Guideline for the Development of Premium T-VER Methodology

Version 02

Effective from 19 March 2026

1. Scope and Applicability

This document outlines the procedures, principles, and requirements for developing new T-VER Methodology under the Thailand Voluntary Emission Reduction Program (T-VER) for the Premium T-VER. It also includes provisions for revising existing methodologies applicable to Premium T-VER projects that have already been adopted for relevant stakeholders such as project developers, validation and verification bodies (VVBs), and consultants.

The T-VER methodologies that have been developed or proposed are intended to develop the projects of greenhouse gas emission reduction for registration and carbon credit issuance under the Premium T-VER. The newly developed or proposed methodology can only be applied to the projects of greenhouse gas emission reduction, as it has been approved by the Board of the Thailand Greenhouse Gas Management Organization (TGO) and formally acknowledged.

2. Principles and Requirements

The development of T-VER methodologies must adhere to six fundamental principles for assessing greenhouse gas (GHG) emission sources, proposing GHG emission reduction quantification methods, and defining monitoring approaches to ensure the trust in carbon credits under the Premium T-VER. These principles include:

1) Relevance refers to the selection of GHG emission sources, carbon sinks, data collection methods, measurement approaches, and calculation methodologies that must align with the requirements of the target stakeholders. The collected or estimated amount of GHG emission reduction should accurately reflect the emission reduction occurring within or related to the project boundary.

2) Completeness refers to the collected or assessed amount of GHG emission must account for GHG emissions from all activities occurring within the project boundary or related to the project. All relevant data related to GHG reduction must be gathered, including any information necessary to support the criteria and processes in a comprehensive manner.

3) Consistency refers to the data collection and GHG emission reduction quantification methods must follow the same principles and approaches throughout the methodology.

4) Accuracy refers to the methodologies for GHG emission data collection and quantification that must be scientifically robust, reliable, and widely accepted.

5) Transparency refers to the relevant project information must be disclosed, and the collection or calculation of GHG emission reductions must be sufficient, appropriate, and verifiable.

6) Conservativeness refers to the assumptions, figures, and processes that must be applied in a manner that ensures the estimated GHG emission reductions from the project are not overestimated beyond actual reductions achieved.

In addition, the development of T-VER methodologies for the Premium T-VER must comply with the principles and requirements outlined in the Standard: Application of the requirements of Chapter V.B (Methodologies) for the development and assessment of Article 6.4 mechanism methodologies) under the Paris Agreement, published by the Supervisory Body established under the Paris Agreement.

2.1 Project Starting Date

According to section 4 of the Regulation of the Board of Directors of Thailand Greenhouse Gas Management Organization re: rules, procedures, and conditions for considering Thailand Voluntary Emission Reduction (T-VER) projects, B.E. 2566 (2023), project developers must refer to the T-VER methodology for the definition of the project starting date. Therefore, TGO or the proponent of the draft T-VER methodology must define the project starting date in accordance with the principles of the Premium T-VER.

For project's type 1 to 12 and 14, the project starting date must be the date which the project developer considers the carbon credit mechanism as a factor in the investment decision for GHG emission reduction technologies corresponding to the project activity context. For example, the date which the project owner (employer) and the contractor have jointly signed a contract for the construction or installation of a greenhouse gas reduction project to be developed to the Premium T-VER project.

For project's type 13 (Reduction, absorption and sequestration GHG and in forestry and agriculture), the project starting date means the date which the project developer starts activities in the project area. For example, the date on which planting or sowing of seeds in the project area begins, excluding site preparation such as weeding, digging holes for planting, etc.

2.2 GHG Emission Reduction

The newly developed or proposed T-VER methodology must apply a fundamental calculation equation to assess GHG emission reductions for project activities under the T-VER program. The unit of GHG emission reduction must be expressed in metric tons of carbon dioxide equivalent (tCO_2eq), the fundamental calculation equation is as follows:

$$ER = BE - (PE + LE)$$

In which

ER = GHG emission reduction in year y (tCO_2eq/year)

BE = Baseline GHG emissions in year y (tCO_2eq/year)

PE = Quantity of GHG emissions from project activity in Year y (tCO_2eq/year)

LE = GHG emission outside the project boundary in year y (tCO_2eq/year)

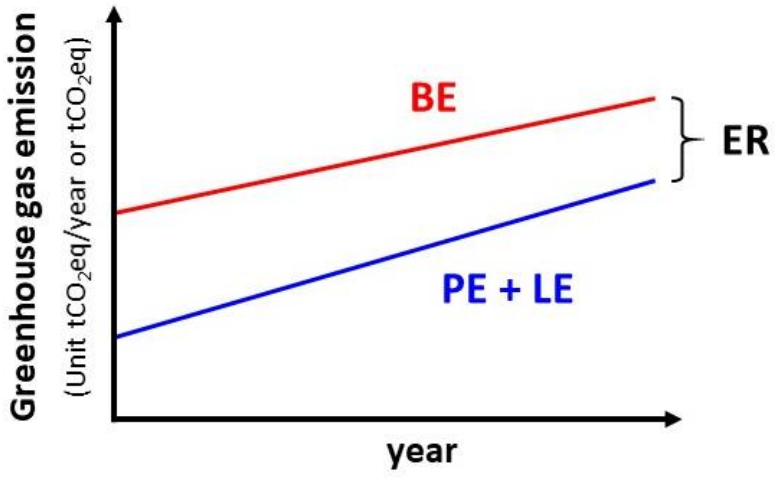

Figure 1 Fundamental calculation principle for assessing GHG emission reductions

2.2.1 Baseline Emission (BE) refers to GHG emissions in the absence of project activities. BE depends on the baseline scenario, as specified by the TGO, and are aligned with the characteristics of the project activity, such as the replacement of existing technology (Replacement) or the installation or procurement of new technology where no prior use existed (Greenfield).

2.2.2 Project Emission (PE) refers to various GHG emissions resulting from the implementation of project activities within the project boundary, such as electricity consumption by auxiliary equipment, methane and nitrous oxide emissions from aerobic decomposition in composting systems for soil amendment.

2.2.3 Leakage Emission (LE) refers to various GHG emissions resulting from the implementation of project activities where the activities and emission sources occur outside the project boundary. Further details are provided in Section 3.3.

Accordingly, in cases where relevant data used for calculations have a high degree of uncertainty, such as monitored parameters or the selection of default values, the amount of GHG emission reductions or carbon credits may be subject to adjustment using a deduction factor.

2.3 Baseline Scenario

The determination of the baseline scenario for calculating GHG emission reductions under the Premium T-VER must adhere to the Below Business-as-Usual (Below BAU) principle to align with Article 6.4 of the Paris Agreement, for which the Supervisory Body (SB) has established a standard for the development of methodologies (Standard: Application of the requirements of Chapter V.B (Methodologies) for the development and assessment of Article 6.4 mechanism methodologies). In accordance with this standard, the T-VER methodology must adopt one of three baseline determination approaches.

The determination of the baseline scenario for calculating GHG emission reduction under the Premium T-VER must adhere to the Below Business-as-Usual (Below BAU) principle to align with Article 6.4 of the Paris Agreement, for which the Supervisory Body (SB) has established A6.4-AMM-001 Standard: Setting the baseline in mechanism methodologies, version 1. In accordance with this standard, the T-VER methodology must adopt the baseline determination approaches as following.

2.3.1 Determine baseline emission in the first year of crediting period considering to project activities including.

- Green filed: apply best available approach (BAT) or ambitious benchmark approach and then shift to 2.3.3.
- Replacement: apply adjusted downwards approach see the detail in 2.3.2.

2.3.2 Calculate baseline emission in the first year of crediting period using adjusted downwards approach: $\mathbf{BE_{adj,y1}}$ following equation.

$$\mathbf{BE_{adj,y1} = min\left(BE_{adj,min,y1} : BE_{adj,UNC,y1}\right)}$$

where

$$\mathbf{BE_{adj,min,y1} = BE_{Hist,y1} - 0.1 \times \left(BE_{Hist,y1} - PE_{y1}\right)}$$

$$\mathbf{BE_{adj,UNC,y1} = BE_{Hist,y1} \times \left(1 - UNC_{BE\text{-}Hist,y1}\right)}$$

$BE_{adj,y1}$	=	Downward adjusted baseline emission in the first year of crediting period (tCO_2e/year)
$BE_{adj,min,y1}$	=	Minimum downward adjusted baseline emission in the first year of crediting period (tCO_2e/year)
$BE_{adj,UNC,y1}$	=	Minimum downward adjusted baseline emission based on uncertainty in the first year of crediting period (tCO_2e/year)
$BE_{Hist,y1}$	=	Existing actual or historical baseline emission based on baseline activity in the first year of crediting period (tCO_2e/year)
PE_{y1}	=	Project emission in the first year of crediting period (tCO_2e/year)
$UNC_{BE\text{-}Hist,y1}$	=	Uncertainty of baseline emission at the lower bound of the 95% confidence compared to unadjusted baseline emission in the first year (% by applied value between 0 and 1)

2.3.3 Calculate value of adjusted downwards: $\mathbf{DA_{y1}}$ for determine baseline emission in the second year onwards for which choose the maximum value between both values following equation.

$$\mathbf{DA_{y1} = max}\begin{cases} \mathbf{0.1 \times \left(BE_{Act,y1} - PE_{y1}\right)} \\ \mathbf{BE_{Act,y1} \times UNC_{BE\text{-}Hist,y1}} \end{cases}$$

where

$BE_{Act,y1}$	=	Unadjusted baseline emission in the first year of crediting period (tCO_2e/year)
PE_{y1}	=	Project emission in the first year of crediting period (tCO_2e/year)

$UNC_{BE\text{-}Act,y1}$ = Uncertainty of baseline emission at the lower bound of the 95% confidence compared to unadjusted baseline emission in the first year (% by applied value between 0 and 1)

2.3.4 Calculate BAU (Business as Usual) emission based on conservative principle $\mathbf{BAU_{cons,y}}$ by following equation.

$$\mathbf{BAU_{cons,y} = min\ (BAU_{cons,min,y} : BAU_{cons,UNC,y})}$$

where

$$\mathbf{BAU_{cons,min,y} = BAU_y - 0.1\ x\ (BAU_y - PE_y)}$$

$$\mathbf{BAU_{cons,UNC,y} = BAU_y\ x\ (1 - UNC_{BAU,cp1,y})}$$

$BAU_{cons,min,y}$ = Minimum conservative BAU emission in year y (tCO_2e/year)

$BAU_{cons,UNC,y}$ = Minimum conservative BAU emission based on the uncertainty in year y (tCO_2e/year)

BAU_y = BAU emission in year y (tCO_2e/year)

PE_y = Project emission in year y of crediting period (tCO_2e/year)

$UNC_{BAU,cp1,y}$ = Uncertainty of BAU emission at the lower bound of the 95% confidence compared to unadjusted baseline emission in year y (% by applied value between 0 and 1)

2.3.5 Calculate the downward adjusted baseline emission in year y (from the second year onwards) $\mathbf{BE_{adj,y}}$ using the equation

$$\mathbf{BE_{adj,y} = BE_y - \left[DA_{BE,y1} + BE_{y1}\ x\ 0.01\ x\ (y - y_1)\right]}$$

where

BE_y = Baseline emission in year y (tCO_2e/year)

BE_{y1} = Baseline emission in the first year of crediting period (tCO_2e/year)

$DA_{BE,y1}$ = Downward adjustment to baseline emission in the first year based on section 2.3.3 (tCO_2e/year)

y = Year y of crediting period

y1 = The first year of crediting period

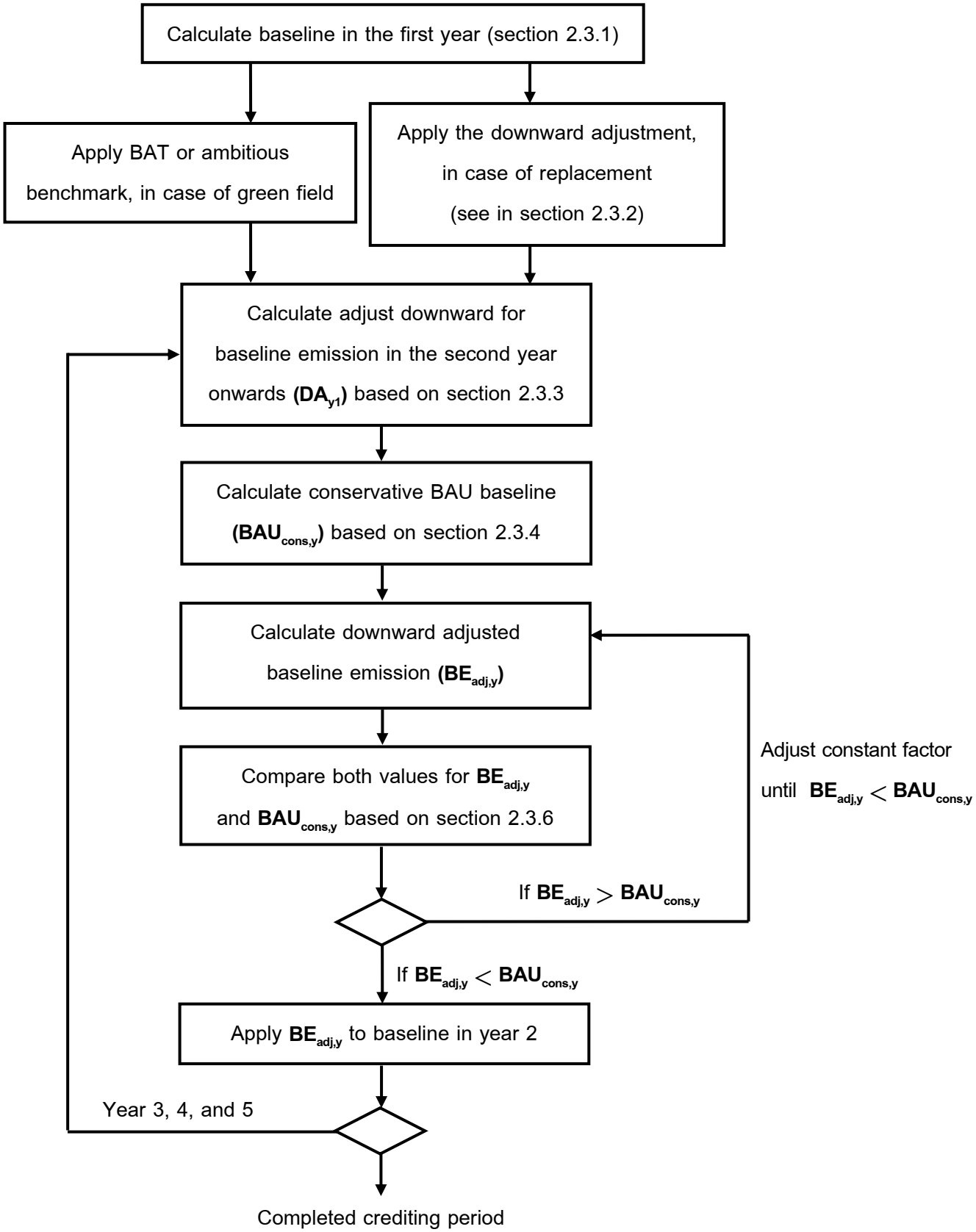

Figure 2 Steps to determine baseline emission in each year throughout crediting period

2.3.6 Compare both values for $\mathbf{BE}_{adj,y}$ and $\mathbf{BAU}_{cons,y}$ based on section 2.3.4 and proceed by following conditions

- If $\mathbf{BE}_{adj,y} < \mathbf{BAU}_{cons,y}$, apply the $\mathbf{BE}_{adj,y}$
- If $\mathbf{BE}_{adj,y} > \mathbf{BAU}_{cons,y}$, recompute the $\mathbf{BE}_{adj,y}$ based on section 2.3.5 by adjusting constant factor, which the $\mathbf{BE}_{adj,y}$ is lower than $\mathbf{BAU}_{cons,y}$

2.3.7 Repeat calculation steps based on section 2.3.3 to 2.3.6 to determine baseline emission in year of 3, 4, and 5 until crediting period is completed.

The Premium T-VER project must continuously enhance its commitment to GHG emission reductions to align with paragraph 33 of the Rules, Modalities, and Procedures (RMP) for the Article 6.4 mechanism under the Paris Agreement. Therefore, TGO mandates a review of the baseline determination approach in the first year for green filed in case of BAT or ambitious benchmark approaches each T-VER Methodology at least every three years, starting from the first year of its adoption. This review will cover assumptions, the determination of feasible implementation options, monitoring and evaluation methods, and GHG emission factors in the context of the national circumstances.

2.4 Additionality

TGO requires that the developed T-VER methodology for the Premium T-VER must demonstrate that the project activity achieves the additionality in terms of GHG emission thresholds, the use of advanced technologies, or enhanced practices, in addition to the following aspects:

- The project activity being implemented is surplus to regulatory requirements.
- The return on investment of the project activity is analyzed.
- The barriers for project implementation are demonstrated

These three aspects have been considered in the latest version of the Guidelines for the Demonstration and Assessment of Additionality for Premium Thailand Voluntary Emission Reduction Program.

2.5 Leakage

TGO requires that the T-VER methodology for the Premium T-VER must prevent the occurrence of leakage, which results in GHG emissions outside the project boundary. This includes the displacement of existing emission sources beyond the project area due to project activities. Therefore, the T-VER methodology must take the following aspects into consideration:

- Project activity must be implemented to avoid, control, or handle leakage to be at minimum using suitable methodologies. Additionally, an assessment of GHG emissions occurring outside the project boundary must be conducted to effectively manage any residual leakage.
- Project activities and GHG emission sources associated with leakage must be identified comprehensively and appropriately. If a Premium T-VER project applies a T-VER methodology that requires the consideration of leakage but the project proponent does not account for leakage, a clear and well-substantiated justification must be provided for their exclusion.
- If leakage is significant, the T-VER methodology must specify requirements or procedures for monitoring, reporting, and verification (MRV) to cover the identified leakage.

Examples of possible leakage include:

- The continued use of baseline machinery or main equipment that has been transferred or relocated for use outside the project boundary.
- The disposal or destruction of baseline machinery or equipment, including major components in the baseline machinery or equipment, which are replaced by machinery or equipment under the project activities, such as destruction of the refrigerant in the baseline air conditioner.
- The utilization of resources or raw materials for the project activity, leading to resource competition or increased production, which results in higher GHG emissions at the resource site or raw material production area.
- Changes to an existing production process that has been established as the baseline scenario, where operations are relocated and carried out beyond the project boundary.

- Upstream impacts related to the use of resources and raw materials, as well as downstream impacts associated with the management of residues and waste from the project activity and/or products generated by the project activity.

The control or management of leakage to minimize or avoid its occurrence includes the following measures:

- Discount of carbon credits by assessing leakage emissions and considering the lifetime of machinery or equipment.
- Decommissioning, destruction, retirement, or disposal of baseline core machinery or equipment, with supporting evidence to verify this action.
- Repurposing components of machinery or equipment to enhance efficiency, resulting in GHG emissions lower than the established standard values.

2.6 Uncertainty Analysis

The T-VER methodology must be transparent and comprehensible, considering to assumptions, theories, parameters, data sources, and other relevant factors. Therefore, in the development of T-VER methodologies for the Premium T-VER, the TGO requires the implementation of uncertainty analysis to assess various factors affecting the calculation of GHG emission reductions using the calculation tool “Uncertainty Analysis for GHG Emission Reduction Calculation Equations” (T-VER-P-TOOL-02-06) in order to calculate baseline emission according to baseline scenario approach in the section 2.3.

Therefore, a newly propose T-VER methodology must specify the value or define the source of the uncertainty for all monitored parameters and non-monitored parameters related to the greenhouse gas emission reduction calculation equation. An example forms for presenting the consideration guidelines is shown in the table below.

Table 1 Example of considering uncertainty for non-monitored parameters

Parameter	-
Description	-
Unit	-
Equation referred	-
Propose of data	-
Value applied	-

Source of data	-
Procedure for measurement	-
Treatment for uncertainties	Apply uncertainty based on the IPCC (2019 Refinement)
Additional comments	-

Table 2 Example of considering uncertainty for monitored parameters

Parameter	-	
Description	-	
Unit	-	
Equation referred	-	
Propose of data	-	
Frequency for monitor	-	
Method and procedure for measurement	-	
Entity/person responsible for the measurement	-	
Measuring instruments	Type	-
	Accuracy class	-
	Calibration requirement	-
	Location	-
Procedure for Quality Assurance (QA) and Quality Control (QC)	-	
Treatment for uncertainties	Uncertainties are determined based on the measuring instruments	
Additional comments	-	

2.7 Data Sources and Monitoring

The T-VER methodology must specify a list of parameters that require monitoring throughout the crediting period, including parameters that must be directly measured and parameters that must be referenced from other data sources. Additionally, the T-VER

methodology must specify measurement or monitoring approaches (at least one method), data collection and storage for monitored parameters, as well as data sources for parameters that do not require monitoring. The methodology must also specify requirements for Quality Assurance (QA) and Quality Control (QC) of data, such as calibration for measured instrument and device, verification of accuracy in reporting and recording data.

2.8 Non-Permanence and Reversals

The development or proposal of T-VER methodologies for Premium T-VER for project activity type 13 (GHG emission reduction, removal, and sequestration from the forestry and agriculture sector) and type 14 (GHG capture, storage, and/or utilization) must address non-permanence and reversals. The TGO or methodology developers must establish appropriate measures for managing reversals, which may be specified within the methodology or documented separately.

3. Process for the Development of a T-VER Methodology

The T-VER methodology may be developed by TGO officers or external individuals/entities. The development process follows the steps outlined in Figure 3 as follows:

1) TGO officers or external individuals/entities prepare a draft T-VER methodology in accordance with the structure and format specified in Section 3.1. In cases where an external individual or entity develops the draft T-VER methodology, it must be submitted to TGO, along with contact details, including address, phone number, and email.

2) TGO, in its capacity as the secretariat, reviews the calculation principles, accuracy, and completeness of the draft T-VER methodology within 20 working days. If the document does not meet the required standards, TGO will notify the developer to revise and resubmit the draft T-VER methodology.

3) TGO conducts a stakeholder consultation on the draft T-VER methodology that has completed the review in Step 2 through focus group discussions and public hearing on the Premium T-VER's website for 30 days. The details are provided in Section 3.2.

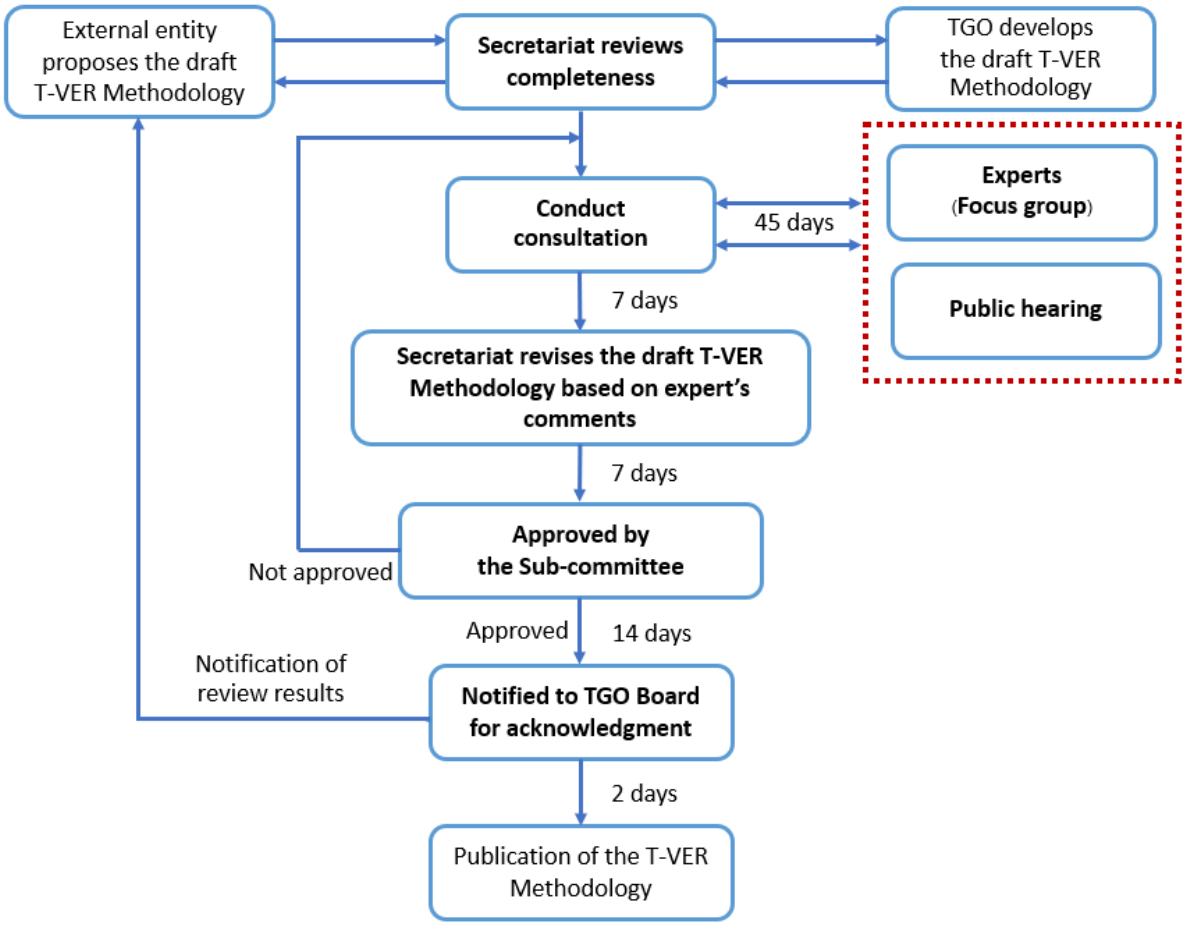

Figure 3: Process for the Development of a T-VER Methodology

4) TGO revises the draft T-VER methodology based on comments and recommendations received from the stakeholder consultation in Step 3.

5) TGO proposes the draft T-VER methodology to the sub-committee on GHG Mitigation Projects and Activities for approval, in accordance with the meeting schedule set by TGO[1]. In cases where the sub-committee recommends revisions to the draft T-VER methodology, TGO may invite experts to provide additional comment and may request the developer of the draft T-VER Methodology to provide explanations or clarifications as necessary.

[1] The meeting schedule of the sub-committee can be found at the website http: tver.tgo.or.th

6) TGO submits the T-VER methodology approved by the sub-committee to the TGO board for acknowledgment, upon which the T-VER methodology takes effect on the day following the board's resolution for acknowledgment.

In case of external individuals/entities propose a draft methodology to TGO, when it was completeness checked by TGO as following step (2), TGO has up to with 75 days for complete step (3) to (6) until the methodology is effective.

3.1 Preparation of the Draft T-VER Methodology Document

TGO or the proponent of a new T-VER methodology for the Premium T-VER must prepare the document in accordance with the template specified by TGO (T-VER-P-F015-METH), available on the Premium T-VER's website. The document must include the following sections:

1. Applicability
2. Project Starting Date
3. Conditions
4. Scope of Project
5. Baseline Scenario
6. GHG Emission Sources Included in the Calculation
7. Calculation of Baseline Emission
8. Calculation of Project Emission
9. Calculation of Leakage Emission
10. Calculation of Emission Reduction
11. Monitoring Plan
    - 11.1 Non-Monitored Parameters
    - 11.2 Monitored Parameters

3.2 Stakeholder Consultation

TGO has established two approaches for conducting stakeholder consultations on the draft T-VER Methodology for the Premium T-VER, as follows:

3.2.1 Stakeholder Consultation Meeting (Focus Group Discussion)

TGO will conduct stakeholder consultation meetings to gather feedback from experts from government agencies, academics, and relevant stakeholders, including project developers, consultants, and validation and verification bodies (VVBs), among others. The meetings will be held in person and/or virtual. Additionally, TGO will invite the developer of the draft T-VER mMethodology to provide clarifications and respond to inquiries as appropriate.

3.2.2 Public Hearing via Website

TGO will publish the draft T-VER Methodology on the Premium T-VER website for 30 days to collect public comments.

After completion of both consultation approaches, TGO will collect the comments and suggestions to refine and improve the draft T-VER methodology before submitting it to the sub-committee for further consideration.

4. Amendment of a T-VER Methodology

TGO allows project developers to propose amendments to an approved T-VER methodology for the Premium T-VER. To request an amendment, the project developer must submit a formal request to TGO, outlining the issues encountered in applying the methodology (if applicable), and proposed solutions for improvement. In this case, TGO may have a meeting with the proponent to discuss and clarify the request as appropriate.

If the proposed amendment is deemed justifiable and does not conflict with the fundamental principles of carbon crediting under the Premium T-VER, TGO will submit the amendment for consideration by the Sub-Committee on GHG Mitigation Projects and Activities, following the meeting schedule established by TGO. After that, the sub-committee's approval, the amendment will be presented to the TGO board for formal acknowledgment.

Accordingly, once TGO announces the revised T-VER methodology (which takes effect on the day following the board’s resolution for acknowledgment), the previous version of the T-VER methodology may be valid to be used for no more than 180 days from the date of publication. This means that project developers must submit the project documents for registration or renewal crediting period to TGO within the period in which the methodology with previous version remains effective.

Amendment Record

Version	Amendment No.	Effective Date	Amendment Details
02	1	19 March 2026	● Revise the procedure for baseline scenario setting ● Revise the description for uncertainty analysis ● Add the duration for methodology approval process
01	-	25 February 2025	-