Revised Monitoring Plan

I.1 Project Activity

Title: Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by-products, tyres and municipal solid waste (MSW) in the manufacturing of portland cement at Grasim Industries Limited-Cement Division South (GIL-CDS), Tamilnadu, India

UN ref no – 0339

Date – 03/06/2008

Version - 01

II.1: Monitoring Methodology

Title: "Emission reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture"

REFERENCE: ACM003 VER01, WWW.UNFCCC.INT

II.2: Monitoring Period

The monitoring of parameters has been done for both baseline emission and project emissions calculations. Monitoring period chosen for the project activity is from 01/04/2006 -31/10/2007. Parameters monitored during the period and their recording frequency is given in the table below. Data has been archived for verification purpose.

II.3 Emission Reduction Calculations

Project Emissions Calculations

Step 1. Calculate project heat input from alternative fuels

Heat input from alternative fuels with significant moisture content is calculated first to allow for the calculation of a project-specific moisture "penalty" for alternative fuel heat input requirements.

$$HI_{AF} = \sum Q_{AF} \times HV_{AF} \quad \textbf{(1)}$$

Where:

HI_{AF} = heat input from alternative fuels (TJ/yr)

Q_{AF} = quantity of each alternative fuel (tones/yr)

HV_{AF} = lower heating value of the alternative fuel(s) used (TJ/tone fuel).

Step 2. Calculate alternative heat input as a share of total baseline fossil fuel heat input

$$S_{AF} = \frac{HI_{AF}}{(\sum Q_{FF} \times HV_{FF}) + HI_{AF}} \quad \textbf{(2)}$$

Where:

S_{AF} = alternative heat input share of total baseline fossil fuel heat input

HI_{AF} = heat input from alternative fuels (TJ/yr)

Q_{FF} = quantity of each fossil fuel used in baseline (tones/yr)

HV_{FF} = lower heating value of the fossil fuel(s) used in baseline (TJ/tone fuel).

Step 3. Application of project specific moisture "penalty"

$$mp = \frac{(HC_{AF}(i) - HC_{FF})}{S_i} \times 10 \quad \textbf{(3)}$$

Where:

mp = moisture penalty (MJ/tonne/10% alternative fuel share of total heat input)

$HC_{AF}(i)$ = specific heat consumption using *i* % alternative fuel (MJ/tone clinker)

HC_{FF} = specific heat consumption using fossil fuels only (MJ/tone clinker)

Si = alternative fuel heat input share of total baseline heat input in the moisture penalty test

The total moisture penalty is therefore calculated as follows:

$$MP_{Total} = \frac{S_{AF}}{10\%} \times C \times mp \quad \textbf{(4)}$$

Where:

MP_{Total} = total moisture penalty (TJ/yr)

S_{AF} = alternative fuel heat input share of total baseline heat input

C = total clinker production (tones/yr)

mp = moisture penalty (MJ/tonne-10% alternative fuel share of total heat input)

Step 4: Calculate GHG emissions from the use of alternative fuels in kilns:

$$AF_{GHG} = \sum (Q_{AF} \times HV_{AF} \times EF_{AF}) \quad \textbf{(5)}$$

Where:

AF_{GHG} = GHG emissions from alternative fuels (tCO_2e/yr)

Q_{AF} = monitored alternative fuels input in clinker production (tones/yr).

HV_{AF} = heating value(s) of the alternative fuel(s) used (TJ/tone fuel).

EF_{AF} = emission factor(s) of alternative fuel(s) used (tCO_2e/TJ).

Step 5. Calculate GHG emissions due to on-site transportation and drying of alternative fuels

OTGHG = (RC * OHrs)/1000 * EEF + (FD * FD_HV * VEFD) **(6)**

Where:

OTGHG = GHG emissions from on-site transport and drying of alternative fuels (tCO2e/yr)

RC = Rated capacity of all motors involved (kW)

OHrs = Total annual operating hours for Alternate Fuel System

EEF = electricity emission factor for coal based CPP (tCO2/MWh)

FD = fuel used for drying alternative fuels (t/yr),

FD_HV = heating value of the fuel used for drying (TJ/t fuel), and

VEFD = emission factor of the fuel used for drying (tCO2/TJ)

Step 6. Calculate emission savings from reduction of on-site transport of fossil fuels

$$OT\_GHG_{FF} = OF_{FF} \times EF_{T\,CO2e} \quad \textbf{(7)}$$

Where:

$OT\text{-}GHG_{FF}$ = emissions from reduction of on-site transport of fossil fuels (tCO2e)

OF_{FF} = fuel saving from on-site transportation of fossil fuels (t/yr)

$EF_{T\,CO2e}$ = emission factor of fuel used for transportation (tCO2e/t fuel),

Baseline Emissions

1. Calculate the baseline GHG emissions from the fossil fuel(s) displaced by the alternative fuel(s)

$$FF_{GHG} = [(Q_{AF} \times HV_{AF}) - MP_{TOTAL}] \times EF_{FF} \quad \textbf{(8)}$$

Where:

FF_{GHG} = GHG emissions from fossil fuels displaced by the alternatives (tCO_2/yr)

$Q_{AF} * HV_{AF}$ = total actual heat provided by all alternative fuels (TJ/yr)

MP_{total} = total moisture penalty (TJ/yr)

EF_{FF} = emissions factor(s) for fossil fuel(s) displaced (tCO_2/TJ).

EF_{FF} is the baseline value and would be the weighted average for the mix of fossil fuels if more than one fossil fuel is used.

Leakage Calculations

Step 1. Calculate CH_4 emissions due to biomass that would be burned in the absence of the project.

$$BB_{CH4} = Q_{AF-B} * BCF * CH_4F * CH_4/C * GWP\_CH_4 \quad \textbf{(9)}$$

Where:

BB_{CH4} = GHG emissions due to burning of biomass that is used as alternative fuel (tCO2e/yr)

Q_{AF-B} = amount of biomass used as alternative fuel that would have been burned in the open field in the absence of the project (t/yr)

BCF = carbon fraction of the biomass fuel (tC/t biomass) estimated on basis of default values,

CH_4F = fraction of the carbon released as CH4 in open air burning (expressed as a fraction),4

CH_4/C = mass conversion factor for carbon to methane (16 tCH4/12 tC), and

GWP_CH_4 = global warming potential of methane (21).

Step 2. Calculate the CH4 emissions due to anaerobic decomposition of wastes in landfills.

$$LW_{CH4} = Q_{AF-L} * DOC * DOC_F * MCF * F * C * (1-OX) * NFL * GWP\_CH_4 \quad \textbf{(10)}$$

Where:

LW_{CH4} = baseline GHG emissions due to anaerobic decomposition of biomass wastes in landfills (tCO_{2e}/yr)

Q_{AF-L} = amount of wastes (e.g. biomass) used as alternative fuel that would be land-filled in the absence of the project (t/yr)

DOC = degradable organic carbon content of the waste (%)

DOC_F = portion of DOC that is converted to landfill gas (0.77 default value)

MCF = methane conversion factor for landfill (%)

F = fraction of CH_4 in landfill gas (0.5 default value)

C = carbon to methane conversion factor (16/12)

OX = oxidation factor (fraction default is 0)

NFL = non-flared portion of the landfill gas produced (%)

GWP_CH_4 = global warming potential of methane (21).

Step 3. Calculate emissions from off-site transport of alternative and fossil fuels.

The emissions from transportation should be calculated as follows:

$$LK_{trans} = LK_{AF} - LK_{FF} \quad \textbf{(11)}$$

$LK_{AF} = (Q_{AF}/CT_{AF}) * DAF * EFCO2e/1000$ **(12)**

$LK_{FF} = (Q_{FF}/CT_{FF}) * D_{FF} * EF_{CO2e}/1000$ **(13)**

Where:

LK_{trans} = leakage from transport of alternative fuel less leakage due to reduced transport of fossil fuels (tCO_2/yr)

LK_{AF} = leakage resulting from transport of alternative fuel (tCO_2/yr)

LK = leakage due to reduced transport of fossil fuels (tCO_2/yr)

Q_{AF} = quantity of alternative fuels (tones)

CT_{AF} = average truck or ship capacity (tones/truck or ship)

D_{AF} = average round-trip distance between the alternative fuels supply sites and the cement plant sites (km/truck or ship)

Q_{FF} = quantity of fossil fuel (tones) that is reduced due to consumption of alternative fuels.

CT_{FF} = average truck or ship capacity (tones/truck or ship)

D_{FF} = average round-trip distance between the fossil fuels supply sites and the cement plant sites (km/truck or ship)

EF_{CO2e} = emission factor from fuel use due to transportation (kg CO_{2e}/km) estimated as:

$EF_{CO2e} = EFT_{CO2} + (EF_{T\,CH4} * 21) + (EF_{T\,N2O} * 310)$ **(14)**

Where:

$EF_{T\,CO2}$ = emission factor of CO_2 in transport (kg CO_2/km)

$EF_{T\,CH4}$ = emission factor of CH_4 in transport (kg CH_4/km)

$EF_{T\,N2O}$ = emission factor of N_2O in transport (kg N_2O/km)

21 and 310 are the Global Warming Potential (GWP) of CH_4 and N_2O respectively.

Step 4. Calculate emissions from off-site preparation of alternative fuels

The GHG emissions generated during the preparation of alternative fuels outside the project site are estimated as follows:

$GHG_{PAFO} = FD_{AFO} * HV_{FDAFO} * EF_{FDAFO} + PD_{AFO} * EF_{pO}$ **(15)**

Where:

GHG_{PAFO} = GHG emissions that could be generated during the preparation of alternative fuels outside the project site (tCO_2/yr)

FD_{AFO} = fuel used in drying of alternative fuels outside the project site (t/yr)

HV_{FDAFO} = heating value of fuel used for drying alternative fuels outside the project site (TJ /tone)

EF_{FDAFO} = emission factor for the fuel used for drying of alternative fuels outside the project site (tCO_2/TJ)

PD_{AFO} = power consumption in drying the alternative fuels (MWh/yr) outside the project site

EF_{pO} = CO_2 emission factor due to power generation outside the project where the drying of alternative fuels takes place, determined according to the methodology presented in AM0002 (tCO_2/MWh).

Emission Reduction Calculations

Emission reductions by the project activity

Total emission reductions are given by the following formula

$AF_{ER} = FF_{GHG} - AF_{GHG} - OT_{GHG} - LK_{trans} + OT\_GHG_{FF} + BB_{CH4} + LW_{CH4} - GHG_{PAFO}$ **(16)**

Where:

FF_{GHG} = GHG emissions from fossil fuels displaced by the alternatives (tCO_2/yr)

AF_{GHG} = GHG emissions from alternative fuels (tCO_{2e}/yr)

OT_{GHG} = GHG emissions from on-site transport and drying of alternative fuels (tCO_{2e}/yr)

LK_{trans} = leakage from transport of alternative fuel less leakage due to reduced transport of fossil fuels (tCO_2/yr)

$OT\text{-}GHG_{FF}$ = emissions from reduction of on-site transport of fossil fuels (tCO_{2e})

BB_{CH4} = GHG emissions due to burning of biomass that is used as alternative fuel (tCO_{2e}/yr)

LW_{CH4} = baseline GHG emissions due to anaerobic decomposition of biomass wastes in landfills (tCO_{2e}/yr)

GHG_{PAFO} = GHG emissions that could be generated during the preparation of alternative fuels outside the project site (tCO_2/yr)

II.4: Monitoring Parameters

II.4.1For project emissions Calculations

ID number	***Data variable***	***Source of data***	***Data unit***	***Measured (m), calculated (c) or estimated (e)***	***Recording Frequency***	***How will the data be archived? (electronic/ paper)***	***Comment***
Monitoring of parameter related to clinker production							
D.2.1.a	Clinker Production (C)	Daily production report	Tones	C	Recorded/ calculated and reported monthly	Electronic, paper	Instrument used: Weighing feeders Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
Monitoring of emissions related to the use of alternative fuels in kilns during the crediting period (for each type of fuels)							
D.2.2.a	Quantity of Alternative	Daily production	Tonne	M & C	Recorded continuousl	Electronic, paper	Instrument used: Scale

ID number	*Data variable*	*Source of data*	*Data unit*	*Measured (m), calculated (c) or estimated (e)*	*Recording Frequency*	*How will the data be archived? (electronic/ paper)*	*Comment*
	fuel used (Q_{AF})	report			y and reported monthly		Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.2.2.b	Heat value of alternative fuel (HV_{AF})	Laboratory/ Plant reported in Daily production report	TJ/ton	M & C	Monthly	Electronic, paper	Instrument used: Calorimeter Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.2.2.c	Alternative fuel heat input (HI_{AF})	Plant	TJ	C	Monthly	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference:

ID number	*Data variable*	*Source of data*	*Data unit*	*Measured (m), calculated (c) or estimated (e)*	*Recording Frequency*	*How will the data be archived? (electronic/ paper)*	*Comment*
							GIS/PR/CDM/001
D.2.2.d	Emission factor (EF_{AF})	IPCC emission factor	TCO_2/TJ	IPCC Default value	Fixed	Electronic, paper	Data Archived: entire crediting period ISO reference: GIS/PR/CDM/001
D.2.2.e	Share of heat input from alternative fuel (S_{AF})	Calculated based on the value reported	%	C	Calculated Monthly	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.2.2.f	Moisture penalty (mp)	Plants	MJ/tonne /10% alt fuel share	C	At start of crediting period	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/00

ID number	*Data variable*	*Source of data*	*Data unit*	*Measured (m), calculated (c) or estimated (e)*	*Recording Frequency*	*How will the data be archived? (electronic/ paper)*	*Comment*
							1
Monitoring of emissions related to on-site transportation and drying of alternative fuels							
D.2.3.a	Rated capacity of all motors involved (RC)	Plant	kW	E	Fixed Recording: Annually	Electronic, paper	Data Archived: the whole crediting period ISO reference: GIS/PR/CDM/001
D.2.3.b	Total annual operating hours for Alternate Fuel System (OH)	Plant	Hours	M	Monthly	Electronic, paper	Data Archived: the whole crediting period ISO reference: GIS/PR/CDM/001
D.2.3.c	Electricity emission factor (EEF)	Plant	tCO_2/MWh	C	Fixed	Electronic, paper	Data Archived: the whole crediting period ISO reference: GIS/PR/CDM/001
D.2.3.d	Fuel used for	Plant	Kg	M	Recorded	Electronic,	Instrument used:

ID number	*Data variable*	*Source of data*	*Data unit*	*Measured (m), calculated (c) or estimated (e)*	*Recording Frequency*	*How will the data be archived? (electronic/ paper)*	*Comment*
	any drying of alternative fuels (FD)				and reported monthly	paper	Flow meter, Weigh Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.2.3.e	Heating value for fuel used for drying alt. fuels (FD_HV)	Plant	TJ/tonne	M	Monthly	Electronic, paper	Instrument used: Calorimeter Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.2.3.f	Emission factor for the fuel used for	Plant	tCO_2/TJ	Fixed IPCC Default value	IPCC default value	Electronic, paper	Data Archived: Whole crediting period

ID number	*Data variable*	*Source of data*	*Data unit*	*Measured (m), calculated (c) or estimated (e)*	*Recording Frequency*	*How will the data be archived? (electronic/ paper)*	*Comment*
	drying (VEF_D)				Fixed		ISO reference: GIS/PR/CDM/001
Monitoring of emission reduction from reduction of on-site transport of fossil fuel							
D.2.4.a	Fuel saving from on-site transportation of fossil fuel (OF_{FF})	Plant	Kg	M	Measured monthly and reported monthly	Electronic, paper	Source: Fuel consumption records Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.2.4.b	Fuel emission factor (EF_{TCO2e})	Plant	$kgCO_{2e}/kg$ fuel	IPCC Default value	Default values Fixed	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001

II.4.2: Data Monitored for Baseline Emission Calculations

ID number	*Data variable*	*Source of data*	*Data unit*	*Measured (m), calculated (c), estimated (e)*	*Recording Frequency*	*How will the data be archived? (electronic / paper)*	*Comment*
Monitoring of parameter related to clinker production							
D.3.1.a	Clinker Production (C)	Daily production report	Ton	M, C	Recorded/ calculated & reported monthly	Electronic, Paper	Instrument used: Weighing feeders Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
Monitoring of emissions related to the baseline GHG emissions from the fossil fuel(s) displaced by the alternative fuel(s)							
D.3.2.a	Fossil fuel used (Q_{FF})	Daily production report	Tonne	M, C	Recorded continuously & reported monthly and adjusted	Electronic, Paper	Instrument used: Scale Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001

							Comment: For each of fossil fuels consumed: i) in the year prior to the validation ii) during the project activity iii) Average fuel mix in the Indian cement industry.
D.3.2.b	Heat value of fossil fuel (HV_{FF})	Laboratory and reported in daily production report	TJ/ton	M, C	Monthly	Electronic, Paper	Instrument used: Calorimeter Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: For each of fossil fuels consumed: i) in the year prior to the validation ii) during the project activity iii) average fuel mix in the Indian cement

							industry
D.3.2.c	Emission factor (EF_{FF})	Fixed	TCO_2/TJ	IPCC Default value	IPCC Default value Fixed	Electronic	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: For each of fossil fuels consumed: i) in the year prior to the validation ii) During the project activity iii) Average fuel mix in the Indian cement industry.

II.4.3: Data Monitored for Leakage Calculations

ID number	***Data variable***	***Source of data***	***Data unit***	***Measured (m), calculated (c) or estimated (e)***	***Recording Frequency***	***How will the data be archived? (electronic / paper)***	***Comment***
Monitoring of emissions due to burning of biomass in the field in the baseline scenario							

D.4.1.a	Biomass fuel which would have been burnt in absence of the project ($Q_{AF-D/B}$)	Plant	Tones	M	Recorded continuously and reported monthly	Electronic	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001. Assumed that 100% of biomass is burnt in the absence of project activity
D.4.1.b	Carbon fraction of biomass	IPCC	Tones C per ton of biomass	IPCC Default value	IPCC default		
D.4.1.c	Carbon released as CH_4 in open air burning	IPCC		IPCC Default value	IPCC default		
Monitoring of emissions due to landfilling of biomass in the baseline scenario							
D.4.2.a	MSW fuel that would have been land filled without project (Q_{AF-L})	Plant	Tones	Estimated once before the project activity	Recorded Continuously and reported monthly	Electronic, Paper	Data Archived: 2 years after the end of crediting period. ISO reference: GIS/PR/CDM/001. Conservatively assumed that 90% is landfilled. Based on the available limited information. This

							value will be fixed exante during the crediting period. This assumption will be reconfirmed at the start of project activity by any updated data which would be published by municipal corporation /, CPCB or any other relevant agencies.
D.4.2.b	Methane conversion factor (MCF)	IPCC		IPCC default value based on actual landfill site.	IPCC default value based on actual landfill site.	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: Default =0.4
D.4.2.c	Degradable organic carbon content of the biomass (DOC)	IPCC	tC/tones of biomass	IPCC default value (Fixed)	IPCC default value (Fixed)		Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: Default

							value is 0.3
D.4.2.d	Portion of DOC that is converted to landfill gas (DOC_F)	IPCC		IPCC Default	IPCC default	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: Default value is 0.77
D.4.2.e	CH_4 in landfill gas (F)	IPCC		IPCC default	IPCC default	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: Default value is 0.5
D.4.2.f	CH_4 that is oxidised (OX)	IPCC		IPCC default	IPCC default	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: Default value is 0.
D.4.2.g	Landfill gas portion that is flared (NFL)	Landfill site		E	Estimated	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference:

							GIS/PR/CDM/001 Comment: Default factor for Indian conditions
Monitoring of emissions due to off-site transport of fuels							
D.4.3.a	Alternative fuels (Q_{AF})	Plant	Ton	M	Recorded continuously & reported monthly based on actual silo stock level change	Electronic, paper	Instrument used: weighing feeders Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.4.3.b	Average truck capacity for alternative fuel (CT_{AF})	Plant	Ton/truck	C	Monthly	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: The quantity can be estimated based on additive material hauling distance and estimated fuel consumption per shipment

D.4.3.c	Average distance for transport of alternative fuels (D_{AF})	Plant / transporters	Km/truck	C	Monthly	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.4.3.d	Emission factor (EF_{CO2e})	National communication, India	Kg CO2 eq/km or per kg of fuel	C	Fixed	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.4.3.e	Quantity of fossil fuel which is reduced due to consumption of alternative fuels (RQ_{FF})	Plant	Ton	C	Calculated monthly	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.4.3.f	Average truck capacity for transport of Q_{FF} (CT_{FF})	Plant	Tones / truck	C	Monthly	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001
D.4.3.g	Average distance for transport of Q_{FF}	Plant / transporters	Km/truck	C	Monthly	Electronic, paper	

Monitoring of preparation of alternative fuel outside the project site/outside the cement plant site							
D.4.4.a	Power consumption of drying the alternative fuels outside the project site (PD_{ADO})	Plant	KWh	c	Monthly	Electronic	This includes the monitoring of the electricity consumption at the proposed RDF plant as part of MSW usage.
D.4.4.b	Emission factor for power generation outside the project site where drying of the alternative fuels takes place (EFpO)	Power plant/grid	ton CO_2/ MWh	C	Calculated and reported yearly	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: To be calculated from each fuel type
D.4.4.c	Fuel used for any drying of alternative fuels outside the project site (FD_{AFO})	Plant	Ton, Kg or Liter	m	Monthly	Electronic, paper	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: To be calculated from each fuel type
D.4.4.d	Heating value	Plant	TJ or	Calculated	Monthly	Electronic,	Data Archived: 2

	for fuel used for drying of alternative fuels outside the project site (HV_{FDADO})		Tcal/unit of fuel	based on default value		paper	years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: To be estimated from each fuel type
D.4.4.e	Emission factor for the fuel used for drying of alternative fuels outside the project site (EF_{ADO})	IPCC	TCO_2/TJ	IPCC Default	Fixed IPCC default value	Electronic	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: To be estimated for each fuel type
Monitoring of alternative fuel reserves that may be used by other users (Data to be completed for each type of fuel independently)							
D.4.5.a	Alternative fuels used by other users	Third party survey	Ton	e	Estimated Yearly	Electronic	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: Track whether project activity reduces alternative fuel

							available to other users groups so that their GHG emissions will increase
D.4.5.b	Alternative fuel reserve available in the region	Third party survey	Ton	E	Estimated Yearly	Electronic	Data Archived: 2 years after the end of crediting period ISO reference: GIS/PR/CDM/001 Comment: Track whether project activity reduces alternative fuel available to other users groups so that their GHG emissions will increase