

VCS Methodology

VMR0014

---

# ELECTRIC AND HYBRID VEHICLES AND MOBILE MACHINERY (AMS-III.C REVISION)

Version 1.0

3 July 2025

Sectoral Scope 7: Transport

This methodology revision was developed by Grütter Consulting AG.



# CONTENTS

---

<b>1</b>	<b>SUMMARY DESCRIPTION.....</b>	<b>4</b>
<b>2</b>	<b>SOURCES.....</b>	<b>4</b>
<b>3</b>	<b>DEFINITIONS.....</b>	<b>5</b>
<b>4</b>	<b>APPLICABILITY CONDITIONS .....</b>	<b>5</b>
<b>5</b>	<b>PROJECT BOUNDARY .....</b>	<b>6</b>
<b>6</b>	<b>BASELINE SCENARIO .....</b>	<b>6</b>
<b>7</b>	<b>ADDITIONALITY .....</b>	<b>6</b>
7.1	Regulatory Surplus .....	6
7.2	Option 1: Apply VT0008 Additionality Assessment .....	6
7.3	Option 2: Annual Sales.....	8
<b>8</b>	<b>QUANTIFICATION OF REDUCTIONS.....</b>	<b>8</b>
8.1	Baseline Emissions .....	8
8.2	Project Emissions .....	12
8.3	Leakage Emissions .....	14
8.4	Net Reductions .....	14
<b>9</b>	<b>MONITORING .....</b>	<b>14</b>
9.1	Data and Parameters Available at Validation .....	14
9.2	Data and Parameters Monitored.....	15
9.3	Description of the Monitoring Plan.....	17
	<b>DOCUMENT HISTORY .....</b>	<b>18</b>

# 1 SUMMARY DESCRIPTION

Additionality and Crediting Method	
Additionality	Project/Activity Method
Crediting Baseline	Project Method
Mitigation Outcome	Reductions

CDM methodology *AMS-III.C.: Emission Reductions by Electric and Hybrid Vehicles* quantifies greenhouse gas (GHG) emission reductions from project activities that introduce new electric and/or hybrid vehicles to displace the use of fossil fuel vehicles in passenger and freight transportation.

This revision expands the applicability of the methodology to include electric mobile machinery (EMM), such as building and construction machines. EMM includes both battery-electric mobile machinery and plug-in hybrid electric mobile machinery.

The methodology is globally applicable.

# 2 SOURCES

This methodology revision applies to CDM methodology *AMS-III.C.: Emission Reductions by Electric and Hybrid Vehicles*. Project proponents must use this methodology revision in conjunction with the most recent version of *AMS-III.C.*

Project proponents using this methodology revision must make the following tool replacements throughout *AMS-III.C.*:

- *TOOL21 Demonstration of additionality of small-scale project activities* is replaced with VCS tool *VT0008 Additionality Assessment*
- *TOOL05 Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation* (which uses TOOL07 Tool to calculate the emission factor for an electricity system) is replaced with *VT0011 Electricity System Emission Factors*

## 3 DEFINITIONS

In addition to the definitions set out in *AMS-III.C.* and the *VCS Program Definitions*, the following definition applies to this methodology revision.

### **Electric mobile machinery (EMM)**

Equipment that operates on electric power and is not fixed to a specific site, allowing it to be moved either under its own propulsion or with assistance as required by engineering specifications or logistics. EMM must be self-propelled, except in cases where a self-propelled unit has had its drive carriage removed to secure the unit to a structure during operation. EMM includes both battery-electric mobile machinery and plug-in hybrid electric mobile machinery. Some examples of EMM are:

- construction machinery (e.g., excavators, road-building equipment)
- material handling equipment (e.g., forklifts, cargo-container handling equipment at ports such as cranes, reach stackers, tractor-trailers, straddle carriers)
- airport support equipment (e.g., pushback tractors, boarding stairs, belt and container loaders, luggage tugs)

For the avoidance of doubt, non-plug-in hybrid electric mobile machinery and generators used for power generation do not qualify as EMM under this methodology.

## 4 APPLICABILITY CONDITIONS

CDM methodology *AMS-III.C.* applies to project activities that introduce new electric and/or hybrid vehicles that displace the use of fossil fuel vehicles in passenger and freight transportation. This VCS methodology also applies to EMM. The methodology is globally applicable.

In all applicability conditions of *AMS-III.C.*, the term “electric vehicles” must be replaced with “electric vehicles and EMM.”

Applicability conditions 7 and 10 must be replaced as follows:

7. The project participant must demonstrate that double counting of emission reductions does not occur following the rules and requirements in the most recent version of the *VCS Standard*. Provisions to avoid double counting may include a contractual agreement with the end-user(s), maintenance of a comprehensive inventory of project vehicles, or unique identification of the vehicles owned by end-user(s). The steps undertaken to avoid double-counting must be documented in the project description.

10. The types of hybrid/electric vehicles and EMM include, but are not limited to:

- 1) passenger and commercial vehicles (e.g., cars, buses, trucks, jeepneys, commuter vans, taxis)
- 2) two- and three-wheeled vehicles (e.g., motorcycles, tricycles)
- 3) electric mobile machinery (e.g., construction machinery)

## 5 PROJECT BOUNDARY

The project boundary must be determined following the procedure provided in the most recent version of *AMS-III.C*. The term “vehicles” must be read as “vehicles and mobile machinery.”

## 6 BASELINE SCENARIO

The baseline scenario must be determined following the procedure provided in the most recent version of *AMS-III.C*. The term “vehicles” must be read as “vehicles and mobile machinery.”

## 7 ADDITIONALITY

In place of the additionality requirements 20 through 22 in the latest version of *AMS-III.C*, project proponents must demonstrate additionality by demonstrating regulatory surplus and applying either Option 1 (project method) or Option 2 (activity method) below.

### 7.1 Regulatory Surplus

Project proponents must demonstrate regulatory surplus in accordance with the rules and requirements set out in the most recent versions of the *VCS Standard* and *VCS Methodology Requirements*. Where the project proponent demonstrates regulatory surplus, proceed to Section 7.2 or Section 0. Otherwise, the project activity is not additional.

### 7.2 Option 1: Apply VT0008 Additionality Assessment

Project proponents must apply a barrier analysis and/or investment analysis, and a common practice analysis as described below.

### 7.2.1 Barrier analysis and/or investment analysis

Project proponents must follow the procedures and requirements of the most recent version of VCS tool VT0008 *Additionality Assessment* to conduct either a barrier analysis (Step 2) or an investment analysis (Step 3). Project proponents may choose to apply both analyses to further strengthen the additionality demonstration.

When applying a barrier analysis, barriers are limited to:

- 1) **Commercial/legal barrier:** The “owner/tenant” contractual issue may be a barrier to the introduction of new electric and/or hybrid vehicles or EMMs. For example, this is typical in the case of car rental company fleets, where the car renter pays for the fuel and the owner makes the vehicle investment. Many taxi fleets are also managed in this manner, especially in developing countries, with taxi drivers paying a fixed daily rent per vehicle. For projects facing the commercial/legal barrier, project proponents must demonstrate that the contractual relationship between the parties does not provide an incentive for any party to implement the project activity.
- 2) **Aggregation barrier:** In order to make the introduction of new electric and/or hybrid vehicles or EMMs feasible, an aggregation mechanism may be required. Aggregation parties are generally business associations, clean mobility-focused institutions, or providers of technology solutions. Establishing and maintaining such an aggregation mechanism can be a significant barrier that can be overcome with carbon credit revenues.

*Note — Projects may choose to demonstrate additional implementation barriers using the list of barriers provided in the most recent version of the VT0008 Additionality Assessment. However, as a minimum requirement, project proponents must demonstrate additionality through the existence of at least one of the barriers listed above or an investment analysis. Other barriers may further strengthen the additionality demonstration but are not sufficient on their own.*

Where the project proponent demonstrates that all conditions of either the barrier analysis and/or the investment analysis per VT0008 are met, proceed to Section 7.2.2 (common practice analysis). Otherwise, the project activity is not additional.

### 7.2.2 Common practice analysis

Project proponents must conduct a common practice analysis for each vehicle and EMM category in accordance with “Step 4c: Common Practice Analysis for Measures Not Listed in Step 4a” of the most recent version of VT0008.

Where the project proponent demonstrates that the project is not considered common practice, the project is additional. Otherwise, the project activity is not additional.

### 7.3 Option 2: Annual Sales

Project proponents must apply Option 2 of *AMS-III.C*. The term “vehicles” must be read as “vehicles or mobile machinery” in this section. Where the project proponent demonstrates that the project meets the conditions in *AMS-III.C*. for annual sales, the project is additional. Otherwise, the project activity is not additional.

## 8 QUANTIFICATION OF REDUCTIONS

### 8.1 Baseline Emissions

Baseline emissions are determined using the approaches described below which replace paragraphs 27-39 in *AMS-III.C*.

Each project vehicle/EMM category *i* must be applied consistently with their respective units of service, which is distance traveled (kilometers) for vehicles and hours of service for EMM.

#### Approach 1: Units of service

The baseline emissions are calculated based on the unit of service provided by the project vehicles or EMM multiplied by the emission factor for the baseline vehicle / mobile machinery that provides the same units of service as per the equation below:

$$BE_y = \sum_i EF_{BL,i} \times SU_{PJ,i,y} \times N_{PJ,i,y} \times 10^{-6} \quad \text{Equation (1)}$$

Where:

$BE_y$	=	Total baseline emissions in year <i>y</i> (t CO <sub>2</sub> )
$EF_{BL,i}$	=	Emission factor for baseline vehicle / mobile machinery category <i>i</i> (g CO <sub>2</sub> /km for vehicles or g CO <sub>2</sub> /h for mobile machinery)
$SU_{PJ,i,y}$	=	Units of service of project vehicle / EMM category <i>i</i> in year <i>y</i> (average annual distance traveled in kilometers for vehicles or average annual operating hours for EMM)
$N_{PJ,i,y}$	=	Number of operational project vehicles / EMM in category <i>i</i> in year <i>y</i>

#### Approach 2: Electricity consumed for charging

The baseline emissions are calculated by transforming the electricity charged to the project vehicles / EMM at the charging points into traveled distance / hours of service and multiplying by the emission factor for fossil fuels used by the baseline vehicles that provide the same service.

$$BE_y = \sum_i EF_{BL,i} \times \frac{EC_{PJ,i,y}}{SEC_{PJ,i,y}} \times 10^{-6} \quad \text{Equation (2)}$$



Where:

$BE_y$	=	Total baseline emissions in year $y$ (t CO <sub>2</sub> )
$EF_{BL,i}$	=	Emission factor for baseline vehicle / mobile machinery category $i$ (g CO <sub>2</sub> /km for vehicles or g CO <sub>2</sub> /h for mobile machinery)
$EC_{PJ,i,y}$	=	Electricity consumed for charging project vehicle / EMM category $i$ in year $y$ (kWh)
$SEC_{PJ,i,y}$	=	Specific electricity consumption per unit of service of project vehicle / EMM category $i$ in year $y$ (kWh/km for vehicles and kWh/h for EMM)

For plug-in hybrid vehicles/EMM,  $SEC_{PJ,i,y}$  must be determined based on running on 100% electricity, i.e. no fuel consumption.

Under either of the two approaches, the emission factor per unit of service for baseline vehicle / mobile machinery category  $i$  ( $EF_{BL,i}$ ) is determined as follows:

$$EF_{BL,i} = SFC_{BL,i} \times NCV_{BL,i} \times EFCO2_{BL,i} \times IR^t \times 10^{-3} \quad \text{Equation (3)}$$

Where:

$EF_{BL,i}$	=	Emission factor for baseline vehicle / mobile machinery category $i$ (g CO <sub>2</sub> /km for vehicles and g CO <sub>2</sub> /h for mobile machinery)
$SFC_{BL,i}$	=	Specific fuel consumption of baseline vehicle / mobile machinery category $i$ (g/km for vehicles and g/h for mobile machinery)
$NCV_{BL,i}$	=	Net calorific value of fossil fuel consumed by baseline vehicle / mobile machinery category $i$ (MJ/kg)
$EFCO2_{BL,i}$	=	CO <sub>2</sub> emission factor of fossil fuel consumed by baseline vehicle / mobile machinery category $i$ (g CO <sub>2</sub> /MJ)
$IR^t$	=	Technology improvement factor for baseline vehicle / mobile machinery in year $t$ . The improvement rate is applied to each calendar year. The default value of the technology improvement factor for all baseline vehicle / mobile machinery categories is 0.99.
$t$	=	Year counter for annual improvement (dependent on age of data per vehicle / mobile machinery category)

There are five options for calculating the specific fuel consumption of a vehicle / mobile machinery ( $SFC_{BL,i}$ ):

#### Option (1): Sample measurement

Measure the actual fuel consumption and corresponding units of service (distance traveled for vehicles and hours of service for mobile machinery) of a sample of baseline vehicles / mobile machinery that meets all of the following conditions:

- Of the same vehicle / mobile machinery category as the project vehicles / EMM
- Operating in comparable surroundings to the project vehicles / EMM

- c) Of a similar age to or newer than the project vehicles / EMM. The baseline vehicle / mobile machinery must not be more than 10 years older than the project vehicle / EMM. Where the baseline vehicle / mobile machinery sample is between 1 and 10 years older than the project vehicles / EMM, the technology improvement factor  $IR^t$  must be applied.<sup>1</sup>
- d) With a comparable passenger or load carrying capacity with a maximum deviation of  $\pm 20\%$  between the baseline and project vehicles / mobile machinery.

Sample vehicles must be randomly chosen in accordance with the most recent version of the *Guidelines for Sampling and Surveys for CDM Project Activities and Programmes of Activities* using a 90% confidence interval and  $\pm 10\%$  precision to determine the sample size. The lower bound of the 90% confidence interval must be used as the specific fuel consumption.

### Option (2): Top 20%

The specific fuel consumption for comparable baseline vehicles / mobile machinery is estimated by using the specific fuel consumption of the top 20% most efficient (i.e., least fuel-consuming) of the vehicle / mobile machinery fleet from manufacturer specifications for vehicles / mobile machinery in the project region.

### Option (3): Using operational data

The baseline vehicle / mobile machinery may be identified from the base case with comparable operating conditions<sup>2</sup> or in a similar area<sup>3</sup> and that will not be replaced over the lifetime of the project. The specific fuel consumption is determined from data of baseline vehicles / mobile machinery under comparable conditions. Historical data for at least one year is collected per vehicle / mobile machinery category. Otherwise, the specific fuel consumption is obtained from manufacturer specifications.

In project activities where baseline vehicles / mobile machinery include non-standard vehicles / mobile machinery for which manufacturer data are not available, the specific fuel consumption may be determined using one of the following two options:

- a) Measure the actual fuel consumption and corresponding unit of service of a sample of baseline vehicles / mobile machinery that meets all of the following conditions:
  - i) Operating in similar conditions to the project vehicles / EMM
  - ii) Of a similar age to or newer than the project vehicles / EMM. The baseline vehicle / mobile machinery must not be more than 10 years older than the project vehicle / EMM. Where the baseline vehicle / mobile machinery sample

<sup>1</sup> This adjustment normalizes the baseline vehicle's performance to the reference age of the project vehicle to account for technological improvements over time.

<sup>2</sup> Comparable conditions refer to usage types (e.g., usage of construction machinery in a quarry).

<sup>3</sup> Comparable areas are primarily urban or inter-urban for vehicles.

is between 1 and 10 years older than the project vehicles / EMM, the technology improvement factor  $IR^t$  must be applied.<sup>4</sup>

- iii) With a similar or smaller engine size compared to the project vehicle / EMM
- iv) With a similar or lower passenger / goods load capacity as the project vehicle / EMM
- v) Any other relevant factors to distinguish vehicles / mobile machinery with different fuel consumption rates

Sample baseline vehicles / mobile machinery must be randomly chosen in accordance with the most recent version of the *Guidelines for Sampling and Surveys for CDM Project Activities and Programmes of Activities* using a 90% confidence interval and  $\pm 10\%$  precision to determine the sample size. The lower bound of the 90% confidence interval must be used as the specific fuel consumption.

- b) Use values from peer-reviewed literature, publicly available studies, datasets, technical reports, or publications from recognized independent third parties (e.g., research institutes) where the specific fuel consumption value is derived with characteristics leading to similar or lower emissions compared to the baseline vehicles / mobile machinery (e.g., using specific fuel consumption values for vehicles / mobile machinery of a similar age or newer, with a similar or smaller engine size, with a similar or lower passenger / goods load capacity, and other relevant factors to distinguish vehicles / mobile machinery with different fuel consumption rates).

#### **Option (4): Using data from a control group**

Where no specific baseline vehicle / mobile machinery can be identified or appropriate operational data are not available, specific fuel consumption should be obtained through a statistically significant control group or existing statistics that are regularly updated. Such a control group or the source of data must have similar or conservative characteristics with respect to vehicle / mobile machinery age (equal or newer) and operating conditions. The control group must be chosen from the following, listed in descending order of preference:

- 1) Fleet of the same company operating simultaneously to the project activity
- 2) Fleet of a different company with similar operations operating simultaneously to the project activity
- 3) Host country statistics
- 4) Intergovernmental Panel on Climate Change (IPCC) or other international data

<sup>4</sup> This adjustment normalizes the baseline vehicle's performance to the reference age of the project vehicle to account for technological improvements over time.

Under this option, specific fuel consumption is monitored throughout the project crediting period, thus gradual efficiency improvements in the fleet or gradual deterioration of driving conditions are automatically incorporated into project efficiency levels. Where using this option, the technology improvement factor  $IR^t$  is not applied in Equation (3).

#### Option (5): Existing statistics

Where none of the above options apply due to lack of data, other publicly available existing statistics may be used as industry default values. Appropriate sources of data are host country statistics (released by transportation department or other authorities), IPCC, and other international data. Conservative (lower) values must be selected from available ranges.

## 8.2 Project Emissions

Project emissions include electricity and fossil fuel consumption associated with the operation of project vehicles / EMM and are calculated using the equations in this section instead of paragraphs 40-43 in AMS-III.C.

Each project vehicle / EMM category  $i$  must be applied consistently with their respective unit of service (i.e. either km or hours).

#### Electricity emissions

$$PEE_y = \sum_i EC_{PJ,i,y} \times GEF_y \times 10^{-3} \quad \text{Equation (4)}$$

Where:

- $PEE_y$  = Total project emissions from electricity usage in year  $y$  (t CO<sub>2</sub>)
- $EC_{PJ,i,y}$  = Electricity consumed for charging project vehicle / EMM category  $i$  in year  $y$  (kWh)
- $GEF_y$  = Grid emission factor in year  $y$  (t CO<sub>2</sub>/MWh)

Electricity consumed by project vehicles / EMM may be measured or calculated using the following equation:

$$EC_{PJ,i,y} = SEC_{PJ,i,y} \times SU_{PJ,i,y} \times N_{PJ,i,y} \quad \text{Equation (5)}$$

Where:

- $EC_{PJ,i,y}$  = Electricity consumed for charging project vehicle / EMM category  $i$  in year  $y$  (kWh)
- $SEC_{PJ,i,y}$  = Specific electricity consumption per unit of service of project vehicle / EMM category  $i$  in year  $y$  (kWh/km for vehicles or kWh/h for EMM)
- $SU_{PJ,i,y}$  = Unit of service of project vehicle / EMM category  $i$  in year  $y$  (average annual distance in kilometers for vehicles and average annual operating hours for EMM)
- $N_{PJ,i,y}$  = Number of operational project vehicles / EMM in category  $i$  in year  $y$

Plug-in hybrid vehicles / EMM, must determine  $EC_{PJ,i,y}$  based on measurement. Equation 5 may be used if no simultaneous electricity and fuel is consumed. The grid emission factor is established as follows:

$$GEF_y = \frac{EF_{elec,y}}{(1-TDL_y)} \quad \text{Equation (6)}$$

Where:

- $GEF_y$  = Grid emission factor in year  $y$  (t CO<sub>2</sub>/MWh)
- $EF_{elec,y}$  = Emission factor for electricity consumption in year  $y$  (t CO<sub>2</sub>/MWh)
- $TDL_y$  = Average technical transmission and distribution losses for providing electricity in year  $y$  (ratio)

The emission factor  $EF_{elec,y}$  must be determined in accordance with the procedures in the most recent version of *VT0011 Electricity System Emission Factors*.

### Fossil fuel emissions

$$PEF_y = \sum_i FC_{PJ,i,y} \times NCV_{PJ,i} \times EFCO2_{PJ,i} \times 10^{-6} \quad \text{Equation (7)}$$

Where:

- $PEF_y$  = Total project emissions from fossil fuel usage in year  $y$  (t CO<sub>2</sub>)
- $FC_{PJ,i,y}$  = Fossil fuel consumed by project vehicle / EMM category  $i$  in year  $y$  (kg)
- $NCV_{PJ,i}$  = Net calorific value of fossil fuel consumed by project vehicle / EMM category  $i$  (MJ/kg)
- $EFCO2_{PJ,i}$  = CO<sub>2</sub> emission factor of fossil fuel consumed by project vehicle / EMM category  $i$  (g CO<sub>2</sub>/MJ)

Fossil fuel consumed by project vehicles or EMM may be measured or calculated using the following equation:

$$FC_{PJ,i,y} = SFC_{PJ,i,y} \times SU_{PJ,i,y} \times N_{PJ,i,y} \times 10^{-3} \quad \text{Equation (8)}$$

Where:

- $FC_{PJ,i,y}$  = Fossil fuel consumed by project vehicle / EMM category  $i$  in year  $y$  (kg)
- $SFC_{PJ,i,y}$  = Specific fuel consumption factor for project vehicle / EMM category  $i$  in year  $y$  (g/km for vehicles and g/h for EMM)
- $SU_{PJ,i,y}$  = Units of service of project vehicle / EMM category  $i$  in year  $y$  (average annual distance in kilometers for vehicles or average annual operating hours for EMM)
- $N_{PJ,i,y}$  = Number of operational project vehicles / EMM in category  $i$  in year  $y$

Plug-in hybrid vehicles / EMM, must determine  $FC_{PJ,i,y}$  based on measurement. Equation 8 may be used if no simultaneous electricity and fuel is consumed.

### Total project emissions

$$PE_y = PEE_y + PEF_y \quad \text{Equation (9)}$$

Where:

$PE_y$	=	Total project emissions in year $y$ (t CO <sub>2</sub> )
$PEE_y$	=	Total project emissions from electricity usage in year $y$ (t CO <sub>2</sub> )
$PEF_y$	=	Total project emissions from fossil fuel usage in year $y$ (t CO <sub>2</sub> )

### 8.3 Leakage Emissions

No change from *AMS-III.C*.

### 8.4 Net Reductions

No change from *AMS-III.C*.

## 9 MONITORING

Project proponents must follow the monitoring procedures of the most recent version of *AMS-III.C*. and apply the changes indicated in this section.

### 9.1 Data and Parameters Available at Validation

This refers to the parameters *NCV*, *EFCO2*, and *IR*. Project proponents must follow the procedures provided in the most recent version of *AMS-III.C*.

Data / Parameter	$SFC_{BL, i}$
Data unit	g/km for vehicles and g/h for mobile machinery
Description	Specific fuel consumption of baseline vehicle / mobile machinery category $i$
Equations	Equation (3)
Source of data	As per options 1 through 5
Value applied	As per options 1 through 5
Justification of choice of data or description of measurement methods and procedures applied	As per options 1 through 5
Purpose of Data	Calculation of baseline emissions
Comments	Depending on the option selected, monitoring may be required

## 9.2 Data and Parameters Monitored

Project proponents must follow the procedures provided in the most recent version of *AMS-III.C*. and apply the changes indicated in this section. Changes are made to include mobile machinery in the following parameters.

Data / Parameter:	$FC_{PJ,i,y}$
Data unit:	kg
Description:	Fossil fuel consumed by project vehicle / EMM category $i$ in year $y$
Equations	Equation (10)
Source of data:	Fuel charging records
Description of measurement methods and procedures to be applied:	Fuel charging records of project vehicles / EMM
Frequency of monitoring/recording:	Annual aggregation
QA/QC procedures to be applied:	The fuel charging records will be crosschecked with driver logs or invoices from filling station and with typical Specific Fuel Consumption for the vehicle / EMM type.
Purpose of data:	<i>Calculation of project emissions</i>
Calculation method:	NA
Comments:	NA

Parameters 1, 3 and 4 from AMS-III.C. must be replaced as follows:

**Data/Parameter table 1.**

Data / Parameter:	$SU_{PJ,i,y}$
Data unit:	Vehicles: kilometers EMM: hours
Description:	Units of service of project vehicle / EMM category $i$ in year $y$
Source of data:	Measurement

Measurement procedures (if any):	<p>Measure the annual units of service provided by the project vehicles / EMM through:</p> <p>Option (A): monitoring of all project vehicles / EMM units</p> <p>or</p> <p>Option (B): representative sample survey for each project vehicle and EMM category <math>i</math>. Sample units must be chosen in accordance with the most recent version of the <i>Guidelines for Sampling and Surveys for CDM Project Activities and Programmes of Activities</i> using a 90% confidence interval and <math>\pm 10\%</math> precision to determine the sample size. The lower bound of the 90% confidence interval must be used as the annual units of service.</p>
Any comment:	Average annual distance traveled in kilometers for project vehicles or average annual operating hours for EMM

Data / Parameter table 1.

Data / Parameter:	$SEC_{PJ,i,y}$
Data unit:	Vehicles: kWh/km EMM: kWh/h
Description:	Specific electricity consumption per unit of service of project vehicle / EMM category $i$ in year $y$
Source of data:	Measurement
Measurement procedures (if any):	<p>Measure the specific electricity consumption through:</p> <p>Option (A): monitor electricity consumption of all project vehicles / EMM</p> <p>or</p> <p>Option (B): measure the specific electricity consumed for a representative sample of each project vehicle / EMM category. Sample vehicles / mobile machinery must be chosen in accordance with the most recent version of the <i>Guidelines for Sampling and Surveys for CDM Project Activities and Programmes of Activities</i> using a 90% confidence interval and <math>\pm 10\%</math> precision to determine the sample size. The upper bound of the 90% confidence interval must be used as the specific electricity consumed.</p> <p>Plug-in hybrid vehicles / EMM, must determine <math>SEC_{PJ,i,y}</math> based on running on 100% electricity, i.e. no fuel consumption.</p> <p>Project proponents must cross-check values against vehicle manufacturer specifications of specific energy consumption and use the highest of the two values.</p>
Any comment:	-

Data / Parameter table 2.



Data / Parameter:	$SFC_{PJ,i,y}$
Data unit:	Vehicles: g/km EMM: g/h
Description:	Specific fuel consumption factor for project vehicle / EMM category $i$ in year $y$
Source of data:	Measurement
Measurement procedures (if any):	<p>Measure the specific fossil fuel consumption through:</p> <p>Option (A): monitor consumption of all project vehicles / EMM or</p> <p>Option (B): measure the specific fossil fuel consumption for a representative sample of each project vehicle / EMM category. Sample vehicles / mobile machinery must be chosen in accordance with the most recent version of the <i>Guidelines for Sampling and Surveys for CDM Project Activities and Programmes of Activities</i> using a 90% confidence interval and <math>\pm 10\%</math> precision to determine the sample size. The upper bound of the 90% confidence interval must be used as the specific fuel consumption factor.</p> <p>Plug-in hybrid vehicles / EMM, must determine <math>SFC_{PJ,i,y}</math> based on running 100% on fossil fuel, i.e. no electricity consumption.</p> <p>Project proponents must cross-check values against vehicle manufacturer specifications of specific fuel consumption and use the highest of the two values.</p>
Any comment:	-

Data parameter tables 6, 7, 8, and 9 replace the term “project vehicle(s)” with the term “project vehicle(s) / EMM.”

### 9.3 Description of the Monitoring Plan

All monitoring requirements of the most recent version of *AMS-III.C.* must be followed.

# DOCUMENT HISTORY

Version	Date	Comment
v1.0	03 July 2025	<p>This revision to <i>AMS-III.C.</i> incorporates the following updates:</p> <ul style="list-style-type: none"><li>• Inclusion of battery-electric mobile machinery and plug-in hybrid electric mobile machinery</li><li>• Replacement of CDM <i>TOOL21 Demonstration of additionality of small-scale project activities</i> with <i>VT0008 Additionality Assessment</i></li><li>• Replacement of CDM <i>TOOL05 Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation</i> (which uses <i>TOOL07 Tool</i> to calculate the emission factor for an electricity system) with <i>VT0011 Electricity System Emission Factors</i></li></ul>