

Additional Information

JCM_MD_F_PM_ADD1 | Host country: Republic of Moldova

Methodology: Electricity generation and avoidance of methane emissions through capture and utilization of landfill gas (LFG), ver. 01.0

Related document: JCM Proposed Methodology Form (JCM_MD_F_PM), Section F (Establishment and calculation of reference emissions).

This document provides the underlying figures and the detailed derivation of the discount factors used to set the reference emissions in the proposed methodology. The numerical basis is made explicit so that the link between the Republic of Moldova's NDC 3.0 (Section 1) and the conservative discount factors applied in the methodology (Section 2) is transparent and reproducible for validation.

1. Updated Nationally Determined Contribution (NDC 3.0) of the Republic of Moldova

The Republic of Moldova submitted its updated Nationally Determined Contribution (NDC 3.0) to the UNFCCC in 2025 (April/May 2025). The indicators relevant to the reference-emission setting of this methodology are summarised below. These figures are used in Section 2 to construct the project-specific reference scenario and to derive the conservative discount factors for the methane component and the electricity component.

Indicator	Value (per NDC 3.0)
Long-term target	Net zero (climate neutrality) by 2050 (Law on Climate Actions, 2024)
Economy-wide GHG reduction by 2030 (vs. 1990)	71% (unconditional) / 73% (conditional)
Economy-wide GHG reduction by 2035 (vs. 1990)	75% (unconditional) / 78% (conditional)
Anticipated CH ₄ reduction by 2030 (vs. 1990)	at least 64%
Anticipated CH ₄ reduction by 2035 (vs. 1990)	at least 68%
CH ₄ emissions – 1990 base year	6.0 MtCO ₂ e
CH ₄ emissions – 2020 (≈ 40% of 1990 level)	2.42 MtCO ₂ e
CO ₂ emissions – 1990 base year	43.81 MtCO ₂
CO ₂ emissions – 2020 (≈ 30% of 1990 level)	13.37 MtCO ₂

Sources: Republic of Moldova, *Nationally Determined Contribution 3.0* (submitted to the UNFCCC, 2025); Law on Climate Actions (2024). 1990 base-year and 2020 emission levels per the project PIN materials approved at the PIN stage.

Because reference emissions under the JCM must be set below business-as-usual (BaU) emissions and in a manner that contributes to the achievement of the host country's latest NDC, the figures above are used to derive conservative discount factors for the methane component and the electricity component, as set out below.

2. Derivation of the conservative discount factors

Reference emissions are calculated separately for the methane component ($RE_{CH_4,p}$) and the electricity component ($RE_{elec,p}$). For each component, a conservative discount factor is derived

directly from the NDC 3.0 indicators in Section 1. The common principle is the same: starting from the most recent observed emission level (the 2020 level), a *linear* emission-reduction trajectory toward net zero in 2050 is assumed. The share of the project's mitigation outcome that the host country is expected to deliver autonomously along this NDC-consistent trajectory in each decade is reserved as the country's non-creditable NDC contribution, and the remainder is treated as creditable under the JCM.

2.1 Methane component — discount factor $DF_{CH_4} = 0.87$

Step 1 – Starting point. As shown in Section 1, Moldova's CH_4 emissions in 2020 were 2.42 MtCO_{2e}, i.e. approximately 40% of the 1990 base-year level (6.0 MtCO_{2e}).

Step 2 – Trajectory to net zero. Under NDC 3.0, Moldova is committed to net zero by 2050. Assuming a linear reduction from the 2020 level (40% of 1990) to zero in 2050 — a 30-year, three-decade path — the country is expected to reduce CH_4 emissions by approximately $40\% \div 3 \approx 13$ percentage points of the 1990 base in each decade. Equivalently, in each decade roughly 13% of the prevailing methane mitigation is delivered autonomously along the NDC-consistent pathway.

Step 3 – Conservativeness check against NDC targets. This assumed 13%-per-decade autonomous reduction is well below the methane-specific NDC 3.0 targets of at least 64% by 2030 and 68% by 2035 (vs. 1990). Reserving only 13% to the host country is therefore conservative relative to what the NDC ultimately targets, ensuring reference emissions remain below BaU while still contributing to the NDC.

Conclusion. Accordingly, 13% of the creditable methane mitigation outcome — calculated from monitored methane in captured LFG — is treated as a non-creditable contribution to Moldova's NDC, and the remaining 87% is treated as creditable under the JCM. Hence $DF_{CH_4} = 1 - 0.13 = 0.87$.

2.2 Electricity component — discount factor = 0.90

Step 1 – Starting point. Moldova's CO_2 emissions in 2020 were 13.37 MtCO₂, i.e. approximately 30% of the 1990 base-year level (43.81 MtCO₂).

Step 2 – Trajectory to net zero. Assuming a linear reduction from the 2020 level (30% of 1990) to zero in 2050 — again a three-decade path — the country is expected to reduce CO_2 emissions by approximately $30\% \div 3 = 10$ percentage points of the 1990 base in each decade, i.e. about 10% of the prevailing electricity-related mitigation is delivered autonomously along the NDC-consistent pathway.

Step 3 – Conservativeness check against NDC targets. This assumed 10%-per-decade autonomous reduction is well below the economy-wide NDC 3.0 targets of 71% by 2030 and 75% by 2035 (vs. 1990). Reserving 10% to the host country is therefore conservative.

Conclusion. Accordingly, 10% of the estimated electricity-related mitigation outcome is treated as a non-creditable contribution to Moldova's NDC, and the remaining 90% is treated as creditable under the JCM, giving an electricity discount factor of 0.90.

3. Conservative default grid emission factor ($EF_{elec,RE}$)

$EF_{elec,RE}$ is set below the most recent observed grid emission factor by applying the electricity discount factor of 0.90 derived in Section 2.2, ensuring the displaced-electricity reference emissions contribute to Moldova's NDC.

Item	Value	Unit
$EF_{\text{elec,PE}}$ — most recent observed grid emission factor	0.5073	tCO ₂ /MWh
Electricity discount factor (Section 2.2)	0.90	—
$EF_{\text{elec,RE}} = 0.5073 \times 0.90$	0.45657	tCO ₂ e/MWh

Source of the observed grid emission factor: “Assessment of the Grid Emission Factor of Moldova’s Electricity System” (USAID, 2024). The most recent value available at the time of validation is applied and fixed for the monitoring period thereafter.

4. Application in the methodology equations

The parameters derived above enter the reference-emission equations of the methodology as follows:

$$RE_{\text{CH}_4,p} = DF_{\text{CH}_4} \times [F_{\text{CH}_4,\text{PJ,capt},p} - F_{\text{CH}_4,\text{BL},p}] \times GWP_{\text{CH}_4} \quad \text{with } DF_{\text{CH}_4} = 0.87 \text{ and } GWP_{\text{CH}_4} = 27.$$

$$RE_{\text{elec},p} = EG_{\text{elec},p} \times EF_{\text{elec,RE}} \quad \text{with } EF_{\text{elec,RE}} = 0.45657 \text{ tCO}_2\text{e/MWh } (= 0.5073 \times 0.90).$$

For this project, no landfill gas capture or destruction system exists at the SWDS in the baseline (the project installs a new collection and utilization system at a site where LFG has not previously been recovered). Accordingly, the baseline methane captured/destroyed $F_{\text{CH}_4,\text{BL},p}$ is set to zero ($F_{\text{CH}_4,\text{BL},p} = 0$) for the entire crediting period.

These reference emissions are deliberately set below BaU so that the reserved residual mitigation (13% for the methane component and 10% for the electricity component) is counted as the Republic of Moldova’s contribution toward the achievement of its NDC 3.0.