



**GLOBAL STAKEHOLDER CONSULTATION FORM FOR
PROPOSED NEW BASELINE AND MONITORING
METHODOLOGY OR METHODOLOGICAL TOOL
(version 01.0)**

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<i>Reference number of proposed new methodology or methodological tool</i>	A6.4-PMM011
<i>Based on an assessment of information in the A6.4-FORM-METH-002 and its application in sections A to C of the submitted draft project design document (A6.4-FORM-AC-020), provide your comments to the proposed new methodology using the tabular format below. Please indicate the sections or issues to which your comments refer to.</i>	
<i>Date received by the secretariat</i>	

#	Section / Para no./ Annex / Figure / Table	Type of comment ge = general te = technical ed = editorial	Comment (including justification for change)	Proposed change (including proposed text)
1	Section 3	ed	The use of the term “grid electricity” throughout the methodology can give rise to different interpretations, since renewable electricity supplied through contractual arrangements like PPAs is also typically delivered via the grid.	(Proposed additions to current text in bold) 4. In addition to the definitions contained in the ‘Article 6.4 mechanism Glossary of Terms’, the following definitions apply for the purpose of this methodology: ... (e.1) Grid electricity: electricity input to the hydrogen production system that is supplied from the national or regional grid without a contractual arrangement demonstrating its renewable origin, such as power purchase agreements (PPAs), renewable energy certificates, or equivalent instruments recognized by the host Party. ...

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2	Section 8, Paragraph 13, Table 2	te	For the proposed methodology to be applicable to solid oxide electrolysis (SOEC), heat generated outside the project boundary and imported for consumption by the electrolyser should be included in the activity boundary as an emission source. <i>Justification for change:</i> Unlike alkaline, proton exchange membrane (PEM) and anion exchange membrane (AEM) technologies, which operate at low temperatures and use electricity to split liquid water, SOEC operates at 600-850°C to electrolyse water in the form of steam. At such high temperatures, thermal energy can replace a portion of the electrical energy required for water splitting in an SOEC system.¹ This heat can be generated internally in the electrolyser or supplied from external sources as superheated steam, for example from: - Electricity (e.g., electric boilers converting electricity into steam); - Dedicated heat sources (e.g., renewable heat, biomass boilers); and - Imported heat (e.g., from industrial processes). Crucially, the methodology should distinguish between waste heat generated as an unavoidable by-product with no alternative uses; and heat that is diverted from another use or generated specifically to supply the electrolyser system. These cases require different treatment of emissions allocation and opportunity costs. Where diversion causes replacement heat or steam generation elsewhere, the methodology should account for leakage emissions in accordance with the latest version of Draft Standard A6.4-MEP005-A02 ("Addressing leakage in mechanism").	(Proposed additions to current text in bold) Activity: Source – Imported heat consumption for electrolysis GHG – CO₂, CH₄, N₂O. Justification/Explanation – Relevant combustion emissions and upstream fuel supply emissions (where applicable) shall be included. Leakage: Source – Diversion of imported heat from alternative end-uses. GHG – CO₂, CH₄, N₂O. Justification/Explanation – Emissions if heat that would otherwise have been supplied to another user is diverted to the project, and the displaced user generates replacement steam or heat.

¹ Thermal energy represents a significant share of an SOEC system's total energy demand. One report estimates that an SOEC system importing steam from an external industrial source is at least 14% more efficient than comparable alkaline, PEM, or AEM systems. See Clean Air Task Force (2023), "Solid Oxide Electrolysis: A Technology Status Assessment".

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3	Section 11, Part 11.1, Paragraph 74	te	See comments on Row 1.	(Proposed additions to current text in bold) - Activity emissions sources include: - Indirect emissions resulting from grid electricity consumption for electrolyzers, compressors, and auxiliary equipment; Indirect emissions resulting from imported heat consumption for electrolyzers; ... - Data sources and assumptions ... - Other data sources include: - Plant-level monitoring systems (SCADA, IoT sensors, smart meters, and leak detection sensors); - Process control system records for direct and indirect emissions; - Electricity consumption records and renewable power purchase agreements; Supplier records identifying the source, production process, fuel and electricity consumption, supply quantity, and applicable emissions factors for imported heat; Documentation that the imported heat would otherwise have been dissipated unused (e.g., sent to cooling towers) and does not therefore cause additional fossil fuel consumption or other material emissions.

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3	Section 11, Part 11.1, Paragraph 74 (CONTINUED)	te	See comments on Row 1.	(Proposed additions to current text in bold) Step 1: Define system boundary for activity emissions Activity emissions are calculated for the following project components: • Hydrogen production (electrolysis or equivalent zero/low-carbon pathway); • Water treatment, desalination and pumping; • Grid electricity consumption ($\leq 10\%$ of supply); • Imported heat consumption; • Backup or auxiliary fossil fuel use (e.g., diesel for start-up, compressors); • Cooling and balance-of-plant energy use (if significant); • Fugitive hydrogen leaks during production, compression, storage, and distribution.

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3	Section 11, Part 11.1, Paragraph 74 (CONTINUED)	te	See comments on Row 1.	Step 3a: Calculate emissions from imported heat consumption (if applicable) $AE_{y,Heat} = \sum i(HC_{i,y} * EF_i)$ Where: $AE_{y,Heat}$ = Emissions from imported heat use in year y (tCO₂e). $HC_{i,y}$ = Quantity of imported heat from source i consumed (GJ). EF_i = Emission factor of imported heat from source i (tCO₂e/GJ) Note: Include emissions associated with heat production and delivery. Attribute zero emissions to heat production if heat is generated as an unavoidable by-product of another process and has no alternative use. ... Step 6: Calculate total activity emissions $AE_y = AE_{y,Elec} + AE_{y,Heat} + AE_{y,Fossil} + AE_{y,Water} + AE_{y,Leak}$...

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4	Section 12, Part 12.1, Paragraph 76	te	See comments on Row 1.	(Proposed additions to current text in bold) Step 1.2a Diversion of imported heat Leakage may result from diversion of heat from other users. If the electrolyser system uses heat that was previously supplied to other users, those users may be forced to rely on higher-emission heat sources or fossil-based alternatives. The methodology includes procedures to: Identify whether imported heat would otherwise have been dissipated unused or is diverted from existing uses; Quantify associated emissions using emission factors where diversion occurs.
5	Section 12, Part 12.3, Paragraph 8	te	See comments on Row 1.	(Proposed additions to current text in bold) Leakage emissions that cannot be avoided or minimized shall be deducted from the emission reductions claimed. Total leakage emissions in year y are calculated as: $LE_Y = LE_Y^{Elec} + LE_Y^{Heat} + LE_Y^{H_2} + LE_Y^{Water} + LE_Y^{Supply} + LE_Y^{Equip} + LE_Y^{Env} + LE_Y^{Market}$ Where: LE_Y^{Elec} = Leakage from diversion of renewable electricity (tCO₂e) LE_Y^{Heat} = Leakage from diversion of imported heat (tCO₂e) $LE_Y^{H_2}$ = Leakage from hydrogen transport and distribution losses (tCO₂e) ...

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5	Section 12, Part 12.3, Paragraph 8 (CONTINUED)	te	See comments on Row 1.	(Proposed additions to current text in bold) Detailed calculation methods: ... 2a. Leakage from diversion of imported heat (E_V^{Heat}) $LE_V^{\text{Heat}} = HC_V^{\text{diverted}} * EF_{\text{marginal}}$ Where: • HC_V^{diverted}: Imported heat consumption diverted from other users (GJ/year) • EF_{marginal}: Marginal emission factor representing replacement heat generation (tCO₂e/GJ) ...

(Please add rows as required)

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	23 May 2025	Initial publication of form template.
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