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Initiative for Climate Action Transparency - ICAT

MRV Procedure

UNEP DTU
PARTNERSHIP

Contents

PROCEDURE for DATA MONITORING at O & M Company – P1

Passenger shift from private to public

Procedure: P1_PRS_OMC

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved under the Passenger shift from private to public. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities (One week survey per year)

1. The MRV focal point at O & M Company shall enter the following information annually into the companies monitoring system using the collected data during survey week.

Table 1: data requirement

Data requirement	Indicator	Unit
Number of vehicle-kilometers vehicle category *i* using fuel type *n* driven in year *x* or number of vehicles in vehicle category *i* using fuel type *n* in year *x*	$\mathbf{N}_{i,n,x}$	Vehicles
Number of vehicle-kilometers of category *i* driven in year *x* or number of vehicles of category *i* in year x	$\mathbf{N}_{i,x}$	Vehicles
Number of stations *sp* selected in the stratum *h* (3 stratus are created i.e. high, medium and low passenger flow);	$\mathbf{n}_{lhps}$	Stations
Total number of *stations* sp in the stratum *h*	$\mathbf{N}_{lhps}$	Stations
Number of passengers selected in the station *sp*, in stratum *h*	$\mathbf{n}_{ihps}$	Passengers
Total number of passengers in the station *sp*, in stratum *h*	$\mathbf{N}_{ihps}$	Passengers
Number of passengers in the time period of the survey (1 week)	$\mathbf{P}_{SPER}$	Passengers

X-Project year
n -Fuel types (Diesel, petrol, etc.)
i- Vehicle categories
sp - Station

Table 2: Monitoring template

MONITORING TEMPLATE TO BE USED AT O & M COMPANY																								
Year : 20XX	1 Day : 20YY/ MM/DD Number of passengers in the 1st of the survey : NNNN																							
Number of vehicles in category i	Cars (i1)				Motorcycles (i2)				Three-Wheeler (i3)				Bus (i4)				Van (i5)				Pickups (i6)			
Number of vehicles in vehicle category i using fuel type n (n1: Gasoline (Petrol), n2: Diesel, n3: Electricity, n4: Fuel gas)	n1	n2	n3	n4	n1	n2	n3	n4	n1	n2	n3	n4	n1	n2	n3	n4	n1	n2	n3	n4	n1	n2	n3	n4
Total number of stations sp in the stratum h (h1: High, h2 : Medium, h3: Low)	h1								h2								h3							
Number of stations sp selected in the stratum h (3 stratus are created i.e. high, medium and low passenger flow);																								
Number of passengers selected in the station sp, in stratum h (sp1: Station 1, sp2: Station 2, sp3:	sp1	sp2	sp3	sp4	sp5	sp6	sp7	sp8	sp1	sp2	sp3	sp4	sp5	sp6	sp7	sp8	sp1	sp2	sp3	sp4	sp5	sp6	sp7	sp8

Station 3, sp4: Station 4,sp5 .....)																							
Total number of passengers in the station *sp, in stratum h*																							

Note: This template covers data collection for one day. Data for seven (7) consecutive days should be collected on this format for each year using data collected through the survey

1. Fill data for the remaining 6 days using same template

2. Calculate number of passengers in the time period of the survey (1 week) using the survey data

3. The completed tables with survey data (including number of passengers in the time period of the survey) are submitted to MRV Manager at O & M Company

4. The completed tables in the company monitoring system will submitted to the NDC center in the end of year

Back up procedure - activities in case of issues with primary data

1. Collect necessary data

Table 3: data requirement

Data requirement	
Number of vehicles in vehicle category *i* using fuel type *n* in year *x*	National default value can be used
Number of vehicles of category *i* in year x	National default value can be used
Total Population of Sri Lanka in the year x	Collect data from national statistics
Total number of passengers in the station sp, in stratum h in year x	Collect data from number of sale of tickets in each station

1. Decide stratum of station using ticket sale

2. Calculate remaining data by using the collected data in the previous table

3. After that follow the same reporting procedure to NDC unit as described before

Annual Activities

The MRV focal point at O & M Company shall enter the following information annually into the companies monitoring system

Table 4: Data requirement

Data requirement	Indicator	Unit
Baseline trip distance *p* per surveyed passenger using mode *i* in the year *y*	$\mathbf{BTD_{,p,i,y}}$	km
Indirect project trip distance of the surveyed passenger using mode "i"	$\mathbf{IPTD_{p,y,i}}$	km

y- Project year

i- Vehicle categories

p –Distance

Measure and record above data annually

Table 5: Data requirements

Data requirements Date 20XX/XX/XX	Value	Unit
Baseline trip distance *p* per surveyed passenger using mode *i* in the year *y*		km
Indirect project trip distance of the surveyed passenger using mode "i"		km
Year	20XX	

1. The completed table will submitted to MRV Manager at O & M Company

The completed tables in the company monitoring system will submitted to the NDC center in the end of year

Monthly Activities

1. The MRV focal point at O & M Company shall enter the following information monthly into the companies monitoring system

Table 6: Data Requirement

Data requirement	Indicator	Unit
Total number of passengers in the year *y*	$\mathbf{P_y}$	Passengers
Quantity of electricity consumed by the LRT	$\mathbf{EC_{PJ,y}}$	MWh

Y-Project year

Table 7: data requirement

Data requirement	Collection methods	01 /xx	02 /xx	03 /xx	04 /xx	05 /xx	06 /xx	07 /xx	08 /xx	09 /xx	10/ xx	11/ xx	12/ xx
Total number of passengers in the year *y* (Passengers)	Tickets												
Quantity of electricity consumed by the LRT(MWh)	Bills												

The completed table will submitted to MRV Manager at O & M Company in the end of the year

The completed tables in the company monitoring system will submitted to the NDC center in the end of the year

Annex 1: Survey Template

SECTION A: Data concerning surveyor

Survey ID (correlative number): ……..

Interviewer: ……..

Date:……..

Time: ……..

Place (station) where interview was performed:……..

Survey response/completeness:

☐ Survey was fully completed

☐ Survey was fully or partially not responded

Comments/Observations of surveyor:…?…?…?…?…?.

SECTION B: General Data of Interviewed Person

This section can also be filled out at the end of the interview!

Age of surveyed person:

☐ 12-17 years ☐ 18-25 years ☐ 26-35 years ☐ 36-45 years ☐ 46-55 years ☐ 56-65 years ☐ over 65 years

Gender of the surveyed person

☐ female ☐ male

Socio-economic level of the surveyed person

☐ < 1 minimum wage ☐ 1-2 minimum wages ☐ 2-4 minimum wages ☐ 4-6 minimum wages

☐ > 6 minimum wages

SECTION C: Trip Data of Interviewed Person

Question 1

"Describe the trip you are currently realizing"

Your trip origin (starting trip point, e.g. my home):……

1.1. Your entry (boarding) station LRT lane (name or code of LRT station):……

1.2. Your exit (deboarding) station LRT lane (name or code of LRT station):……

1.3. Your final trip destination (final trip point, e.g. office):……..

Explanations for the interviewer:

- *The question refers to the current trip the passenger is making;*
- *The trip origin and the trip destination shall be identified with a clear address. Use a map if it is unclear. If the person does not know or does not want to disclose this information then stop at this point. The questionnaire is deemed thereafter as non valid;*
- *The LRT stations identified in 1.2 and 1.3 shall be listed with their official names or codes;*
- *Only urban trips are considered. If the passenger has as trip origin or trip destination a point outside the boundaries of larger urban zone of the city then discontinue the interview. The questionnaire is deemed thereafter as non-valid.*

Question 2

"What mode of transport did you use from your trip start to the LRT? Please refer to the mode on which you performed the longest stretch if you used various modes"

☐ Bus (conventional not bus lane) ☐ Existing bus lane/BRT (NOT the project) ☐ Rail (NOT the project) ☐ Taxi ☐ Passenger car ☐ Motorcycle ☐ Motorized taxi tri-cycle ☐ Bike or per foot ☐ Other

Explanations for the interviewer:

- *See graph 1 for explanation;*
- *Rail refers to non-project metro, urban rail, tram etc.;*
- *Only tick 1 answer (the mode used for the longest stretch of this trip segment).*

Question 3

"What mode of transport will you use from the point where you leave the LRT lane until your final destination? Please refer to the mode on which you will perform the longest stretch if you intend to use various modes"

☐ Bus (conventional not bus lane) ☐ Existing bus lane/BRT (NOT the project) ☐ Rail (NOT the project) ☐ Taxi ☐ Passenger car ☐ Motorcycle ☐ Motorized taxi tri-cycle ☐ Bike or per foot ☐ Other

Explanations for the interviewer:

- *See graph 1 for explanation;*
- *Rail refers to non-project metro, urban rail, tram etc.;*
- *Only tick 1 answer (the mode used for the longest stretch of this trip segment).*

Question 4

"Assuming that the LRT you are currently using would not exist: Would you have made the trip you are currently doing anyway or would you have stayed at home/office/origin?"

☐ I would have made the trip" ➔ *Continue with question 5*

☐ I would have stayed at home/office/origin ➔*The questionnaire is terminated*

For the interviewer:

The purpose of this question is to know if the passenger made this trip only because the LRT exists. In absence of the LRT he would not have made any trip and would have stayed at his point of origin.

Question 5

"Have you moved your home or workplace since the start of operations of the LRT?"

☐ No ➔*continue with question 6*

☐ Yes: "Has the availability of the new LRT been an important factor when choosing the location of your new home or new workplace?"

☐ No ➔ *continue with question 6*

☐ Yes ➔ "What was your original/former trip origin and trip destination?" (at the time before you moved your home or workplace)

Origin point:…?…?…?…?…?

Destination point: …?…?…?…?….

Continue with question 6 (based on the origin and destination as identified)

Question 6

"Assuming that the LRT you are currently using would not exist: How would you have made the same trip you are doing now?"

From Home/Office/Others[1] (…?…….) to point…?…?…by *…?…?…?

From point……to point ……by *……..

From point……to point ……by *……..

From point……to home/office/others[2] (……..) by *……..

*can be

- ☐ Bus (conventional not bus lane)
- ☐ Existing bus lane/BRT (NOT the project)
- ☐ Rail (NOT the project)
- ☐ Taxi ➔ *continue with question 6A*
- ☐ Passenger car ➔ *continue with question 6B*
- ☐ Motorcycle ➔ *continue with question 6C*
- ☐ Motorized taxi tri-cycle ➔ *continue with question 6D*
- ☐ Bike or per foot
- ☐ Other

Explanations for the interviewer:

- *Rail refers to non-project metro, urban rail, tram etc.;*

For each segment of the trip make a separate answer.

Question 6A

"Have you used a taxi in the last 6 months?"

☐ Yes ☐ No

Question 6B

[1] Origin of trip
[2] Final destination

"Do you or your family own a car or do you have access to a car (e.g. car-sharing) or have you used a passenger car in the last 6 months?"

☐ Yes ☐ No

Question 6C

"Do you or your family own a motorcycle or do you have access to a motorcycle or have you used a motorcycle in the last 6 months?"

☐ Yes ☐ No

Question 6D

"Have you used a motorized taxi tri-cycle in the last 6 months?"

☐ Yes ☐ No

If interviewed persons respond in the questions 6A to 6D with NO they are not included in the final calculation i.e. this specific survey is not included as the response is deemed as non-consistent with the one given in question 6.

The questionnaire is to be reviewed by the O & M Company under Ministry of Megapolis and Western Development. The O & M Company assesses if the questionnaire is in accordance with the principles (core elements of survey) specified above.

PROCEDURE for DATA MONITORING at SLR- P2

Electrification of railway

Procedure: P2_ER_SLR

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved under the electrification of railway. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities

The MRV focal point at SLR shall enter the following information annually into the SLR-specific monitoring logbook

Table 8: Monitoring Log Book

	Year		**Month**	
Railway Line	Consumption of fuel associated with the operation of Passenger trains	Unit (tonnes/ Liter/ m^3)	Electricity consumption associated with the operation of the passenger trains	Unit (MWh / kWh)

Total				

Railway electrification			
Monitoring template to be used at SLR			
Reporting month		Reporting year	
Engine/power set number		Traveling Distance per month (km)	
Responsible Person:			
Signature:	Date:		

The logbooks calculate the amount of fuel and electricity consumed for passenger trains within the year.

The completed logbooks are submitted to MRV Manager at SLR.

Parameters to be verified /collected prior to the monitoring period

The MRV focal point at the SLR shall verify the following information for one time prior to the monitoring period or at the reporting.

Engine/Power set number

Traveling Distance per year

Fuel Usage per year

Electricity consumption per year

Back up procedure - activities in case of issues with primary data

Table 9: Back up procedure

Variable		Back-up procedure				
Engine/ Power set No:		Total km per day	Turn per day	Route No	Departure Station	Arrival station
Annual total trip distance						
		Liters per km				
Specific fuel consumption associated with the operation of passenger train						
		kWh per km				
Specific electricity consumption associated with the operation of electrified passenger train						

PROCEDURE for DATA MONITORING at SLSEA- P3

Electrification of railway

Procedure: P3_ER_SLSEA

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved under the electrification of railway. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities

The MRV focal point at SLSEA shall enter the following information annually into the specific monitoring logbook.

Table 10: Monitoring Log book

Parameter	Year	Value	Unit	Reference
CO_2 emission factor of the grid electricity			t-CO_2/MWh	
Reporting month			Reporting year	
Responsible Person				
Signature			Date	

Parameters to be verified /collected prior to the monitoring period

The completed logbook is submitted to NDC unit in the end of the year.

PROCEDURE for DATA MONITORING at NTC- P4

Purchasing new Rolling Stocks

Procedure: P4_PNRS_NTC

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved under the purchasing new rolling stock. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities

The MRV focal point at NTC shall enter the following information annually into the NTC-specific monitoring logbook

Table 11: Data Monitoring Template

Year	
Mode	Share of passengers transported in year y (%)/ modal share
Bus	
Van	
Motor Car	
Three Wheeler	
Motor Cycle	
Railway	

Total			
Monitoring template to be used at NTC			
Reporting month		Reporting year	
Responsible Person:			
Signature:		Date:	

The logbooks calculate the share of passenger transported by each mode within the year.

The completed logbooks are submitted to MRV Focal point at NTC

Parameters to be verified /collected prior to the monitoring period.

The MRV focal point at the NTC shall verify the following information for one time prior to the monitoring period or at the reporting.

Share of passenger by each transport mode

PROCEDURE for DATA MONITORING at SLR- P5

Purchasing new Rolling Stocks

Procedure: P5_PNRS_SLR

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved under the purchasing new rolling stock. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities

The MRV focal point at SLR shall enter the following information annually into the SLR-specific monitoring logbook

Table 12: Data Monitoring template

	Year		Month	
Power set No	Consumption of fuel i associated with the operation of New power sets in year y	Unit (tonnes/ Liter/ m^3)	No of passengers transported	Total distance travelled per year

Total				
Monitoring template to be used at SLR				
Reporting month		Reporting year		
Responsible Person:				
Signature:		Date:		

The logbooks calculates the amount of fuel consumption and passenger volume of new power sets within the year.

The completed logbooks are submitted to MRV Focal point at SLR.

Parameters to be verified /collected prior to the monitoring period

The MRV focal point at the SLR shall verify the following information for one time prior to the monitoring period or at the reporting.

Engine/Power set number

Traveling Distance per year

Fuel Usage of new power sets

Passenger volume transported by new power sets

PROCEDURE for DATA MONITORING at DMT- P6

Introduction of new electric and hybrid vehicles _ Tax

Procedure: P6_INEHV_DMT

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved by introducing new electric and hybrid vehicles. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities

The MRV focal point at department of motor traffics shall enter the following information annually into the companies monitoring system

Table 13: Data requirement

Data requirement	Indicator	Unit
Annual new vehicle sale of fuel type i mode j engine capacity c vehicles (year y)		No. of Vehicles
Total vehicle population		No. of Vehicles
New updates about carbon tax		

Table: Data collection template for annual new vehicle sale of fuel type i mode j engine capacity c vehicles (year y)

Table 14: Data requirement

Data requirements	Value	Unit
Year : 20XX Date : 20XX/ XX/ XX		
Vehicle mode : (Cars, Vans, Bicycles……etc.) :		
Engine capacity of the vehicles (CC) :		
Number of vehicle registration (Petrol)		No. of Vehicles
Number of vehicle registration (Diesel)		No. of Vehicles
Number of vehicle registration (Petrol/electric or Petrol hybrid)		No. of Vehicles
Number of vehicle registration (Diesel/electric or Diesel hybrid)		No. of Vehicles
Number of vehicle registration (Electric)		No. of Vehicles
Total vehicle population for the year		No. of Vehicles

Enter the data into monitoring system

Collect the new updates of carbon tax from Sri Lanka Budget, if any

The completed tables submit to MRV Manager at DMT

The completed tables in the company monitoring system submit to the NDC unit under Ministry of Transport

Back up procedure - activities in case of issues with primary data

Table 15: Data Requirements

Data requirement	
annual new vehicle sale of fuel type i mode j engine capacity c vehicles (year y)	Vehicle retailers
Updates on carbon tax	Ministry of Finance

Collect necessary data

The completed tables submit to MRV Manager at DMT

The completed tables in the company monitoring system submit to the NDC unit under Ministry of Transport

Quinquennial Activities

The MRV focal point at department of motor traffics shall enter the following information every five year into the companies monitoring system

Table 16: Data Requirements

Data requirement	Indicator	Unit
Specific fuel consumption. Average consumption per VKT in municipal, regional or national fleet (with fuel type *i*, mode *j*, in year *y*)		Litre per VKT

note: Data collection template for specific fuel consumption (with fuel type *i*, mode *j*, in year *y*)

Table 17: Data Requirements

Data requirements	Value	Unit
Year : 20XX Date : 20XX/ XX/ XX		
Vehicle mode: (Cars, Vans, Bicycles……etc.):		
Specific electricity consumption (Electric)		kWh per VKT

Enter the data into monitoring system

The completed tables submit to MRV Manager at DMT

The completed tables in the company monitoring system submit to the NDC unit under Ministry of Transport

Back up procedure - activities in case of issues with primary data

Table 18: Data Requirements

Data requirement	
Specific fuel consumption. Average consumption per VKT in municipal, regional or national fleet (with fuel type *i*, mode *j*, in year *y*)	Default values in CDM TOOL18 Methodological tool: Baseline emissions for modal shift measures in urban passenger transport Version 01.0

Collect necessary data

The completed tables submit to MRV Manager at DMT

The completed tables in the company monitoring system submit to the NDC unit under Ministry of Transport

PROCEDURE for DATA MONITORING at SLC-P7

Introduction of new electric and hybrid vehicles _ Tax

Procedure: P7_INEHV_SLC

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved by introducing new electric and hybrid vehicles. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities

Table 19: Data requirements

Data requirement	Indicator	Unit
Cost, Insurance and Freight (CIF) value		Rs.
New updates about tax		

Data collection template for annual CIF value of fuel type i mode j engine capacity c vehicles (year y)

Table 20: Data Requirements

Data requirements	Value	Unit
Year : 20XX Date : 20XX/ XX/ XX		
Vehicle mode: (Cars, Vans, Bicycles……etc.) :		
Engine capacity of the vehicles (CC) :		
CIF value of vehicle (Petrol)		Rs.
CIF value of vehicle (Diesel)		Rs.

CIF value of vehicle (Petrol/electric or Petrol hybrid)		Rs.
CIF value of vehicle (Diesel/electric or Diesel hybrid)		Rs.
CIF value of vehicle (Electric)		Rs.

The MRV focal point at Sri Lanka Customs shall enter the following information annually into the companies monitoring system

Enter the data into monitoring system

Collect the new updates of tax from Sri Lanka Budget, if any

The completed tables submit to MRV Manager at SLC

The completed tables in the company monitoring system submit to the NDC unit under Ministry of Transport

Back up procedure - activities in case of issues with primary data

Table 21: Data Requirements

Data requirement	
Updates on tax	Ministry of Finance

Collect necessary data

The completed tables submit to MRV Manager at SLC

The completed tables in the company monitoring system submit to the NDC unit under Ministry of Transport

PROCEDURE for DATA MONITORING at SLTB- P8

Introduce electric buses

Procedure: P8_IEV_SLTB

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved under the introduction of electric buses NDC. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities

The MRV focal point at SLTB shall enter the following information annually into the SLTB specific monitoring logbook

Table 22: Data requirements

Data requirement	Indicator	Unit
Annual average distance travelled by project vehicle category *i* in the year *y*	$DD_{i,y}$	km
Number of operational project vehicles in category *i* in year *y*	$N_{i,y}$	
Specific fuel consumption of baseline vehicle category *i*	SFC_i	g/km
Specific electricity consumption by project vehicle category *i* per km in year *y* in urban conditions	$SEC_{PJ,km,i,y}$	kWh/km

i – Buses

Table 23: Data requirements

MONITERING TEMPLATE TO BE USED AT SLTB - 1			
Year		**Region**	
Bus category	Electric		
Number of the bus	**Total distance travelled (km)**	**Total electricity consumption (kWh)**	**Specific electricity consumption (kWh/km)**

Table 24: Data requirements

MONITERING TEMPLATE TO BE USED AT SLTB - 2			
Year		Region	
Bus category		Fuel type	
Number of the bus	**Total distance travelled (km)**	**Total fuel consumption (L)**	**Specific fuel consumption (L/km)**

The logbooks record the transport distance, total fuel/electricity consumption

The logbook calculates the specific fuel/electricity consumption

The completed logbooks are submitted to MRV Manager at SLTB

The completed logbook will submitted to NDC unit in the end of the year

Parameters to be verified /collected prior to the monitoring period

The MRV focal point at the SLTB shall verify the following information for one time prior to the monitoring period or at the reporting

Bus number

Fuel type (Diesel/electric)

Number of seats in each bus

Back up procedure - activities in case of issues with primary data

Annual average distance travelled by project vehicle

Table 25: Template for annual average distance travelled by project vehicle

Year		Region	
Bus category	electric		
Total number of buses	**Total distance travel (km)**	**Average annual distance travelled (Total distance/number of buses**	

Specific fuel consumption

Table 26: Template for specific fuel consumption

Year		**Bus category**	
Region		**Fuel type**	

Total number of buses	
Total fuel consumption (L)	
Total distance transport (km)	
Specific fuel consumption (L/km)	

Specific electricity consumption

Table 27: Template for specific electricity consumption

Year		**Bus category**	
Region		**Total number of buses**	
Total electricity consumption (kwh)			
Total distance transport (km)			
Specific electricity consumption (kWh/km)			

PROCEDURE for DATA MONITORING at CPSTL-P9

Freight shift from road to rail

Procedure: P9_FSRR_CPSTL

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved under the freight shift from road to rail NDC. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Daily Activities

The MRV focal point at CPSTL shall enter the following information daily into the CPSTL-specific monitoring logbook

Table 28: Data Requirements

Data requirement		Unit
Amount of fuel *i* consumed by the trucks in year *x*	$FC_{BL,i,x}$	liter or m^3
Amount of cargo transported in trucks in year *x*	T_x	tonne
Amount of cargo transported in trucks in the return trips in year *x*	$T_{RT,x}$	tonne
Distance of the return trip route in year *x*	RTD_x	km
Distance of the baseline trip route (km)	AD	km
Weighted average net calorific value of fuel type i in year y	NCVi,y	GJ per m^3 or ton

x -Year (365 days) prior to the implementation of the project activity

y -Project year

i -Fuel types (Diesel, petrol, etc.)

Table 29: monitoring template

MONITERING TEMPLATE TO BE USED AT CPSTL						
Date						
Dispatch center		**Received center**		**Trip distance**		km
Number of the Bowser		Amount of fuel transported (MT)		Fuel type use in the running tank		Amount of fuel combusted by bowser (L/m^3)
Total				Diesel		
				Petrol		

Note: If return trips are non-empty, please provide above information for those trips as well.

The logbooks calculates the amount of fuel transported

The logbook calculates the amount of fuel combusted by bowsers for the operation

The completed logbooks are submitted to MRV Manager at CPSTL

The completed logbook will submitted to NDC unit in the end of the year

Parameters to be verified /collected prior to the monitoring period

The MRV focal point at the CPSTL shall verify the following information for one time prior to the monitoring period or at the reporting

Bowser number

Fuel type

Bowser capacity

Net Calorific value of the fuel

Etc

Back up procedure - activities in case of issues with primary data

Table 30: Monitoring template

MONITERING TEMPLATE TO BE USED AT CPSTL						
Reporting year						
Dispatch center		**Received center**		**Trip distance**		km
Number of the bowser	Capacity of the bowser (L/MT)	Fuel type use in the running tank	Fuel economy of the bowser (L/t.km)	Amount of fuel transported (MT)		

PROCEDURE for DATA MONITORING at SLR-P10

Freight shift from road to rail

Procedure: P10_FSRR_SLR

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved under the freight shift from road to rail NDC. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Daily Activities

The MRV focal point at SLR shall enter the following information daily into the SLR-specific monitoring logbook

Table 31: Data requirements

Data requirement	Indicator	Unit
The origin and destination point and transportation route of the cargo transported by train in year *y*	OD_y	km
Type of cargo transported by the project transportation mode in year *y*	C_{ty}	
Amount of cargo transported by train in year *y*	T_y	tonne
Amount of cargo transported by train in the return trips in year *y*	$T_{RT,y}$	tonne
Quantity of fuel type i combusted for cargo transportation	$FC_{i,j,y}$	m^3/yr

y -Project year

i -Fuel types (Diesel, petrol, etc.)

Table 32: Monitoring template

MONITERING TEMPLATE TO BE USED AT SLR					
Date				**Cargo type**	
Dispatch center		**Received center**			
Engine Type		Engine Number	Trip Distance (km)	Amount of fuel transported (MT)	Amount of fuel combusted by train (L/m^3)

Note: If return trips are non-empty, please provide above information for those trips as well.

The logbooks calculates the amount of cargo transported

The logbooks calculated the amount of fuel consumed for the operation

The completed logbooks are submitted to MRV Manager at SLR

The completed logbook will submitted to the NDC center in the end of year

Back up procedure - activities in case of issues with primary data

Table 33: Back up procedure

MONITERING TEMPLATE TO BE USED AT SLR					
Date				**Cargo type**	
Dispatch center		**Received center**			
Engine Type		Engine Number	Trip Distance (km)	Fuel economy of the Engine (L/t.km)	Amount of fuel transported (MT)

PROCEDURE for DATA MONITORING at VET-P11

Introduction of new electric and hybrid vehicles _ Tax

Procedure: P11_INEHV_VET

Approved by:

OVERVIEW

This procedure outlines the roles and responsibilities of the personnel involved in monitoring and reporting of emission reductions achieved by introducing new electric and hybrid vehicles. The procedure shall serve as a manual to describe in details the activities to be carried out to ensure comprehensive and accurate monitoring, reporting and verification (MRV) of the project activity.

Annual Activities

Table 34: Data requirements

Data requirement	Indicator	Unit
Vehicle kilometers travelled (with fuel type *i*, mode *j*, in year *y*)	$d_{i,j,y}$	km

The MRV focal point at vehicle emission testing shall enter the following information annually into the companies monitoring system

Feed the average vehicle kilometers data into the available data base of VET

Calculate average vehicle kilometers travelled for the fuel type i, mode j, in year y using new software

Table 35: Data requirements

Data requirements	Value	Unit
Year : 20XX Date : 20XX/ XX/ XX		
Vehicle Mode : (Cars, Vans, Bicycles……etc.) :		
Vehicle kilometers travelled (Petrol)		km
Vehicle kilometers travelled (Diesel)		km
Vehicle kilometers travelled (Petrol/electric or Petrol hybrid)		km
Vehicle kilometers travelled (Diesel/electric or Diesel hybrid)		km

The completed tables will be submitted to MRV Manager at VET

The completed tables in the company monitoring system will submitted to the NDC center

Back up procedure - activities in case of issues with primary data

Collect necessary data

Table 36: Data requirements

Data requirement	
Vehicle kilometers travelled (Petrol)	IPCC_AR5_Annex III : Technology-specific Cost and Performance Parameters
Vehicle kilometers travelled (Diesel)	
Vehicle kilometers travelled (Petrol/electric or Petrol hybrid)	
Vehicle kilometers travelled (Diesel/electric or Diesel hybrid)	

The completed tables will be submitted to MRV Manager at VET

The completed tables in the company monitoring system will submitted to the NDC unit at Ministry of Transport and Civil Aviation