SIMPLIFIED SUMMARY OF THE NEW BASELINE AND MONITORING METHODOLOGY OR METHODOLOGICAL TOOL FORM (Version 01.0)

BASIC INFORMATION OF THE NEW BASELINE AND MONITORING METHODOLOGY OR METHODOLOGICAL TOOL	
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Type of standard	New baseline and monitoring methodology
Unique reference number	A6.4-PNM001
Title of the new baseline and monitoring methodology or new methodological tool	Production of Ammonia through electrolysis of water, air separation and synthesis of hydrogen and nitrogen
Date of completion of the initial assessment	20/05/2024
SUMMARY OF THE NEW BASELINE AND MONITORING METHODOLOGY	
Scope of the methodology	**4. Manufacturing industries** Ammonia production as an industrial process requiring substantial energy input This methodology is globally applicable to project activities that produce ammonia, that is less carbon-intensive than conventional ammonia production, primarily with renewable electricity (RE) for: • Production of hydrogen (H_2) using electrolysers to separate water into H_2 and O_2; • Production of nitrogen (N) through Air Separation Plants or other facilities that use renewable energy only; • Synthesis of hydrogen and nitrogen to produce ammonia (Haber Bosch Process).
Key applicability conditions	1. Production of green ammonia using renewable energy to power the associated processes, including the electrolyser, air separation unit, synthesis of hydrogen and nitrogen via the Haber-Bosch process, and other related utilities. 2. This methodology applies to project activities that encompass the following scenarios: i. All subprocesses involved in green ammonia production are greenfield, or ii. The electrolyser plant is greenfield, while other subprocesses are existing or retrofitted. 3. In the case of a brownfield or retrofitted project activity, where the electrolyser plant is greenfield and all subprocesses are existing or retrofitted, the output(s) or level(s) of service must remain identical to those in the pre-PACM project condition. 4. This methodology is limited to the production and storage of ammonia within the manufacturing facilities.

	5. The electricity consumed by the ammonia production plant must be primarily sourced from greenfield renewable power plants or renewable electricity supplied via the grid, with grid electricity allowed only as a supplementary source. 6. The use of grid electricity in ammonia production and any of its subprocesses shall not exceed 10% of the total electricity consumption on an annual basis. 7. The Renewable energy generation, its storage, and use may or may not be co-located. 8. Project activities may consist of modular green ammonia production equipment, in the vicinity where ammonia will be used or supplement the ammonia production in existing manufacturing facilities. 9. In cases where green ammonia production supplements an existing facility, the project must ensure clear separation and robust monitoring/metering to distinguish green ammonia from conventional output. 10. The project shall limit the use of locally available water (whether surface or groundwater) for electrolysis to no more than 5%, ensuring minimal impact on water needed for drinking, agriculture, or livelihoods. 11. If the project activity involves installing a greenfield electrolyser within an existing ammonia production facility, the existing equipment used for hydrogen production must be decommissioned, destroyed, or properly disposed of. Failure to do so will require that emissions associated with its continued use be fully accounted for.
Baseline approach	The baseline scenario is the conservative among the following three: i. Best Available Technology (BAT); ii. Ambitious benchmark; and iii. Existing actual or historical emissions corrected for downward adjustment. However, the baseline can be chosen from either one or two of the approaches, in cases when data and information is available for conducting these approaches. All the subprocesses to produce ammonia are to be powered mainly by renewable electricity sourced from the greenfield renewable power plant. The RE supply, use of fossil fuels, and leakages arising out of diversion of RE or water, all parameters and information that is related to baseline and project scenario are comprehensively addressed within the Monitoring framework and are thoroughly accounted for in the subsequent sections on Methodology, Recording and Verification. Life cycle emissions are considered both in baseline and activity emissions Downward adjustment in the calendar year of the start date of the first crediting period (for approaches based on 36(iii)): not available. Downward adjustment in subsequent years: based on annual decrease to reach the net zero target.
Demonstration of additionality	The demonstration of additionality contains the following steps detailed in the methodology: STEP 1. Demonstration of prior consideration STEP 2. Regulatory Analysis STEP 3. Avoidance of locking-in the level of emissions **OPTION 1: FINANCIAL ADDITIONALITY AND COMMON PRACTICE ANALYSIS**

	STEP 4. Financial additionality Sub-step 4.1. Investment Analysis Sub-step 4.2. Barrier Analysis STEP 5. Common practice analysis **OPTION 2: PERFORMANCE-BASED APPROACH** STEP 4. Performance-based approach
Calculation of emission reductions or net GHG removals	Activity emissions refer to the total direct and indirect greenhouse gas (GHG) emissions resulting from the implementation of the Green Ammonia production project. These emissions must be compared with baseline emissions to determine the net mitigation impact. Activity emissions sources include: • Direct onsite emissions from hydrogen and ammonia during ammonia production, including physical leaks of both gases; • Indirect emissions resulting from electricity consumption during the ammonia production process.
Monitored parameters	BAT Best Available Technology $Performance\ Based\ Approach$ AF Downward Adjustment Factor $F_{consume}$ Fuel consumed by the project activity P_{NH3} Quantity of Green Ammonia produced in PACM project activity in year y H_{req} Total hydrogen production PL_{NH3} Physical leaks of ammonia in ammonia value chain as a percentage of the total production PL_{H2} Physical leaks of Hydrogen in hydrogen value chain as a percentage of the total production $Q_{g,y}$ Quantity of GHGs released
SUMMARY OF THE NEW METHODOLOGICAL TOOL	
Scope of the methodological tool	>>
Key applicability conditions	>>
Calculation of baseline emissions/removals, project emissions/removals or leakage	>>
Monitored parameters	>>

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Document information

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01.0	18 December 2024	Initial publication of form template.

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