

# MRV of Thailand Voluntary Emission Reduction Program (T-VER)

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**Review and Monitoring Office** 

**Thailand Greenhouse Gas Management Organization** 



Thailand Greenhouse Gas Management Organization (Public Organization)

### **Presentation outline**

- Principle of T-VER
- Development cycle of T-VER
- M: Measurement
- R: Reporting
- V: Verification



## **Principle of T-VER**

#### **Basic principle of T-VER**

1. Relevance	4. Completeness
2. Consistency	5. Accuracy
3. Transparency	6. Conservativeness

#### Approach for reliability assurance of T-VER's carbon credit

- 1) T-VER project is designed and operated in accordance with the principles and requirements of ISO 14064-2
- 2) Validation and verification is conducted according to the principles and requirements of 14064-3
- 3) Validation and Verification is performed by registered Validation and Verification Body (VVB)



## Project types and GHGs covered by T-VER

#### **Project types**

1. Energy efficiency

5. Transportation

2. Alternative energy

6. Forestry and green area

3. Renewable energy

7. Agriculture

4. Waste management

8. others

**GHGs covered by T-VER** 

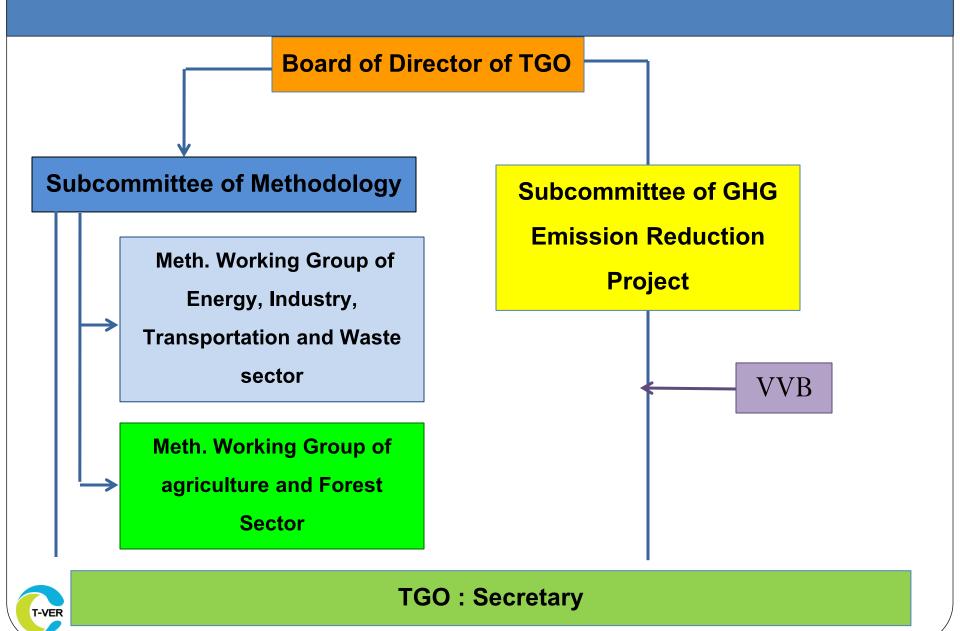
CO2, CH4, N2O

Unit of carbon credit

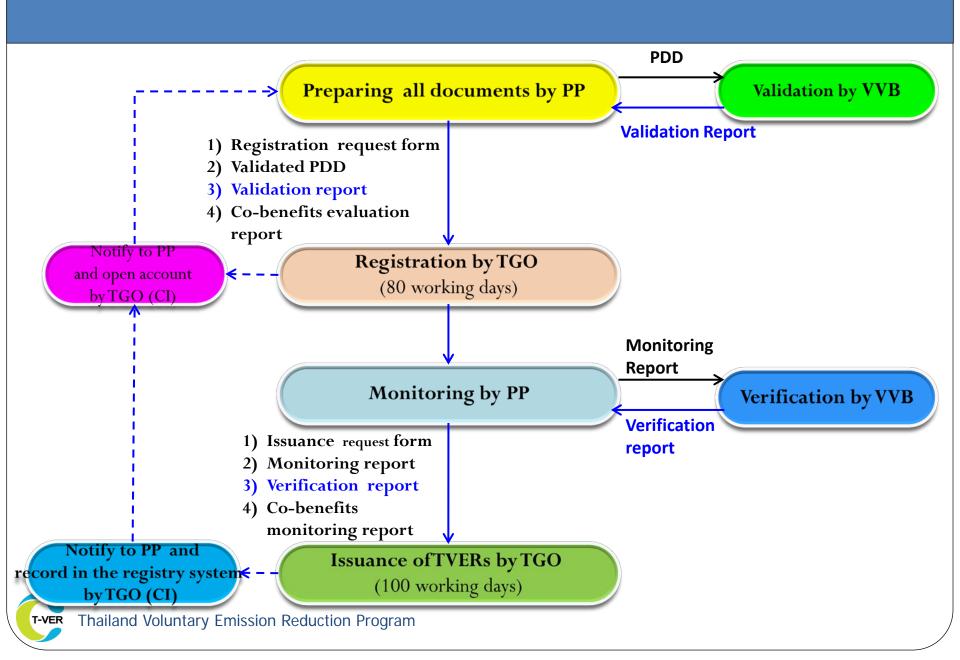
→ **TVERs** (Thailand Verified Emission Reduction)



#### Institutional Framework for T-VER



# T-VER cycle



#### **Definition of MRV for T-VER**

M

#### Measurement

→ Measuring values of parameters as specified in the Project Design Document (PDD)

R

#### Reporting

→ Preparing monitoring report using provided template

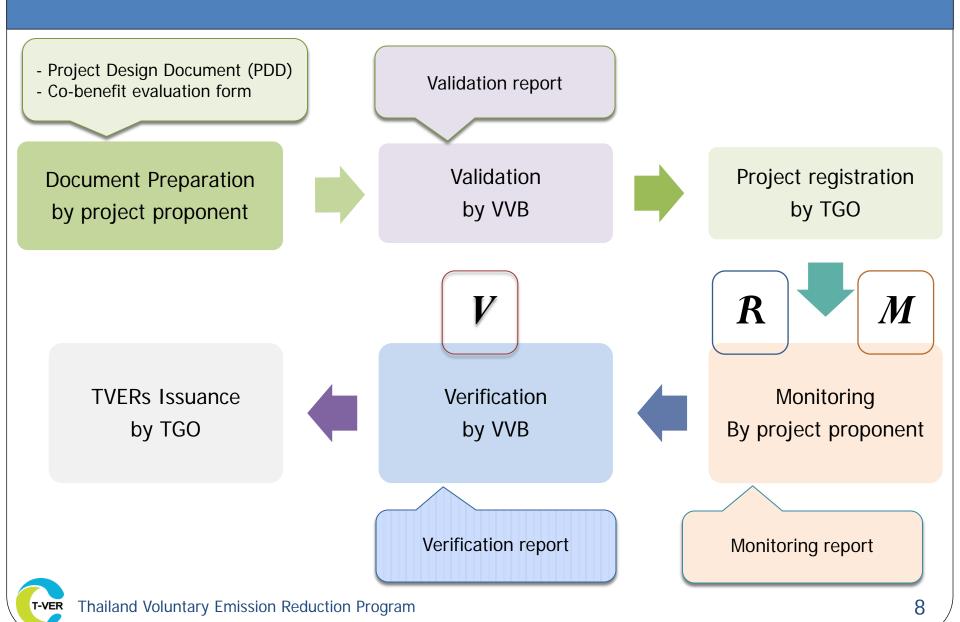
V

#### Verification

→ Verified by registered Validation and Verification Body (VVB) to assure that T-VERs reflect real emission reduction



# T-VER project cycle



# M

# **Measurement according to T-VER methodology**

Project type	T-VER- METH-	Approved methodology
Energy	EE-01	Energy Efficiency Improvement from Lightings
efficiency	EE-02	High Energy Efficiency Lighting Installation in Buildings
	EE-03	Installation of Cogeneration System to Replace the Separated System
	EE-04	New Installation of Cogeneration System
Alternative	RE-01	On-Grid Renewable Electricity Generation
and	RE-02	Off-Grid Renewable Electricity Generation
renewable .	DE 00	
energy	RE-03	Switching of Fossil Fuel or Increasing of Renewable Energy Utilization to
		Generate Thermal Energy
	RE-04	New Installation of Renewable Energy System to Generate Thermal Energy
	RE-05	Biodiesel Production for Use as Fuel of Vehicle or Agricultural Machinery





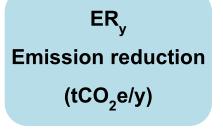
# **Measurement according to T-VER methodology**

Project type	T-VER- METH-	Approved methodology
Waste	WM-01	Methane Capture from Anaerobic Wastewater Treatment for Utilization or
manage-		Flaring
ment		
Agriculture	AGR-01	Good Fertilization Practice in Agricultural Land
	AGR-02	Carbon Sequestration and Reducing Emission in Orchards
Forestry	FOR-01	Sustainable Forestation
	FOR-02	Reducing Emission from Deforestation and Forest Degradation and
		Enhancing Carbon Sequestration in Forest Area
		Project Level: P-REDD+



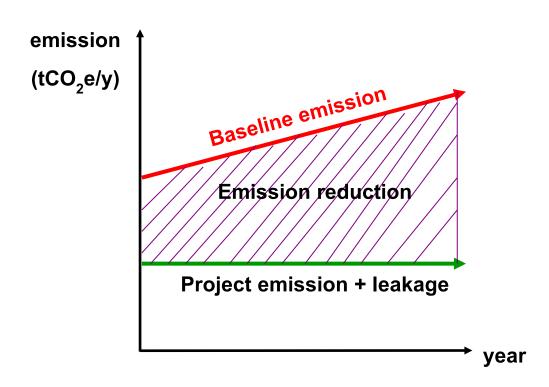


### **Calculation of Emission Reduction**



BE<sub>y</sub>
Baseline emission
(tCO<sub>2</sub>e/y)

PE<sub>y</sub> + LE<sub>y</sub>
Project emission (tCO<sub>2</sub>e/y)
+
Leakage emission (tCO<sub>2</sub>e/y)





#### Sample project

#### Methane Capture from Anaerobic Wastewater Treatment for Electricity Generation

wethane Capture from Anaerobic wastewater Treatment for Electricity Generation				
Activities	Baseline	Project	T-VER-METH	
Wastewater treatment	Open lagoon	Covered lagoon	WM-01	
Electricity generation by using	Fossil fuel	Biogas captured from covered lagoon	RE-01	
<del>-</del>	25,000 mg/l	COD <sub>eff,PJ,WWTP</sub> 5,000 mg/l  vered Lagoon  Aero  as Scrubber  Supply 15,000,000 kV	bic Pond Vh/y	

 $ER_y = BE_y - PE_y - LE_y$ 

Generator

Project uses electricity 50,000 kWh/year, diesel oil 100 L/y

Grid

#### T-VER-METH-WM-01:

Methane Capture from Anaerobic Wastewater Treatment for Utilization or Flaring



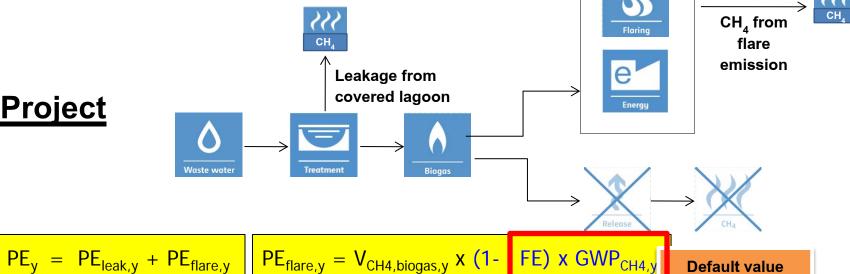


$$BE_y = BE_{ww,treatment,y}$$

 $BE_{ww,treatment,y} = Q_{ww,PJ,y} x (COD_{inf,PJ,WWTP} - COD_{eff,PJ,WWTP}) x MCF_{BL} x UF_{BL} x B_o x GWP_{CH4,y} x 10^{-6}$ 

**Default value** 

# **Project**



 $PE_{leak,y} = Q_{ww,treatment,y} \times (COD_{inf,PJ,WWTP} - COD_{eff,PJ,WWTP}) \times MCF_{PJ} \times (1-CFE) \times UF \times B_o \times GWP_{CH4,y} \times 10^{-6}$ 

#### T-VER-METH-RE-01:

#### **On-Grid Renewable Electricity Generation**

# **Baseline**

$$BE_y = BE_{EG,y}$$

 $BE_y = BE_{EG,y}$   $BE_{EG,y} = (EG_{PJ,y} \times 10^{-3}) \times EF_{Grid,CM,y}$ 

## **Project**

$$PE_y = PE_{EL,y} + PE_{FF,y}$$

$$PE_{EL,y} = (EC_{PJ,y} \times 10^{-3}) \times EF_{Grid,CM,y}$$

$$PE_{FF,y} = \Sigma(FC_{PJ,i,y} \times NCV_{i,y} \times EF_{CO2,i,y}) \times 10^{-3}$$



#### **Project Design Document: PDD**

Part 1 Description of project activity

project details/ installed engines/ project status, double counting declaration, crediting period

Part 2 Baseline and monitoring methodology

methodology/ project boundary/ baseline/ emission sources/ additionality proof

Part 3
Emission reduction

baseline emission/ project emission/
leakage emission/ emission reduction

**Part 4 Monitoring** 

Monitoring plan/ parameters do not need/ need to be monitored

**Annex** 

Related information

**T-VER-PDD-Guideline** 



# **Additionality proof**

Large scale project must demonstrate the additionality of the project

The project is considered as additional if the payback period is 3 years or more.

#### Scale of the large project

Type I: Renewable energy: installed capacity > 15 MW

Type II: Energy efficiency improvement: energy saving > 60 GWh/year

Type III: Other project activities: Emission reductions > 60,000 tCO<sub>2</sub>e/y



# Reporting

Monitoring report must be prepared by using the template provided by TGO.

Thailand Volunt	ary Emission Reduction Program T-VER-MR Version 1	หน้า1				
รายงานผลการติดตามปริมาณการลดการปล่อยก๊าซเรือนกระจก						
สาหรบเครงเ	สำหรับโครงการลดก๊าชเรือนกระจกภาคสมัครใจของประเทศไทย					
	(Monitoring Report: MR)					
รายละเอียดโครงการ						
ชื่อโครงการ	<ระบุภาษาอังกฤษ>					
ประเภทโครงการ	🗆 การเพิ่มประสิทธิภาพพลังงาน					
	🗆 การพัฒนาพลังงานทางเลือก					
	🗆 การพัฒนาพลังงานหมุนเวียน					
	🗆 การจัดการขยะมูลฝอย สิ่งปฏิกูล และวัสดุเหลือใช้					
	🗆 การจัดการในภาคขนส่ง					
	🗆 อื่นๆ					
ที่ตั้งโครงการ						
เลขที่ขึ้นทะเบียนโครงการ						
วันขึ้นทะเบียนโครงการ						
ระยะเวลาคิดคาร์บอน	ปี					
เครดิตของโครงการ	วัพเดือนปี – วัพเดือนปี					
รายงานฉบับที่						
ช่วงเวลาที่ติดตามผล	วัพเดือนปี – วัพเดือนปี					
ปริมาณการลดก๊าซเรือน	ตันคาร์บอนไดออกไซด์เทียบเท่า (tCO <sub>2</sub> e)					
กระจก						



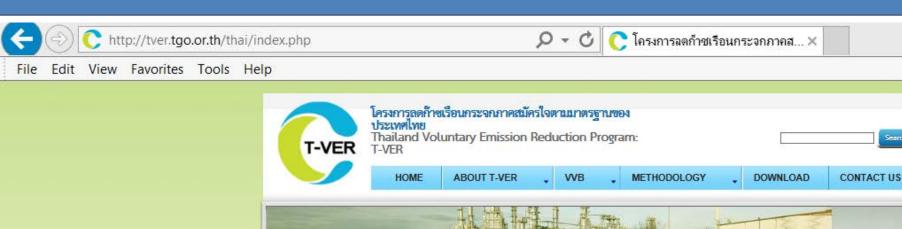
# V

### **Verification**

- ➤ Validation and verification is conducted in accordance with the principles and requirements of 14064-3 and V&V Guidelines provided by TGO.
- Validation and Verification is performed by registered Validation and Verification Body (VVB). VVB is currently approved and registered by TGO. Qualified candidates include DoE, juristic person accredited under ISO 14065 or juristic person which has at least 1 permanent staff who is an expert in the project area or having more than 2 year-auditing experience. DoE and juristic person accredited under ISO 14065 must pass 1 training course (basic knowledge of T-VER), whereas the other must pass 2 training courses (basic knowledge of T-VER + T-VER validation and verification)
- Validation or verification plan and opinion expressed in the assurance statement has been formed on the basis of a reasonable level of assurance and materiality shall not exceed 5%.
- Validation or verification report must be prepared by using the template provided by TGO.



# Website <a href="http://tver.tgo.or.th">http://tver.tgo.or.th</a>





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# Thank you



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