THE INTERNATIONAL REC STANDARD

Empowering Electricity Purchasers

I-REC GUIDE – HOW I-REC WORKS

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1. Introduction

The International REC Standard (I-REC Standard) is the incorporation of two distinct elements:

1. The I-REC Standard is a list of rules, regulations and best practices which are to be used by all attribute tracking systems. These rules, regulations and best practices together combine to form the I-REC Code. The I-REC Code provides the blueprints for a standardized tracking system that can be implemented in any country or region. Standardization allows for simplified consumer claims and the elimination of double claiming, double counting and double certificate issuance.

2. The I-REC Standard is also an operational attribute tracking system that, based on the I-REC Code rules and regulations, can be made available in countries or regions without a reliable and transparent electricity tracking system. In such regions, implementation on a voluntary basis is possible, however the I-REC Standard organization prefers that implementation be done in combination with national regulatory, or policy making authorities.

In this memo we provide a general description of the principles of the I-REC Standard attribute tracking system (referred to as the 'I-REC System'). Special attention is paid to the role of *participants*, *registrants* and *issuers.* We will also address what drives *end-consumers* to participate on attribute tracking systems like the I-REC Standard, EECS-GO system, or US-RECs market.

In the last paragraph a more detailed explanation is given of the I-REC Code documentation and participation within the I-REC Standard organization.

2. General Description of the I-REC System

2.1 What is the I-REC attribute tracking system?

The I-REC attribute tracking system supports tracking compliance with governmental renewable energy requirements, as well as voluntary consumers to track and verify progress towards their environmental goals. This allows all I-REC system participants the ability to track attributes of (renewable) electricity production from its location of generation to its place of consumption. These attributes, defined as "descriptive or performance characteristics of a particular [electricity] generation resource,[1]" are factual, auditable statements of an electricity generating facility and an electricity generating event. Items such as the location of the electricity generator, the type of primary energy input, the date of commissioning, the installed capacity, the volume of electricity produced and when the electricity was produced, are all factual attributes that can be tracked with the I-REC attribute tracking system.

[1] World Resources Institute, GHG Protocol Scope 2 Guidance. 2015. http://www.ghgprotocol.org/scope_2_guidance.

This tracking takes place in the form of a digital statement, or I-REC standard certificate (shortened to 'an I-REC') which is based on one MWh of electricity production from a single, generation facility. Ownership of this digital statement allows consumers of electricity the ability to claim the attributes of a particular generating facility and electricity generating event. I-REC Standard certificates fall into a category of 'attribute tracking certificates', as is described in the GHG Protocol Scope 2 Guidance Document, "A category of contractual instruments used in the energy sector to convey information about energy generation to other entities involved in the sale, distribution, consumption, or regulation of electricity."

2.2 Roles in the I-REC system

Participant

Anyone wishing to hold or trade I-RECs must have at least one account on the I-REC registry. Individuals or organisations with an account are referred to as a 'participant'. End-consumers wishing to purchase and redeem I-REC certificates can be participants and have their own accounts or they can be clients of an existing market-player who will hold accounts on their behalf.

Registrant

Electricity generating facilities must be registered with the I-REC system before I-RECs can be issued. Owners of these electricity generators are able to register their production stations and request I-REC issuance on their own behalf, or through the appointment of a third-party agent. The individual or organization tasked with registering the generating facility and requesting frequent I-REC issuance is called a 'registrant'. Registrants do not hold accounts on the I-REC registry, however an individual or organisation can apply to be both a registrant and a participant if necessary.

Issuer

The issuer for a country or region may be a government agency or an independent entity preferably acting with the recognition and support of the government authorities. The issuer controls the registration of generating facilities, oversees and verifies the reporting of generation data, and issues I-RECs based on reported generation. The issuer must have a contract with the I-REC organization, which maintains the registry.

2.3 Steps in creating an I-REC standard certificate

All reliable attribute tracking certificates, such as an I-REC, undergo the steps of issuance, documentation and redemption. For a better understanding of attribute tracking certificates the following steps need to be understood.

Step 1: Registering the generating facility with I-REC

Registration of a generating facility only needs to happen one-time and is completed by a registrant. The registrant can be the facility owner themselves or a third-party working on behalf of the electricity generator. The details of the production facility make up most of the attributes that participants can claim when they redeem I-RECs produced from the generator. Other attributes redeemed by participants come from the actual electricity generating event that was the reference for the I-REC standard certificate issuance.

Step 2: Producing renewable electricity

Producers of electricity always must adhere to national regulations regarding the production of that electricity. In each different national or regional electricity market these regulations will be different (such as permitting responsibilities, electricity frequency management, grid balancing responsibilities, etc.)

Step 3: Application for I-RECs

The registrant of the renewable electricity generators is responsible for the application to issue I-REC standard certificates. This can be done on a voluntary basis or as the result of national regulation requiring the issuance of I-RECs. As such contractual agreements between the electricity generator and the local I-REC issuer must be signed. The issuer is responsible for auditing the attributes declared by the registrant as true and factual. Following the assurance that the generating details are factual the issuer will register the generating facilities details in the certificate registry. Detailed information about the certificate registry can be found later in this document.

Step 4: Submitting meter readings

The actual electricity production data will need to be submitted to the issuer as per the rules agreed upon in the contract. All production data must be audited by a third-party prior to I-REC standard certificate issuance. This third-party confirmation of production details may be available from the national grid operator, national regulator or public authority. The person or organization responsible for providing this information to the issuer is the facility-appointed registrant. The issuer will conduct frequent audits to ensure the information delivered and verified by the third-party were accurate.

Step 5: Issuing I-RECs

When the third-party verified information has been received by the issuer it will review the request and issue I-RECs for the production facility for the relevant period. The issuer creates or issues the I-RECs into the electronic registry. Since individual I-RECs must always be contained in an account, similar to a bank account, the generator must declare which account will receive their issued I-REC certificates. This can be different for each issuance request. Since the I-REC system has a centralized registry, auditing and control of I-REC issuance is easily monitored by the system operator and third-party observers.

Step 6: Accounts within the registry

The issuer, as per step 5, needs to be informed as to which account the I-REC certificates can be issued. It is possible for a generator to open a trade account (become a 'participant') and to hold, trade or subsequently redeem the issued I-REC certificates. It is more likely however that individual generating facilities will choose to work with an existing market player so that any issued I-RECs can be delivered to the market player's account. Participants can open two types of I-REC accounts: A trade account allows the I-REC certificates to be transferred to another market player or end-consumer/client, and a redemption account allows the participant to redeem the attributes contained within the certificate. Certificates in redemption accounts cannot again be traded or moved to a different account.

Step 7: Trading of I-RECs

I-RECs that are issued to a trade account can be traded from one trade account to another trade account or placed in a redemption account. Issued I-RECs can only exist in a single trade account or redemption account at any one time - individual certificates cannot be in two accounts at the same time. The owner of the trade account has the right to move, trade or sell the certificates as they wish. For all intents and purposes the owner of a trade account is the owner of all the I-RECs in that account. It is possible for any end-user, market player or generator to open a trade account and redemption account effectively becoming an I-REC participant.

Step 8: Redemption of I-RECs
Claims to the underlying attributes contained within an I-REC are only asserted upon redemption. Redemption occurs when an I-REC certificate is moved into a redemption account. It is possible for a single participant to have multiple redemption accounts on the I-REC registry. As such, market players and end-consumers are welcome to make any number of redemption accounts, each with different authorized users as needed. It is likely that smaller end-consumers of I-RECs will contract for a single redemption account with an existing participant/market player. Larger consumers of I-RECs may opt to open a trade account and redemption account on the I-REC registry becoming an I-REC participant, and under a renewable energy requirement, electricity suppliers may be required to register as participants to demonstrate compliance with the requirement.

Step 9: Claiming the attributes of an I-REC
The participant (electricity supplier or end-consumer of electricity) has the right to claim the use or consumption of a certain volume of renewable electricity corresponding to the volume of I-RECs that are in the participant's redemption account.

3. The Certificate Issuer

The issuer plays an important role in the creation and eventual redemption of an I-REC certificate because an issuer provides I-REC issuance services for a given region/country. How does an entity become an issuer?

3.1 Two issuer options

Issuers can be appointed in one of two ways, 1. As the result of a governmental order, appointment or decree or, 2. By the I-REC Standard as elected by the market players involved. The most important factor of being an issuer is their pledge to independence, reliability and transparency. This commitment is part of the I-REC issuer agreement which is signed by the issuer organization and the I-REC Standard. The agreement guarantees the quality of I-REC certificate issuance, use of the registry and other aspects related to the functioning of the I-REC system.

In some instances the local situation will not be conducive to setting up a local issuer, as such, the issuer of last resort, known as the Rest of the World (RotW) issuer, can provide the services needed to continue the issuance of I-RECs in a specific location or region. This RotW issuer is currently a UK-based company that is authorised by the I-REC Standard to conduct the issuance where no local issuer is appointed. The RotW issuer operates under the direct supervision of the I-REC Standard and adheres to the quality qualifications as laid down in the I-REC Code.

Local issuers may be appointed by the national or regional government, in some cases the government authorities themselves will be responsible for I-REC issuance. Governments are able to mandate issuance or consumption of I-RECs for compliance or mandatory system purposes (such as national or regional RPS, quota systems or support systems).

Local issuers are expected to speak the local language and support generators in registering and issuing I-REC certificates. It is the intention of the I-REC Standard that local issuers have information available on a website in their local language and in English.

3.2 Financing the issuer

Issuers will bear significant costs that must be paid for by the users of the system. Issuer costs include the registration, issuance, verification and auditing of production data and production facilities. These costs are covered through the tariffs market players pay for use of the I-REC system. Electricity generators will be charged by the issuer for the registration of production devices and the issuance of I-REC certificates.

4. Certificate Registry

The certificate registry is an electronic database where all information related to the I-REC system is registered and stored for the lifetime of the system. The registry is a single database. The registry provides individual accounts to each market player in a client-friendly and simple manner. Participants are able to manage their active and previously redeemed certificates from all I-REC standard countries. Public information is available as well, however contracting I-REC partners (such as national governments) have the ability to create customised reports on various elements of I-REC issuance, redemption and/or use.

4.1 Registration of devices

All electricity generators requesting I-REC issuance must first be registered in the I-REC registry. This is executed by the I-REC issuer at the request of a registrant. In the process of registering devices the issuer will bring in all the details of the generating facility to the registry. Part of this information will be made available on the public reports of the I-REC registry.

4.2 Opening a trade account

Trade accounts can be opened by all electricity suppliers, companies or individuals that have an interest in trading I-RECs. A trade account can be opened by filling out an application form directly with the I-REC Standard organization.

4.3 Opening a redemption account

Redemption accounts can be opened by any owner of a trade account. By transferring an I-REC to a redemption account the certificate is redeemed and can never be transferred to another trade account or redemption account. At this point the underlying attributes of the certificate are redeemed on behalf of the redemption account's authorized user or owner. This form of redemption allows for the easy auditing/certification of mandatory compliance and voluntary consumer claims. Each redeemed certificate can be sorted on the registry as per the date of redemption, technology type or other criteria.

4.4 Cost for trade accounts

Market players, generators or end-consumers interested in opening an I-REC trade account pay a yearly fee and one-time registration fee. Smaller I-REC end-consumers may prefer to contract with a market player for a redemption account under their name. An overview of the tariffs can be found on the I-REC website, www.irecstandard.org.

5. The I-REC Code

In order to guarantee the quality of the I-REC system, including the avoidance of double attribute or certificate counting, a set of rules are published by the I-REC Standard. The rules are known as the I-REC Code and its subsidiary documents. The I-REC Code sets out the rules for all actors in the I-REC system. They are all available on the I-REC website.

5.1 I-REC Code and the issuer

The RotW issuer is appointed by the I-REC Standard and in direct communication with the organization. All issuers, and other I-REC contractors, must adhere to the I-REC Code documents. Their adherence to the I-REC Code is frequently audited by third-parties at the request of the I-REC Standard.

Local issuers will sign 'issuer agreements' with the I-REC Standard. This allows a government appointed local issuer the opportunity to apply additional national or regional regulations. These additional regulations cannot interfere with the reliability or robustness of the I-REC tracking system. However it is possible for local government appointed issuers to create additional regulations for each national situation, including renewable electricity compliance mechanisms, I-REC issuance eligibility rules or additional information fields. This allows the flexibility needed for the I-REC system to comply with international standards, with respect to REC attributes and greenhouse gas accounting, and the ability to comply with local/national regulation or renewable market support. In all situations third-party auditing must be conducted to ensure the issuer is following the regulations of the I-REC Standard and local regulations.

5.2 I-REC Code and the registry

The I-REC registry is provided by an independent service provider working on behalf of the I-REC Standard organization. The registry provides access to the I-REC standardized certificate database for all registered market players, end-consumers, generators, issuers, national governments and informed stakeholders. In addition the registry provides public reports on non-confidential information. The registry is a flexible mechanism for both the voluntary and potential compliance uses of the I-REC certificate. Audits of the registry to ensure adherence with the I-REC Code are completed at the request of the I-REC Standard organization.

5.3 I-REC Code and subsidiary documents

The I-REC Code outlines the principles and regulations for the various I-REC service providers and market players. The Code has a number of subsidiary documents which provide the detail and operational information behind the principles and standards set out in the Code. Additional documents, such as national issuer requirements/regulations will also be part of the code documentation in the future. Currently there are seven I-REC Code subsidiary documents in addition to the I-REC Code itself.

5.3.1 CSD 01. Registrant and Participant Application

This document is intended for market players, end-consumers and generators to explain the process of becoming a 'participant' or 'registrant' of the I-REC system.

5.3.2 CSD 02. Production Device Registration

Electricity generators must register with an issuer prior to the issuance of I-REC certificates. Registration must be undertaken by device owners or their agents, also known as registrants, and is described in CSD 02.

5.3.3 CSD 03. I-REC Issuer

Local issuers are requested to review this subsidiary document to have a better understanding of the rules and requirements of being an I-REC certified issuer.

5.3.4 *CSD 04. Issuing I-RECs*

Eligible and registered I-REC production devices are able to produce electricity and request I-REC standard certificate issuance for that electricity generating event. The process and forms for issuing I-RECs are found here.

5.3.5 *CSD 05. Change Management*

Management of the Code is an important task that is conducted together with the I-REC Standard organization and an independent regulatory code writer.

5.3.6 *CSD 06. National Residual Mix Calculation*

Residual mix calculations are necessary for the reliability of attribute tracking certificates and the avoidance of double counting, for example for greenhouse gas accounting. The methodology and use of residual mix calculations are laid out in this document.

5.3.7 *CSD 07. Redemption and Disclosure Statements*

The process of redeeming I-REC certificates and creating independent 'disclosure statements' is described here. Disclosure statements can be published and used as proof of I-REC redemption by electricity and I-REC end-consumers.

6. I-REC Governance

The I-REC Standard is a foundation based in the Netherlands. Board members of the I-REC Standard are world-wide industry experts in the use and creation of attribute tracking certificates and systems.

6.1 Participation in the I-REC Standard

All informed and interested stakeholders are encouraged to get in touch and participate in the I-REC Standard. All registrants and participants in the I-REC system automatically form the advisory group of the I-REC Standard organization. Additional working groups or coordination groups can be established by interested stakeholders. All levels of participation have the opportunity to directly influence the I-REC Standard and I-REC Code documents.

Additional information:

More information can be found in the other 'I-REC Guide' documents or on our website www.irecstandard.org.