

For the 1st APEC CLCH Annual Convention



THE JAPAN GAS ASSOCIATION

Toward Interoperable Certification Scheme for CLCH Derivatives in the APEC Economic Community – a case of e-methane

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Ryota KUZUKI, Ph.D.

Senior Research Fellow, Planning Dept.

The Japan Gas Association

Introduction: About JGA and current situation of Japan's city gas industry

- The Japan Gas Association (JGA) is a non-profit organization established in 1947, consisting of about 200 companies.
- Our members cover about 27 million customers, or about half of the total number of households in Japan, total volume of annual gas supply is about 40 billion m³, total pipeline length is over 270 thousand km.
- Japan's city gas industry was the "first mover" in the world to introduce and commercialize LNG for city gas supply in 1969. Now, there are 37 LNG terminals.

About 50 years have passed
since the introduction of LNG

In October 2020, the Japanese government announced its goal of becoming **carbon neutral (net zero carbon emissions) by 2050**.



LNG tanker
In 1969
Photos:
Tokyo Gas



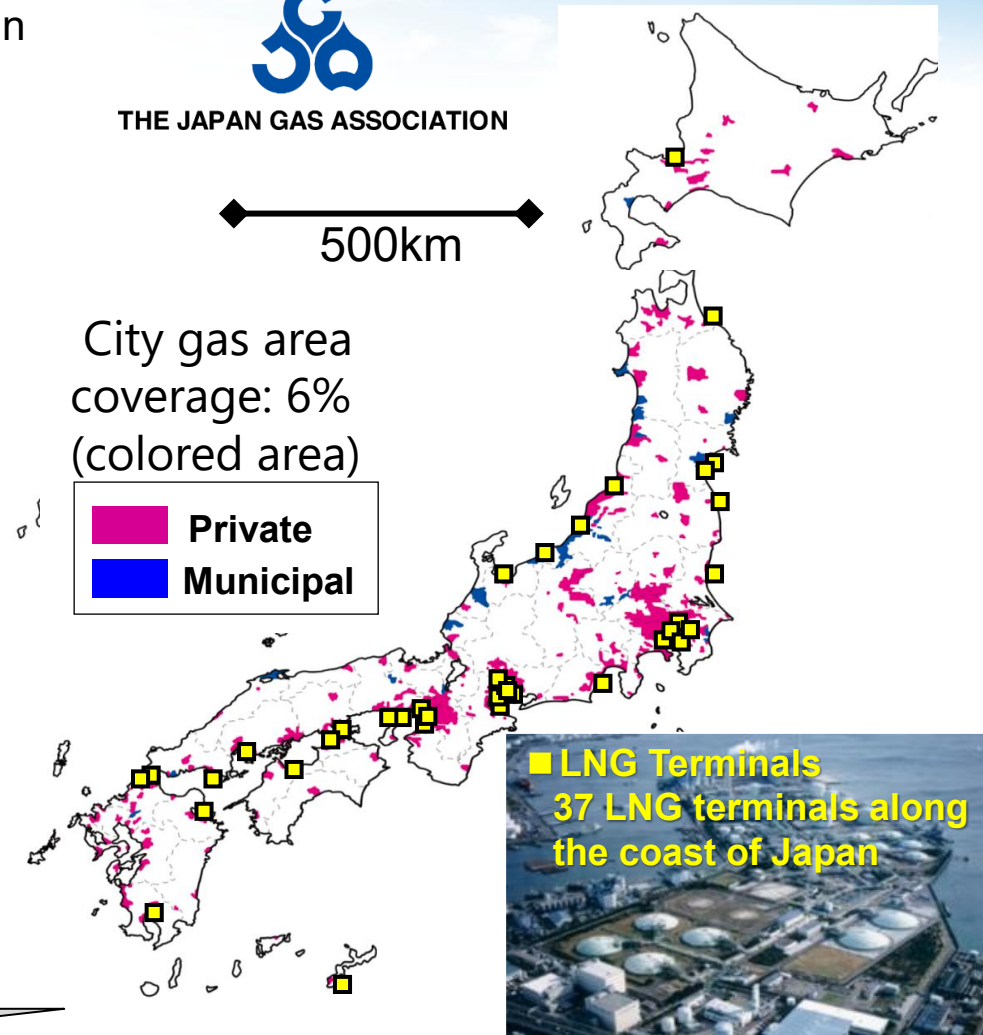
Prime Minister
Y.Suga announced
national target in
2050 in October,2020



500km

City gas area
coverage: 6%
(colored area)

Private
Municipal



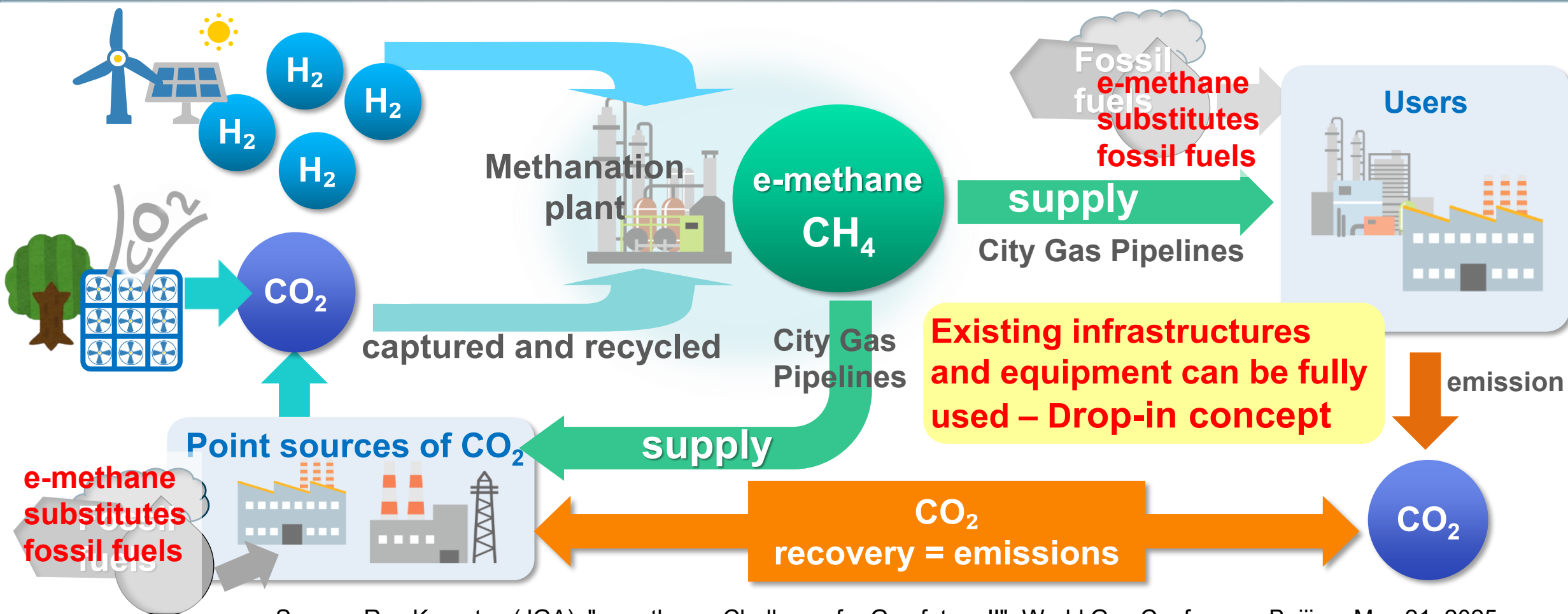
■ LNG Terminals
37 LNG terminals along
the coast of Japan

Japan's city gas industry is now facing a new challenge to meet the target.

- 1. Concept of e-methane, as CLCH derivatives and recent achievements of “Clean Gas Certificates” in Japan**
2. Toward interoperable certification within the APEC economic community to more activate the CLCH market
3. Harmonization with major international GHG accounting rules, with a focus on the role of certificates

Drop-in concept of CLCH derivatives by use of recycled carbon – a case of e-methane

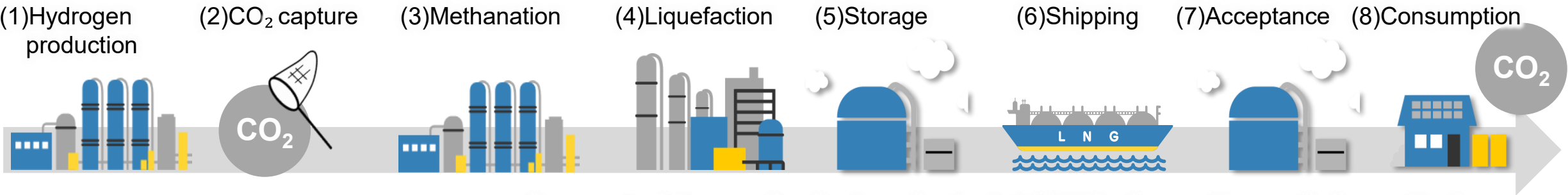
- As one of the major CLCH demand, **synthetic hydrocarbon fuels by use of recycled carbon** is a promising pathway.
- **E-methane, one of the CLCH derivatives**, can be used with existing infrastructures and equipment – **Drop-in concept**.
- CO₂ emitted from e-methane combustion originally comes from exhausted flue gases, biomass, atmosphere, or recycled carbon fuels. Therefore, **it does not cause additional emission of CO₂ into the atmosphere**.



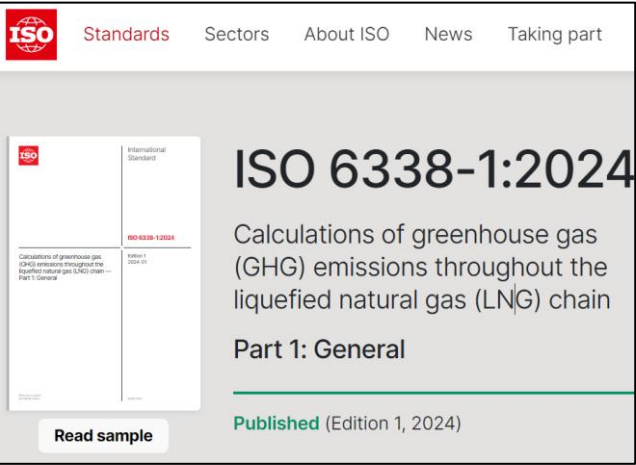
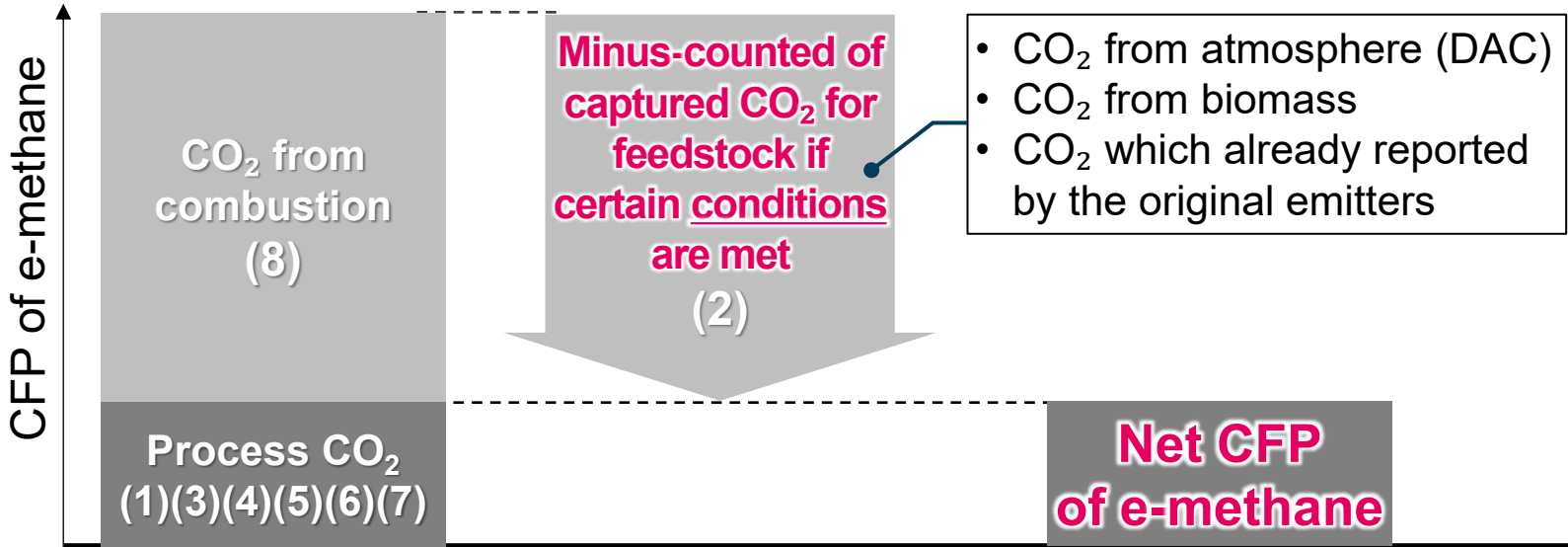
Source: Ryu Komatsu (JGA), "e-methane, Challenge for Gas future !!", World Gas Conference Beijing, May 21, 2025

(Reference) Carbon intensity of e-methane - authorized rules in the ISO 6338-1:2024

- ISO 6338-1, published in January, 2024, includes calculation formula which JGA proposed for **carbon footprint (CFP) (carbon intensity (CI)) of e-methane** in accordance with ISO14067, well known standard of CFP calculation.
- The core concept is that if the CO₂ feedstock (captured carbon) meets certain conditions, **it should be minus-counted to calculate CFP in the entire boundary.**



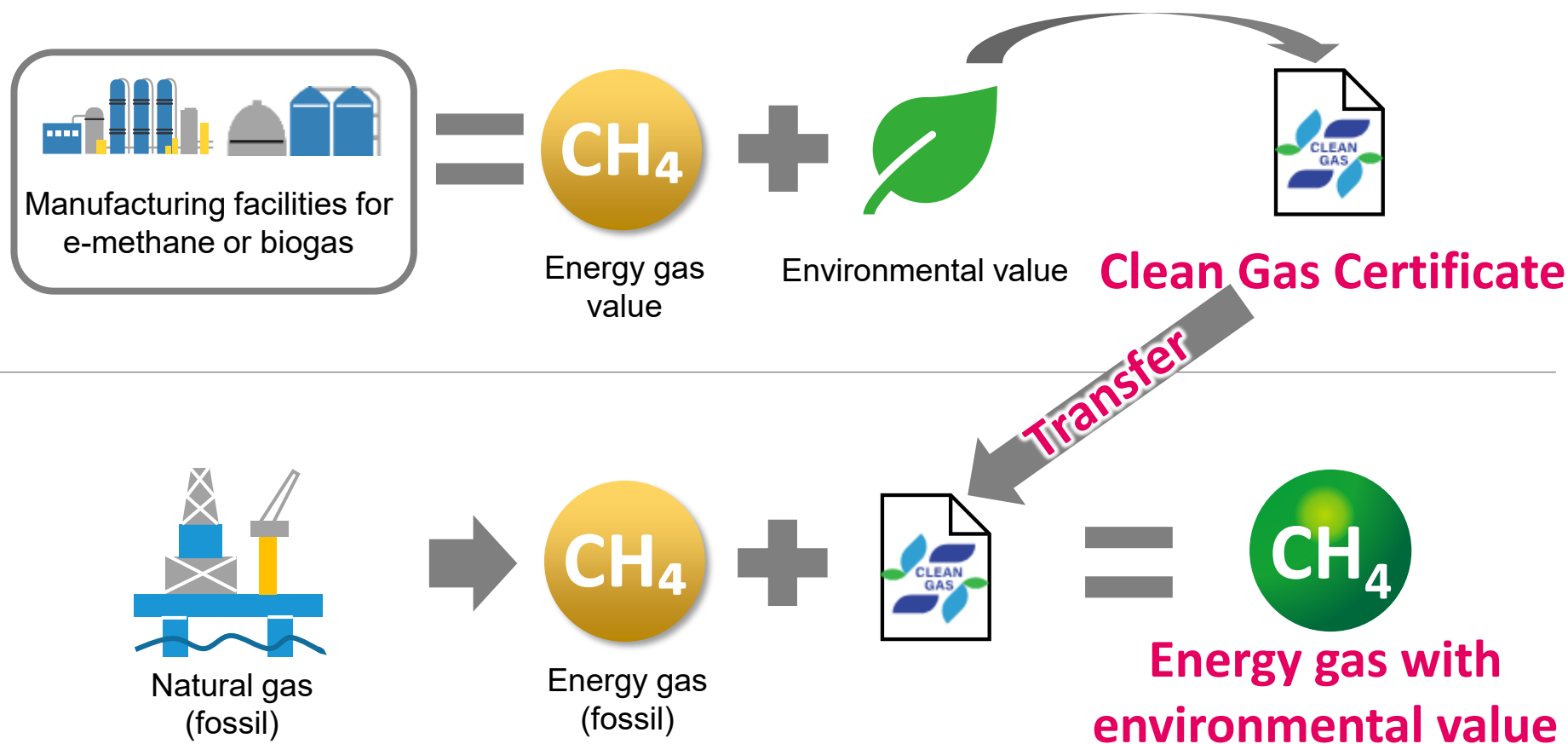
Concept of Annex C : Carbon footprint (CFP) of e-methane (Informative)



Source: ISO Website
<https://www.iso.org/standard/87114.html>

Launch of “Clean Gas Certificate” for e-methane and biogas

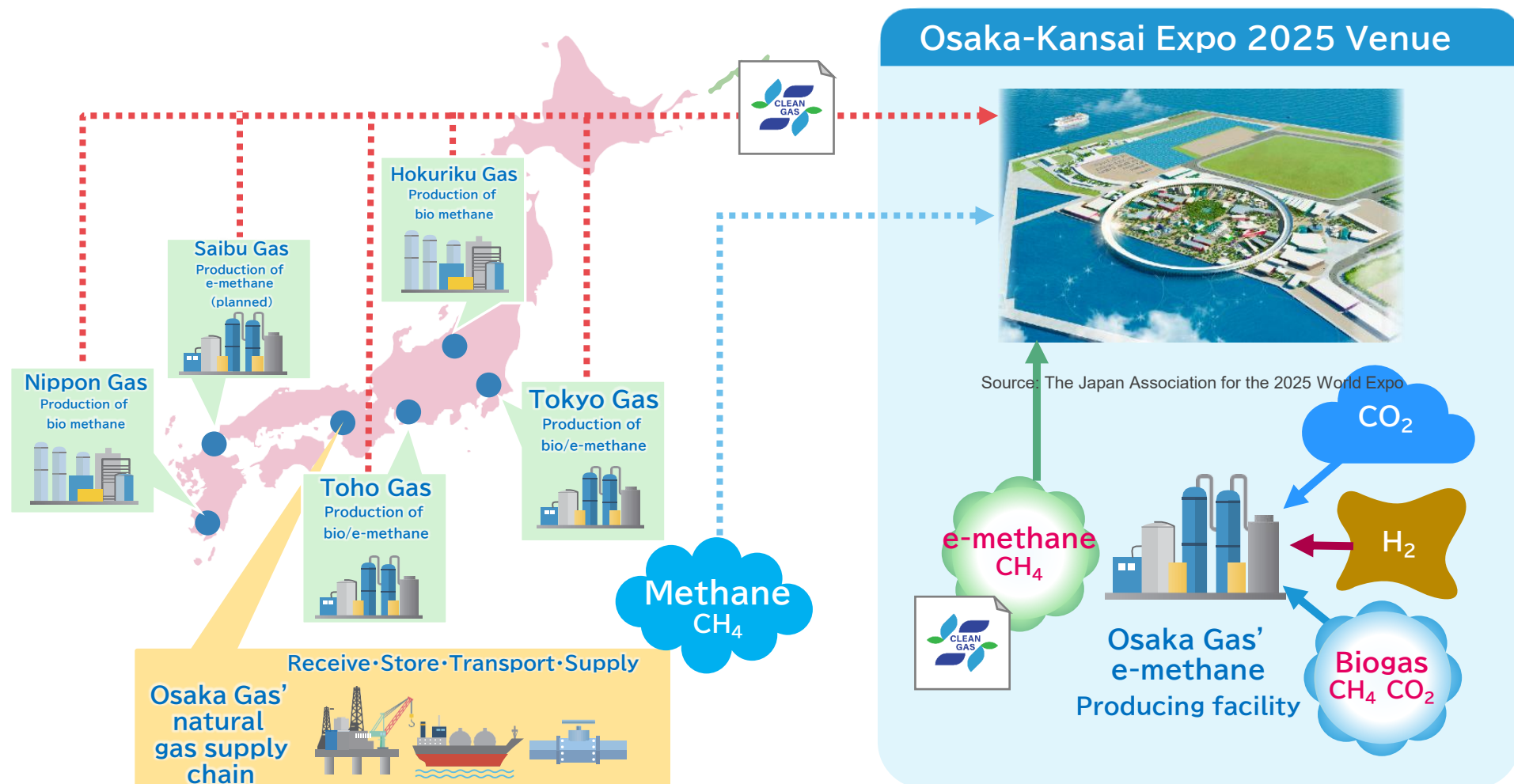
- Since April 2024, JGA and gas-related organizations have launched “**Clean Gas Certificates (TM)**”, a scheme of certifying the environmental value attributes of e-methane and biogas produced in Japan.
- **6 projects have already been approved**, and the Clean Gas Certificates have been issued, respectively.
- So far, it is voluntary and applicable for only domestically produced gases, **this scheme is aimed to be harmonized to certificates for cross-border traded e-methane and biogas.**



Source: Clean Gas Certificate Website
(only in Japanese)
<https://www.clean-gas-certificate.com/>

Example: “Clean Gas Certificate” contribution to the Osaka-Kansai Expo 2025

Environmental value attribute of e-methane and biogas was transferred from other city gas companies nationwide through Clean Gas Certificates to supply **zero-emission gas** to the **Osaka Kansai Expo 2025**.



Source: Osaka Gas, Contribution of methanation to Expo 2025 Osaka, Kansai, 14th Public-Private Council for Promoting Methanation, June 18, 2025

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(Reference) CLCH and its derivatives' certification schemes in the APEC economic community

- A research report “**The Role of Certificates for Hydrogen and Hydrogen Derivatives in the APEC Economic Community,**” undertaken under the leadership of Chile on behalf of the APEC Energy Working Group, was published in January 2026.
- **There exist certification schemes covering e-methane as derivatives of CLCH. But there are still few practices.**

Certification of Hydrogen and Its Derivatives in APEC Economies: Its Role in Driving the Market

APEC Energy Working Group

January 2026

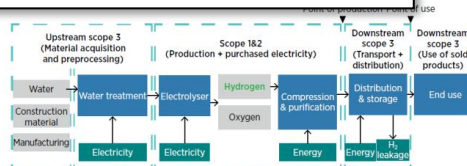


Figure 1.2 Defined scope of renewable hydrogen production according to its LCA [2]

1.4.3 System Boundary Aspect

Table 4.1 Hydrogen (and derivatives) certification and fuel standards in APEC economies and their life-cycle overview

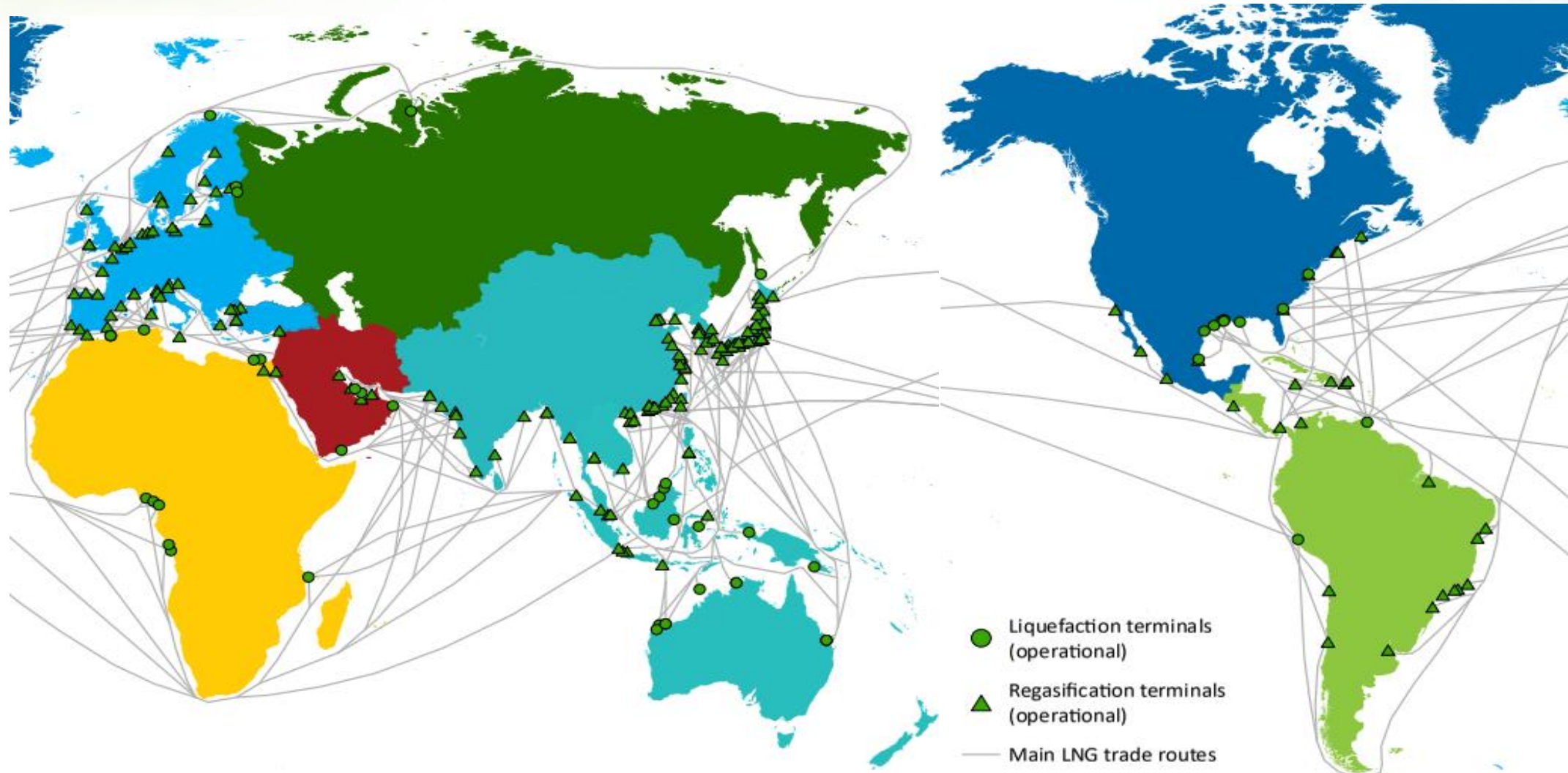
Name	Economy	Type	Product Covered	Purpose	System Boundary	Status	Emission Intensity
GO scheme	Australia	Certification scheme	Hydrogen, Ammonia, Methylcyclohexane	Voluntary certification for renewable H ₂ and derivatives; enables tax credit eligibility	Well-to-delivery	Planned (2025)	None specified
GH2 Green Hydrogen Standard	Australia	Certification scheme	Green hydrogen, green ammonia	Voluntary; supports labeling, trading, and market recognition of green hydrogen, green ammonia	Well-to-gate (electrolysis)	Active	≤ 1 kgCO ₂ e/kg H ₂
Zero Carbon Certification Scheme	Australia	Certification scheme	Renewable hydrogen and ammonia	Voluntary; provides Guarantees of Origin and carbon intensity labeling for renewable H ₂ and ammonia	Production only	Active	Project-specific zero emissions
Hydrogen Society Promotion Act	Japan	Standard / Regulatory framework	Low-carbon hydrogen, ammonia, synthetic fuels, synthetic methane	Regulatory; supports hydrogen promotion, incentives, and low-carbon energy adoption	Well-to-Gate (H ₂ and NH ₃); Well-to-Wheel (synfuels and methane)	Active	H ₂ : 3.4 kgCO ₂ e/kg; NH ₃ : 0.87 kgCO ₂ e/kg; Synfuels: 39.9 gCO ₂ e/MJ; Syn. methane: 49.3 gCO ₂ e/MJ
Tokyo Green Hydrogen Certification Scheme	Japan	Certification scheme	Green hydrogen	Voluntary; verifies corporate green hydrogen use within Tokyo region	Production + Transport + Use (local)	Planned (2024)	None specified
Aichi Low-Carbon Hydrogen Certification	Japan	Certification scheme	Low-carbon hydrogen	Voluntary; regional low-carbon hydrogen certification to support decarbonization	Production only (direct emissions)	Active	Project-specific
Clean Hydrogen Certification System	Korea	Certification scheme					

Pro-duction Tax Credit (PTC)		scheme	(electricity and methane)	tax credits for lifecycle-based clean hydro- gen production	45VH2-GREET)		1.5–2.5; Tier 3: 0.45–1.5; Tier 4: 0.45 kgCO ₂ e/kg H ₂
California Low Carbon Fuel Standard (LCFS)	United States (California)	Regulatory / Incentive scheme	Hydrogen and biofuels	Regulatory; market-based mechanism to reduce carbon intensity of transportation fuels including hydrogen	Well-to- Wheel	Active	1.3–18.1 kgCO ₂ e/kg H ₂ depending on pathway
Oregon Clean Fuels Program (CFP)	United States (Oregon)	Regulatory / Incentive scheme	Hydrogen and biofuels	Regulatory; market-based mechanism to reduce carbon intensity of transportation fuels, incl. hydrogen	Cradle-to-Wheel	Active	CI reduction: 10% by 2025; 37% by 2035
Washington Clean Fuel Standard (CFS)	United States (Washington)	Regulatory / Incentive scheme	Hydrogen and biofuels	Regulatory; market-based mechanism to reduce carbon intensity of transportation fuels, incl. hydrogen	Cradle-to-Wheel	Active	CI reduction: 20% by 2034 vs. 2017
Assessment for Low-carbon Hydrogen, Clean Hydrogen and Renewable Hydrogen Energy	People's Republic of China	Standard	Hydrogen	Voluntary; promotes high-quality development of China's hydrogen energy industry and facilitates target achievement.	Well-to-gate	Active	Low-carbon hydrogen: 14.5 ; Renewable hydrogen, clean hydrogen: 4.9 kgCO ₂ e/kgH ₂
Clean Hydrogen Investment Tax Credit	Canada	Incentive scheme / Standard	Hydrogen and Ammonia	Regulatory/incentive; provides tax credits for clean hydrogen and ammonia production.	Well-to-gate	Active	clean hydrogen: < 0.75, 0.75–2, 2.4 kgCO ₂ e/kgH ₂ ; Ammonia <4 kgCO ₂ e/kgH ₂
CertHILAC	Chile; Peru	Certification scheme	Hydrogen	Voluntary; flexible mechanism supporting national hydrogen goals in Chile and Peru	Cradle-to-gate (ISO / CertifHy based)	Under development by the InterAmerican Development Bank and Organización Latinoamericana de Energía	Undefined

<https://www.apec.org/publications/2026/01/certification-of-hydrogen-and-its-derivatives-in-apec-economies--its-role-in-driving-the-market>

(Reference) Cross-border LNG supply chains (as of 2024)

LNG trade is particularly active in the Asia-Pacific region. **Cross-border traceability** is the key for certificates



Source: International Gas Union (IGU), Global Gas Report 2025 <https://www.igu.org/igu-reports/global-gas-report-2025>

(Reference) Biogas import with certificates trial by Daigas Group

- In November 2025, the Daigas Group (Osaka Gas) signed a procurement agreement for biomethane produced by **Archaea Energy**, a member of the bp Group.
- Utilizing the “**M-RETS (Midwest Renewable Energy Tracking System)**,” which certifies environmental value in the **United States**, environmental-value-bundled city gas is supplied to the Daigas Group customers in Japan.
- The environmental attributes are equivalent to approximately 26,000 Nm³ of landfill gas.

Procurement flow diagram



Source: Osaka Gas Co. Ltd., Progress of introduction of e-methane and biomethane, 16th Public-Private Council for the Promotion of Methanation, December 15, 2026

Australia : Gas certificates approved applicable to the national GHG reporting program

- In June 2025, the Australian government announced **National Greenhouse and Energy Reporting (Measurement) Amendment (2025 Update)** for the 2025–26 reporting year, which was first legislated in 2008.
- This revision includes a new rule allowing the commercial and industrial sectors to **report natural gas consumption as no-emissions under Scope 1 by purchasing eligible gas certificates, RGGO and PGO**.

Renewable Gas Guarantee of Origin: RGGO



Source : Green Power; About the certification (YouTube)
<https://www.greenpower.gov.au/about-greenpower/renewable-gas-certification/about-certification>

Product Guarantee of Origin : PGO



OFFICIAL

Guarantee of Origin (GO) Scheme

Product Guarantee of Origin (PGO) - Hydrogen

Draft Cost Recovery Implementation Statement (CRIS)
public webinar

Monday 7 July 2025



Source: CER Product Guarantee of Origin scheme (Hydrogen products) Cost Recovery Webinar (YouTube)
<https://www.youtube.com/watch?v=pFd5wss4ZBM>

Australia: NGER legislation 2025 update – Renewable Gas Certificate (RGC) added



National Greenhouse and Energy Reporting
(Measurement) Amendment (2025 Update)
Determination 2025¹

I, Chris Bowen, Minister

Dated 6 June 2025¹

Chris Bowen¹
Minister for Climate Change

- RGGO, one of the RGCs, began operations as a voluntary scheme in 2024 following a pilot program starting in 2023.
- **When it became eligible RGC in July 2025, e-methane has been added in the scope of RGGO.**

$$Q_{RG} = RGC \times (1 - LF)$$

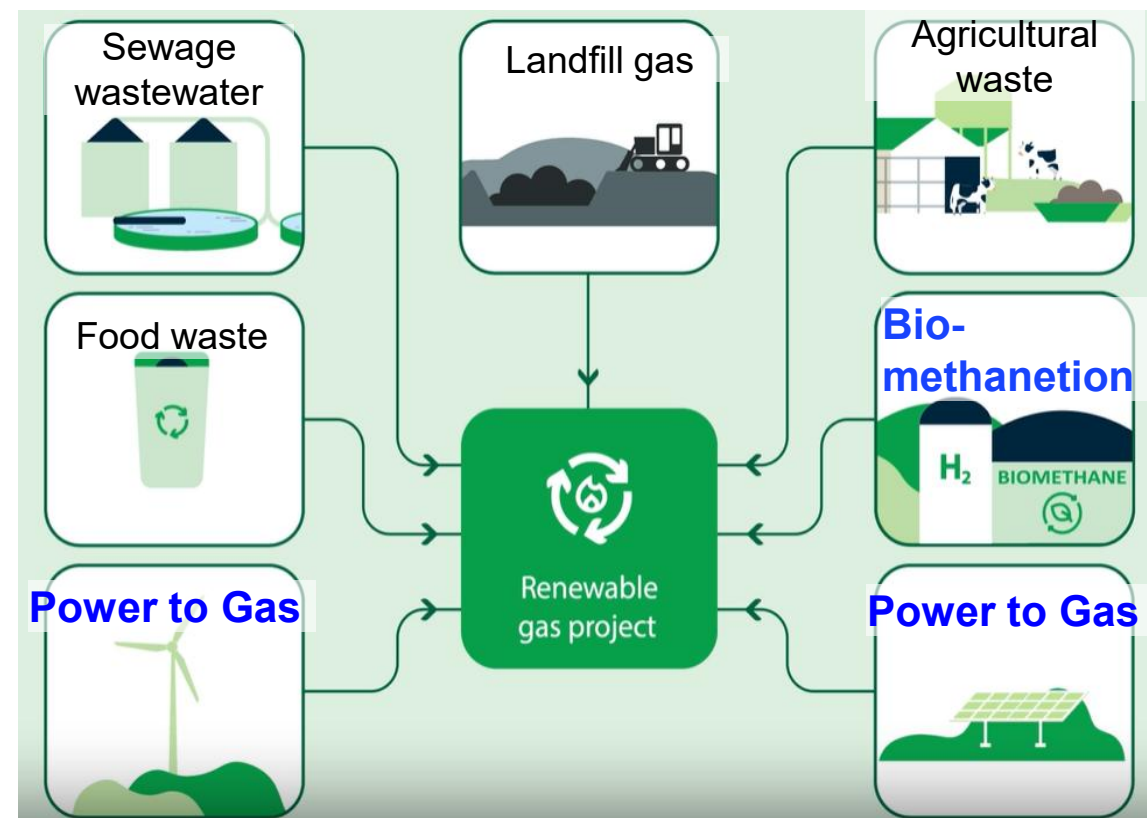
where:

RGC is an amount, in gigajoules, of a renewable gas that has been injected into the natural gas network, as represented by an amount of eligible Renewable Gas Certificates.

LF is a default loss factor equal to:

- (a) if the renewable gas is biomethane – 0.01; or
 - (b) if the renewable gas is hydrogen – 0.009.
- (3) Any blended fuel received from a natural gas network that is not determined to contain an amount of renewable gas in accordance with subsection (2) is determined to be natural gas transmitted or distributed in a pipeline.
- (4) For **RGC**, an **eligible Renewable Gas Certificate** is:
- (a) a Renewable Gas Guarantee of Origin certificate (**RGGO**) issued under the GreenPower Renewable Gas Certification scheme; or
 - (b) a PGO certificate (**PGO**) for renewable gas registered under the *Future Made in Australia (Guarantee of Origin) Act 2024*;

Eligible gases for RGGOs

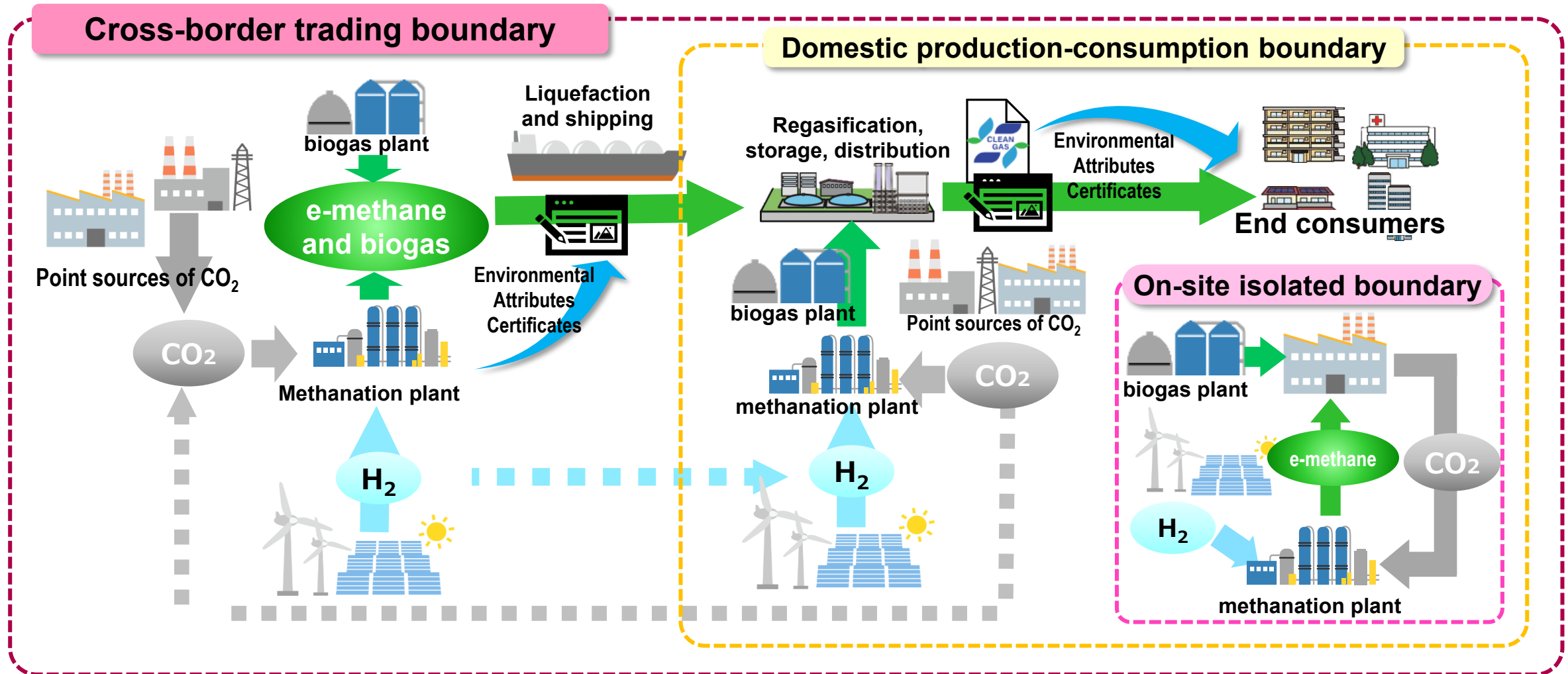


Source: Australian Government The Clean Energy Regulator; NGER legislation amendments for the 2025–26 reporting year

Source: Green Power; About the certification (YouTube)

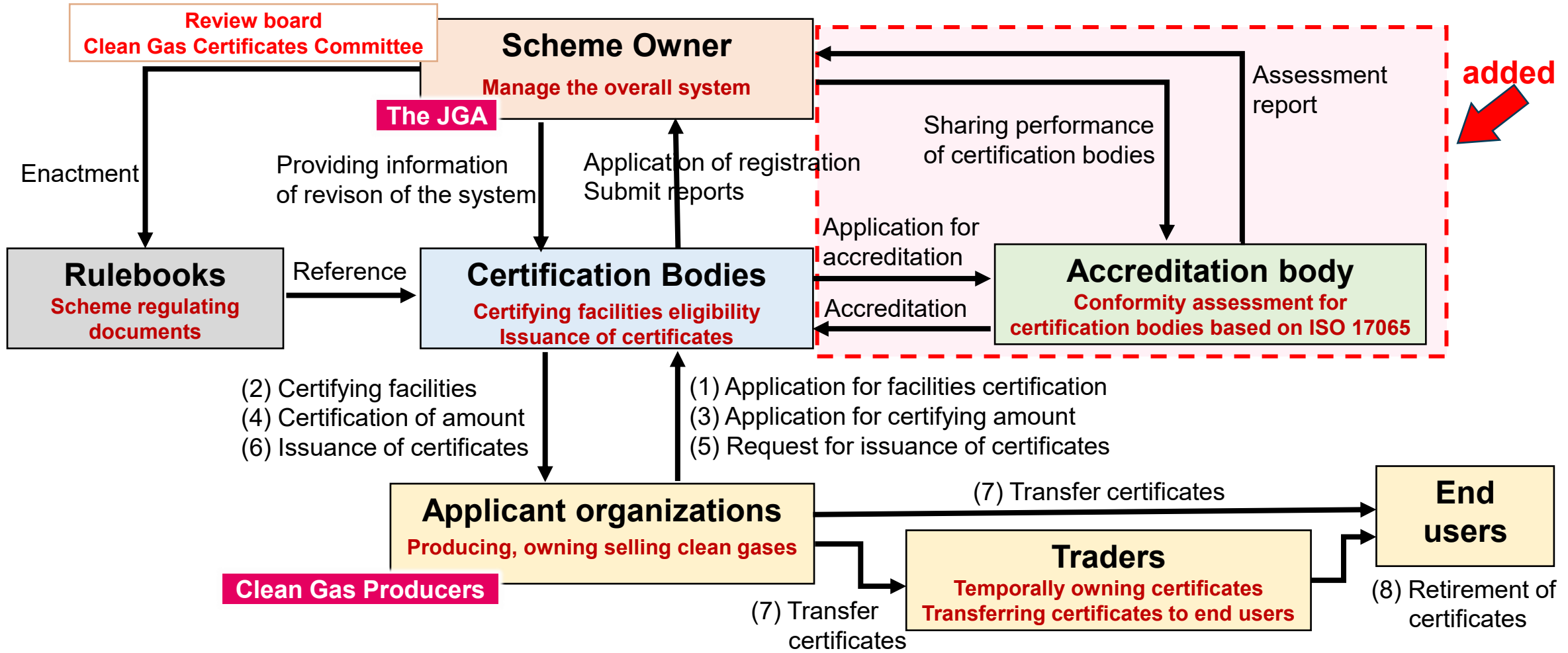
Image of e-methane and biogas with certificates for cross-border gas supply chain

- Harmonizing the internationally applicable environmental value attributes certificates for CLCH and derivatives would be effective.
- **Cross-border traceability and interoperability within various supply chain boundaries** should be well designed.



Developing a certification scheme for CLCH derivatives in accordance with ISO

- From the perspective of enhancing the objective reliability of the Clean Gas Certificate, the scheme is re-designed by adding an **ISO-based accreditation function for certification bodies**.
- Based on **ISO 17065** and **International Accreditation Forum (IAF)**, the first accredited certification body will be determined and start operations from FY 2027.



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international GHG accounting rules update process relating certificates and carbon recycling

- Major international GHG accounting rules do not have methods enough for encouraging recycled carbon fuels such as e-methane.
- **Revisions are expected in update processes of GHG Protocol collaborated by ISO, IPCC Inventory Guideline.**
- **The JGA is trying to involve in their update processes** through advocacy activities and making efforts to develop standard (e.g. carbon footprint of e-methane), and launching a Clean Gas Certificates which would serve as one of the references.



Collaboration of GHG calculation standards and guidance by 2027-2028



Aiming to add calculation methods including for CCU technology by Q4 2027

Advocacy activities (example)

More than 200 organizations submitted a joint proposal to the GHG Protocol secretariat.



The public and private sectors are collaborating for effective involvement.

Efforts for developing internationally applicable accounting rules

- Method of **calculating carbon footprint of e-methane**, which has become effective as an international standard (ex. ISO 6338-1).
- Launch of “**Clean Gas Certificate**” scheme for transferring environmental value attribute of e-methane.



Source: Ryu Komatsu (JGA), "e-methane, Challenge for Gas future !!", World Gas Conference Beijing, May 21, 2025

Example of Advocacy - Submission of an open letter to GHG Protocol secretariat

- In January 2025, the JGA partnered with a group of like-minded organizations to submit a **joint letter to the GHG Protocol**. The letter, **which was signed by a total of 210 organizations**,
- This called for **the inclusion of renewable gas certificates in the rules for calculating emissions inventories under Scope 1** - while electricity certificates are already permitted under Scope 2.

GHG Protocol Should Fully Recognise Robust Market Instruments in End-Users' Scope 1 Emissions Inventories

A global call to support decarbonisation of corporates and industries

(omitted)

10/02/2025

We urgently call on the GHG Protocol to:

- 1) Adopt a market-based approach for renewable gases in Scope 1 inventory, for both fuel and feedstock applications. This approach could be part of the dual-reporting structure which includes both the location-based and market-based approach.
- 2) Issue an interim statement¹ in the first half of 2025 confirming that robust market instruments will be recognized in GHG inventories, offering clarity and confidence for stakeholders as final standards are being developed.

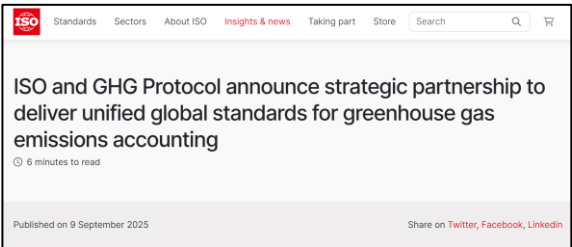
Renewable gases and their derivatives² are necessary to decarbonise the industry, transport and building sectors. Many of the decarbonisation strategies across the globe rely on their urgent deployment. A prerequisite for this deployment is the use of a market-based approach as it uniquely overcomes economic, technical and environmental barriers and inefficiencies that arise from the requirement for a physical (local) connection. Robust market instruments enable the supply of decarbonised products to a much wider pool of consumers that cannot have local access to such products.



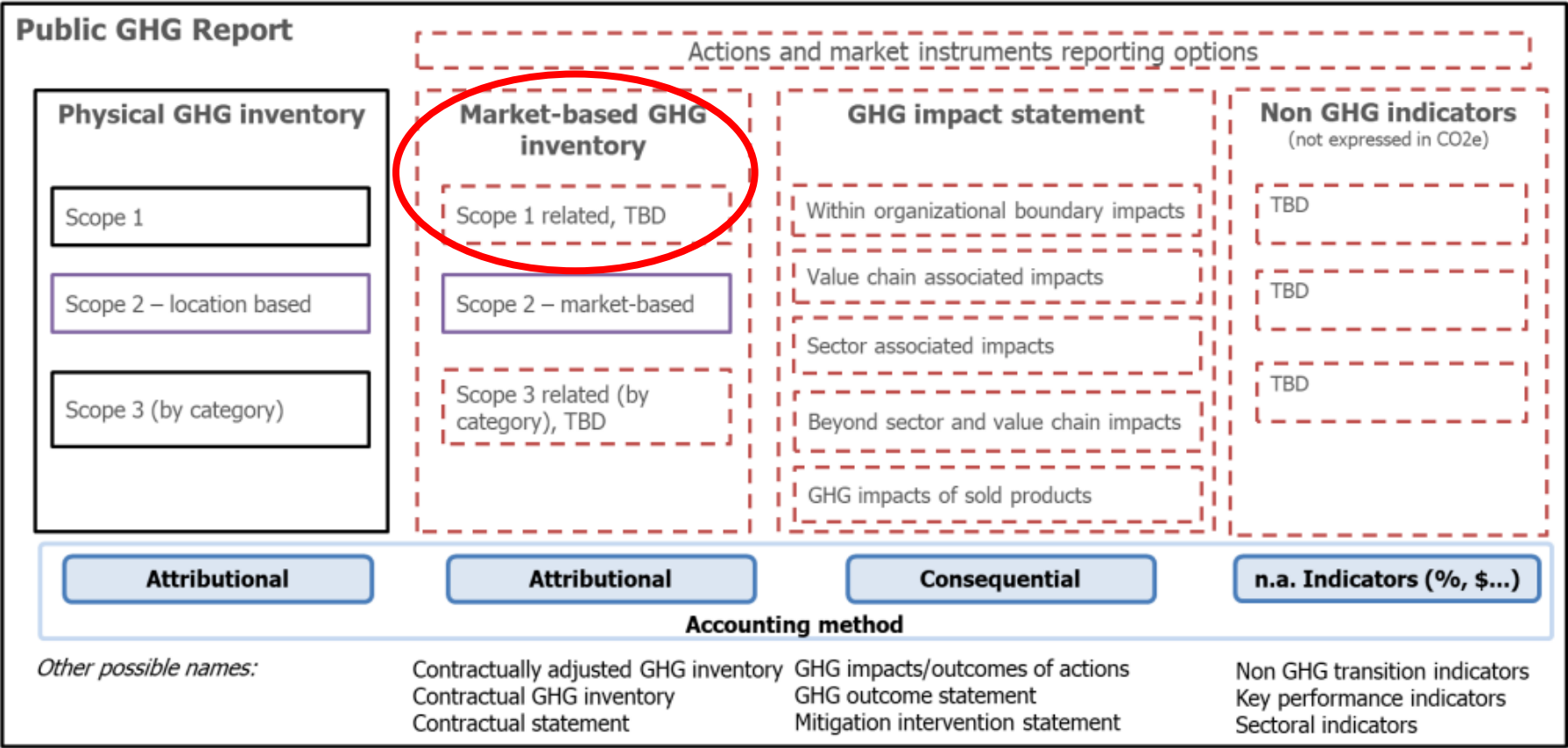
Let Green Gas Count: GHG Protocol Should Fully Recognise Robust Market Instruments in End-Users' Scope 1 Emissions Inventories – Eurogas

Certiactes for Scope 1 inventory is under discussion in GHG Protocol and ISO

- In September 2025, the GHG Protocol and ISO announced their collaboration to integrate GHG accounting standards and guidance. They are **expected to be published in 2027–2028**.
- **Certificates for fuels** - such as biofuels and hydrogen derivatives like e-methane would be included **as a market-based GHG inventory report by attributional methods** - which are currently under discussion in the calculation of **Scope 1's market-based inventory accounting**.



Source: Websites of ISO and GHG Protocol
September 9, 2025



Source: Greenhouse Gas Protocol Actions and Market Instruments Phase 1 Progress Update White Paper Version 3
- Request for Information, March 2026

The IPCC's guidelines update – expect new inclusion carbon capture and utilisation (CCU)

- At the IPCC at its 63rd Session (October 2025), it was decided to prepare a Methodology Report including Carbon Dioxide Removal Technologies, **Carbon Capture, Utilization**, and Storage for National Greenhouse Gas Inventories.
- A new chapter of CCU fuels is expected to be added properly by Q4 2027.

Volumes overview



Volume 1: General Guidance and Reporting

Volume 2: Energy

Volume 3: Industrial Processes and Product Use

Volume 4: Agriculture, Forestry and Other Land Use

Volume 5: Waste



New volume to be added

Volume 6: Carbon Dioxide Capture, Removal, Transport, Utilization and Storage

Key Tasks and Schedule

2026 Q1-2 Author Selection & 1st Lead Author Meeting (LAM)
Q3-4 Science Meeting 2nd LAM, Expert Review

2027 Q1-2 3rd LAM

Mid Government & Expert Review

Q3-4 4th LAM, Adoption, Publication

Source: IPCC Task Force on National Greenhouse Gas Inventories Website <https://www.ipcc-nggip.iges.or.jp/index.html>

Conclusions – for boosting the demand for CLCH and its derivatives in the APEC

1. Japan's gas industry is working towards providing carbon-neutral city gas, which is much needed especially in the **industrial and commercial sectors to reduce Scope 1 emissions**.
2. E-methane, one of the CLCH derivatives, is a good example of **a drop-in solution that allows the existing gas supply chain infrastructure and equipment** to be used as-is.
3. **Some economies in the APEC already have certification schemes for e-methane and biogas**, with certificates traded domestically. The cases of Japan and Australia are introduced.
4. **Leveraging the growing LNG supply chains in the APEC region** would provide an effective means of **transferring the environmental value of CLCH across borders using certificates**.
5. Given the latest discussions regarding **international GHG accounting rules such as the GHG Protocol, ISO, and IPCC**, establishing a system that **ensures the interoperability of these certificates among APEC economies** would boost the demand for CLCH within the APEC.

Thank you very much.

e-metane

