	110
																	-101
																	=9
Final number	3	7	6	1	0	4	2	5	0	0	2	1	2	3	4	5	6

*Example GSRN-based Production Device Numbers are:*

**512345670000012347** (8-digit Company Prefix with 9-digit Service Reference and single Check Digit)

**598765432000001235** (9-digit Company Prefix with 8-digit Service Reference and single Check Digit)

**A2.5 Coding of Trader Account IDs**

A2.5.1 Each trader shall be assigned a unique account reference by their host IB. The account reference shall be composed according to either (a) or (b) below:

A2.5.2 The EECS type account reference consists of the following:

- IB\_ID (2 numeric digits)
- X (single 'X' character)
- 6-character alphanumeric ID (0-9 and A-Z only)
- check character (see below)

An example Trader Account ID is 10XRWENETJ.

A check character is a character added to the end of the Trader Account ID that validates the authenticity of the code. A simple algorithm is applied to the other digits or letters of the code which yields the check character.

The last character of each of the Trader Account ID represents the check character that is calculated from the other characters using the following algorithm. An example of a Trader Account ID is 10XRWENETJ.

Calculation of the check character:

(i) The first 9 characters of the code are individualised as follows:

1	0	X	R	W	E	N	E	T
---	---	---	---	---	---	---	---	---

(ii) Where alphabetic characters are present, they are replaced by a numeric value with the value 10 for the letter « A »; 11 for the letter « B »; 12 for the letter « C », etc. and 35 for the letter « Z », as follows:

1	0	33	27	32	14	23	14	29
---	---	----	----	----	----	----	----	----

(iii) Then, the positions are again weighted, beginning with the greatest value to the left and ending with a one at the far right.

1	0	33	27	32	14	23	14	29
<i>10</i>	<i>9</i>	<i>8</i>	<i>7</i>	<i>6</i>	<i>5</i>	<i>4</i>	<i>3</i>	<i>2</i>

(iv) Each digit is multiplied by its position weight

10	0	264	189	192	70	92	42	58
----	---	-----	-----	-----	----	----	----	----

- (v) The products are then summed to give a total value: 917
- (vi) A modulo 36 (which corresponds to the total number of characters available) is applied to the value 917 with the formula  $(36 - \text{MOD}([\text{value}],36))$ . This produces a numeric value in the range 1 to 36.

In the above example, the result is 19 which, since it is superior to 9 has to be converted to a letter using a similar mechanism as in Step 2. Number 0 is not an allowed output. Where the check character code is 36 this is represented as the character [.

Thus, the code for the above example is: 10XRWENETJ. With an account base of 11XYWZNET the check character would be [and the full account code would be 11XYWZNET[.

A2.5.3 The GS1 type account reference consists of the following:

- 12 numerical characters
- check character (also numerical; see below)

An example Trader Account ID is 871686799993 8

A check character is a character added to the end of the Trader Account ID that validates the authenticity of the code. A simple algorithm is applied to the other digits or letters of the code which yields the check character.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N <sub>9</sub>	N <sub>10</sub>	N <sub>11</sub>	N <sub>12</sub>	N <sub>13</sub>
12 numbers without the control number	8	7	1	6	8	6	7	9	9	9	9	3	
Step 1: Multiply by	1	3	1	3	1	3	1	3	1	3	1	3	
Step 2: Result	8	21	1	18	8	18	7	27	9	27	9	9	

Step 3: Count the total sum of step 2	162
Step 4: Round up to the nearest multiple of 10	170
Step 5: Subtract the total of step 2	162
The check character is	8

**A2.6 Coding of Issuing Bodies, Competent Authorities, Energy sources, Technologies, Cogeneration GO Codes, Earmarks, Geographical Coordinate codes, EECS Scheme Members and EECS Products, Transfer Error codes**

- A2.6.1 Permissible valid codes for
- A2.6.2 Issuing Bodies and Competent Authorities are found in AIB-EECS-FS04 (Member and Competent Authority Codes)
- A2.6.3 Types of Energy Sources and Technologies and their emission factors are found in AIB-EECS-FS05 (Types of Energy Inputs and Technologies)
- A2.6.4 Use of Heat Codes for Cogeneration GOs are found in AIB-EECS-FS11 (Cogeneration GO Codes)
- A2.6.5 Earmark flags are found in AIB-EECS-FS3 (Types of Public Support)
- A2.6.6 Coordinate Codes for Production Device Location are found in AIB-EECS-FS16 (Geographical Coordinates)



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- A2.6.7 EECS Schemes and the Members of each EECS Product are found in AIB-EECS-FS17 (EECS Scheme Members and EECS Products)
  - A2.6.8 Transfer Error Codes are found in AIB\_EECS\_FS18 (Transfer Error Codes).
  - A2.6.9 Please consult the latest version of this list for details.

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## B2 Introduction

### B2.1 Purpose and Scope

B2.1.1 This annex describes the file structures for:

- transferring certificates between registries
- acknowledging the receipt of such transfers

B2.1.2 This interface specification annex addresses data transfer, including acknowledgement of transfer, between registries, specifically relating to certificates for EECS Electricity Scheme. The EECS Electricity Scheme is based on Renewable Energy Directives 2001/77/EC and 2009/28/EC, the Cogeneration Directive 2004/8/EC and the Internal Markets Electricity Directive 2003/54/EC

B2.1.3 The acceptability of certificates in certain markets is not a matter for this document. The data file is designed to allow certificates issued and processed under different rules to be distinguished from each other, even though the underlying data elements may be the same across a number of systems.

B2.1.4 File record specifications are defined for each data record relating to transfers of certificates between registries. Message content and management process are defined.

## B3 Overview of Certificate Transfer File Structure

### B3.1 Introduction

B3.1.1 The transfer data file is designed to handle EECS Certificates for a number of technologies, fuels and sources and Energy Carriers.

### B3.2 Preamble

B3.2.1 The XML preamble describes the encoding and data schema that apply to the file. It takes the form. Note: the schema version used should be given as below (in below example the "exportenv80.xsd" version is used):

```
<?xml version="1.0" encoding="UTF-8"?>  
<r:Env xsi:schemaLocation="http://system.aib-net.org/exportenv80.xsd"  
xmlns:r="http://system.aib-net.org"  
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
```

B3.2.2 The hosting of the schema does not form part of this specification.

B3.2.3 The current supported schemas:

- v71: 'exportenv71.xsd' is described in this standard and addresses the requirements for certificates issued under the EECS Electricity Scheme; This schema version will be due to 28<sup>th</sup> February 2024.
- v80: 'exportenv80.xsd' is described in this standard and addresses the requirements for certificates issued under the EECS Electricity and Gas Scheme; This schema version should be implemented by registries latest 28th February 2024. It will be available for registries after implementation in AIB Hub in 2022.

### B3.3 Header

B3.3.1 Transfer file has a header section. This is designed to identify the file and to assist registries in routing the file to the appropriate process in their system. Messages received by the Hub must contain appropriate information to identify the eventual recipient.

B3.3.2 As an example, this file fragment shows a transfer between the registry using the GS1 code number 6420616413223 to the registry using the GS1 code number 5987654321234. The context is “transfer”, indicating a certificate transfer.

```
<r:Header MessageTransmissionTime="2001-07-30T15:07:00Z">
  <r:MessageID >042001073000001</r:MessageID >
  <r:FromRegistry cS="GS1">6420616413223</r:FromRegistry >
  <r:ToRegistry cS="GS1">5987654321234</r:ToRegistry>
  <r:Context >transfer</r:Context >
</r:Header >
```

B3.3.3 The example shows the use of ‘cS’ attributes on the r:FromRegistry and r:ToRegistry fields to identify different interpretations of the fields. The default is to have no such attribute, in which case the registry GS1 number should be used.

**B3.4 Certificate Transfer File: Body**

- B3.4.1 The body section of the certificate transfer file contains the data on the certificates to be transferred, and the identities of the old and new holders of the certificates.
- B3.4.2 The file structure is designed to handle certificates issued under the EECS Electricity and Gas Scheme
- B3.4.3 It is the responsibility of the sending registry to ensure that the data contained in the file is consistent with the Directive the certificate relates to.
- B3.4.4 It is the responsibility of the receiving registry to ensure that the data contained in the file is used in accordance with the rules appropriate to the particular certificate.
- B3.4.5 This fragment shows a transfer of EECS certificates.

(a) Example Body created with Schema v71 for Electricity non-HEC

```
<r:Body>
  <r:SendingAccountID cS="eecs">04X00VAPOU</r:SendingAccountID>
  <r:ReceivingAccountID cS="eecs">02XSHELL0V</r:ReceivingAccountID>
  <r:NumberOfCertificates>10</r:NumberOfCertificates>
  <r:Certificates>
    <r:EnergyMedium>Electricity</r:EnergyMedium>
    <r:Purpose>Disclosure</r:Purpose>
    <r:ProductStatus>GO</r:ProductStatus>
    <r:ProductType>source</r:ProductType>
    <r:StartCertificateNumber cS="eecs">871686799993800000000001267377
  </r:StartCertificateNumber>
    <r:EndCertificateNumber cS="eecs">871686799993800000000001267386
  </r:EndCertificateNumber>
    <r:IssuingBody>08</r:IssuingBody>
    <r:CompetentAuthority>NO01</r:CompetentAuthority>
    <r:CountryOfIssue>NO</r:CountryOfIssue>
    <r:IssuedDate>2010-08-15</r:IssuedDate>
    <r:ProductionDeviceID cS="GS1">6420616413130000012
  </r:ProductionDeviceID>
    <r:ProductionDeviceName>Name</r:ProductionDeviceName>
  <r:Capacity>
```









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```

<r:Product name="EECS:GO" legalStatus="LC">
  <r:Purpose>Disclosure</r:Purpose>
  <r:CompetentAuthority>XX01</r:CompetentAuthority>
  <r:ProductType type="driver">Source</r:ProductType>
</r:Product>
<r:ProductionDeviceID>NNNNNNNNNNNNNNNNNNNN</r:ProductionDeviceID>
<r:ProductionDeviceName>Production Device A</r:ProductionDeviceName>
<r>DateOperational>2021-01-12</r>DateOperational>
<r:Capacity>
  <r:GasProductionCapacity>10000.000</r:GasProductionCapacity>
</r:Capacity>
<r:ProductionTechnology>XNNNNNNN</r:ProductionTechnology>
<r:EnergySource advancedBiomassFeedstock="true">XNNNNNNNN</r:EnergySource>
<r:SourceShares>XNNNNNNNN1:10%, XNNNNNNNN2:90%</r:SourceShares>
<r:SupportFlag>1</r:SupportFlag>
<r:ProductionSupportDescription>Production support.</r:ProductionSupportDescription>
<r:InvestmentSupportDescription>Investment support.</r:InvestmentSupportDescription>
<r:ProductionDeviceLocation>
  <r:Coordinates Longitude="LO" Latitude="LA" CoordinateCode="WGS-
84"/></r:ProductionDeviceLocation>
<r:DisseminationLevel>02</r:DisseminationLevel>
<r:Gas type="XNNNN">
  <r:CompositionPurity>YNNNN</r:CompositionPurity>
  <r:GasCompositionCriteria>ZNNNN</r:GasCompositionCriteria>
  <r:GasUsage>a</r:GasUsage>
</r:Gas>
<r:CalorificValue type="higher">123.123</r:CalorificValue>
<r:GHGEmissions GHGSavingsCriteriaMet="true">
  <r:GHGEmissionProduced calculationMethod="XNNNNNNNN">
234.123</r:GHGEmissionProduced>
  <r:AbsoluteGHGEmissionSaved
calculationMethod="XNNNNNNNN">123.123</r:AbsoluteGHGEmissionSaved>
</r:GHGEmissions>
<r:Sustainability sustainabilityCriteriaMet="true" certificationBody="XX">
  <r:RequirementReference>REDIIart.30</r:RequirementReference>
  <r:Scheme>ISCC</r:Scheme>
  <r:AuditReport>Reference to the report</r:AuditReport>
  <r:SustainabilityAdditionalInfo>More info</r:SustainabilityAdditionalInfo>
</r:Sustainability>
<r:Label>EKOENERGY</r:Label>
<r:Label>Another label</r:Label>
<r:AdditionalInfo>Example GAS with Sustainability</r:AdditionalInfo>
</r:Certificates>
</r:Body>

```

B3.4.6 The original holder and the new holder are identified in elements 'r:SendingAccountID' and 'r:ReceivingAccountID' respectively. The 'cS' attribute shows that the identifiers are both EECS identifiers.

- B3.4.7 The actual certificates are described in the 'r:Certificates' block (bundle). This refers to a contiguous set of certificates with serial numbers between 87168679999380000000001267377 and 87168679999380000000001267386 inclusive. If the transfer involves non-contiguous sets of certificates then further 'r:Certificates' blocks can be included as required.
- B3.4.8 A single transfer file can only have one body element. This implies that:
- (a) All the certificates are to be transferred from the same original holder;
  - (b) All the certificates are to be transferred to the same new holder.
- B3.4.9 A single transfer file can only contain certificates of one EnergyCarrier

## **B4 Certificate Transfer Message Definition**

### **B4.1 Introduction**

- B4.1.1 Data fields defined in the message schema are described in further detail in this section. Examples of application are presented in Section B3.
- B4.1.2 Where appropriate, details of field structure have been included.

### **B4.2 Optional and Mandatory Elements of a Certificate v71**

- B4.2.1 The set of certificate types supported may be extended without reference to this specification so long as the data element set remains as described here.

Element		ProductType=Source			ProductType=Technology
Hierarchy	Name	RES-E	Nuclear EnergySource=F03...	Fossil EnergySource=F02...	CHP/HEC
Header	MessageTransmissionTime	M	M	M	M
Header	MessageID	M	M	M	M
Header	FromRegistry	M	M	M	M
Header	ToRegistry	M	M	M	M
Header	Context	M	M	M	M
Body	OriginalHolder (SendingAccountID)	M	M	M	M
Body	NewHolder (ReceivingAccountID)	M	M	M	M
Body	NumberOfCertificates	M	M	M	M
Certificates	EnergyMedium	M	M	M	M
Certificates	Purpose	M	M	M	M



Element		ProductType=Source			ProductType=Technology
Hierarchy	Name	RES-E	Nuclear EnergySource=F03...	Fossil EnergySource=F02...	CHP/HEC
Certificates	ProductStatus	M	M	M	M
Certificates	ProductType	M	M	M	M
Certificates	StartCertificateNumber	M	M	M	M
Certificates	EndCertificateNumber	M	M	M	M
Certificates	IssuingBody	M	M	M	M
Certificates	CompetentAuthority	M	M	M	M
Certificates	CountryOfIssue	M	M	M	M
Certificates	IssuedDate	M	M	M	M
Certificates	ProductionDeviceID	M	M	M	M
Certificates	ProductionDeviceName	O	O	O	O
Capacity	Electrical Capacity	M	M	M	M
Capacity	Mechanical Capacity	O	O	O	O
Capacity	Thermal Capacity	O	O	O	M
Certificates	DateOperational	M	M	M	M
Certificates	StartDate EndDate (ProductionPeriod)	M	M	M	M
Certificates	EarmarkFlag	M	M	M	M
Certificates	ProductionSupportDescription	O	O	O	O
Certificates	InvestmentSupportDescription	O	O	O	O
Certificates	TypeOfInstallation	M	M	M	M
Certificates	EnergySource	M	M	M	M
Production Device Location	ProductionDeviceCoordinates <sup>3)</sup>	X	X	X	X
Production Device Location	ProductionDeviceAddress <sup>3)</sup>	X	X	X	X



Element		ProductType=Source			ProductType=Technology
Hierarchy	Name	RES-E	Nuclear EnergySource=F03...	Fossil EnergySource=F02...	CHP/HEC
Certificates	UseOfHeat	O	O	O	M
Certificates	LowerCalorificValue	O	O	O	M
Primary Energy Saving	PercentagePrimaryEnergySaved	O	O	O	M
Primary Energy Saving	AmountPrimaryEnergySaved	O	O	O	M
Primary Energy Saving	OverallPrimaryEnergySavings	O	O	O	M
CO2 Emission	CO2EmissionProduced	O	O	M	M
CO2 Emission	AbsoluteCO2EmissionSaved	O	O	O	M
Certificates	RadioactiveWasteProduced	O	M	O	O
Certificates	UsefulCogenHeat (v71) <sup>4)</sup>	O	O	O	M
Certificates	ElectricalEfficiency (v71) <sup>4)</sup>	O	O	O	M
Certificates	ThermalEfficiency (v71) <sup>4)</sup>	O	O	O	M

- M Mandatory element
- O Optional element<sup>5)</sup>
- X Conditionally mandatory element, see notes.

Notes:

- 1) The value ProductType: Technology means that the Certificate was issued for electricity production from High Efficient Cogeneration, as defined by the Energy Efficiency Directive 2012-27. This value of the ProductType =Technology is only allowed to be used for High Efficient Cogeneration.
- 2) Combined certificates, e.g. GO/RES-E and HEC are recognized by having both ProductTypes: Technology and Source. Mandatory fields from both types have to be filled in.
- 3) Each certificate must contain at least the ProductionDeviceCoordinates or the ProductionDeviceAddress and may contain both.
- 4) Optional means that it is optional to give this information at the time of issuing the Certificate, but after a Certificate is being issued, it is compulsory to keep the information in imports and exports. (ref EECS Rules A3 IMMUTABILITY)

**B4.3 Optional and Mandatory Elements of EECS:GO Certificate v80**

B4.3.1 Below table gives the overview of the mandatory and optional fields in v80 for EECS:GO certificates per Energy Carrier. Electricity is separated by non-High Efficiency Certificates (non-HEC) and High Efficiency Certificates (HEC).

Element		PRODUCT: EECS:GO (Disclosure)			
		Energy Carrier:			
Hierarchy	Name in v80	Electricity (non-HEC)	Electricity (HEC)	Energy Gas	Hydrogen
Header	Attribute: MessageTransmissionTime	M	M	M	M
Header	MessageID	M	M	M	M
Header	FromRegistry	M	M	M	M
Header	ToRegistry	M	M	M	M
Header	Context	M	M	M	M
Body	SendingAccountID	M	M	M	M
Body	ReceivingAccountID	M	M	M	M
Body	NumberOfCertificates	M	M	M	M
Body	Message	O	O	O	O
Certificates	Attribute: faceValue	M	M	M	M
Certificates	StartCertificateNumber	M	M	M	M
Certificates	EndCertificateNumber	M	M	M	M
Certificates	IssuingBody	M	M	M	M
Certificates	CountryOfIssue	M	M	M	M
Certificates	DateOfIssue	M	M	M	M
Production Period	Attributes: start end	M	M	M	M
Certificates	EnergyCarrier	M	M	M	M
Certificates	Conversion	M	M	M	M
Conversion	Attribute: tag	M	M	M	M
Conversion	Attribute: preConversionSupportFlag	N	N	O	O
Certificates	Storage <sup>3)</sup>	X <sup>3)</sup>	X <sup>3)</sup>	X <sup>3)</sup>	X <sup>3)</sup>
Storage	Attribute: tag	X	X	X	X
Certificates	<b>*Product</b>	M	M	M	M
Product	Attribute: name	M	M	M	M
Product	Attribute: legalStatus	M	M	M	M
Product	<b>*Purpose</b>	M	M	M	M
Product	<b>*CompetentAuthority</b>	M*	M*	M*	M*
Product	<b>*ProductType</b>	M	M	M	M
*ProductType	Attribute: type	M	M	M	M
Certificates	ProductionDeviceID	M	M	M	M

Element		PRODUCT: EECS:GO (Disclosure)			
		Energy Carrier:			
Hierarchy	Name in v80	Electricity (non-HEC)	Electricity (HEC)	Energy Gas	Hydrogen
Certificates	ProductionDeviceName	O	O	O	O
Certificates	DateOperational	M	M	M	M
Capacity	ElectricalCapacity	M	M	N	N
Capacity	MechanicalCapacity	O	O	O	O
Capacity	ThermalCapacity	O	M	O	O
Capacity	GasProductionCapacity	N	N	M	M
Module	ModuleCapacity	O	O	O	O
Module	ModuleDateOperational	O	O	O	O
Module	ModuleDescription	O	O	O	O
Certificates	ProductionTechnology	M	M	M	M
Certificates	EnergySource	M	M	M	M
EnergySource	Attribute: advancedBiomassFeedstock	N	N	O	O
Certificates	SourceShares	N	N	O	O
Certificates	SupportFlag	M	M	M	M
Certificates	ProductionSupportDescription	O	O	O	O
Certificates	InvestmentSupportDescription	O	O	O	O
ProductionDevice Location	Coordinates <sup>1)</sup>	x <sup>1)</sup>	x <sup>1)</sup>	x <sup>1)</sup>	x <sup>1)</sup>
ProductionDevice Location	Address <sup>1)</sup>	x <sup>1)</sup>	x <sup>1)</sup>	x <sup>1)</sup>	x <sup>1)</sup>
Certificates	DisseminationLevel	M	M	M	M
Certificates	Cogeneration	O	M	N	N
Cogeneration	Attribute: HECCriteriaMet	O	M	N	N
Cogeneration	UseOfHeat	O	M	N	N
Cogeneration	PercentagePrimaryEnergySaved	O	M	N	N
Cogeneration	AmountPrimaryEnergySaved	O	O	N	N
Cogeneration	OverallPrimaryEnergySavings	O	O	N	N
Cogeneration	UsefulHeat	O	M	N	N
Certificates	ElectricalEfficiency	O	M	N	N
Certificates	ThermalEfficiency	O	M	N	N
Certificates	Gas	N	N	M	M
Gas	Attribute: type	N	N	M	M
Gas	CompositionPurity	N	N	O	O
Gas	GasCompositionCriteria	N	N	O	O
Gas	GasUsage	N	N	O	O
Certificates	CalorificValue	N	M	Only attribute	Only attribute

Element		PRODUCT: EECS:GO (Disclosure)			
		Energy Carrier:			
Hierarchy	Name in v80	Electricity (non-HEC)	Electricity (HEC)	Energy Gas	Hydrogen
				mandatory, value not	mandatory, value not
CalorificValue	Attribute: type	N	M	M	M
CalorificValue	Attribute: unit	N	M	M	M
Certificates	GHGEmissions	O	O	O	O
GHGEmissions	Attribute: GHGSavingsCriteriaMet	N	N	O	O
GHGEmissions	GHGEmissionProduced	O	O	O	O
GHGEmissionProduced	Attribute: unit	O	O	O	O
GHGEmissionProduced	Attribute: calculationMethod	X	X	X	X
GHGEmissions	AbsoluteGHGEmissionSaved	O	O	O	O
AbsoluteGHGEmissionSaved	Attribute: unit	O	O	O	O
AbsoluteGHGEmissionSaved	Attribute: calculationMethod	X	X	X	X
Certificates	RadioactiveWasteProduced	O	O	O	O
RadioactiveWasteProduced	Attribute: calculationMethod	O	O	O	O
Certificates	Sustainability	O	O	O	O
Sustainability	Attribute: sustainabilityCriteriaMet	O	O	O	O
Sustainability	Attribute: certificationBody	O	O	O	O
Sustainability	RequirementReference	O	O	O	O
Sustainability	Scheme	O	O	O	O
Sustainability	AuditReport	O	O	O	O
Sustainability	SustainabilityAdditionalInfo	O	O	O	O
Certificates	Label	O	O	O	O
Certificates	AdditionalInfo	O	O	O	O

- M Mandatory element (Note, if an attribute is set to Mandatory, it is Mandatory only if the Element itself is set to Mandatory)
- O Optional element <sup>4)</sup>
- N Not applicable (cannot be given to the type of certificate)
- X Conditionally mandatory element, see notes. If X used for an attribute, the attribute is mandatory if the Element itself is given.

Notes:

- 1) Each certificate must contain at least the ProductionDeviceCoordinates or the ProductionDeviceAddress and may contain both.
- 2) Optional means that it is optional to give it on issuing, but after a certificate is being issued, it is compulsory to keep the information in imports and exports. There are exceptions to this rule where data loss is allowed to specific data fields in case it is done as part of transformation between v71 and v80 and according to the rules introduced for each element in the B4.6 Data Field Definitions – Certificate Transfer File Certificates. (ref EECS Rules A3 IMMUTABILITY)

- 3) Storage element is mandatory if the Storage Tag to be related to the Certificate does not correspond to the default value “S0100” in the Fact Sheet Conversion Track.

**B4.4 Data Field Definitions – Certificate Transfer File Header**

**B4.4.1 Message Transmission Time**

Timestamp for message file. The recipient may validate the format of this field but may not reject the message if the date is beyond some arbitrary limit in the past. It is the responsibility of the Sender to monitor the total turnaround time of the transaction to ensure that an AK message is received within the required time.

Attribute	MessageTransmissionTime
Type	DateTime
Length	Not applicable
Format	UTC (Z). Use of referential time zones (e.g. +1:00) is not permitted.
Occurrence	Required
Structure	YYYY-MM-DDTHH:MM:SSZ
Unit	DateTime
Example	2022-01-15T12:24:00Z

**B4.4.2 Message ID**

Message ID for transfer message.

Element Name	MessageID
Type	Long
Length	15 digits
Format	15 digits fixed length number
Occurrence	1 (per Header element of transfer message) NOTE: Unique identification number for a transfer
Structure	IB code (2 digits) & YYYYMMDD & sequential number (5 digits)
Unit	Not applicable
Example	042002101800001

**B4.4.3 From Registry**

Identifier for Sending Registry.

This field may be validated for agreement with the XML specification. The recipient may not reject the message based on the content.

Element Name	FromRegistry
--------------	--------------

Type	Token <sup>1</sup>
Length	6-13
Format	GS1 GLN number
Occurrence	1 (per Header element)
Structure	See section A2.2
Example	6420616413223
<b>Attribute</b>	<b>cS</b>
Type	String
Format	'GS1'
Default	'GS1'

#### B4.4.4 To Registry

Identifier for Receiving Registry.

This field may be validated for agreement with the XML specification. The recipient may not reject the message based on the content.

<b>Element Name</b>	<b>ToRegistry</b>
Type	Token
Length	6-13
Format	GS1 GLN number
Occurrence	1 (per Header element)
Structure	See section A2.2
Example	6420616413223
<b>Attribute</b>	<b>cS</b>
Type	String
Format	'GS1'
Default	'GS1'

#### B4.4.5 Context

Processing context to assist file routing.

<b>Element Name</b>	<b>Context</b>
Type	Token
Length	1-20

<sup>1</sup> Token: A string with no leading or trailing white space, no tabs, no linefeeds, and not more than one consecutive space.

Format	'transfer' is the only supported value for now
Occurrence	1 (per Header element)
Example	Transfer

**B4.5 Data Field Definitions – Certificate Transfer File Body**

**B4.5.1 Original Holder**

Account ID for party transferring certificates.

Element Name	SendingAccountID
Type	Token
Length	See section A2.5. eecs: 9 + 1 check digit GS1: 12 + 1 check digit
Format	Depends on setting of cS attribute, see section A2.5
Occurrence	1 (per Header element)
Structure	See section A2.5
Unit	Not applicable
Example	Type eecs: <r:SendingAccountID cS="eecs">10XRWENETJ</r:SendingAccountID>  Type GS1: <r:SendingAccountID cS="GS1">8716867999938 </r:SendingAccountID>
<b>Attribute</b>	<b>cS</b>
Type	String
Format	One of: 'eecs' or 'GS1' NOTE: Not case sensitive
Default	'eecs'

**B4.5.2 New Holder**

Account ID for party receiving certificates.

Element Name	ReceivingAccountID
Type	Token
Length	See section A2.5. eecs: 9 + 1 check digit GS1: 12 + 1 check digit
Format	Depends on setting of cS attribute
Occurrence	1 (per Body element)



Structure	See section A2.5
Unit	Not applicable
Example	Type eecs: <r:ReceivingAccountID cS="eecs">10XRWENETJ</r:ReceivingAccountID>  Type GS1: <r:ReceivingAccountID cS="GS1">8716867999938 </r:ReceivingAccountID>
<b>Attribute</b>	<b>cS</b>
Type	String
Format	One of: 'eecs' or 'GS1' NOTE: Not case sensitive
Default	'eecs'

#### B4.5.3 Number of Certificates

Number of certificates transferred in the message.

Element Name	NumberOfCertificates
Type	Positive Integer
Length	1-11
Format	Number
Occurrence	1 (per Body element)
Structure	N...[N]
Unit	Not applicable
Example	682

#### B4.5.4 Message

Free text Message which can be used to communicate information from sender to buyer.

Element Name	Message
Type	String
Length	1-1024
Format	Free text
Occurrence	0 or 1 (per Body element)
Structure	Not applicable
Unit	Not applicable
Example	"Transfer in accordance with order nr ... dated ..."

<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Information will be lost.

#### B4.5.5 Certificates

Each transfer may have one or more “Certificates” elements.

See information about maximum number of “Certificates” elements from 2.3.5.4 To ensure the performance of the AIB Hub a transfer may not contain more certificate bundles than a cap configured in the AIB Hub. This limit is initially set to 5000. A certificate bundle starts with the tag <r:Certificates> and ends with the tag </r:Certificates>. More details about a certificate bundle can be found in paragraph B3.4.7.

<b>Element Name</b>	<b>Certificates</b>
Type v71	Element with sub elements
Type v80	Element with an attribute and sub elements
Occurrence	1 to 5000 or another maximum limit agreed separately.
<b>Attribute</b>	<b>faceValue</b>
Description	Face Value in accordance with the Section of PART IV of the EECS Rules establishing the EECS Scheme in respect of the relevant Output
Length	1-8
Default value	MWh
Occurrence	Optional
Structure	MWh or other value agreed time to time. In accordance with sections N4 and O4 of the EECS Rules, the Face Value is always 1MWh. Once this would be modified, then consistency should be foreseen by revisiting the statistics section, B7.
Example v71	<r:Certificates>...</r:Certificates>
Example v80	<r:Certificates faceValue="MWh">...</r:Certificates>
<b>Transformation rules</b>	
v71 to v80	Transformation is possible as in V71 the face value is always the default value given above.
v80 to v71	Transformation is possible only if the Face value is MWh.

#### B4.6 Data Field Definitions – Certificate Transfer File Certificates

##### B4.6.1 Start Certificate Number

The number of the first certificate in the block of certificates to be transferred.

<b>Element Name</b>	<b>StartCertificateNumber</b>
Type	Non-negative Integer
Length	30
Format	30-digit fixed length number
Occurrence	1 (per Certificates element)
Structure	See section A2.3.1 <i>N</i> -digit Company Prefix with <i>N</i> -digit Individual Asset Reference, total 30 digits
Example	<r:StartCertificateNumber cS="eecs"> 87168679999380000000001267377 </r: StartCertificateNumber>
<b>Attribute</b>	<b>cS</b>
Type	string
Format	One of: 'eecs' or other encodings to be agreed from time to time.
Default	'eecs'

#### B4.6.2 End Certificate Number

The number of the last certificate in the block of certificates to be transferred.

<b>Element Name</b>	<b>EndCertificateNumber</b>
Type	Non-negative Integer
Length	30
Format	30-digit fixed length number
Occurrence	1 (per Certificates element)
Structure	See also section A2.3.1 <i>N</i> -digit Company Prefix with <i>N</i> -digit Individual Asset Reference, total 30 digits
Example	<r:EndCertificateNumber cS="eecs"> 87168679999380000000001267377 </r:EndCertificateNumber>
<b>Attribute</b>	<b>cS</b>
Type	string
Format	One of: 'eecs' or other encodings to be agreed from time to time.
Default	'eecs'

#### B4.6.3 Issuing Body

The ID of the Issuing Body responsible for the issue of the certificates being transferred.

Element Name	IssuingBody
Type	Token
Length	2
Format	NN
Occurrence	1 (per Certificates element)
Structure	2-character numeric, leading zero if required. See Fact sheet 4 "Member & Competent Authority Codes" for possible values
Example	07

#### B4.6.4 Country of Issue

The Country of originating Production Device.

Element Name	CountryOfIssue
Type	Token
Length	2
Format	XX
Occurrence	1 (per Certificates element)
Structure	2-characters' code according to the ISO 3166-1 country code list
Example	FI

#### B4.6.5 Certificate Issue Date

The date on which the certificate was issued.

Element Name v71	IssuedDate
Element Name v80	DateOfIssue
Type	Date
Length	Not applicable
Format	Date is according to local time, not UTC Minimum value 2004-03-17 (the date when EECS GOs came into being)
Occurrence	1 (per Certificates element)
Structure	YYYY-MM-DD
Example	2002-10-15

#### B4.6.6 Production Period

Start and End of actual generation of the Output represented by the certificate. The period is defined by two mandatory attributes.

<b>Element Name</b>	<b>ProductionPeriod</b>
Type	An element having 2 attributes
Occurrence	1 (per Certificates element)
Example v71	<r:ProductionPeriod startdate="2022-01-01" enddate="2022-01-01" />
Example v80	<r:ProductionPeriod start="2022-01-01T00:00+02:00" end="2022-01-01T23:59+02:00" />
<b>Attribute v71</b>	<b>startdate</b>
<b>Attribute v80</b>	<b>start</b>
Type v71	Date
Type v80	DateTime
Format v71	Date according to local time, not UTC. Minimum value 2004-03-17
Format v80	Required. Datetime according to local time, but the offset to UTC time has to be specified. Minimum value 2004-03-17T00:00+00:00.
Occurrence	Required
Structure v71	YYYY-MM-DD
Structure v80	YYYY-MM-DDTHH:MMO where O is offset to UTC time and has format of +/-HH:MM
<b>Attribute v71</b>	<b>enddate</b>
<b>Attribute v80</b>	<b>end</b>
Type v71	Date
Type v80	DateTime
Format v71	Date according to local time, not UTC. Required. Minimum value 2004-03-17 (the date when EECS GOs came into being)
Format v80	Required. Datetime according to local time, but the offset to UTC time has to be specified. Minimum value 2004-03-17T00:00+00:00.
Occurrence	Required
Structure v71	YYYY-MM-DD
Structure v80	YYYY-MM-DDTHH:MMO where O is offset to UTC time and has format of +/-HH:MM
<b>Transformation rules</b>	
from v71 to v80	Change of attribute names and add time part. In the transformation the UTC Z will be used. "startDate" attribute will be converted to "start" by adding 00:00+00:00 in the end. "endDate" attribute will be converted to "end" by adding 23:59+00:00 in the end.
from v80 to v71	The time part will be lost

#### B4.6.7 Energy Carrier

Energy Carrier for which the EECS the certificates have been issued.

<b>Element Name (v71)</b>	<b>EnergyMedium</b>
---------------------------	---------------------

<b>Element Name (v80)</b>	<b>EnergyCarrier</b>
Type	Token
Length	1-20
Format	Text field.
Occurrence	1 (per Certificates element)
Example v71	<EnergyMedium>Electricity</EnergyMedium>
Example v80	<EnergyCarrier>Electricity</EnergyCarrier>
Business Rules v71	Allowed values: Electricity
Business Rules v80	Allowed values: <ul style="list-style-type: none"> <li>• Electricity</li> <li>• EnergyGas</li> <li>• Hydrogen</li> </ul> or other value to be agreed by AIB time to time One Certificate Transfer can only contain Certificates of same EnergyCarrier.
<b>Transformation rules</b>	
from v71 to v80	The element name changed.
from v80 to v71	The element name changed. The transformation possible only if EnergyCarrier has value Electricity, otherwise export blocked.

**B4.6.8 Conversion Information**

Information about conversion and the input used in case the Certificate was issued as a consequence of EECS Certificate Conversion.

<b>Element Name v80</b>	<b>Conversion</b>
Type	Element with an attribute and child element
Occurrence	1 (per Certificates element)
<b>Attribute</b>	<b>tag</b>
Type	Token
Length	3
Occurrence	Mandatory
Description	An indication whether or not the Certificate was Issued following EECS Certificate Conversion.
Structure	One of the Conversion Tags from Fact Sheet 23 "Conversion tracking"

Example	"C01"
<b>Attribute</b>	preConversionSupportFlag
Type	Token
Length	1-2
Occurrence	Optional. Only applicable for certificates where EnergyCarrier is "EnergyGas" or "Hydrogen".  Only applicable if the Conversion type-attribute is other than code corresponding "Produced directly from primary energy source".
Description	Where the Certificate was issued as a consequence of EECS Certificate Conversion, and in general for EECS Gas Certificates issued for Output as a result from Energy Carrier Conversion, an indication of the public support granted in relation with the energy fed as Input into the converting Production Device ("pre-conversion support info"), in accordance with the values listed in EECS Fact Sheet 03 Types of Public Support.
Structure	One of the codes listed in EECS Rules Fact Sheet 3 ("Types of Public Support").
Example	Example for EnergyCarrier "Electricity" <r:Conversion tag="C01"/>  Example for EnergyCarrier "EnergyGas" or "Hydrogen" where the conversion was done. <r:Conversion tag="C02" preConversionSupportFlag="1"/>
<b>Transformation rules</b>	
from v71 to v80	The tag attribute will be set to "C01"
from v80 to v71	Export will be blocked if the tag attribute is other than "C01".  Export will be blocked if preConversionSupportFlag attribute is given.

#### B4.6.1 Storage

An indication whether or not the Certificate was Issued following release from a Storage System in accordance with the provisions of EECS Rules section C3.2.4.

Element Name v80	Storage
Type	Element with an attribute
Occurrence	0-1 (per Certificate element)  NOTE: Storage element is mandatory if the Storage Tag to be related to the certificate does



	not correspond to the default value “S0100” according to the Fact Sheet Conversion Track.
<b>Attribute</b>	<b>tag</b>
Type	Token
Length	5
Default	S0100
Occurrence	Mandatory
Description	An indication whether or not the Certificate was Issued following release from a Storage System in accordance with the provisions of EECS Rules section C3.2.4
Structure	One of the values for Storage Tags from Fact Sheet 23 “Conversion Tracking”
Example	<r:Storage tag=”S0100”/>
<b>Transformation rules</b>	
from v71 to v80	The tag attribute will be set to “S0100”
from v80 to v71	Export will be blocked if the tag attribute starts with S02.  If it is “S0100” or “S0101” or “S0102”, and if it is transferred back from v71 to v80 it will be set to “S0100” as shown above.

B4.6.2 Product

Element to group Product related information.

<b>Element Name v71</b>	<b>ProductStatus</b>
<b>Element Name v80</b>	<b>Product</b>
Type v71	Token
Type v80	Element with attributes and child elements
Length v71	1-20 chars
Format v71	Text field. Values according to Fact Sheet “ <i>EECS Scheme Members and EECS Products</i> ”.
Occurrence	1 or more (per Certificates element)
Structure v71	Product Status field comprises two indications:  Whether the Certificate is a Guarantee of Origin or not – in the latter case, it is a Non-Governmental Certificate (NGC);  Where the Certificate conforms to an Independent Criteria Scheme (ICS), the relevant Independent Certification Schemes (as defined in Fact Sheet

	“EECS Scheme members and EECS Products”), if any, under which the Certificate was Issued.
Structure v80	<p>Product with attributes defining the name of the Product, and its legal status.          Product has child elements to further describe the Product. Each child element is described separately later in the document:</p> <ul style="list-style-type: none"> <li>• Purpose</li> <li>• CompetentAuthority (required when the legalStatus-attribute is “LC”)</li> <li>• ProductType</li> </ul> <p>Note: Certificate may represent several Products and this logic can keep together the information related to a specific Product.</p>
<b>Attribute v80</b>	<b>name</b>
Type	Token
Length	1-20
Occurrence	Mandatory
Format	“EECS:GO” or “ICS:EECS Disclosure” or other Product name defined in FS17: EECS Scheme Members and EECS Products
<b>Attribute v80</b>	<b>legalStatus</b>
Type	Token
Length	1-20
Occurrence	Mandatory
Format	<p>One of below:</p> <ul style="list-style-type: none"> <li>• “LC”, meaning Legal Certificate</li> <li>• “NGC”, meaning Non-Governmental Certificate</li> </ul>
Example v71	<p>GO:          &lt;r:ProductStatus&gt;GO&lt;/r:ProductStatus&gt;          GO with an ICS:          &lt;r:ProductStatus&gt;GO&lt;/r:ProductStatus&gt;          &lt;r:ProductStatus&gt;ICS:XXXX&lt;/r:ProductStatus&gt;          ICS:          &lt;r:ProductStatus&gt;ICS:XXXX&lt;/r:ProductStatus&gt;</p>
Example v80	<p>GO:          &lt;r:Product name=“EECS:GO” legalStatus=“LC”&gt;            &lt;r:Purpose&gt;Disclosure&lt;/r:Purpose&gt;            &lt;r:CompetentAuthority&gt;CA01          &lt;/r:CompetentAuthority&gt;            &lt;r:ProductType          type=“driver”&gt;Source&lt;/r:ProductType&gt;</p>

	<pre>&lt;r:ProductType type="driver"&gt;Technology&lt;/r:ProductType&gt; &lt;/r:Product&gt;  ICS being non-governmental certificate: &lt;r:Product name="ICS:XXX" legalStatus="NGC"&gt;   &lt;r:Purpose&gt;Disclosure&lt;/r:Purpose&gt;   &lt;r:ProductType type ="XX"&gt;AAA&lt;/r:ProductType&gt;   &lt;r:ProductType type ="XX"&gt;BBB&lt;/r:ProductType&gt;   &lt;r:ProductType type ="YY"&gt;CCC&lt;/r:ProductType&gt; &lt;/r:Product&gt;</pre>
<b>Transformation rules</b>	
from v71 to v80	<p>ProductStatuses will be divided to Products and Labels:</p> <p>GO will be EECS:GO: &lt;r:Product name="EECS:GO" legalStatus="LC"&gt;</p> <p>ICS:EECS Disclosure: &lt;r:Product name="ICS:EECS Disclosure" legalStatus="NGC"&gt;</p> <p>The other "ICS:"s will become as Labels.</p>
from v80 to v71	<p>Only possible if the Product is EECS:GO or ICS:EECS Disclosure and if there is only one CompetentAuthority, otherwise export blocked.</p>

(a) Purpose

The Purpose for which the certificates have been issued.

Element Name	Purpose
Type	Token
Length	1-20
Format	Text field.
Occurrence	1 or more (per Certificates element)
Structure	Not applicable
Unit	Not applicable
Example v71	<Purpose>Disclosure</Purpose>
Example v80	<Purpose>Disclosure</Purpose> <Purpose>Support</Purpose>
Business Rules v71	Indicates the purpose of the certificate. Allowed value:

	<p>One of below:</p> <ul style="list-style-type: none"> <li>• Disclosure</li> </ul>
Business Rules v80	<p>The Purpose or Purposes for which the Certificate has been issued. Purpose(s) must be within the Purposes defined for the Product for which the certificate is being issued.</p> <p>One or more of below:</p> <ul style="list-style-type: none"> <li>• Disclosure</li> <li>• Support</li> <li>• Target</li> </ul>
<b>Transformation rules</b>	
from v71 to v80	No change
from v80 to v71	<p>Disclosure: No change</p> <p>Support: Transformation not possible -&gt; export blocked</p> <p>Target: Transformation not possible -&gt; export blocked</p>

(b) Competent Authority ID

The ID of the Competent Authority responsible for the EECS Product of the certificates being transferred.

Element Name	CompetentAuthority
Type	Token
Length	4
Format	XXNN
Occurrence v71	1 (per Certificates element)
Occurrence v80	0 or more (per Product element). If the legalStatus attribute is "LC", then at least one Competent Authority is mandatory.
Structure	Country code + 2-digit See Fact sheet 4 "Member & Competent Authority Codes" for possible values
Example	<p>&lt;CompetentAuthority&gt;NO01&lt;/CompetentAuthority&gt;</p> <p>&lt;CompetentAuthority&gt;NO02&lt;/CompetentAuthority&gt;</p>
<b>Transformation rules</b>	
from v71 to v80	No change
from v80 to v71	Only possible if there is one CompetentAuthority, otherwise export blocked

(c) Product Type

Element for describing Product.

<b>Element Name</b>	<b>ProductType</b>
Type	Token
Length	1-20
Format v71	Text field. Values: <ul style="list-style-type: none"> <li>• Source</li> <li>• Technology</li> </ul> <p>The value Technology means that the certificate was issued for electricity production from High Efficient Cogeneration, as defined by the Energy Efficiency Directive 2012-27. This value of the ProductType (Technology) is only allowed to be used for High Efficient Cogeneration.</p>
Format v80	Element with attribute
Occurrence v71	1 or more (per Certificates element)
Occurrence v80	1 or more (per Product element)
<b>Attribute v80</b>	<b>type</b>
Type	String
Length	1-20
Description	Showing the type of the information, which the element describes. Time to time there might added more types.
Occurrence	Mandatory
Format	One of below: <ul style="list-style-type: none"> <li>• driver</li> <li>• targetType</li> <li>• targetScheme</li> </ul>
Example v71	<code>&lt;r:ProductType&gt;Source&lt;/r:ProductType&gt;&lt;r:ProductType&gt;Technology&lt;/r:ProductType&gt;</code>
Example v80	<code>&lt;r:ProductType type="driver"&gt;Source&lt;/r:ProductType&gt;&lt;r:ProductType type="driver"&gt;Technology&lt;/r:ProductType&gt;</code>
Business Rules v80	When type-attribute is: <ul style="list-style-type: none"> <li>• “driver”: where the Certificate is a Guarantee of Origin, or Support Certificate, whether it is issued driven by the energy source for the Output to which it relates and/or the technology type used in producing such Output. Possible values:</li> </ul>

	<ul style="list-style-type: none"> <li>○ Source and/or</li> <li>○ Technology</li> <li>• “typeOfTarget”: where the Certificate is a Target Certificate, the type of Target it relates to</li> <li>• “targetScheme”: where the Certificate is a Target Certificate, a reference to the relevant target accounting scheme</li> </ul>
<b>Transformation rules</b>	
from v71 to v80	Setting the type-attribute to “driver”
from v80 to v71	Only possible if the type-attribute is “driver”

#### B4.6.3 Production Device ID

The ID of the Production Device for which the certificates being transferred were issued.

Element Name	ProductionDeviceID
Type	Long
Length	Fixed length 18 for GS1
Format	Depends on setting of cS attribute
Occurrence	1 (per Certificates element)
Structure	See section A2.4
Unit	Not applicable
Example	506003453000000275
<b>Attribute</b>	<b>cS</b>
Type	String
Format	One of: ‘eecs’, ‘GS1’ or other encodings to be agreed from time to time.  Format described in: A2.4 Coding of Production Devices
Default	GS1
Structure	Not applicable

#### B4.6.4 Production Device Name

Name of the originating Production Device.

Element Name	ProductionDeviceName
Type	Token
Length	1-255
Format	Text field

Occurrence	0 or 1 (per Certificates element)
Structure	Free text
Unit	Not applicable
Example	

#### B4.6.5 Date Operational

The date on which the Production Device became operational in accordance with national legislation.

Element Name	DateOperational
Type	Date
Length	Not applicable
Format	Date is according to local time, not UTC Minimum value 1800-01-01
Occurrence	1 (per Certificates element)
Structure	YYYY-MM-DD
Unit	Date
Example	2002-10-15

#### B4.6.6 Capacity

Each Certificate requires at least one Capacity -element.

Element Name	Capacity
Type	Element with child elements
Occurrence	1 (per Certificates element)
Structure	<r:Capacity> <r:ElectricalCapacity>10.999</r:ElectricalCapacity> <r:ThermalCapacity>20.999</r:ThermalCapacity> </r:Capacity>
Transformation rules	
from v71 to v80	No change
from v80 to v71	Transformation possible only if the GasProductionCapacity is not presented.

##### (a) Electrical Capacity

Production Device Electrical Capacity in kW.

Element Name	ElectricalCapacity
Type	Decimal
Type v80	Decimal(11,3)
Occurrence	1 (per Capacity element)



	Only applicable for EnergyCarrier “Electricity”.
Structure v71	Up to a total of 11 characters, including the decimal point and up to a maximum of 3 decimal places
Structure v80	Always 3 decimals Maximum value 99999999.999 Minimum value 0.001
Unit	kW
Example	<r:ElectricalCapacity>78.050</r:ElectricalCapacity>
<b>Transformation rules</b>	
from v71 to v80	Possible additional decimals will be added. E.g. 10.1 will become as 10.100 If capacity is below 0.001, the export is blocked.
from v80 to v71	Decimals after 3 will be lost.

(b) Mechanical Capacity

Production Device Mechanical Capacity in kW.

Element Name	MechanicalCapacity
Type v71	Decimal
Type v80	Decimal(11,3)
Occurrence	0 or 1 (per Capacity element)
Structure v71	Up to a total of 11 characters, including the decimal point and up to a maximum of 3 decimal places
Structure v80	Always 3 decimals Maximum value 99999999.999 Minimum value 0.001
Unit	kW
Example	<r:MechanicalCapacity>10.785</r:MechanicalCapacity>
<b>Transformation rules</b>	
from v71 to v80	Possible additional decimals will be added. E.g. 10.1 will become as 10.100 If capacity is below 0.001, the export is blocked.
from v80 to v71	Decimals after 3 will be lost.

(c) Thermal Capacity

Production Device Thermal Capacity in kW.

Element Name	ThermalCapacity
Type	Decimal
Type v80	Decimal(11,3)
Length	0-11
Occurrence v71	0 or 1 (per Capacity element) Mandatory for High Efficiency Cogeneration Certificates (when ProductType has value Technology)
Occurrence v80	0 or 1 (per Capacity element) Mandatory for High Efficiency Cogeneration Certificates, when HECCriteriaMet-attribute has value "true" Only applicable for EnergyCarrier "Electricity"
Structure v71	Up to a total of 11 characters, including the decimal point and up to a maximum of 3 decimal places
Structure v80	Always 3 decimals Maximum value 99999999.999 Minimum value 0.001
Unit	kW
Example	<r:ThermalCapacity>185.200</r:ThermalCapacity>
<b>Transformation rules</b>	
from v71 to v80	Possible additional decimals will be added. E.g. 10.1 will become as 10.100. If capacity is below 0.001, the export is blocked.
from v80 to v71	Decimals after 3 will be lost.

(d) Gas Production Capacity

Production Device Gas Production Capacity.

Element Name v80	GasProductionCapacity
Type	Decimal
Type v80	Decimal(11,3)
Occurrence	0 or 1 (per Capacity element) Only applicable and mandatory for EnergyCarriers "EnergyGas" and "Hydrogen".
Structure	Always 3 decimals Maximum value 99999999.999 Minimum value 0.001

Unit	kW
Example	<r:GasProductionCapacity>78.050</r:GasProductionCapacity>
from v71 to v80	No change
from v80 to v71	Export will be blocked.

#### B4.6.7 Module

Module description and date-operational, in case the Production Device consists of separate modules (e.g. 1) where there is a plant which upgrades the gas quality, the date on which the plant(s) that produced the raw gas became operational and its/their capacity. 2) where the Production Device has added new capacity later: the capacity and date operational of the new module).

Element Name v80	Module
Type	Element with child elements
Format	Not applicable
Occurrence	0 or 1 (per Certificates element)
Structure	<pre>&lt;r:Module&gt;   &lt;r:ModuleCapacity&gt;10.999&lt;/r:ModuleCapacity&gt;   &lt;r:ModuleDateOperational&gt;2022-01-01 &lt;/r:ModuleDateOperational&gt;   &lt;r:ModuleDescription&gt;Element1 &lt;/r:ModuleDescription&gt; &lt;/r:Module&gt;</pre>
Transformation rules	
from v71 to v80	No change
from v80 to v71	Information will be lost

#### (a) Module Capacity

Element Name v80	ModuleCapacity
Type	Decimal(11,3)
Occurrence	1 (per Module element)
Structure	Always 3 decimals. Maximum value 99999999.999 Minimum value 0.001 Type of capacity is the same as the overall capacity element.
Unit	kW
Example	185.200

<b>Transformation rules</b>	
from v71 to v80	No change
from v80 to v71	Information will be lost

(b) Module Date Operational

The date on which the relevant production module became operational in accordance with national legislation.

<b>Element Name v80</b>	<b>ModuleDateOperational</b>
Type	Date
Length	Not applicable
Format	Minimum value 1800-01-01
Occurrence	0 or 1 (per Module element)
Structure	YYYY-MM-DD
Unit	Date
Example	2002-10-15
<b>Transformation rules</b>	
from v71 to v80	No change
from v80 to v71	Information will be lost

(c) Module Description

Description of Module. Free text description.

<b>Element Name v80</b>	<b>ModuleDescription</b>
Type	String
Length	1-255
Format	Free text
Occurrence	0 or 1 (per Module element)
Example	
<b>Transformation rules</b>	
from v71 to v80	No change
from v80 to v71	Information will be lost

B4.6.8 Production Technology

Technology of the Originating Production Device.

<b>Element Name v71</b>	<b>TypeOfInstallation</b>
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<b>Element Name v80</b>	<b>ProductionTechnology</b>
Type	Token
Length	1-20
Format	Depends on setting of cS attribute cS='eecs' the format is ANNNNNN A is a letter and N is a number.
Occurrence	1 (per Certificates element)
Structure	One of the Technology codes from EECS Rules Fact Sheet 5 "Types of Energy Inputs and Technologies".  Combination of <b>Production Technology</b> and "Energy Source" for a Certificate must be a valid combination from EECS Rules Fact Sheet 5.
Example	T030200
<b>Attribute</b>	cS
Type	String
Format	One of: 'eecs' or other encodings to be agreed from time to time.
Default	'eecs'

#### B4.6.9 Energy Source and Advanced Biomass Feedstock

Energy Source from which the Output was produced.

<b>Element Name</b>	<b>EnergySource</b>
Type	Token
Length	1-20
Format	Depends on setting of cS attribute If cS='eecs' it is FNNNNNNN
Occurrence	1 (per Certificates element)
Structure	One of the Fuel & Heat codes from EECS Rules Fact Sheet 5 " <i>Types of Energy Inputs and Technologies</i> ".  Combination of "Production Technology" and "Energy Source" for a Certificate must be a valid combination in EECS Rules Fact Sheet 5.
Example	F01050203
<b>Attribute</b>	<b>cS</b>
Type	String

Format	One of: 'eecs' or other encodings to be agreed from time to time.
Default	'eecs'
<b>Attribute v80</b>	<b>advancedBiomassFeedstock</b>
Type	Boolean
Description	Where the Source Type is an energy source of biological origin, an indication whether or not this energy source originates from an Advanced Biomass Feedstock, according to the feedstocks listed in Annex IX of the Renewable Energy Directive.
Format	true or false
Occurrence	Optional. Only applicable for Carrier "EnergyGas" and "Hydrogen".
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Export will be blocked if advancedBiomassFeedstock attribute is given.

#### B4.6.10 Source Shares

If Output is produced from a mixture of Inputs, consisting of other than only the Input from the Energy source: in addition to the recorded EnergySource for which the corresponding Certificate was Issued, information on those Inputs, EnergySource, and their share in total energy Input. This share shall be determined in accordance with the Energy Input Factor;

<b>Element Name v80</b>	<b>SourceShares</b>
Type	String
Length	1-255
Format	Free text
Occurrence	0 or 1 (per Certificate element) Only applicable for EnergyCarriers "EnergyGas" and "Hydrogen".
Structure	Not applicable
Example	F01010101: 10%, F01010201: 90%
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Export will be blocked.

#### B4.6.11 Support Flag

Support Flag denoting whether the relevant Production Device and/or its Output have benefited or will benefit from Support.

<b>Element Name v71</b>	<b>EarmarkFlag</b>
<b>Element Name v80</b>	<b>SupportFlag</b>
Type	byte (Schema)
Length	8
Format	Depends on setting of cS attribute
Occurrence	1 (per Certificates element)
Structure	The allowed codes are listed in EECS Rules Fact Sheet 3 (" <i>Types of Public Support</i> ").
Example	1
<b>Attribute</b>	<b>cS</b>
Type	String
Format	One of: 'eecs' or other encodings to be agreed from time to time.
Default	'eecs'

#### B4.6.12 Production Support Description

Description of Production Support Scheme. Free text description based on values in EECS Rules Fact Sheet ("*Types of Public Support*").

<b>Element Name</b>	<b>ProductionSupportDescription</b>
Type	String
Length	1-1024
Format	Free text
Occurrence	0 or 1 (per Certificates element)
Example	

#### B4.6.13 Investment Support Description

Description of Investment Support Scheme.

<b>Element Name</b>	<b>InvestmentSupportDescription</b>
Type	String
Length	1-1024
Format	Free text
Occurrence	0 or 1 (per Certificates element)
Example	

#### B4.6.14 Production Device Location

ProductionDeviceLocation element is required for a Certificates element, and it should contain element(s) Coordinates and/or Address which are described below.

(a) Coordinates

Location of the Production Device described with geographical coordinates. This element has no data associated with it. The coordinates and the code are defined by three mandatory attributes.

<b>Element Name v71</b>	<b>ProductionDeviceCoordinates</b>
<b>Element Name v80</b>	<b>Coordinates</b>
Type	Element with 3 attributes
Occurrence	0 or 1 (per ProductionDeviceLocation element) Note: either Coordinates and/or Address is required
Structure	See below the definition of the needed attributes
Example v71	<r:ProductionDeviceCoordinates Longitude="448 92 N" Latitude="115 778 E" CoordinateCode="WGS-84"/>
Example v80	<r:Coordinates Longitude="448 92 N" Latitude="115 778 E" CoordinateCode="WGS-84"/>
<b>Attribute</b>	<b>Longitude</b>
Type	Token
Length	1-20
Format	Depends on CoordinateCode.
Structure	Required
<b>Attribute</b>	<b>Latitude</b>
Type	Token
Length	1-20
Format	Depends on Coordinate Code
Structure	Required
<b>Attribute</b>	<b>CoordinateCode</b>
Type	Token
Length	1-20
Format	Coordinate code in accordance with the EECS Rules Fact Sheet 16 " <i>Geographical Coordinates</i> ".
Structure	Required

(b) Production Device Address



Location of the Production Device described with country, city, and postal code. This element has no data associated with it. The address is defined by three mandatory attributes.

<b>Element Name v71</b>	<b>ProductionDeviceAddress</b>
<b>Element Name v80</b>	<b>Address</b>
Type	Element with 3 attributes
Occurrence	0 or 1 (per ProductionDeviceLocation element) Note: either Coordinates and/or Address is required
Structure	See below the definition of the needed attributes
Example v71	<r:ProductionDeviceAddress PostCode="NO2342" Country="NO" City="Hønefoss"/>
Example v80	<r:Address PostCode="NO2342" Country="NO" City="Hønefoss"/>
<b>Attribute</b>	<b>Country</b>
Type	Token
Length	2
Format	Text field. 2 characters. Code is according to the ISO 3166-1 country code list
Structure	Required
Example	FI
<b>Attribute</b>	<b>City</b>
Type	Token
Length	1-150
Format	Text field
Structure	Required 1-150 characters
<b>Attribute</b>	<b>PostCode</b>
Type	Token
Length	1-10
Format	-
Structure	Required 1-10 characters

#### B4.6.15 Dissemination level

The dissemination level of the Output for which an EECS Certificate is issued, in accordance with EECS Rules section C3.5.4. (t).

<b>Element Name v81</b>	<b>DisseminationLevel</b>
Type	Token

Length	1-2
Occurrence	1 (per Certificates element).
Structure	Refer to EECS Fact Sheet 20. Note that the DisseminationLevel code must match to the EnergyCarrier as given in the Fact Sheet 20.
Unit	Not applicable.
<b>Transformation rules</b>	
from v71 to v80	“8” (Unspecified).
from v80 to v71	Information will be lost.
Example	<r:DisseminationLevel>8</r:DisseminationLevel>

#### B4.6.16 Cogeneration

Element containing fields specific to Cogeneration

<b>Element Name v71</b>	<b>PrimaryEnergySavings</b>
<b>Element Name v80</b>	<b>Cogeneration</b>
Type v71	Element child elements
Type v80	Element with an attribute and child elements
Occurrence	0-1 (per Certificate element) Only applicable for EnergyCarrier “Electricity”
Business rule v71	For Certificates where the ProductType is Technology: whether the energy unit has met the primary energy savings criteria of the Directive on Energy Efficiency 2012/27/EU Annex II. Where these primary energy savings criteria for High-Efficiency Cogeneration (HEC) are met, this Certificate can be considered to be a High-Efficiency Cogeneration Certificate, and the related mandatory attributes are to be included in the Certificate.
Business rule v80	For Certificates where the HECCriteriaMet-attribute is “true” and ProductType is “Technology”: whether the energy unit has met the primary energy savings criteria of the Directive on Energy Efficiency 2012/27/EU Annex II. Where these primary energy savings criteria for High-Efficiency Cogeneration (HEC) are met, this Certificate can be considered to be a High-Efficiency Cogeneration Certificate, and the related mandatory attributes are to be included in the Certificate.
<b>Attribute v80</b>	<b>HECCriteriaMet</b>
Type	Boolean
Occurrence	Required

Structure	<p>Allowed values:</p> <ul style="list-style-type: none"> <li>• true</li> <li>• false</li> </ul>
Business rule	<p><b>true:</b> For Certificates where the ProductType is Technology: whether the energy unit has met the primary energy savings criteria of the Directive on Energy Efficiency 2012/27/EU Annex II. The below fields are compulsory:</p> <ul style="list-style-type: none"> <li>• UseOfHeat</li> <li>• PercentagePrimaryEnergySaved</li> <li>• AmountPrimaryEnergySaved</li> <li>• OverallPrimaryEnergySavings</li> <li>• UsefulCogenerationHeat</li> <li>• ElectricalEfficiency</li> <li>• ThermalEfficiency</li> <li>• CalorificValue</li> <li>• ThermalCapacity</li> <li>• ProductType driver =Technology</li> </ul> <p><b>false:</b> the above criteria not met.</p>
Example v71	<r:PrimaryEnergySavings>...</r:PrimaryEnergySavings>
Example v80	<r:Cogeneration HECCriteriaMet="true">...</r:Cogeneration>
<b>Transformation rules</b>	
from v71 to v80	<ul style="list-style-type: none"> <li>• If ProductType includes Technology, then in v80: ProductType includes Technology and HECCriteriaMet = "true"</li> </ul>
from v80 to v71	<ul style="list-style-type: none"> <li>• If in v80 HECCriteriaMet has value "true" and ProductType includes Technology, then in v71 ProductType includes Technology.</li> <li>• If in v80 HECCriteriaMet has value "false" and ProductType includes Source, then export is being processed, but without ProductType Technogy.</li> <li>• If in v80 HECCriteriaMet has value "false" and ProductType does not include "Source", then export is being blocked.</li> </ul>

(a) Use of Heat

Use of heat being one of the values identified in Fact Sheet 11 "CHP Codes" under "Use of Heat";

Element Name	UseOfHeat
Type	Token
Length	1-20
Format	Text field

Occurrence v71	0 or 1 (per Certificates element). Mandatory when certificate includes ProductType=Technology.
Occurrence v80	0 or 1 (per Cogeneration element). Mandatory when HECCriteriaMet has value "true"  Only applicable for EnergyCarrier "Electricity"
Default	-
Structure	One of the values identified in the EECS Rules Fact Sheet 11 "Cogeneration Codes" under "Use of Heat"
Example	'a'

(b) Percentage Primary Energy Saved

The primary energy saved expressed as a percentage according to Annex II of the Energy Efficiency Directive

Element Name	PercentagePrimaryEnergySaved
Type v71	Non-negative integer (min value 0)
Type v80	Decimal(4,1)  Always 1 decimal Maximum value 100.0 Minimum value 0.1
Occurrence v71	1 (per PrimaryEnergySavings element). Mandatory when certificate includes ProductType=Technology.
Occurrence v80	0 or 1 (per Cogeneration element). Mandatory when HECCriteriaMet has value "true"  Only applicable for EnergyCarrier "Electricity"
Unit	%
Example v71	98
Example v80	98,0
<b>Transformation rules</b>	
from v71 to v80	Add one decimal
from v80 to v71	Decimal will be lost

(c) Amount Primary Energy Saved

The actual amount of primary energy saved expressed in mega joules per MWh

Element Name	AmountPrimaryEnergySaved
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Typev71	Positive integer Minimum value 1
Type v80	Decimal(11,3) Always 3 decimals Maximum value 99999999.999 Minimum value 0.001
Occurrence v71	1 (per PrimaryEnergySavings element). Mandatory when certificate includes ProductType=Technology.
Occurrence v80	0 or 1 (per Cogeneration element). Mandatory when HECCriteriaMet has value "true" Only applicable for EnergyCarrier "Electricity"
Unit	MJ/MWh
Example	10.200
<b>Transformation rules</b>	
from v71 to v80	No change
from v80 to v71	Possible additional decimals will be added. E.g. 10 will come as 10.000

(d) Overall Primary Energy Savings

The overall primary energy savings expressed as a percentage based on the total energy input and output flows of a Cogeneration unit

<b>Element Name</b>	<b>OverallPrimaryEnergySavings</b>
Typev71	Positive integer
Type v80	Decimal(4,1) Always 1 decimal Maximum value 100.0 Minimum value 0.1
Occurrence v71	1 (per PrimaryEnergySavings element). Mandatory when certificate includes ProductType=Technology.
Occurrence v80	0 or 1 (per Cogeneration element). Mandatory when HECCriteriaMet has value "true" Only applicable for EnergyCarrier "Electricity"
Unit	%
Example v71	17
Example v80	17.0
<b>Transformation rules</b>	
from v71 to v80	Add one decimal

from v80 to v71	Decimal will be lost
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(e) Useful Cogeneration Heat

Useful Heat production from Cogeneration correlating to 1 MWh of High-Efficiency Cogeneration electricity production.

<b>Element Name v71</b>	<b>UsefulCogenHeat</b>
<b>Element Name v80</b>	<b>UsefulHeat</b>
Type v71	Decimal
Type v80	Decimal (11,3) Always 3 decimals Maximum value 99999999.999 Minimum value 0.001
Occurrence v71	0 or 1 (per Certificates element). Mandatory when certificate includes ProductType=Technology.
Occurrence v80	0 or 1 (per Cogeneration element). Mandatory when HECCriteriaMet has value "true" Only applicable for EnergyCarrier "Electricity"
Unit	GJ/MWh
Example	10.030
<b>Transformation rules</b>	
from v71 to v80	Add possible needed decimals into the end. If there are more than 3 decimals, round it to 3 decimals.
from v80 to v71	-

B4.6.17 Electrical Efficiency

The electrical efficiency of a production device expressed as a percentage.

<b>Element Name</b>	<b>ElectricalEfficiency</b>
Type	Positive integer Minimum value 1
Type v80	Decimal(4,1) Always 1 decimal Maximum value 100.0 Minimum value 0.1
Occurrence v71	0 or 1 (per Certificates element). Mandatory when certificate includes ProductType=Technology.

Occurrence v80	0 or 1 (per Certificates element). Mandatory when HECCriteriaMet has value "true". Only applicable for EnergyCarrier "Electricity"
Unit	%
Example v71	67
Example v80	67.0
<b>Transformation rules</b>	
from v71 to v80	Add one decimal
from v80 to v71	Round to the nearest Integer (decimal will be lost)

#### B4.6.18 Thermal Efficiency

The thermal efficiency of a production device expressed as a percentage.

<b>Element Name</b>	<b>ThermalEfficiency</b>
Type v71	Positive integer Minimum value 1
Type v80	Decimal(4,1) Always 1 decimal Maximum value 100.0 Minimum value 0.1
Occurrence v71	0 or 1 (per Certificates element). Mandatory when certificate includes ProductType=Technology.
Occurrence v80	0 or 1 (per Certificates element). Mandatory when HECCriteriaMet has value "true". Only applicable for EnergyCarrier "Electricity"
Unit	%
Example	67
Example v80	67.0
<b>Transformation rules</b>	
from v71 to v80	Add one decimal
from v80 to v71	Round to the nearest Integer (decimal will be lost)

#### B4.6.19 Gas

This element and its child elements are applicable only for Energy Carriers Energy Gas and Hydrogen. For other Energy Carriers those are not applicable.

<b>Element Name v80</b>	<b>Gas</b>
Type	Element with an attribute and child elements
Occurrence	0 or 1 (per Certificates element) Only applicable and <b>required</b> for certificates where EnergyCarrier is “EnergyGas” or “Hydrogen”
<b>Attribute</b>	<b>type</b>
Type	Token
Length	5
Occurrence	Required
Description	Type of Gas, referring to the chemical composition of the produced Gas.
Format	Code from FactSheet “Type of Gas”
Example	<r:Gas type="XNNNN"> <r:CompositionPurity> XNNNN</r:CompositionPurity> <r:GasCompositionCriteria>ZNNNN </r:GasCompositionCriteria> <r:GasUsage>YNNNN</r:GasUsage></r:Gas>
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Export will be blocked.

(a) Composition Purity

An indication of the purity of the composition of the Gas that constitutes the Output for which the EECS Certificate is issued.

<b>Element Name v80</b>	<b>CompositionPurity</b>
Type	Token
Length	1-4
Format	From Fact sheet “Type of Gas”
Occurrence	0 or 1 (per Gas element)
Unit	From Fact sheet “Type of Gas”, mostly % vol
Business Rules	It can be given optionally for Energy Carriers “EnergyGas” and “Hydrogen”. For other Energy Carriers it is not applicable.
Example	XNNNN
<b>Transformation rules</b>	



from v71 to v80	-
from v80 to v71	Export will be blocked.

(b) Gas Composition Criteria Reference

Where the Output complies with specific criteria relating to the physical composition of the produced gas, a reference to the relevant criteria, as mentioned on the EECS Fact Sheet Type of Gas.

Element Name v80	GasCompositionCriteria
Type	Token
Length	2-5
Format	From Fact Sheet "Type of Gas"
Occurrence	0 or 1 (per Gas element)
Business Rules	It can be given optionally for Energy Carriers "EnergyGas" and "Hydrogen". For other Energy Carriers it is not applicable.
Example	XNNNN
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Export will be blocked.

(c) Gas Usage

End-use of the Gas, as set out in EECS Rules Fact Sheet "Use of Gas";

Element Name v80	GasUsage
Type	Token
Length	1-5
Occurrence	0 or 1 (per Gas element)
Structure	Code from EECS Rules Fact Sheet "Use of Gas".
Example	<r:GasUsage>a</r:GasUsage>
Business Rules	It can be given optionally for Energy Carriers "EnergyGas" and "Hydrogen". For other Energy Carriers it is not applicable.
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Export will be blocked.

B4.6.20 Calorific Value

For electricity certificates (Energy Carrier being "Electricity"), the Calorific Value relates to the Input fed into the Production Device. For gaseous certificates, Energy

Carrier being “EnergyGas” or “Hydrogen”, the Calorific Value relates to the Output for which EECS Certificates are issued.

<b>Element Name (v71)</b>	<b>LowerCalorificValue</b>
<b>Element Name (v80)</b>	<b>CalorificValue</b>
Type (v71)	Positive integer Minimum value 1
Type (v80)	Decimal (11,3) Always 3 decimals Maximum value 99999999.999 Minimum value 0.001
Occurrence (v71)	0 or 1 (per Certificates element). Mandatory for High Efficient Cogeneration certificate (ProductType includes “Technology”).
Occurrence (v80)	0 or 1 (per Certificates element). Mandatory for High Efficient Cogeneration certificate (HECCriteriaMet= “true”) the attribute “type” must be “lower” and numeric value for the element must be filled in.  For Energy Carriers “EnergyGas” and “Hydrogen” the “type”- attribute is mandatory, but the element value is optional to fill in.
Unit v71	MJ/kg of fuel, MJ/m <sup>3</sup> of gaseous fuel or MJ/l of liquid fuels
Example v71	<LowerCalorificValue>11</LowerCalorificValue>
Example v80	For HEC certificate: <CalorificValue type=“lower” unit=“MJ/kg”>11.120</CalorificValue>  E.g. for EnergyGas when there is no value: <CalorificValue type=“lower”/>
<b>Attribute v80</b>	<b>type</b>
Type	String
Occurrence	Required
Format	One of: <ul style="list-style-type: none"> <li>• lower</li> <li>• higher</li> </ul> <p>Note: when the certificate is a High Efficient Cogeneration certificate (ProductType contains “Technology” and HECCriteriaMet= “true”), then the attribute type should be “lower”.</p>
<b>Attribute</b>	<b>unit</b>

Type	Token
Length	1-20
Format	One of below: <ul style="list-style-type: none"> <li>• MJ/kg</li> <li>• MJ/m<sup>3</sup></li> <li>• MJ/l</li> <li>• Unspecified (only for Transformation use)</li> </ul> or other unit approved time to time.
Default	<ul style="list-style-type: none"> <li>• MJ/kg</li> </ul>
<b>Transformation rules</b>	
from v71 to v80	The integer converted to decimal. The type-attribute will have value "lower". The unit-attribute will have value "Unspecified".
from v80 to v71	The decimals will be lost. The unit-attribute will be lost. The transformation possible only if the type-attribute has value "lower", and the value is minimum of 1, otherwise export blocked.

**B4.6.21 GHG emissions**

Greenhouse gas emissions intensity of the output.

<b>Element Name v71</b>	<b>CO2Emissions</b>
<b>Element Name v80</b>	<b>GHGEmissions</b>
Type v71	Element with child elements
Type v80	Element with an attribute and child elements
Occurrence v71	0 or 1 (per Certificates element) Mandatory when the EnergySource parameters starts with F02, meaning that the energy was produced with fossil energy sources. Mandatory for High Efficiency Cogeneration Certificates (when ProductType has value Technology)
Occurrence v80	0 or 1 (per Certificates element)
<b>Attribute v80</b>	<b>GHGSavingsCriteriaMet</b>
Type	Boolean
Occurrence	Optional
Format	true or false, in relation with article 29 of the Renewable Energy Directive
Example v71	<r:CO2Emissions> <r:CO2EmissionProduced>111

	<pre>&lt;/r:CO2EmissionProduced&gt; &lt;r:AbsoluteCO2EmissionSaved&gt;222 &lt;/r:AbsoluteCO2EmissionSaved&gt; &lt;/r:CO2Emissions&gt;</pre>
Example v80	<pre>&lt;r:GHGEmissions GHGSavingsCriteriaMet="true"&gt; &lt;r:GHGEmissionProduced calculationMethod="E010000000"&gt;234.000&lt;/r:GHG EmissionProduced&gt;&lt;r:AbsoluteGHGEmissionSaved calculationMethod="E010000000"&gt;123.000&lt;/r:Absol uteGHGEmissionSaved&gt;&lt;/r:GHGEmissions&gt;</pre> <p>Example when the minimum information given:  <pre>&lt;r:GHGEmissions&gt;&lt;r:GHGEmissionProduced calculationMethod="E010000000"&gt;234.000&lt;/r:GHGE missionProduced&gt;&lt;/r:GHGEmissions&gt;</pre></p>
<b>Transformation rules</b>	
from v71 to v80	In the transformation, a) GHGSavingsCriteriaMet will be empty. b) calculationMethod="E010000000" (CO2)
from v80 to v71	GHGSavingsCriteriaMet attribute will be lost. Export will be blocked if the Energysource is Fossil or certificate is HEC certificate, and <b>GHGEmissions is missing</b> as it is mandatory in v71 for such certificates.

(a) GHG Emission Produced

The GHG emissions produced

<b>Element Name v71</b>	<b>CO2EmissionProduced</b>
<b>Element Name v80</b>	<b>GHGEmissionProduced</b>
Type v71	Non-negative integer Minimum value 0
Type v80	Decimal(11,3) Always 3 decimals Minimum value -99999999.999 Maximum value 99999999.999
Occurrence v71	1 (per CO2Emissions element). Mandatory when the EnergySource starts with F02, meaning that the energy was produced with fossil energy source.
Occurrence v80	0 or 1 (per GHGEmissions element)
<b>Attribute</b>	<b>calculationMethod</b>
Type	Token
Length	11
Occurrence	Required

Format	ENNNNNNNNNN, where every N is a natural number between 0 and 9, in accordance with EECS Rules Fact sheet 24 “Methodology GHG Methodology Reference”
<b>Attribute</b>	<b>unit</b>
Type	Token
Length	1-20
Format	Kg CO2eq/MWh or other unit approved from time to time.
Default	Kg CO2eq/MWh
<b>Transformation rules</b>	
from v71 to v80	The integer converted to decimal. In the transformation the calculationMethod will have default information: “E0100000000”.
from v80 to v71	The value will be rounded to nearest integer. The calculationMethod-attribute value will be lost. If unit-attribute is other than empty or “Kg CO2eq/MWh”, the export will be blocked. If the value of the element is negative, the export will be blocked. If the value does not exist and when the EnergySource starts with F02, meaning that the energy was produced with fossil energy source the export will be blocked.

(b) Absolute GHG emissions saved

Absolute GHG emissions saved in kilo grams per MWh compared with the best available and economically justifiable technology for separate production of heat and electricity using the same fuels; and which was on the market in the year of construction of the CHP unit, as defined in Annex II(f)(2) of the Energy Efficiency Directive

<b>Element Name v71</b>	<b>AbsoluteCO2EmissionSaved</b>
<b>Element Name v80</b>	<b>AbsoluteGHGEmissionSaved</b>
Type	Non-negative integer Minimum value is 0
Type v80	Decimal(11,3) Always 3 decimals Minimum value 0.000 Maximum value 99999999.999
Occurrence (v71)	0 or 1 (per CO2Emissions element)..Mandatory for Cogeneration certificates when ProductType contains “Technology”.
Occurrence (v80)	0 or 1 (per GHGEmissions element).
Unit v71	Kg/MWh
<b>Attribute v80</b>	<b>calculationMethod</b>

Type	Token
Length	11
Occurrence	Required
Format	ENNNNNNNNNN, where every N is a natural number between 0 and 9, in accordance with the Code structure from EECS Rules Fact sheet 24 "Methodology GHG Methodology Reference"
<b>Attribute v80</b>	<b>unit</b>
Type	Token
Length	1-20
Format	Kg/MWh or other unit approved time to time.
Default	Kg/MWh
<b>Transformation rules</b>	
from v71 to v80	The integer converted to decimal. In the transformation the calculationMethod will have specific code from Fact Sheet 24: E0100000000).
from v80 to v71	The decimals will be lost. calculationMethod-attribute value will be lost. If unit-attribute is other than empty or "Kg/MWh", the export will be blocked.

**B4.6.22 Radioactive waste produced**

Where the source type relates to nuclear energy, a quantification of the radioactive waste produced per MWh of Output to which that EECS Certificate relates, and it may provide a reference to the methodology used for this quantification.

<b>Element Name</b>	<b>RadioactiveWasteProduced</b>
Type v71	Positive integer Minimum value 1
Type v80	Decimal(11,3) Always 3 decimals  Minimum value 0.000 Maximum value 99999999.999
Occurrence v71	0 or 1 (per Certificates element). Mandatory when the Energy Source value starts with F03, meaning that the certificate is issued for energy production from nuclear energy sources
Occurrence v80	0 or 1 (per Certificates element).
Unit	g/MWh
<b>Attribute v80</b>	<b>calculationMethod</b>
Type	Token
Occurrence	Optional
Length	1-9
Format	Code from Fact Sheet Methodologies for environmental impact of production"

Example v71	4
Example v80	<r:RadioactiveWasteProduced calculationMethod="XYZ">4.030</r:RadioactiveWasteProduced>
<b>Transformation rules</b>	
from v71 to v80	The integer converted to decimal.
from v80 to v71	The decimals will be lost. calculationMethod-attribute value is lost. Transfers with certificates from Nuclear Energy Source "F03", but without RadioactiveWasteProduced will be blocked.

#### B4.6.23 Sustainability

Element with child elements to describe additional optional sustainability information.

Element Name v80	Sustainability
Type	Element with attributes and child elements
Occurrence	0 or 1 (per Certificates element) Note, in the future there might be several Sustainability elements allowed.
<b>Attribute</b>	<b>sustainabilityCriteriaMet.</b>
Type	Boolean
Occurrence	Optional
<b>Attribute</b>	<b>certificationBody</b>
Type	String
Length	1-20
Format	Free text
Occurrence	Optional
Example	<r:Sustainability sustainabilityCriteriaMet="true" certificationBody=""XX"> ... </r:Sustainability>
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Information will be lost

#### B4.6.24 Sustainability Requirement Reference

A reference to the relevant legislative or other source that sets sustainability requirements

Element Name v80	RequirementReference
Type	String
Length	1-20
Format	Free text
Occurrence	0 or 1 (per Sustainability element)
Example	REDIIart.29
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Information will be lost

#### B4.6.25 Sustainability Scheme

A reference to the relevant sustainability certification scheme(s).

Element Name v80	Scheme
Type	String
Length	1-20
Format	Free text
Occurrence	0 or 1 (per Sustainability element)
Example	<r:Scheme>ISCC</r:Scheme>
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Information will be lost

#### B4.6.26 Sustainability Audit Report

Reference to the relevant reports, certificates or other documents produced by the abovementioned certification body under the abovementioned sustainability certification scheme.

Element Name v80	AuditReport
Type	String
Length	1-255
Format	Free text
Occurrence	0 or 1 (per Sustainability element)
Example	<r:AuditReport>https://example.ex/report.pdf</r:AuditReport>
<b>Transformation rules</b>	



from v71 to v80	-
from v80 to v71	Information will be lost

**B4.6.27 Sustainability Additional Information**

Additional information on sustainability in free text.

<b>Element Name v80</b>	<b>SustainabilityAdditionalInfo</b>
Type	String
Length	1-255
Format	Free text
Occurrence	0 or 1 (per Sustainability element)
Structure	Not applicable
Unit	Not applicable
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Information will be lost

**B4.6.28 Label**

The Label indicates whether the Certificate conforms to an Attribute on a Certificate reflecting that the Output and/or Production Device and/or Input to which a Certificate relates, conforms to a specific set of qualities defined in a Label Scheme, following an agreement between the Authorised Issuing Body and the corresponding Label.

<b>Element Name v80</b>	<b>Label</b>
Type	Token
Length	1-20 chars
Occurrence	0 or more (per Certificates element)
Structure	See EECS Fact Sheet 17 “EECS Scheme Members and Products” for possible values
Example v80	<r:Label>Naturemade</r:Label> <r:Label>GREENENERGY</r:Label >
<b>Transformation rules</b>	
from v71 to v80	The ProductStatuses having “ICS:” in the beginning will be transferred to Labels by removing the “ICS:” – except the ICS:EECS Disclosure which is transferred to a Product.
from v80 to v71	The labels will be transformed to ProductStatuses by adding “ICS:” in the beginning.

**B4.6.29 Additional Information**

Additional information on certificates as free text.

Element Name v80	AdditionalInfo
Type	String
Length	1-255
Format	Free text
Occurrence	0 or 1 (per Certificates element)
Example	
<b>Transformation rules</b>	
from v71 to v80	-
from v80 to v71	Information will be lost

## B5 Account Holders

A parent element for keeping all the individual Account Holder elements. Each Account holder file may have one or more "AccountHolder" elements which are described in the B5.1.1 Account Holder.

Element Name	AccountHolders
Type	Element to hold one or more Account Holder elements
Length	No restrictions
Format	Hold one or more Account Holder child elements
Occurrence	1 (per Account holder file)
Structure	Not applicable
Unit	Not applicable
Example	<pre> &lt;AccountHolders&gt;   &lt;AccountHolder&gt;     &lt;IssuingBodyCode&gt;43&lt;/IssuingBodyCode&gt;     &lt;AccountNumber&gt;43X0EXMP1B&lt;/AccountNumber&gt;     &lt;CompanyName&gt;Company 1&lt;/CompanyName&gt;     &lt;Country&gt;BE&lt;/Country&gt;     &lt;PostCode&gt;01234&lt;/PostCode&gt;     &lt;City&gt;ExampleCity1&lt;/City&gt;     &lt;ValidFrom&gt;2018-01-01&lt;/ValidFrom&gt;     &lt;ValidTo&gt;2099-12-31&lt;/ValidTo&gt;     &lt;VATNumber&gt;BE0000000000001&lt;/VATNumber&gt;     &lt;ModifiedOn&gt;2018-02-23&lt;/ModifiedOn&gt;   &lt;/AccountHolder&gt;   &lt;AccountHolder&gt;     &lt;IssuingBodyCode&gt;43&lt;/IssuingBodyCode&gt;     &lt;AccountNumber&gt;43X0EXMP29&lt;/AccountNumber&gt;     &lt;CompanyName&gt;Company 2&lt;/CompanyName&gt;     &lt;Country&gt;CZ&lt;/Country&gt;     &lt;ValidFrom&gt;2016-01-01&lt;/ValidFrom&gt;     &lt;ValidTo&gt;2099-12-31&lt;/ValidTo&gt;   &lt;/AccountHolder&gt; </pre>

	</AccountHolders>

### B5.1.1 Account Holder

Element for keeping individual Account Holder information

Element Name	AccountHolder
Type	Element to hold information of one Account holder
Length	Not applicable
Format	Not applicable
Occurrence	minimum 1 maximum not defined, but at the moment 10 000 should be supported.
Structure	Not applicable
Unit	Not applicable
Example	<p>With all the fields filled in:</p> <pre>&lt;AccountHolder&gt;   &lt;IssuingBodyCode&gt;43&lt;/IssuingBodyCode&gt;   &lt;AccountNumber&gt;43X0EXMP1B&lt;/AccountNumber&gt;   &lt;CompanyName&gt;Company 1&lt;/CompanyName&gt;   &lt;Country&gt;BE&lt;/Country&gt;   &lt;PostCode&gt;01234&lt;/PostCode&gt;   &lt;City&gt;ExampleCity1&lt;/City&gt;   &lt;ValidFrom&gt;2018-01-01&lt;/ValidFrom&gt;   &lt;ValidTo&gt;2099-12-31&lt;/ValidTo&gt;   &lt;VATNumber&gt;BE0000000000001&lt;/VATNumber&gt;   &lt;ModifiedOn&gt;2018-02-23&lt;/ModifiedOn&gt; &lt;/AccountHolder&gt;</pre> <p>With only compulsory fields filled in:</p> <pre>&lt;AccountHolder&gt;   &lt;IssuingBodyCode&gt;43&lt;/IssuingBodyCode&gt;   &lt;AccountNumber&gt;43X0EXMP29&lt;/AccountNumber&gt;   &lt;CompanyName&gt;Company 2&lt;/CompanyName&gt;   &lt;Country&gt;CZ&lt;/Country&gt;   &lt;ValidFrom&gt;2016-01-01&lt;/ValidFrom&gt;   &lt;ValidTo&gt;2099-12-31&lt;/ValidTo&gt; &lt;/AccountHolder&gt;</pre>

### B5.1.2 Issuing Body Code

Code of the Issuing Body to whom the Account holder belongs.

Element Name	IssuingBodyCode
Type	Token
Length	2
Format	NN
Occurrence	1 (per <b>AccountHolder</b> element)
Structure	2-character numeric, leading zero if required. See Fact sheet 4 "Member & Competent Authority Codes" for possible values

Unit	Not applicable
Example	43

**B5.1.3 Account Number**

Account ID of the Account Holder

Element Name	AccountNumber
Type	Token
Length	See section A2.5. eecs: 9 + 1 check digit GS1: 12 + 1 check digit
Format	Depends on the type, see section A2.5
Occurrence	1 (per <b>AccountHolder</b> element) AccountNumber should be unique within the IssuingBody.
Structure	See section A2.5
Unit	Not applicable
Example	43X0EXMP1B (when cS='eecs') 8716867999938 (when cS='GS1')

**B5.1.4 Company Name**

Name of the Account Holder.

Element Name	CompanyName
Type	Token
Length	0-100
Format	Text field
Occurrence	1 (per AccountHolder element)
Structure	Free text
Unit	Not applicable
Example	Example Company 1

**B5.1.5 Country**

The Country of originating Account Holder (this might be different than the country of Issuing body).

Element Name	Country
Type	String
Length	2
Format	XX
Occurrence	1 (per AccountHolder element)
Structure	2-characters' code according to the ISO 3166-1 country code list
Unit	Not applicable
Example	BE

**B5.1.6 Post Code**

Post Code of the Account Holder

Element Name	PostCode
Type	String

Length	0-10
Format	Text
Occurrence	0-1 (per AccountHolder element)
Structure	0-10 characters
Unit	Not applicable
Example	01234

#### B5.1.7 City

City of the Account Holder

Element Name	City
Type	String
Length	0-150
Format	Not applicable
Occurrence	0-1 (per AccountHolder element)
Structure	0-10 characters
Unit	Not applicable
Example	Example City 1

#### B5.1.8 Valid From

The date from which the Account Holder got valid and from which date it is ok to transfer certificates to the Account Holder:

Element Name	ValidFrom
Type	Date
Length	Not applicable
Format	Date is according to local time, not UTC
Occurrence	1 (per AccountHolder element)
Structure	YYYY-MM-DD
Unit	Not applicable
Example	2018-01-01

#### B5.1.9 Valid To

The date to which the Account Holder is valid. If the date is in the past, the account holder is seen as deactivated and it is not possible to transfer certificates to it anymore:

Element Name	ValidTo
Type	Date
Length	Not applicable
Format	Date is according to local time, not UTC
Occurrence	1 (per AccountHolder element)
Structure	YYYY-MM-DD
Unit	Not applicable
Example	2099-12-31

#### B5.1.10 VAT Number

VAT number of the Account Holder

Element Name	VATNumber
--------------	-----------

Type	String
Length	0-15
Format	Not applicable
Occurrence	0-1 (per AccountHolder element)
Structure	0-15 characters
Unit	Not applicable
Example	BE0000000000001

#### B5.1.11 Modified On

The date when the Account Holder was modified in the registry:

Element Name	ModifiedOn
Type	Date
Length	Not applicable
Format	Date is according to local time, not UTC
Occurrence	0-1 (per AccountHolder element)
Structure	YYYY-MM-DD
Unit	Not applicable
Example	2018-02-23

## B6 Statistics Elements Description

This Annex describes all the elements in the XML file.

### B6.1 General

B6.1.1 Hub User should deliver statistics in monthly bases. The Hub User have to deliver statistics for the completed previous month and possible corrections and updates for the previously reported months up to 24 months backwards. Those statistics can be delivered in one file with several monthly periods in it, or in several files (e.g. divided to monthly files).

B6.1.2 Statistics contain values collected based on Production Period and Transaction Date:

B6.1.3 PRODUCTION PERIOD BASED STATISTICS (Production date):

Relates to when the energy associated with the GO was produced. The reporting Domain should identify, for every reported month, the certificates having Production Period To date belonging to the specific month and report all the actions done to those certificates within the Domain (regardless the time when the action was done). These statistics give indication of how much active certificates (active certificates = Issue – Cancel – Expiry – possible Withdrawals) there are in the market from that specific period. After a year the volume should be close to zero in the AIB level (not in the single Domain level due imports and exports):

1. Issue: The quantity of GOs issued by the reporting Domain (for energy production within the reporting Domain only)
2. Cancel: The quantity of GOs cancelled by the reporting Domain including cancelled to other Domains (regardless of where the GOs were issued)
3. Expire: The quantity of GOs expired by the reporting Domain (regardless of where the GOs were issued)

B6.1.4 TRANSACTION DATE BASED STATISTICS:

Relates to when the GO itself was issued, transferred, cancelled or expired (action based). The reporting Domain should identify, for each reported calendar month, the quantity of GOs issued, transferred, imported, expired, withdrawn or cancelled:

1. Issue: The quantity of GOs that has been issued by the reporting Domain in the specific calendar month
2. Transfer: The quantity of GOs transferred between Account Holders on the reporting Domain in the specific calendar month
3. Export: The quantity of GOs transferred from reporting Domain to accounts in another Domain in the specific calendar month
4. Import: The quantity of GOs transferred from accounts in another Domain to the reporting Domain in the specific calendar month
5. Expire: The quantity of GOs expired in the reporting Domain in the specific calendar month
6. Withdraw: The quantity of GOs withdrawn in the reporting Domain in the specific calendar month. This item is only optional to report. Consider on taking this amount into account when reporting other values. E.g. if there was a withdrawal due to wrongly issued certificates, then quantity reported on issued GOs should be reduced.
7. Cancel:
  - a. The quantity of GOs cancelled in the reporting Domain per consumption year.
  - b. The quantity of GOs cancelled to out of the reporting Domain per Consumption Year and Consumption Domain (ex-domain cancellations).

B6.1.5 Interface Files for Statistics follow the schema defined in B7.4 Statistics Schema – Statistics

B6.1.6 Example of Statistics file

```
<?xml version="1.0" encoding="UTF-8"?>
<Statistics MessageTransmissionTime="2020-02-11T16:00:00Z" Type="EECS-
Electricity">
  <DomainCode>DK</DomainCode>
  <IssuingBodyCode>02</IssuingBodyCode>
  <Period YearMonth="2018-03">
    <Item TypeOfInstallation="T050000" EnergySource="F0100000">
      <ProductionDate>
        <Issue>1</Issue>
        <Cancel>2</Cancel>
        <Expire>0</Expire>
      </ProductionDate>
      <TransactionDate>
        <Issue>10</Issue>
        <Transfer>20</Transfer>
        <Export>30</Export>
        <Import>40</Import>
        <Expire>50</Expire>
        <Withdraw>0</Withdraw>
        <Cancel>50</Cancel>
      </TransactionDate>
    </Item>
  </Period>
</Statistics>
```

```

        <Cancel ConsumptionDomainCode="HU"
ConsumptionYear="2018">50</Cancel>
        </TransactionDate>
    </Item>
</Period>
</Statistics>
    
```

**B6.2 Header**

B6.2.1 The Statistics file contains the below header lines to identify to which Domain and the Issuing Body the Statistics belongs to (the Registry is identified based on the selected Registry in the User interface or in case of Webservice based on the client certificate of the Sending Registry).

```

<?xml version="1.0" encoding="UTF-8"?>
<Statistics MessageTransmissionTime="2020-02-11T16:00:00Z" Type="EECS-
Electricity">
    <DomainCode>DK</DomainCode>
    <IssuingBodyCode>02</IssuingBodyCode>
    
```

B6.2.2 Message Transmission Time - attribute

B6.2.3 (a) Timestamp for when the statistics were retrieved from the original database. Shows from which moment the data was taken from the registry (that might be different than the one to insert the data to AIB Hub and might help on identifying possible problems).

Attribute	MessageTransmissionTime
Type	DateTime
Length	Not applicable
Format	UTC (Z). Use of referential time zones (e.g. +1:00) is not permitted
Occurrence	Required
Structure	YYYY-MM-DDTHH:MM:SSZ
Unit	DateTime
Example	2019-10-15T12:24:00Z

B6.2.4 Type -element

B6.2.5 Type of statistics contained in the report

Attribute	Type
Type	xs-token
Length	1-20
Format	Possible values: <ul style="list-style-type: none"> <li>• EECS-Electricity</li> <li>• National-Electricity</li> <li>• EECS-Gas</li> </ul> NOTE: later there might be more types to come. See related master data in the AIB Hub
Occurrence	Required
Structure	Not applicable
Unit	Not applicable
Example	EECS-Electricity



B6.2.6 Domain Code - element

B6.2.7 Represents the Domain to whom the statistics are reported:

Element Name	DomainCode
Type	xs:token
Length	2-3
Format	2 to 3 digits
Occurrence	1 (per statistics file)
Structure	Refer to Domain Code in FS04 Domain code in Master data of AIB Hub
Unit	Not applicable
Example	BEF, FI

B6.2.8 Issuing Body Code - element

B6.2.9 Represents the Issuing Body to whom the statistics are reported:

Element Name	IssuingBodyCode
Type	xs:token
Length	2
Format	2 digits
Occurrence	1 (per statistics file)
Structure	2-character numeric, leading zero if required. See Fact sheet 4 "Member & Competent Authority Codes" for possible values
Unit	Not applicable
Example	29

**B6.3 Period -element**

B6.3.1 General Description

B6.3.2 Each Statistics file may have one or more "Period" elements. Maximum number of period elements in one file is 24 and Period should not be older than 24 months.

B6.3.3 One period holds statistics of a specific one-month period.

B6.3.4 Each Period may contain one or more "Item"-element which are described later

B6.3.5 Year Month -attribute

B6.3.6 Period has an attribute "YearMonth" which the given statistics belongs to.

Attribute	YearMonth
Type	xs:gYearMonth
Length	7
Format	YYYY-MM
Occurrence	Required once per Period element. Must be unique within the Statistics XML. Maximum occurrence of Period element per Statistics XML is 24.
Structure	Minimum value: 24 months from the running date. Maximum value: Running month Should be unique within the Statistics XML.

Unit	Not applicable
Example	2019-01

**B6.3.7** Example of a Period with two Items:

```

<Period YearMonth="2018-03">
  <Item TypeOfInstallation="T050000" EnergySource="F01000000">
    <ProductionDate>
      <Issue>0</Issue>
      <Cancel>0</Cancel>
      <Expire>0</Expire>
    </ProductionDate>
    <TransactionDate>
      <Issue>0</Issue>
      <Transfer>0</Transfer>
      <Export>40000</Export>
      <Import>20000</Import>
      <Expire>0</Expire>
      <Withdraw>0</Withdraw>
    </TransactionDate>
  </Item>
  <Item TypeOfInstallation="T050000" EnergySource="F01010101">
    <ProductionDate>
      <Issue>19519</Issue>
      <Cancel>0</Cancel>
      <Expire>0</Expire>
    </ProductionDate>
    <TransactionDate>
      <Issue>18551</Issue>
      <Transfer>0</Transfer>
      <Export>0</Export>
      <Import>0</Import>
      <Expire>0</Expire>
      <Withdraw>0</Withdraw>
      <Cancel>50</Cancel>
      <Cancel ConsumptionDomainCode="HU"
ConsumptionYear="2018">50</Cancel>
    </TransactionDate>
  </Item>
</Period>

```

**B6.4** **Item -element**

**B6.4.1** General Description

One Item holds statistics of a specific one-month period and of a specific Type of Installation and Energy Source combination.

Each "Period" element may have one or more "Item" elements. Maximum number of Item elements in one period is the number of unique TypeOfInstallation and EnergySource combinations. At least one Item is required per each Period.

Combination of TypeOfInstallation and Energysource within a “Period” must be unique.

Examples of Items:

```

<Item TypeOfInstallation="T050000" EnergySource="F01000000">
  <ProductionDate>
    <Issue>0</Issue>
    <Cancel>0</Cancel>
    <Expire>0</Expire>
  </ProductionDate>
  <TransactionDate>
    <Issue>0</Issue>
    <Transfer>0</Transfer>
    <Export>40000</Export>
    <Import>20000</Import>
    <Expire>0</Expire>
    <Withdraw>0</Withdraw>
  </TransactionDate>
</Item>
<Item TypeOfInstallation="T050000" EnergySource="F01010101">
  <ProductionDate>
    <Issue>19519</Issue>
  </ProductionDate>
  <TransactionDate>
    <Export>40</Export>
    <Import>50</Import>
    <Expire>0</Expire>
    <Withdraw>0</Withdraw>
    <Cancel>50</Cancel>
    <Cancel ConsumptionDomainCode="HU"
ConsumptionYear="2018">50</Cancel>
  </TransactionDate>
</Item>

```

**B6.4.2 Type of Installation -attribute**

Type of Installation for which the given statistics belongs. NOTE: it is recommended to report the statistics in the level those are in the certificates.

Attribute	TypeOfInstallation
Type	Token
Length	7
Format	TNNNNNN where the T could be also another letter and N represent a number from 0-9.
Occurrence	Required (once per Item element)
Structure	One of the Technology codes from EECS Rules Fact Sheet 5 “Types of Energy Inputs and Technologies  Combination of “Type of Installation” and “Energy Source” must be unique for a Period

	Combination of "Type of Installation" and "Energy Source" must be a valid combination in EECS Rules Fact Sheet 5
Unit	Not applicable
Example	T030200

**B6.4.3 Energy Source -attribute**

Energy Source for which the given statistics belongs. NOTE: it is recommended to report the statistics in the level those issued.

Attribute	EnergySource
Type	Token
Length	9
Format	FNNNNNNNN, where N represent a number from 0-9
Occurrence	Required (once per Period element)
Structure	One of the Energy Source codes from EECS Rules Fact Sheet 5 "Types of Energy Inputs and Technologies"  Combination of "Type of Installation" and "Energy Source" must be unique for a Period  Combination of "Type of Installation" and "Energy Source" must be a valid combination in EECS Rules Fact Sheet 5
Unit	Not applicable
Example	F01040100

**B6.5 ProductionDate -element**

**B6.5.1 General Description**

Each "Item" element has one "ProductionDate" element.

ProductionDate element contains statistics collected based on the Certificate Production Period End.

ProductionDate element must contain at least one of the following elements: Issue, Cancel or Expire

Example of a ProductionDate -element:

```

<ProductionDate>
  <Issue>0</Issue>
  <Cancel>0</Cancel>
  <Expire>0</Expire>
</ProductionDate>
```

**B6.5.2 Production Date > Issue -element**

Quantity of all the Certificates issued in the reporting Domain where the Certificate Production Period (Production Period End) belongs to the given Period, and where Energy Source and Type of Installation is as given in the attributes of the Item.

Element Name	Issue
Type	xs:nonNegativeInteger

Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per ProductionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)
Example	1000000

**B6.5.3 Production Date > Cancel -element**

Quantity of all the certificates Cancelled in the reporting Domain (including cancelled to external domain) and where the Certificate Production Period (Production Period End) belongs to the given Period, and where Energy Source and Type of Installation is as given in the attributes of the Item.

Element Name	Cancel
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per ProductionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)
Example	1000000

**B6.5.4 Production Date > Expire -element**

Quantity of all the Certificates expired in the reporting Domain and where the Certificate Production Period (Production Period End) belongs to the given Period and Energy Source and Type of Installation is as given in the attributes of the Item.

Element Name	Expire
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per ProductionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)
Example	1000000

**B6.6 Transaction Date -element**

**B6.6.1 General description**

Each “Item” element has maximum one “TransactionDate” element and that is followed by the ProductionDate element.

TransactionDate element contains statistics collected based on the Transaction Date, and it must contain at least one of the following elements: Issue, Transfer, Export, Import, Expire, Withdraw or Cancel.

Example of a TransactionDate element:

```
<TransactionDate>
  <Issue>0</Issue>
  <Transfer>0</Transfer>
  <Export>40000</Export>
  <Import>20000</Import>
  <Expire>0</Expire>
  <Withdraw>0</Withdraw>
  <Cancel>50</Cancel>
  <Cancel ConsumptionDomainCode="HU"
ConsumptionYear="2018">50</Cancel>
</TransactionDate>
```

**B6.6.2 Transaction Date > Issue -element**

Issuing statistics for the related Period collected based on the Issuing transaction date

Element Name	Issue
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per TransactionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)
Example	1000000

**B6.6.3 Transaction Date > Transfer -element**

Transfer statistics for the related Period collected based on the Transfer transaction date

Element Name	Transfer
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per TransactionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)

Example	1000000
---------	---------

**B6.6.4 Transaction Date > Export -element**

Export statistics for the related Period collected based on the Export transaction date

Element Name	Export
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per TransactionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)
Example	1000000

**B6.6.5 Transaction Date > Import -element**

Import statistics for the related Period collected based on the Import transaction date

Element Name	Import
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per TransactionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)
Example	1000000

**B6.6.6 Transaction Date > Expire -element**

Expire statistics for the related Period collected based on the Expire transaction date

Element Name	Expire
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per TransactionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)
Example	1000000

B6.6.7 Transaction Date > Withdraw -element

Withdraw statistics for the related Period collected based on the Withdraw transaction date.

Element Name	Withdraw
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required Maximum one per TransactionDate -element. If not given, the value in the AIB Hub is kept.
Structure	-
Unit	Certificates (1 MWH is the size of one certificate)
Example	1000000

B6.6.8 Transaction Date > Cancel -element

Cancel statistics for the related Period collected based on the Cancel transaction date. There might be more than one Cancel-element in a TransactionDate-element if those all have unique combination of ConsumptionDomainCode and ConsumptionYear.

Element Name	Cancel
Type	xs:nonNegativeInteger
Length	1-10
Format	Minimum value: 0 Maximum value: 1000000000 (billion)
Occurrence	Not required There might be more than one Cancel-element in a TransactionDate-element if those all have unique combination of ConsumptionDomainCode and ConsumptionYear. If not given, the value in the AIB Hub is kept.
Structure	See below the definition of the attributes
Unit	Certificates (1 MWH is the size of one certificate)
Example	<Cancel>50</Cancel> <Cancel ConsumptionDomainCode="HU" ConsumptionYear="2018">50</Cancel>
Attribute	ConsumptionDomainCode
Type	Token
Length	2-3
Format	FS04 Domain code or ISO 3166-01
Occurrence	Not required. <b>If not given, it is expected that all the reported volume is being cancelled to the reporting domain.</b>





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HUB USER COMPLIANCE DOCUMENT  
(AIB-EECS-SD03: EECS Registration Databases)



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Structure	Fact sheet 04. Domain Code, if cancelled outside of AIB Members, then ISO 3166-01 Country code. Master data table in AIB Hub is used to validate this.
Unit	Not applicable
Example	BEW, FI, MA
<b>Attribute</b>	<b>ConsumptionYear</b>
Type	Token
Length	4
Format	YYYY
Occurrence	Not required. <b>If not given, it is expected that all the reported volume is being cancelled to the year of the reported period.</b>
Structure	YYYY
Unit	Not applicable
Example	2018

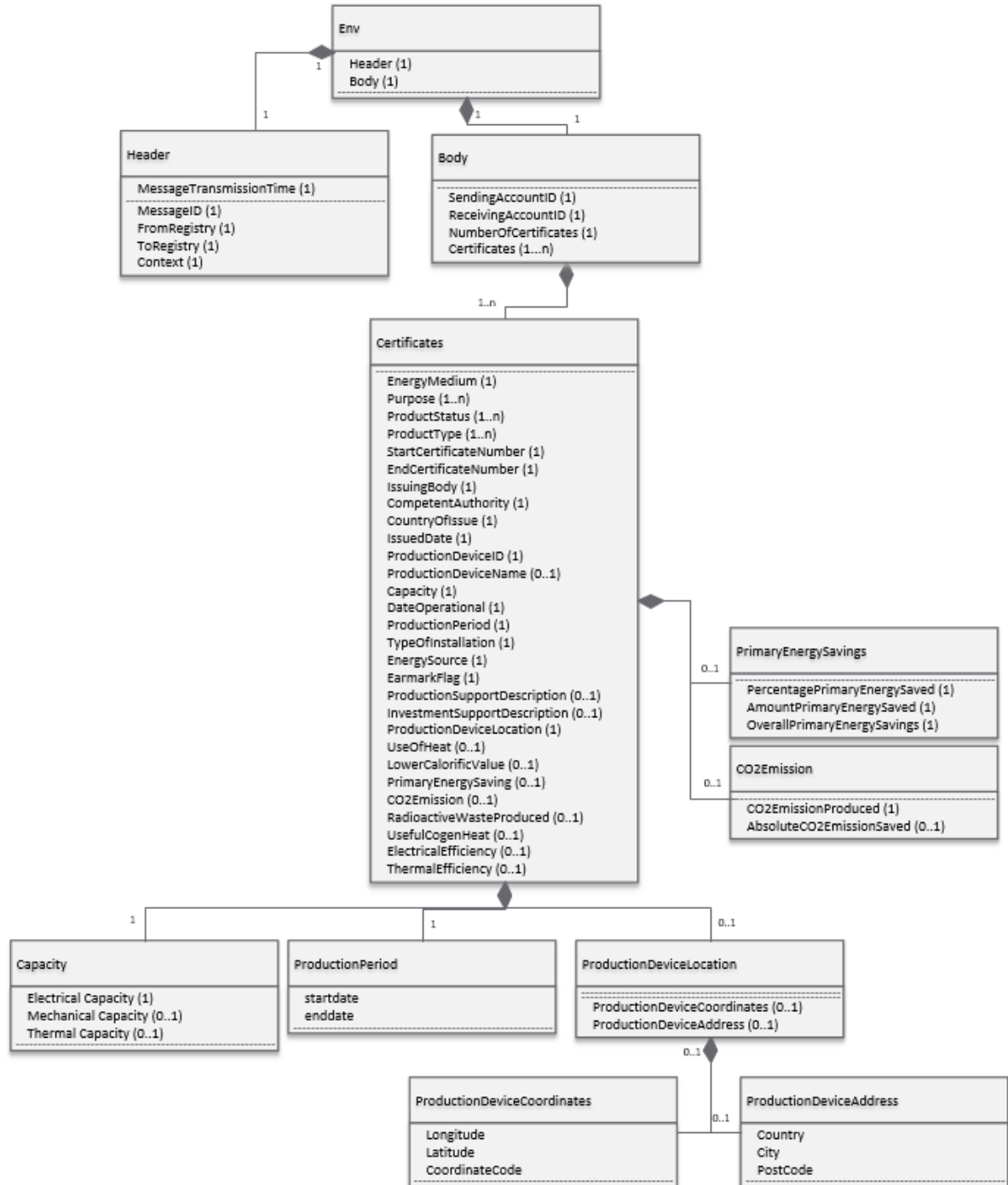
## B7 Logical Message Definitions (XSD)

The following schema definitions are available on request and can be downloaded from AIB Hub website.

### B7.1 Message Schema – EECS Electricity Certificates

#### B7.1.1 Certificate Transfer Schema v71

##### (a) UML Schema – exportenv71



(b) Schema exportenv71.xsd

Interface Files for certificate transfer follow the schema (exportenv71.xsd) described below.

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:r="http://system.aib-net.org"
xmlns:xs="http://www.w3.org/2001/XMLSchema" targetNamespace="http://system.aib-net.org"
elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:element name="Env">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="r:Header"/>
        <xs:element ref="r:Body"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="Header">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="r:MessageID"/>
        <xs:element ref="r:FromRegistry"/>
        <xs:element ref="r:ToRegistry"/>
        <xs:element ref="r:Context"/>
      </xs:sequence>
      <xs:attribute name="MessageTransmissionTime" type="xs:dateTime"
use="required"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="MessageID" type="xs:token"/>
  <xs:element name="FromRegistry">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:token">
          <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="GS1"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="ToRegistry">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:token">
          <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="GS1"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="Context">
    <xs:simpleType>
      <xs:restriction base="xs:token">
        <xs:enumeration value="transfer"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
  <xs:element name="Body">
    <xs:complexType>
      <xs:sequence>
```

```

    <xs:element ref="r:SendingAccountID"/>
    <xs:element ref="r:ReceivingAccountID"/>
    <xs:element ref="r:NumberOfCertificates"/>
    <xs:element ref="r:Certificates" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="SendingAccountID">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:token">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="ReceivingAccountID">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:token">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="NumberOfCertificates" type="xs:positiveInteger"/>
<xs:element name="Certificates">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="r:EnergyMedium"/>
      <xs:element ref="r:Purpose" maxOccurs="unbounded"/>
      <xs:element ref="r:ProductStatus" maxOccurs="unbounded"/>
      <xs:element ref="r:ProductType" maxOccurs="unbounded"/>
      <xs:element ref="r:StartCertificateNumber"/>
      <xs:element ref="r:EndCertificateNumber"/>
      <xs:element ref="r:IssuingBody"/>
      <xs:element ref="r:CompetentAuthority"/>
      <xs:element ref="r:CountryOfIssue"/>
      <xs:element ref="r:IssuedDate"/>
      <xs:element ref="r:ProductionDeviceID"/>
      <xs:element ref="r:ProductionDeviceName" minOccurs="0"/>
      <xs:element ref="r:Capacity"/>
      <xs:element ref="r:DateOperational"/>
      <xs:element ref="r:ProductionPeriod"/>
      <xs:element ref="r:TypeOfInstallation"/>
      <xs:element ref="r:EnergySource"/>
      <xs:element ref="r:EarmarkFlag"/>
      <xs:element ref="r:ProductionSupportDescription" minOccurs="0"/>
      <xs:element ref="r:InvestmentSupportDescription" minOccurs="0"/>
      <xs:element ref="r:ProductionDeviceLocation"/>
      <xs:element ref="r:UseOfHeat" minOccurs="0"/>
      <xs:element ref="r:LowerCalorificValue" minOccurs="0"/>
      <xs:element ref="r:PrimaryEnergySavings" minOccurs="0"/>
      <xs:element ref="r:CO2Emissions" minOccurs="0"/>
      <xs:element ref="r:RadioactiveWasteProduced" minOccurs="0"/>
      <xs:element ref="r:UsefulCogenHeat" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

```

```

        <xs:element ref="r:ElectricalEfficiency" minOccurs="0"/>
        <xs:element ref="r:ThermalEfficiency" minOccurs="0"/>
    </xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="EnergyMedium">
    <xs:simpleType>
        <xs:restriction base="xs:token">
            <xs:enumeration value="Electricity"/>
        </xs:restriction>
    </xs:simpleType>
</xs:element>
<xs:element name="Purpose" type="xs:token"/>
<xs:element name="ProductStatus" type="xs:token"/>
<xs:element name="ProductType" type="xs:token"/>
<xs:element name="StartCertificateNumber">
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension base="r:CertificateNumberType">
                <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="eecs"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
</xs:element>
<xs:element name="EndCertificateNumber">
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension base="r:CertificateNumberType">
                <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="eecs"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
</xs:element>
<xs:element name="IssuingBody" type="xs:token"/>
<xs:element name="CompetentAuthority" type="xs:token"/>
<xs:element name="CountryOfIssue" type="xs:token"/>
<xs:element name="IssuedDate" type="xs:date"/>
<xs:element name="ProductionDeviceID">
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension base="xs:token">
                <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="GS1"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
</xs:element>
<xs:element name="ProductionDeviceName" type="xs:token"/>
<xs:element name="Capacity">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="ElectricalCapacity" type="xs:decimal"/>
            <xs:element name="MechanicalCapacity" type="xs:decimal" minOccurs="0"/>
            <xs:element name="ThermalCapacity" type="xs:decimal" minOccurs="0"/>
        </xs:sequence>
    </xs:complexType>

```

```

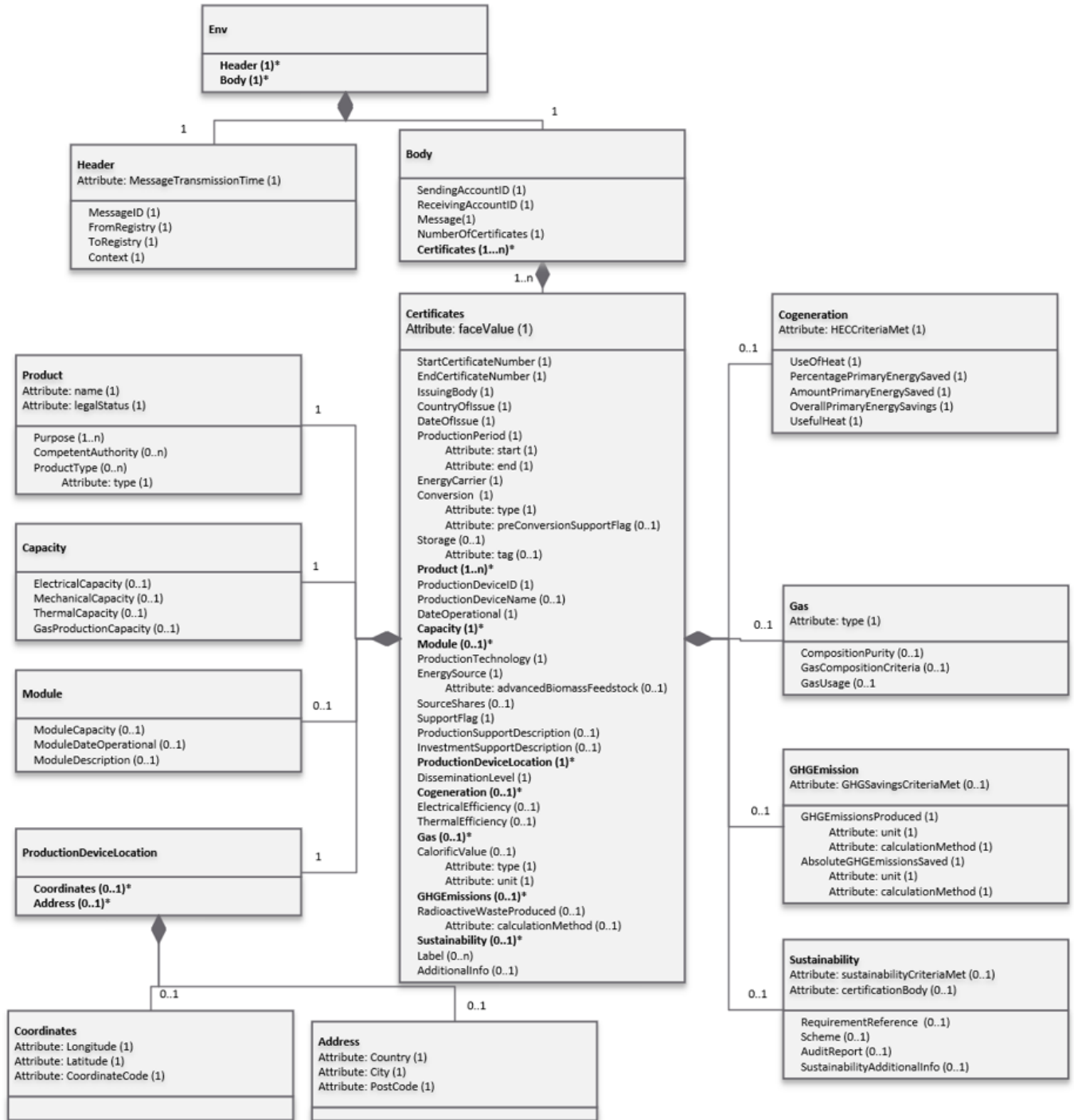
</xs:element>
<xs:element name="DateOperational" type="xs:date"/>
<xs:element name="ProductionPeriod">
  <xs:complexType>
    <xs:attribute name="startdate" type="xs:date" use="required"/>
    <xs:attribute name="enddate" type="xs:date" use="required"/>
  </xs:complexType>
</xs:element>
<xs:element name="TypeOfInstallation">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:token">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="EnergySource">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:token">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="EarmarkFlag">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:byte">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional"
default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="ProductionSupportDescription" type="xs:string"/>
<xs:element name="InvestmentSupportDescription" type="xs:string"/>
<xs:element name="ProductionDeviceLocation">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="r:ProductionDeviceCoordinates" minOccurs="0"/>
      <xs:element ref="r:ProductionDeviceAddress" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="ProductionDeviceCoordinates">
  <xs:complexType>
    <xs:attribute name="Longitude" type="xs:token" use="required"/>
    <xs:attribute name="Latitude" type="xs:token" use="required"/>
    <xs:attribute name="CoordinateCode" type="xs:token" use="required"/>
  </xs:complexType>
</xs:element>
<xs:element name="ProductionDeviceAddress">
  <xs:complexType>
    <xs:attribute name="Country" type="xs:token" use="required"/>

```



B7.1.2 Certificate Transfer Schema v80

(a) UML Schema – exportenv80





(b) Schema – exportenv80.xsd

Interface Files for certificate transfer follow the schema (exportenv80.xsd) described below.

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:r="http://system.aib-net.org"
xmlns:xs="http://www.w3.org/2001/XMLSchema" targetNamespace="http://system.aib-net.org"
elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:element name="Env">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="r:Header"/>
        <xs:element ref="r:Body"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="Header">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="r:MessageID"/>
        <xs:element ref="r:FromRegistry"/>
        <xs:element ref="r:ToRegistry"/>
        <xs:element ref="r:Context"/>
      </xs:sequence>
      <xs:attribute name="MessageTransmissionTime" type="xs:dateTime" use="required"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="MessageID" type="xs:token"/>
  <xs:element name="FromRegistry">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:token">
          <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="GS1"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="ToRegistry">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:token">
          <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="GS1"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="Context">
    <xs:simpleType>
      <xs:restriction base="xs:token">
        <xs:enumeration value="transfer"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
  <xs:element name="Body">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="r:SendingAccountID"/>
        <xs:element ref="r:ReceivingAccountID"/>
        <xs:element ref="r:NumberOfCertificates"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>

```

```

    <xs:element ref="r:Message" minOccurs="0"/>
    <xs:element ref="r:Certificates" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="SendingAccountID">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:AccountID">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="ReceivingAccountID">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:AccountID">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="NumberOfCertificates" type="xs:positiveInteger"/>
<xs:element name="Message" type="r:LongString"/>
<xs:element name="Certificates">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="r:StartCertificateNumber"/>
      <xs:element ref="r:EndCertificateNumber"/>
      <xs:element ref="r:IssuingBody"/>
      <xs:element ref="r:CountryOfIssue"/>
      <xs:element ref="r:DateOfIssue"/>
      <xs:element ref="r:ProductionPeriod"/>
      <xs:element ref="r:EnergyCarrier"/>
      <xs:element ref="r:Conversion"/>
      <xs:element ref="r:Storage" minOccurs="0"/>
      <xs:element ref="r:Product" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element ref="r:ProductionDeviceID"/>
      <xs:element ref="r:ProductionDeviceName" minOccurs="0"/>
      <xs:element ref="r:DateOperational"/>
      <xs:element ref="r:Capacity"/>
      <xs:element ref="r:Module" minOccurs="0"/>
      <xs:element ref="r:ProductionTechnology"/>
      <xs:element ref="r:EnergySource"/>
      <xs:element ref="r:SourceShares" minOccurs="0"/>
      <xs:element ref="r:SupportFlag"/>
      <xs:element ref="r:ProductionSupportDescription" minOccurs="0"/>
      <xs:element ref="r:InvestmentSupportDescription" minOccurs="0"/>
      <xs:element ref="r:ProductionDeviceLocation"/>
      <xs:element ref="r:DisseminationLevel"/>
      <xs:element ref="r:Cogeneration" minOccurs="0"/>
      <xs:element ref="r:ElectricalEfficiency" minOccurs="0"/>
      <xs:element ref="r:ThermalEfficiency" minOccurs="0"/>
      <xs:element ref="r:Gas" minOccurs="0"/>
      <xs:element ref="r:CalorificValue" minOccurs="0"/>
      <xs:element ref="r:GHGEmissions" minOccurs="0"/>
      <xs:element ref="r:RadioactiveWasteProduced" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>

```

```

    <xs:element ref="r:Sustainability" minOccurs="0"/>
    <xs:element ref="r:Label" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="r:AdditionalInfo" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="faceValue" type="r:FaceValue" default="MWh"/>
</xs:complexType>
</xs:element>
<xs:element name="StartCertificateNumber">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:CertificateNumberType">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="EndCertificateNumber">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:CertificateNumberType">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="IssuingBody" type="r:TinyToken"/>
<xs:element name="CountryOfIssue" type="r:TinyToken"/>
<xs:element name="DateOfIssue">
  <xs:simpleType>
    <xs:restriction base="xs:date">
      <xs:minInclusive value="2004-03-17"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="ProductionPeriod">
  <xs:complexType>
    <xs:attribute name="start" use="required" type="r:ProductionDateTime"/>
    <xs:attribute name="end" use="required" type="r:ProductionDateTime"/>
  </xs:complexType>
</xs:element>
<xs:element name="EnergyCarrier">
  <xs:simpleType>
    <xs:restriction base="xs:token">
      <xs:enumeration value="Electricity"/>
      <xs:enumeration value="EnergyGas"/>
      <xs:enumeration value="Hydrogen"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="Conversion">
  <xs:complexType>
    <xs:attribute name="tag" type="r:TinyToken" use="required"/>
    <xs:attribute name="preConversionSupportFlag" type="r:TinyToken" use="optional"/>
  </xs:complexType>
</xs:element>
<xs:element name="Storage">
  <xs:complexType>
    <xs:attribute name="tag" type="r:TinyToken" use="optional" default="S0100"/>
  </xs:complexType>

```

```

</xs:complexType>
</xs:element>
<xs:element name="Product">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="r:Purpose" maxOccurs="unbounded"/>
      <xs:element ref="r:CompetentAuthority" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element ref="r:ProductType" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="name" type="r:TinyToken" use="required"/>
    <xs:attribute name="legalStatus" type="r:LegalStatus" use="required"/>
  </xs:complexType>
</xs:element>
<xs:element name="Purpose">
  <xs:simpleType>
    <xs:restriction base="r:TinyToken">
      <xs:enumeration value="Disclosure"/>
      <xs:enumeration value="Support"/>
      <xs:enumeration value="Target"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="CompetentAuthority">
  <xs:simpleType>
    <xs:restriction base="xs:token">
      <xs:length value="4" fixed="true"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="ProductType">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:TinyToken">
        <xs:attribute name="type" use="required">
          <xs:simpleType>
            <xs:restriction base="xs:NMTOKEN">
              <xs:enumeration value="driver"/>
              <xs:enumeration value="targetType"/>
              <xs:enumeration value="targetScheme"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="ProductionDeviceID">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:ProductionDeviceID">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="GS1"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="ProductionDeviceName" type="r:MediumToken"/>
<xs:element name="DateOperational" type="r:Date"/>
<xs:element name="Capacity">

```

```

<xs:complexType>
  <xs:sequence>
    <xs:element name="ElectricalCapacity" type="r:Decimal_Positive" minOccurs="0"/>
    <xs:element name="MechanicalCapacity" type="r:Decimal_Positive"
minOccurs="0"/>
    <xs:element name="ThermalCapacity" type="r:Decimal_Positive" minOccurs="0"/>
    <xs:element name="GasProductionCapacity" type="r:Decimal_Positive"
minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="Module">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="ModuleCapacity" type="r:Decimal_Positive" minOccurs="0"/>
      <xs:element name="ModuleDateOperational" type="r:Date" minOccurs="0"/>
      <xs:element name="ModuleDescription" type="r:MediumString" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="ProductionTechnology">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:TinyToken">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="EnergySource">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:TinyToken">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="eecs"/>
        <xs:attribute name="advancedBiomassFeedstock" type="xs:boolean"
use="optional"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="SourceShares" type="r:MediumString"/>
<xs:element name="SupportFlag">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:byte">
        <xs:attribute name="cS" type="xs:NMTOKEN" use="optional" default="eecs"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="ProductionSupportDescription" type="r:LongString"/>
<xs:element name="InvestmentSupportDescription" type="r:LongString"/>
<xs:element name="ProductionDeviceLocation">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="r:Coordinates" minOccurs="0"/>
      <xs:element ref="r:Address" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>

```

```

</xs:complexType>
</xs:element>
<xs:element name="Coordinates">
  <xs:complexType>
    <xs:attribute name="Longitude" type="r:TinyToken" use="required"/>
    <xs:attribute name="Latitude" type="r:TinyToken" use="required"/>
    <xs:attribute name="CoordinateCode" type="r:TinyToken" use="required"/>
  </xs:complexType>
</xs:element>
<xs:element name="Address">
  <xs:complexType>
    <xs:attribute name="Country" type="r:TinyToken" use="required"/>
    <xs:attribute name="City" type="r:MediumToken150" use="required"/>
    <xs:attribute name="PostCode" type="r:TinyToken10" use="required"/>
  </xs:complexType>
</xs:element>
<xs:element name="DisseminationLevel" type="r:TinyToken"/>
<xs:element name="Cogeneration">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="r:UseOfHeat" minOccurs="0"/>
      <xs:element ref="r:PercentagePrimaryEnergySaved" minOccurs="0"/>
      <xs:element ref="r:AmountPrimaryEnergySaved" minOccurs="0"/>
      <xs:element ref="r:OverallPrimaryEnergySavings" minOccurs="0"/>
      <xs:element ref="r:UsefulHeat" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="HECCriteriaMet" type="xs:boolean" use="optional"/>
  </xs:complexType>
</xs:element>
<xs:element name="UseOfHeat" type="r:TinyToken"/>
<xs:element name="PercentagePrimaryEnergySaved" type="r:FixedPercentage"/>
<xs:element name="AmountPrimaryEnergySaved" type="r:Decimal_Positive"/>
<xs:element name="OverallPrimaryEnergySavings" type="r:FixedPercentage"/>
<xs:element name="UsefulHeat" type="r:Decimal_Positive"/>
<xs:element name="ElectricalEfficiency" type="r:FixedPercentage"/>
<xs:element name="ThermalEfficiency" type="r:FixedPercentage"/>
<xs:element name="Gas">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="CompositionPurity" type="r:TinyToken" minOccurs="0"/>
      <xs:element name="GasCompositionCriteria" type="r:TinyToken" minOccurs="0"/>
      <xs:element name="GasUsage" type="r:TinyToken" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="type" type="r:TinyToken" use="required"/>
  </xs:complexType>
</xs:element>
<xs:element name="CalorificValue">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:Decimal_Positive_Allow_Empty">
        <xs:attribute name="type" type="r:CalorificValueType" use="required"/>
        <xs:attribute name="unit" type="r:TinyToken" use="optional" default="MJ/kg"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="GHGEmissions">
  <xs:complexType>

```

```

<xs:sequence>
  <xs:element ref="r:GHGEmissionProduced" minOccurs="0"/>
  <xs:element ref="r:AbsoluteGHGEmissionSaved" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="GHGSavingsCriteriaMet" use="optional" type="xs:boolean"/>
</xs:complexType>
</xs:element>
<xs:element name="GHGEmissionProduced">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:Decimal">
        <xs:attribute name="calculationMethod" type="r:TinyToken" use="required"/>
        <xs:attribute name="unit" type="r:TinyToken" use="optional" default="Kg
CO2eq/MWh"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="AbsoluteGHGEmissionSaved">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:Decimal_Non_Negative">
        <xs:attribute name="calculationMethod" type="r:TinyToken" use="required"/>
        <xs:attribute name="unit" type="r:TinyToken" use="optional" default="Kg/MWh"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="RadioactiveWasteProduced">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="r:Decimal_Positive">
        <xs:attribute name="calculationMethod" type="r:TinyToken" use="optional"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="Sustainability">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="RequirementReference" type="r:TinyToken" minOccurs="0"/>
      <xs:element name="Scheme" type="r:TinyToken" minOccurs="0"/>
      <xs:element name="AuditReport" type="r:MediumString" minOccurs="0"/>
      <xs:element name="SustainabilityAdditionalInfo" type="r:MediumString"
minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="sustainabilityCriteriaMet" type="xs:boolean" use="optional"/>
    <xs:attribute name="certificationBody" type="r:TinyToken" use="optional"/>
  </xs:complexType>
</xs:element>
<xs:element name="Label" type="r:TinyToken"/>
<xs:element name="AdditionalInfo" type="r:MediumString"/>
<!--Defined Types-->
<xs:simpleType name="FaceValue">
  <xs:restriction base="r:TinyToken">
    <xs:enumeration value="MWh"/>
  </xs:restriction>
</xs:simpleType>

```



```

<xs:simpleType name="CertificateNumberType">
  <xs:restriction base="xs:token">
    <xs:pattern value="[0-9]{30}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="AccountID">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="preserve" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ProductionDeviceID">
  <xs:restriction base="xs:token">
    <xs:pattern value="[0-9]{18}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="LegalStatus">
  <xs:restriction base="r:TinyToken">
    <xs:enumeration value="LC" />
    <xs:enumeration value="NGC" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="CalorificValueType">
  <xs:restriction base="xs:token">
    <xs:enumeration value="lower" />
    <xs:enumeration value="higher" />
  </xs:restriction>
</xs:simpleType>
<!-- Datatypes -->
<xs:simpleType name="MediumString">
  <xs:restriction base="xs:string">
    <xs:minLength value="1" />
    <xs:maxLength value="255" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="LongString">
  <xs:restriction base="xs:string">
    <xs:minLength value="1" />
    <xs:maxLength value="1024" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="TinyToken">
  <xs:restriction base="xs:token">
    <xs:minLength value="1" />
    <xs:maxLength value="20" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="TinyToken10">
  <xs:restriction base="xs:token">
    <xs:minLength value="1" />
    <xs:maxLength value="10" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="MediumToken">
  <xs:restriction base="xs:token">
    <xs:minLength value="1" />
    <xs:maxLength value="255" />
  </xs:restriction>
</xs:simpleType>

```



```

<xs:simpleType name="MediumToken150">
  <xs:restriction base="xs:token">
    <xs:minLength value="1"/>
    <xs:maxLength value="150"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ProductionDateTime">
  <xs:restriction base="xs:dateTime">
    <xs:minInclusive value="2004-03-17T00:00:00+00:00"/>
    <xs:pattern value="\d{4}-\d{2}-\d{2}T\d{2}:\d{2}:\d{2}[+-]\d{2}:\d{2}"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="Date">
  <xs:restriction base="xs:date">
    <xs:minInclusive value="1800-01-01"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="Decimal_Non_Negative">
  <xs:restriction base="xs:decimal">
    <xs:minInclusive value="0.000"/>
    <xs:maxInclusive value="99999999.999"/>
    <xs:fractionDigits fixed="true" value="3"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="Decimal_Positive">
  <xs:restriction base="xs:decimal">
    <xs:minInclusive value="0.001"/>
    <xs:maxInclusive value="99999999.999"/>
    <xs:fractionDigits fixed="true" value="3"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="Decimal">
  <xs:restriction base="xs:decimal">
    <xs:minInclusive value="-99999999.999"/>
    <xs:maxInclusive value="99999999.999"/>
    <xs:fractionDigits fixed="true" value="3"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="FixedPercentage">
  <xs:restriction base="xs:decimal">
    <xs:minInclusive value="0.1"/>
    <xs:maxInclusive value="100.0"/>
    <xs:fractionDigits fixed="true" value="1"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="Decimal_Positive_Allow_Empty">
  <xs:union memberTypes="r:Empty r:Decimal_Positive"/>
</xs:simpleType>
<xs:simpleType name="Empty">
  <xs:restriction base="xs:string">
    <xs:enumeration value=""/>
  </xs:restriction>
</xs:simpleType>
</xs:schema>

```

**B7.2 Account Holders Schema – Account Holders**

B7.2.1 XML files for Account Holders follow the schema described below (both when importing and exporting via AIB Hub User Interface or via Webservice)

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:r="http://system.aib-net.org"
xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified">
  <xs:element name="AccountHolders">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="AccountHolder" minOccurs="1" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="IssuingBodyCode">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:length value="2"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="AccountNumber">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:minLength value="10"/>
                    <xs:maxLength value="13"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="CompanyName">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:minLength value="1"/>
                    <xs:maxLength value="100"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="Country">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:length value="2"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="PostCode" minOccurs="0" maxOccurs="1">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:maxLength value="10"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="City" minOccurs="0" maxOccurs="1">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:maxLength value="150"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="ValidFrom" type="xs:date"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>

```

```

        <xs:element name="ValidTo" type="xs:date"/>
        <xs:element name="VATNumber" minOccurs="0" maxOccurs="1">
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:maxLength value="15"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:element>
        <xs:element name="ModifiedOn" type="xs:date" minOccurs="0"
maxOccurs="1"/>
    </xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:unique name="accountHolderUnique">
    <xs:selector xpath="AccountHolder"/>
    <xs:field xpath="IssuingBodyCode"/>
    <xs:field xpath="AccountNumber"/>
</xs:unique>
</xs:element>
</xs:schema>

```

### B7.3 Statistics Schema – Statistics

B7.3.1 Interface Files for Statistics follow the schema (statistics.xsd) described below:

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified">
    <xs:element name="Statistics">
        <xs:complexType>
            <xs:sequence>
                <xs:element ref="DomainCode"/>
                <xs:element ref="IssuingBodyCode"/>
                <xs:element ref="Period" minOccurs="1" maxOccurs="24"/>
            </xs:sequence>
            <xs:attribute name="MessageTransmissionTime" type="xs:dateTime" use="required"/>
            <xs:attribute name="Type" type="statisticsType" use="required"/>
        </xs:complexType>
        <xs:unique name="PeriodMustBeUnique">
            <xs:selector xpath="Period"/>
            <xs:field xpath="@YearMonth"/>
        </xs:unique>
    </xs:element>
    <xs:element name="DomainCode">
        <xs:simpleType>
            <xs:restriction base="xs:token">
                <xs:minLength value="2"/>
                <xs:maxLength value="3"/>
            </xs:restriction>
        </xs:simpleType>
    </xs:element>

```

```
</xs:simpleType>
</xs:element>
<xs:element name="IssuingBodyCode">
  <xs:simpleType>
    <xs:restriction base="xs:token">
      <xs:length value="2"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="Period">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="Item" minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="YearMonth" use="required" type="xs:gYearMonth"/>
  </xs:complexType>
  <xs:unique name="TypeOfInstallationAndEnergySourceMustBeUniqueForPeriod">
    <xs:selector xpath="Item"/>
    <xs:field xpath="@TypeOfInstallation"/>
    <xs:field xpath="@EnergySource"/>
  </xs:unique>
</xs:element>
<xs:element name="Item">
  <xs:complexType>
    <xs:choice>
      <xs:sequence>
        <xs:element ref="ProductionDate"/>
        <xs:element ref="TransactionDate" minOccurs="0" maxOccurs="1"/>
      </xs:sequence>
      <xs:sequence>
        <xs:element ref="TransactionDate"/>
      </xs:sequence>
    </xs:choice>
    <xs:attribute name="TypeOfInstallation" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:token">
          <xs:length value="7"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="EnergySource" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:token">
          <xs:length value="9"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```

```

        </xs:attribute>
    </xs:complexType>
</xs:element>
<xs:element name="ProductionDate">
<xs:complexType>
    <xs:choice>
        <xs:sequence>
            <xs:element name="Issue" type="certificateCount"/>
            <xs:element name="Cancel" type="certificateCount" minOccurs="0"/>
            <xs:element name="Expire" type="certificateCount" minOccurs="0"/>
        </xs:sequence>
        <xs:sequence>
            <xs:element name="Cancel" type="certificateCount"/>
            <xs:element name="Expire" type="certificateCount" minOccurs="0"/>
        </xs:sequence>
        <xs:sequence>
            <xs:element name="Expire" type="certificateCount"/>
        </xs:sequence>
    </xs:choice>
</xs:complexType>
</xs:element>
<xs:element name="TransactionDate">
<xs:complexType>
    <xs:choice>
        <xs:sequence>
            <xs:element name="Issue" type="certificateCount"/>
            <xs:element name="Transfer" type="certificateCount" minOccurs="0"/>
            <xs:element name="Export" type="certificateCount" minOccurs="0"/>
            <xs:element name="Import" type="certificateCount" minOccurs="0"/>
            <xs:element name="Expire" type="certificateCount" minOccurs="0"/>
            <xs:element name="Withdraw" type="certificateCount" minOccurs="0"/>
            <xs:element ref="Cancel" minOccurs="0" maxOccurs="unbounded"/>
        </xs:sequence>
        <xs:sequence>
            <xs:element name="Transfer" type="certificateCount"/>
            <xs:element name="Export" type="certificateCount" minOccurs="0"/>
            <xs:element name="Import" type="certificateCount" minOccurs="0"/>
            <xs:element name="Expire" type="certificateCount" minOccurs="0"/>
            <xs:element name="Withdraw" type="certificateCount" minOccurs="0"/>
            <xs:element ref="Cancel" minOccurs="0" maxOccurs="unbounded"/>
        </xs:sequence>
        <xs:sequence>
            <xs:element name="Export" type="certificateCount"/>
            <xs:element name="Import" type="certificateCount" minOccurs="0"/>
            <xs:element name="Expire" type="certificateCount" minOccurs="0"/>
            <xs:element name="Withdraw" type="certificateCount" minOccurs="0"/>
        </xs:sequence>
    </xs:choice>
</xs:complexType>
</xs:element>

```

```

        <xs:element ref="Cancel" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:sequence>
        <xs:element name="Import" type="certificateCount"/>
        <xs:element name="Expire" type="certificateCount" minOccurs="0"/>
        <xs:element name="Withdraw" type="certificateCount" minOccurs="0"/>
        <xs:element ref="Cancel" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:sequence>
        <xs:element name="Expire" type="certificateCount"/>
        <xs:element name="Withdraw" type="certificateCount" minOccurs="0"/>
        <xs:element ref="Cancel" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:sequence>
        <xs:element name="Withdraw" type="certificateCount"/>
        <xs:element ref="Cancel" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:sequence>
        <xs:element ref="Cancel" maxOccurs="unbounded"/>
    </xs:sequence>
</xs:choice>
</xs:complexType>
<xs:unique
name="CancelConsumptionDomainCodeAndConsumptionYearMustBeUniqueForTransaction
Date">
    <xs:selector xpath="Cancel"/>
    <xs:field xpath="@ConsumptionDomainCode"/>
    <xs:field xpath="@ConsumptionYear"/>
</xs:unique>
</xs:element>
<xs:element name="Cancel">
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension base="certificateCount">
                <xs:attribute name="ConsumptionDomainCode" use="optional" default="NUL">
                    <xs:simpleType>
                        <xs:restriction base="xs:token">
                            <xs:minLength value="2"/>
                            <xs:maxLength value="3"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:attribute>
                <xs:attribute name="ConsumptionYear" use="optional" type="xs:gYear"
default="1000"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>

```

```
</xs:element>
<xs:simpleType name="statisticsType">
  <xs:restriction base="xs:token">
    <xs:enumeration value="EECS-Electricity"/>
    <xs:enumeration value="EECS-EnergyGas"/>
    <xs:enumeration value="EECS-Hydrogen"/>
    <xs:enumeration value="National-Electricity"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="certificateCount">
  <xs:restriction base="xs:nonNegativeInteger">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="1000000000"/>
  </xs:restriction>
</xs:simpleType>
</xs:schema>
```

## ANNEX C - EECS Transfer and Account Holders Interface Transport Specification

### C1 Introduction

#### C1.1 Purpose

- C1.1.1 This annex details the message transport aspects of the Interface Specification for communication between EECS Registration Databases.
- C1.1.2 The scope of this Interface Specification annex is the definition of all interfaces between EECS Registration Databases using the AIB Hub. Interfaces between individual database operators and other national or participant systems unique to a specific domain are not part of this annex and are therefore not included.

#### C1.2 Approach

- C1.2.1 This annex takes the requirements outlined in the main document, AIB-EECS -SD03, and specifies a protocol for transferring files and a method of providing public/private security keys.

#### C1.3 File transfer protocols

- C1.3.1 Web service connection between Registries and the AIB Hub

The AIB Hub web service is exposed by the AIB Hub to receive messages and acknowledgements from the Registry via https connection. The AIB Hub expects the Registry operator to expose its registry web service to the AIB Hub to receive those messages and acknowledgements. The web services are described in C2.

#### C1.4 Protocol Specification

- C1.4.1 **Signed:** all messages are digitally signed by the Sender. The AIB Hub validates the digital signature on receipt and digitally signs the message before it is sent to the recipient. The recipient validates the digital signature from the Hub on receipt. The signature format is X509 as incorporated into the SSL (Secure Sockets Layer) protocol.





**AIB-HPA-A2-HubCOM**  
**HUB USER COMPLIANCE DOCUMENT**  
**(AIB-EECS-SD03: EECS Registration Databases)**



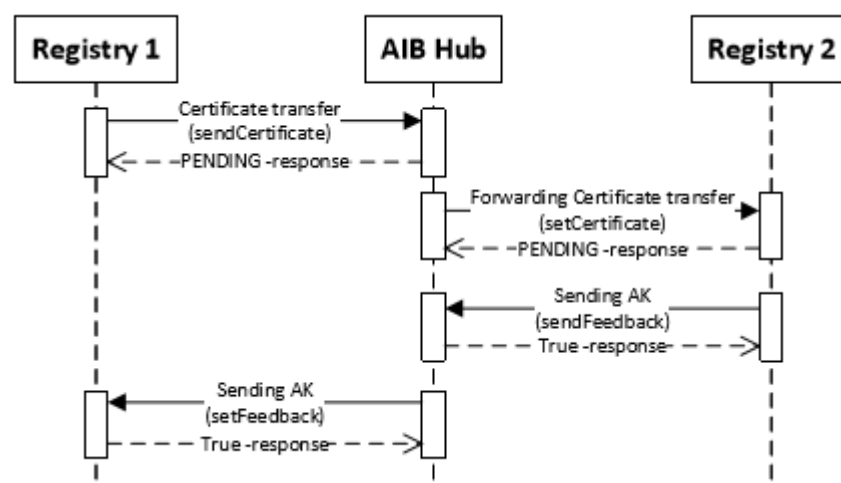
- 
- C1.4.2 Use of a signature addresses the **attributable** and **accurate** requirements. X509 is supported by Microsoft and the openssl project and is available on suitably up to date versions of Windows and Unix. This form of the signature therefore supports the **immediate, delivery, and cost** requirements.
- C1.4.3 **Encrypted:** all messages are encrypted after signature. The encrypted message conforms to the S/MIME message structure.
- C1.4.4 Encryption addresses the **private** requirement. S/MIME is supported by Microsoft and the openssl project and is available on suitably up to date versions of Windows and Unix. This form of encryption therefore supports the **immediate, delivery, and cost** requirements.
- C1.4.5 **Acknowledgement:** on receipt of a message the recipient is required to validate the signature and confirm that the message conforms to the expected structure and that the data content is of the correct type and falls within expected ranges. The recipient must generate an AK message if the message is acceptable and a NAK message otherwise. This acknowledgement is then signed and returned to the return address via the Hub given on the incoming message. The original Sender should look for a valid acknowledgement. If there is no response within the defined **AK-time**, or if a NAK is received, the original Sender should attempt to resolve the problem by direct contact with the original recipient and thereafter the Hub.
- C1.4.6 The use of an acknowledgement response in this way addresses the **transparency** requirement. The need to validate the original message before transmitting the acknowledgement introduces a process within the receiving registry which is outside the scope of this annex. It is therefore not possible to say what impact the acknowledgement activity will have on the **AK-time** requirement. It is left to each individual registry operator to devise appropriate procedures to address this.
- C1.5 Management of Public/Private Keys**
- C1.5.1 **CA:** A Certificate Authority is required to issue Digital Certificates on behalf of all Registries. This body also generates the public/private key pair for each registry. The AIB is responsible for providing this service.
- C1.5.2 The use of a CA simplifies the issue and management of keys. It therefore addresses the **attributable, private, immediate and delivery** requirements. The **cost** implications will vary from registry to registry depending on their level of expertise in handling Digital Certificates.
- C1.5.3 Key protocol: The CA generates a public/private key pair for each registry. The public keys are signed and issued to all Registries. The private key, signed by the CA, is sent to the relevant registry.
- C1.5.4 Allowing a registry to generate its own keys would add complexity to the key exchange protocols.
- C1.5.5 The CA can be required to ensure that a sufficiently random input is used to generate key pairs.
- C1.5.6 Each Registry Operator is responsible for monitoring the contents of its specified receipt container on its own server location and initiating the processing operation once a file is detected.
- C1.5.7 It is the responsibility of individual Registries to manage the files and security on their own server locations.

## **C2 AIB HUB Web Service Interface Description**

- C2.1 Where an EECS Registration Database is connected to the AIB Hub through the AIB Hub web service, then it must use the definitions set out in this appendix.**
- C2.1.1 General requirements for the web services:



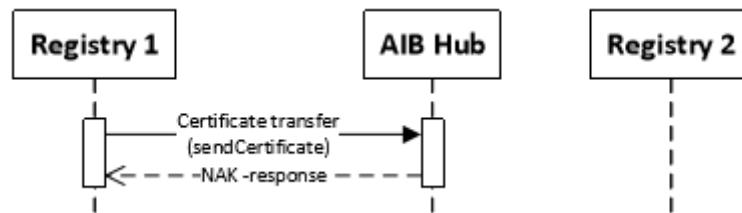
- C2.1.2 The AIB Hub will communicate with your Web Service via the specified URL defined in the Registry configuration (in the AIB Hub web interface).
- C2.1.3 A HTTP secure connection is required to exchange certificates through the AIB Hub by a web service (https).
- C2.1.4 The registry must authenticate to the AIB Hub Web Service via a client certificate. AIB Hub will not authenticate via a client certificate. The description of the certificates used in the communication can be found from separate documentation: "AIB Hub Connection guide".
- C2.1.5 The transfer XML encryption is described later in this document.
- C2.1.6 It is recommended that the registry restricts the access to its Web Service to the IP address of the AIB Hub server.
- C2.1.7 The Registry Web Service should support SOAP 1.1 standard, and that it conforms to the WSDL description given in this document. The namespaces for the SOAP messages are described later in Appendix C.
- C2.1.8 The time-out for the Web Service connections to AIB Hub is 2 minutes and the same timeout is recommended for the Registry as well. The timeout setting can be revisited time to time by AIB. For avoiding manual work for Registries Operators and AIB Hub Superuser it is recommended to take all the possible actions to avoid timeout in the communications.
- C2.1.9 If timeout anyway happens it is highly recommended to check manually what is the real situation of it in the AIB Hub and in the counter registry.
- C2.1.10 The maximum length of an input and output requests are reflected by the maximum limit of the certificate bundles per transfer (ref: 2.3.5.4). NOTE: encryption of a file increases the size of a request relatively much in top of the plain transfer XML size.
- C2.1.11 Necessary preventions on exposing the Web Service are to be taken care by the AIB for the Hub and by the Registries Operators connected into it.
- C2.1.12 The registry Web Service should handle receiving several simultaneous requests from AIB Hub.
- C2.1.13 Below are basic flows of communication between registries and AIB Hub.
- C2.1.14 Deliver a transfer XML from Registry1 to Registry2. It consists of four separate Web Service requests as shown below (each of those have 2 minutes' timeout from Hub end).



- Registry1 initiates a transfer to AIB Hub using **SendCertificate** request of AIB Hub Web Service.

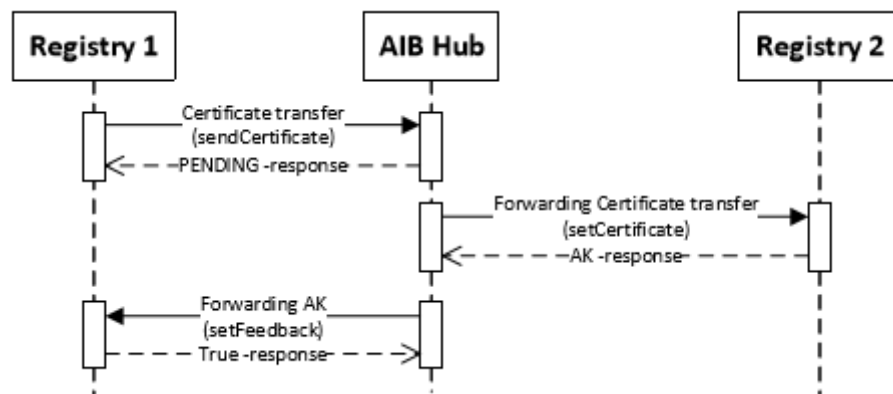
- AIB Hub validates the request and replies to Registry1 with **SendCertificateResponse** (PENDING) to notify the request was received and to close the connection to Registry1.
- AIB Hub forwards the transfer to Registry2 using **SetCertificate** request of Registry2 Web Service.
  - Registry2 takes the request for processing and replies to Hub with **SetCertificateResponse** (PENDING) to notify the request was received and to close the connection to AIB Hub. Meanwhile Registry2 will further process the request.
- Registry2 gives the final answer to AIB Hub using **SendFeedback** request (AK/NAK) of AIB Hub Web Service.
  - AIB Hub replies to Registry2 with **SendFeedbackResponse=**True to notify the request was received and to close the connection to Registry2.
- AIB Hub forwards the answer to Registry1 using **SetFeedback** request (AK/NAK) of Registry1 Web Service.
  - Registry1 replies to AIB Hub with **SetFeedbackResponse=**True to notify the request was received and to close the connection to AIB Hub.

C2.1.15 Deliver a transfer from Registry1 to Registry2 in case AIB Hub finds the transfer message or content of the message being invalid.



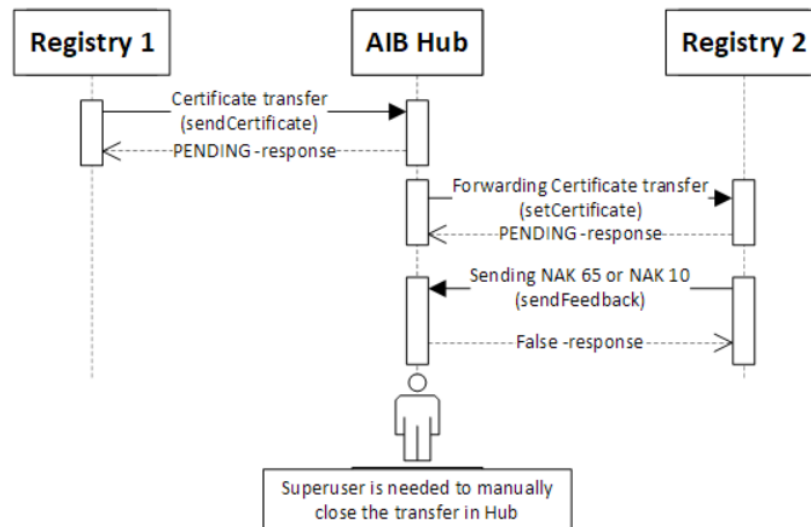
- Registry1 initiates a transfer to AIB Hub using **SendCertificate** request of AIB Hub Web Service.
  - Hub replies to Registry1 with **SendCertificateResponse** with NAK answer to close the connection to Registry1. There will not be connection to Registry2 at all.

C2.1.16 Deliver a transfer message from Registry1 to Registry2 in case Registry2 has not implemented PENDING reply for **SetCertificate**. This option is not recommended as it is very likely to lead timeout situation between AIB Hub and Registry2.



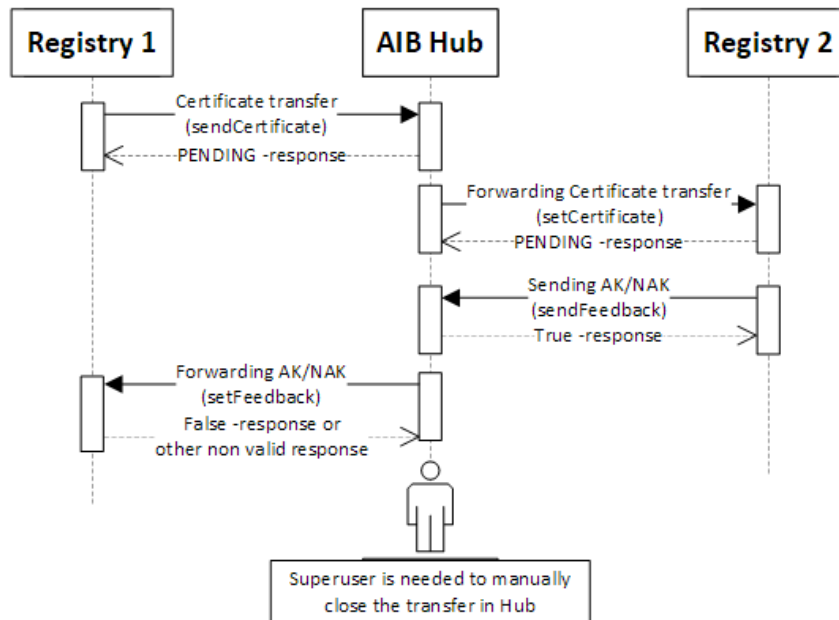
- Registry1 initiates a transfer to AIB Hub using **SendCertificate** request of AIB Hub Web Service.

- AIB Hub validates the request and replies to Registry1 with **SendCertificateResponse** (PENDING) to notify the request was received and to close the connection to Registry1.
  - AIB Hub forwards the transfer to Registry2 using **SetCertificate** request of Registry2 Web Service.
    - Registry2 takes the request for processing and replies to Hub with **SetCertificateResponse** (AK) to notify the transfer was accepted in their registry and to close the connection to AIB Hub. NOTE: there is a high possibility for a timeout especially in case of big file as import of it could take long time to progress. It would be recommended that Registry would implement sending of PENDING.
  - AIB Hub forwards the answer to Registry1 using **SetFeedback** request (AK/NAK) of Registry1 Web Service.
    - Registry1 replies to AIB Hub with **SetFeedbackResponse**=True to notify the request was received and to close the connection to AIB Hub.
- (b) Special handling of NAK 65 and NAK 10 error codes. When AIB Hub receives NAK 65 (double counting) or NAK 10 (the same transfer was sent already) from the Registry 2, it does not forward it to Registry1. Those both might be related to certificate double counting situation. The transfer is kept open in AIB Hub. After investigation of the reason behind the error, the transfer can be closed from AIB Hub user interface by a Superuser.

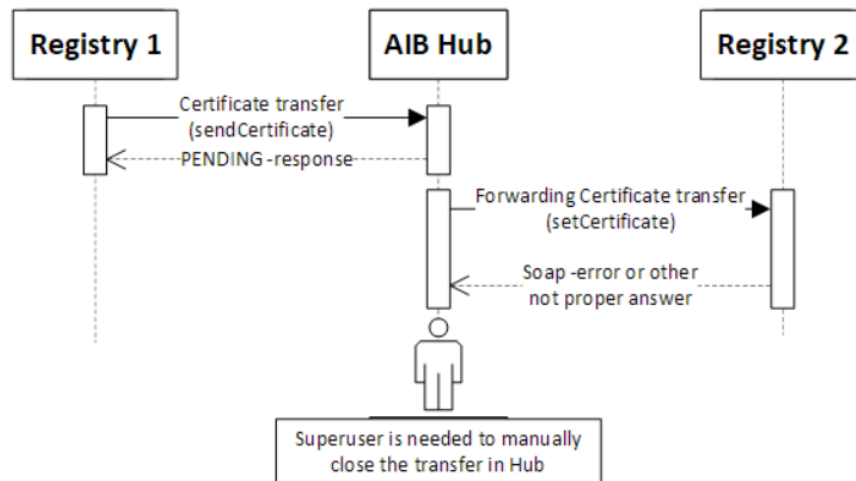


- Registry1 initiates a transfer to AIB Hub using **SendCertificate** request of AIB Hub Web Service.
  - AIB Hub validates the request and replies to Registry1 with **SendCertificateResponse** (PENDING) to notify the request was received and to close the connection to Registry1.
  - NOTE: if it would be AIB Hub which finds that there is Double counting or that the same transfer was already sent, then the Hub would not forward the message to Registry2 at all, but instead keep the transfer open to wait for Superuser action.
- AIB Hub forwards the transfer to Registry2 using **SetCertificate** request of Registry2 Web Service.

- Registry2 takes the request for processing and replies to Hub with **SetCertificateResponse** (PENDING) to notify the request was received and to close the connection to AIB Hub. Meanwhile Registry2 will further process the request.
  - Registry2 gives the final answer to AIB Hub using **SendFeedback** request (NAK 65 or NAK 10) of AIB Hub Web Service.
  - AIB Hub replies to Registry2 with **SendFeedbackResponse=**False to notify to the receiver to close the connection to Registry2, but to say that the NAK is not forwarded. AIB Hub does not forward the NAK 65 nor NAK 10 to Registry. For closing the transfer in the AIB Hub (and possible in Registry1), Superuser manual action is needed.
- (c) Some other cases when the transfer is not completed in the AIB Hub and needs special manual attention from Superuser to close the transfer in the AIB Hub and possible in the registries:
- (i) In case the Registry 1 gives false-response or other non-valid response for the setFeedback call:



- (ii) In case Registry2 gives soap-error or other non-valid response to the setCertificate-call:



- (d) In case Superuser action is needed to close a transaction manually, there is needed a communication between Superuser, Registry1 and Registry2 to find out the correct status of the transfer and decide what is the correct action to follow. There are three possibilities:
- (i) Superuser can close the transfer in AIB Hub by sending NAK to Registry1 from the User interface of AIB Hub
  - (ii) Superuser can close the transfer in AIB Hub by sending AK to Registry1 from the User interface of AIB Hub
  - (iii) Superuser can close the transfer in AIB Hub without sending any answer to Registry1, in case the transfer is already completed in the Registry1 and with correct status.

## C2.2 Web Services exposed by the AIB Hub to Registries

C2.2.1 This interface describes the Web Service input interface of the AIB Hub. Registries will use this interface for communicating with the AIB Hub. The interface is responsible for receiving the transfer messages and acknowledgements (AK/NAK/PENDING) from Registries. The AIB Hub will forward the request to another registry using the output interface described in C2.3.1. The web service request can contain one of following contents:

- (e) One transfer message with certificates from the Sender Registry web service (**SendCertificate**)
- (f) Acknowledgement (AK/NAK/PENDING) message from the Receiving Registry web service. (**SendFeedback**)

### C2.2.2 **SendCertificate**: Request for sending a transfer

C2.2.3 When the **SendCertificate** of the AIB Hub Web Service is imposed by a Sending Registry, the AIB Hub will validate the request and its content against the set of rules and master data and log the details of the transfer into the AIB Hub database and possibly convert the message to another XML Schema where relevant.

C2.2.4 If all the validations are passed in the AIB Hub, then the AIB Hub will respond with **SendCertificateResponse** with **ReturnCode** PENDING (ref. C2.2.8) to close the Web Service call for time being and forward the transfer to Receiving Registry by using the **SetCertificate** method of the Receiving Registry (ref. C2.3.2).

C2.2.5 If the validation would fail in the AIB Hub, then the AIB Hub will respond with **SendCertificateResponse** with **ReturnCode** NAK (ref. C2.2.8) to close the Web Service call to Sending Registry and no connection to Receiving Registry will be established.

C2.2.6 **SendCertificate** elements are described below:

- (i) **sCertificateMime** (xs:string, mandatory):
  - A string containing the transfer xml (the xml format is described in ANNEX B -).
  - UTF-8 encoding must be used.
  - There are three possibilities how the **sCertificateMime** parameter can be filled:
    1. XML message in an encrypted and signed form (NOTE: If the Registry Operator has enabled the "Signed mime" option in the registry configuration in the AIB Hub, the mime message should be signed.)
    2. XML message in an encrypted form without signature.
    3. Plain XML message.

Encryption and signature is done primarily in a native way by web service technologies (client PKI certificate and HTTPS protocol). Encryption and signature of the **sCertificateMime** (XML message) itself is only an optional feature. AIB Hub identifies these options on the fly during the web service request processing. The description of certificates to be used for encryption and decryption can be found from additional document "AHUB-Connection Guide.

- (ii) **bTest (xs:boolean, optional)**: Flag to define if the transfer is meant to be a test file and not to be handled as normal production mode transfer. Possible values:
  - 1 **True**: The requests send to AIB Hub will be handled by the AIB Hub testing tool (described in D5) and will not be recorded as a production mode transfer and will not be forwarded to the Receiving Registry. If a registry is performing the automated tests described in D5, the value should be true.
  - 2 **False**: The transfer will be handled as Production mode transfer. The value should be false if the registry is expecting to send production mode transfers.

C2.2.7 XML example of **SendCertificate**:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<SendCertificate xmlns="http://system.aibhub.net/">
<sCertificateMime>Content-Disposition: attachment; filename=smime.p7m Content-Transfer-
Encoding: base64 Content-Type: application/x-pkcs7-mime; name=smime.p7m
MIJOJgYJKoZIhvcNAQc....
</sCertificateMime>
<bTest>true</bTest>
</SendCertificate>
</soap:Body>
</soap:Envelope>
```

C2.2.8 **SendCertificateResponse**: output for **SendCertificate** request

C2.2.9 When Sending Registry is using the **SendCertificate** method of the AIB Hub, the AIB Hub is expected to respond to the Sending Registry with a **SendCertificateResponse** as an output within timeout limit given in C2.1.



C2.2.10 If a valid **SendCertificateResponse** is not given as output for a **SendCertificate** request (timeout, invalid answer), it is recommended that the Registry Operator keeps the transfer open in their registry to avoid possible double counting and check with Superuser and the Receiving Registry the status of the transfer. Similarly, the AIB Hub keeps the transfer in Waiting for AK status, if Receiving Registry is not replying with this answer into the **SetCertificate** call.

C2.2.11 The valid **SendCertificateResponse** contains **SendCertificateResult**, which is type of **ReturnMessage**.

C2.2.12 **ReturnMessage** elements are described below:

- (iii) **ReturnCode (xs:string, mandatory):** defines if the transfer was accepted or not by the receiver. The possible values for **ReturnCode** are:
  - 1 "NAK": the transfer validation failed either in AIB Hub or in the Receiving Registry (Negative acknowledgement)
  - 2 "AK": the transfer validation was successful in the AIB Hub and the transfer was delivered and accepted by the Receiving Registry (Positive acknowledgement)
  - 3 "PENDING": the transfer validation was successful in the AIB Hub, and the transfer has been taken for further progressing. The AK or NAK will be returned later.
- (iv) **Id (xs:string, mandatory):** The unique id of the message to which the answer belongs to. (ref. B4.4.2) NOTE: Id can contain leading zero and hence it is defined as a string.
- (v) **ErrorCode (xs:int, mandatory):** The valid value for **ErrorCode** depends on the value of **ReturnCode**:
  - 1 In case **ReturnCode** = "NAK": **ErrorCode** > 0 and is one of the error codes given in the Fact Sheet 18.
  - 2 In case **ReturnCode** = "AK": **ErrorCode** = 0
  - 3 In case **ReturnCode** = "PENDING": **ErrorCode** = 0
- (vi) **ErrorMessage (xs:string, optional):** Error message given (recommended value is the description from Fact Sheet 18).
- (vii) **DestinationVersion (string, optional):** The field will be filled with the XML version of the transfer, which has been used by the AIB Hub to send the transfer to the Receiving Registry.
- (viii) **AdditionalInfo (string, optional):** Contains additional information about the error occurred.
- (ix) **SignatureMime (string, optional):** If the mime message signature is enabled for the registry configuration, this property will contain a signed mime body with the **ReturnCode** + **Id**, signed with the client certificate. For example, if the **ReturnCode** is a "NAK" and the **Id** is 992017010100001, then the text in the mime body is "NAK992017010100001", which is signed with the client certificate.

C2.2.13 XML example of **SendCertificateResponse**:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<SendCertificateResponse xmlns="http://system.aibhub.net/">    <SendCertificateResult>
```

```
<ReturnCode>NAK</ReturnCode>
<Id>992017010100001</Id>
<ErrorCode>1</ErrorCode>
<ErrorMessage>Not correct signed</ErrorMessage>
<AdditionalInfo>The registry configuration for your authentication is in productive mode, but the
file you have sent was sent in test mode!</AdditionalInfo> </SendCertificateResult>
</SendCertificateResponse>
</soap:Body>
</soap:Envelope>
```

C2.2.14 **SendFeedback**: Request for sending an AK or a NAK answer to a transfer asynchronously

C2.2.15 **SendFeedback** method allows the Receiving Registry to send a NAK or an AK answer to a received transfer if PENDING was given as a reply for the **SendCertificateResponse (C2.2.10)**.

C2.2.16 When AIB Hub receives **SendFeedback** request, the request is being validated and Hub will give **SendFeedbackResponse** as an output (C2.2.19). If the validations were passed, the request is forwarded to the Sending Registry using **SetFeedback** (ref. C2.3.10). If the validations were not passed, then the transfer is being kept in “Waiting for AK” status and the answer is not forwarded to the Sending Registry.

C2.2.17 **SendFeedback** method contains **FeedbackMessage** (mandatory). FeedbackMessage element then contains **ReturnMessage** similar than was described in C2.2.12 with below differences:

- (x) As a **ReturnCode** only “AK” and “NAK” are allowed.
- (xi) The decision whether the **SignatureMime** is filled in is up to the Registry Operator. If it is given, AIB Hub is validating it.

C2.2.18 XML example of **SendFeedback**:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<SendFeedback xmlns="http://system.aibhub.net/">
<FeedbackMessage>
<ReturnCode>NAK</ReturnCode>
<Id>992017010100001</Id>
<ErrorCode>5</ErrorCode>
<ErrorMessage>File was not encrypted</ErrorMessage>
<DestinationVersion />
<AdditionalInfo />
</FeedbackMessage>
</SendFeedback>
</soap:Body>
</soap:Envelope>
```

C2.2.19 **SendFeedbackResponse**: Output for **SendFeedback** request

C2.2.20 When the Receiving Registry is using the **SendFeedback** method of the AIB Hub, the AIB Hub is expected to respond to the Receiving Registry with **SendFeedbackResponse** as an output within timeout limit given in C2.1.

C2.2.21 Below is described the elements required for that message:



- (xii) **SendFeedbackResponse** (mandatory, Boolean) being either True or False:
- 1 True: the delivery of the answer was successful. If AIB Hub receives this answer, then the status of the transfer in Hub will be set to completed and will not accept further answers to the transfer.
  - 2 False: the delivery of the answer was not successful; if AIB Hub will receive this answer, then it will keep the transfer in “Waiting for Acknowledgement” status and hence Superuser can complete the transfer from User interface manually. The same happens if the SendFeedBackResponse is not sent on time.

C2.2.22 XML example of SendFeedbackResponse

```
<?xml version="1.0" encoding="utf-8"?> <soap:Envelope
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
  <SendFeedbackResponse xmlns=http://system.aibhub.net/>
    <SendFeedbackResult>>false</SendFeedbackResult>
  </SendFeedbackResponse>
</soap:Body>
</soap:Envelope>
```

C2.2.23 **SendAccountHolders**: Request for sending Account Holders to AIB Hub

C2.2.24 It is recommended to call the method daily as a maximum and to send the uploads of the Account Holders of the Registry before midnight UTC to coordinate with the downloads of the other Registries.

C2.2.25 When **SendAccountHolders** of AIB Hub Web Service is imposed by a Registry, the AIB Hub will validate the request and its content against the set of rules and master data and log the details of the request into the AIB Hub database and if the validation was ok, update the Account Holders sent in the request.

C2.2.26 AIB Hub will answer to this call using **SendAccountHoldersResponse**, which is described in C2.2.29.

C2.2.27 **SendAccountHolders** elements are described below:

- (xiii) **AccountHoldersMime** (xs:string, mandatory):
- A string containing the Account Holders xml (the xml schema is described in **Error! Reference source not found.ANNEX B -**)
  - When sending Account Holders, all the active Account Holders of the Registry should be included into the XML (the ones not included will be set inactive in the AIB Hub with ValidTo -date as the date of sending the file).
  - Account Holders are transferred in MIME format (similar to certificate transfers) and encrypted with registry\_WEB public certificate.
  - UTF-8 encoding must be used.
  - There are three possibilities how the **AccountHoldersMime** parameter can be filled:
    1. XML message in an encrypted and signed form (NOTE: If the Registry Operator has enabled the "Signed mime" option in the registry configuration in the AIB Hub, the **AccountHoldersMime** must be signed with Registry PKI certificate REGISTRY\_AUTH)
    2. XML message in an encrypted form without signature.
    3. Plain XML message.

Encryption and signature is done primarily in a native way by web service technologies (client PKI certificate and HTTPS protocol). Encryption and signature of the **AccountHoldersMime** (XML message) itself is only an optional feature. AIB Hub identifies these options on the fly during the web service request processing. The description of certificates to be used for encryption and decryption can be found from additional document "AHUB-Connection Guide".

C2.2.28 XML example of SendAccountHolders:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<SendAccountHolders xmlns="http://system.aibhub.net/">
  <AccountHoldersMime>
    Content-Type: application/x-pkcs7-mime; name="smime.p7m"; smime-type="enveloped-
data"
    Content-Disposition: attachment; filename="smime.p7m"
    Content-Transfer-Encoding: base64
MIIILtgYJKoZIhvcNAQcDoIILpzCCC6MCAQAxggKuMIICqgIBADCBkTCBhTElMAkGA1UEBhMCQkUx
GzAZBgNVBAGTEkJSVVhFTExFUy1DQVBJVEFMRTESMBAGA1UEBxMjQnJ1eGVsbGVzMSwwKgYDVQ
QKEyNBU1NPQ0IBVEIPTiBPRiBJU1NVSU5HIEJPREIFUyBBSVNCTDEXMBUGA1UEAxM0d3d3LmFpYm
h1
    ...
  </AccountHoldersMime>
</SendAccountHolders>
</soap:Body>
</soap:Envelope>
```

(xiv) Example of "plain-text" decrypted form of previous WS call – the first example has all fields filled, and the second only the compulsory:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<SendAccountHolders xmlns="http://system.aibhub.net/">
  <AccountHoldersMime>
    <?xml version="1.0" encoding="UTF-8"?>
    <AccountHolders>
      <AccountHolder>
        <IssuingBodyCode>43</IssuingBodyCode>
        <AccountNumber>43X0EXMP1B</AccountNumber>
        <CompanyName>Company 1</CompanyName>
        <Country>BE</Country>
        <PostCode>01234</PostCode>
        <City>ExampleCity1</City>
        <ValidFrom>2018-01-01</ValidFrom>
        <ValidTo>2099-12-31</ValidTo>
        <VATNumber>BE0000000000001</VATNumber>
        <ModifiedOn>2018-02-23</ModifiedOn>
      </AccountHolder>
      <AccountHolder>
        <IssuingBodyCode>43</IssuingBodyCode>
        <AccountNumber>43X0EXMP29</AccountNumber>
        <CompanyName>Company 2</CompanyName>
        <Country>CZ</Country>
        <ValidFrom>2016-01-01</ValidFrom>
        <ValidTo>2099-12-31</ValidTo>
```

```

</AccountHolder>
</AccountHolders>
</AccountHoldersMime>
</SendAccountHolders>
</soap:Body>
</soap:Envelope>

```

C2.2.29 **SendAccountHoldersResponse**: output for **SendAccountHolders** request

C2.2.30 When a Registry is using the **SendAccountHolders** method of the AIB Hub, the AIB Hub is expected to respond to the Sending Registry with **SendAccountHoldersResponse** as an output within timeout limit given in C2.1.

C2.2.31 If valid **SendAccountHoldersResponse** is not given as an output for **SendAccountHolders** request (timeout, invalid answer), it is recommended that the Registry Operator would check from the AIB Hub user interface if the file was processed fine before resending the request.

C2.2.32 The valid **SendAccountHoldersResponse** contains **SendAccountHoldersResult**, which is type of **SendAccountHoldersReturnMessage**.

C2.2.33 **SendAccountHoldersReturnMessage** elements are described below:

(xv) **Result (xs:boolean, minOccurs="1", maxOccurs="1")**: defines if the request was accepted or not:

- 1 "TRUE": The request validation was successful in the AIB Hub and the Account Holders were updated in the Account Holder database
- 2 "FALSE": The request validation was not successful; the errors is described in the **ErrorMessage**.

(xvi) **ErrorMessage (xs:string, minOccurs="1", maxOccurs="1")**: If there was errors on the sent file, AIB Hub will give the errors in this field: If all was ok, this will be empty.

C2.2.34 XML example of **SendAccountHoldersReturnMessage**:

(xvii) **Result = True**:

```

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<SendAccountHoldersResponse xmlns=>
<SendAccountHoldersResult>
<Result>>true</Result>
<ErrorMessage></ErrorMessage>
</SendAccountHoldersResult>
</SendAccountHoldersResponse>
</soap:Body>
</soap:Envelope>

```

(xviii) **Result = False**:

```

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<SendAccountHoldersResponse xmlns="http://system.aibhub.net/">
<SendAccountHoldersResult>
<Result>>false</Result>
<ErrorMessage>Error on line 4: 02 – Non-existing Country Code</ErrorMessage>

```

```
</SendAccountHoldersResult>
</SendAccountHoldersResponse>
</soap:Body>
</soap:Envelope>
```

- C2.2.35 **GetAccountHolders**: Request for receiving Account Holders XML from AIB Hub
- C2.2.36 It is recommended to call the method daily as a maximum and to download the Account Holders after midnight UTC to coordinate with uploads of other Registries.
- C2.2.37 When **GetAccountHolders** of the AIB Hub Web Service is imposed by a Registry, the AIB Hub will validate the request and its content against the set of rules and master data and log the details of the request into the AIB Hub database. If the validation was ok, it will send back the Account Holders list matching to the given filters. NOTE: both active and in-active Account Holders will be returned as there is no filter for the validity period of the Account Holders.
- C2.2.38 AIB Hub will answer to this call using **GetAccountHoldersResponse**, which is described in C2.2.42GetAccountHoldersResponse: output for GetAccountHolders request.
- C2.2.39 **GetAccountHolders** elements are described below:

- (xix) **IssuingBodyCode** (type="xs:string", minOccurs="1", maxOccurs="1"):
  - Max length: 2 chars (Refer: Fact Sheet 04 (Member code))
  - Default value: Null – No special filter against Issuing Body is done. Account Holders of all the Issuing Bodies will be returned. NOTE: That includes also the Account Holders of your own Registry.
  - If value is given, only the Account holders of the given Issuing Body are returned.
- (xx) **AccountNumber** (type="xs:string", minOccurs="1", maxOccurs="1")
  - Default value: Null – No special filter against Account Number is done. All Account Holders will be returned.
  - If value given, the records where Account Number match to the given Account Number will be returned.
  - Max length: 13 chars
- (xxi) **DateFrom** (type="xs:dateTime", minOccurs="1", maxOccurs="1")
  - Format: "YYYY-MM-DDThh:mm:ss"
  - Default value: Null – No special filter against Account Holder modified date is done. All Account Holders are returned.
  - If value given, only the records, where Account Holder was modified after the given datetime, will be returned (including Account Holders which were inactivated after the given timestamp).

C2.2.40 Couple of examples how to filter the results:

- (xxii) Get all Account Holders in the Account Holder database IssuingBodyCode is null or empty, AccountNumber is null or empty and DateFrom is null or empty.
- (xxiii) Get all Account Holders assigned to the given IssuingBodyCode: IssuingBodyCode is the given IssuingBodyCode, AccountNumber is null or empty and DateFrom is null or empty.
- (xxiv) Get the Account Holder based on the given AccountNumber: IssuingBodyCode is null or empty, AccountNumber is the given AccountNumber and DateFrom is null or empty.
- (xxv) Get all Account Holders which were changed since specified DateTime: IssuingBodyCode is null or empty, AccountNumber is null or empty, DateFrom

is the DateTime in the format "YYYY-MM-DDThh:mm:ss". That will return all Account Holders which were changed since the given timestamp. NOTE: that will include also the inactivated Account Holders if those were changed after the given timestamp.

C2.2.41 XML example of GetAccountHolders:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<GetAccountHolders xmlns="http://system.aibhub.net/">
  <IssuingBodyCode>43</IssuingBodyCode>
  <AccountNumber></AccountNumber>
  <DateFrom>2016-01-01T21:30:00</DateFrom>
</GetAccountHolders>
</soap:Body>
</soap:Envelope>
```

C2.2.42 GetAccountHoldersResponse: output for GetAccountHolders request

C2.2.43 When a Registry is using the **GetAccountHolders** method of AIB Hub, AIB Hub is expected to respond to the Sending Registry with **GetAccountHoldersResponse** as an output within timeout limit given in C2.1.

C2.2.44 If a valid **GetAccountHoldersResponse** is not given as an output for **GetAccountHolders** request (but instead e.g. timeout, invalid answer), the Registry can try to repeat the request, but it is recommended not to do it more than three times. If even the third time did not give results, check the situation in AIB Hub user interface and contact AIB Hub Superuser.

C2.2.45 The valid GetAccountHoldersResponse contains GetAccountHoldersResult, which is type of GetAccountHoldersReturnMessage.

C2.2.46 GetAccountHoldersReturnMessage elements are described below:

(xxvi) **AccountHoldersMime** (xs:string, minOccurs="1", maxOccurs="1"):

- AIB Hub will return the Account Holders in MIME format (similar to certificate transfers) and encrypted with registry\_WEB public certificate.

C2.2.47 XML example of GetAccountHoldersResponse:

(xxvii) **Mime**

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<GetAccountHoldersResponse xmlns="http://system.aibhub.net/">
  <GetAccountHoldersResult>
    <AccountHoldersMime>
      Content-Type: application/x-pkcs7-mime; name="smime.p7m"; smime-type="enveloped-
data"
      Content-Disposition: attachment; filename="smime.p7m"
      Content-Transfer-Encoding: base64
      MIILtgYJKoZIhvcNAQcDoIILpzCCC6MCAQAxggKuMIICqgIBADCBkTCBhTElMAkGA1UEBhMCQkUx
      GzAZBgNVBAGTEKJSVvVhFTExFUy1DQVBJVEFMRTESMBAGA1UEBxMjQnJ1eGVsbGVzMSwwKgYDEyN
      BU1NPQ0IBVEIPTiBPRiBJU1NVSU5HIEJPREIFUyBBSVNCTDEXMBUGA1UEAxMOD3d3LmFpYmhh1
      ...
      ...
    </AccountHoldersMime>
  </GetAccountHoldersResult>
</GetAccountHoldersResponse>
```

```
</soap:Body>
</soap:Envelope>
```

(xxviii) Example of "plain-text" decrypted form of previous WS call:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
<GetAccountHoldersResponse xmlns="http://system.aibhub.net/">
  <GetAccountHoldersResult>
    <AccountHoldersMime>
      <AccountHolder>
        <IssuingBodyCode>43</IssuingBodyCode>
        <AccountNumber>43X0EXMP1B</AccountNumber>
        <CompanyName>Company 1</CompanyName>
        <Country>BE</Country>
        <PostCode>01234</PostCode>
        <City>ExampleCity1</City>
        <ValidFrom>2018-01-01</ValidFrom>
        <ValidTo>2099-12-31</ValidTo>
        <VATNumber>BE0000000000001</VATNumber>
        <ModifiedOn>2018-02-23</ModifiedOn>
      </AccountHolder>
      <AccountHolder>
        <IssuingBodyCode>43</IssuingBodyCode>
        <AccountNumber>43X0EXMP29</AccountNumber>
        <CompanyName>Company 2</CompanyName>
        <Country>CZ</Country>
        <PostCode>12345</PostCode>
        <City>ExampleCity2</City>
        <ValidFrom>2016-01-01</ValidFrom>
        <ValidTo>2099-12-31</ValidTo>
        <VATNumber>BE0000000000002</VATNumber>
        <ModifiedOn>2018-02-23</ModifiedOn>
      </AccountHolder>
    </AccountHoldersMime>
  </GetAccountHoldersResult>
</GetAccountHoldersResponse>
</soap:Body>
</soap:Envelope>
```

### **C2.3 Web Services exposed by Registries to the AIB Hub**

- C2.3.1 This interface describes the Web Service output interface of AIB Hub which should be implemented in the Registry and which the AIB Hub uses for the communication with the Registry. This interface is responsible for forwarding of the message to the web service of the receiving registry and on returning the acknowledgement (AK/NAK/PENDING) messages to the AIB Hub.
- C2.3.2 **SetCertificate:** Request for receiving a transfer from the AIB Hub into the Receiving Registry.
- C2.3.3 AIB Hub calls **SetCertificate** method for forwarding the transfer from Sending Registry to the Receiving Registry after the Sending Registry has been invoking the **SendCertificate** of the AIB Hub Web Service and after AIB Hub has validated the request.
- C2.3.4 When **SetCertificate** of the Receiving Registry Web Service is imposed by the AIB Hub, it is expected that the Receiving Registry will process the request and perform required validations and give **SetCertificateResponse** as an output to AIB Hub following description in C2.3.7.



C2.3.5 Elements for **SetCertificate** are identical to the ones for **SendCertificate** (ref C2.2.6) expect below notifications:

- (xxix) There are two possibilities how the parameter **sCertificateMime** is filled:
  - 1 If the Receiving Registry configuration has an option “Use signed mime” checked, the parameter **sCertificateMime** is encrypted and signed.
  - 2 If the Receiving Registry configuration has an option “Use signed mime” not checked, the parameter **sCertificateMime** is only encrypted.
- (xxx) **bTest (xs:boolean, optional)**: the Registry Operator can define what would be the effect of the bTest flag in their environment for the incoming transfers.

C2.3.6 XML example of **SetCertificate**:

```

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <SetCertificate xmlns="http://system.aibhub.net/">
      <sCertificateMime>Content-Disposition: attachment; filename=smime.p7m
Content-Transfer-Encoding: base64
Content-Type: application/x-pkcs7-mime;
name=smime.p7m MIIGfgYJKoZI...
    </sCertificateMime>
    <bTest>true</bTest>
  </SetCertificate>
</soap:Body>
</soap:Envelope>

```

C2.3.7 SetCertificateResponse: output for SetCertificate request

- (g) **SetCertificate** method expects **SetCertificateResponse** as an output to the request, the reply should be given before the timeout given in C2.1. If the **SetCertificateResponse** is not given on time or is invalid, AIB Hub keeps the transfer in “Waiting for AK” status.

C2.3.8 The valid **SetCertificateResponse** contains **SetCertificateResult**, which is type of **ReturnMessage** described in the C2.2.12)

- (i) It is recommended that the registry would answer always with **ReturnCode** PENDING when receiving this request to avoid timeout situation.

C2.3.9 XML example of SetCertificateResponse:

```

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <SetCertificateResponse xmlns="http://system.aibhub.net/">
      <SetCertificateResult>
        <ReturnCode>NAK</ReturnCode>
        <Id>123456789012345</Id>
        <ErrorCode>5</ErrorCode>
        <ErrorMessage>File was not encrypted</ErrorMessage>
        <DestinationVersion>v71</DestinationVersion>
        <AdditionalInfo>This is just a test</AdditionalInfo>
        <SignatureMime />
      </SetCertificateResult>
    </SetCertificateResponse>
  </soap:Body>
</soap:Envelope>

```

- C2.3.10 **SetFeedback**: request for sending an AK or a NAK answer to a transfer
- C2.3.11 AIB Hub will use this method for delivering an answer to a Sending Registry.
- C2.3.12 When Receiving Registry receives **SetFeedback** request from AIB Hub, **SetFeedbackResponse** output is to be given as an output (ref. C2.3.15). If the **True** response is not given before timeout, the transfer will be kept in 'Waiting for AK' status in AIB Hub.
- C2.3.13 The content of **SetFeedback** is identical to the **SendFeedback**: C2.2.17
- C2.3.14 XML example of **SetFeedback**:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <SetFeedback xmlns="http://system.aibhub.net/">
      <FeedbackMessage>
        <ReturnCode>NAK</ReturnCode>
        <Id>082010070905512</Id>
        <ErrorCode>22</ErrorCode>
        <ErrorMessage>To cS, receiving registry, @1 is unknown CMO</ErrorMessage>
        <DestinationVersion />
        <AdditionalInfo />
      </FeedbackMessage>
    </SetFeedback>
  </soap:Body>
</soap:Envelope>
```

- C2.3.15 **SetFeedbackResponse**: output for **SetFeedback** request
- C2.3.16 When the AIB Hub is using the **SetFeedback** method of a Sending Registry, the Sending Registry is expected to respond to AIB Hub with **SetFeedbackResponse** as an output within timeout limit given in C2.1.
- C2.3.17 Below are described the parameters required for that message:
- (ii) **SetFeedbackResponse** (mandatory, Boolean) being either False or True:
    - 1 **True**: the delivery of the answer was successful. If AIB Hub receives this answer, then the status of the transfer in AIB Hub will be set to "completed" and will not accept further answer to the transfer.
    - 2 **False**: the delivery of the answer was not successful; if AIB Hub will receive this answer, then the transfer will be kept in "Waiting for Acknowledgement" status in AIB Hub and hence Superuser can complete the transfer from AIB Hub manually.

- C2.3.18 XML example of **SetFeedbackResponse**

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <SetFeedbackResponse xmlns="http://system.aibhub.net/">
      <SetFeedbackResult>true</SetFeedbackResult>
    </SetFeedbackResponse>
  </soap:Body>
</soap:Envelope>
```



## **C2.4 WSDL of the Web Service (Web Services Description Language (WSDL))**

C2.4.1 WSDL Definition of AIB Hub Web Service including Account Holder database methods:  
<https://www.aibhub.org/ws/hub?wsdl>

```
<?xml version='1.0' encoding='UTF-8'?>
<wsdl:definitions xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:tns="http://system.aibhub.net/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:ns1="http://schemas.xmlsoap.org/soap/http" name="ServiceSoapService"
targetNamespace="http://system.aibhub.net/">
  <wsdl:types>
    <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://system.aibhub.net/" elementFormDefault="qualified"
targetNamespace="http://system.aibhub.net/" version="1.0">
      <xs:element name="GetAccountHolders">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="IssuingBodyCode" type="xs:string"/>
            <xs:element name="AccountNumber" type="xs:string"/>
            <xs:element name="DateFrom" type="xs:dateTime"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="GetAccountHoldersResponse">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="GetAccountHoldersResult"
type="tns:GetAccountHoldersReturnMessage"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="SendAccountHolders">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="AccountHoldersMime" type="xs:string"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="SendAccountHoldersResponse">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="SendAccountHoldersResult"
type="tns:SendAccountHoldersReturnMessage"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="SendCertificate">
        <xs:complexType>
          <xs:sequence>
            <xs:element minOccurs="0" name="sCertificateMime" type="xs:string"/>
            <xs:element name="bTest" type="xs:boolean"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="SendCertificateResponse">
        <xs:complexType>
          <xs:sequence>
            <xs:element minOccurs="0" name="SendCertificateResult" type="tns:ReturnMessage"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:schema>
  </wsdl:types>

```

```

<xs:element name="SendFeedback">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" name="FeedbackMessage" type="tns:ReturnMessage"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="SendFeedbackResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="SendFeedbackResult" type="xs:boolean"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:complexType name="ReturnMessage">
  <xs:sequence>
    <xs:element minOccurs="0" name="ReturnCode" type="xs:string"/>
    <xs:element minOccurs="0" name="Id" type="xs:string"/>
    <xs:element name="ErrorCode" type="xs:int"/>
    <xs:element minOccurs="0" name="ErrorMessage" type="xs:string"/>
    <xs:element minOccurs="0" name="DestinationVersion" type="xs:string"/>
    <xs:element minOccurs="0" name="AdditionalInfo" type="xs:string"/>
    <xs:element minOccurs="0" name="SignatureMime" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="GetAccountHoldersReturnMessage">
  <xs:sequence>
    <xs:element name="AccountHoldersMime" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="SendAccountHoldersReturnMessage">
  <xs:sequence>
    <xs:element name="Result" type="xs:boolean"/>
    <xs:element name="ErrorMessage" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
</xs:schema>
</wsdl:types>
<wsdl:message name="SendAccountHoldersResponse">
  <wsdl:part element="tns:SendAccountHoldersResponse" name="parameters"></wsdl:part>
</wsdl:message>
<wsdl:message name="GetAccountHoldersResponse">
  <wsdl:part element="tns:GetAccountHoldersResponse" name="parameters"></wsdl:part>
</wsdl:message>
<wsdl:message name="GetAccountHolders">
  <wsdl:part element="tns:GetAccountHolders" name="parameters"></wsdl:part>
</wsdl:message>
<wsdl:message name="SendCertificateResponse">
  <wsdl:part element="tns:SendCertificateResponse" name="parameters"></wsdl:part>
</wsdl:message>
<wsdl:message name="SendAccountHolders">
  <wsdl:part element="tns:SendAccountHolders" name="parameters"></wsdl:part>
</wsdl:message>
<wsdl:message name="SendFeedbackResponse">
  <wsdl:part element="tns:SendFeedbackResponse" name="parameters"></wsdl:part>
</wsdl:message>
<wsdl:message name="SendFeedback">
  <wsdl:part element="tns:SendFeedback" name="parameters"></wsdl:part>
</wsdl:message>
<wsdl:message name="SendCertificate">
  <wsdl:part element="tns:SendCertificate" name="parameters"></wsdl:part>

```



AIB-HPA-A2-HubCOM  
HUB USER COMPLIANCE DOCUMENT  
(AIB-EECS-SD03: EECS Registration Databases)



```
</wsdl:message>
<wsdl:portType name="ServiceSoap">
  <wsdl:operation name="SendFeedback">
    <wsdl:input message="tns:SendFeedback" name="SendFeedback"></wsdl:input>
    <wsdl:output message="tns:SendFeedbackResponse"
name="SendFeedbackResponse"></wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="GetAccountHolders">
    <wsdl:input message="tns:GetAccountHolders" name="GetAccountHolders"></wsdl:input>
    <wsdl:output message="tns:GetAccountHoldersResponse"
name="GetAccountHoldersResponse"></wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="SendCertificate">
    <wsdl:input message="tns:SendCertificate" name="SendCertificate"></wsdl:input>
    <wsdl:output message="tns:SendCertificateResponse"
name="SendCertificateResponse"></wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="SendAccountHolders">
    <wsdl:input message="tns:SendAccountHolders"
name="SendAccountHolders"></wsdl:input>
    <wsdl:output message="tns:SendAccountHoldersResponse"
name="SendAccountHoldersResponse"></wsdl:output>
  </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="ServiceSoapServiceSoapBinding" type="tns:ServiceSoap">
  <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
  <wsdl:operation name="SendFeedback">
    <soap:operation soapAction="http://system.aibhub.net/SendFeedback" style="document"/>
    <wsdl:input name="SendFeedback">
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output name="SendFeedbackResponse">
      <soap:body use="literal"/>
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="GetAccountHolders">
    <soap:operation soapAction="http://system.aibhub.net/GetAccountHolders"
style="document"/>
    <wsdl:input name="GetAccountHolders">
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output name="GetAccountHoldersResponse">
      <soap:body use="literal"/>
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="SendCertificate">
    <soap:operation soapAction="http://system.aibhub.net/SendCertificate" style="document"/>
    <wsdl:input name="SendCertificate">
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output name="SendCertificateResponse">
      <soap:body use="literal"/>
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="SendAccountHolders">
    <soap:operation soapAction="http://system.aibhub.net/SendAccountHolders"
style="document"/>
    <wsdl:input name="SendAccountHolders">
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output name="SendAccountHoldersResponse">
```

```

    <soap:body use="literal"/>
  </wsdl:output>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="ServiceSoapService">
  <wsdl:port binding="tns:ServiceSoapServiceSoapBinding" name="ServiceSoapPort">
    <soap:address location="https://www.aibhub.org/ws/hub"/>
  </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```

#### C2.4.2 Example of a Registry WSDL

```

<WL5G3N0:definitions xmlns:WL5G3N0="http://schemas.xmlsoap.org/wsdl/"
xmlns:WL5G3N1="http://system.aibhub.net/"
xmlns:WL5G3N2="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:WL5G3N3="http://schemas.xmlsoap.org/wsdl/soap12/"
targetNamespace="http://system.aibhub.net/">
  <WL5G3N0:types>
    <s:schema xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:tns="http://system.aibhub.net/" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
elementFormDefault="qualified" targetNamespace="http://system.aibhub.net/">
      <s:element name="SetCertificate">
        <s:complexType>
          <s:sequence>
            <s:element maxOccurs="1" minOccurs="0" name="sCertificateMime" type="s:string"/>
            <s:element maxOccurs="1" minOccurs="1" name="bTest" type="s:boolean"/>
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="SetCertificateResponse">
        <s:complexType>
          <s:sequence>
            <s:element maxOccurs="1" minOccurs="0" name="SetCertificateResult"
type="tns:ReturnMessage"/>
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="ReturnMessage">
        <s:sequence>
          <s:element maxOccurs="1" minOccurs="0" name="ReturnCode" type="s:string"/>
          <s:element maxOccurs="1" minOccurs="0" name="Id" type="s:string"/>
          <s:element maxOccurs="1" minOccurs="1" name="ErrorCode" type="s:int"/>
          <s:element maxOccurs="1" minOccurs="0" name="ErrorMessage" type="s:string"/>
          <s:element maxOccurs="1" minOccurs="0" name="DestinationVersion" type="s:string"/>
          <s:element maxOccurs="1" minOccurs="0" name="AdditionalInfo" type="s:string"/>
          <s:element maxOccurs="1" minOccurs="0" name="SignatureMime" type="s:string"/>
        </s:sequence>
      </s:complexType>
      <s:element name="SetFeedback">
        <s:complexType>
          <s:sequence>
            <s:element maxOccurs="1" minOccurs="0" name="FeedbackMessage"
type="tns:ReturnMessage"/>
          </s:sequence>
        </s:complexType>

```



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```
</s:element>
<s:element name="SetFeedbackResponse">
  <s:complexType>
    <s:sequence>
      <s:element maxOccurs="1" minOccurs="1" name="SetFeedbackResult"
type="s:boolean"/>
    </s:sequence>
  </s:complexType>
</s:element>
</s:schema>
</WL5G3N0:types>
<WL5G3N0:message name="SetCertificateSoapIn">
  <WL5G3N0:part element="WL5G3N1:SetCertificate" name="parameters"/>
</WL5G3N0:message>
<WL5G3N0:message name="SetCertificateSoapOut">
  <WL5G3N0:part element="WL5G3N1:SetCertificateResponse" name="parameters"/>
</WL5G3N0:message>
<WL5G3N0:message name="SetFeedbackSoapIn">
  <WL5G3N0:part element="WL5G3N1:SetFeedback" name="parameters"/>
</WL5G3N0:message>
<WL5G3N0:message name="SetFeedbackSoapOut">
  <WL5G3N0:part element="WL5G3N1:SetFeedbackResponse" name="parameters"/>
</WL5G3N0:message>
<WL5G3N0:portType name="RegistryServiceSoap">
  <WL5G3N0:operation name="SetCertificate">
    <WL5G3N0:input message="WL5G3N1:SetCertificateSoapIn"/>
    <WL5G3N0:output message="WL5G3N1:SetCertificateSoapOut"/>
  </WL5G3N0:operation>
  <WL5G3N0:operation name="SetFeedback">
    <WL5G3N0:input message="WL5G3N1:SetFeedbackSoapIn"/>
    <WL5G3N0:output message="WL5G3N1:SetFeedbackSoapOut"/>
  </WL5G3N0:operation>
</WL5G3N0:portType>
<WL5G3N0:binding name="RegistryServiceSoap" type="WL5G3N1:RegistryServiceSoap">
  <WL5G3N2:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
  <WL5G3N0:operation name="SetCertificate">
    <WL5G3N2:operation soapAction="http://system.aibhub.net/SetCertificate"
style="document"/>
    <WL5G3N0:input>
      <WL5G3N2:body use="literal"/>
    </WL5G3N0:input>
    <WL5G3N0:output>
      <WL5G3N2:body use="literal"/>
    </WL5G3N0:output>
  </WL5G3N0:operation>
  <WL5G3N0:operation name="SetFeedback">
    <WL5G3N2:operation soapAction="http://system.aibhub.net/SetFeedback"
style="document"/>
    <WL5G3N0:input>
      <WL5G3N2:body use="literal"/>
    </WL5G3N0:input>
    <WL5G3N0:output>
      <WL5G3N2:body use="literal"/>
    </WL5G3N0:output>
  </WL5G3N0:operation>
</WL5G3N0:binding>
<WL5G3N0:binding name="RegistryServiceSoap12" type="WL5G3N1:RegistryServiceSoap">
  <WL5G3N3:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
  <WL5G3N0:operation name="SetCertificate">
    <WL5G3N3:operation soapAction="http://system.aibhub.net/SetCertificate"
style="document"/>
```



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```
<WL5G3N0:input>
  <WL5G3N3:body use="literal"/>
</WL5G3N0:input>
<WL5G3N0:output>
  <WL5G3N3:body use="literal"/>
</WL5G3N0:output>
</WL5G3N0:operation>
<WL5G3N0:operation name="SetFeedback">
  <WL5G3N3:operation soapAction="http://system.aibhub.net/SetFeedback"
style="document"/>
  <WL5G3N0:input>
    <WL5G3N3:body use="literal"/>
  </WL5G3N0:input>
  <WL5G3N0:output>
    <WL5G3N3:body use="literal"/>
  </WL5G3N0:output>
</WL5G3N0:operation>
</WL5G3N0:binding>
<WL5G3N0:service name="RegistryService">
  <WL5G3N0:port binding="WL5G3N1:RegistryServiceSoap" name="RegistryServiceSoap">
    <WL5G3N2:address location="https://ac-
esb02.acce.alfa.local:9043/ECS/InternationalCertificatesTrade/receiveCertificate"/>
  </WL5G3N0:port>
</WL5G3N0:service>
</WL5G3N0:definitions>
```



---

## ANNEX D - EECS Transfer Interface Test Specification for the Hub

### D1 Introduction

#### D1.1 Purpose

D1.1.1 This document details the Interface Test Specification (ITS) for the common communication interfaces operated by the registries within the context of the AIB.

D1.1.2 The scope of this ITS document is the definition of all tests to be completed when commissioning interfaces between a Registry and the AIB Hub.

#### D1.2 Approach

D1.2.1 The approach to interface testing is defined, along with requirements for test data and test environments. Individual tests are identified. Specific test scripts, detailed file specifications and registry-specific procedures are not detailed in this document. Each registry will be responsible for the production of these items and the submission of these documents to the AIB. Following completion of any tests the test results will be provided by the AIB Hub.

#### D1.3 Scope of testing

D1.3.1 Communications between registries are, for the purposes of this test specification, assumed to be mediated by the AIB Hub.

D1.3.2 The registry Operator must undertake the full set of tests described in this annex with the AIB Hub testing service and in addition the tests specified in Technical Audit document (SD07) when:

D1.3.3 The registry is newly constituted and has never previously undertaken tests.

D1.3.4 The registry is replaced.

D1.3.5 There is made a change to the registry that may affect compliance with SD03 Hubcom,

D1.3.6 The registry is intended to support a new certificate type or new file format,

D1.3.7 The IB is audited in the context of the AIB Member Audit.

D1.3.8 The following are excluded from registry interface testing:

D1.3.9 tests of interfaces between national or participant systems unique to the registries; and

D1.3.10 testing of the business functionality of the registry provided services.

### D2 Test Mechanism

#### D2.1 Overview

D2.1.1 The AIB Hub provides a communications testing facility (the Test Facility). During a test, messages are passed between the tested registry and the Test Facility. The Test Facility records the responses to the transfers and the results are made available as appropriate.

D2.1.2 A number of test protocols may be defined. These will normally address different file formats required by the ANNEX B -EECS Transfer Interface File Specification, or different versions of the file formats that may from time to time be specified.

D2.1.3 The records kept by the Test Facility allow each registry to be given a test status against each protocol, and, by extension, against a specific file format.



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**D2.2 Test Protocols**

- D2.2.1 Testing facilities are based on the concept that a registry operator will request one of a set of possible protocols. The system will then undergo a pre-defined sequence of sending message files to the chosen registry and expecting files from that registry. The tests do not address any functionality within the tested registry other than the ability to conform to the interface protocol.
- D2.2.2 The tests themselves will address the following abilities:
- D2.2.3 The tested registry is able to operate the secure message transport protocol,
- (iii) Tests address the ability of the Registry to both create and interpret signed and encrypted messages. In practice, this test is rolled up with other tests by requiring test messages to be signed and encrypted.
- D2.2.4 The tested registry is able to send validly formatted files.
- (iv) Tests require the tested registry to send a number of messages with variations on the content of fields as well as on the numbers of repeating elements in the file structure. The tested registry is only required to send valid files. Invalid files are, for the most part detected and rejected by the Hub itself, while remaining errors would be detected by any receiving registry. The protocol therefore provides evidence that the tested registry is able to generate correctly formatted files.
- D2.2.5 The tested registry is able to detect errors in the files sent,
- (v) Tests require the Test Facility to send a number of messages, each with specific errors. The tested registry responds with an AK or NAK as appropriate.
- D2.2.6 The tested registry understands both AK and NAK responses.
- (vi) Tests require the Test Facility to send both AK and NAK responses. Since the tested registry is only required to send valid files the test requires the Test Facility to return a NAK for some randomly chosen test file. The response is validated by the registry user entering the file ID for the file that received the NAK response.
- D2.2.7 The tested registry understands PENDING response
- D2.2.8 For each flow tested, as defined within the Interface Specification and specific test scripts, the Test Facility identifies:
- D2.2.9 Pass
- (vii) For a flow output from the tested registry, the Test Facility was able to match the flow against one of the expected files for the chosen protocol and was able to respond with an AK.
  - (viii) For a flow output from the tested registry, matching an expected file chosen at random when the test was initiated, the Registry Operator reports that a NAK was received when an AK was expected.
  - (ix) For a flow output from the Test Facility, the Test Facility noted an AK or NAK response from the registry corresponding to the expected response for that file.
- D2.2.10 Fail
- (x) For a flow output from the Test Facility, no response was received or the response was not that expected.
  - (xi) For a flow output from the registry, that the data was not as expected or no response was created.
- D2.2.11 An overall test result covering all the flows within the test will be reported:



D2.2.12 Pass

(xii) Tests for all flows within the slot were successful.

D2.2.13 Fail

(xiii) Test for at least one flow was not successful.

### **D2.3 Witnessing and Evidence**

D2.3.1 There is no requirement for on-site witnessing of registry tests by the AIB.

### **D2.4 Test Process**

D2.4.1 The test process is managed by the registry, all activities and process on the AIB Hub testing facility being automatic.

D2.4.2 The process involves a number of explicit steps.

D2.4.3 **Initiate test run:** The registry operator registers intent to test by starting a new test instance with the Test Facility.

D2.4.4 **AIB protocol messages:** These messages are exchanged according to the needs of the protocol. The protocol does not say anything about how the registry operator initiates the test messages, only that certain types of message are appropriate for this protocol.

D2.4.5 **Present status:** The tested registry must provide status information back to the Test Facility.

### **D2.5 Test Environment**

D2.5.1 The test process involves sending valid data files from the Test Facility to the tested registry. The tested registry must accept these files and report an AK, and it is essential that the testing activities do not corrupt live data. Since the AIB protocols do not allow for test certificates the AIB Hub is designed to prevent messages from a test or demonstration environment being transferred to a live environment.

D2.5.2 In order to operate a successful test under these conditions the tested registry must:

D2.5.3 Set the Registry to Test mode on the AIB Hub,

D2.5.4 Either contain no live data, or be able to make a proper distinction within itself between live and test data, and

D2.5.5 Ensure that the bTest flag is set to True.

D2.5.6 The Production- and Test-mode transfers are recorded into a separate data structure in the AIB Hub for not mixing Test data to Production data. The transfers in Test-mode are validated by AIB Hub, but not forwarded to the receiving registry.

D2.5.7 The AIB authorises the use of a mirror system on a test communication system if a registry is unable to support testing on their live system. This environment must be using the same software applications as are to be used in production, and the database configured in a similar way.

## **D3 Test System Configuration**

D3.1.1 Each registry is responsible for the preparation of test data and a test environment.

### **D3.2 Test Scripts and Data**

D3.2.1 Test data and scripts will be required from each registry. The registry must arrange files to be sent according to the defined test protocol. The registry must also ensure that appropriate responses can be generated for received files.

D3.2.2 Registries are expected to use the same applications, procedures and local working instructions that will be used in live operation to receive and generate flows and to generate

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acknowledgements or rejections. However, it is up to individual registries to decide whether they can generate the required flows without the need to run their full business processes - the data must only be syntactically correct, not necessarily representative business data.

### **D3.3 Systems and Procedures**

- D3.3.1 Registries are expected to use the same procedures and systems as will be used in live operation to:
- D3.3.2 receive input flows and generate acknowledgements or rejections; and
- D3.3.3 generate output messages.
- D3.3.4 For these tests the AIB Hub Test Facility will transmit to the registry files containing data covering the test cases identified in the chosen protocol. This will cover both valid and invalid data. The registry will validate the data and respond with an acknowledgement as appropriate.
- D3.3.5 The AIB Hub Test Facility will then confirm that the expected responses (acknowledgement with correct rejection reason if appropriate) are received from the registry.
- D3.3.6 The registry will transmit to the AIB Hub Test Facility a set of messages required by the chosen protocol. All of these messages, except one chosen at random, are expected to result in an AK response from the AIB Hub Test Facility. The registry must identify the message which elicited a NAK response.

## **D4 Test Processes**

### **D4.1 Problem Reporting and Problem Management**

- D4.1.1 The registry will log all test failures observed at the tested registry. It will be the responsibility of the registry to track the problem resolution in their systems/processes and to ensure that the problem is fixed.

### **D4.2 Problem Escalation**

- D4.2.1 Any concern arising from a registry failing a test may be escalated, in the first instance to the AIB Test Manager, and, if that does not result in successful resolution, to the full AIB.

### **D4.3 Test Result Reporting**

- D4.3.1 The AIB Hub Test Facility records all responses and provides a test status.

## **D5 Test Protocol Principles**

### **D5.1 Data agreement**

- D5.1.1 In order to allow the tested registry to evaluate incoming files, some agreement is required on acceptable trader and production device IDs.
- D5.1.2 A set of acceptable IDs is made available from time to time.
- D5.1.3 There is no guarantee that any one ID will be used in any particular data file sent by the Test Facility.

### **D5.2 Files sent by Test Facility**

- D5.2.1 Files correspond to an identified XML interface specification version.
- D5.2.2 The valid files sent to the tested registry are designed to address some of the potential complexities of the data file. They might address, for example:
- D5.2.3 A single bundle of certificates.
- D5.2.4 Multiple bundles of certificates, each bundle with a different production device.



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- D5.2.5 Multiple bundles of certificates, each bundle with different range of certificate numbers.
  - D5.2.6 The invalid files sent to the tested registry are designed to address a single error each, so that error identification is straightforward. Examples include:
  - D5.2.7 A single bundle of certificates with an invalid checksum on either Sending Account Holder or Receiving Account Holder ID.
  - D5.2.8 A single bundle of certificates with an invalid checksum on the Production Device.
  - D5.2.9 A single bundle of certificates with an invalid Date of issue.
  - D5.2.10 A single bundle of certificates with an invalid Technology code.
  - D5.2.11 A single bundle of certificates with an invalid Earmark.
  - D5.2.12 Multiple bundles of certificates with an invalid Number of Certificates.

**D5.3 Files expected from the tested registry**

- D5.3.1 Files correspond to an identified XML interface specification version.
- D5.3.2 Files sent by the tested registry are matched against templates within the Test Facility. The Test Facility does not attempt to forward the transfers into a Receiving Registry.
- D5.3.3 Lists of expected patterns are made available from time to time.
- D5.3.4 Templates are designed to address some of the potential complexities of the data file. They might address, for example:
- D5.3.5 A single bundle of certificates.
- D5.3.6 Multiple bundles of certificates, each bundle with a different production device.
- D5.3.7 Multiple bundles of certificates, each bundle with a different range of certificate numbers.