No.353/69/2024-NT
Government of India
Ministry of New and Renewable Energy
(Hydrogen Division)

Atal Akshay Urja Bhawan
Opp. CGO Complex, Lodhi Road
New Delhi-110003
Date: 25th February 2026

Subject: Request for stakeholders Comments on Draft Guidelines to Establish the Mandatory Framework for Quantifying Greenhouse Gas (GHG) Emissions from Offsite Water Drawl and Treatment, Ensuring Compliance with the Green Hydrogen Certification Scheme of India (GHCI) and Achieving Alignment with ISO 19870:2023.

The undersigned is directed to state that, in order to assess compliance with Green Hydrogen Standard for India, the Ministry of New and Renewable Energy (MNRE) has published the Green Hydrogen Certification Scheme of India (GHCI) in April 2025. The objective of GHCI is to specify a detailed methodology for the measurement, reporting, onsite verification, and certification of Green Hydrogen.

2. Para no. 7.4 of GHCI states that "The emission from onsite water treatment of raw water (such as ground water, river, sea water etc), shall be counted. For the water treatment plant out of the control of the project developer, default value of the emission factor for water supply may be prescribed. The GHG emission related to drawal of water from the natural source shall not be counted. **MNRE shall issue separate detailed guidelines for emission calculation from offsite water treatment.**"

3. The draft guidelines for emission calculation from offsite water drawl and treatment are attached as annexure-I. **It is kindly requested to provide your comments by 13th March 2026 at the email address:** abhilash.rajwanshi@gov.in

4. This issues with the approval of competent authority.

(Prasad A Chaphekar)
Director
Email: prasad.chaphekar@gov.in

To,
(i) All Green Hydrogen Producers
(ii) All Industry Associations in the field of Renewable Energy

Copy to,
(i) Principal Secy (Energy) of States
(ii) Chairman DPA, VOCPA, PPA
(iii) NIC, MNRE

Annexure-I

Guidelines to stablish the mandatory framework for quantifying greenhouse gas (GHG) emissions from offsite water drawal and treatment, ensuring compliance with the Green Hydrogen Certification Scheme of India (GHCI) and achieving alignment with ISO 19870:2023

Guidelines for Offsite Water Supply Emissions

1. Scope and General Principles

1.1. These guidelines govern the calculation of emissions for water processed outside the plant boundary.

1.2. In line with GHCI Section 7.4, the physical drawal of water from natural sources is not counted.

1.3. However, emissions from offsite treatment of raw water must be included in the total GHG intensity.

1.4. The objective is to maintain a "Well-to-Gate" boundary encompassing all stages up to hydrogen compression and onsite storage.

2. Scenario A: Captive Offsite Treatment (Self-Operated)

2.1. **Description**: This scenario applies when the Green Hydrogen producer owns and operates a dedicated water treatment or desalination facility located outside the primary hydrogen plant boundary.

2.2. **Methodology**: Emissions must be calculated based on primary data using the logic of GHCI Equations 12 and 13.

2.3. **Energy Inputs**: The producer shall record metered electricity consumption for all stages, including pre-treatment, membrane processes (e.g., Reverse Osmosis), and high-pressure pumping.

2.4. **Grid Electricity**: If the facility uses grid electricity, the CEA Grid Emission Factor and state-specific T&D losses must be applied as per Equation 4.

2.5. **Material Inputs**: Emissions from chemicals used for conditioning (e.g., antiscalants, catalysts, acids) must be included using Equation 8.

2.6. **Renewable Energy Integration**: If the captive plant is powered by a dedicated RE line or a PPA-backed source, the producer must provide load dispatch certificates to claim zero electricity emissions.

2.7. **Monitoring Plan**: The producer must maintain a monitoring plan (MRV) specifically for the offsite water facility, including calibration certificates for all monitoring instruments.

2.8. **Illustration**: For a plant with a captive desalination unit 5km away, the producer must account for the specific energy used at the desalination site plus the pumping energy required to transport the water to the hydrogen facility gate.

3. Scenario B: State Agency or Municipal Supply

3.1. **Description**: This applies to water sourced from state-owned utilities (e.g., Jal Board) where the producer has no direct control over the treatment process or the energy mix.

3.2. **Methodology**: In accordance with GHCI Section 7.4, a default emission factor for water supply may be prescribed.

3.3. **Standard Benchmark**: Producers shall apply the **Municipal Water Supply Benchmark** defined in Schedule 1.

3.4. **Documentation**: The primary documentation required is the water utility bill or an official allotment letter stating the monthly volume consumed in cubic meters (m^3).

3.5. **Exemption Path**: If the state agency officially certifies that a specific supply line is powered by 100% renewable energy, the producer may apply for a lower emission factor upon submitting verified evidence to the Technical Committee.

4. Scenario C: Jointly Owned or Common Infrastructure

4.1. **Description**: This covers "Industrial Clusters" where a Special Purpose Vehicle (SPV) or a third-party operator runs a common desalination or purification plant for multiple users.

4.2. **Allocation**: Emissions are allocated using a volume-based approach where the hydrogen producer's share is proportional to their water offtake.

4.3. **Formula**: The emissions attributable to the Green Hydrogen production unit shall be determined as per the following formula:

$$E_{water,H2} = \left(\frac{Q_{H2}}{Q_{Total}}\right) \times E_{Common}$$

Where:

- $E_{water,H2}$= GHG emissions attributable to water treatment for the Green Hydrogen production unit during the reporting period (tCO_2e);
- Q_{H2}= Quantity of treated water consumed for Green Hydrogen production during the reporting period (in m^3);
- Q_{Total}= Total quantity of water processed by the common water treatment facility during the reporting period (in m^3);
- E_{Common}= Total GHG emissions associated with the operation of the common water treatment facility during the reporting period (tCO_2e).

4.4. **Default Option**: If the common plant operator does not disclose primary energy data, the producer shall use the **Common Desalination Benchmark** provided in Schedule 1.

4.5. **Waste Heat Integration**: If the common plant utilizes waste heat, no emissions are attributed if the heat is truly "waste" and does not require extra fuel combustion.

4.6. **Illustration**: In a port-based hub, if a common RO plant serves multiple firms, a Green Hydrogen plant consuming 10% of the output is responsible for 10% of that plant's verified emissions.

5. Scenario D: Tertiary Effluent / Recycled Water

5.1. **Description**: This involves using treated municipal wastewater which requires additional "polishing" (Ultra-filtration/RO) for electrolysis quality.

5.2. **Methodology**: The GHG calculation covers only the **incremental treatment** performed to upgrade the water from standard secondary effluent to electrolysis-grade.

5.3. **System Boundary**: Energy used by the municipality for initial sewage treatment is outside the hydrogen production boundary.

5.4. **Calculation**: Only the "polishing" energy (per Scenario A) or the **Recycled Water Benchmark** (Schedule 1) is applied.

5.5. **Illustration**: A producer taking secondary treated water and installing an onsite polishing unit captures those emissions under the onsite system boundary.

6. Scenario E: Hybrid Supply Chains

6.1. **Description**: Situations where a producer uses a mix of sources (e.g., municipal supply and captive desalination).

6.2. **Methodology**: The producer must maintain disaggregated daily records of consumption from each source.

6.3. **Weighted Average**: A weighted average emission factor for water shall be calculated for the evaluation cycle.

The weighted average emission factor for water shall be calculated as follows:

$$EF_{water,avg} = \frac{\sum(Q_i \times EF_i)}{\sum Q_i}$$

Where:

- $EF_{water,avg}$= Weighted average emission factor for water for the evaluation cycle ($kgCO_2e/m^3$);
- Q_i= Quantity of water sourced during the evaluation cycle (m^3);
- EF_i= Emission factor associated with water source ($kgCO_2e/m^3$).

6.4. **Verification**: The ACV agency shall verify the source-wise meters and the corresponding calculations during the annual audit.

Schedule 1: Calculation of Benchmarks

S1.1. Grid Emission Factor (GEF)

S1.1.1. Latest CEA published Average Grid Emission Factor. **Current Value: 0.710~$kgCO_2eq/kWh$** [1].

S1.1.2. **T&D Loss Factor**: A standard adjustment will be applied for offsite power drawl based on Latest CEA data. **Current Value is 17.63%** [2].

Sources:

[1] https://cea.nic.in/wp content/uploads/baseline/2025/12/User_Guide_V_21.0.pdf

[2] https://cea.nic.in/wp-content/uploads/pdm/2025/11/Growth_Book_2025.pdf

S1.2. Municipal Water Supply Benchmark

S1.2.1. **Input**: 0.7~kWh/m^3 (standard pumping and surface treatment energy) [3].

S1.2.2. **Calculation**: The emission factor shall be calculated as follows:

$$EF_{water,default} = SEC_{water} \times \left(\frac{GEF}{1 - TDL}\right)$$

For the applicable evaluation cycle:

$$0.7 \times (0.710/(1 - 0.1763)) = 0.603 \text{kgCO}_2\text{e/m3}$$

Where:

- $EF_{water,default}$= Default emission factor for surface water treatment ($kgCO_2e/m^3$);
- SEC_{water}= Specific energy consumption for pumping and treatment (0.7 kWh/m^3);
- GEF= Applicable grid emission factor ($kgCO_2e/kWh$);
- TDL= Transmission and distribution loss factor (expressed as a fraction).

S1.3. Common Desalination (SWRO) Benchmark

S1.3.1. **Input**: 3.5~kWh/m"3 (Standard energy intensity for Sea Water Reverse Osmosis) [4].

S1.3.2. **Calculation**: The emission factor shall be calculated as follows:

$$EF_{water,desal} = SEC_{desal} \times \left(\frac{GEF}{1 - TDL}\right)$$

For the applicable evaluation cycle:

$$3.5\times (0.710 / (1–0.1763)) =3.017 \text{ kgCO2e/m3}$$

Where:

- $EF_{water,desal}$= Default emission factor for desalination or advanced treatment ($kgCO_2e/m^3$);
- SEC_{desal}= Specific energy consumption for desalination / advanced treatment (3.5 kWh/m^3);
- GEF= Applicable grid emission factor ($kgCO_2e/kWh$);
- TDL= Transmission and distribution loss factor (expressed as a fraction).

Sources:

[3] https://www.mdpi.com/1996-1073/18/5/1086

[4] https://www.mdpi.com/1996-1073/18/5/1086

S1.4. Recycled Water (Polishing) Benchmark

S1.4.1. **Input**: 0.45~kWh/m^3 (Incremental energy for tertiary polishing) [5].

S1.4.2. **Calculation**: The emission factor shall be calculated as follows:

$$EF_{water,recycled} = SEC_{recycled} \times \left(\frac{GEF}{1 - TDL}\right)$$

For the applicable evaluation cycle:

$$00.45 \times (0.710/(1 - 0.1763)) = 0.388\text{kgCO}_2\text{e/m3}$$

Where:

- $EF_{water,recycled}$= Default emission factor for recycled / treated wastewater ($kgCO_2e/m^3$);
- $SEC_{recycled}$= Specific energy consumption for recycled water treatment and pumping (0.45 kWh/m^3);
- GEF= Applicable grid emission factor ($kgCO_2e/kWh$);
- TDL= Transmission and distribution loss factor (expressed as a fraction).

S1.5. Compliance and Data Failures

S1.5.1. In the event of documented technical failure of water meters, the Technical Committee may allow the use of the highest applicable benchmark for the period of failure to ensure conservative reporting.

Sources:

[5] https://www.sciencedirect.com/science/article/pii/S0048969724074308