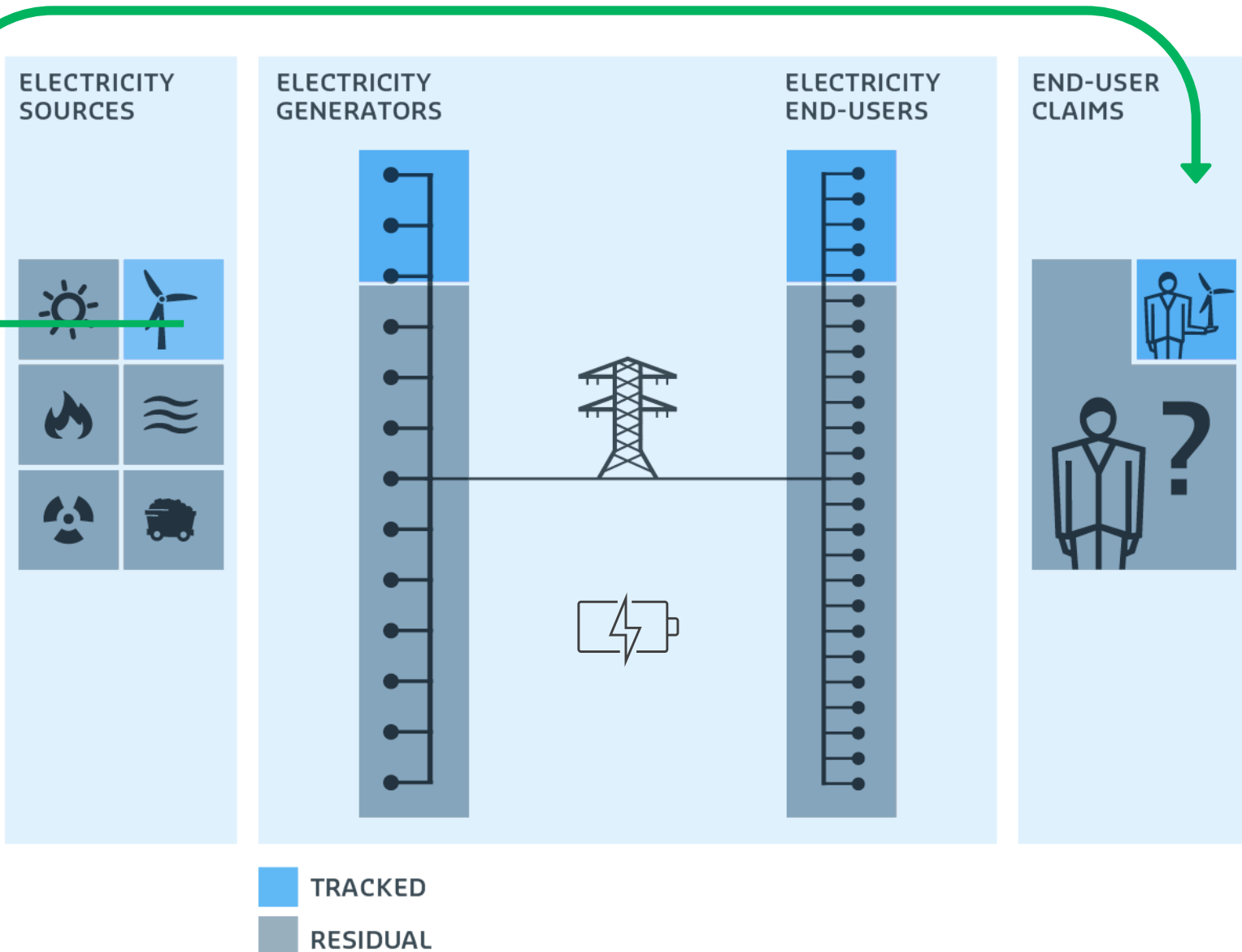


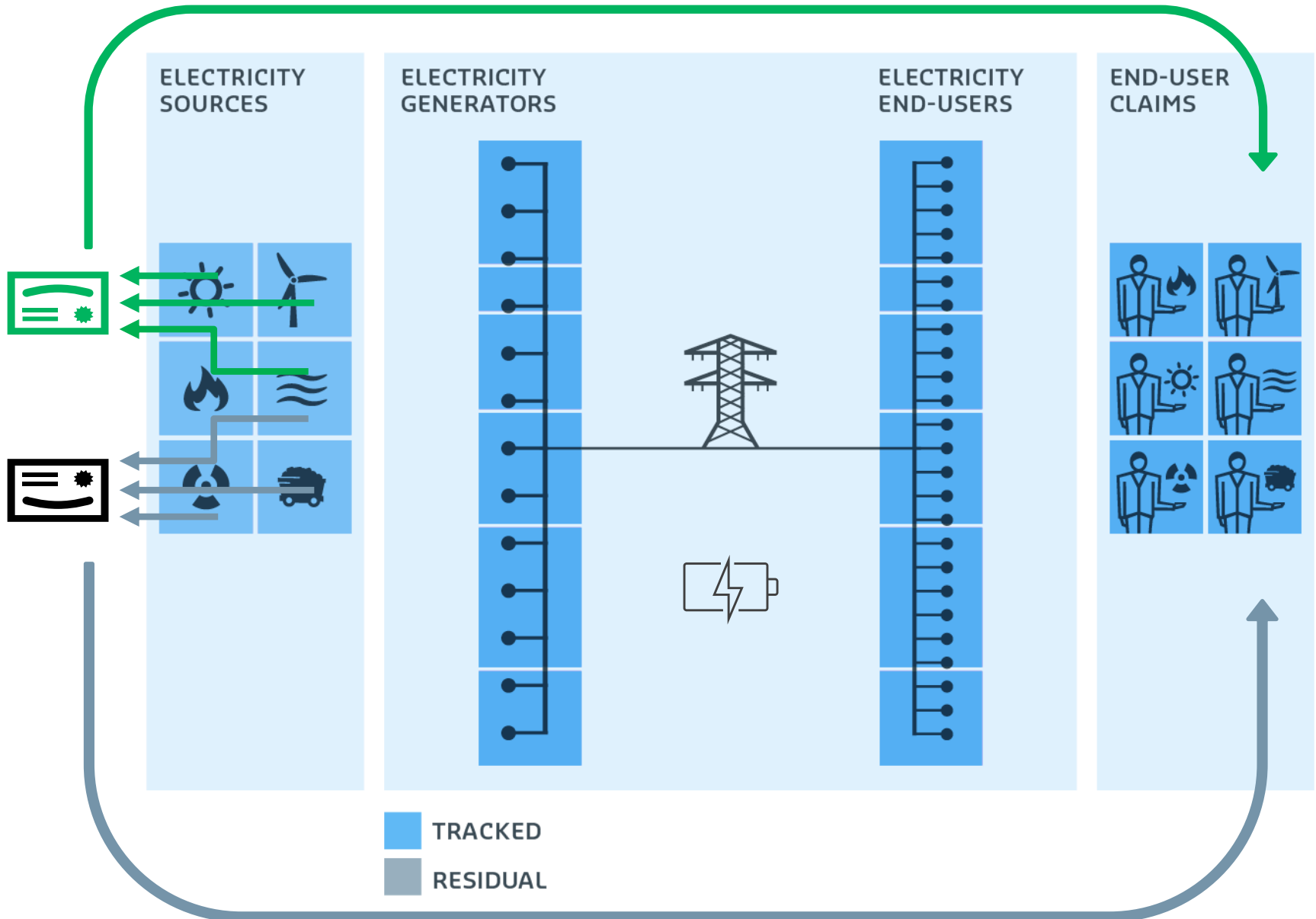
Hydrogen Tracking and Certification: *Lessons learned from 25-years of electricity tracking*

Benjamín Herrera Vergara
Regional Director LATAM

Standardizing Global Attribute Markets

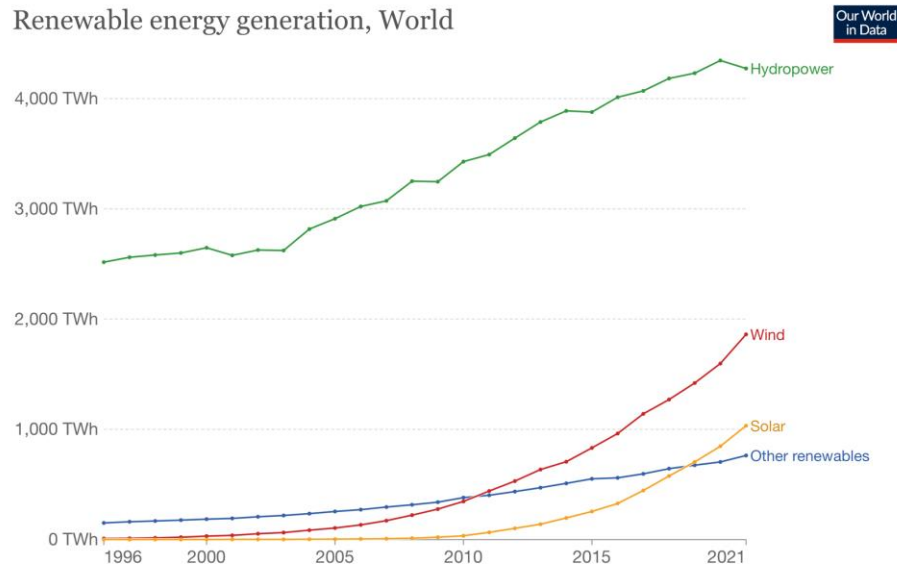




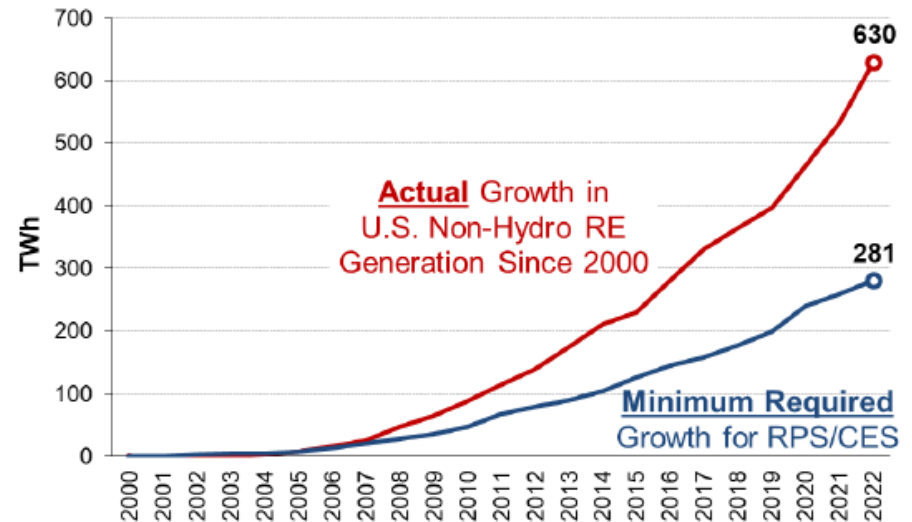


25 years later

Renewable energy generation, World



Source: Statistical Review of World Energy - BP (2022)
OurWorldInData.org/renewable-energy • CC BY
Note: 'Other renewables' refers to renewable sources including geothermal, biomass, waste, wave and tidal. Traditional biomass is not included.



Source: LBNL, 2023

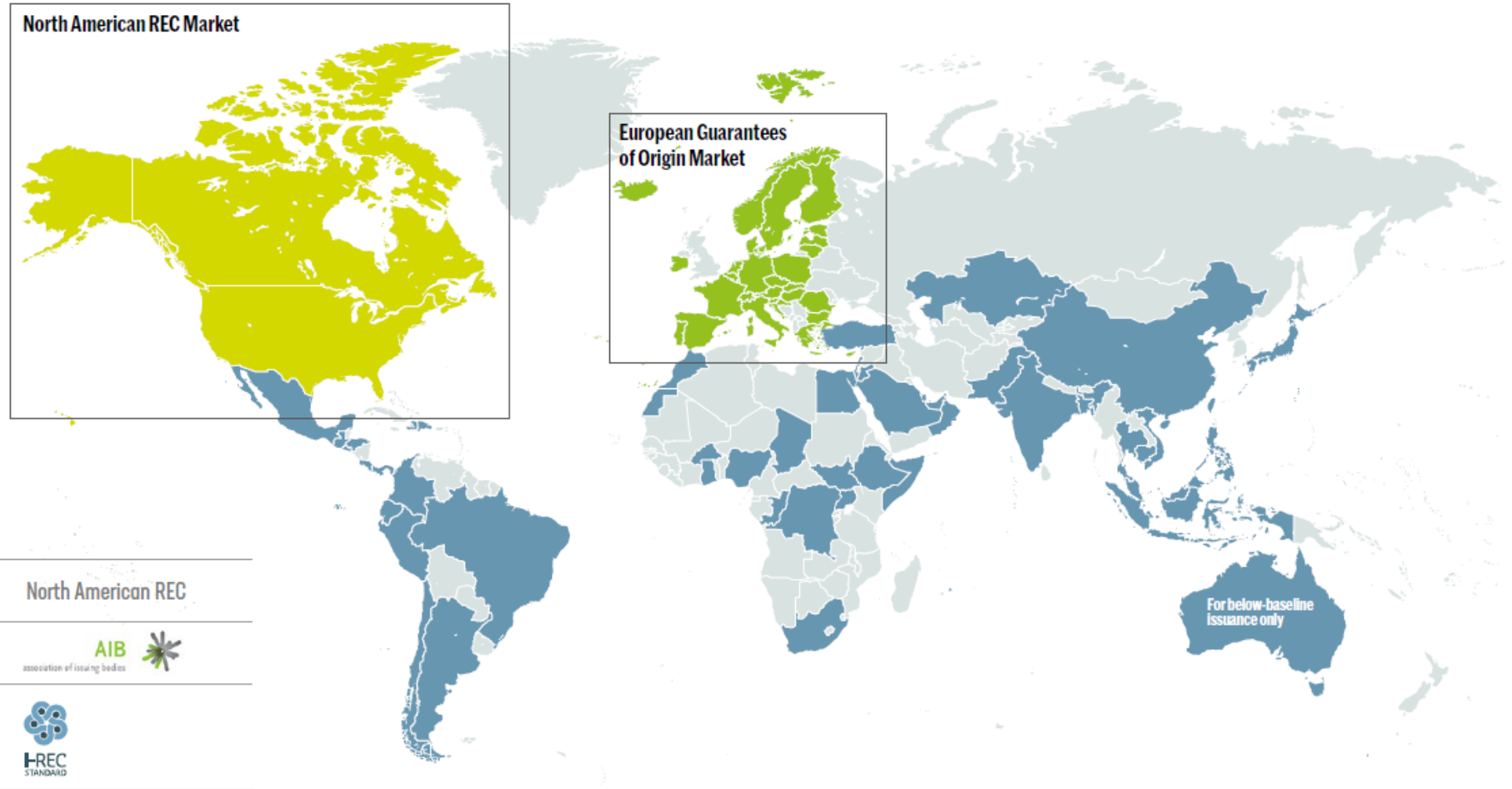
RE growth related to:

- ▣ Competitive costs
- ▣ Regulation
- ▣ Leadership and reputation

RE growth outside RPS's associated with:

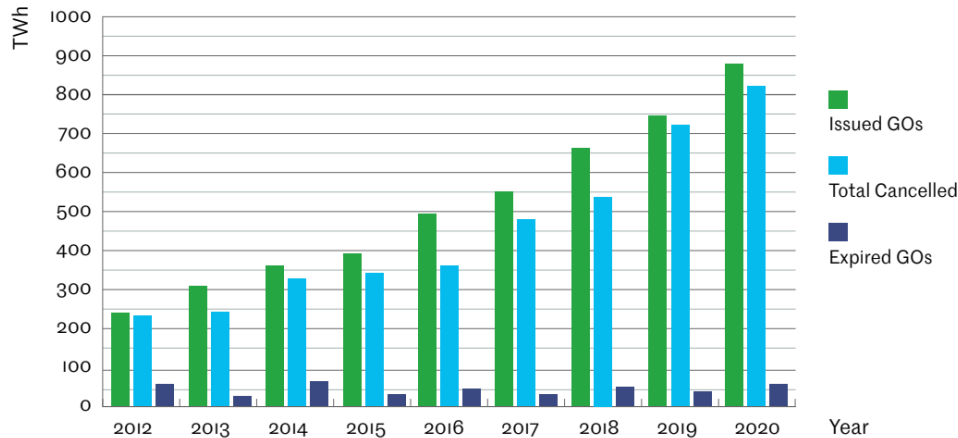
- ▣ Voluntary utility procurement
- ▣ Net-metered PV
- ▣ Voluntary green power markets

Global Electricity Tracking Standards



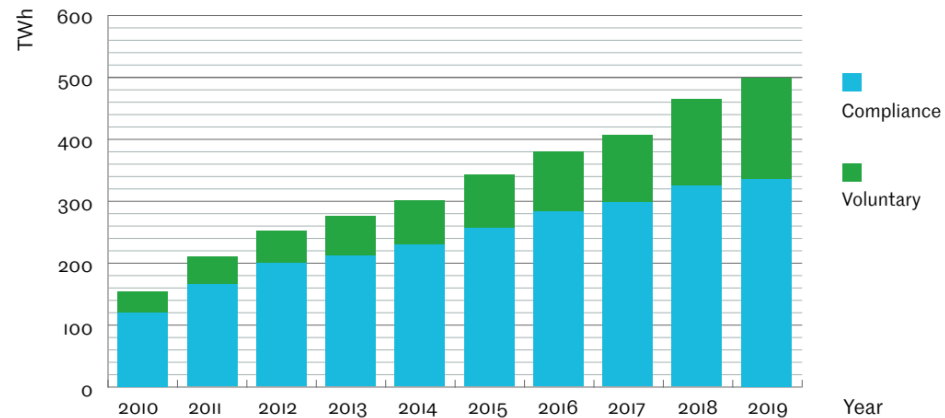
Global Electricity Tracking Standards

Figure 3. EECS GO market activity*



*Source: The Association of Issuing Bodies

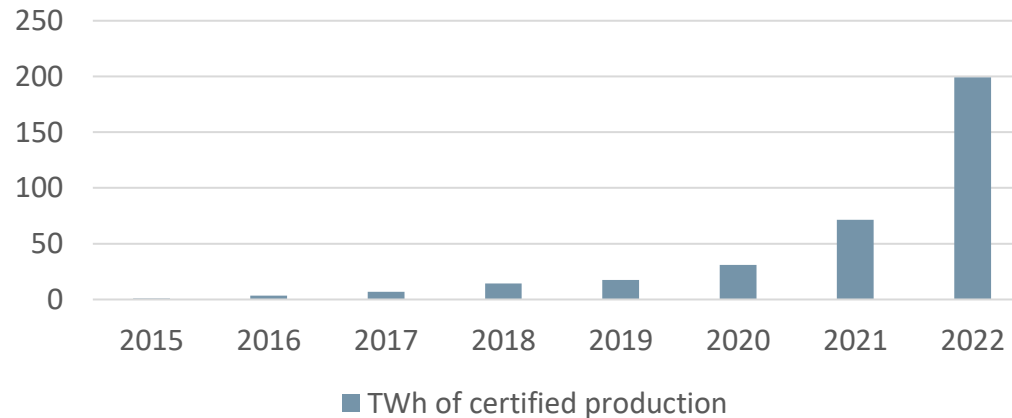
Figure 4. US REC sales*



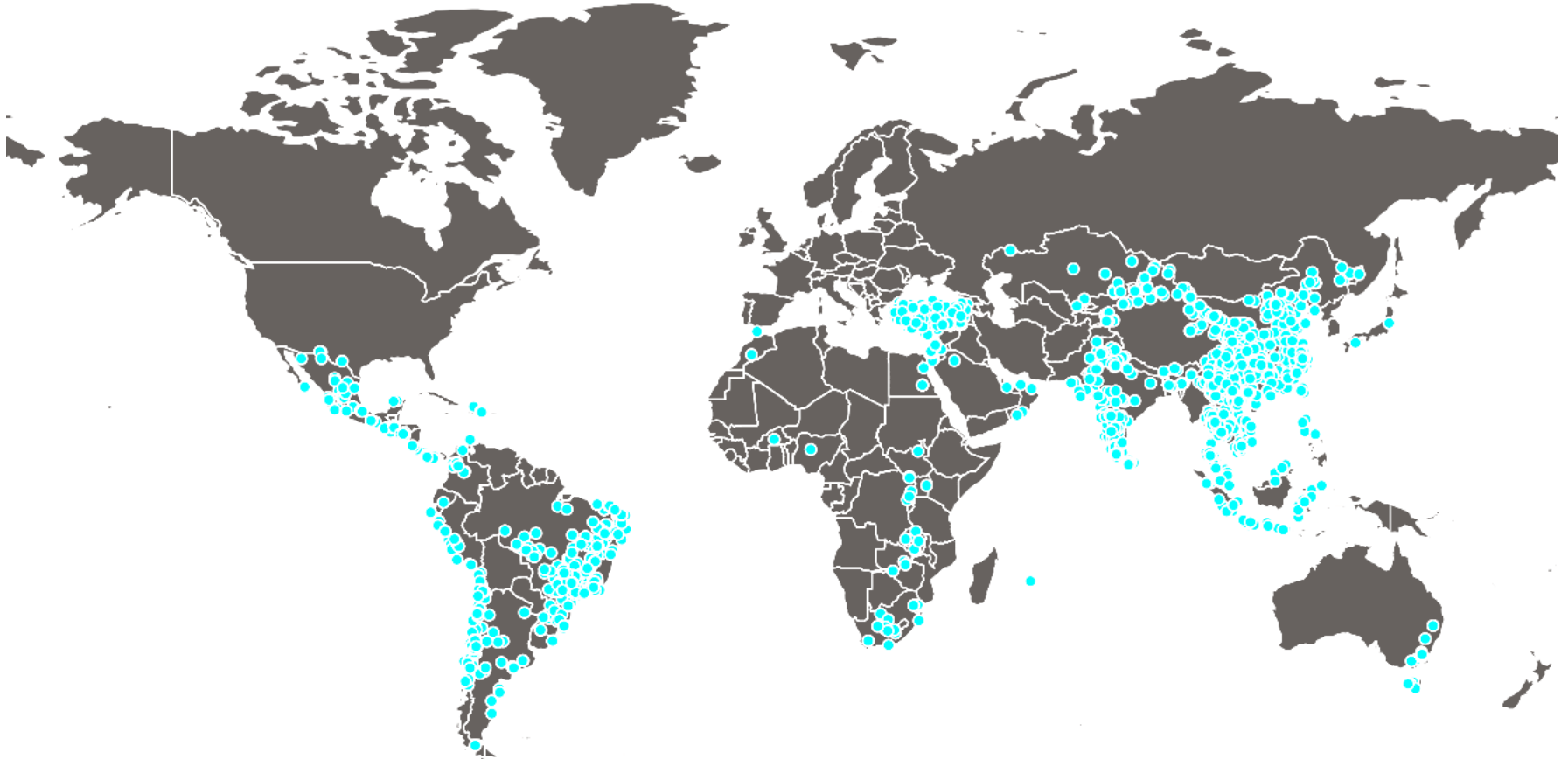
*Source: National Renewable Energy Laboratory (NREL) and Lawrence Berkeley National Lab

Global I-REC(E) Issuance (TWh)

Source: I-REC Standard Foundation

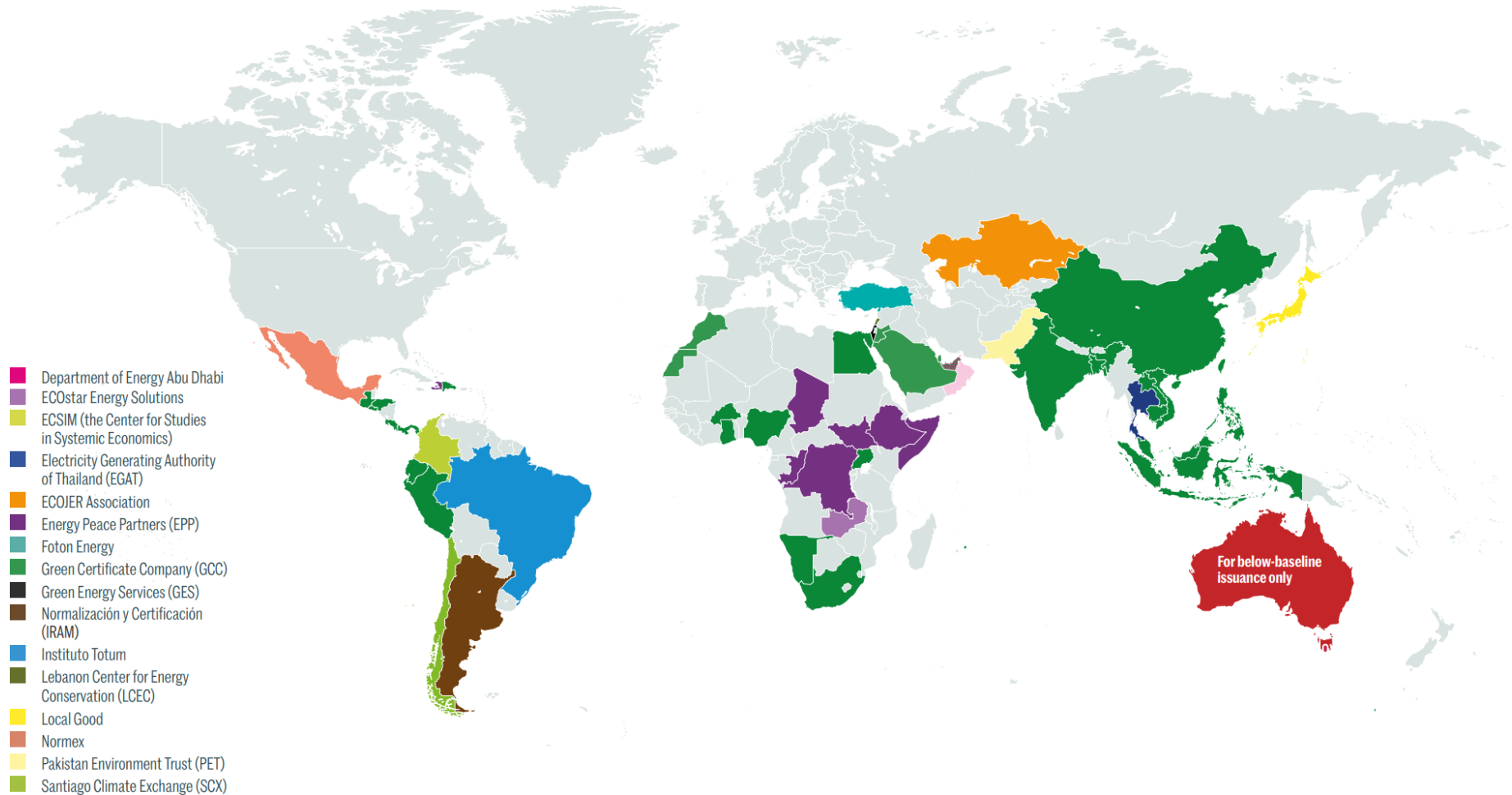


I-REC Standard Registered Devices



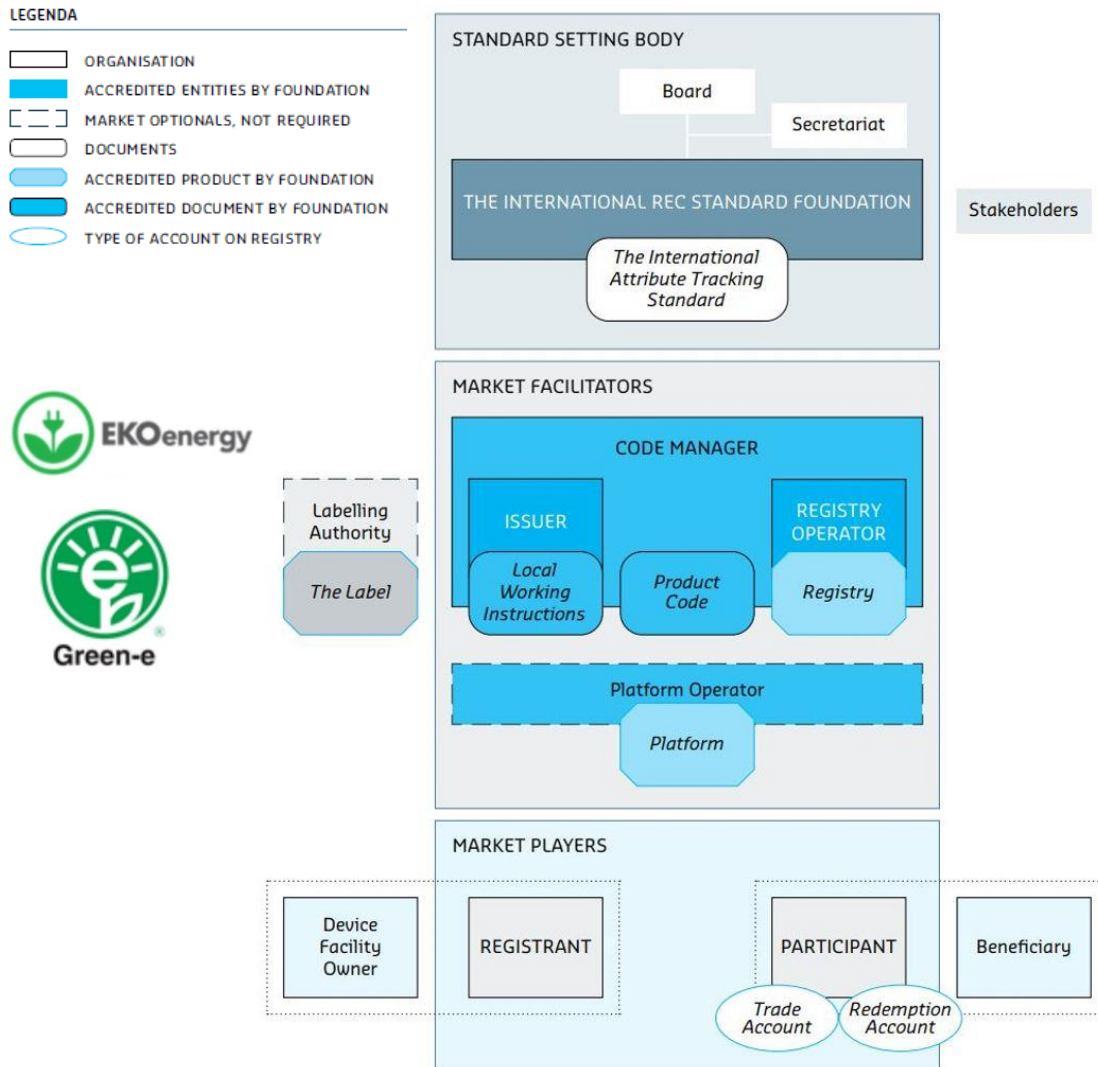
Sep 2023: **951** trading organizations, **4426** registered devices (198 GW) in **48** countries.

I-REC Standard - Issuers



Global standard with local implementation

Lesson learned #1: Governance Model



The International Attribute Tracking Standard

Release Date: 01 April 2021
Version: 1.0

Evident Code
for I-REC(Electricity)



Evident

Version: 1.0
Release Date: 01 October 2021



- Best practices in market facilitation*
- Fair and leveled playing field*

Lesson learned #2: Global Recognition

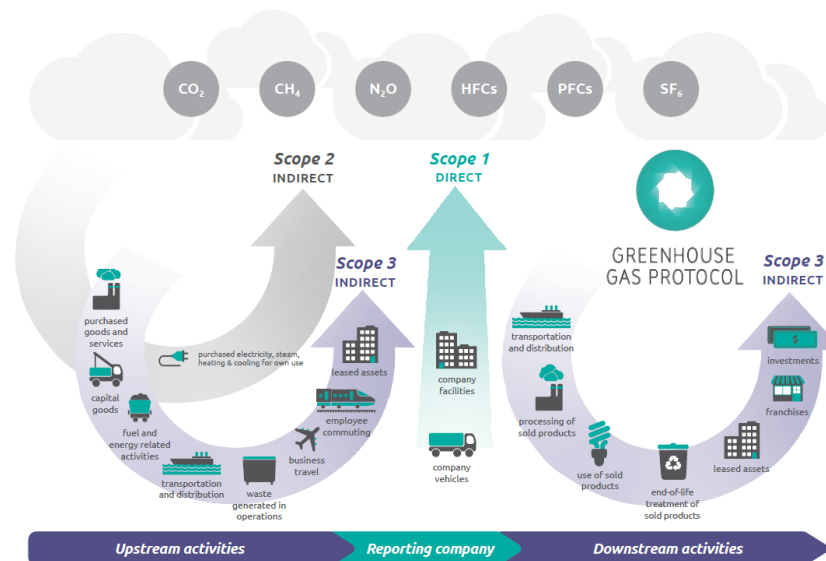
18,000+ companies reporting on climate change, water security and deforestation – scope 2 reporting in line with GHGP



RE 100

400 members who committed to 100% renewable electricity procurement using scope 2 guidance. RE100 also focuses on scope 3

6,000 companies have approved emission reductions targets with SBTi – scope 2 reporting in line with GHGP

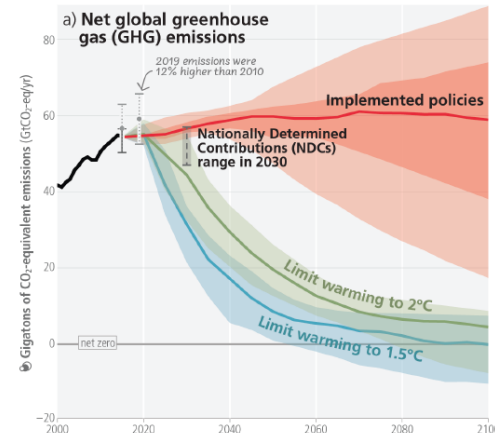


25 years later we are moving...

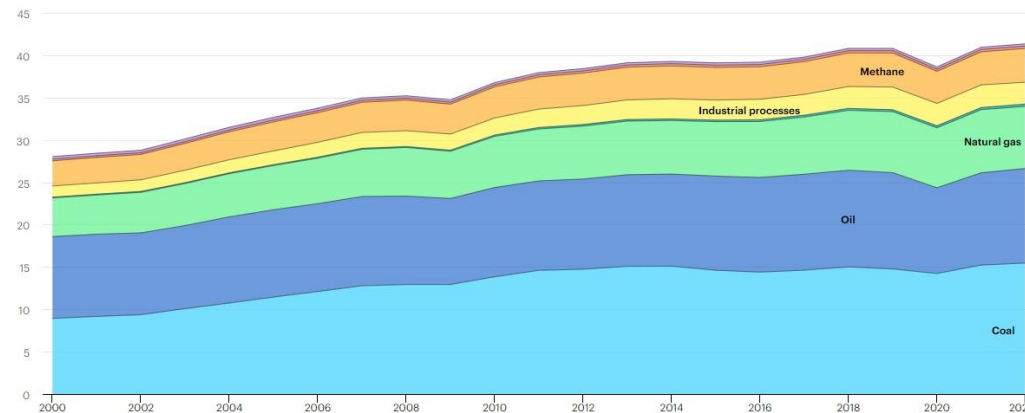
- Beyond Corporate Social Responsibility
- Beyond voluntary
- Beyond demand-drive

We are already seeing...

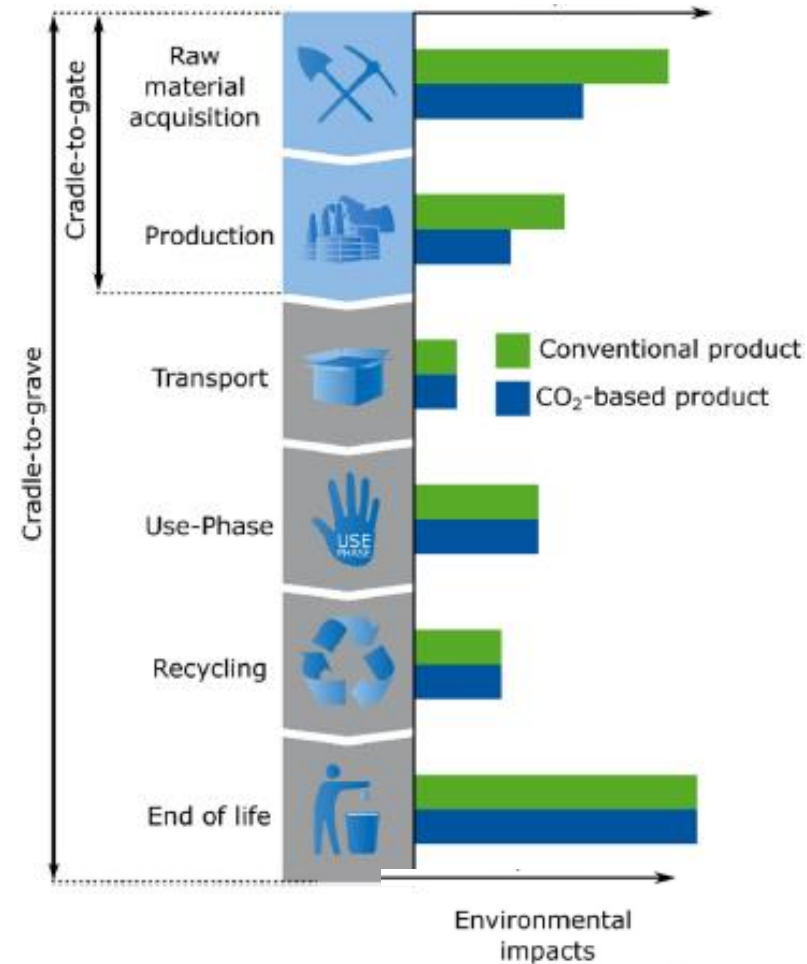
- Required disclosure
- Required compliance
- Required supply



Global energy-related greenhouse gas emissions, 2000-2022



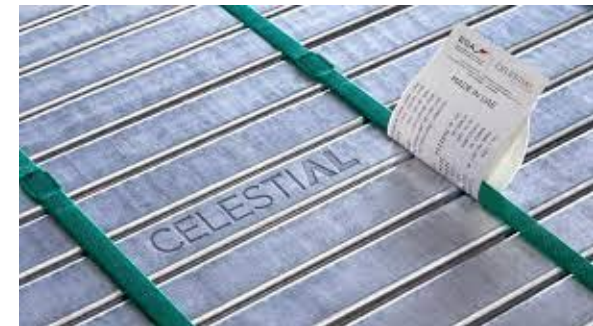
Product CO₂ accounting principles



Source: Petit et al. (2020)

From consumer claim to product claim





Fully decarbonized grids require 24/7 green electricity

Same for: H2 / data / aluminum / steel

iea

**Advancing Decarbonisation
Through Clean Electricity
Procurement**



24/7 Carbon-free Energy
(Eliminating emissions)



Carbon Neutrality
(Offsetting emissions)



Since 2007

100% Renewable Energy
(Reducing emissions)



Since 2017



By 2030

Types of markets

Voluntary markets

- Individuals and Businesses choosing to claim and support renewable energy.
- European and I-REC markets are voluntary markets.

Compliance markets

- Mandated markets created as a result of regulatory prescription.
- Movement to product-based accounting frameworks (i.e. CBAM/RFNBO others) where adherence is required for participation.

→ Towards product-level emissions accounting

Not companies, but their **products** that will be required to procure renewable electricity or prove embedded carbon emission

Getting ready for hydrogen under the European CBAM

CBAM Approved by EU Parliament

EU Member States have a clear pathway towards mandated product emissions reporting for imported commodities.

Initially: iron, steel, cement, aluminum, fertilizers, electricity and hydrogen.



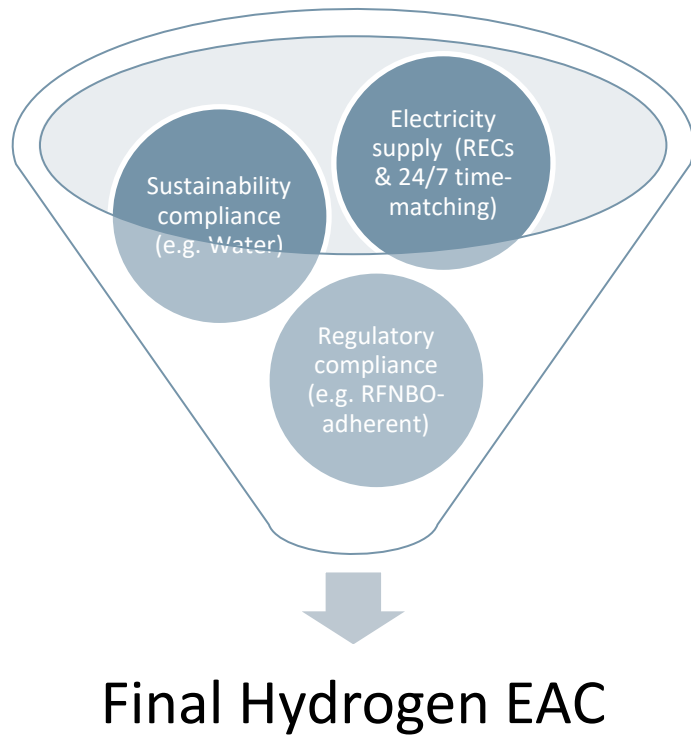
Transitional Period - 1 Oct 2023 to 31 Dec 2025

Further implementing acts by June 30 2025

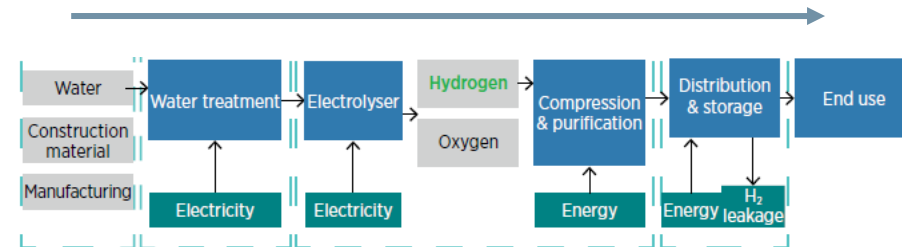
Adherent commodity producers (declarants) will have the option of using either **default emissions factors** for indirect emissions (*Annex IV, point 4.3*) or applying **actual embedded emissions** if they can prove a direct physical link or **power purchase agreement (PPA)** with a renewable electricity producer for an equivalent amount of electricity used in their commodity's production (*Annex IV, point 5 and 6*).

PPA's with EACs *can* and *will* support the implementation of CBAM globally

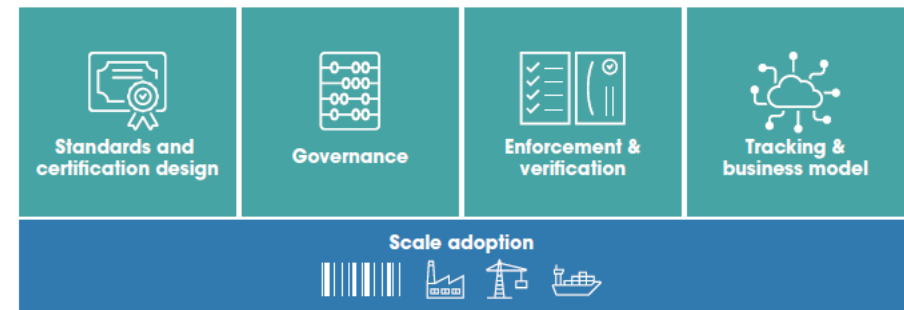
What can EACs do for hydrogen tracking and certification?



Verifying, collating and tracking the origins down the supply chain

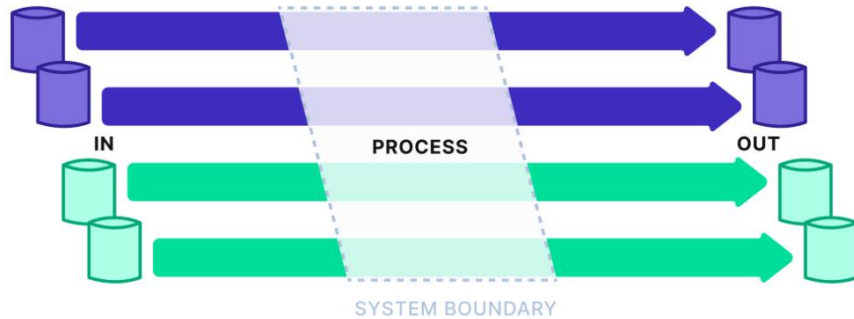


Source: IRENA (2023)

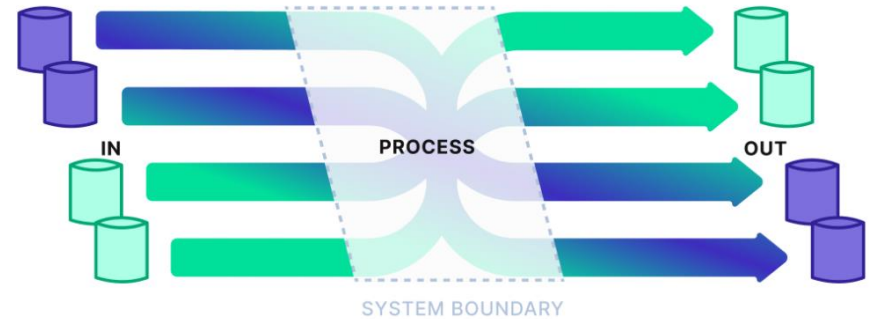


Chain of Custody concepts

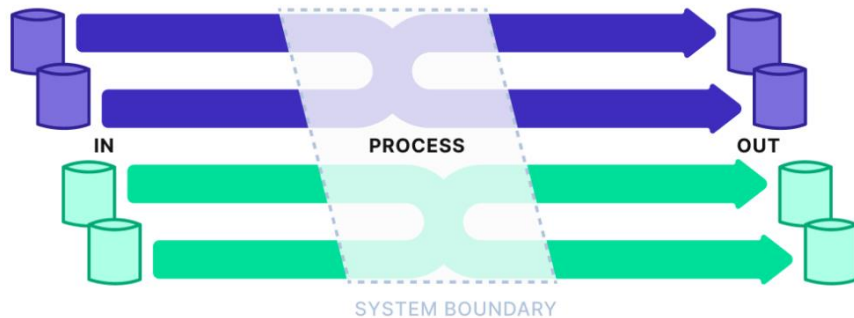
IDENTITY PRESERVATION



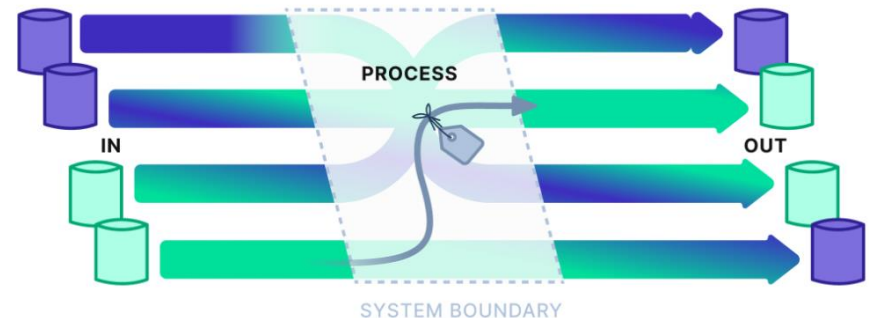
MASS BALANCE



SEGREGATION



BOOK & CLAIM

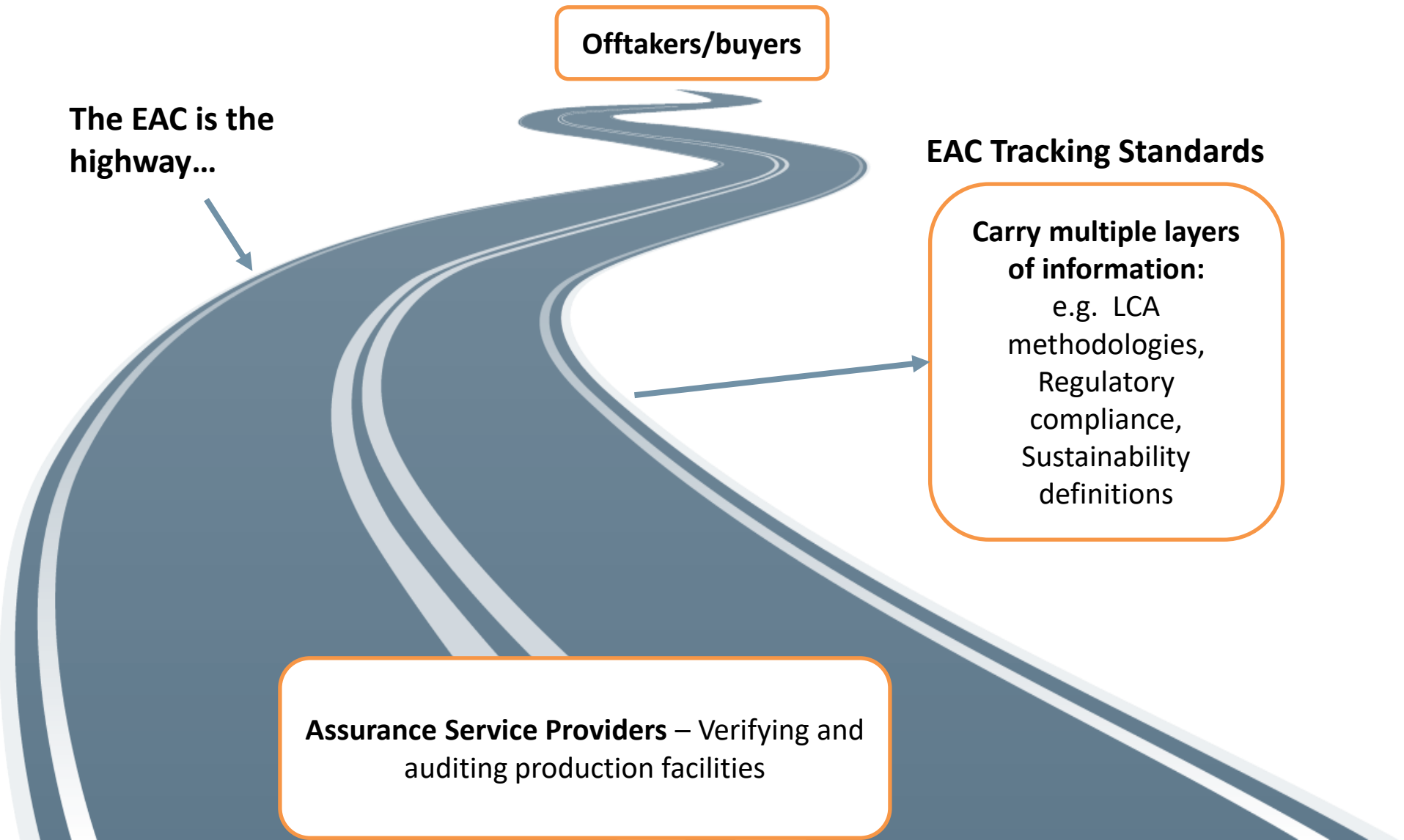


Tracking Scheme versus Certification Scheme

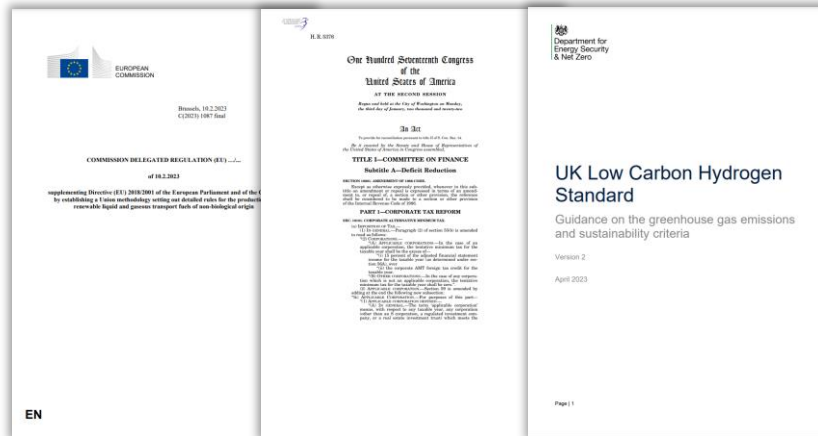
For any discussion of hydrogen, we first need to differentiate:

Tracking certificate scheme	Certification scheme
Often just a statement of fact : technology agnostic, non-preferential, fact-based, removes opinions	Defines criteria to meet such as technology, location, use of water, CO2 content, communities, etc.
Reflect stackable information on the product and ownership during the complete supply chain	Often site-specific certifications that require individual assessments for consideration and adherence
Can be used easily to meet obligation quotas	Can be used easily to determine adherence to legislative requirements
The core element used to transfer ownership . Only one can exist per unit of energy	Compliance with one (or more) certification can be placed on the tracking certificate as a label to prove adherence

A clearer example of the hydrogen certification landscape



How to define low-carbon hydrogen?

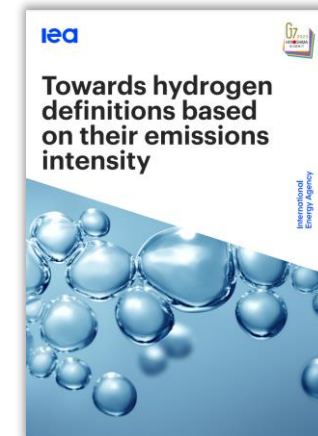


EU RFNBO rules

USA IRA definition

UK Low-Carbon Hydrogen Standard

+ numerous non-governmental definitions



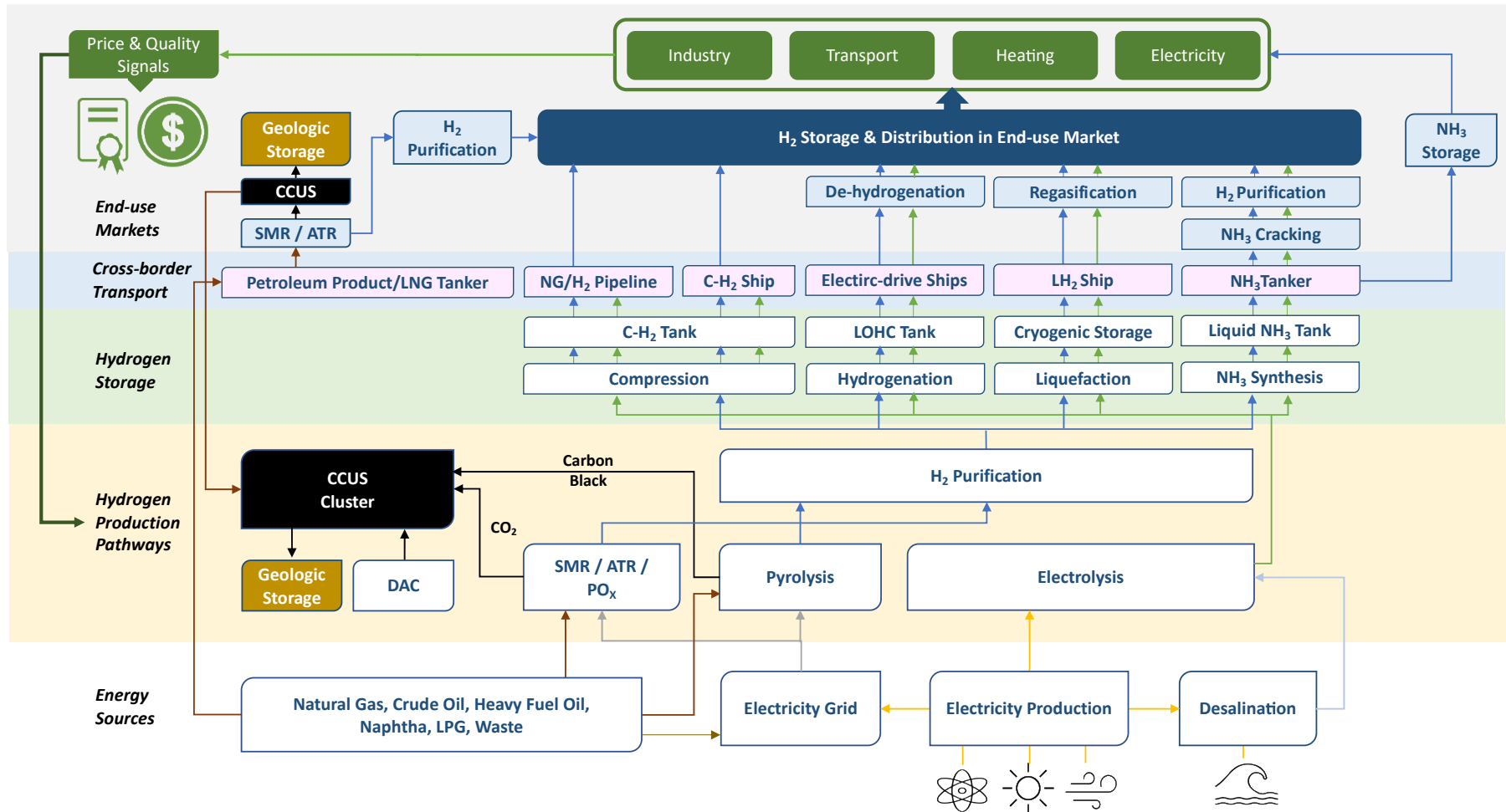
"Using colors to refer to different production routes, or terms such as 'sustainable', 'low-carbon' or 'clean' hydrogen, **obscures many different levels of potential emissions.**"

"By agreeing to use the emissions intensity of hydrogen production in the definition of national regulations about hydrogen, governments can **facilitate market and regulatory interoperability.**"

Source: IEA 2023

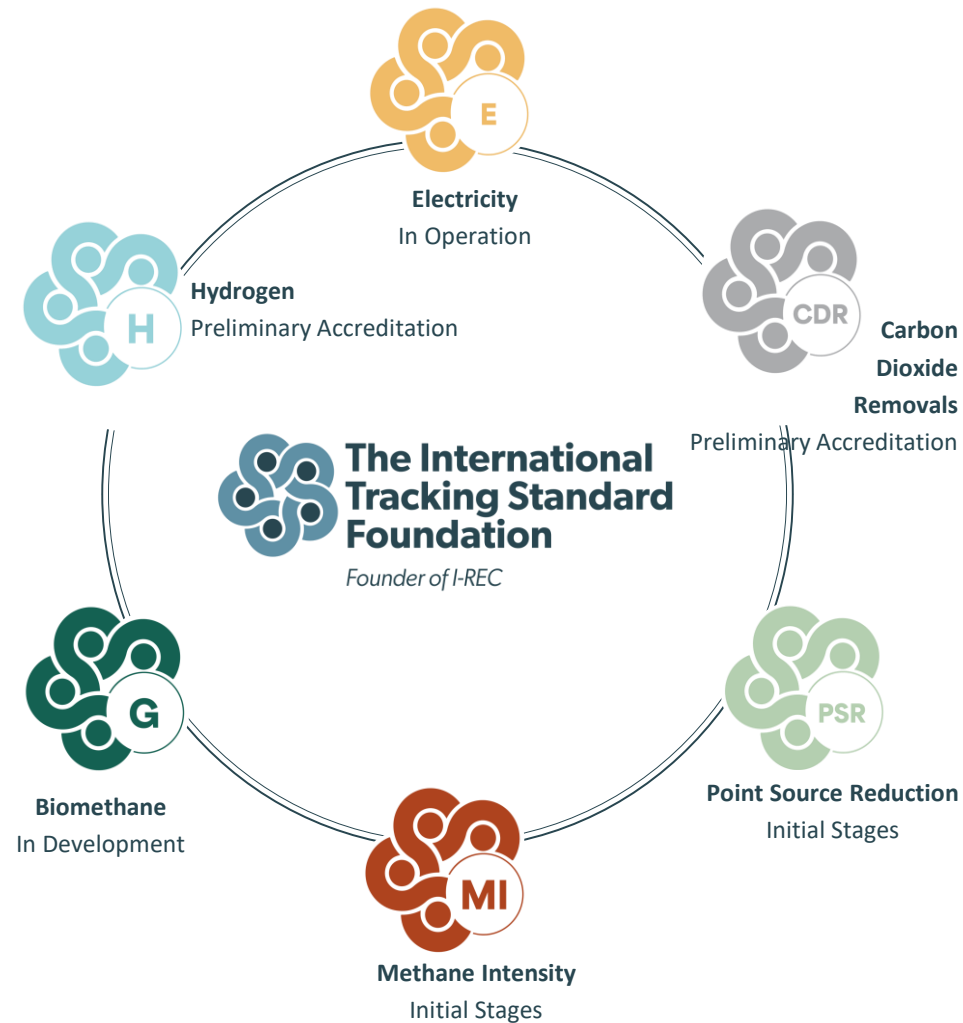
Hydrogen is complex

Certification schemes may certify some pathways, but tracking schemes need to facilitate them all!



Legend: ATR: Autothermal Reforming / PO_x Partial Oxidation / SMR: Steam Methane Reforming / CCUS: Carbon Capture, Utilization & Storage / DAC: Direct Air Capture / LOHC: Liquid Organic Hydrogen Carriers

- New energy supply chains are emerging for low-carbon global trade
- We need international standards to harmonise national, regional and industry-led certification schemes
- Enabling and facilitating harmonised EAC systems around the world is the mission of the I-TRACK Foundation.





I-REC STANDARD CONFERENCE 2024



The International
Tracking Standard
Foundation

Founder of I-REC

Standardizing
Global Attribute
Markets



São Paulo

BRAZIL



2 & 3 July
2024



Grand Hyatt
São Paulo

READ MORE www.irecstandard.org

Thank you

BENJAMIN HERRERA
REGIONAL DIRECTOR, LATIN AMERICA
b.herrera@irecstandard.org



The I-REC Standard
Achter de Tolbrug 151
5211 SM 's-Hertogenbosch
The Netherlands
secretariat@irecstandard.org