



# I-REC (HX) Product Code For Hydrogen and Hydrogen Derivative Fuels and Products

**Developed by Avance Labs**

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## Preface - Administrative

This document has been developed in full accordance with the International Attribute Tracking Standard held by the I-REC Standard Foundation (“Foundation”). This document does not represent the International Attribute Tracking Standard’s rules, requirements, or instructions. Instead, this document explains how the I-REC (HX) Product Code is compliant with the International Attribute Tracking Standard and how users shall implement the I-REC (HX) Product Code.

The reader is referred to the *table* below for administrative information regarding this version of the document. The reader is instructed to check online at the [Code Manager’s website \(https://avance.energy\)](https://avance.energy) to ensure that they are utilizing the most up-to-date version of the document. Use of an outdated or older version of the guidance document may result in the incorrect implementation of the Product Code, which could ultimately impact the eligibility of one’s ability to retain I-REC (HX) Certificates.

For consistent interpretation and implementation of this guidance document, the following definitions are employed:

- The word “shall” indicates an obligation for compliance with the I-REC (HX) Product Code
- The word “should” indicates a recommendation as opposed to an obligation or requirement
- The word “may” or “can” indicates a permissible option the user may employ in implementing the instructions of this document

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## Preface – Statement of Objectives

The world needs to ensure that hydrogen is produced and used across the supply chain in the most *environmentally responsible, economically efficient, and transparently evidenced manner*. This invariably requires that energy attributes associated with the production, conversion, reconversion, and transportation (the “Hydrogen Processes”) of hydrogen and hydrogen-derived fuels and products (“Hydrogen”) are tracked and certified across their entire supply chains, which is what the I-REC Product Code for hydrogen or the I-REC (HX) Certificate (whereby X denotes hydrogen derivatives) and its corresponding certificates are designed to do.

I-REC (HX) Certificates provides an independently verified, fact-based, ex-post record of attributes for Hydrogen across its supply chain. In addition, the I-REC (HX) Certificate was designed to achieve three further objectives.

**Regulatory Labels:** The hydrogen sector is rapidly changing, with regulators and policy makers attempting to keep pace by setting regulations on the import and export of Hydrogen. These regulations effectively mean that many countries have different criteria for defining eligible attributes. Therefore, in the absence of harmonized regulations and voluntary criteria, the I-REC (HX) Certificate has been designed to provide market-centric regulatory labels that demonstrate whether a certain Hydrogen batch is eligible for import and/or consumption in a target market. In this regard, the I-REC (HX) Certificate is designed to be an inclusive certificate, acting as a one-stop-shop for all regulatory and third-party Hydrogen requirements.

**Interoperability of Product Codes:** The Hydrogen supply chain involves several Hydrogen Processes for which associated attributes need to be tracked and certified. The I-REC (HX) Certificate allows for the stacking of different I-REC Accredited Product Code Certificates to create a composite certificate to account for all these attributes (“Stacking”). This effectively allows for the subdivision of certification for key life-cycle stages (e.g. production, conversion, reconversion, transport, and use) of the Hydrogen product and provides a clear visualization of how key Scope 2 and Scope 3 emission sources were tracked, verified, and certified.

**Product Benchmark:** To ensure that the Hydrogen contributes to decarbonization of supply chains, the I-REC (HX) compares Hydrogen attributes against a rigorous net-zero product benchmark to create an apples-to-apples comparison between all Hydrogen products irrespective of how and where they were produced.

As a result, the I-REC (HX) Certificate accommodates three tiers of certifiable data.

- I. Tier 1 data relates to fact-based information related to the Device Facility itself (e.g. location, technology type, and product types) and the production batch as it pertains to production amounts, production times, and similar data monitored in real time.
- II. Tier 2 data relates to energy, environmental and other attributes of a production batch which are generally defined by regulations or third-party requirements.
- III. Tier 3 data relates to benchmarking of the production batch against net-zero criteria.

## 1. Terms & Definitions

The list of definitions below is an aggregation of definitions already defined by the I-REC Standard as well as new definitions specific to the I-REC (HX) Product Code.

Legend	
	New definitions related to the I-REC (HX) which are not shared with the other I-REC Product Codes or Attribute Tracking Standard, or common definitions which have been amended for the Hydrogen Product Code
	Definitions found in the I-REC(E) Product Code and / or Attribute Tracking Standard
Term	Definition
Account	A data store within a Registry that is attributed directly to a single Entity for the purpose of recording a Product Certificate within that Registry. The Registry contains the following accounts: Registration Account, Trade Account, Marketplace Account, Insurance Account, Self-Consumption Redemption Account, and Redemption Account.
Accreditation Agreement	An agreement that is formalized between the Foundation and the Code Manager or other Accredited Entities.
Accredited Entity	An Entity that has achieved Accreditation.
Accredited or Accreditation	The act of acknowledging that a Product or Entity is compliant with the Standard.
Administrator	The Entity designated as the manager of the infrastructure.
AML	'Anti-money laundering' and other fraud prevention criteria as implemented based on applicable laws or otherwise applied in accordance with good industry practice.
Approved Tracking Scheme or ATS	An attribute tracking system accepted by a Code Manager as indirect evidence of production and production attributes.
Assignment or Assigned	The allocation of a redeemed Product Certificate to a specified End-user for use in a disclosure statement for a specified consumption period.
Assurance Service Provider (ASP)	An entity accredited by the Code Manager which validates and verifies all information and data associated with a Device Facility and/or Hydrogen. May also refer to a Verifier, Validator, or Auditor.
Avance (HX) Portal	A cloud-based dashboard created by Avance for user, company, and project management and which is built on the Evident Registry via Application Programming Interfaces ("APIs") to enable issuance of I-REC (HX) Certificates.
Beneficiary	An End-user to which a Product Certificate may be irrevocably Assigned as part of a Redemption Transaction.
Book and Claim	A Chain of Custody model in which certificates (i.e. claims) are unbundled from the physical product.
Brand Assets	A collective term that includes all company names, trading names and styles, trademarks, logos, and marketing style sheets that are assets of an Entity.
Business Week	A period of seven calendar days plus an additional day for each public holiday observed in the applicable country during that period.
Carbon Intensity	The GHG emissions (expressed as CO <sub>2</sub> equivalents) per unit of product, process, or services.
Central Issuer	An Issuer authorized and appointed by the Code Manager to provide support to other Issuers, Issuing services to Registrants.
Chain of Custody	Documenting and demonstrating the custodial sequence that occurs when the ownership (or control) of a verified unit of production and the claims regarding that final product are transferred from one custodian to another in a supply chain.
Code Manager	The entity which is responsible for defining the Hydrogen Product Code and coordinating service operators within the scope of that Product. The Hydrogen Product Code is owned by the Code Manager. For this document, Avance Labs Limited is the Code Manager.

Commercial Operations Date (COD)	The stage when project construction ends, commercial operations start, or a facility starts to generate revenue.
Consumption Period	A defined period of time during which an End-user reports consumption or use of a Product Certificate.
Core Records	The records that Registries must, as a minimum, maintain. These include records of Device Facilities, Issuing events, Product Certificates, Transfer events, Redemption events, and Entities interacting with the Registry.
Device Facility or Device Facilities	One or more related Hydrogen Processes (and associated ancillary equipment) capable of producing, converting, reconverting, and/or transporting Hydrogen, delivered through an identifiable measurement point. <i>Device Facilities are considered to be distinct registrations if they are not geographically co-located within the same facility, factory, or plot of land, and even if geographically co-located, Device Facilities are considered to be distinct registration if it is shown that not 100% of the total output from one Hydrogen Facility is consumed by the other Facility under question (i.e. Facility 1's production would need to be completely consumed by Facility 2 in order to make the case for a single registration of Facility 2, whereby Certificates are only created for Facility 2's products) In addition, products that are produced as the result of the Registrants activities but fall under another I-REC Product Code, are considered to be distinct registrations.</i>
Device Facility Owner	The legally defined owner or owners of a Device Facility.
Device Facility Verification	Verification of a Device Facility's (or Facilities') characteristics as part of the Device Facility registration process and conducted by an Assurance Service Provider.
Effective Registration Date	The latest or the earliest date of a Production Period permitted in the relevant I-REC (HX) Product Code; or the date from which the owner of a Device Facility grants exclusivity for the attributes of the Device Facility to a responsible Entity. See Section 7.5.1.
End-user	An Entity that uses, claims, redeems, or is the Beneficiary associated with the removal of a Product Certificate from a Market.
Entity	An organization or individual with 'legal person' status.
Foundation	The International REC Standard Foundation. The governance body for the International Attribute Tracking Standard ("Standard"). A not-for-profit Foundation that is independent of the various Entities that may be Accredited. The Foundation owns the Standard and is staffed and supported by a secretariat. Legally known as "Stichting I-REC" and founded in the Netherlands under Chamber of Commerce number 5945884.
Full Segregation	A chain-of-custody model whereby Certificates are not separated from the associated physical product, meaning that the holder and owner of the product and Certificates are the same.
Greenhouse Gases (GHG)	A set of primary gases which contribute toward the greenhouse gas effect and particularly include those related to the gases that are largely influenced by human-related activities (CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, CFCs, HCFC, HFCs SF <sub>6</sub> , and NF <sub>3</sub> ).
Hybrid Chain of Custody	Certification which mixes two or more chain-of-custody models within the product's life cycle.
Hydrogen	Hydrogen and Hydrogen Derivatives. Hydrogen Derivatives are defined as all fuels and products derived from hydrogen, including, among others, ammonia, methanol, and synthesis fuels, where the latter are manufactured by combining hydrogen with captured and/or stored carbon dioxide.
Hydrogen Derivatives	(See "Hydrogen").
Hydrogen Processes	The activities from one or more Device Facilities related to hydrogen production, conversion, reconversion, and transport.
HX	Hydrogen and Hydrogen Derivatives.
Infrastructure	A Registry or Platform created to facilitate the ownership, transfer, trade, or visualization of Products.

Infrastructure Operator	The owner of the relevant Infrastructure, who must develop, procure, implement, and operate all Infrastructure in accordance with the Principles and expectations of the Board. An Infrastructure Operator is either a Registry Operator or a Platform Operator.
International REC Standard Foundation Board (or Board)	The legally mandated governance organ of the Foundation, as listed with the Dutch Chamber of Commerce.
Interoperability	The conditions under which Product Certificates accredited by the Foundation are permitted to be Stacked together to form a composite Product Certificate. (Also called Stacking/Certificate Interoperability and further defined in each accredited Product Code where relevant).
Interoperability Protocol	Guidance for all I-REC accredited Product Codes relating to Interoperability.
Interoperable Certificates	I-REC Accredited Product Certificates that adhere to the Interoperability Protocol.
I-REC (HX) Product Certificate	An attribute certificate that is a verified record of an event of a Hydrogen Process at a registered Device Facility Issued according to the I-REC (HX) Product Code accredited under the Standard.
I-REC (HX) Product Code	A document or set of documents that set out the rules and procedures, and other information required to form the specification of a Product.
I-REC Code Manager	An Entity that is responsible for defining a Product and coordinating service operators within the scope of that Product. The Code Manager authorizes and/or accredits any Issuer. The nature of that Product and the services provided are defined in the I-REC (HX) Product Code that is owned by the relevant Code Manager. In the context of this document, Avance Labs is the Code Manager.
I-REC Certificate	(See Product Certificate).
Issuance or Issue	The act of creating a record of one or more Product Certificates in an Account at a Registry.
Issue Account	An Account operated by an Issuer and capable only of sending I-REC (HX) Certificates to another account.
Issue Request	A formal request by a Registrant of a Device Facility to an Issuer to Issue a Product Certificate in relation to that Device Facility against evidence provided for a given Production Period.
Issuer	An Issuer is responsible for processing Device Facility registrations, as well as Issue Requests relating to the activity of registered Device Facilities.
KYC	The 'know your customer' and other counterparty evaluation criteria as implemented based on applicable laws or otherwise applied in accordance with good industry practice.
Labeling Authority	An entity that establishes a set of criteria for attributes and how those attributes are to be measured and reported.
Labeling Scheme or Label	A set of rules established by a Labeling Authority for the purpose of regulatory compliance and/or product differentiation. Labels can either be Regulatory Compliance Labels or Third-Party Labels.
Net Zero Benchmarking Methodology (APP-NZ™)	A methodology developed by Avance for providing an assessment of a product's greenhouse gas emissions impacts which are normalized to a benchmark reference of net zero, and whereby the assessment is done using only a single methodological approach and single source of secondary data.
LCA Material Change	Any change of relevant fact or input which might cause the existing Baseline LCA or Updated LCA to produce results that are likely to be at least 5% different from the baseline.
LCA Ongoing Duty of Disclosure	Registrants and any associated Device Facility are subject to a LCA Ongoing Disclosure Duty, which requires disclosure as soon as reasonably practicable of any material change of fact or input likely to adversely affect the accuracy of the most recent LCA carried out for a Device Facility (to obtain that Device Facility's current LCA Qualification).
LCA Service Provider	Third-party entity that conducts the LCA Study on behalf of the Registrant, whereby the LCA provider is not the same as the Assurance Service Provider, Code Manager, the Issuer, the Registry Operator, or the Foundation.

Life-Cycle Assessment (LCA) Or Life-Cycle Study	The compilation and evaluation of the inputs, outputs, and the environmental impacts, most notably global warming potential, of the Hydrogen product system throughout its life-cycle. Such an assessment must be performed initially, and thereafter updated periodically, for any Device Facility wishing to make Issue Requests for I-REC (HX) Certificates that would include Regulatory Compliance Labels or Third-Party Labels.
Local Working Instructions or LWI	A document or set of documents adopted and owned by an Accredited Entity that sets out procedures to ensure that the quality and integrity of the Product are defined.
Market Facilitator	Either the Code Manager, an Issuer, Registry Operator, or Platform Operator providing services under the I-REC (HX) Product Code.
Mass Balance	A Chain of Custody model in which the amount of a certified product (e.g. a consumable, feedstock) is controlled and an equivalent amount of product leaving the operation can be sold as certified. Physical mixing of certified and non-certified materials is not necessarily required but can take place during the process.
Organization	An Entity registered on the Registry that can access and interact with the Registry.
Participant	An Entity that manages one or more Trade and Redemption Accounts (other than Self-Consumption Redemption Accounts) within the Registry. Participants are the specified owners of I-REC (HX) Certificates held within their Accounts. At the time of Redemption, a Participant may nominate a Beneficiary to receive rights to the Product Certificate. Participants do not require Accreditation.
Platform Operator	An Entity responsible for providing and operating a Platform that provides functions that extend the functionality of a Registry. Platforms do not constitute a primary record of the custody of a Product Certificate but may remotely initiate actions within the Registry. Platform Operators may have varied commercial relationships, depending on the nature of their platform.
Portal	(See "Avance (HX) Portal").
Principles	A section in the Standard that provides guidance to the Board as to the core elements which support their decisions related to the adherence of Accredited Entities and Products.
Product	A unit of output or production the attributes of which are being tracked. Examples include, but are not limited to, units of energy, fuel, materials, and gases.
Product Certificates	Any certificate that adheres to an I-REC-accredited Product Code
Production Auditor	An Entity that is independent of the Registrant and whose role it is to verify the measured volume of eligible production stated in an Issue Request.
Production Period	A defined period of time over which a Device Facility reports its eligible production.
Redemption Account	An account held either by a Participant that allows certificates to be redeemed, assigned to a beneficiary, and a Redemption Statement to be generated for that redemption.
Redemption Authority	An Entity with a Redemption Label that can be used on Redeemed Certificates after approval by the Redemption Authority itself. A Redemption Authority does not require Accreditation.
Redemption Country	The country where an I-REC (HX) Certificate is being redeemed.
Redemption or Redeem	The act of using a Product Certificate for making a claim about attributes or benefits. Redeeming removes the Product Certificate from circulation. Redemption may be accompanied by an Assignment to a Beneficiary.
Redemption Statement	A statement that provides evidence of Redemption. It is specified in the I-REC (HX) Product Code and may be uniquely verified in a secure manner by an Entity such as an auditor that does not have a user account on that Registry.
Registered User	An individual registered on the Registry who has been authorized by an Organization to access the Registry on their behalf. A Registered User is linked to a single username and set of contact details.
Registrant	An Entity responsible for acting on behalf of the owner of a Device Facility regarding the registration of the facility for a specific Product and associated Issue Requests. The owner of a Device Facility may act as a Registrant or may appoint an agent to act as Registrant on its behalf. This authority must be proven to the satisfaction of the Code Manager. Registrants do not require Accreditation. For the purposes of reporting certifiable production, and any self-consumption of I-REC (HX) Certificates, the relevant Device Facility will be responsible for any actions taken on its behalf by the Registrant.

Registry	A Foundation Accredited database of Product Certificates that includes records of the full life cycle of ownership and use of the Product Certificate. A Registry acts as a record keeper and primary information source and may support multiple Product Certificates of differing types.
Registry Operator	An Accredited Entity responsible for providing and operating a Registry that records the issuance, transfer, and use of a Product Certificate as an immutable source of information. In the context of this document, Evident is the Registry Operator.
Regulatory Compliance Labels	A type of Labeling Scheme or Label which is defined by a governmental or intergovernmental entity, and which must be satisfied to achieve regulatory compliance.
Resolution Period	A set time period during which an incompatibility is to be remedied.
Self-Consumption Redemption Account	An account operated by a Registrant, Issuer (on behalf of a Registrant), or Platform Operator that is capable only of receiving I-REC (HX) Certificates from another account.
Standard	The I-REC International Attribute Tracking Standard, which describes the tools required for the reliable and robust implementation of an attribute tracking system.
Stack / Stacking	The terms Stack or Stacking refer to the aggregation and netting of attributes from different Interoperable I-REC Product Certificates. In other words, a certificate can be redeemed by another certificate (as opposed to conventional redemption by an End-user).
Third-Party Labels	A type of Labeling Scheme or Label which is defined by a third-party, non-governmental or private entity and which must be satisfied to achieve voluntary compliance of the said scheme.
Tier 1 Attributes	Statements of immutable fact that are related to a Device Facility's core specifications such as physical location, deployed technology, production description, and other such information.
Tier 2 Attributes	Attributes that are defined and assessed based on Regulatory or voluntary third-party compliance Labels such as, but not limited to, LCA or GHG related data.
Tier 3 Attributes	An attribute defined by the Avance Net Zero Benchmark Methodology.
Trade Account	An Account operated by a Participant and capable of receiving and sending I-REC (HX) Certificate records from or to another Account.
Universal Carbon ID	An identification (ID) number or code which is unique to a Device Facility (or Facilities) or Project(s) which are already registered or would like to register for a carbon-related attribute credit or certification program and kept in a universal (i.e. internationally recognized) database, primarily for the purpose of avoiding double counting.
Universal Coordinated Time or UTC	A time standard by which the Core Records are to be timestamped.
Verification Agent	A suitably qualified Entity accepted by an Accredited Entity as being competent to independently verify information provided by a Registrant. An Issuer may act in the capacity of a Verification Agent.
Verification Method	A methodology that is approved for use by the Code Manager and used by the Assurance Service Provider for purposes of carrying out Device Facility Verification (i.e. inspections and auditing).
Verified Attribute Record	A list of fact-based objective and subjective energy attributes recorded on the I-REC (HX) Certificate.



## 2. Introduction

This document is the I-REC (HX) Product Code for *hydrogen and hydrogen derivative fuels and products* (collectively referred to as “Hydrogen” in this document). Hydrogen derivatives are defined as all fuels and products derived from hydrogen, including, among others, ammonia, methanol, and synthetic fuels, where the latter are manufactured by combining hydrogen with captured and/or stored carbon dioxide.

Its purpose is to describe the implementation of the International Attribute Tracking Standard (the “Standard”) in delivering an exchangeable Energy Attribute Certificate (“EAC”) for Hydrogen, hereinafter referred to as the I-REC (HX) Certificate. The Standard is owned by the International REC Standard Foundation (the “Foundation”) and this document is a Product Code as defined within the Standard. The I-REC (HX) Product Code sets out the definitions, processes, and procedures that form the specification of the I-REC (HX) Certificate.

The Code Manager and associated Market Facilitators provide services to Market Entities that require the Issuance, Transfer, or Redemption of I-REC (HX) Certificates, primarily representing the means of production, conversion, reconversion, and transport of Hydrogen delivered to an end-user. Within this Scope of service provision, Avance Labs (“Avance”) acts as Code Manager, Evident acts as Registry Operator and multiple other Entities appointed on a national or sub-national basis act as Issuers.

All Entities acting as Code Manager, Registry Operator, Issuer, or Platform Operator under this I-REC (HX) Product Code are subject to Accreditation by the Foundation.

### 2.1 The I-REC (HX) Certificate

The I-REC (HX) Certificate is an ex-post, empirical evidence-based certificate for Hydrogen. The I-REC (HX) Certificate provides a fact-based Foundation for meeting a variety of reporting requirements, including but not limited to regulatory compliance, voluntary product-level GHG foot-printing, general end-user claims, and other supporting mechanisms. The I-REC (HX) Certificate allows all industry stakeholders to make a conscious and evidence-based choice to procure Hydrogen (and its associated energy attributes) from a Device Facility engaged in the production, conversion, reconversion, and transport of Hydrogen.

The I-REC (HX) Certificate plugs into the proven I-REC ecosystem, which includes the Evident Registry, providing a convenient and comprehensive means of documenting, validating, issuing, transferring, and redeeming certificates that demonstrate traceability throughout the *entire* supply chain. The I-REC (HX) Certificate will accommodate ‘Labels’, which determine the compliance of Hydrogen attributes with regulatory requirements (e.g. EU Renewable Fuels of Non-biological Origin or RFNBO Delegated Acts) and/or other third-party schemes (e.g. safety labels, sustainability labels, circularity labels, etc.).

Each I-REC (HX) Certificate is uniquely attributable – where applicable – to the Device Facility in which it was produced, converted, reconverted and/or transported (the “Device Facilities”), containing a unique reference that can be tracked throughout the product’s chain of custody.

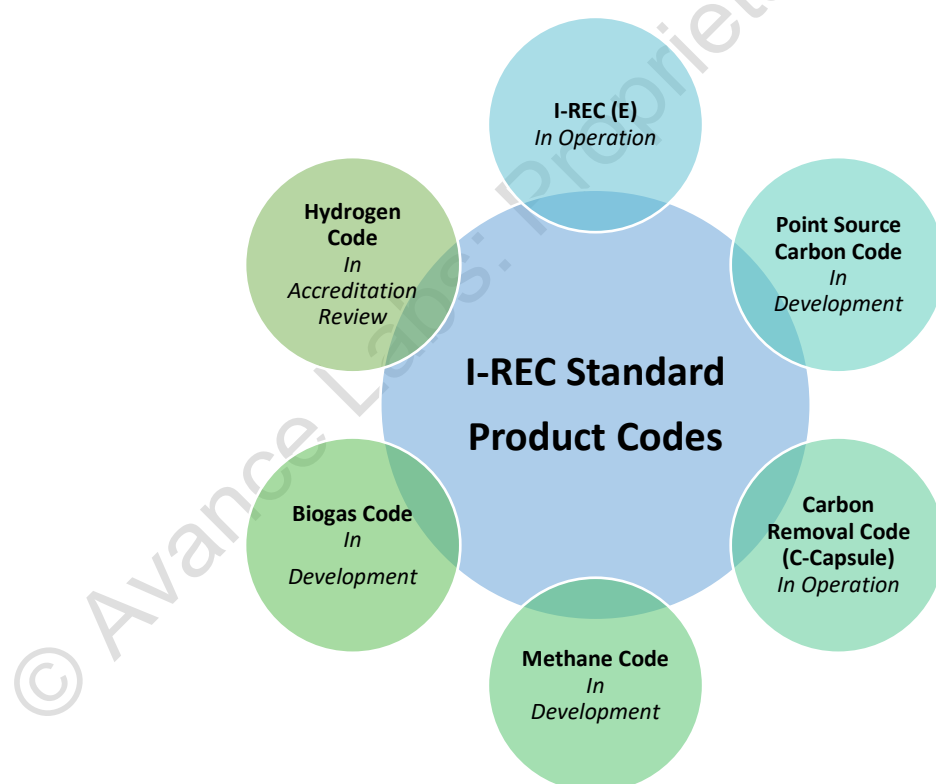
To provide a robust chain of custody across all stages of the Hydrogen life-cycle and to include other I-REC Product Codes, the I-REC (HX) Certificate uses two chain of custody approaches: (1) a book and claim; and (2) mass balance, both of which are described in Chapter 8. The book and claim approach applies to I-REC (HX) Certificates that are unbundled from the physical supply of the Hydrogen or other

relevant physical flows in the supply chain. The mass balance approach applies to certificates that are bundled with the physical flows of certifiable products. As a result, the I-REC (HX) Certificate effectively allows for a hybrid chain-of-custody certification which mixes two or more chain-of-custody models together. This may occur for example when multiple components of the product's value chain are certified separately and then Stacked together. This issue is outlined below and further explained in Chapters 5 and 9.

The I-REC (HX) Product Code is designed to be open and accessible to all organizations intending to be active in Hydrogen markets.

## 2.2 Stacking with other I-REC Product Codes

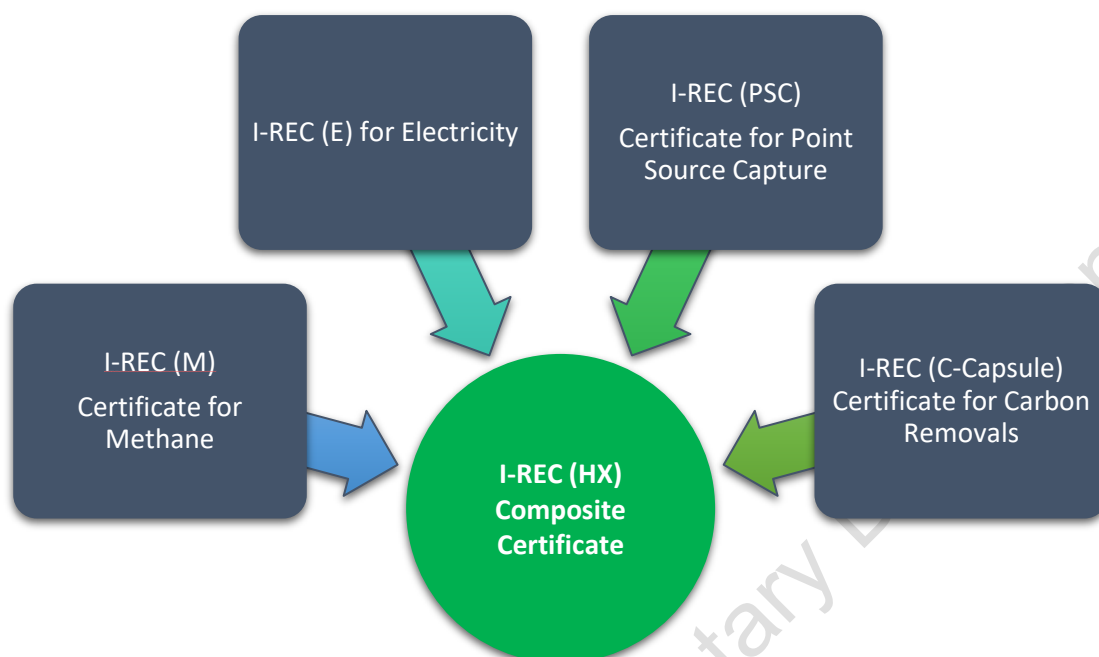
To enhance the role of EACs in supporting decarbonization, the Foundation is facilitating the development of new Product Codes that will strictly adhere to the Standard. Subject to meeting certain Interoperability guidelines, the I-REC (HX) Certificate can be Stacked together with other Product Certificates accredited by the Foundation. The Interoperability of I-REC Codes and specifically the aggregation and netting of different product attributes is referred to as Stacking under the I-REC Attribute Tracking Standard. These Product Certificates shall include I-REC (E) for electricity; C-Capsule or I-REC (CDR) for Carbon Dioxide Removal; I-REC(M) for Biogas/biomethane, I-REC (PSC) Code for point source carbon reduction; Methane emissions; and other product codes currently under development for future Accreditation by the Foundation (**Figure 1**).



**Figure 1** I-REC Product Codes and Standards

A stacked product certificate provides producers and end-users with increased transparency and the ability to validate and verify their product's GHG emissions footprint. This is of particular importance when supply chains involve many critical interdependencies such as renewable energy systems,

carbon capture systems, various hydrogen processing and reprocessing processes (see an example in **Figure 2**). Stacking also allows for enhanced sustainability reporting for Hydrogen Device Facilities across the supply chain, in adherence with international carbon accounting standards.



**Figure 2** General Depiction of Stacking of Different I-REC Product Codes

### 2.3 Regulatory Scope

This I-REC (HX) Product Code encompasses services that are delivered primarily within a voluntary commercial environment. Where services under this I-REC (HX) Product Code are provided within an environment where mandatory legal regulations apply, such legislation shall take legal precedence over this I-REC (HX) Product Code. However, it is important to note that the purpose of the I-REC (HX) is to simplify hydrogen certification for national authorities by providing a clear, robust, and fact-based certification rulebook that can be easily and expeditiously implemented in national markets without cost. This rulebook can also be used as the mechanism via which adherence to national and international legislative requirements for hydrogen can be determined. In this way, the I-REC (HX) Product Code can be a Foundation for proving adherence to any regulatory requirements applicable to the underlying Hydrogen.

## 3. Purpose & Principles

This section outlines the principles which underpin the I-REC (HX) Product Code. These principles ensure that related activities and relationships between Market Facilitators are consistent with the requirements of the Standard to provide a transparent and robust service to the Hydrogen industry.

### 3.1 Purpose

The purpose of the I-REC (HX) Certificate is to facilitate traceability, chain of custody, and clarity in the procurement of Hydrogen for consuming Entities. Hydrogen end-users can procure I-REC (HX) Certificates as an evidentiary statement of the ownership of underlying attributes associated with their physical Hydrogen consumption.

The I-REC (HX) Certificate provides a historic and verified record of attributes (e.g. carbon intensity) for Hydrogen along critical stages of its life-cycle including aspects such as production, conversion, reconversion, and transport.

As defined and explained throughout this document, the I-REC (HX) shall facilitate a verified record of attributes that are unique to each specific unit of Hydrogen produced, converted, rec-converted and transported. In addition, it shall facilitate the communication of compliance with third-party labels that are defined by either regulatory requirements or voluntary labeling schemes.

## 3.2 Organizational Principles

### 3.2.1 End-users' Right to Information

The owner or End-user of any I-REC (HX) Certificate has a right to obtain full information concerning the associated origin and attributes of the certified product. This right is reflected within this I-REC (HX) Product Code and associated documents and evidenced through the provision of a unique Redemption Statement which may be Assigned to a Beneficiary or End-user.

### 3.2.2 Collaboration

Avance's primary objective is to enable Entities to make reliable and robust claims about the origin and nature of the Hydrogen they consume. Wherever possible, Avance will engage with governments and relevant NGOs to implement the service, ensuring open and fair access to the market for all.

All Accredited Entities are required to be collaborative with other similar attribute tracking systems to help ensure that all such systems can provide full and accurate information for end-users and to minimize the potential for double counting of similar attributes. Avance structures and maintains its relationships with all Accredited Entities to ensure compliance with this principle.

Where information exists within Avance's control it shall, subject to applicable laws, be made available to the Foundation and relevant legal authorities without charge.

Where appropriate and practicable, services and Infrastructure may be integrated with, or connected to, other similar tracking systems, whether these are Accredited to the Standard or not.

### 3.2.3 Independence

Avance is independent of the market it serves. It has no role in the production, conversion, reconversion, or transport of Hydrogen. Avance itself shall not engage in any trade or exchange of I-REC (HX) Certificates, nor shall serve as an LCA Service Provider or Assurance Service Provider. Avance shall only provide services under published tariffs that are independent of the traded price of I-REC (HX) Certificates. Avance shall maintain confidentiality and not provide privileged or otherwise private information to other parties.

Independence from the market allows Avance to operate in a clear, transparent, and equitable manner, offering services which the users of the associated market and stakeholders can trust.

Accredited Entities providing services shall, unless otherwise required by legislation, be contracted under restrictive agreements that prevent them from undertaking any Market Entity role within the I-REC (HX) Certificates market. Where required, appropriate provisions designed to prevent abuse of position and ensure equitable treatment of all parties shall be agreed with the Foundation and enshrined within relevant contracts.

### 3.2.4 Flexibility

Avance recognizes that technologies, markets, and laws are subject to evolution and change. Where appropriate, the services provided may accommodate flexibility in how compliance can be demonstrated. Any provision not explicitly documented within this I-REC (HX) Product Code that might conflict with the Standard shall be referred to the Foundation prior to adoption.

### 3.2.5 Stakeholder Engagement

To help ensure that this I-REC (HX) Product Code remains consistent with evolving knowledge, technologies, and best practice, Avance shall, where appropriate, seek and consider the views of stakeholders. Stakeholder engagement may include education and training in the I-REC (HX) Product Code, consultation on changes to the I-REC (HX) Product Code and ad-hoc liaison with interested parties. Moreover, Avance is committed to actively promoting the use of I-REC (HX) Certificates to regulatory authorities, Hydrogen producers and market actors, and end-users. Avance is also committed to being an active partner to the Foundation in the development and promotion of the Standard.

### 3.2.6 Dispute Resolution

Except where legislation – or contracts – requires otherwise, Avance may appoint the Foundation to act as an independent arbiter, expert, or mediator in the resolution of disputes between Entities relating to the implementation of this I-REC (HX) Product Code. Details of the Dispute Resolution process are set out in Section 12.

### 3.2.7 Entry Barriers and Non-discrimination

Avance aims to enable wide and diverse access to the I-REC (HX) Certificate market. Participation in the I-REC (HX) Certificate market is non-discriminatory and conditional only on appropriate due diligence processes and applicable legislation. Where services are charged for, the fees shall reflect the service provided and applied on a consistent basis to all Entities without bias. The Accredited Entities providing services reserve the right to require prepayment for services on a case-by-case basis without disclosure of the reasons for such a requirement. Avance shall, to the extent that quality is not detrimentally impacted, deliver and charge for services in a cost-effective manner. Fees for services are set out in Avance Fees for the I-REC (HX) Product Code as outlined on Avance's [website \(https://avance.energy\)](https://avance.energy).

### 3.2.8 Accurate and Clear Communication

Avance commits to ensuring that all communication is accurate and clearly presented. Wherever practical, all public communications shall be made available on the Avance website (<https://avance.energy>).

### 3.2.9 Adherence to National Regulations

Avance will adhere to national and local regulations in the countries in which it provides, or seeks to provide, services related to the implementation of an attribute tracking standard and certification program for Hydrogen.

Prior to market development, analysis of relevant existing and planned Hydrogen legislation may be undertaken to avoid conflict with existing methods of attribute reporting and carbon emissions accounting. Avance will not provide services where I-REC (HX) certificates conflict with legislation or

the operation of a similar mechanism by an appointed national authority. Where possible, responsible national or local authorities will be notified prior to commencement of services in any jurisdiction.

Avance confirms that this I-REC (HX) Product Code will be implemented in compliance with any applicable national and regional legislation and that it will cease providing services when it becomes aware of any conflict which is not resolved within 90 calendar days.

Local Working Instructions shall be developed in collaboration with the Issuer to avoid interference between this I-REC (HX) Product Code and national regulations.

### 3.2.10 Promote Markets Where All Actors Have a Role

Avance provides services in an open and transparent manner and actively seeks engagement not only with Market Entities but also wider interest groups, such as governments, NGOs, and end-users.

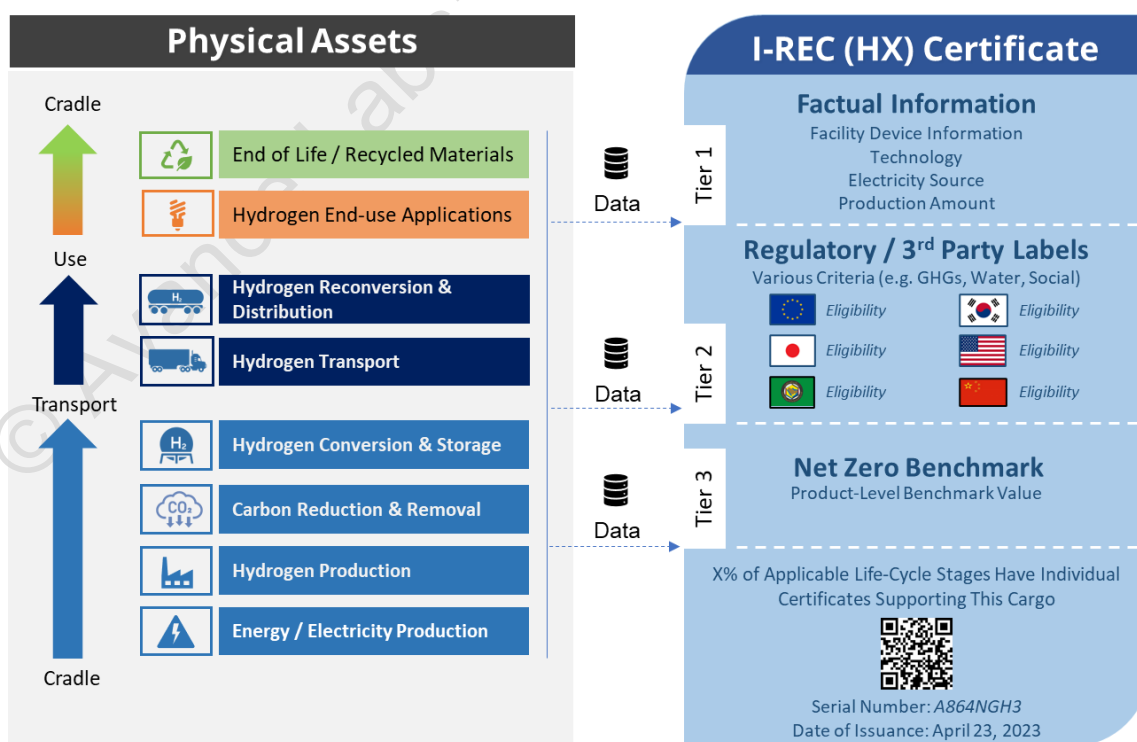
## 3.3 I-REC (HX) Certificate Principles

### 3.3.1 Immutable Statement of Fact

The primary output of an I-REC (HX) Certificate is an ex-post (historical) factual Verified Attribute Record relating to one or more events or activities at a Hydrogen Device Facility or a Group of Device Facilities. This is why the I-REC (HX) Certificate cannot be issued for any future (ex-ante) activity or events.

Information contained within an I-REC (HX) Certificate at the time of Issue cannot be amended later other than in exceptional circumstances when verified historic facts are ruled to have been wrong.

The I-REC (HX) Certificate shall facilitate the recording of attributes relating to Hydrogen as well as those relating to Regulatory Compliance and Third-Party Labels. (See Appendix 2).



Source: Avance Labs

### Figure 3 I-REC (HX) Product Code Framework

Specifically, the I-REC (HX) Certificate's Verified Attribute Record shall include the following attributes:

- 1) **Tier 1** attributes based on factual information related to the Device Facility or Facilities.
- 2) **Tier 2** attributes based on *subjective* information related to regulatory and third-party voluntary requirements, such as those defining which power production technologies, carbon intensity thresholds, and production pathways are permissible within the Hydrogen supply chain. (See Appendix-2)
- 3) **Tier 3** attributes based on the Avance Net-Zero Product Benchmark Methodology, which provides a single methodology, rules, and sources for primary and secondary data for comparing Hydrogen produced by the Device Facilities with an equivalent net-zero Hydrogen from a greenhouse gas emissions perspective. (See Appendix-3)

The I-REC (HX) Certificate does not carry an expiration date. However, the certificate could potentially become ineligible for the intended beneficiary's end-use purpose if the age of the certificate conflicts with the regulations or applicable rules governing its consumption.

Any attribute included within an I-REC (HX) Certificate may not be later extracted for separate transfer.

#### 3.3.2 An I-REC (HX) Certificate is a Unique Record of a Hydrogen Process with a Specified Time

An I-REC (HX) Certificate is a unique statement representing the evidenced attributes associated with a specific Hydrogen Process event or activity during a specified period of time.

No I-REC (HX) Certificates may be issued where another certificate or similar instrument exists, whether it be a record in an alternative I-REC accredited product code or another third-party attribute tracking system (e.g. carbon credit registry).

#### 3.3.3 Possession and Ownership of an I-REC (HX) Certificate

The clear and uninterrupted chain of possession of an I-REC (HX) Certificate from producer to End-user claim is fundamental. Records of possession of all I-REC (HX) Certificates are recorded within the Registry and may be displayed on an associated Platform authorized by Avance.

An I-REC (HX) shall always exist within an Account in the Registry, until the point of Redemption, after which a record of any Redemption of a Product Certificate will be maintained at the Registry for a period of at least **six (6)** years. In this period of time, the Registry will maintain records noting the details of the redeemed Product Certificate as initially issued to the relevant Registrant, and/or held in a Participant Account, and also details of the relevant Beneficiary pursuant to the Redemption Transaction.

#### 3.3.4 Use of an I-REC (HX) Certificate is Distinct

An I-REC (HX) Certificate is considered used when it is Redeemed and can only be Redeemed once.

A Redeemed I-REC (HX) Certificate ceases to be transferable to another Entity.

The I-REC (HX) Certificate and its Verified Attribute Record can only be verifiably Assigned to an End-user after Redemption.

#### 3.3.5 An I-REC (HX) Certificate is Evidence-based

An I-REC (HX) Certificate can be issued only against independently verified evidence of a historical event or activity (ex-post). If that evidence is derived from another attribute tracking methodology, then that source information must have been prevented from further use (i.e. removed from any market) by means of cancellation or similar deactivation process.

### *3.3.6 Labeling Schemes and Information Carrier Provision*

An I-REC (HX) Certificate may be used to convey additional attributes, such as applicable Labeling Schemes, in accordance with the guidelines outlined in [SD-03: Supported Labeling Schemes](#).

## **3.4 Infrastructure Principles**

This section contains only general information. For security reasons, design and operational details of the Registry are confidential and documented in [CA-02: Registry \(Design, Development, and Management\)](#).

### *3.4.1 Operational Reliability*

The Registry uses a bespoke general-purpose activity accounting engine based on the Registry Operator's unique immutable data model. This provides secure storage and management of production data and attributes which are essential to the correct and trusted operation of a Registry service.

The Registry is continuously monitored and developed to ensure consistent and reliable operation.

### *3.4.2 Data Integrity and Security*

The Registry is designed with referential integrity, full transaction logs, and double entry bookkeeping protocols to ensure that data integrity is maintained within the Registry and when interacting with other systems.

Security protocols are in place to prevent unauthorized access to records and the Registry codebase.

### *3.4.3 Cost Effectiveness*

The Registry is designed to enable operation over low bandwidth Internet connections and on general use specification computer platforms requiring no additional paid-for software.

### *3.4.4 Accessibility*

The Registry is accessible via the Internet and maintained to be compatible with current versions of commonly used computer operating systems such as Microsoft Windows and macOS. User interfaces are designed in line with best practice for such infrastructure.

## **3.5 Accreditation**

### *3.5.1 Confirmation of Compliance with The Standard*

The services provided under the I-REC (HX) Product Code are provided in compliance with the Standard and will maintain alignment with the Standard to ensure the continuing Accreditation status for I-REC (HX) and any associated Entities and Infrastructure.

## **4. Market Structure and Services**

To clearly assign responsibilities to Entities within a best-practice environment, the service provided under the I-REC (HX) Product Code is based on a structure and set of requirements designed to be

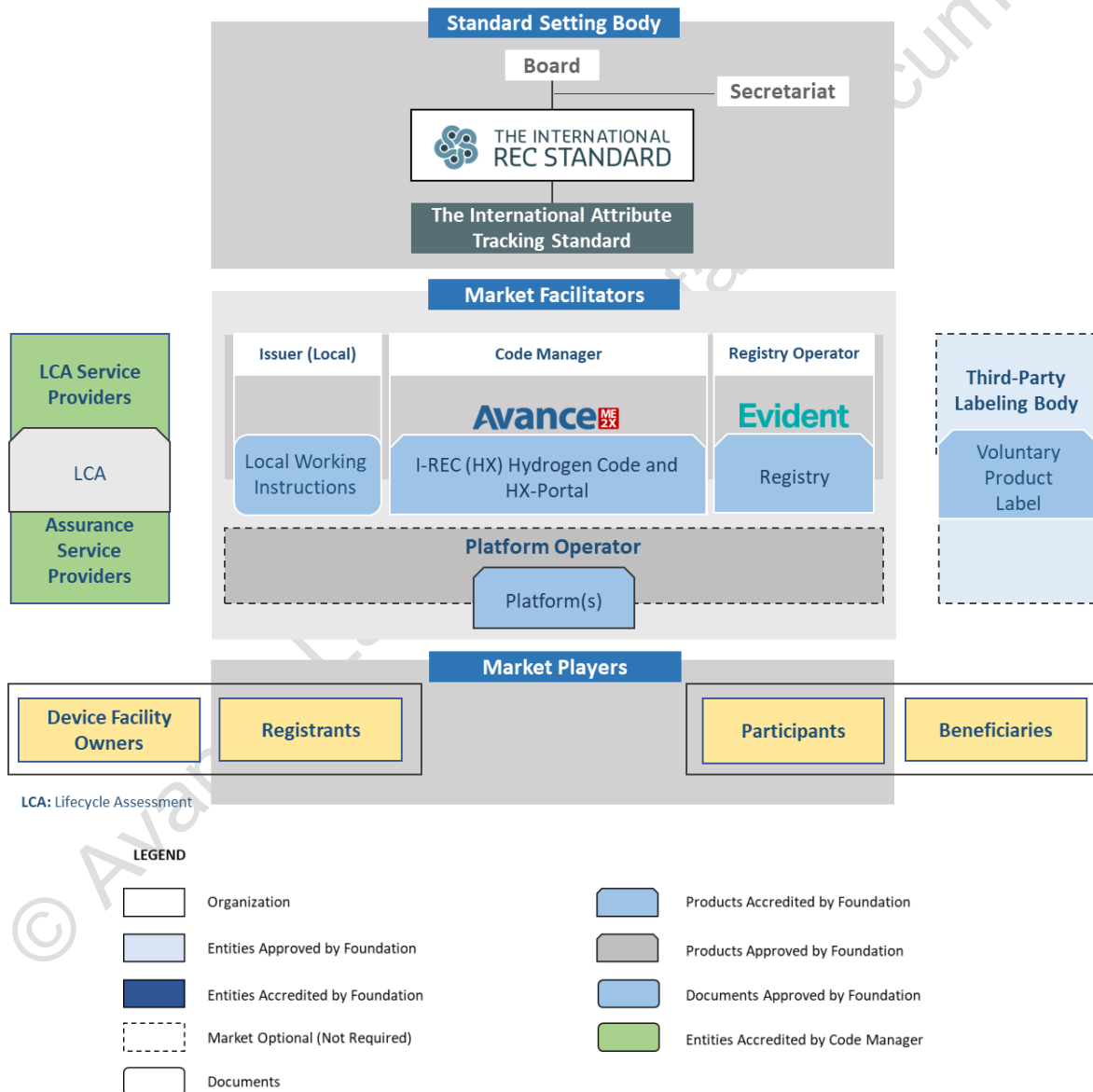


independent, transparent, and auditable. This section sets out the high-level definitions of roles and responsibilities and the structure within which the service is delivered.

### 4.1 Overview and Responsibilities

Figure 1 shows the relationships between the roles described within the Standard. Avance, as the Code Manager, has adopted this model as the basis for all services provided under the I-REC (HX) Product Code.

Not all roles require Accreditation under the Standard, only those which perform a function integral to the implementation and operation of I-REC (HX) Product Code. Users of I-REC (HX) Certificates, primarily Device Facility Owners, Registrants, Participants, and Beneficiaries, do not require Accreditation as their role is that of a consumer of services.



**Figure 4** I-REC Ecosystem Structure – Outlining the Role of the Entities

## 4.2 Code Manager

As Code Manager, Avance is responsible for delivering and ensuring the quality of the services associated with the I-REC (HX) Certificate, including services provided by Accredited Entities, including:

- Authorization of Issuers, Registry Operators, Platform Operators, Assurance Service Providers, and LCA Service Providers as well as such Entities' Accreditation by the Foundation.
- Maintenance of procedures and governance arrangements related to the I-REC (HX) Product Code; and
- Overall compliance with the Standard.

The Code Manager may not be a Participant, Registrant, Device Facility Owner, LCA Provider, or Assurance Service Provider.

## 4.3 Registry Operator

As the Registry Operator, Evident is contracted by Avance (as Code Manager) and is responsible for delivering and ensuring the quality of the Registry. The Registry Operator reviews, verifies, and approves the onboarding of Participants to the Registry and provides services related to the Transfer and Redemption of the I-REC (HX) Certificates. The Registry Operator may not be a Registrant, Device Facility Owner, or Participant.

## 4.4 Issuers

Avance's services under this I-REC (HX) Product Code are supported and delivered by multiple Accredited Entities acting as Issuers. An Issuer is responsible for the processing of Facility registrations and Issue Requests relating to the activity of the Facilities. The procedures adopted by an Issuer to ensure the quality and integrity of the Product are defined in Local Working Instructions (LWIs), which are owned by the respective Issuer. Details of all Issuers are set out in [SD-01: Authorized Issuing Countries](#) and relevant Local Working Instructions.

In order to allow the implementation of the I-REC (HX) Product Code and for an Issuer to fulfill its role, an Issuer will enter into an agreement with Avance, the Foundation, and the Registry Operator (Evident), through which the Issuer shall uphold and be bound by the I-REC (HX) Product Code and the Standard and be granted the authority to register Device Facilities and subsequently issue I-REC (HX) Certificates on the Registry.

## 4.5 Registrants

A Registrant may either be the Device Facility Owner or can be appointed by the Device Facility Owner to undertake the relevant activities.

Registrants are responsible for submitting Device Facility registrations and Issue Requests for I-REC (HX) Certificates. *Note: At the time of issuance, a Registrant must designate an Account to deposit the certificates in. Only Self-Consumption Redemption Accounts or specific Redemption Accounts related to Interoperable Certification (see Appendix 1) are relevant accounts which the Registrant might also have registered under its name. Otherwise, all certificates must be designated to a Participant's Trade Account or Platform Operators Marketplace Account.*

To Register Device Facilities, Registrants are required to enter into a single contract with the Issuer.

A Registrant may contract with more than one Issuer, but a single Device Facility may only be registered with one Issuer at any one time.

Any legal person or organization can be a Registrant unless they are an Accredited Entity, in which case restrictive (i.e., non-trading) participation provisions may apply.

A Registrant may also be a Participant.

Entities wishing to become a Registrant should follow the procedure specified in Section 6. Where an organization or individual wishes to register Device Facilities in more than one country it may be necessary to apply to be a Registrant with more than one Issuer.

#### 4.6 Participants

Participants may hold a specific type of Account in the Registry through which they can hold, transfer, and Redeem I-REC (HX) Certificates (apart from self-redemption certificates or certificates issued and redeemed specifically for Stacking, which can only be held in a Redemption Account linked to a Registrant and Device Facility).

Participants are required to enter into a contract with the Registry Operator (Evident) to gain access to the Registry.

Any legal person or organization can be a Participant. Restrictions may be placed on Participants who are also Accredited Entities to ensure that no potential conflict of roles and duties arises.

A Participant may also be a Registrant.

Entities wishing to become a Participant should follow the procedure specified in Section 6.

#### 4.7 Device Facility Owner

A Device Facility Owner is an Entity that owns a Device Facility that is eligible to be registered in accordance with this I-REC (HX) Product Code.

#### 4.8 Beneficiaries

Beneficiaries are the End-users of I-REC (HX) Certificates which have been Assigned as part of a Redemption Transaction.

Any Entity may also be a Beneficiary.

#### 4.9 LCA Service Provider

An LCA Service Provider is an Entity which conducts an LCA Study or a greenhouse gas (GHG) assessment on behalf of the Registrant or the Product Facility Owner for the Device Facility. The assessments will be conducted according to methodologies outlined by Hydrogen market regulations, and the results can be reported within the Tier 2 Regulatory and Third-Party Labels alongside other attribute criteria where applicable.

LCA Service Providers must be third-party entities accredited by Avance and independent of the Registrant, the Device Facility Owner, and the Assurance Service Provider. LCA Service Providers will provide a report with a carbon product footprint (or carbon intensity) to the Registrant or the Device Facility Owner to incorporate into the Tier 2 Verified Attribute Record Certificate. LCA Service

Providers may be retained by the Registrant or the Device Facility Owner to conduct additional LCA Studies based on alternative LCA methodologies.

#### 4.10 Assurance Service Providers

An Assurance Service Provider (ASP) is an Entity which conducts validation, verification, and auditing of Device Registration Data, Inspection Data, an LCA Study, and/or other relevant verification steps of the hydrogen certification process. ASPs must be third-party entities accredited by Avance and independent of the Registrant, the Device Facility Owner, and the LCA Service Provider.

ASPs shall provide a Limited Assurance Statement to the Registrant affirming that the LCA Study conducted by the LCA Service Providers is without material misstatements or misrepresentations. ASPs may be retained by the Registrant or the Device Facility Owner to validate, verify and audit LCA Studies conducted by LCA Service Providers, which are based on alternative LCA methodologies.

#### 4.11 Third-Party Labeling Bodies

A Labeling Authority is an Entity which imparts additional criteria or attributes beyond the scope of an I-REC (HX) Certificate, but which may be associated with an I-REC (HX) Certificate.

Where a Labeling Authority has an agreement with Avance, and the Labeling Authority's additional criteria are met by the Registrant, the relevant I-REC (HX) Certificate may be issued carrying the Label.

Where a requirement is established for a Labeling Authority to apply a Redemption Label, Avance will establish protocols and propose such changes as may be required to the I-REC (HX) Product Code to affect such a requirement.

See [Appendix 2](#) for further details on Labels.

#### 4.12 Platform Operators

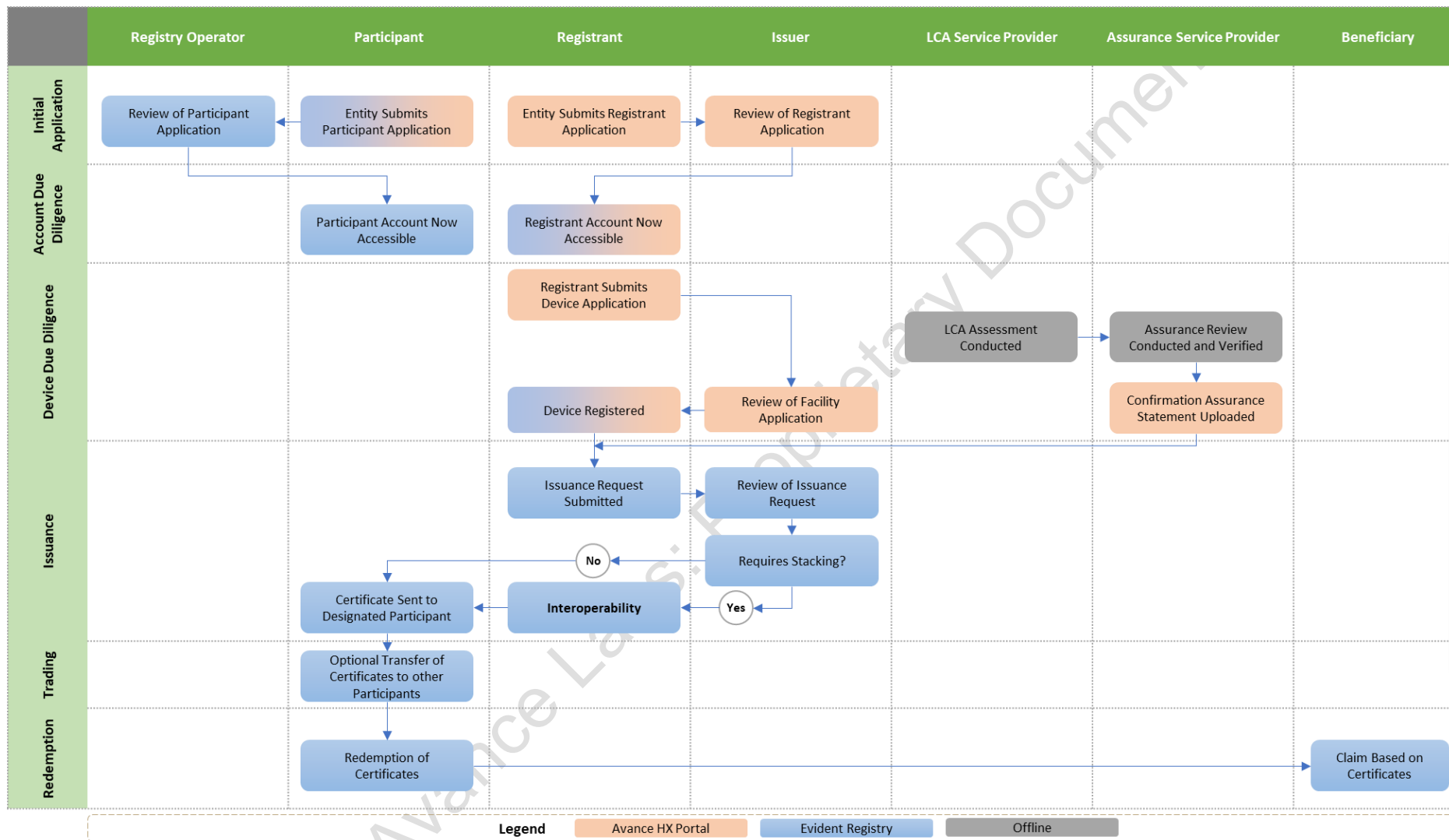
A Platform Operator is an Entity that is responsible for the provision and operation of a Platform that provides functions that extend the scope of a Registry. Platforms do not constitute a primary record of the custody of an I-REC (HX) Certificate but may act as a custodian on behalf of Entities and hold details of legal title to an I-REC (HX) Certificate.

Platform Operators may have varied commercial relationships depending on the nature of their Platform.

Further details relating to Platforms can be found in Section 14 and [SD-04: Authorized Platforms](#).

## 5. I-REC (HX) Certificate Life-cycle Overview

The I-REC (HX) Certificate market is designed to enable simple and clear engagement for Registrants and Participants. An overview of the key processes is shown in **Figure 5**.



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**Figure 5** Depiction of the Certification Process Overview

## 6. Avance (HX) Portal

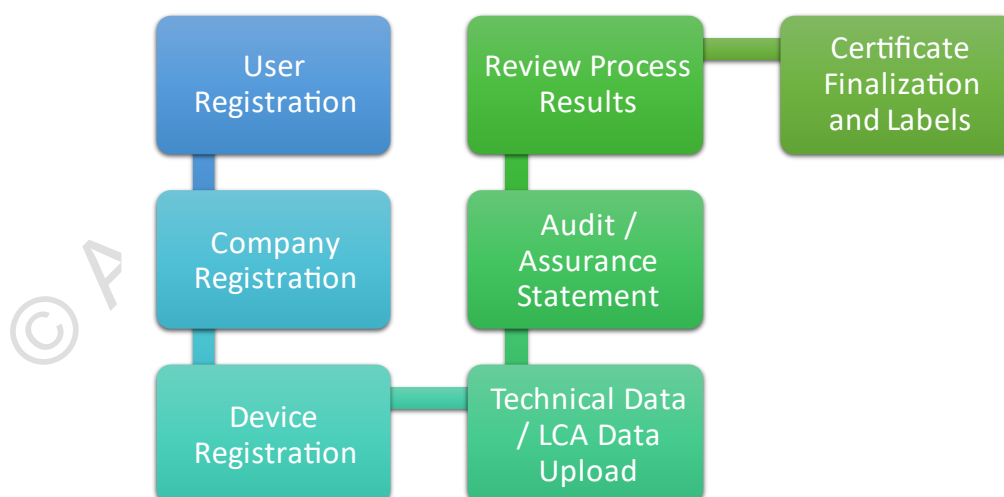
Data flows that are required for the I-REC (HX) Certification process are partly managed within the Avance (HX) Portal, which is a cloud-based dashboard for user, company, and project management and is integrated with the Evident Registry. Please refer to the [Avance \(HX\) Portal User Manual](#) for more information on how the portal works. The portal contains the necessary security and governance layers for ensuring that data is kept private, encrypted, and in accordance with international best practices.

As described below in subsequent sections, the user experience for Registrants starts by interfacing with the Avance (HX) Portal and communicating with the Registry (Evident Platform) via Application Programming Interfaces (“APIs”) in order to enable issuance of I-REC (HX) Certificates.

The portal is accessible on the Code Manager’s [website \(https://avance.energy\)](https://avance.energy) from any Internet-connected device; however it is best suited for non-mobile and non-tablet devices. Users will be assigned a login and password for accessing the Portal. Once approved, a login and password will be supplied by Avance to a single primary registrant-managing-user of the Avance (HX) Portal as well as a mirrored account on the Registry (Evident Platform). The Registrants’ lead user will be responsible for requesting that additional company-specific accounts be created.

The Avance (HX) Portal is the engine for all attribute-related information that will eventually be displayed on the I-REC (HX) Certificate. Thus, a registrant will be using the HX Portal to enter Facility, production, and LCA-related data, which is then processed by the HX Portal for various services available to the user, which include benchmarking of the carbon footprint of a Device Facility, among others. Additionally, this information will be relayed to the Evident Registry for supporting Issue Requests. All details provided by the Registrant will require third-party verification prior to Issuance.

Issue Requests will then be carried out on the Registry, whereby mirrored copies of such information will be relayed to the Avance (HX) Portal for cross-referencing.



**Figure 6** General Overview and Workflow based on the User’s Interaction with the Avance (HX) Portal

## 7. Market Entity Entry and Exit

### 7.1 Context and General Provisions

#### 7.1.1 Standard Terms

Entities wishing to act as Registrant shall be required to agree to Standard Terms as outlined in [ST-02: Registrant-Issuer](#).

Entities wishing to act as Participant shall be required to agree to Standard Terms as outlined in [ST-01: Participant-Registry Operator](#).

An Applicant who wishes to become both a Registrant and a Participant must enter into an agreement with the Issuer and an agreement with the Registry Operator, respectively, to cover both roles.

#### 7.1.2 Equitable Treatment

Standard Terms are applied to all Market Entities to ensure that no Entity benefits from a preferential position compared with another. Variations to Standard Terms are not permitted without explicit approval of Avance, which may seek guidance from the Foundation.

The service is provided on a non-discriminatory basis. This means the Standard Terms are generally non-negotiable. Amended terms may be accepted where required by local law or good practice, but these shall not give rise to any direct or indirect benefit to the Applicant.

#### 7.1.3 Compliance

Compliance checks shall be performed for all Applicants in accordance with [CA-01: Compliance Protocols](#). Avance and the Issuers shall always have the right to either refuse to enter into or terminate with immediate effect agreements with Entities that have not satisfied their reasonable requirements for compliance with international best practice in commercial agreements and anti-money laundering regulations. Entities can request formal arbitration by the Foundation if Avance refuses their participation with the Code Manager.

### 7.2 Process Overview

The process for market entry is shown in **Figure 7** (for Participants) and **Figure 8** (for Registrants) with the process for market exit being shown in **Figure 9**.

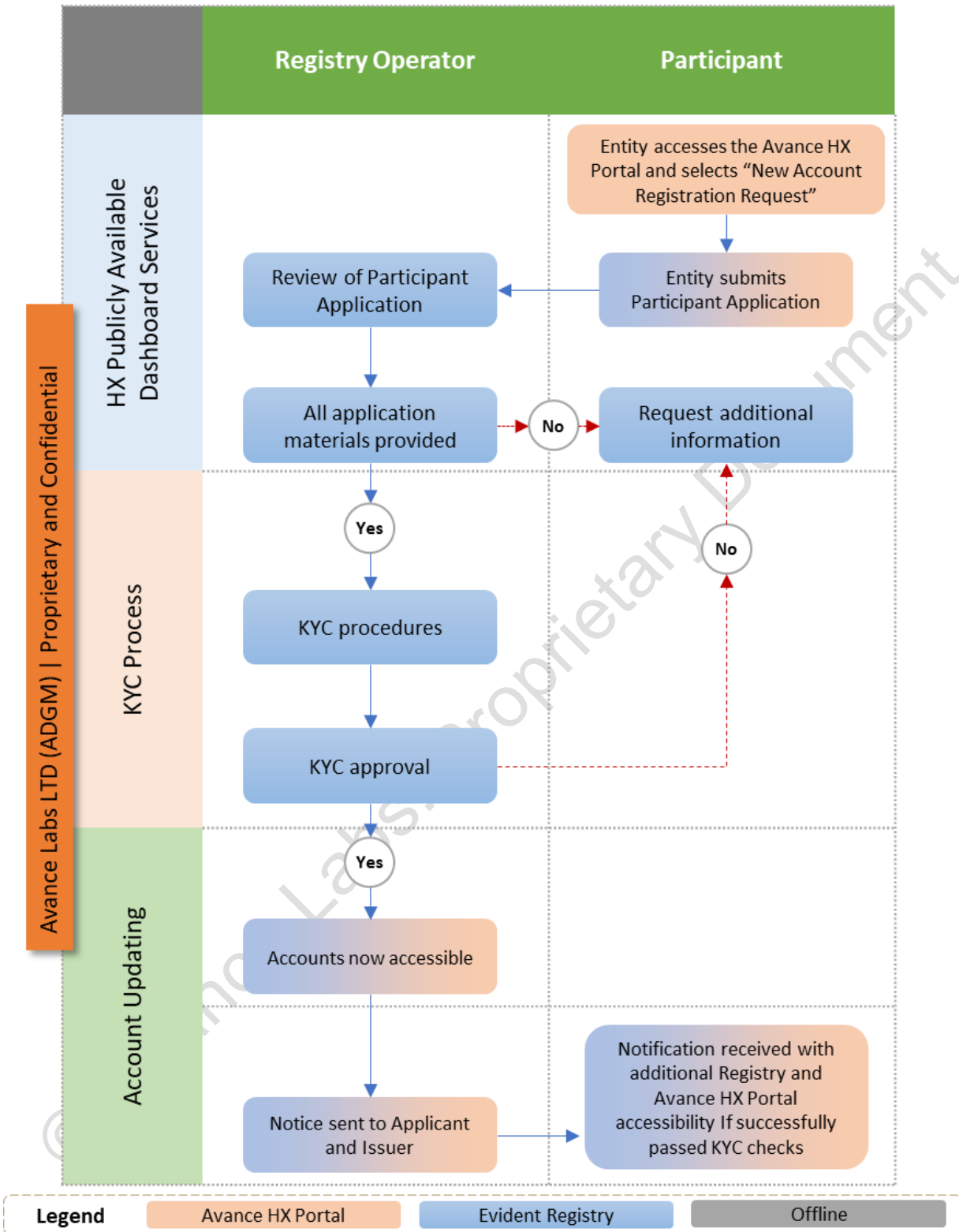


Figure 7 Depiction of the Market Entry and Approval Process for Participants



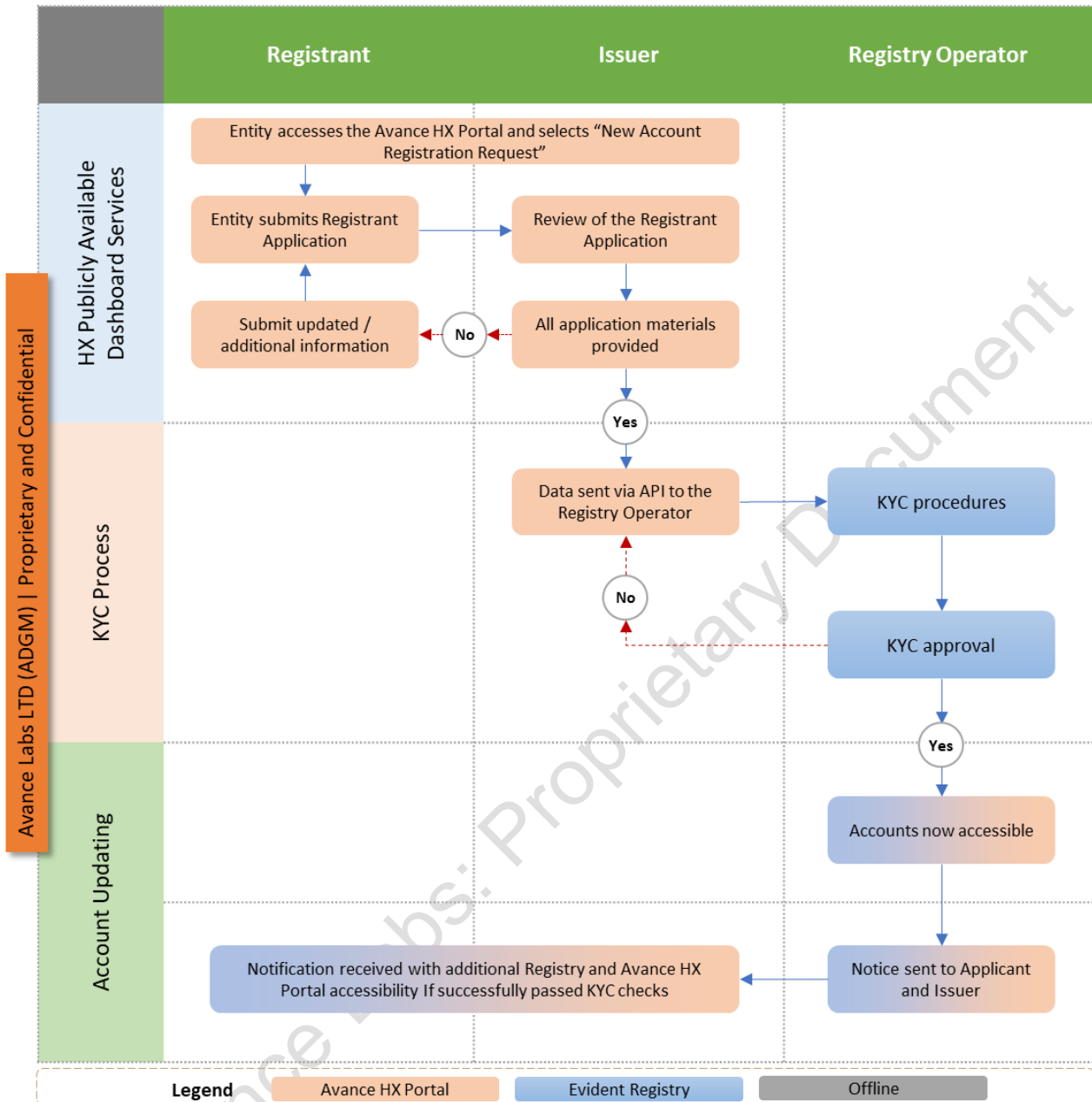
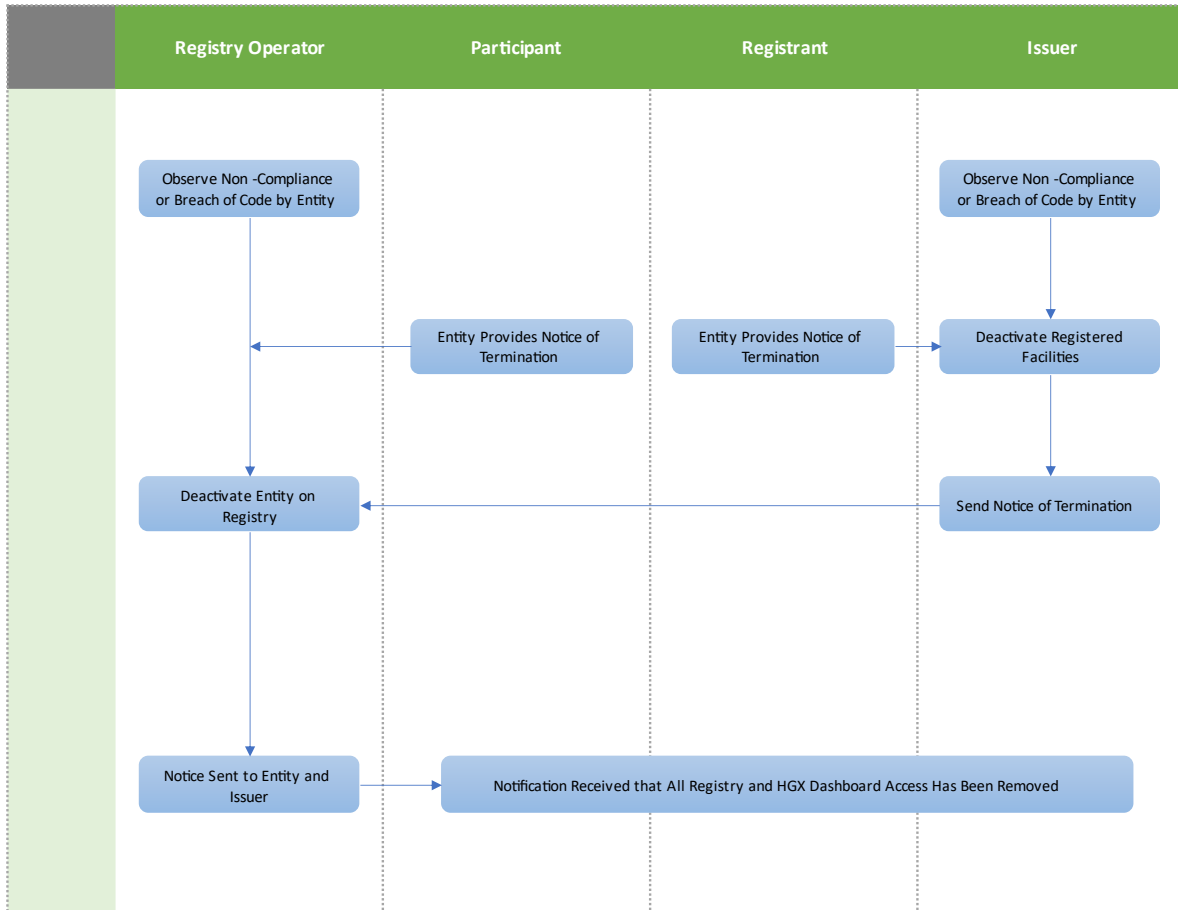


Figure 8 Depiction of the Market Entry and Approval Process for Registrants



**Figure 9** Depiction of the Market Exit and Deactivation Process

## 7.3 Application

### 7.3.1 The Applicant

The Applicant must be a legal entity (e.g. a registered incorporated or unincorporated business existing and recognized by law in its place of incorporation, a public sector entity authorized by law in the country of its existence, or a private individual).

### 7.3.2 The Application

The Applicant must complete the application form(s) or process as specified on the Avance (HX) Portal. The application will then be forwarded on to the Registry Operator (in the case of Participant application) or the relevant Issuer (in the case of Registrant application).

All information must be submitted in English and appropriate supporting evidence must be provided when requested. Except for Standard Terms provided in an approved form by an Issuer, documents, or other submissions in languages other than English should be accompanied by an English translation.

The Issuer, Avance or Evident may request additional information to support an application and may reject an application if they are not satisfied that the applicant has passed their Know Your Customer (KYC) and Anti-Money Laundering (AML) verification.

### 7.3.3 Required Information

Applicants shall, as a minimum, be required to provide the following information:

- Role(s) requested under the application (e.g. Participant and/or Registrant)
- Applicant Legal Name (individual's name, if the applicant is an individual or business name, if the applicant is a business)
- Registered office address
- Main business activity
- Year of formation or registration
- Website URL
- Approximate number of employees
- Name of the Chief Executive Officer or General Manager
- Legal Status (e.g. registered incorporated body, public sector entity, or private individual)
- Countries where business activity takes place
- Country of company registration, tax domicile, or private residence
- Shareholders and ultimate beneficial owners holding more than 10% of shares
- Corporate registration number or passport number
- Balance sheet total for the last financial year (with the currency specified)
- Operational contact person's name, email, and telephone number
- Lead user contact person's name, email, and telephone number
- Finance contact person's name, email, and telephone number
- Details of related Entities

Other additional information that may be added to this list is specified on the Issuer's or the Code Manager's website (<https://avance.energy>).

## 7.4 KYC Verification and AML Checks

### 7.4.1 Identity Check

The application will be reviewed by the relevant Issuer and/or Avance. Each Market Facilitator must be satisfied with the legal identity and good standing of the applicant.

Accredited Entities are required to follow international good practice in the application of KYC and AML due diligence checks.

In the interests of an orderly and transparent market, Accredited Entities may consult national and international anti-fraud and money laundering authorities as part of the review.

### 7.4.2 Supporting Evidence

Evidence to support an application may include, *inter alia*:

- In the case of an individual, a copy of a relevant ID document or Passport
- Published annual (business) financial accounts dated within the previous 12 months
- Certificate of incorporation (or company registration documents)
- A relevant company-held operating license
- Trade association memberships
- ISO accreditations
- Proof of existence of a corporate bank account

The exact documentation required may vary between Accredited Entities and country and is at the discretion of Avance and in accordance with internationally accepted KYC/AML requirements.

## 7.5 Decision

### 7.5.1 Processing of Approved Applications

Where an application has been approved, the Code Manager will provide updated access to the Avance (HX) Portal and Evident will enable relevant access to the Registry. Confirmation that registration has been completed will be sent to the Applicant. Evident will also advise the lead user of their user ID and initial credentials for gaining access to the Registry.

### 7.5.2 Creation of Accounts

Once Registry access has been provided, Registrants may create and manage Device Facilities (including making requests for the issuance of certificates) and Participants may create and manage Accounts in accordance with [UG-04: Participant](#).

### 7.5.3 Credit Terms

Where the Registry Operator (Evident) and/or the Issuer is unable to establish an acceptable credit rating for the Applicant they may at their sole discretion require a deposit or prepayment for services to be provided in accordance with any provisions that may exist within their respective Standard Terms.

### 7.5.4 Refusal

Where the Issuer is unable to verify the identity of the applicant, has reasonable reason to doubt the good conduct of the applicant or has reasonable reason to doubt the authenticity of the evidence

provided, the Issuer may refuse the application, in accordance with the requirements of the Standard, whereby Arbitration of refusals shall be referred to the Foundation.

## 7.6 Suspension and Termination of services

Access to services may be permanently or temporarily withheld without notice in cases where a Market Entity is suspected of any of the following: to have acted fraudulently; to have committed any offense under the laws applicable to their places of domicile or trade; to have acted in breach of this I-REC (HX) Product Code; or where a Market Entity is in default of contractual terms with an Accredited Entity.

### 7.6.1 Termination by Registrants and Participants

Registrants and Participants may terminate agreements with Issuers or Evident without notice but will be eligible for a rebate for services paid for but not received only if this is explicitly provided within the relevant Standard Terms.

### 7.6.2 Termination by Accredited Entity

When an Accredited Entity terminates an agreement for reasons of default or non-compliance by a Market Entity, it shall have no obligation to re-contract with that Market Entity and no other Accredited Entity shall be obliged to contract with that Market Entity.

See also Section 16.4.

### 7.6.3 Termination of Code Manager

If Avance is prevented from providing services through either a legal requirement or through contractual default, all Issuers shall make reasonable efforts to ensure that a replacement Code Manager is appointed, and terms offered to all impacted Market Entities within a period of 12 months.

## 7.7 Transparency

A list of Registrants and Participants shall be published on the Code Manager's [website \(https://avance.energy\)](https://avance.energy).

# 8. Device Facility Registration

## 8.1 Context and General Provisions

To issue I-REC (HX) Certificates, a Device Facility or Device Facilities must first be registered in the Avance (HX) Portal, the primary point of contact into the I-REC ecosystem, which relays relevant information via APIs to the Evident Registry. Device Registration is initiated by a submission from a Registrant and administered by an Issuer who is authorized to act in the country in which the Device Facility is located.

Device Facility Registration shall include submission of a Facility Registration application and an audit report (if necessary). If a Device Facility audit is required, this shall be conducted by an approved Assurance Service Provider in accordance with the nominated Hydrogen market methodology. The Issuer may act in the capacity of a Verification Authority at the sole discretion of the Foundation.

The Issuer shall satisfy itself that the information available in the Device Facility Registration form, Audit Report, and any other associated documents is in line with what is expected from the relevant methodology before approving the Facility Registration.

The detailed process for registering Device Facilities is set out in [UG-02: Issuer](#) and [UG-03: Registrant](#).

The schedule of authorized countries, their Issuers, and any additional country-specific requirements are set out in [SD-01: Authorized Issuing Countries](#).

The list of eligible Hydrogen technologies, fuels and products and any associated requirements are set out in [SD-02: Technologies and Fuels](#).

Examples of acceptable evidence are set out in [CA-04: Accepted Evidence](#). An Issuer may accept other independent evidence of similar or greater quality.

When an Entity wishes to register a Device Facility in a location that is not served by an Issuer, they may make representation to Avance requesting that the appointment of an Issuer be considered, and such appointment is to be subject to the approval of the Foundation. See Section 13.

It is possible for a Device Facility to be registered for other tracking systems, but it must not receive more than one attribute tracking certificate for the relevant unit of hydrogen produced. Any existing registrations or changes to registrations for other tracking systems must be notified by the Registrant to the Issuer.

The Registrant must first have signed Standard Terms with the Issuer and Avance prior to registering the Device Facility.

Registrants remain responsible for updating registration details for Device Facilities where any the data provided changes during the period of registration.

## 8.2 Process Overview

Please refer to Figure 5 for an overview of the device registration process.

### Required Information

The supporting evidence must, as a minimum, include:

- A Device Facility registration form
- A Device Facility Audit Report (if necessary)
- Unedited project photos (ideally with the Device Facility location embedded)
- Unedited satellite photos of the Device Facility
- Sample metering evidence of Hydrogen Processing or similarly related commercial records
- A Bulk Flow Diagram and / or Process Flow Diagrams
- The Basis of Design with mass balances
- Identification of the Source of Feedstock
- Identification of the Electricity Source
- Single line diagrams for the electricity source, if self-produced
- Confirmation if Point Source Carbon Capture (or Carbon Reductions) is part of the project
- Confirmation if carbon removals will be included as part of the product life-cycle
- Confirmation if hydrogen is the final output or if a hydrogen derivative is the final product
- End-use applications of the Hydrogen (e.g. contractual evidence of off-take agreements)

- Proof that the Registrant is the owner of the energy attributes

The Registrant shall provide the information specified in [SF-02: Device Facility Registration](#).

The Registrant shall complete a Registrant's Declaration as set out in Section 7.8.

If the Device Facility can operate on mixed or alternative fuels (e.g. biomass and waste), this must be specified on the application form. If there is a direct and fixed relationship between fuel types and processing units within the installation, the different sections must be registered as separate Device Facilities.

Where a Device Facility is to be associated with the issuance of a Label, the Registrant shall provide evidence to support the eligibility of the relevant Device Facility to be issued the Label.

A Registrant must be the Device Facility Owner, or an agent duly appointed and authorized by the Device Facility, as demonstrated to the satisfaction of Avance.

For owners of Device Facilities, proof of such status will be required. Such proof may be a copy of the legal ownership or of an Owner's Declaration form accompanied by documents proving the legal existence of the owner. See Section 7.9 for details of the accepted wording for an Owner's Declaration.

In some instances, other documents such as proof of state ownership may be required.

[SD-01: Authorized Issuing Countries](#) provides details of all country-specific requirements.

It is the Registrant's responsibility to satisfy Avance and the Issuer that the proposed registration is valid and that the output of the Device Facility is eligible for issuing I-REC (HX) Certificates. Avance or the Issuer can request any additional information it deems necessary to verify the eligibility of a submitted Device Facility registration.

### 8.3 Verification of the Production Device Registration

#### 8.3.1 Initial Review

Avance and/or the Issuer will review the application to ensure:

- The Registrant is legally able to register a Device Facility on behalf of the Device Facility Owner.
- The Registrant is not suspected of having engaged in fraudulent activity in relation to attribute certificates or financial transactions.
- The Device Facility is, in principle, eligible to make Issue Requests for I-REC (HX) certificates.
- There is no existing registration for the Device Facility in the I-REC Registry.
- The Device Facility is eligible for any notified Device Facility Label.

#### 8.3.2 Installed Capacity

The Audit Report shall include the installed hydrogen processing capacity of the Facility. A Facility shall not request issuance of I-REC (HX) Certificates that exceed the annual installed capacity provided at Facility Registration, unless the Issuer receives written consent and evidence signed by the Verification Authority that the Facility's capacity has increased since the last Facility Audit.

#### 8.3.3 Inspection

A site inspection will be required if the Issuer is unable to verify the application data such as, but not limited to, a lack of evidence for the location of the Facility, a lack of consistency in supporting data, a lack of empirical data (e.g. metered readings, third-party reporting, etc.) or similar incongruences. The Issuer will engage an ASP, agreed with the Registrant, at the Registrant's expense. The ASP will arrange with the Registrant to conduct a site verification inspection. The ASP will have a checklist stating the minimum verification requirements. This will normally include confirmation of:

- The location of the Device Facility both as an address and latitude and longitude
- The energy sources/type of Device Facility (including photographic evidence)
- The capacity and number of hydrogen generation units
- The nature and size of any on-site consumer loads
- The location and class of metering equipment
- The connection to the grid system (including network operator and connection voltage)
- Any standby generators (e.g. for start-up) and whether they can directly contribute to the export of electricity from the site
- How and when the site takes electricity from the network
- The date of Device Facility commissioning
- The accuracy of the single line diagram provided

An inspection should not normally require more than half a day. The Assurance Service Provider should submit their inspection report to the Issuer within one week of the inspection.

#### 8.3.4 Final Review

Avance / the Issuer will review any inspection report provided to ensure that the application contains a true and accurate representation of the Device Facility.

Avance / the Issuer must verify any Labeling Scheme accreditations listed in the application with the responsible Labeling Authority. Attachment of Labeling Schemes to a Device Facility registration cannot be made without confirmation from the Labeling Authority. Identification of the Device Facility's status on the website of the Labeling Authority is acceptable as confirmation.

Avance / t Issuer will check other known registries to ensure that the Device Facility is not likely to be receiving energy attribute certificates from any other sources.

### 8.4 Registration

Once the final review is complete and satisfactory, the Issuer will approve and activate the Device Facility in the Avance (HX) Portal, which will in turn relay the relevant information to the Registry.

#### 8.4.1 Effective Registration Date

The Effective Registration Date shall be supported by verifiable evidence of the Device Facility characteristics on that date or earlier.

The Effective Registration Date of a Device Facility's registration shall normally be no earlier than its Commissioning Date. Exceptions to this may be agreed at the Issuer's discretion.

The Issuer will confirm to the Registrant that registration has been completed and will notify them of any publicly visible identifiers assigned to that Device Facility. They will also confirm the first date of operation for which I-REC (HX) Certificates can be issued following all assurance-related activities.



While no restriction is placed on the Effective Registration Date, Issuing is restricted in accordance with the provisions of Section 9.

#### 8.4.2 Expiry and Renewal of Registration

Registration of a Device Facility shall expire **five years from the Effective Registration Date** unless an earlier date is specified by the responsible Issuer or if the Device Facility has failed to comply with the I-REC (HX) Product Code's requirements. A Registrant may apply for renewal of registration in accordance with the general requirements for registration. Any renewal of registration shall be assessed based on the requirements in place at the time of renewal.

### 8.5 Device Facility Boundary

Device Facilities are considered to be distinct registrations if they are not geographically co-located within the same facility, factory, or plot of land, and even if geographically co-located, Device Facilities are considered to be distinct registrations if it is shown that 100% of the total output from one Hydrogen Facility is not consumed by the other Facility concerned (i.e. the output of Facility 1 would have to be completely consumed by Facility 2 in order to make the case for a single registration of Facility 2, whereby Certificates are only created for Facility 2's products). In addition, products that are produced as the result of the Registrant's activities but fall under another I-REC Product Code, are considered to be distinct registrations.

*Conceptual Example: The I-REC (HX) Code strives to enable the most robust attribute tracking possible. Thus, we advocate the subdivision of certification at multiple steps along a product's life-cycle for enhanced validation, verification, and traceability, where possible and within reason. In many cases, this will be more obvious than others. For example, if a Registrant has both a solar photovoltaic power plant to produce electricity as well as an electrolyzer for producing hydrogen, then the Registrant would need to register both the solar plant under the I-REC (E) Code and the electrolyzer under the I-REC (HX) Code. Similarly, if the Registrant also had an ammonia production facility on site and it consumed 100% of the hydrogen, then the Registrant would only be expected to register a single device which would encompass all of the electrolyzer and ammonia production steps / loops. However, if the Registrant utilizes less than 100% of the hydrogen for the ammonia production and then sells, trades, or utilizes the balance for purposes other than disposal, then the Registrant would need to register two devices: one for the electrolyzer which will create Hydrogen (HX) Certificates and a second for the ammonia plant which will create Ammonia (HX) Certificates.*

See Section 8.8 for details on boundary conditions and definitions as they relate to such topics as LCA or GHG accounting.

### 8.6 Registrant's Declaration

*SF-02A: Registrant's Declaration* details the approved text to be signed by all Registrants in support of applications for Device Facility registration. If it is not made available by the Issuer as a template document, it should be copied onto the Registrant's headed paper, completed, and signed by an authorized representative of the Registrant. It can then be scanned and sent electronically to the Issuer.

Avance / the Issuer may accept a company stamp as an alternative to an authorized representative's signature. Text within [square brackets] on the template should be replaced with the appropriate content.

Issuers may accept Registrants' Declarations in languages other than English provided they are satisfied that the effect remains as specified in [SF-02A: Registrant's Declaration](#). A legally certified translation into English of that document may be required.

If acceptable to the responsible Issuer, the Registrant's Declaration may be permitted by Avance to be completed as a digital contract.

## 8.7 Owner's Declaration

When a Registrant is not the Owner of the relevant Device Facility, the Owner shall be required to submit a declaration confirming that the Registrant has been assigned the right to register the Device Facility. [SF-02C: Owner's Declaration](#) details the approved text to be used in such cases. It should be copied onto the Device Facility Owner's headed paper, completed, and signed by an officer of the Device Facility Owner. It can then be scanned and sent electronically to Avance and the Issuer. Avance, and any relevant Issuer may accept a company stamp as an alternative to an officer's signature. Text within [square brackets] on the template should be replaced with the appropriate content.

An Issuer may accept Owners' Declarations in languages other than English provided they are satisfied that the effect remains as specified in [SF-02C: Owner's Declaration](#). A legally certified translation into English of that document may be required.

If acceptable to the responsible Issuer, the Owner's Declaration may be permitted by Avance to be completed as a digital contract.

## 8.8 Life-Cycle Assessments (LCA)

The life-cycle assessment ("LCA") should include all Scope 1 and Scope 2 emission sources and should additionally cover all relevant Scope 3 emission sources.

The Boundaries of the LCA shall be determined by the requirements of the relevant Regulatory Compliance Labels or third-party Labels that the Registrant seeks to obtain.

The perspective of the Device Facility will determine under which scopes the emissions sources are categorized (i.e. whether two or more Device Facilities are owned by the same Registrant, are on the same plot of land, or other criteria for adhering to the GHG Protocol).

The LCA Service Provider shall adjust the LCA Study in reference to each relevant Regulatory Compliance Label, third-party Label, or Net-Zero Benchmark Methodology such as allocation, choice of data, choice of emissions factors, and boundaries, among others. Prior to the Commercial Operations Date ("COD"), the Registrant will provide the LCA Service Provider with information on the Performance Warranties of the Device Facility to enable verification of LCA inventory data. After COD, the Registrant will provide the LCA Service Provider with access to primary measured data from the Device Facility for re-validating the LCA inventory data (i.e. validation shall ensure that the LCA inventory data is within the upper and lower bounds of the measured data), whereby the average of the upper and lower bounds of measured data forms the basis of the LCA inventory data for a specified amount of time as defined in the Regulatory Compliance Labels or third-party Labels.

### 8.8.1 Submission of LCA Data

The LCA data shall be uploaded to the Avance Hydrogen Portal either by the Registrant or its LCA Service Provider.

### 8.8.2 Audit of the LCA Data

The Registrant shall retain an accredited Assurance Service Provider (ASP) to audit the LCA data, and the Registrant or the ASP shall upload the reasonable-assurance statement (i.e. audit report) to the Avance HX Portal.

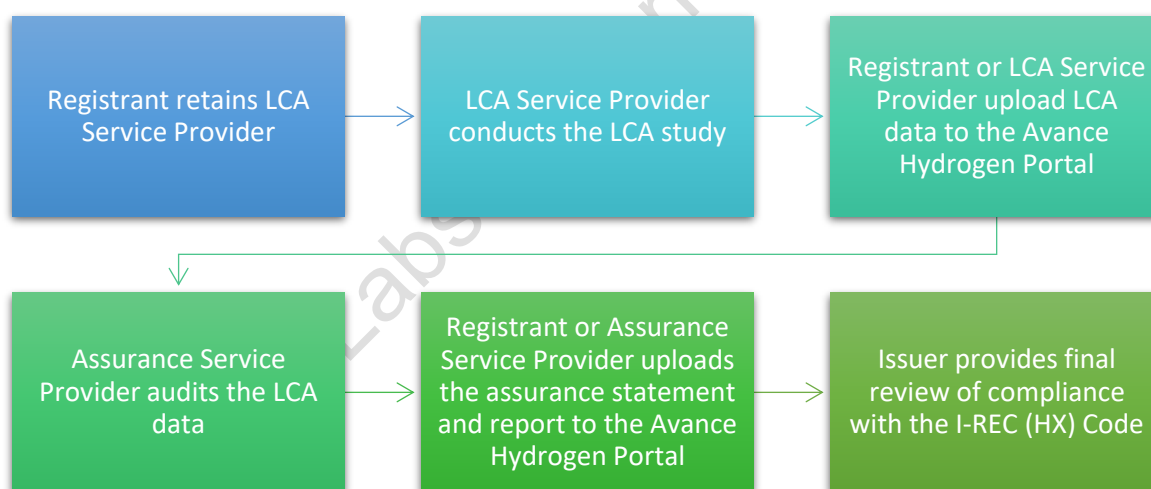
### 8.8.3 LCA Approval

The Issuer will review the LCA data and assurance statement for conformity to the I-REC (HX) Product Code and grant its approval, provided all requirements are met.

### 8.8.4 LCA Ongoing Duty of Disclosure

Registrants and any associated Device Facilities are subject to a LCA Ongoing Disclosure Duty, which requires disclosure to the Issuer of any material change of fact, input, or operating conditions likely to affect the specificity and/or accuracy of the most recently approved LCA data uploaded to the Avance Hydrogen Portal for a Device Facility. These material changes are outlined on the Code Manager's website (<https://avance.energy>).

Such changes may require the Registrant to obtain an update to their LCA as per the requirements of the Regulatory Compliance Labels, third-party Labels, or Net Zero Benchmark Methodology.



**Figure 10** Sequence of Events for the LCA as it Relates to the Certification Process

## 9. Issuing Certificates

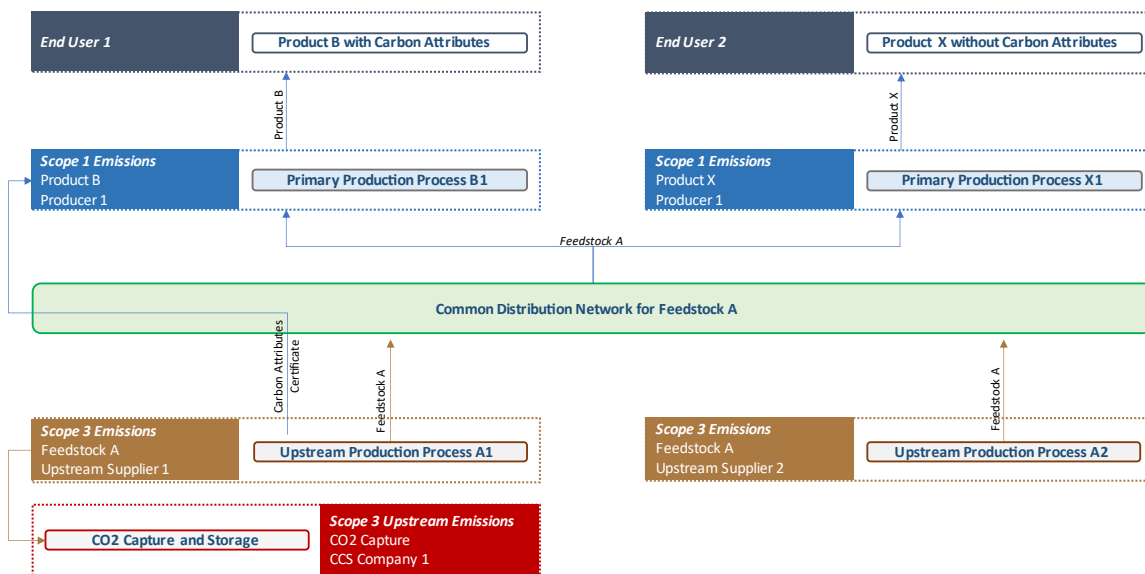
Certificates provide the basis of a Chain of Custody (CoC) model. CoC refers to documenting and demonstrating the custodial sequence that occurs when the ownership (or control) of a verified unit of Hydrogen and the claims regarding that final product (e.g. carbon intensity ownership) are transferred from one custodian to another in a supply chain.

In order to accommodate various producer and consumer needs, the I-REC (HX) Product Code takes three primary CoC approaches: (1) a Book and Claim (**Figure 11**); (2) Mass Balance (**Figure 12**); and (3) Full Segregation, to allow for a wider range of certification scenarios.

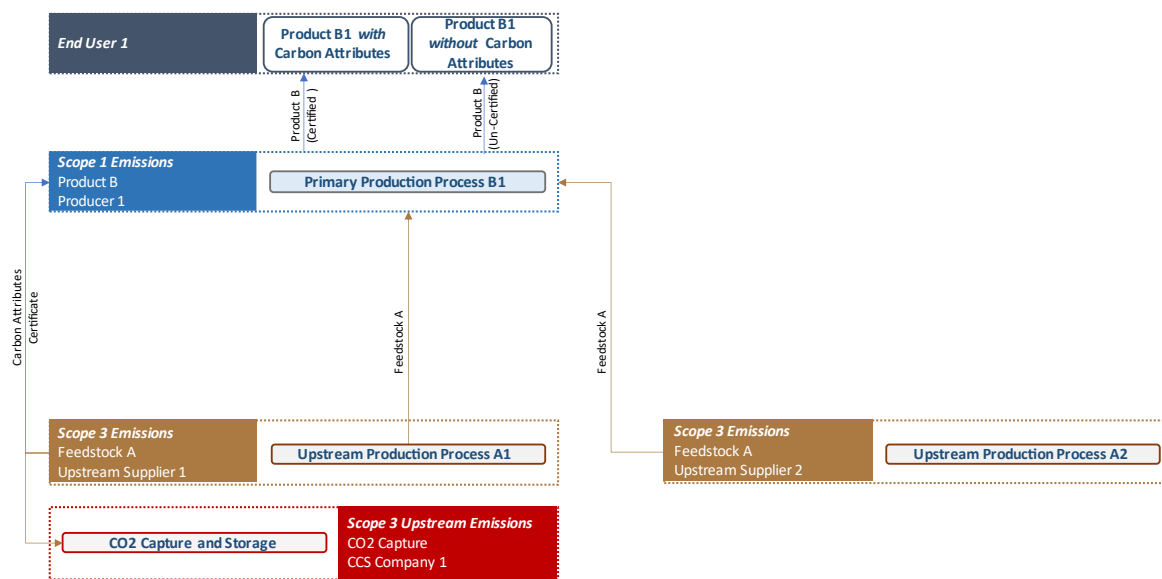
These three CoC models can be considered to lie on a spectrum of supply chain tracking. On the one side, Full Segregation requires constant association of Certificates with the physical Hydrogen at every point in the supply chain. On the other side, Book and Claim allows for the complete separation and disassociation of the physical Hydrogen product from the attributes and claims resulting from Certificate ownership. In between these two approaches is Mass Balance, which can take several forms due to a variety of accepted definitions and interpretations around the world and involves a partial association of certificates with the underlying product.

The I-REC (HX) Certificate operates a hybrid chain of custody model by accommodating all three CoC types at different points in the supply chain. Depending on the required use case and whether sufficient proof is provided in an Issue Request, each Certificate will communicate which parts of the underlying Hydrogen Processes adhere to Book and Claim, Mass Balance, or Full Segregation principles. These three approaches are further described below:

- **Book and Claim:** The key concept for 'book and claim' is that Certificates, or the attributes that a Certificate carries, are unbundled from the physical product. While the buyer of the Certificate and the product could theoretically be the same company, this is typically not the case, and the buyer of a Certificate will thus be in possession of an attribute (e.g. a sustainability claim) while the buyer of the physical product will not be able to make any claims regarding those attributes. CoC models based on 'book and claim' are most appropriate for situations in which certifiable products are distributed, transmitted, and/or transported in ways which involve mixing with other products with different attributes and where differentiating between certifiable and non-certifiable physical products is not possible.
- **Mass Balance:** This CoC model is useful for scenarios where products with different attributes/characteristics are mixed together in a known percentage (e.g. renewable and non-renewable ammonia are mixed together for internationally shipping). The result is that product attributes such as the emissions intensity of the final product may be allocated to any physical outputs of the process as long as the volumes/percentages of the separate input qualities are maintained (e.g. reflecting the fraction of the 'renewable ammonia' content in 100% of the products or stating the volume of products that are 100% renewable in comparison to the non-renewable products).
- **Full Segregation:** The key concept for Full Segregation is that certified products are never mixed with non-certified products (i.e. they are fully segregated product supply chains). Thus, there will be no dispute regarding whether the Certificates and underlying physical product are exact virtual and physical twins of one another. CoC models based on Full Segregation are most appropriate for situations in which certifiable products can be segregated and isolated from non-certifiable products (or products with different attributes) at key points within the distribution, transmission, and/or transportation of the product.



**Figure 11** Depiction of the Book and Claim Chain of Custody where Physical Flows of Products and the Attribute Certificates can be Separated from the Associated Physical Product (i.e. the Product-Specific, Mixed-Supply Scenario)



**Figure 12** Depiction of the Mass Balance Chain of Custody where Physical Flows of Products and Certificates are *not* Separated from the Associated Physical Product (i.e. the Product-Specific, Non-Mixed-Supply Scenario)

### 9.1 Context and General Provisions

An I-REC (HX) Certificate can only be issued against the provision of evidence of Hydrogen Processes (e.g. production, conversion, reconversion, transport, etc.) which may have occurred. That evidence can be in a direct form, through measurement data relating to a Device Facility registered in the

Registry, or it can be indirect through the transfer of information from an Approved Tracking Scheme that adheres to a similarly rigorous energy attribute certification (“EAC”) system.

An Issue Request shall only be approved by an Issuer when all required data and supporting evidence (as outlined throughout this code) have been supplied by the Registrant and whereby the Issuer is satisfied that the evidence provided will be an appropriate representation of the attributes of the measured volume.

The Issuer will store all documentation related to the issued I-REC (HX) Certificates in the Registry.

The detailed process for issuing I-REC (HX) Certificates is set out in [UG-02: Issuer](#) and [UG-03: Registrant](#).

The schedule of authorized countries, their Issuers, and any additional country-specific requirements are set out in [SD-01: Authorized Issuing Countries](#).

Examples of acceptable evidence are set out in [CA-04: Accepted Evidence](#).

Measurement evidence for the output of a Device Facility for a Production Period must be gathered and validated by an appropriately qualified independent party. A Device Facility cannot validate its own Hydrogen Processes.

## 9.2 Eligible Periods for Hydrogen Processes

Unless specified otherwise by Regulatory Compliance Labels or third-party Labels, a Production Period shall be eligible for issuing if the following conditions are met:

- There must be any duration equal to or less than one year, unless restricted by the requirements detailed in 8.5.7.
- This must be wholly within a single calendar year.
- It should not start earlier than the Effective Registration Date of the associated Device Facility registration.
- It should not end later than the End Date of the associated Device Facility registration.
- It should not include any period not specified within a valid owner's declaration for the associated Device Facility.

Across the life-cycle, Hydrogen batches can either be segregated or co-mingled with other products with differing attributes, following Mass Balance or ‘Book and Claim’ CoCs, respectively.

When Hydrogen batches follow different Chains of Custody (**Figure 11**, **Figure 12**) for the same life-cycle stage, separate Issue Requests shall be made for each CoC batch.

When a single Hydrogen batch can follow one or more CoCs at different stages of its life-cycle, separate Issue Requests can be Stacked together, and these will be communicated on the I-REC (HX) Certificate to demonstrate the Hybrid-CoC.

When I-REC (HX) Certificates are used as a tool for evidencing time-based reports of Hydrogen Processes, a restriction on the latest submission date or approval date for an Issue Request may be imposed.

This will be specified in [SD-01: Authorized Issuing Countries](#).

To avoid any doubt, all Issue Requests shall be supported by evidence of the underlying Hydrogen Processes and an Issue Request for a Production Period occurring later than the date of submission shall be invalid.

### 9.3 Other Tracking Systems

Several authorities, including – without limitation – the European Union and Treaty Countries and parts of the United States are considering the development of their own hydrogen certification tracking schemes. I-REC (HX) Certificates can only be issued in these countries following country approval by the Foundation and where there is clear evidence that the same unit of Hydrogen is not separately eligible for an End-user claim. Such evidence may include cancellation of another attribute certificate.

### 9.4 Issuing Process Overview

Please refer to Figure 5 for the certificate issuance process.

### 9.5 Required Information

It is the Registrant's responsibility to satisfy the Issuer that the Issue Request is valid and the Device Facility is eligible for issuing I-REC (HX) Certificates. The Issuer may request any additional information it deems necessary to verify the admissibility of an Issue Request.

When an Issue Request is to be associated with a Verification Label the Registrant shall provide evidence of the eligibility for the relevant Verification Label to be applied.

#### 9.5.1 Hierarchy of Evidence

This I-REC (HX) Product Code observes a hierarchy of evidence for proving production volumes from Hydrogen Processes:

- a) For a Device Facility which is connected to a national Hydrogen pipeline (backbone) or other network, the evidence should be market settlements metering data.
- b) Where such market settlement data is not available, appropriate metering data which has not been through settlement validation may be accepted at the discretion of the Issuer.
- c) Where metering data is not available, measured volume documentation for the periodic commercial/legal energy transfer from the producer to another entity (e.g. off-taker, purchaser) may be accepted at the discretion of the Issuer.
- d) If neither of (a), (b), or (c) is feasible, a system of measurement approved by both Avance, and the Issuer may be used.

The Registrant must give the reason for using evidence that is based on any category listed above, except (a), unless prior approval has been granted by Avance.

Approval of methods under (c) or (d) above will be granted only if all of the following criteria are satisfied:

- The measured volume is agreed by the purchaser of the Hydrogen or an independent auditor.
- The measured volume cannot be claimed by another person.
- The measurement is a reasonable representation of the volume produced by the Device Facility during the Hydrogen Processing period identified.

The measured volume should, where available, be provided to the nearest whole MWh, ton, MJ, or as required by the Regulatory Compliance Labels or third-party Labels.

Where measurement data is not provided from a primary source, indirect evidence may, if agreed with the Issuer, be used as set out in Section 8.5.10.

#### 9.5.2 Interoperability and Stacking of Certificates

Registrants shall be transparent and clear for all Interoperable I-REC certificates which they intend to redeem as a part of the I-REC (HX) Certificate (see Appendix 1).

#### 9.5.3 Verification of Evidence

All evidence provided by Registrants in support of an Issue Request shall be independently verified.

In most cases, verification of measured volume takes place within the hydrogen settlement process and secure reports from this mechanism are deemed acceptable. In such instances, the settlement system operator is deemed to be the Production Auditor.

When settlement validated data is not available, the Issuer may agree with the Registrant an appropriate form of alternative independent verification. An independent party must be nominated to act as Assurance Service Providers and make an independent verification of the measurement data. This provides the Issuer with proof that the generation event has occurred as described by the volume data and that no evidence of data tampering exists. The audit costs shall be the responsibility of the Registrant.

#### 9.5.4 Self-Consumption of I-REC (HX) Certificates

When a Registrant issues a Request for an I-REC (HX) Certificate for consumption within their own business group this should identify a Self-Consumption Redemption Account as the receiving Account on the Issue Request. This Account must be registered to the Registrant who is responsible for the relevant Device Facility.

Volume evidence for the consumption site must also be submitted with the Issue Request.

The Issuer and Avance must be satisfied that the following criteria have been met:

- The consumer and the Device Facility must each be at least 51% equity owned by a common holding company.
- The consumer site and the location of the Device Facility must be in the same country.
- The metering data evidence for the consumer has been independently verified to at least the standard of the Hydrogen Processing volume evidence.
- The volume of I-REC (HX) Certificates requested does not exceed the volume of consumption.

#### 9.5.5 Fuel Consumption Statements

When a Device Facility uses more than one fuel, the Registrant shall provide evidence of the fuels used throughout the Hydrogen Processing period. This may be using *SF-04C: Fuel Consumption Statement* or other means agreed with the Issuer.



### 9.5.6 Calculation of Eligible Production

When the measurement times for data points relating to a Device Facility do not align with the Production Period, the measured volume for a Device Facility shall be calculated assuming a level volume of Hydrogen Processing throughout the measurement period and applying an appropriate proportion of this to the Production Period.

### 9.5.7 Indirect Evidence

Indirect evidence may be provided by an Approved Tracking Scheme (ATS). The precise details of the transfer will depend on the ATS and its exit procedures.

#### 9.5.7.1 Conversion Request

An Issue Request must be submitted to the Issuer managing the interface with the relevant ATS. This Issue Request may be automated and will be defined in the interface protocols agreed for that ATS.

#### 9.5.7.2 Pre-Issuing Checks

Issuers must ensure they have adequate information to securely Issue I-REC (HX) Certificates into the correct Account. All certificates from the ATS must have been made no longer valid for transfer within that ATS by cancellation or a similar process, as stated in the interface protocols agreed for that ATS. Where the information from the ATS identifies a consumer beneficiary, the I-REC (HX) Certificates must be issued into an Account that is recognizably the same organization.

#### 9.5.7.3 Issuing I-REC (HX) Certificates

Once the Issuer is satisfied that I-REC (HX) Certificates issued in respect of the evidence provided will be a unique representation of the environmental attributes of the volume, they shall create a record in the Registry. This will use data from the ATS to convey the fact that the appropriate number of I-REC (HX) Certificates have been issued.

## 9.6 Issue Request Submission

The Registrant must submit a completed Issue Request to the Registry Operator (Evident) and all other information which may be required by the Issuer for an Issue Request to be processed. This may include the use of [SF-04: Issue Request](#) together with a declaration as set out in [SF-04A: Issuing Declaration](#) or other means specified by the Issuer. It is the Registrant's responsibility to provide the evidence to the Issuer in a timely manner.

There are three types of Issue Requests currently available:

- A General Issue Request
- An Interoperable Issue Request (for Stacked Certificates)
- A Self-Consumption Issue Request

## 9.7 Issuer Review

On receipt of an Issue Request that is complete and duly authorized, the Issuer will check, to the extent possible, that the measured volume has not been presented to any other system for the purposes of attribute tracking or carbon offsets. Any identified inconsistency with the declarations given by the Registrant or other queries will be raised with the Registrant.

Any residual unit of measured hydrogen remaining after issuing for previously approved Issue Requests may be added to the measurement volume of the issued I-REC (HX) Certificates. The number of I-REC (HX) Certificates to be issued will be the number of whole tons or MJ in this summation.

I-REC (HX) Certificates will not be issued where the Registrant is in default of payment terms with the Issuer in relation to the service.

## 9.8 Device Facility Confirmation of Issuing

When the Issuer is satisfied that all requirements for issuing have been met, it will proceed with the issuance of I-REC (HX) Certificates into the Account nominated by the Registrant.

### 9.8.1 Service Timing

If no further information is required, the Issuer will normally Issue I-REC (HX) Certificates within one Business Week of receiving a complete Issue Request with appropriate supporting evidence. If notified by the Registrant, Avance will raise any failure to meet this service level with the responsible Issuer. Unless explicitly stated in the relevant Standard Terms, the service level stated in this Section 9.8.1 is indicative and non-binding.

## 10. Certificate Ownership and Transfer

### 10.1 Account Types

The Registry supports multiple classifications of Accounts with the flow of I-REC (HX) Certificate between account types shown in **Figure 13**.

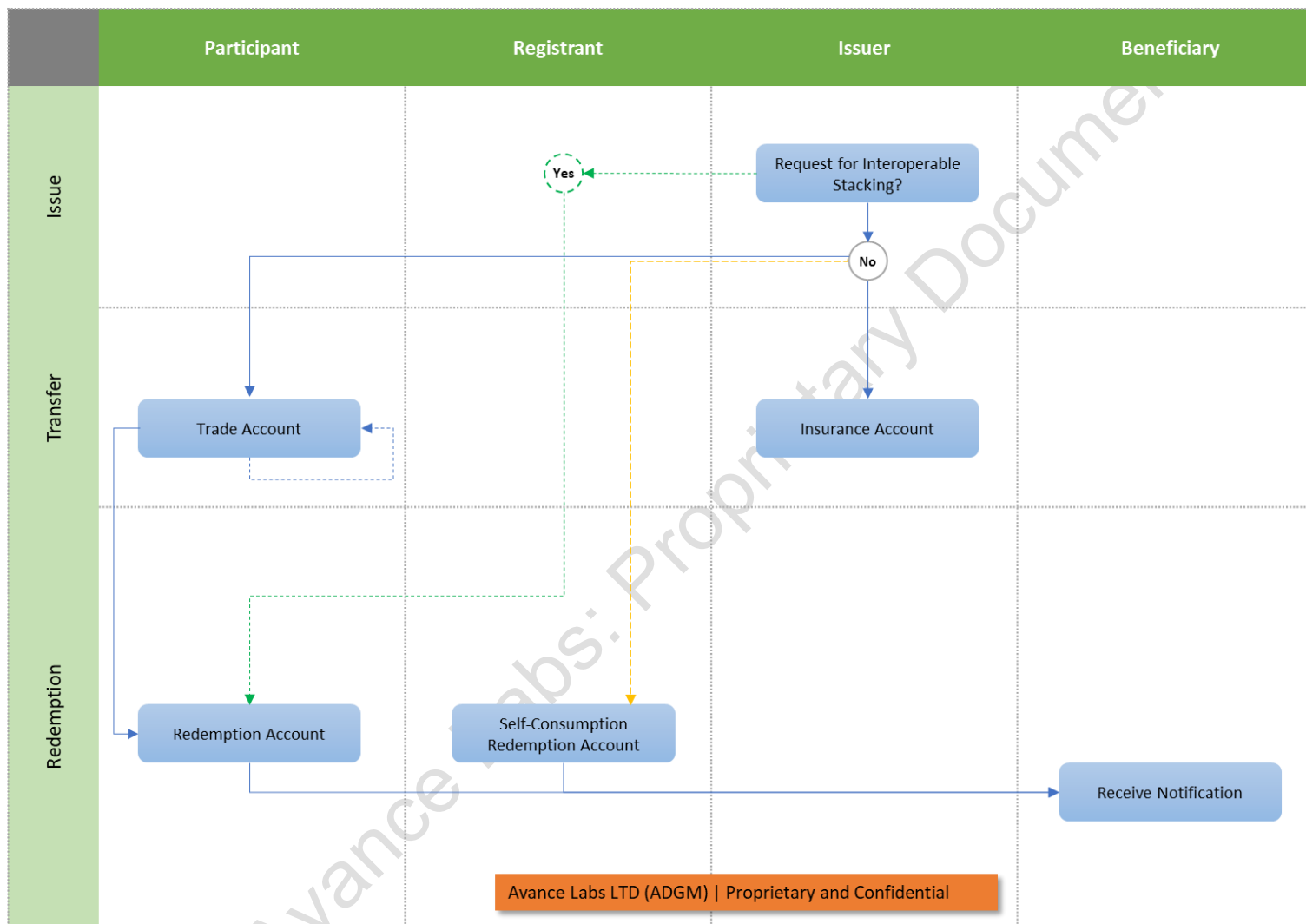


Figure 13 Depiction of the Ownership and Transfer of Certificates in the Registry

Available Account types are:

#### *10.1.1 Trade Accounts*

An Account operated by a Participant and capable of receiving and sending I-REC (HX) Certificates from or to another Account.

#### *10.1.2 Marketplace Accounts*

An Account operated by a Platform Operator and capable of receiving and sending I-REC (HX) Certificates from or to another Account.

#### *10.1.3 Redemption Accounts*

An Account operated by a Participant or Platform Operator and capable only of receiving I-REC (HX) Certificates from another Account.

#### *10.1.4 Redemption Accounts (for Interoperability of accredited I-REC Product Code Certificates)*

An account operated by a Registrant on behalf of a single Device Facility that is capable of receiving I-REC (HX) Certificates or other relevant I-REC Product Code Certificates for the purpose of Stacking, such that the carbon intensity value from the redeemed certificate is used as a Scope 2 or Scope 3 emission factor for the redeemer's value-chain emissions.

Interoperability refers to the Stacking of different I-REC Product Code Certificates together through their serial numbers, such that one certificate becomes Interoperable with another certificate. In other words, one certificate can be redeemed by another certificate (as opposed to the conventional redemption where the end use is by a company). The redeeming certificate will carry the redeemed certificate's serial number and carbon intensity. The carbon intensity of the redeemed certificate will be used in the final carbon intensity of the redeemed certificate. This is equivalent to an analog blockchain process.

#### *10.1.5 Self-Consumption Redemption Accounts*

An Account operated by a Registrant, Issuer (on behalf of a Registrant), or Platform Operator and capable only of receiving I-REC (HX) Certificates from another Account.

#### *10.1.6 Issue Accounts*

An Account operated by an Issuer and capable only of sending I-REC (HX) Certificates to another Account.

## **10.2 Ownership of Attribute Rights**

Custodianship of I-REC (HX) Certificates and the associated attribute rights are recorded in the Registry.

Where an I-REC (HX) Certificate is held within a Trade Account, it is deemed to be owned by the Participant owning that Trade Account.

Where an I-REC (HX) Certificate is held within a Marketplace Account, the record of ownership shall be maintained by the relevant Platform Operator.

Where an I-REC (HX) Certificate is held within a Redemption Account or a Self-Consumption Redemption Account, it is deemed to be owned by the Beneficiary recorded on the Redemption Transaction.

### 10.2.1 Carbon Credits / Offsets

The I-REC (HX) Certificate is an inclusive certificate and can carry other energy attributes based on different accounting methodologies (i.e. as a Tier 2 set of certified data), if such attributes are in accordance with the accounting rules under the GHG Protocol Corporate and Product Standards or if they are generated on an ex-post basis.

Therefore, carbon credit removals are a category of carbon credits that can be featured on an I-REC (HX) Certificate. It should be noted that carbon credits and carbon offsets are used interchangeably in this document and refer specifically to any such emissions “avoidance”, “reduction”, or “removal” claim which is generated and redeemed in a voluntary (i.e. non-compliance) market.

### 10.3 Transfer of Ownership

Transfer of I-REC (HX) Certificates between Accounts within the Registry is initiated and completed by the Account Holder of the source Account. No confirmation is required by the Account Holder of the destination Account.

All Transfers shall be recorded within the Registry as specified within [UG-04: Participant](#).

## 11. Redemption and Assignment

### 11.1 Context and General Provisions

Before any claim can be made, the I-REC (HX) Certificate must be removed from a Trade Account and placed in a Redemption Account or a Self-Consumption Redemption Account. This process is known as Redemption.

Once an I-REC (HX) Certificate has been Redeemed, only one claim to the underlying attributes of that I-REC (HX) Certificate can be made. Participants can generate a Redemption Statement from the Registry, which can be used as a disclosure statement.

Redemption of I-REC (HX) Certificates is initiated and completed by the Account Holder of the source Account.

No confirmation is required by another party.

The use of an I-REC (HX) Certificate can only be verifiably Assigned to an End-user (or Beneficiary) on Redemption.

All Redemptions shall be recorded within the Registry. The detailed process and requirements for producing and using Redemption Statements are set out in [UG-04: Participant](#) and [UG-05: Beneficiary](#).

The act of Redemption is irreversible and error correction is only permissible on demonstration to the Registry Operator that the Redemption details have not been used for any purpose.

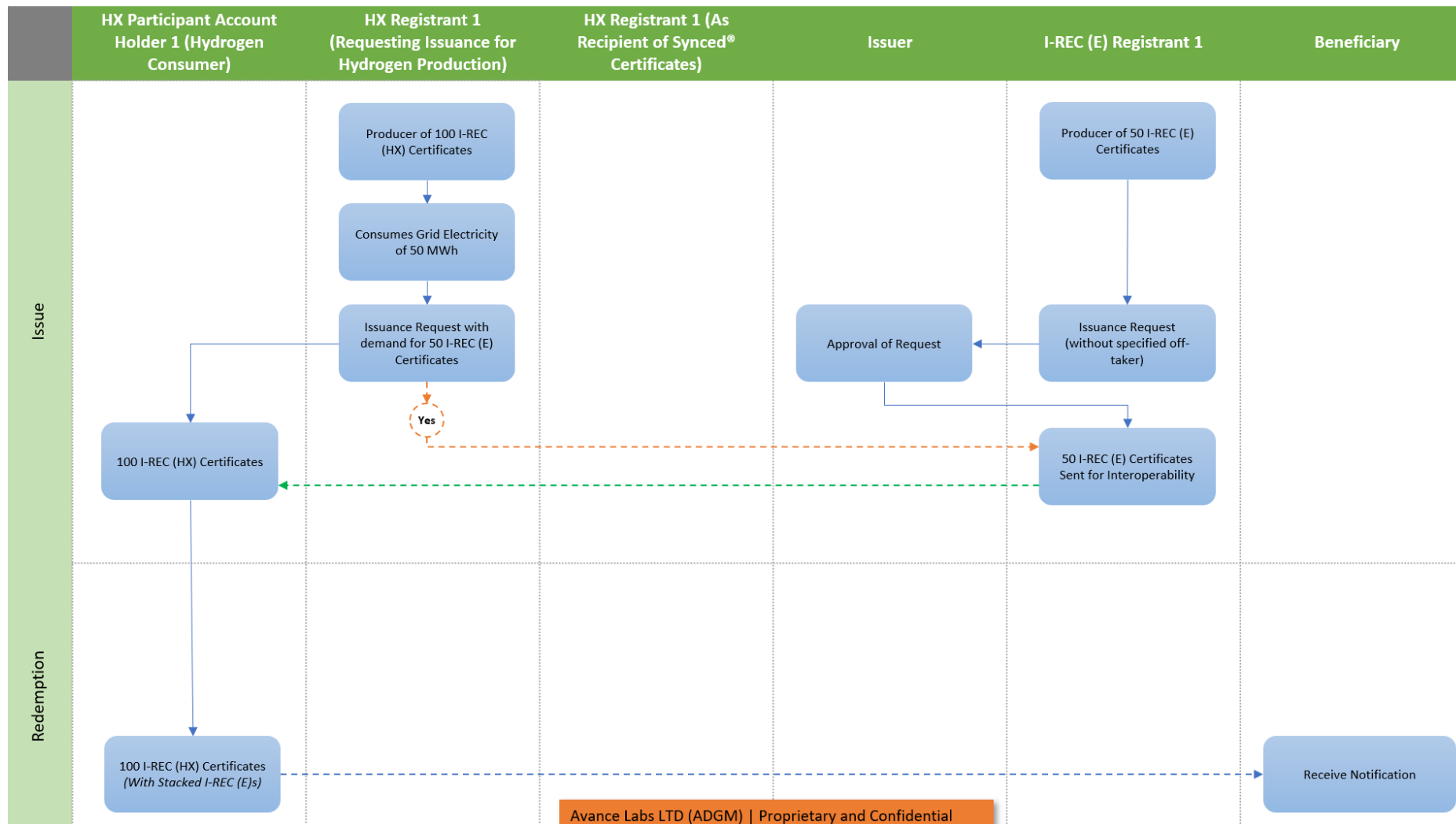
Error correction of Redemptions is at the sole discretion of the Registry Operator and may be subject to payment of a fee, to be agreed in advance, to cover any work involved.

### 11.2 Self-Consumption Redemption

When a Registrant wishes to report the Assignment of an I-REC (HX) Certificate for self-consumption, it shall notify the responsible Issuer, Avance and Evident, as part of the Issuing process set out in Section 9. Self-consumption are certificates that are redeemed on behalf of the Device Facility Owner with the location of consumption being the same location as the location of the Production Facility.

### 11.3 Stacked Redemptions for Interoperable Certificates

When a Registrant is the recipient of an Interoperable I-REC Product Code Certificate, the certificates will be available in a Redemption Account (*see 10.1.4 and Appendix 1*). Otherwise, other I-REC Product Code Certificates will be the recipient of an Interoperable Certificate if they are to be Stacked onto one another (**Figure 14**).



**Figure 14** Depiction of the Interoperable Certificate Issue Request, Stacking and Redemptions

#### 11.4 Required Information

At the point of Redemption, the responsible Participant shall record the Beneficiary, purpose of Redemption, location of related consumption, and Reporting Period relating to the Redemption. Once a Redemption has been processed, these details may not be amended.

#### 11.5 Eligibility of I-REC (HX) Certificates for Redemption Purposes

As a statement of verified historical fact, an I-REC (HX) Certificate is enduring and does not have an expiration date. The eligibility of an I-REC (HX) Certificate to be Redeemed for a purpose may expire in accordance with the requirements of the Entity to which the Redemption is reported or any applicable law.

#### 11.6 Redemption Statements

A Redemption Statement is a uniquely verifiable report confirming the Redemption and Assignment of I-REC (HX) Certificates. The following elements apply to all Redemption Statements:

- Only Redemption Statements produced within the Registry are valid for disclosure purposes.
- Transaction copies and extracts do not constitute evidence of a Redemption.
- Participants shall not create or use alternative forms of Redemption Statements unless this is approved by the Registry Operator.
- Redemption Statements include a QR code and verification key that can be used to confirm their validity.
- The Registry Operator shall have the right to review Participant records to confirm any such declarations and may publish on the Registry Operator's website a notice of non-compliance and/or terminate service provision to the Participant should a material discrepancy be identified.

##### 11.6.1 Display of Labels

I-REC (HX) Certificates may be used to convey additional criteria beyond the scope of the core Product specification detailed in this I-REC (HX) Product Code. Where Labels have been applied these may be displayed on the Redemption Statement.

A list of supported Labeling Schemes can be found in [SD-03: Supported Labeling Schemes](#).

## 12. Error Management

### 12.1 Context and General Provisions

An I-REC (HX) Certificate shall not be deleted or altered except for the correction of an error. If it becomes clear that an I-REC (HX) Certificate has been issued in error, it may be subject to withdrawal by Avance and/or the Registry or, if this is not practicable, other remedial action may be taken by Avance and/or the Registry to preserve the integrity of services under the I-REC (HX) Product Code.

Where Avance and/or the Registry becomes aware that the provenance of an I-REC (HX) Certificate is suspect, Avance may suspend the I-REC (HX) Certificate from Transfer or Redemption until any required investigation has been concluded. As soon as information is received or shared with Avance, the Registry may, after consultation with Avance, amend the details of any relevant I-REC (HX)



Certificate or take other appropriate remedial action when it has been confirmed that such an error exists.

I-REC (HX) Certificates may not be subject to amendment or withdrawal after Redemption other than by agreement with the respective Participant.

## 12.2 Process Overview

Errors are unplanned occurrences, and the handling of errors therefore depends on the circumstances encountered.

When an Entity identifies an error, it shall immediately notify Avance by email to the helpdesk email address provided on Avance's website (<https://avance.energy>).

Avance will respond promptly to all notified errors, seeking to remedy the situation with minimal impact.

In the event of an error being identified after the Issuance of an I-REC (HX) Certificate, but before it has been Redeemed, the Registry will, in consultation with Avance, withdraw or amend the I-REC (HX) Certificate concerned and notify the Participant in whose Account the I-REC (HX) Certificate exists. Following withdrawal, replacement I-REC (E) Certificates may be issued by the originating Issuer.

## 12.3 Record Keeping

The Registry and Avance shall keep a record of all notified errors, investigations conducted, and remedial actions taken.

## 12.4 Prevention of Recurrent Errors

Avance and the Registry shall work together to seek to minimize the recurrence of errors by, where practicable, identifying and implementing process or system improvements to prevent the recurrence of all notified errors.

# 13. Complaint Management

## 13.1 Context and General Provisions

Any Entity or group of Entities may submit a complaint to Avance as Code Manager. Avance will review all received complaints and determine, acting reasonably, the most appropriate process for resolution. To be considered, complaints shall relate only to the subject matters covered by this I-REC (HX) Product Code, including but not limited to:

- Accredited Entities, their service performance, or their Standard Terms.
- Market Entities or their actions.
- Regulations of this I-REC (HX) Product Code or their interpretation.

On submission of a complaint, the notifying Entity should indicate if it believes the situation to be such that an urgent investigation is required to minimize potential impact. The reason for the urgency of the investigation as well as the identified potential impact(s) must also be clearly stated when such a complaint is submitted.

### 13.2 Process Overview

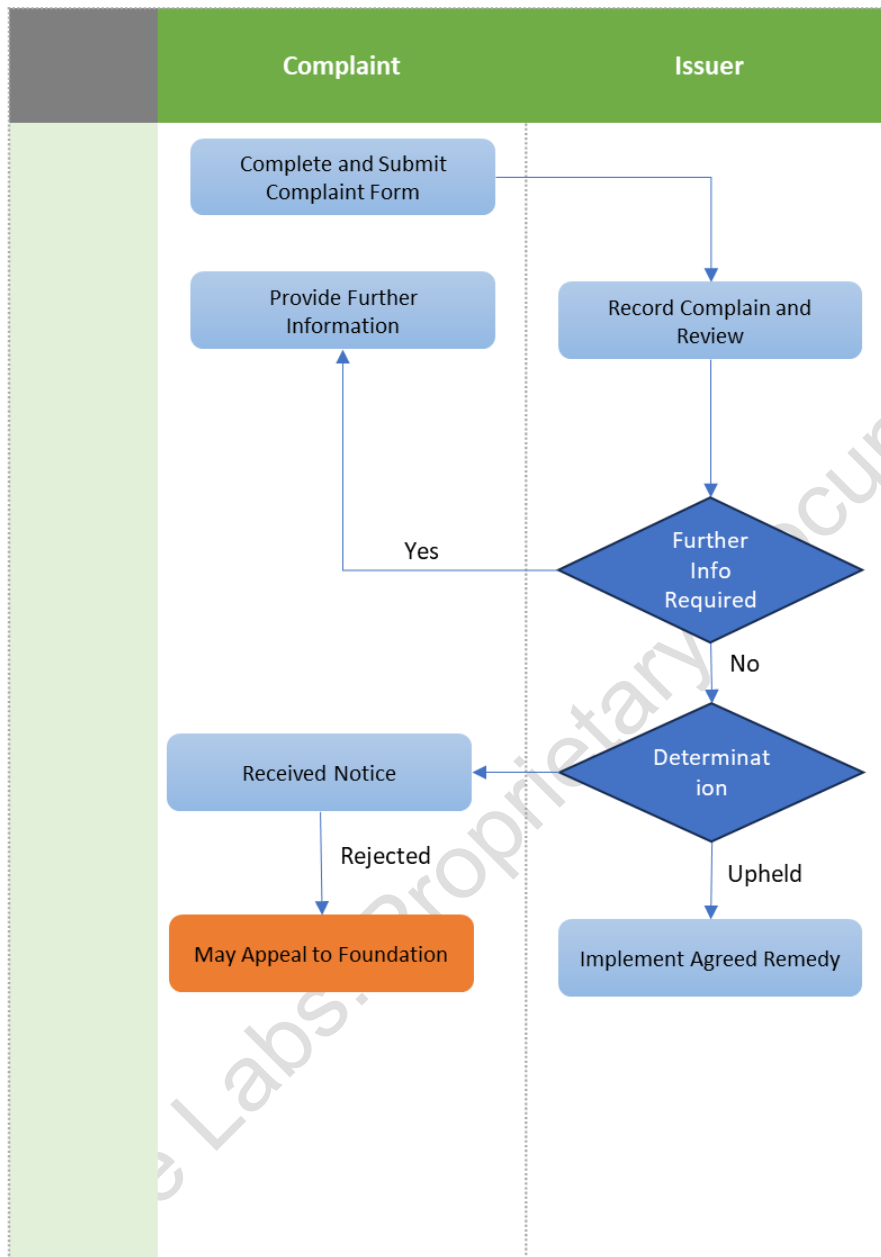


Figure 15 Complaint Process Overview

#### 13.3 Reporting a Complaint

An Entity notifying a complaint shall document the complaint on a complaint form (SF-05: Complaint).

#### 13.4 Complaint Handling

Following receipt of a complaint, Avance will record the basis of the complaint and details of any associated Entities. Based on Avance’s opinion of the urgency of the complaint, Avance will establish an appropriate process through which the complaint can be further evaluated, informing affected Entities if this is deemed necessary.

Avance may request that the Entity notifying the complaint and/or other Entities respond to questions in relation to the complaint to enable effective resolution of the issue. Avance may at its discretion implement further investigatory procedures, including in relation to any Entity materially affected by the complaint.

Avance may elect to constitute formal or informal discussions with any affected Entity with the goal of resolution.

### 13.5 Determination

Once the complaint has been evaluated and Avance has determined a resolution or response, Avance shall notify affected Entities.

Avance shall not be required to provide a resolution in relation to the complaint. At the request of any affected Entity, an unresolved complaint may be submitted to the Foundation for Arbitration.

## 14. Authorization of Countries for Issuing

### 14.1 Context and General Provisions

Issuing I-REC (HX) Certificates is restricted to countries authorized by the Foundation.

The current list of all authorized issuing countries is provided in [SD-01: Authorized Issuing Countries](#).

The process of adding a new issuance country of I-REC (HX) Certificates is typically initiated by market players or stakeholders with knowledge of the respective national electricity and Hydrogen market. Prior to providing services in any additional country, Avance (with support from local market players) must complete and submit a Country Report to the Foundation for authorization.

### 14.2 Country Report

The purpose of a Country Report is to both justify the introduction of I-REC (HX) Certificates in a particular country and to determine and document any conditions that may be applied to the provision of services within that country. A template for production of a such a report is provided in [SF-07: Country Report Template](#).

#### 14.2.1 Government Interaction

Avance recognizes the sovereign position of governments to set legislative requirements that may impact the desire or ability to provide services within a country. Wherever possible, Avance shall seek to engage with governments in the provision of services related to the I-REC (HX) Product Code. Depending on the local context, ideal operating conditions are listed as follows in order of preference:

- Government body acting as or appointing an Issuer under this I-REC (HX) Product Code
  - Government body acting as or appointing an Issuer under a bespoke I-REC (HX) Product Code Accredited to the Standard
  - Government acknowledgment of an Avance appointed Issuer under this I-REC (HX) Product Code
  - Government confirmation that there is no conflict for the provision of services under this I-REC (HX) Product Code
  - No government objection being received following notification to the government of Avance's intent to provide services under this I-REC (HX) Product Code

Avance shall not provide services where a government has instructed it not to do so.

## 15. Support Platforms

### 15.1 Context and General Provisions

The Code Manager's service is designed to be open and inclusive in terms of both technical and commercial models intended to facilitate cooperation with other Entities. The Registry is designed to enable other Entities to provide services to customers both outside the scope of, or in place of, existing Registry functionality.

All Infrastructure connected with the Registry must be approved by the Registry and any connection is subject to agreement with Avance.

All Platforms connected with the Registry must be Accredited to the Standard.

### 15.2 Data Collection Infrastructure

To be absolutely clear, Infrastructure that provides functionality not yet existing within the Registry with the exclusive purpose of collecting data from Device Facilities is not classified as a Platform and there is no requirement for such Infrastructure to be Accredited.

Such Infrastructure may be subject to technical review at the discretion of Avance prior to approval for connection to the Registry.

## 16. Accredited Entity Entry and Exit

### 16.1 Context and General Provisions

This section sets out the requirements that must be met for Issuers and Platform Operators to provide services within the scope of this I-REC (HX) Product Code.

All Issuers and Platform Operators and any Infrastructure they operate must be Accredited to the Standard. See the Standard for further details of the Accreditation requirements and process.

Notwithstanding the requirement for Accreditation, all Accredited Entities must be authorized by Avance to provide services under this I-REC (HX) Product Code. Such authorization shall only be by an executed agreement between the parties.

Where an Issuer is also a Platform Operator it shall not be permitted to take title of I-REC (HX) Certificates in its capacity as Platform Operator unless for the purpose of contractually near-instantaneous settlement or unless designated as both Issuer and Platform Operator under relevant national legislation.

### 16.2 Process Overview

The basic process for entry is common for all Accredited Entities, as shown in Figure 15. Exit processes depend on the nature of the Accredited Entity and the circumstances giving rise to the exit. While standard processes for exit have been included in this I-REC (HX) Product Code, it is recognized that circumstances may require alternative action.

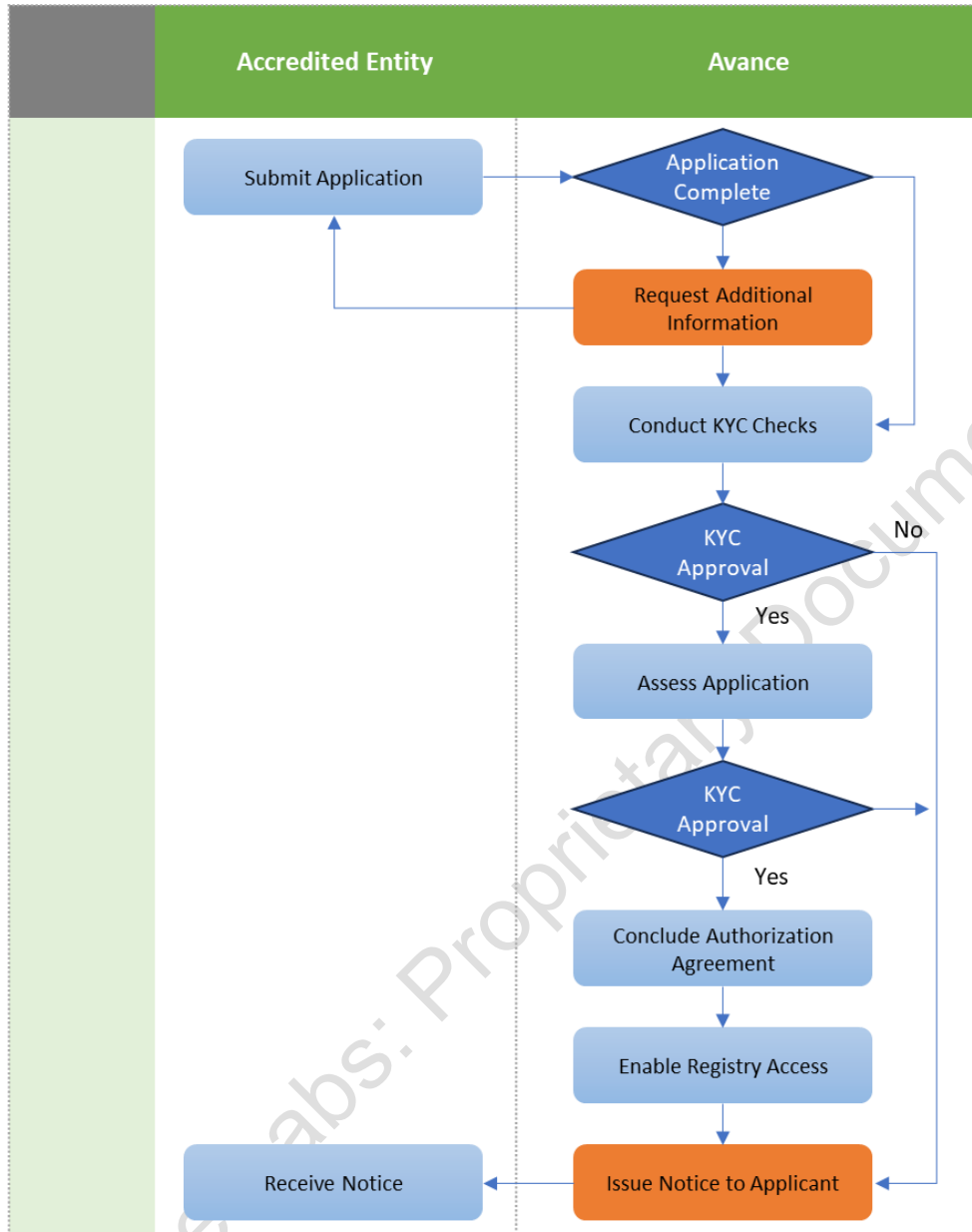


Figure 16 Accredited Entity Process Overview

### 16.3 Application

An organization seeking to become an Issuer or Platform Operator under this I-REC (HX) Product Code must apply to Avance for authorization, including providing the information required in [SF-06: Accredited Entity Application](#).

Avance will review the application and will consult with the Foundation should the applicant not be Accredited to provide the services proposed within the application.

All applicants will be subject to KYC and AML checks in accordance with [CA-01: Compliance Protocols](#).

## 16.4 Assessment

Avance will assess the application. The duration of assessment will, provided all required information is available at the commencement of assessment, not normally exceed six weeks and will include preparation of an assessment report which shall be submitted to the Foundation.

The terms of reference for the assessment shall include, but not be limited to:

- The conformity of the applicant's Infrastructure and internal procedures with the requirements, objectives, and principles of this I-REC (HX) Product Code;
- The ability of the applicant to deliver a compliant, high-quality service;
- The likely impact of any regions being excluded within the nominated country;
- The probability of the business plan being delivered.

### 16.4.1 Test Environments

The applicant will be given access to one or more Registry test environments.

Where appropriate, Avance and/or Evident will create a schedule of test scenarios in which the applicant must successfully demonstrate competence. The results of the scenario testing may be used to inform the assessment.

### 16.4.2 Local Working Instructions

Applicants shall provide Avance with copies of all relevant Local Working Instructions for the provision of their intended service. These instructions must show how the applicant will manage the full scope of the intended services to ensure compliance with this I-REC (HX) Product Code and, where applicable, be compliant with the Standard.

## 16.5 Determination

Avance will review all information gathered as part of the assessment and decide whether the applicant satisfies the requisite criteria for authorization. Avance may request further relevant information about actions from the applicant at any point and may defer determination until such time as it is either satisfied that all requirements have been met or determined that authorization will not be given.

Authorization involves a commercial relationship and there is no obligation on Avance to enter into such relationships.

## 16.6 Authorization

An Accredited Entity is considered authorized once it has entered into an Authorization Agreement with Avance and where relevant with the Foundation.

Authorization Agreements shall not be entered into until an Accredited Entity has been deemed by Avance to have successfully met the required assessment criteria.

## 16.7 Access to Registry

Access to the Registry for Accredited Entities is granted through the respective Authorization Agreement. The Authorization Agreement may also provide rights to Accredited Entities to enable access to the Registry to Registrants and Participants subject to agreed terms.

Once authorized, an Accredited Entity will be provided with the necessary access to the Registry so that it may provide services. Details of authorized Accredited Entities are included in [SD-01: Authorized Issuing Countries](#) and [SD-04: Authorized Platforms](#).

## 16.8 Platform Operator Exit

When a Platform Operator intends to cease provision of services it shall notify Avance providing no less than 90 days' notice. Avance and the Platform Operator shall discuss any necessary arrangements for the management of the exit process with the aim of minimizing disruption to Market Entities and customers of the Platform Operator.

Where a Platform Operator is unable or unwilling to provide services, including non-exclusively for reason of business failure or contractual breach, Avance may take any actions it deems necessary to minimize the impact of such situations on the service.

## 16.9 Removal of Access

Avance may suspend or terminate an Accredited Entity's access to the Registry without notice where the Accredited Entity is in breach of agreed terms for connection or where, in the reasonable opinion of Avance, it is necessary to remove access to preserve the integrity of Avance's services as Code Manager.

Avance may at any time and without notice suspend or cease provision of services through an Accredited Entity suspected of fraudulent activity or a breach of this I-REC (HX) Product Code or any requirement enacted by this I-REC (HX) Product Code.

If Avance disables the connection between a Platform and the Registry, all I-REC (HX) Certificates held within any associated Account shall be held in suspension pending either restoration of the connection or another resolution approved by the Foundation.

# 17. Issuers

## 17.1 Issuer Service Provision

Avance's services provided under the I-REC (HX) Product Code involve Issuers authorized to make certificate entries in the Registry. All such certificates are then recorded in the Registry. Issuers operate under a contract with Avance that contains geographic restrictions on where they may provide services defined in collaboration with the Foundation.

In addition, Avance may designate a Central Issuer that is permitted to provide services in any country in which Avance services are available, except for those countries where another Issuer has been exclusively designated under relevant national legislation or as otherwise defined by the Foundation.

The Central Issuer may not be a Participant, Registrant, or Device Facility Owner.

In addition to its activities as Issuer, the Central Issuer provides support to other Issuers and acts as a center of excellence.

### 17.1.1 Local Issuers

Avance recognizes that local delivery of services provides benefits for many Market Entities. Avance shall, where required by legislation or in response to market demand, seek to work with suitably

qualified Entities to support their Accreditation with the intention of engaging with them as Issuers of I-REC (HX) Certificates.

When an Issuer is also a Participant, Registrant, or Device Facility Owner in its country of Accreditation (which shall only be permitted if legislation specifies the Issuer or if agreed by the Foundation) the Central Issuer shall function as the Issuer for all the Device Facilities operated by the Issuer in that country.

#### 17.1.2 Authorization of Issuers

Except where legislation prohibits, Avance may at its sole discretion authorize more than one Issuer to provide services within a single country, subject to approval by the Foundation.

All Issuers operate under the requirements of the Standard and within their geographic scope of Accreditation. Except where legislation prohibits this, the Central Issuer is authorized to provide services in all countries in which I-REC (HX) Certificates may be issued.

When an Issuer is unable to provide services or loses its Accreditation status, Avance shall seek to authorize a replacement Issuer in a timely manner to minimize impact on Market Entities.

### 17.2 Tariffs

Issuers may operate with a standard tariff priced in an appropriate local currency, Euros, or US Dollars. However, the Central Issuer will operate with a standard tariff priced in US Dollars for services regardless of the country in which they are provided. Registrants are responsible for payment of all exchange charges and withholding or similar taxes which may be applied.

All tariffs are subject to annual review by Avance.

Reductions to tariffs may be put into effect without notice.

Increases to tariffs shall be notified at least 28 days in advance of when they take effect or at such an earlier date as may be specified within the relevant Standard Terms.

### 17.3 Transferring Registrations

All Issuers shall provide support to Registrants wishing to transfer a registered Device Facility to another Issuer. The transfer process shall be facilitated without unreasonable delay and no reregistration shall be required except where either the new Issuer has additional requirements for registration compared with the old Issuer or the registration has reached its expiry date.

### 17.4 Withdrawal of an Issuer

An Issuer can withdraw provisions of services as a whole or for a geographic subregion of its service.

Avance may terminate or modify its agreement with an Issuer, withdrawing its authorization to provide services under this I-REC (HX) Product Code either as a whole or for a geographic subregion of its service area.

#### 17.4.1 Notice of Withdrawal

When an Issuer wishes to cease providing services, it shall notify Avance and all contracted Registrants providing no less than six months' notice. Where local laws permit, Avance shall ensure that a replacement Issuer is authorized in the relevant country and terms will be offered to all impacted



Registrants. An Issuer may not register new Device Facilities during the notice period without the explicit authority of Avance.

If an Issuer is prevented from providing services through either a legal requirement or through contractual default, Avance shall make every reasonable effort to ensure that a replacement Issuer is authorized in the relevant country and terms are offered to all impacted Registrants within a period of three months.

#### 17.4.2 Issuer Business Failure

In the event of a business failure with the result that an Issuer has ceased Issuing operations, Avance will publish that information on its website as soon as it becomes aware of the situation and shall make all reasonable effort to ensure that a replacement Issuer is authorized in the relevant country and terms are offered to all impacted Registrants within a period of three months.

#### 17.4.3 Contract Breach

When Avance determines that there has been a breach of contract by an Issuer, it may withdraw authorization for that Issuer to act under this I-REC (HX) Product Code and notify those Registrants contracted to the Issuer, invoking the business failure provisions under Section 16.4.2.

## 18. Change Management

### 18.1 Context and General Provisions

All changes to this I-REC (HX) Product Code shall be subject to approval by Avance.

A register of change requests will be published on Avance's website (<https://avance.energy>).

Proposed changes are considered in the first instance by Avance and may be referred to the Foundation for their opinion.

### 18.2 Categories of Change Requests

#### 18.2.1 Housekeeping Change Request

A change request which has no material impact on the rights and obligations of Accredited Entities, Market Entities, or their contracted parties, may be classified as a 'housekeeping change' by Avance.

Such changes may arise from clear errors, or they may represent minor administrative changes.

Consultation shall not normally be conducted for such changes.

#### 18.2.2 Emergency Change Request

These changes are exceptional and are essential to remain in legal compliance; noticeably short timescales may be necessary to ensure that a reliable service is maintained.

Emergency change requests may be implemented without advance referral to the Foundation but must be notified to the Foundation immediately.

Consultation in advance shall not normally be conducted for such changes but may be undertaken post-implementation.

### 18.2.3 Ordinary Change Requests

An ordinary change request is one which is not classified under either of the two previous classifications.

Consultation shall normally be conducted for such changes.

### 18.3 Process Overview

See for an illustration of the change review process flow and request steps.

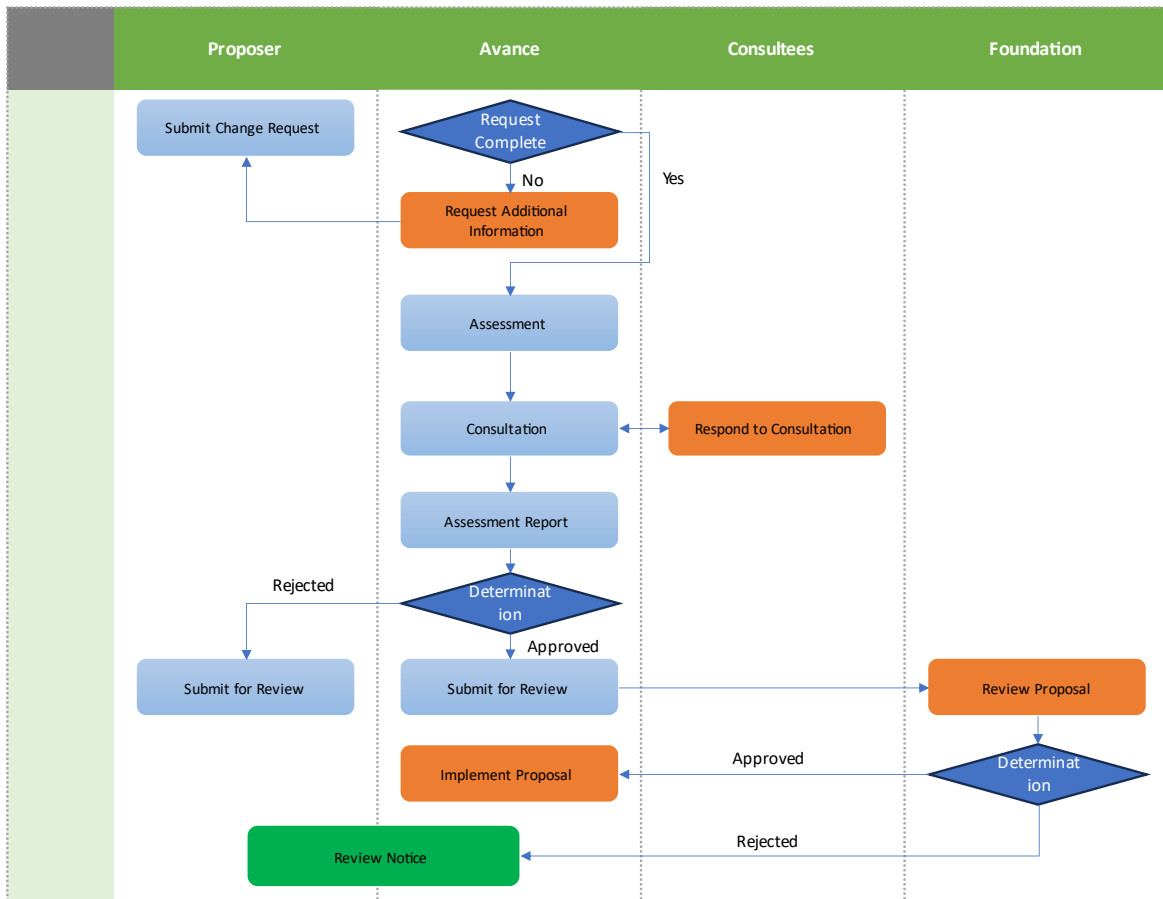


Figure 17 Change Request Process Overview

### 18.4 Raising a Change Request

A change request can be raised by any Accredited Entity or Market Entity associated with this I-REC (HX) Product Code by submitting a completed form from [SF-03: Change Request](#).

The form must be submitted in English to Avance for assessment.

### 18.5 Assessment

Avance will check the proposal for completeness. Incomplete change requests may be referred to the proposer without further review.

Avance will conduct an impact assessment of the change as proposed and, if considered appropriate, consider alternative solutions. A cost-benefit analysis of the proposed change may also be conducted.

Avance may initiate a consultation on the proposed change. The consultation process shall be as determined by Avance to be appropriate. Details of any consultation process shall be included within the assessment report.

Avance will draft proposed changes to the I-REC (HX) Product Code or other documentation where appropriate.

An assessment report, including any cost-benefit analysis and the draft documentation changes, will be produced by Avance and a copy of this will be sent to the proposer.

The assessment stage will normally be completed within two calendar months from receipt of the completed change request, but it may take longer.

### **18.6 Conduct of Consultation**

Where Avance elects to conduct a consultation on a change request it shall ensure that the criteria for selection of invited consultees is non-discriminatory. Notwithstanding that Avance may invite individual organizations to respond to a consultation, notice shall be given on the Code Manager's website (<https://avance.energy>) of all consultations no less than 14 days prior to the closing date for responses.

### **18.7 Determination**

Avance shall have absolute discretion to decide whether and how to progress a change request. Progression may include further assessment, consultation, modification, or implementation as proposed.

Change requests approved by Avance shall be submitted to the Foundation for review and confirmation. When the Foundation confirms a submitted change request it will be implemented.

When Avance is minded to reject or modify a change request, the proposer shall be notified and provided no less than seven days to make supporting submissions, which may be in writing or through attendance at a physical or online meeting, and Avance shall not reject or modify a change request before the expiry of this period.

Rejected change requests may be referred by the proposer to the Foundation for review of Avance's decision to reject and the Foundation may recommend adoption by Avance.

### **18.8 Implementation**

Following a decision to implement a change request, the draft documentation may be referred for minor refinement prior to inclusion in the next scheduled change release.

Unless they are urgent, implementation of approved changes shall be no more frequent than every three months, effective on the first day of each quarter. Urgent changes may be released with immediate effect.

Approved changes will normally be implemented within the next scheduled release.

Changes will become live on the date of release unless otherwise specified.

Notice of approved changes shall be given on Avance's website (<https://avance.energy>).

## 19. Quality Assurance

### 19.1 Context and General Provisions

Assurance of quality is fundamental to the Product and the role in Hydrogen certification performed by the I-REC (HX) Product Code, and it therefore forms a part of every process. Detailed provisions for elements of quality assurance that may be compromised by publication are, to ensure integrity, set out in [CA-05: Quality Assurance](#).

### 19.2 Procedural Standards

All Accredited Entities operating under this I-REC (HX) Product Code shall document, follow, and maintain Local Working Instructions which shall be provided to Avance for review.

In addition to the above, Local Working Instructions implemented by *Issuers* shall be made available for review by the Foundation and included within [CA-03: Issuer Local Working Instructions \(LWIs\)](#).

### 19.3 Audit Reviews

The service is predicated on trust in the provision of a reliable and robust traceability and reporting system. To maintain a quality service, all Accredited Entities operating under this I-REC (HX) Product Code will be subject to process audits on a periodic ad-hoc basis.

Full details of the Quality Assurance processes are included in [CA-05: Quality Assurance](#). The subsections below are provided for descriptive guidance only and [CA-05: Quality Assurance](#) shall take precedence if there is any inconsistency. Similar reviews to those outlined below will be undertaken for the activities of, and services provided by Avance with such review being conducted by an independent party.

#### 19.3.1 Initial Review

An Accredited Entity will be subject to an initial audit review by Avance, normally no later than 13 months from commencing provision of services under this I-REC (HX) Product Code. This review is a brief review by Avance to ensure that the Accredited Entity has implemented its procedures appropriately. It will normally involve a review of documentation and evidence.

An initial review may involve a visit by Avance to the offices of the Accredited Entity.

#### 19.3.2 Periodic Review

Periodic reviews will be conducted by Avance on an approximately biennial basis following the initial review.

A periodic review may involve a visit by Avance to the offices of the Accredited Entity.

#### 19.3.3 Ad-hoc Review

Avance may request a review of an Accredited Entity at any time. Such a review does not necessarily require or imply inferior performance by the Accredited Entity involved. The ad-hoc review will follow the same requirements as the periodic review but may be specifically targeted if required by Avance.

An ad-hoc review may involve a visit by Avance to the offices of the Accredited Entity.

### 19.3.4 Review Report

Avance will submit a report of its findings to the Accredited Entity within two weeks of the completion of any audit review.

Avance will review the audit report and, where issues are identified, shall provide a copy of the complete report to the Foundation. Where the report indicates poor performance, remedial action and a timeframe for correction may be given. The Accredited Entity's access to the Registry may be suspended if it is determined that there is a risk to the integrity of the service. The registration of a Device Facility may also be suspended pending further investigation.

## 19.4 External Review

The quality of the service is monitored through independent verification by the Foundation and other parties appointed by Avance. This includes but is not limited to:

- Assessment of Issuers as part of their Accreditation process
- Periodic control audits of Issuers
- Initial and periodic review of Device Facility registration
- Independent validation of Hydrogen Processing data
- Registry monitoring
- Independent assessment of change requests
- Liaison with other tracking systems
- Liaison with national and international anti-fraud and money laundering authorities

## 19.5 On-site Inspections

In addition to any verification inspection carried out during the registration or issuing processes, the Issuer, an Assurance Service Provider, or Avance may conduct an unannounced control and auditing visit to the premises of the Registrant, Device Facility Owner, or Device Facility.

The scope of such visits will be confined to verification of the data submitted in support of Device Facility registration and associated issuing. Unreasonable withholding of access to the relevant premises or documentation will result in the immediate suspension of issuing in relation to that Device Facility.

When, for reasons of safety or security, a Registrant reasonably requires additional notice of a requirement for access to the relevant premises or documentation, a notice period of not more than one Business Week may, at the sole discretion of the Entity requesting the inspection, be accepted.

## 20. General Regulations

### 20.1 Submitting Information and Its Effect

#### 20.1.1 Completeness and Accuracy of Information

The submission of any information required by any provision of this Product Code shall be complete, accurate, and legible. Partial, inaccurate, or illegible submissions may delay processing or invalidate a submission.

### 20.1.2 Additional Information

Accredited Entities may require additional information beyond that specified in this I-REC (HX) Product Code before assessment of a complete submission is completed. Any additional information shall be limited to what is considered necessary for the validation of the required information or completion of the related request.

### 20.1.3 Registration of Market Entities

Registration of Market Entities and activation of their status shall be completed before the creation of any associated Account or the processing of any required information relating to registration of a Device Facility or issuing of I-REC (HX) Certificates and the issuing process shall be subject to LCA Qualification.

Required information relating to registration of a Device Facility or issuing of I-REC (HX) Certificates provided before the activation of a Market Entity's status shall be considered received on the date of the Market Entity's activation.

### 20.1.4 Activation of Account for Issue Requests

Once a Device Facility has obtained LCA Approval, it will have LCA Qualification for a defined period of time, and the Account for that Device Facility will then be activated for the purpose of enabling the Registrant associated with that Device Facility to make Issue Requests for Production Certificates in respect of hydrogen produced by that Device Facility.

## 20.2 General Data Protection Regulation

The General Data Protection Regulation (GDPR) established under European Union law applies to the Registry. The Abu Dhabi Global Market (ADGM) Data Protection Regulations (2021) applies to the Avance (HX) Portal.

## 20.3 Access to Data

Accredited Entities may publish detailed data relating to Registrants, Device Facilities, Participants, Issuing, and Redemption and any other data held within the Registry but shall not publish details of individual transactions or Beneficiaries unless authorized by the responsible Participant.

## 21. APPENDIX 1

The section below provides a preliminary summary of the Certificate Interoperability Protocol (CIP) which will be included as a guidance for all I-REC accredited Product Codes in the next revision of the International Attribute Tracking Standard. Specifically, this section outlines the principles for Interoperability and mutual recognition between I-REC accredited Product Codes for the purpose of creating the I-REC (HX) Certificate.

### 21.1 Interoperability with other tracking certificates (EACs)

As demonstrated throughout this Product Code, hydrogen and hydrogen derivative supply chains can prove highly complex, with many critical life-cycle stages and sources of emissions that need to be considered during certification. To efficiently account for and track associated feedstocks and key emissions as well as allow for the swapping of product-level attributes, an I-REC (HX) Certificate needs to integrate seamlessly with other certificates to collaboratively prove the origin of a specific product. This concept is called interoperability.

Interoperability means that an I-REC (HX) Certificate can represent a chain of custody through the stacking together of different product certificate types into a composite, single certificate, the I-REC (HX) Certificate. Composite Product Certificates provide producers and end-users with increased transparency and the ability to validate and verify their product's GHG emissions footprint and the inputs associated with their specific certificate. In this way, a user can differentiate I-REC(HX) products (e.g. whether a product was made from renewable or non-renewable electricity, water that came from natural sources or desalination, or whether CCS or CDR was used throughout the process). This is particularly important in supply chains and products that involve many critical interdependencies across the supply chain; particularly when considering the eventual shipment of these goods across borders.

To ensure the functionality of certificate interoperability, Avance has considered – and will continue to consider – the various production pathways, evolving policy/regulatory requirements and EAC methodologies/standards that may impact the tracking and certification of energy attributes associated with Hydrogen production, conversion, reconversion, and transport.

### 21.2 Interoperability in the I-REC ecosystem of Product Codes for different EACs

While the [International Attribute Tracking Standard](#) has predominantly been implemented as a guidance mechanism for the I-REC(E) for Electricity, this same standard is intended to govern and be implemented across a broader range of EACs. Therefore, the Foundation is collaboratively supporting the development and accreditation of an ecosystem of Product Codes that all adhere to the same EAC Standard. This ecosystem includes the I-REC (E) for Electricity, C-Capsule for Carbon Dioxide Removal, and future codes under development for Biogas, Methane Intensity and Point Source Capture (PSC). Thus, one Product Certificate can form the basis of certified inputs to another Product Certificate such as the I-REC (HX). This results in a composite certificate that stacks together different Product Code Certificates that cover multiple life-cycle inputs upstream and downstream from the Device Facility. This enhances the transparency and integrity of disclosure across the supply chain.

In practice, interoperability is easily facilitated using a path of certificate redemption via a Redemption Account, whereby a Beneficiary redeems the certificate and where the beneficiary is the entity

responsible for generation of that Product Certificate (i.e. Registrant). To facilitate this interoperability:

1. A Device Facility should be **listed as the beneficiary** at the time of redemption of input Product Certificates issued upstream and deposited into their Redemption Account. Elements such as accounting periods (monthly or daily or hourly) are then dealt with by the Device Facility and matched like any other end-user. This is fundamentally no different than if the end-user was an entity not associated with owning or operating the generating facility (i.e. an average certificate purchaser in the market).
2. In addition to the straightforward redemption of certificates to specific beneficiaries within the Hydrogen supply chain, Avance **is recognized as a Redemption Authority** as defined in the Standard. This allows a Participant who redeems the upstream Product Certificate (e.g. an I-REC (E)) against the I-REC (HX) Device Facility to tag the I-REC (HX) Product Code during Redemption. This tag simply informs Avance of the Redemption against the Device Facility and allows them to check that the associated redeemed certificates are clearly allocated to the Device and the relevant I-REC (HX) Issuance. If the Participant does not click “I-REC(HX) Code” this can also be tagged by the Participant at any time post-redemption. Tagging a Redemption Authority post-redemption does not change any aspect of the underlying certificate; rather it just grants access to the Redemption Authority to view redeemed certificates.

Continuity of record keeping and verification of carbon intensity within I-REC Standard accredited Product Certificates helps to ensure that robust LCA calculations can be conducted for the I-REC (HX) Certificate.

Further information on interoperability within the I-REC ecosystem can be found in the Foundation’s [Certificate Interoperability Protocol](#).

### 21.3 Interoperability with other EACs

Avance recognizes that not all countries that wish to adopt the I-REC (HX) use EACs that adhere to the I-REC Standard. For example, in Europe most electricity tracking certificates adhere to the European Energy Certificate System (EECS) Standard administered by the Association of Issuing Bodies, and these are issued by relevant national authorities. This is no less robust than the I-REC (E)€ and European hydrogen producers wishing to use this Product Code and therefore one should not be dissuaded from adopting the I-REC (HX) based on this region-specific feature.

For this reason, Interoperability between EACs for the I-REC (HX) may include EACs beyond the I-REC ecosystem. To achieve this level of integration, Avance, as Code Manager, will review and approve EAC schemes for recognition in the final I-REC (HX) Composite Product Certificate. A list of recognized third-party EAC schemes can be found on Avance’s website (<https://avance.energy>) where all currently-approved EACs are published.



## 22. APPENDIX 2

### 22.1 Regulatory Calculator for Avance Regulatory Compliance Labels

The Regulatory Calculator is a key component for enabling the I-REC (HX) Certificate to determine whether a specific batch of Hydrogen or Hydrogen derivative fuel or product adheres to the requirements of a specific market regulation (i.e. requirements for allowing the use, import, or taxation of a product).

The Regulatory Calculator is based on a global database of regulatory criteria and their corresponding specifications for each end-use market for Hydrogen. These criteria and specifications are developed for each regulation that governs the use, import, or taxation of Hydrogen.

These specifications are cross-referenced with the attribute data associated with a Device Facility and its corresponding processes to determine eligibility with regulations. The output of this cross-referencing is the generation of a Regulatory Compliance Label that confirms the eligibility or ineligibility of the production batch being certified. These labels are the basis of the Tier 2 attributes on the I-REC (HX) Certificate.

### 22.2 Third-Party Labels

The I-REC (HX) Certificate allows for the addition of voluntary Third-Party Labels which disclose other attributes (e.g. sustainability labels, water resource labels, health, and safety labels, etc.) not defined by the Regulatory Labels and which may be of value or required by certain producers or end-users.

Subject to approval from the Device Facility Registrants, Labeling Authorities will be granted access to the relevant Device Facility data for determining compliance with the corresponding Label.

## 23. APPENDIX 3

### 23.1 Net Zero Benchmark Methodology

The I-REC (HX) Certificate provides a historic and verified record of attributes (e.g. carbon intensity) for Hydrogen production, conversion, reconversion, and transport. Tier 3 attributes disclosed on the I-REC (HX) Certificate enable end-users and redemption Beneficiaries to conduct an objective apples-to-apple comparison of Hydrogen irrespective of: (a) where and how they were produced, converted, reconverted, or transported; and (b) the regulations to which their use, import or taxation are subject.

These Tier-3 attributes are translated into a benchmark value, the Net-zero Benchmark, which is calculated based on a cradle-to-cradle Net-Zero Methodology, The Avance Product Passport for Net Zero ("APP-NZ"<sup>TM</sup>), covering all sources of Hydrogen Processes along the supply chain to enhance transparency. This methodology is based on international consensus methodologies such as the GHG-Protocol Product Level Standard and ISO 14067:2018. The APP-NZ<sup>TM</sup> Methodology can be downloaded from the Code Manager's [website \(https://avance.energy\)](https://avance.energy).

Tier 3 attributes will be translated into discrete Hydrogen Grades, with I-REC (HX<sup>0</sup>) indicating that the carbon intensity of the hydrogen product has zero GHG emissions associated with its life cycle.

**Table 1** Hydrogen Grade Taxonomy that Forms Part of the Secondary Attributes of the I-REC (HX) Certificate

Carbon Intensity Category (kg CO <sub>2</sub> eq / kg Hydrogen) or (kg CO <sub>2</sub> eq./ MWh Hydrogen)	Grade Name	Grade Definition
Net Negative Emissions	HX <sup>-n</sup>	Grade (-1 to -10) in ascending order starting with (-1)
<b>Net Zero Emissions</b>	<b>HX<sup>0</sup></b>	<b>Grade 0</b>
Net Positive Emissions	HX <sup>+n</sup>	Grade (+1 to +10) in descending order starting with (+1) for lowest positive emissions

A carbon intensity of zero could be achieved using carbon removals or point source carbon reductions, for which I-REC accredited Product Certificates would be Stacked together in adherence with the Certificate Interoperability Protocol.

$$CI = \frac{GHG_{P,i} - (REM + RED_i)}{Output_i}$$

**Equation 1**

$$GHG_P = E_{S1,i} + E_{S2,i} + E_{S3,i}$$

**Equation 2**

Whereby,

GHG<sub>P</sub>: GHG emissions related to the Device Facility's entire batch of product (i.e. output) related to the specific period of Hydrogen Processing (*i*)

*i*: Period of Hydrogen Processing represented by a date range such as January 1, 2023, to December 31, 2023

REM: Defined as “removals” which include specifically Direct Air Capture. The amount of carbon permanently removed (as a positive absolute value) from the atmosphere. This shall be entered into the equation as a positive value, which is then reflected as a removal due to the negative operator in the equation.

RED: Defined as “reductions” which include specifically point source capture as a part of an industrial operations (e.g. capturing CO<sub>2</sub> emissions from an exhaust stack on a reformer and subsequent utilization and storage), and for which the reductions are shown to be permanent and durable.

Output: The amount of product related to the specific period of Hydrogen Processing (*i*)

E<sub>S1,i</sub>: Scope 1 GHG Emissions

E<sub>S2,i</sub>: Scope 2 GHG Emissions

E<sub>S3,i</sub>: Scope 3 GHG Emissions

In due course, the scope of the APP-NZ™ Benchmarking Methodology shall be expanded to include additional sustainability attributes (e.g. water use, abiotic resource use, land transformation, etc.) across the life cycle of the product system to be included within the **Tertiary** attributes section of the Verified Attribute Record.

## 24. Associated Documents

Except where stated otherwise, all documents detailed in this section shall be published on Avance's website (<https://avance.energy>) as well as on the Registry Operator's (Evident's) website.

The content of Sections 21.1, 21.2, 21.3, 21.4, 21.5, and 21.6 and documents or forms referenced within them extends this I-REC (HX) Product Code and shall:

- Take precedence over the constraints and requirements of this I-REC (HX) Product Code where any statement within the relevant document imposes a further constraint or requirement on any constraint or requirement within this I-REC (HX) Product Code; and
- Be restricted by the constraints and requirements of this I-REC (HX) Product Code where any statement within the relevant document may be interpreted as relaxing or lifting a constraint or requirement within this I-REC (HX) Product Code.

To avoid any doubt documents referenced in Sections 21.7, 21.8, 21.9, and 21.10 do not form part of this I-REC (HX) Product Code and are intended solely for guidance or reference.

### 24.1 User Guides

User guides are documents that relate primarily to the operation of the Registry. They may be published or updated at any time and do not require approval by the Foundation.

As a minimum, the following user guides will be published:

*24.1.1 UG-01: Registry Operator*

*24.1.2 UG-02: Issuer*

*24.1.3 UG-03: Registrant*

*24.1.4 UG-04: Participant*

*24.1.5 UG-05: Beneficiary*

*24.1.6 UG-06: Avance Net Zero Benchmarking Methodology*

User guides for Issuers and the Registry Operator are confidential, issued directly to those Entities, and these are not published on Avance's website (<https://avance.energy>).

Further user guides for other Entities or purposes may be published.

### 24.2 Standard Forms

Standard forms are documents that are to be completed as part of processes defined within this I-REC (HX) Product Code. These forms may be replaced or supplemented by functionality within the Registry, or a Platform or other digital document system that is approved by Evident.

All Standard Forms are published on Avance's website (<https://avance.energy>).

*24.2.1 SF-01: Market Entity Application*

Information required to process a Market Entity application.

*24.2.2 SF-02: Device Facility Registration*

Information required to process a Device Facility registration.

This document also includes:

#### *24.2.2.1 SF-02A: Registrant's Declaration*

#### *24.2.2.2 SF-02C: Owner's Declaration*

#### *24.2.3 SF-03: Change Request*

Information required to process a change request.

#### *24.2.4 SF-04: Issue Request*

Information required to process an Issue Request.

This document also includes:

#### *24.2.4.1 SF-04A: Issuing Declaration*

#### *24.2.4.2 SF-04C: Fuel Consumption Statement*

#### *24.2.4.3 SF-05: Complaint*

Information required to submit a complaint.

#### *24.2.5 SF-06: Accredited Entity Application*

Information required to process an Accredited Entity application.

#### *24.2.6 SF-07: Country Report Template*

Country report template.

### **24.3 Subsidiary Documents**

Subsidiary Documents are documents that relate primarily to the operation of the service, standing data, and access to and use of related services. They may be published, updated, or withdrawn at any time and do not require approval by the Foundation.

#### *24.3.1 SD-01: Authorized Issuing Countries*

Details authorized Issuers, together with their regions of operation, and details any variations or additional requirements imposed by Issuers.

#### *24.3.2 SD-02: Technologies and Fuels*

Provides guidance on the recognized electricity generation technologies and fuel sources eligible for I-REC(E) and details any technology or fuel specific requirements.

#### *24.3.3 SD-03: Supported Labeling Schemes*

Provides guidance on supported Labeling Schemes and details their means of application and any additional requirements.

#### *24.3.4 SD-04: Authorized Platforms*

Provides details of authorized Platforms.

### **24.4 Contracts: Standard Terms**

All agreements with Registrants and Participants shall be subject to Standard Terms which are universally applied to all similar Entities. They may be published, updated, or withdrawn at any time and are subject to prior approval by the Foundation.

#### 24.4.1 ST-01: Participant-Registry Operator

As a prerequisite to becoming a Participant, this agreement sets out the terms of access and performance obligations between Avance and a Participant.

#### 24.4.2 ST-02: Registrant-Issuer

As a prerequisite to becoming a Registrant, this agreement sets out the terms of access and performance obligations between the Issuer and the Registrant. It also includes pass-through provisions relating to access to the Registry.

The service has multiple Issuers. Each has their own form of contract under the relevant applicable laws for the particular Issuer.

### 24.5 Fees

#### 24.5.1 Code Manager's Fees for I-REC (HX) Product Code and Certificates

The schedule of fees covering all activities within the service will be posted on Avance's website (<https://avance.energy>) at [www.avance.energy/code/fees](http://www.avance.energy/code/fees). This schedule may have country-specific variations and encompass multiple Issuers in addition to Avance. Also covered within this document are billing protocols and default processes.

### 24.6 Confidential Appendixes

Where publication of information relating to any element related to this I-REC (HX) Product Code might compromise the integrity of the Product or service, this information is excluded from this document and may be provided only to:

- Avance or an appointed Issuer;
- The Foundation, for the purpose of Accreditation and compliance; or
- Organizations other than Market Entities engaged for professional purposes by Evident under non-disclosure terms.

Confidential Appendixes shall be submitted in support of Accreditation and may then be requested for review by the Foundation at any time as part of monitoring compliance with the Standard. They may be published, updated, or withdrawn at any time and, after initial Accreditation, do not require prior approval by the Foundation.

#### 24.6.1 CA-01: Compliance Protocols

Provides details of the controls put in place to prevent fraud, minimize market abuse and money laundering through KYC and AML protocols.

#### 24.6.2 CA-02: Registry (Design, Development, and Management)

Provides technical details of the Registry, including data security protocols. This document also includes management protocols and procedures for error detection and management.

#### 24.6.3 CA-03: Issuer Local Working Instructions (LWIs)

These documents set out how Issuers perform the activities defined within their service obligations.

#### 24.6.4 CA-04: Accepted Evidence

Provides guidance and examples of the forms of evidence that may be accepted by Issuers when considering requests by Device Facilities to register and issue Certificates.

#### 24.6.5 CA-05: Quality Assurance

This document sets out methods by which Avance ensures the quality-of-service provision and integrity of the I-REC (HX) Certificate market.

#### 24.6.6 CA-06: Business Continuity Plan

This document sets out the business continuity plan implemented by Avance.

#### 24.6.7 CA-07: Fee Benchmarking

This document set out how Avance undertakes fee benchmarking to help ensure transparent, equitable, and cost-effective service provision.

### 24.7 I-REC (HX) Product Code Guidance Notes

I-REC (HX) Product Code Guidance Notes are documents that relate primarily to the interpretation and application of this I-REC (HX) Product Code. They may be published, updated, or withdrawn at any time and do not require approval by the Foundation.

### 24.8 Technical Guidance Notes

Technical Guidance Notes are documents that relate primarily to the operation of the Registry and access to, and use of information held within the Registry. They may be published, updated, or withdrawn at any time and do not require approval by the Foundation.

### 24.9 Accreditation Agreement

An agreement with the Foundation specifying the terms of Accreditation and setting out the basis for ongoing cooperation.

### 24.10 The International Attribute Tracking Standard

This document sets out requirements for the implementation and Accreditation of this I-REC (HX) Product Code to the I-REC International Attribute Tracking Standard. Terms, obligations, requirements, and guidance contained within the Standard shall be deemed to be a part of this I-REC (HX) Product Code unless there is a conflict in which case this I-REC (HX) Product Code shall take precedence.

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**END OF I-REC (HX) CODE**

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