




Validation report form for renewal of crediting period for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for renewal of crediting period for CDM project activities" at the end of this form.

VALIDATION REPORT FOR RENEWAL OF CREDITING PERIOD (RCP)

Title of the project activity	Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)
Reference number of the project activity	UNFCCC ID: 1314 TN P-No. : 8000451520 - 15/010
Number and duration of the next crediting period	CP-No.: 2 nd 30/11/2014 to 29/11/2021 (incl. both days)
Version number of the validation report for RCP	5.0
Completion date of the validation report for RCP	29/06/2018
Version number of PDD to which this report applies	10
Project participant(s)	Industrial de Oleaginosas Americanas S.A. (INOLASA)
Host Party	Costa Rica
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Scope: 1 / Technical area: 1.1 CDM Methodology: AMS-I.C ver. 20, Thermal energy for the user with or without electricity
Estimated annual average GHG emission reductions or net anthropogenic GHG removals in the next crediting period	50,710 t CO ₂ e
Name of DOE	TÜV NORD CERT GmbH
Name, position and signature of the approver of the validation report for RCP	 Evgeni Sud Final Approver

SECTION A. Executive summary

Industrial de Oleaginosas Americanas S.A. (INOLASA has commissioned the TÜV NORD JI/CDM Certification Program to carry out validation of the request for renewal of crediting period (RCP) for the project:

“Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)”

with regard to the relevant requirements for CDM project activities.

The project has been registered on 30-09-2007 under the UNFCCC registration No. 1314. The PPs have chosen a 7 year crediting period which is now due for renewal. The PPs have thus notified the UNFCCC about their intention to request the renewal of the crediting period.

The objective of this RCP validation is the review by an independent entity whether the project is still compliant with the applicable sections of:

- the CDM project standard,
- the CDM cycle procedure
- the updated applied UNFCCC Methodology AMS-I.C ver. 20 and
- the methodological tool “Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period”.

As per the requirements of the CDM Validation and Verification Standard^{VVS/} (section 11) the validation is based on

- the registered and/or latest updated version of the PDD (including revisions of the monitoring plan)^{PDD/},
- the updated emission reduction calculation spread sheet ^{/XLS/},
- further supporting documents made available to the validator as well as
- information collected through performing interviews and during the on-site assessment.

Furthermore publicly available information, such as the host country legislation, was considered as far as available and required.

The project reduces GHG emissions due to the use of biomass as fuel to fire a boiler that supplies thermal energy to a soy bean factory.

Details of the project location are given in table A-1 below:

Table A-1: Project Location

No.	Project Location
Host Country	Costa Rica
Region:	Province of Puntarenas
Project location address:	Riojalandia de Barranca contigua zona franca
Latitude:	09°, 59', 23.5''N
Longitude:	84°, 42', 36.9''W

Basic technical details of the project are summarized in table A-2.

Table - A-2: Technical data of the project activity

Parameter	Unit	Value
Boiler steam capacity	kg/h	35,000
Boiler design pressure	bar	35
Steam Temperature (saturated)	°C	192

Parameter	Unit	Value
Feed water temperature	°C	120 +/- 5%
Air temperature at F.D Fan	°C	220 to 240
Actual steam evaporation	kg/h	35,000
Dust emission	mg/Nm ³	<=100
Overall efficiency on Gross Calorific value of fuel	%	80

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	EI	Andrade	Gilberto	BRTUV	x	x	x	x
2.	Team member	EI	Quireza Campos	Oliver	TN México	x	x	x	x

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Winter	Rainer	TN CERT GmbH
2	Technical reviewer/ Approver	IR	Sud	Evgeni	TN CERT GmbH

SECTION C. Means of validation**C.1. Desk review**

During the desk review all documents initially provided by the client and publicly available documents relevant for the validation were reviewed. The main documents are listed below:

- the last revision of the PDD including the monitoring plan^{/PDD/},
- the last revision of the validation report^{/VAL/},
- documentation of previous verifications^{/VER/}
- the monitoring report, including the claimed emission reductions for the project^{/MR/},
- the emission reduction calculation spreadsheet^{/XLS/}.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

C.2. On-site inspection

Duration of on-site inspection: 16/02/2015 to 20/02/2015				
No.	Activity performed on-site	Site location	Date	Team member
1	Kick off meeting	Inolasa plant	16/02/2015	Oliver Quireza Campos; Gilberto Andrade
2	Viewing of relevant site points	Inolasa plant	16/02/2015	Oliver Quireza Campos; Gilberto Andrade
3	Evidence assessment	Inolasa plant	16/02/2015	Oliver Quireza Campos; Gilberto Andrade
4	Evidence assessment	Inolasa plant	18/02/2015	Oliver Quireza Campos; Gilberto Andrade
5	Preparation of the DVR	Inolasa plant	19/02/2015	Oliver Quireza Campos; Gilberto Andrade
6	Preparation of the DVR Closing meeting	Inolasa plant	20/02/2015	Oliver Quireza Campos; Gilberto Andrade

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1	Castrillo Martin	Danilo	INOLASA	16-20/02/2015	Project and engineering	Oliver Quireza Gilberto Andrade
2	Ugalde	Minor	INOLASA	16-20/02/2015	Energy Data	Oliver Quireza Gilberto Andrade
3	Cerdas	Fabian	Geingenieria	17-20/02/2015	ER calculation	Oliver Quireza Gilberto Andrade
4	Castro Bonilla	Sofia	Geingenieria	16-20/02/2015	MR	Oliver Quireza Gilberto Andrade
5	Rodriguez Marat	Martin	Geingenieria	19/02/2015	Methodological choices	Oliver Quireza Gilberto Andrade

C.4. Clarification requests, corrective action requests and forward action requests raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	0	2	0
Application of baseline and monitoring methodology and standardized baseline	0	2	0
Validity of original baseline or its update	0	1	0
Estimated GHG emission reductions or net anthropogenic GHG removals	0	3	0
Validity of monitoring plan	0	0	0
Crediting period	0	0	0
Project participants	0	0	0
Others (applicable legislation)	0	1	0
Total	0	9	0

SECTION D. Validation findings**D.1. Compliance with PDD form**

Means of validation	<p>A draft revised PDD was submitted to the validation team by the project participants. By means of the UNFCCC website it has been checked whether the latest applicable PDD template CDM-PDD-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the PDD template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /unfccc/ 	
Findings	<input type="checkbox"/>	The latest reporting template CDM-PDD-FORM as listed on the UNFCCC website has been used for the PDD.
	<input type="checkbox"/>	The latest instructions for filling out the PDD have been followed. No adverse finding has been identified in the course of this validation.
	<input checked="" type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:
		- CAR A2, CAR A3
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.2. Application of baseline and monitoring methodology and standardized baseline

Means of validation	<p>By means of comparison of the PDD with</p> <ul style="list-style-type: none"> (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline <p>the verification team has checked whether the updated PDD is in compliance with the requirements of the applied methodology/tools/SB.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /TOOL/ • /unfccc/ • /TECH/ <p>In accordance with Incomplete number 4 received by UNFCCC on august 16th and teleconference held on September 8th 2017 between PP, DOE and UNFCCC personnel and in line with VVS version 09 paragraph 437 (b) and in accordance with paragraph 302 of PS v09 and step 1.4 (point 2) of the tool "Assessment of the validity</p>
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of the original/current baseline and update of the baseline at the renewal of the crediting period, version 03.0.1", the VT performed the following analysis:

Methodology conditions

The conditions for the application of the methodology AMS-I.C, version 20 were identified by the PP in section B.2 of the PDD, those conditions were assessed in detail by the VT in the table include in Appendix 5 of this report. The VT concluded that the applicable conditions selected by the PP are in line with the real situation of the project which was validated on site by interviews with personnel of the PA and revision of technical documentation,

Baseline emissions

For determining the baseline the PP used the criteria stated in paragraph 24 of the methodology AMS-I.C, version 20, which is in line with the original baseline identified at registration time with version 10 of AMS-I.C.

Regarding the biomass mix and the energy demand the PP is requested to clarify and document the biomass mix and energy demand values which were modified in the updated PDD as a PRC with prior approval, for which the DOE will performed the respective validation assessment. CAR A4

Project boundary

By analysis of section B.3 of the updated PDD and the boundary conditions in section 5.1 of the methodology AMS-I.C, version 20, it is confirmed that the boundaries have been selected correctly by the PP. Specially the topic related to the leakage calculation it is confirmed that is properly considered in the ER calculation as some of the itineraries for biomasses are transported over distances greater than 200 km, which is in line with paragraph 77 of the methodology AMS-I.C, version 20.

Leakage

The leakage consideration includes biomass transportation from palm mills, sugar cane mills and a saw mills, which is in line with Option B of the tool "Project and leakage emissions from transportation of freight" (version 01.1.0).

Project Emissions

Project emission calculation is properly considered by the PP in the updated PDD according paragraph 66 and 67 of the methodology AMS-I.C, version 20.

Findings

<input checked="" type="checkbox"/>	The updated PDD is completely in accordance with the approved methodology applicable for the CDM project		
<input checked="" type="checkbox"/>	The breakdown of PDD accordance of the referenced tools is as follows:		
	1	Title (of the tool)	Tool to calculate baseline, project and/or leakage emissions from electricity consumption
		Version	2
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
	2	Title (of the tool)	Tool to determine the baseline efficiency of thermal or electric energy generation systems
		Version	1
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
<input checked="" type="checkbox"/>	3	Title (of the tool)	Tool Project and leakage emissions from transportation of freight
		Version	01.1
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A

	<input checked="" type="checkbox"/>	4	Title (of the tool)	Tool to calculate the emission factor for an electricity system
			Version	6
			MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	<input checked="" type="checkbox"/>	5	Title (of the tool)	Tool for the demonstration and assessment of additionality
			Version	2
			MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	<input type="checkbox"/>	The breakdown of PDD accordance of the applicable SB is as follows:		
		1	Title (of the SB)	
			Version	
			MP compliance	
<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR B1			
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.		
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		

D.3. Validity of original baseline or its update

Means of validation	<p>In order to check the validity of the original baseline or its updates the validation team has applied the following stepwise approach:</p> <p><i>Step 1:</i> Check of Applicability of a Standardized Baseline</p> <p><i>Step 2:</i> Check of Baseline Scenario</p> <p><i>Step 3:</i> Compliance check of the baseline with relevant policies</p> <p><i>Step 4:</i> Assessment of impact of circumstances</p> <p><i>Step 5:</i> Assessment of likeliness of investments</p> <p><i>Step 6:</i> Validity check of ex-ante determined parameters.</p> <p>All necessary documentation has been either provided by the client or the validation team has acquired appropriate information required for assessment independently. For a detailed list of reviewed documentation please refer to appendix 3.</p>
Findings	<p><u><i>Step 1: Applicability of a Standardized Baseline:</i></u></p> <p>No standardized baseline is applicable to the project activity. This has been checked by an analysis of the current list of valid standardized baselines on the UNFCCC website^{/unfccc/}.</p>
	<p><u><i>Step 2: Baseline Scenario:</i></u></p> <p>The baseline scenario of the project as per the registered project can be described as follows:</p> <p>The identified baseline was the generation of thermal energy by a coal fired boiler to supply steam to the soy bean production plant.</p>

As per the project standard this scenario is not subject to re-assessment and is thus deemed to be applicable for the next crediting period.

However the baseline itself i.e. the calculation of baseline emissions has been checked regarding the continued validity of underlying assumptions and parameter values. The assessment steps are described in the following subsections.

Step 3: Compliance of the baseline with relevant policies:

The baseline of the registered PDD has been assessed to be compliant with the national legislation and policies applicable for the project activity at the time of validation. During the first crediting period the PP has frequently reviewed the legal requirements and policies relevant for the baseline of the project. On the basis of this the PP has arrived at the conclusion that the baseline is still in line with all applicable legislations and policies.

The validation team has independently reviewed the host country legislation as well as current policies, such as:

- Environmental law and Rules of atmospheric pollution
- National Norm of Carbon Neutrality INTE -12-01-06:2011

Furthermore the VT interviewed different personnel to confirm that no new legislation has been changed that could modify the baseline situation.

On the basis of this analysis the VT confirms that the baseline is still in compliance with the currently applicable national legislation and other national and/or sectoral policies. Therefore the baseline did not need to be adjusted due to changes in this respect.

Step 4: Impact of circumstances:

No circumstances that could change the baseline of the registered PDD have been identified. The Costa Rican energy strategies don't show any real plan to develop renewable energies or biomass project so that the policies can support the development of alternative energies that could change the circumstances of the baseline.

The Costa Rican governments has the intention to implement a voluntary Carbon Neutral goal however there is no real plan or action that support that idea, except by the norm: National Norm of Carbon Neutrality INTE -12-01-06:2011 which contain the framework to regulate the companies that volunteer to become carbon neutral.

The VT reviewed studies, plans and programs in the applicable websites from the Cost Rican Government to evaluate the circumstances related to energy generation and demand in the host country. Also PA representatives were interviewed.

There is no circumstances at the time of requesting renewal of the crediting period which make the continued validity of the baseline not plausible.

Step 5: Likelihood of investments

The project was considered originally for a life time of 15 years. Furthermore the project has the relevant operation licences and no mayor corrective maintenance has been registered.

The VT reviewed the Report of monthly depreciation to confirm that the lifetime of equipment of the PA exceed the 7 years of the new CP. The depreciation of the equipment is set for 15 years. Furthermore the VT reviewed the boiler inspection report which confirms that the boiler operation is still safe as the licence is related to the safety of the pressure vessel. Furthermore the combustion air emissions

analysis show that the boiler emissions comply with the relevant environmental legislation. Additionally the operation and maintenance reports were revised and it could be confirmed that the efficiency of the boiler has not been decreased and no mayor maintenance or reparation has been done or it is expected for the following years.

Furthermore the design boiler capacity is still enough for the operation in the following 7 years, as the design capacity is 35 tonnes/h and from the historic vales it can be seen that the actual steam generation rate for year 2014 is around 20 tonnes/h, so even though considering an average increase of 5.9% in the steam generation, the needs are covered.

So in can be concluded that PA won't require considerable investments during the next 7 years of the renewed CP.

Step 6: Validity of ex-ante determined parameters:

The parameters which have been determined ex-ante in the registered PDD are basically still valid. Only the following changes were required:

Parameter	Previous value	Updated value	Reference
Emission Factor Costa Rica grid	68.86 tCo2/GWh	0.2288 tCO2/MWh	PDD

The VT reviewed the information provided in pages 42-52 of the updated PDD against the requirements stated in the *Tool to calculate the emission factor for an electricity system (version 06.0)*. Also the EF spread sheet provided by the PP was revised with special emphasis against the procedure described in the mentioned tool and the correct application of the formulas. The following steps were revised:

- ✓ The PP selected to not to include off-grid power plants which is in line with the tool.
- ✓ The PP selected the option (b) to Simple adjusted OM which is correct considering the availability of information in Costa Rica.
- ✓ The PP selected to calculate the OM ex-ante option taking with data vintage of 3 years with is in line with the tool.
- ✓ The formulae applied in the 5 sheets included in file EF 2010 provided by the PP were revised, these include "OM, BM, CM, Lambda 08, Lambda 09 and lambda 10". This are correct and in line with the formulae defined in the tool.
- ✓ The original data included in sheets "DSE data, Thermal data, Private generators, Grid Overall and grid stats" was revised against the original data downloaded from the official websites from Costa Rican government (www.dse.go.cr, www.aresep.go.cr).
- ✓ For the BM calculation the PP choose Option 1 (ex ante BM) which is correct and in line with the tool.
- ✓ For the CM calculation the PP choose the following weight $w_{OM} = 0.5$ and $w_{BM} = 0.5$ which is not in line with the tool. As per incomplete from UNFCCC which states *as per Tool to calculate the emission factor for an electricity system paragraph 84 (b) which requires to apply $WOM=0.25$ and $WBM=0.75$ for the second crediting period*. In this context CAR B8 was raised.

It is important to note that this parameter is used for PE calculation only,

The fixed ex-ante parameters used for the baseline calculation are not modified in the updated PDD. For the updated baseline calculation the PP provide an estimation based on the prognoses of energy demand (this topic is discussed in detail in CAR B5), this prognoses is an estimation to obtain an ex ante value of the baseline, nonetheless the actual energy demand value will be determined by the monitored energy demand. This is in line with paragraph 302 of PS v09 and step 1.4 (point 2) of the tool "Assessment of the validity of the original/current baseline and update of

the baseline at the renewal of the crediting period, version 03.0.1 which state respectively:

- To demonstrate the validity of the original baseline or its update, PP are not required to re-assess the baseline scenario. Instead, PP shall assess the GHG emission reductions that would have resulted from that scenario.
- Assess whether data and parameters that were determined only at the start of the crediting period and NOT MONITORED during the crediting period are still valid or whether they should be updated.

According to this the VT confirms that the updated baseline calculation is estimated correctly and in line with the applicable methodology and the requirements of the project standard version 9 and the too "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, version 03.0.1".

It is important to mention that the energy generation is limited by the boiler capacity, so even though the energy demand has been growing at an average rate of 5.9% and it is expected to keep that trend, the maximum capacity will be reached at some point during the lifetime of the project., This is in line with the boiler capacity registered in both the registered and updated PDDs (35 tons of steam/hour) with a design pressure of 35 bars (However, during the first years it will only produce 20 tons of steam/hour with a pressure of 12.7 bar). The VT validated this situation by interviewing different personnel at Inolasa plant and by revising the technical documents of the boiler.

Parameter	EFgrid
Description	Emission Factor Costa Rica grid
Unit	tCO ₂ /GWh
Value	68.86
Assessment	The parameter is updated as per applied tool, being this 0.2288 tCO ₂ /MWh

Parameter	Hssi
Description	Enthalpy of the saturated steam at 12 bar
Unit	kJ/kg
Value	2,782.73
Assessment	The value of the parameter has not been properly considered in the updated PDD; on this regard the CAR B4 was raised.

The following parameters have been included as per applicable methodology "Thermal energy for the user with or without electricity", AMS-I.C, version 20

- EFFF,CO₂
- EFCO_{2,f}

The following parameters remain the same as in the first CP.

- EU_y
- η_{th}
- $k_{mi}=D_{f,y}$

The following fixed ex-ante parameters are not used anymore because the applicable methodology and tools don't require them anymore.

- VCcons
- CVdiesel
- Ddiesel
- EFdiesel
- EU_y
- η_p
- NCV_i=NCV_c
- COEF_i

The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:

	<input checked="" type="checkbox"/>	CAR B4, CAR B8
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	<p>The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> <ul style="list-style-type: none"> The included parameter BBiomass,y in the monitoring plan is in line with the monitoring methodology. The clarification stated by the PP is correct as the parameter will be used only for cross check purposes because the energy supplied by the project will be measured directly. For the 2nd CP the growing energy demand of 5.9% applied by the PP is considered suitable and correct for the following reasons: <ul style="list-style-type: none"> It is based on the historic data of energy consumption from 3.5 years^{/PDD-reg/}, and This was the prognoses growing rate for the 1st CP, which over the 7 years was proofed to be a precise forecast, as practically no difference versus the real growing rate (-1%/XLS-yearly steam production/) was observed. The Inolasa plant director considers that the growing rate of 5.9% should not be updated as the previous forecast was very precise with a difference versus real of -0.61%/letter/. <p>Furthermore:</p> <ul style="list-style-type: none"> No additional information is available to do a new prognoses. As the real biomass demand from the previous CP is not reliable because special situations were presented during the project operation, such as: at the beginning of the CP (first 3 years) the production was unusually low and additionally low availability of biomass was presented, situation that at the second part of the CP (last 3 years) was opposite. <p>So the expected growing rate is confirmed by the VT to be correct, precise and suitable according to the project situation.</p>

D.4. Estimated GHG emission reductions or net anthropogenic GHG removals

Means of validation	<p>For validation of the estimated GHG emission reductions the client has provided the validation team with the following documentation:</p> <ul style="list-style-type: none"> Updated PDD^{/PDD/} version 6 ER spreadsheet^{/XLS/} Yearly stem production spreadsheet (comparison of registered PDD vs. real) EF calculation spreadsheet (for year 2010) Estimate comparison Historic Palm and Soy production Total steam generation Total bean consumption 2006-2016 Emails from PP to the ARESEP and DSE (to obtain energy data for EF calculation). Written confirmation from Inolasa Director to confirm the energy demand growing rate (5.9%). <p>The baseline emissions are calculated as per methodology AMS-IC version 20 by the equation $BE_{thermal,CO2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) \cdot EF_{FF,CO2}$.</p> <p>The ex-ante calculation for the 2nd crediting period is based on plant's energy demand forecast. First the base value was set and then fix increase rate per year is applied. Both this value and its increase are discussed in the following sections (CAR B5,)</p> <p>CAR B5 was raised in order to improve the description of the validation means requested by UNFCCC.</p> <p><i>"Issues: The DOE is requested to clarify:</i></p> <p><i>1) 25% increase of emission reductions in the second crediting period (354,561 tCO2e) as compared to the first crediting period (267,487 tCO2e) and;</i></p>
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2) increase of energy demand during the 2nd crediting period as compared to the 1st crediting period, given the fact that the energy demand for year 2014, 2015 and 2016 as per PDD v03 (1st CP) was 411,702 GJ, 435,990 GJ and 461,711 GJ, whereas the energy demand for the same period as per the revised PDD v06 (2nd CP) is stated as 463,942 GJ, 491,314 GJ and 520,302 GJ respectively".

3) Issue: The DOE is requested to confirm whether the grid emission factor of Costa Rica is calculated using the latest data available at the time of submission of the CDM-PDD to the DOE for validation in line with the "methodological tool: tool to calculate the emission factor for an electricity system" version 05.0.

4) Issue: The DOE is requested to clarify the consistency of the information provided in the PDD regarding 1) the mix of different types of biomass combusted in the boiler given the fact that in section A.3 (page 5/64), % biomass mix is given as 51% palm kernel shells, 28% empty fruit branches, 17% bagasse and 4% wood chips, where as in table 3 (page 5) it is stated as 37% palm kernel shells, 42% empty fruit branches, 14% bagasse and 7% wood chips and ; 2) average technical transmission and distribution losses (TDLj,y) in section B.6.2 is mentioned as 20%, whereas the spreadsheet has used a value of 11.6%.

The VT summary assessment is the following:

1. The increase with 32.6% in the Total ER estimation as stated by the PP is a consequence of the expected annual growing rate with 5.9% in energy demand thought 14 years. This element is already present in the ex-ante calculation presented for the first crediting period and justified by the plant's manager. This values have been validated by the VT as per revision of the steam generation historic data monitored by the project operator. The monitored values were validated by checking steam generation databases (excel file).

Also the increase in the new energy demand prognosis (updated PDD version 7) versus the old prognosis (registered PDD version 3) has an impact in the calculation as the energy demand in base year 2014 (462,707 GJ) is 12% higher than the old prognosis (411,702 GJ) from (PDD ver. 3 2007). Such difference is considered correct and plausible as the new estimation (PDD ver.7) is based on more recent historical data (yearly steam generation).

The VT also confirmed the prognoses and the expected growing rate by information provided by Inolasa Management, the following information was provided:

Letter from Director of Inolasa plant stating:

For the purpose of clarity, the following table presents the biomass consumption during the first crediting period, as compared to the ex-ante expectation on the registered PDD. Note that although actual values have been lower than expected on the initial years and higher than expected on the final ones, the overall estimate for the entire period has been reasonably accurate, with a difference lower than 1%. Thus, and in our opinion, the 5.9% annual growth for steam consumption initially assumed in the original PDD does not need to be revised.

As per CAR B5 the VT concluded that the increase in the ER for the 2nd CP is coherent with the expected and actual ER from the 1st CP. By the letter from the Director and interviewed personnel it is confirmed the correctness of the energy growing rate and by analysis of the energy and ER calculation spreadsheet it is confirmed the correctness of the ER estimation.

2. As stated in the clarification provided by the PP, the difference in the energy values between the 1st and 2 CPs is because the 2 prognoses were done in different time and with different historical data. The values taken from registered PDD ver. 2 are based on a forecast done in 2007 (411,7029 GJ), whereas the values used for the prognoses included in updated PDD ver. 6, are based on projection done in 2014

which uses data from actual energy monitored from 2013 and backwards. The value used for the energy calculation (462,707 GJ) for the 2nd CP is based on the steam demand estimated by the soy plant operator (190,453 tonnes steam for year 2014), so that the 12% difference is considered correct due to the irregular market demand of soybean and other products. The irregular demand is confirmed by the following data revised during validation:

- ✓ "Total soybean consumption by the plant" where the inter annual variation ranges from -25% to a maximum of +12%.
- ✓ "Total steam generation where the annual variation ranges from 0% to 30%.
- ✓ "Palm oil generation where the annual variation ranges from -7% to +28%
- ✓ "Soy oil production where the annual variation ranges from -6% to +18%

3. According to the given trends, it can be confirmed that the market is uncertain and that a revision of the original estimate can yield a difference as the reported 12%. The PP sent the documents for validations to UNFCCC and the DOE on 28.05.2014.

From: Fabio Guerrero Chavarría <fgc@inolasa.com>
 To: "CDM-Registry@unfccc.int" <CDM-Registry@unfccc.int>, "cdmregistration@unfccc.int" <cdmregistration@unfccc.int>
 Date: 28/05/2014 22:27
 Subject: Project "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)" (CDM ref. #1314)

Dear CDM Team,

As focal point of the project "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)" (CDM ref. #1314) I would like to inform you of our intention to renew the project's crediting period, as per paragraph 260 of the CDM project cycle procedure. I hereby attach an updated PDD, which will be in turn submitted to the DOE TÜV-NORD for the purpose of validation.

Kindly confirm receipt of this e-mail.

Best regards,
 Fabio Guerrero
 [attachment "PDD_Inolasa ver 4 clean 30.04.14 .pdf" deleted by Janet Helleberg/UNFCCC]

Whereas the last communication from PP to ICE was on 04.04.2014 and no response was obtained (evidenced by email dated on 21.04.2014). The VT also reviewed the ICE website to confirm which data was available at the time or the validation process commencement (28.05.2014). So it is confirmed that at the time of submission the document for validation the entity (ICE) responsible to provide the most updated information did not made public available other information than the one from year 2010, so the PP used the most updated information which was public available (from year 2010)

4. The revised shares of the different biomass types are consistent throughout the different sections of the PDD. The different biomass shares are in line with the registered PDD.

The reviewed values though the whole PDD 11.6% TDL is considered correct as a default value taken from an official source. The value is taken from the available source at the moment of submission the updated PDD to the VT for revision. The use of the default value is in line with the methodological tool for calculation of PE (Source: CEPAL, Central America, statistics of electric sector, 2012).

Other findings during the validation

CAR 06: an error in the baseline calculation was identified by the VT as the value used for calculation of the base year (2014) for the 2nd CP is not 463,942 GJ as stated by the PP but 462,707 GJ. This corrected value has been validated by the VT as per revision of the steam generation historic data monitored by the project operator. The monitored values were validated by revised by checking steam generation databases (excel file).

	<p>CAR B8 This finding was raised as a result of the feedback provided by UNFCCC in the 5th incomplete:</p> <p>For the EF calculation the CM has not been calculated as per Tool to calculate the emission factor for an electricity system paragraph 84 (b) which requires to apply WOM=0.25 and WBM=0.75 for the second crediting period.</p> <p>Further, the validation team has downloaded from the UNFCCC website the applicable version of the CDM methodology and all referenced methodological tools /unfccc/. Also the following analysis have been performed:</p> <p>The XLS ER calculations have been duly checked. Further it has been checked whether the results have been correctly transferred to the updated PDD for determination of ex-ante ER. The validation team has further checked the updated PDD against the latest version of the applicable methodology incl. the referenced methodological tools for consistency. Special focus was laid on the changes against the previous crediting period.</p>	
Findings	<input type="checkbox"/>	The calculation of ERs is done as per the applied methodology. The calculation in the Excel spreadsheet and the corresponding calculation tables in the PDD have been checked and no mistakes have been identified. The estimation of emission reductions for the 2 nd crediting period is deemed plausible and conservative.
	<input checked="" type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>CAR B5, CAR B6, CAR B8</p>
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.5. Validity of monitoring plan

Means of validation	<p>The validation team has checked the monitoring plan of the updated PDD against the required changes due to the update of the baseline and other methodological changes. Further, changes due to editorial updates of the applicable templates have been checked.</p> <p>In detail all parameters, ex-ante values and applicable formulae have been checked to determine the required changes for the next crediting period.</p> <p>Besides, based on conducted site-visit and interviews with related personnel the validation team has assessed the feasibility of the required changes.</p>	
Findings	<input checked="" type="checkbox"/>	<p>The monitoring plan in the PDD has been updated to comply with the latest applicable version of the monitoring methodology (AMC-I.C, ver.20). The basic changes from the current crediting period can be summarized as follows:</p> <ul style="list-style-type: none"> - Emission Factor Costa Rica grid - The parameter is updated as per applied tool, being this 0.2908 tCO₂/MWh. - Enthalpy of the saturated steam at 12 bar – The value of the parameter has not been properly considered in the updated PDD; on this regard the CAR B4 was raised. <p>The following parameters have been included as per applicable methodology:</p> <ul style="list-style-type: none"> • EFFF,CO₂ • EFCO₂,f <p>The following parameters remain the same as in the first CP.</p> <ul style="list-style-type: none"> • Euy • η_{th} • kmi=Df,y

		<p>The following fixed ex-ante parameters are not used anymore because the applicable methodology and tools don't require them anymore.</p> <ul style="list-style-type: none"> • Vccons • Cvdiesel • Ddiesel • Efdiesel • Euy • η_p • $NCV_i = NCV_c$ • COEF_i <p>The validation team has duly assessed all the required changes due to the upgraded methodological requirements and the re-assessment of the baseline. The validation team has concluded that</p> <ul style="list-style-type: none"> • all necessary changes have been appropriately reflected in the updated PDD, • the monitoring plan in the updated PDD is in compliance with the applied monitoring methodology, • the monitoring arrangements described in the updated PDD can be implemented and are feasible within the project design.
	<input checked="" type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>CAR B4</p>
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.6. Crediting period

Means of validation		The validation team has checked that the UNFCCC Secretariat has been notified within the specified timeframe on 2014-05-28. The CDM Secretariat confirmed the receipt of this notification on 2014-05-29.
Findings	<input checked="" type="checkbox"/>	<p>As the respective requirements are met, the project's 2nd crediting period may start immediately after the expiration of the 1st one, given that all other applicable criteria are met.</p> <p>It is further confirmed that the start date (30/11/2014) and the length of the crediting period (7 years) are in compliance with the project standard.</p>
	<input type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p>
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.7. Project participants

Means of validation	The validation team has checked the revised PDD/ ^{PDD/} and the UNFCCC website/ ^{unfccc/} esp. the latest version of the Modalities of Communication/ ^{MOC/} to check whether the listed project participants have duly been authorized and if communication requirements are met.
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Findings	<input checked="" type="checkbox"/>	The names of the project participants as listed in the revised PDD (sections A.4. and appendix 1) are consistent with those listed on the dedicated UNFCCC project website as well as in the last version of the modalities of communication ^{/MOC/} .
	<input type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Although no findings were raised in this section it is important to clarify that the PP Vattenfall Energy Trading Netherlands N.V. as been retired as PP from this project activity. The VT review the MoC documents properly signed by the representative personnel from Vattenfall Energy Trading Netherlands N.V. It was confirmed also that the MoC documents were sent to UNFCCC on November 22th and 23th November 2017 by the PP. So far the PP status has not been updated on UNFCCC website.	

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
Corrections	Y	1	29/01/2014
Inclusion of a monitoring plan to a registered project activity	-	-	-
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
Changes to the project design of a registered project activity	Y	1	29/01/2014
	Y	1	12/02/2018 ¹
Types of changes specific to afforestation and reforestation project activities	n.a.	n.a.	n.a.

SECTION E. Internal quality control

Before the submission of the final VAL RCP report a technical review of the whole validation procedure was carried out. The technical reviewers are competent GHG auditors where at least one is being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the validation team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation team leader may have been confirmed or revised. Furthermore reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete validation has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting the renewal of crediting period is conducted.

¹ Please refer to related PRC assessment report submitted along with this request for Renewal of CP

SECTION F. Validation opinion

Industrial de Oleaginosas Americanas S.A. (INOLASA) has commissioned the TÜV NORD JI/CDM Certification Program to re-validate the project "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)" for the purpose of renewal of the crediting period. The validation is based on the relevant UNFCCC requirements.

The review of the updated project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews have provided TÜV NORD JI/CDM Certification Program with sufficient evidence to validate the fulfilment of the stated criteria applicable for RCP.

In detail the conclusions can be summarized as follows:

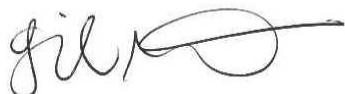
The current baseline of the project is in line with the national and/or sectoral policies and circumstances at the time of requesting renewal of crediting period.

The monitoring plan is transparent and adequate and in line with the applicable monitoring methodology (AMS-I.C ver. 20).

The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 354,969 tCO_{2e} are most likely to be achieved within the second renewable crediting period of 7 years.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the renewal of the crediting period.

Queretaro, 17/06/2018




Gilberto Andrade
TÜV NORD JI/CDM Certification Program
Validation Team Leader

Appendix 1. Abbreviations

ARESEP	Regulator Authority of Public Services
BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent
CP	Certification Program // Crediting Period
DSE	Sectorial Direction of Energy
DNA	Designated National Authority
EB	CDM Executive Board
EF	Emission Factor
ER	Emission Reductions
ETS	Emission Trading Scheme
FAR	Forward Action Request
GHG	Greenhouse gas(es)
ICE	Costa Rican Institute of Electricity
IPCC	Intergovernmental Panel on Climate Change
LOA	Letter of Approval
MOC	Modalities of Communication
PCP	CDM Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PS	CDM Project Standard
QC/QA	Quality control/Quality assurance
RCP	Renewal of Crediting Period
UNFCCC	United Nations Framework Convention on Climate Change
VT	Validation Team
VVS	CDM Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD J/CDM Certification Program

Mr. Gilberto Andrade


SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2018-02-08
VCS / ISO 14064-2	Lead Assessor	2018-02-08

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewables

16 - Rev. 2, Date: 2015-02-09

016_001-VAB05-F20_2015-02-09_rev.2.docx

001-VAB05-F20 rev3 / 2012-10-25



Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD J/CDM Certification Program

Mr. Oliver Quireza Campos

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2018-05-28
VCS / ISO 14064-2	Lead Assessor	2018-05-28


Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
13.1	Solid waste and wastewater
13.2	Manure

337 - Rev. 4, Date: 2015-07-07

007_001-VAB05-F20_2015-07-07_rev4.docx

001-VAB05-F20 rev3 / 2012-10-25



Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD J/CDM Certification Program

Mr. Evgeni Sud

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2018-05-19
J1	Senior Assessor Technical Reviewer	2018-05-19
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2018-05-19


Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.2	Renewables	
13.1	Solid waste and wastewater	

002 - Rev. 3, Date: 2015-05-20

002_001-VAB05-F20_2015-05-20_rev.3.docx

001-VAB05-F20 rev3 / 2012-10-25



Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD J/CDM Certification Program

Mr. Rainer Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2016-07-01
J1	Senior Assessor Technical Reviewer	2016-07-01
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2016-07-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal Energy Generation	
1.2	Renewables	
4.1	Cement and lime production	
4.2	Paper	
5.1	Chemical Industry	
5.2	Citric acid, malic and adipic acid	
8.1	Mining/mineral production	
9.1	Aluminum and magnesium production	
9.2	Iron, steel and Ferro-alloy production	
11.2	Refrigerant gas production	
12.1	Chemical industry	
13.1	Solid waste and wastewater	

003 - Rev. 9, Date: 2015-05-18

003_001_001-VAB05-F20_2015_05_18_rev9.docx

001-VAB05-F20 rev3 / 2012-10-25

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1	Ministry of Environment and Energy	/LOA/	Letter of Approval from DNA from Ministry of Environment and Energy, dated August 3 rd 2007	https://cdm.unfccc.int/filestorage/O/M/Z/OMZ36FKZYVLL8WMX6VQQJU3EBQQ1CQ/LOA%20DNA-%20INOLASA.pdf?t=Zk98bzhyc2c3fDByimLsqEX_0664EZMoGEeA	PP
2	PP	/MAIL1/	Notification mail by the PP to the UNFCCC indicating the intention to renew the crediting period, dt. 2014-05-28.		PP
3	PP	/MAIL2/	Confirmation mail by the UNFCCC in response to /MAIL1/ dt. 2014-05-29		PP
4	PP	/MI/	List of Monitoring Instruments		PP
5	PP	/MOC/	Modalities of Communication by Vattenfall Energy Trading Netherlands N.V., 07/11/2017		UNFCCC
6	PP	/PDD/	RCP Project Design document "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA) " <ul style="list-style-type: none"> • (Version No. 5, dated 30/04/2014) • (Version No. 6, dated 11/04/2016) • (Version No. 7, dated 06/05/2017) • (Version No. 8, dated 16/10/2017) • (Version No. 9, dated 17/10/2017) • (Version No. 10 dated 20/06/2018) 		PP
7	PP	/PDD-Reg/	<ul style="list-style-type: none"> • Registered Project Design Document named "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)", Version No. 2, dated 31/01/2007 • Revised Project Design Document named "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)", Version No. 3, dated 29/11/2013 	https://cdm.unfccc.int/Projects/DB/SGS-UKL1188406311.96/view	UNFCCC
8	PP	/XLS/	<ul style="list-style-type: none"> • Emission reduction calculation spreadsheets, versions: <ul style="list-style-type: none"> 1 dated 19/02/2015 2 dated 15/05/2017 3 dated 30/05/2018 • Emission factor calculation sheets, versions: <ul style="list-style-type: none"> 1, 19/02/2015 2, 30/05/2018 		PP

No.	Author	Reference	Title	References to the document	Provider
9	DOE	/CPM/	TÜV NORD JI / CDM Certification Program Manual (incl. procedures and forms)		TN
10	IPCC	/IPCC/	<ul style="list-style-type: none"> IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual 	http://www.ipcc-nggip.iges.or.jp/public/2006gl/	IPCC
11	UNFCCC	/KP/	Kyoto Protocol (1997)	https://cdm.unfccc.int/Reference/index.html	UNFCCC
12	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7))	https://cdm.unfccc.int/Reference/index.html	UNFCCC
13	UNFCCC	/METH-1/	AMS-I.C ver.10- Thermal energy production with or without electricity	https://cdm.unfccc.int/methodologies/DB/JSEM51TG3UVKADPA25IPUHXJ85HE8A	UNFCCC
14	UNFCCC	/METH-2/	AMS-I.C ver. 20- Thermal energy production with or without electricity	https://cdm.unfccc.int/methodologies/DB/JSEM51TG3UVKADPA25IPUHXJ85HE8A	UNFCCC
15	UNFCCC	/PCP/	CDM project cycle procedure, version 9.0	https://cdm.unfccc.int/Reference/index.html	UNFCCC
16	UNFCCC	/PDD-T/	Project Design Document Form (CDM-PDD-FORM) - Version 8.0 including Attachment: Instructions for filling out the project design document form for CDM project activities	https://cdm.unfccc.int/Reference/index.html	UNFCCC
17	UNFCCC	/PS/	CDM project standard, version 9.0	https://cdm.unfccc.int/Reference/index.html	UNFCCC
18	UNFCCC	/TVB/	<ul style="list-style-type: none"> Methodological Tools: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period version 03.0.1 Tool to calculate baseline, project and/or leakage emissions from electricity consumption version 2 Tool to determine the baseline efficiency of thermal or electric energy generation systems version 1 Tool Project and leakage emissions from transportation of freight version 1.1 Tool to calculate the emission factor for an electricity system version 5 	https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf	UNFCCC
19	UNFCCC	/VAL/	Validation Report for CDM project “Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)” version 00, dated 2009-07-09.	https://cdm.unfccc.int/filestorage/N/M/9/NM94RDPJCUAG8ZIW7KQ5T16OBL2SVX/1314%20%20Validation%20Opinion.pdf?t=UTB8bzhydG51fDAAdIM5RPVhdXUYmjZNFwOR	UNFCCC

No.	Author	Reference	Title	References to the document	Provider
			<p>Assessment Report on PRC for CDM project "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)" version 1, dated 2014-01-29.</p> <p>Validation Report on PRC for CDM project "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)" version 1, dated 2018-02-12, submitted along with this request for renewal of CP.</p>	https://cdm.unfccc.int/filestorage/9/J/U/9JU4F5MAR6GCOVLTZSE0BQKI2N3Y1W/1314%207%20Assessment%20Opinion.pdf?t=Qk18cDQzZHFqfDDkLAqkV_cbZoxpPkFclNe	
20	UNFCCC	/VVS/	CDM Validation and Verification Standard, Version 09.0	https://cdm.unfccc.int/Reference/index.html	UNFCCC
21	PP	/COM/	<ul style="list-style-type: none"> Biomass balance 2015, including historic data, excel from 2011-2014. Increase of electric consumption in Biomass 2013-2014. Table - average price of alternative biomass, Dec 2014. 		PP
22	Costa Rican Government	/LAW/	<p>Legislation applicable to the project activity:</p> <ul style="list-style-type: none"> Rules concerning atmospheric pollutants from boilers N° 30222-S-MINAE - <i>"Reglamento sobre emisiones de contaminantes atmosféricos provenientes de calderas"</i>, 2011/04/27. General Environment Law No. 7554 – <i>"Ley Orgánica del ambiente"</i>, 1995/10/04. Boilers Rules, Decree 26789, 2001, Labour Ministry, Costa Rica. 		TN
23	PP	/TECH/	<p>Engineering Drawing:</p> <ul style="list-style-type: none"> FR/STD -0005, Piping and Instrumentation diagram, Inolasa, Petra Boilers SDN, BHD Technical Information Boiler, PETRA. 		PP
24	PP	/LIC/	<ul style="list-style-type: none"> Boiler Inspection Report (license) No. 1601, dated on 2014/05/14 valid until 2015/05/25 (renovation annually). Sanitary Permit of Operation from the Ministry of Health. PC-ARS-B-170-2014, valid until 2015-08-11 (updated yearly). Atmospheric emissions Report (6 months), 2014-06-18, from INOLASA. 		PP
25	Costa Rican Government	/OF/	Instituto Costarricense de Electricidad, Centro Nacional de Planificación Eléctrica, 2010		PP

No.	Author	Reference	Title	References to the document	Provider
26	PP	/O&M/	Operation and maintenance log books and reports, 2013, 2014, 2015		PP
27	Costa Rican Government	/SECT/	<ul style="list-style-type: none"> National Norm of Carbon Neutrality INTE -12-01-06:2011 National Plan of Energy, Costa Rica, 2012-2030 CEPAL, Central America, Statistics of the Electric Sector, 2012 		TN
28	PP	/yearly steam production/	Yearly steam production		PP
29	PP	/INOLASA historic production/	<ul style="list-style-type: none"> Palm oil generation Soy oil production Total soybean consumption by the plant 		PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 3. CL from this validation

Table 4. CAR from this validation

CAR ID	A1	Section no.	A5	Date: 20/02/2015
Description of CAR				
The pre-project situation describes wrongly the use of 2 bunker fuelled boilers instead of 3.				
Related check list question: A3				
Project participant response				Date: 17/06/2015
Revised and corrected in the PDD v.5 (07/07/2015)				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): All	New version No.: 6	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 15/07/2015
The number of bunker boilers is in line with the actual situation of de PA.				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	A2	Section no.	A5	Date: 20/02/2015
Description of CAR				
The latest PDD version template was not used.				
Project participant response				Date: 17/06/2015
Revised and corrected. Version 05.0 has been now used				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): All	New version No.: 6	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 15/07/2015
The applied version of PDD is in line with the latest version at the UNFCCC website.				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	B1	Section no.	B1	Date: 20/02/2015
Description of CAR				
The latest version of the methodology Thermal energy for the user with or without electricity has not been used.				
Project participant response				Date: 17/06/2015
Corrected, version 20.0 (EB79, 01 June, 2014) has now been used.				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B1	New version No.: 6	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 15/07/2015
The applied version of PDD is in line with the latest version at the UNFCCC website.				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	B2	Section no.	B2	Date: 20/02/2015
Description of CAR				
The following applicability criteria of the methodology have not been considered as per latest version of the methodology: 4, 10, 14,15 and 17.				
Project participant response				Date: 17/06/2015
Table on section B.2 has been revised as per the latest version of the methodology.				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B1	New version No.: 6	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 15/07/2015
All applicable criteria of the methodology have been reviewed in the PDD and the chosen criteria are in line with the technical design of the project as per technical information.				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	B3	Section no.	B4	Date: 20/02/2015
Description of CAR				
The Regulation included in section B.4 and food note 5 page 13 is not the newest version of the reform. Furthermore in sections B4 and B5 the referred version 5 of the CDM project standard is not the latest version.				
Project participant response				Date: 17/06/2015
Corrected, the latest version of the regulation is now stated in section B.4.				
Furthermore, the latest version of the CDM Project Standard v.7, is now been used in Section B4 and B.5.				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B1	New version No.: 6	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 15/07/2015
The regulation mentioned in the PDD is the latest reform as per MINAET webpage. Furthermore the use of the PS version 7 is valid as per UNFCCC website.				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	B4	Section no.	B7	Date: 06/01/2016
Description of CAR				
<ol style="list-style-type: none"> The mentioned metering equipment ICE is not correct. The monitoring parameters needed for the enthalpy calculation of hot air have not been considered. Those include air flow, T and P as per methodology. The enthalpy hg of saturated steam at 13 bar is not in line with the real operation pressure (12.6 bar). The enthalpy hf value of water at 13 bar and 85°C has not been justified properly. The units in SI are missing for parameters P(enthalpy), Fss,y and FRf,y As per applied methodology the monitoring parameters "Net quantity of biomass consumed (Bbiomass)" and the "biomass moisture content" are not included in the monitoring plan. Historic data and prognoses documents are requested to confirm the expected energy demand growing of 5.9%. 				
Project participant response				Date: 25/05/2016
<ol style="list-style-type: none"> The meter description was revised and the text "ICE meter" was replaced by "on-site internal meter". The relevant flows in the determination of the parameter EGthermal,y are feed water and steam resulting from the boiler, i.e. hot air does not enter our calculations. 				

3. The monitoring section has been revised. Although the plant is expected to work under very small variations regarding pressure and temperature conditions, these parameters are now monitored and therefore the enthalpy values will only be determined ex-post. For ex-ante calculations, operation pressure of 13 bar was assumed.
4. In the monitoring reports, EG_{thermal,y} and all intermediate parameters will be reported using SI units.
5. These items have been included in the latest version of the monitoring plan. Kindly note that: i) the quantity of biomass (BBiomass_y) is required for equation (14) in the methodology; however, said equation is not used for the purpose of our baseline emission reductions calculation, which is instead based on actual energy measurements (equation (3) in the methodology). The parameter is nonetheless monitored to evaluate the overall consistency of the energy measurements; and ii) for the parameter "moisture content of the biomass", the monitoring frequency requirement within the parameter box in the methodology (p. 29) applies only to the cases "where emission reductions are calculated based on biomass energy input" (AMS-I.C. ver. 20 p. 29, row "Measurement procedures" on the biomass moisture content box).
6. A letter from the project representative was delivered to the DOE, explaining the continuing suitability of the 5.9% assumption in light of the past project performance, as documented in the project's own monitoring reports.

Documentation provided by project participant

<input checked="" type="checkbox"/> Changes in the PDD	Section(s): B1	New version No.: 6
<input type="checkbox"/> Changes in MR	Section(s):	New version No.:
<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/> Other:		

DOE assessment**Date:** 03/06/2016

1. The incorrect information "ICE" was corrected.
2. The explanation about the no inclusion of hot air is correct as per design of the PA.
3. The monitoring of parameter enthalpy hg, P and T have been considered as per methodology.
4. SI units have been considered in PDD.
5. The parameter BBiomass_y has been included in the monitoring plan which is in line with the monitoring methodology. The clarification stated by the PP is correct as the parameter will be used for cross check purposes only because the energy supplied by the project will be measured directly.
The parameter "biomass moisture content" the parameter is not relevant to the project as the baseline emissions are calculated based actual energy measurements. The methodology has been correctly applied. The monitoring plan is in line with the methodology.
6. For the 2nd CP the growing energy demand of 5.9% applied by the PP is considered suitable and correct for the following reasons:
 - It is based on the historic data of energy consumption from 3.5 years^{/PDD-reg/}, and
 - This was the prognoses growing rate for the 1st CP, which over the 7 years was proofed to be precise forecast, as practically no difference versus the real growing rate (-1%/XLS-yearly steam production/) was observed.
 - The Inolasa plant director considers that the growing rate of 5.9% should not be updated as the previous forecast was very precise with a difference versus real of -0,61%/letter/.

Furthermore:

 - No additional information is available to do a new prognoses. As the real biomass demand from the previous CP is not reliable because special situations were presented during the project operation, such as: at the beginning of the CP (first 3 years) the production was unusually low and additionally low availability of biomass was presented, situation that at the second part of the CP (last 3 years) was opposite.

So the expected growing rate is confirmed by the VT to be correct, precise and suitable according to the project situation.

Conclusion

Tick the appropriate checkbox

- ☐ Additional action should be taken (finding remains open)
- ☒ The finding is closed

CAR ID	B5	Section no.	B4	Date: 07/04/2017
Description of CAR				

Clarification regarding the following data is requested:

1) 25% increase (32% from DOE calculation) of emission reductions in the second crediting period (354,561 tCO₂e) as compared to the first crediting period (267,487 tCO₂e) and;

2) increase of energy demand during the 2nd crediting period as compared to the 1st crediting period, given the fact that the energy demand for year 2014, 2015 and 2016 as per PDD v03 (1st CP) was 411,702 GJ, 435,990 GJ and 461,711 GJ, whereas the energy demand for the same period as per the revised PDD v06 (2nd CP) is stated as 463,942 GJ, 491,314 GJ and 520,302 GJ respectively.

Project participant response

Date: 11/05/2017

1) The difference between the amount of ERs estimated for the 1st CP and the 2nd CP is a consequence of the annual increase in the plant's energy demand (5.9% per year). Said increase was already present in the original PDD for the first crediting period. The following table illustrates the impact of a 5.9% annual increase in baseline emissions (for every hundred tCO₂e; taking $y = 1$ as base value):

y	$BE_{y, 1st CP}$	$BE_{y, 2nd CP}$ (as per calculations in original PDD (1 st CP))	% increase respect same year from previous CP
1	100.00	149.37	49.4%
2	105.90	158.19	49.4%
3	112.15	167.52	49.4%
4	118.76	177.40	49.4%
5	125.77	187.87	49.4%
6	133.19	198.95	49.4%
7	141.05	210.69	49.4%
Total	836.83	1249.99	49.4%

Comparing each year with the corresponding year from the previous crediting period, the amount in the 2nd CP is 49.4% higher. Thus, the increase in emission reductions is only a consequence in the annual growth rate already considered in the first version of the PDD corresponding to the first crediting period. More specifically, baseline emissions (as per Table B.5 in PDD v03, corresponding to the 1st CP) for year 2007 are 32,778 tCO₂, whereas the same figure for 2014 is 48,927 tCO₂, i.e. BE for the first year of the 2nd CP are 49.3% *higher* compared to the first year of the first crediting period as per the original, registered PDD (i.e. PDD v03, 1st CP). Therefore, this aspect of the project was not introduced by/during its renewal. As a matter of fact, different aspects from the 2nd CP PDD (e.g. longer distances for procuring the biomass resulting in higher leakage emissions, consideration of *change* in enthalpy rather than only the enthalpy of the saturated steam, etc.) have determined that the number of ERs expected for the 2nd CP is smaller than the amount foreseen in the calculations presented at the time of registration of the PDD for the same years. In fact, PDD v03 (1st CP) presents BE and PE for 2014, 2015 and 2016, allowing a direct comparison to the figures included in the latest versions of the PDD:

Year	PDD v03 (1st CP) (as per tables B.5 and B.6)			ERs as per PDD v07 (2nd CP)	Difference
	BE	PE	ER		
2014	48,927	1,177	47,750	42,105	-11.8%
2015	51,810	1,235	50,575	44,643	-11.7%
2016	54,862	1,280	53,582	47,331	-11.7%

The table above clearly shows that the amount claimed in the 2nd crediting period is *lower* than the amount originally expected by the project at the time of registration.

2) The basis of the ERs calculation is the plant's heat requirement. The original energy demand estimate was prepared for the first crediting period, i.e. prior to 31/01/2007 (date of the original PDD submitted for registration, i.e. version 02) and considering historical information of the last 3.5 years available at the time (PDD v03, p.18). A revised estimate was prepared for the renewal of the crediting period, as originally submitted for validation (PDD version 04, dated 17/06/2014), more than seven years after the original calculation. According to the plant operators' estimate at the time of submission of the PDD for the renewal,

190,453 t of steam would be required for 2014 (equivalent to 462,707 GJ at the assumed enthalpy values)². The following tables provide an overall comparison of the original (PDD v03) and the revised (PDD v07) estimates:

(I) Year	(II) t of steam from biomass (monitored) ³	Total (GJ) ⁴			Difference (%) ⁵		
		(III) Monitored	(IV) 1st CP PDD (v03)	(V) 2nd CP PDD (v07)	(IV) and (III)	(V) and (IV)	(II) respect to previous year
2008	70,981	172,449	291,890		-40.9%		
2009	90,533	219,952	309,110		-28.8%		27.5%
2010	98,146	238,446	327,346		-27.2%		8.4%
2011	140,905	342,330	346,658		-1.2%		43.6%
2012	131,788	320,180	367,109		-12.8%		-6.5%
2013	161,565	392,523	388,766		1.0%		22.6%
2014	176,817	429,579	411,702	462,707	4.3%	12.4%	9.4%
Total	870,735	2,115,459	2,442,581		-13.39%		

(I) Year	(II) t of steam from biomass (monitored) ³	Total (GJ) ⁶			Difference (%)		
		(III) Monitored	(IV) 1st CP PDD (v03)	(V) 2nd CP PDD (v07)	(V) and (III)	(V) and (IV)	(II) respect to previous year
2015	181,916	441,967	435,990	490,007	-9.8%	12.4%	2.9%
2016	185,457	450,570	461,711	518,918	-13.2%	12.4%	1.9%

The 12.4% variation between an estimate made in 2007 and one made in 2014 is considered reasonable given the high level of uncertainty in the markets for INOLASA's products and the long period of time comprised between an estimate and the other. Note that the estimate for energy demand is ultimately linked to the plants sales (uncertain) rather than the installed capacity (fixed⁷), as it would be the case e.g. for a conventional / renewable power plant serving the grid.

INOLASA supplies the country and the region of Central America with high quality soybean products. In particular, the plant processes soybean to produce human grade quality oils, obtaining as a by-product animal grade quality soy-flour and other animal products. Other vegetable oils processed on-site include sunflower, olive, and palm oil. Therefore, competition and substitute products affect the demand for INOLASA's sales, whereas climatic conditions affect the crops used as inputs in the production process. The historical evolution of the soy bean processed by the plant as well as the time series with the production of the main oils have been made available to the DOE to demonstrate the uncertainty of the plant's core business. This uncertainty naturally translates into the plant's total energy demand (also submitted to the DOE as evidence). Moreover, the availability of biomass adds further complications for the forecasting of the amount of energy that will be procured from this source, an issue that has already

² This value is in line with the evolution of the demand in the period 2008-2013 (i.e. last 6 years of available information at the time of requesting for renewal). As per the respective monitoring reports, energy demand in 2008 was 70,981 t of steam, whereas the demand in 2013 was 161,565 t, thus resulting in an interannual growth rate of 17.9%. Applying this rate to the 2013 value results in 190,453 t for 2014. For subsequent years, an annual increase of 5.90% was assumed (as in the original PDD). This is justified as in recent years (i.e. after approval of changes in the PDD, allowing the use of additional sources of biomass) the availability of biomass has been more stable and therefore the heat production from this source subject to less variation. This is also visible in the data (compare e.g. the interannual rates (last column in the tables above) for the 2008-2013 period with the ones in the 2014-2016 period).

³ Data available in the respective monitoring reports except for November and December 2014 (obtained from plant's files), as these correspond to the second crediting period (not yet submitted for verification).

⁴ Considering same enthalpy values as in the ex-ante calculation of the 2nd CP PDD. See footnote below.

⁵ Note that PDD v03 only considered the enthalpy of the saturated steam leaving the boiler without considering that of the liquid entering the boiler. It can be shown that under this assumption, the overall difference for the entire period reduces from 13.39% to 0.67%.

⁶ Considering same enthalpy values as in the ex-ante calculation of the 2nd CP PDD.

⁷ It is important to stress that the installed capacity of the project has been implemented as per the original PDD.

triggered a notification of changes in the PDD during the first crediting period. Due to the numerous parameters affecting the plant's output, it is extremely unlikely to achieve a fixed / immutable estimate instead of periodically revised ones.

The second table also shows that the revised ex-ante estimate provides a reasonable estimate of the plant's actual performance, especially when the experience from the 1st crediting period is considered.

Documentation provided by project participant

<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B1	New version No.: 6
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/>	Other:		
DOE assessment			Date: 16/05/2017

5. The increase with 32.6% (unfccc 25%) in the Total ER estimation as stated by the PP is a consequence of the expected annual growing rate with 5.9% in energy demand thought 14 years as stated by the PP. This element is already present in the ex-ante calculation presented for the first crediting period and justified by the plant's. This values have been validated by the VT as per revision of the steam generation historic data monitored by the project operator. The monitored values were validated by by checking steam generation databases (excel file).An error in the baseline calculation was identified by the VT as the value used for calculation of the base year (2014) for the 2nd CP is not 463,942 GJ as stated by the PP but 462,707 GJ.

Also the increase in the new energy demand prognosis (updated PDD version 7) versus the old prognosis (registered PDD version 3) has an in impact in the calculation as the energy demand in base year 2014 (462,707 GJ) is 12% higher than the old prognosis (411,702 GJ) from (PDD ver. 3 2007). Such difference is considered correct and plausible as the new estimation (PDD ver.7) is based on more recent historical data (yearly steam generation)

The VT also confirmed the prognoses and the expected growing rate by information provided by Inolasa Management, the following information was provided:

Letter from Director of Inolasa plant stating:

For the purpose of clarity, the following table presents the biomass consumption during the first crediting period, as compared to the ex-ante expectation on the registered PDD. Note that although actual values have been lower than expected on the initial years and higher than expected on the final ones, the overall estimate for the entire period has been reasonably accurate, with a difference lower than 1%. Thus, and in our opinion, the 5.9% annual growth for steam consumption initially assumed in the original PDD does not need to be revised.

As per CAR B5 the VT concluded that the increase in the ER for the 2nd CP is coherent with the expected and actual ER from the 1st CP. By the letter from the Director and interviewed personnel it is confirmed the correctness of the energy growing rate and by analysis of the energy and ER calculation spreadsheet it is confirmed the correctness of the ER estimation.

6. As stated in the clarification provided by the PP, the difference in the energy values between the 1st and 2 CPs is because the 2 prognoses were done in different time and with different historical data. The values taken from registered PDD ver. 2 are based on a forecast done in 2007 (411,7029 GJ), whereas the values used for the prognoses included in updated PDD ver. 6, are based on projection done in 2014 which uses data from actual energy monitored from 2013 and backwards. The value used for the energy calculation (462,707 GJ) for the 2nd CP is based on the steam demand estimated by the soy plant operator (190,453 tonnes steam for year 2014), so that the 12% difference is considered correct due to the irregular market demand of soybean and other products. The irregular demand is confirmed by the following data revised during validation:

- ✓ "Total soybean consumption by the plant" where the inter annual variation ranges from -25% to a maximum of +12%.
- ✓ "Total steam generation where the annual variation ranges from 0% to 30%.
- ✓ "Palm oil generation where the annual variation ranges from -7% to +28%
- ✓ "Soy oil production where the annual variation ranges from -6% to +18%

According to the given trends, it can be confirmed that the market is uncertain and that a revision of the original estimate can yield a difference as the reported 12%.

Conclusion

Tick the appropriate checkbox

- ☐ Additional action should be taken (finding remains open)
- ☒ The finding is closed

CAR ID	A3	Section no.	A3	Date: 07/04/2017
Description of CAR				
<p>Correction requested. Inconsistency of the information provided in the PDD regarding:</p> <p>1) the mix of different types of biomass combusted in the boiler given the fact that in section A.3 (page 5/64), % biomass mix is given as 51% palm kernel shells, 28% empty fruit branches, 17% bagasse and 4% wood chips, where as in table 3 (page 5) it is stated as 37% palm kernel shells, 42% empty fruit branches, 14% bagasse and 7% wood chips.</p> <p>2) average technical transmission and distribution losses (TDLj,y) in section B.6.2 is mentioned as 20%, whereas the spreadsheet has used a value of 11.6%.</p>				
Project participant response				Date: 11/05/2017
<p>1) Revised in the latest version of the PDD.</p> <p>2) Revised in the latest version of the PDD. The value provided by the Central American Statistics for the electric sector compiled by the United Nations' Economic Commission for Latin America and the Caribbean (data corresponds to latest report available at the time of validation). Available at: http://repositorio.cepal.org/bitstream/handle/11362/26293/1/M20130047_es.pdf (see p. 29)</p>				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B1	New version No.: 6	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 16/05/2017
<p>1. The revised shares of the different biomass types are consistent throughout the different sections of the PDD. The different biomass shares are in line with the registered PDD.</p> <p>2. The reviewed values of though the whole PDD 11.6% TDL is considered correct as a default value taken from an official source. The value is taken from the available source at the moment of submission the updated PDD to the VT for revision. The use of the default value is in line with the methodological tool for calculation of PE (Source: CEPAL, Central America, statistics of electric sector, 2012).</p>				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	B6	Section no.	B4	Date: 07/04/2017
Description of CAR				
<p>An error in the baseline calculation was identified as the value used for calculation of the base year (2014) for the 2nd CP is not 463,942 GJ as stated by the PP but 462,707 GJ.</p>				
Project participant response				Date: 11/05/2017
<p>the value was corrected in the revised calculation</p>				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B1	New version No.: 6	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 16/05/2017
<p>The corrected value applied by the PP has been validated by the VT as per revision of the steam generation historic data monitored by the project operator. The monitored values were validated by revised by checking steam generation databases (excel file). As the ER calculation sheet was affected by the change, the whole ER calculation was reviewed.</p> <p>It is confirmed that the applied value is correct and the corrected ER calculation is correct, conservative and in line with the applied methodology.</p>				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	A4	Section no.		Date: 27/09/2017
Description of CAR				
In line with the 4 th incomplete received from UNFCCC on August 26 th 2017 and the interview hold on September 8 th with personnel from UNFCCC/CDM Team and Regarding the biomass mix and the energy demand the PP is requested to clarify and document the biomass mix and energy demand values which were modified in the updated PDD as a PRC with prior approval, for which the DOE will performed the respective validation assessment				
Project participant response				Date: 26/11/2017
The new values were provided by the plant engineer and based on historical data. Analysis of the impact of this new assumptions are presented as Post Registration Changes and submitted for approval.				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B1	New version No.: 9	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 30/11/2017
<p>The revised and updated PDD version dated 17.10.2017 was revised by the VT, the biomass mix and energy demand changes are clarified in a PRC report (annexed to this report). The changes in the biomass mix are clarified as follow:</p> <p>A PDD version 9 was elaborated and the biomass mix was updated according to the most recent monitoring information from the period. For the biomass mix prognoses the PP elaborated a spread sheet file "Biomass projection January 2015" based in the average biomass values taken from the historic records from years 2011-2014.</p> <p>The biomass mix considered in PDD version 3 was approximately: 51% palm kernel shells, 28% empty fruit branches, 17% bagasse and 4% wood chips, which was updated in PDD version 9 to 37% palm kernel shells, 42% empty fruit branches, 14% bagasse and 7% wood chips, according to the prognoses. Furthermore the energy change is clarified as follow:</p> <p>Originally the energy demand was estimated in 291,890 GJ for year 2007 in PDD version 3 with an annual increase of 5.9% respectively 411,702 for year 2014. For the renewal of the crediting period a new energy prognoses was done in 2014 taking as a calculation bases the monitored energy from years 2008 to 2013. The estimated energy demand for 2014 is recalculated in 190,453 t (462,707 GJ) by applying the average increase of the actual energy demand. The year 2014 is taken as the calculation bases and, from that year an annual increase of 5.9% in energy demand is applied.</p> <p>The difference in the energy prognoses generates a difference in the 2014 energy demand of around 12% between the 2 estimations.</p>				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	B7	Section no.	B.4/Table 4	Date: 28/09/2017
Description of CAR				
Section B.4 of the updated PDD does not mention the consideration of the methodology AMS-I.C, version 20.				
Project participant response				Date: 26/11/2017
This was revised in the new version of the PDD.				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B1	New version No.: 9	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 30/11/2017

<p>The VT revised the justification provided by the PP in section B.2 of the updated PDD and the applicability of the methodology (AMS I.C version 20) and it is confirmed that the project is in line with the methodology</p> <p>As the changes only refer to use of a different biomass mix and the methodology does not restrict the amount either combination of biomasses to be used the changes do not affect the applicability and the application of the approved baseline methodology. Furthermore evidence of final destination of biomass in the absence of the project activity was provided. Letters^{/PRC/} of biomass supplier as evidence that the biomasses would be left to decay in the absence of the project activity were checked. Furthermore public evidence^{/PRC/} of the use of wood in Costa Rica was provided to demonstrate that wood residues are not commonly used and there is urgency to promote the use of wood residues. Concluding the project activity is not taking biomass from other users.</p>	
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

CAR ID	B8	Section no.	Appendix 4 (section V)	Date: 21/05/2018
Description of CAR				
Derivate from the incomplete number 5 from UNFCCC the following finding as been raised: For the EF calculation the CM has not been calculated as per Tool to calculate the emission factor for an electricity system paragraph 84 (b) which requires to apply WOM=0.25 and WBM=0.75 for the second crediting period. Correction is requested.				
Project participant response				Date: 30/05/2018
<i>The correction was done to the EF calculation as per the Tool to calculate the emission factor for an electricity system paragraph 84 (b). The new version of the PDD has been revised accordingly.</i>				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): ER Estimate; EF 2010	New version No.: 3 (ER), 2 (EF)	
<input type="checkbox"/>	Other:			
DOE assessment (Round 2)				Date: 17/06/2018
The corrected EF calculation considers the application of the WOM=0.25 and WBM=0.75 for the second crediting period as per Tool to calculate the emission factor for an electricity system. Also the ER calculation applied the corrected EF of 0.2288 TCO2/year, nonetheless the WOM and WBM weights provided in page 50 are not consistent.				
Also page 9 of PDD refers to the "Tool to calculate the emission factor for an electricity system" version 6, whereas the rest of the document refers to version 5. Correction is requested.				
Project participant response (Round 2)				Date: 20/06/2018
<i>The WOM and WBM of page 50 of the PDD were corrected. The PDD was reviewed and version of the "Tool to calculate the emission factor for an electricity system" was corrected to version 6.</i>				
Documentation provided by project participant				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): several	New version No.: 10	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: 23/06/2018
<i>The WOM and WBM weights for calculated CM are correct though out the updated PDD version 10. Also the Tool to calculate the emission factor for an electricity system" version 6 has been referred correctly though out the whole document (updated PDD). The corrected EF and ER calculation are in line with the applied methodology and methodological tool. Also they are considered correct and conservative.</i>				
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

Table 5. FAR from this validation

N/A

Appendix 5. Assessment of applicability criteria

Applicability Criteria	Evidence used	met	not met	N/A	Assessment of validation team (results and means of assessment)
#2: As per numeral 2 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The project activity involves a biomass-based cogeneration. As per the PDD “the proposed CDM project activity comprises the installation of a biomass fuelled boiler to supply steam for internal production processes, displacing a coal-fired boiler”. Therefore the criteria is met. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD and in table included in section B.2 of updated PDD and furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA..
#3: As per numeral 3 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The proposed CDM project activity comprises the installation of a biomass fuelled boiler to supply steam for internal production processes, displacing a coal-fired boiler. Thus the emission reductions from a biomass cogeneration system will accrue from thermal energy production for on-site consumption. Therefore the criteria is met. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD and in table included in section B.2 of updated PDD and furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#4: As per numeral 4 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The criteria is met. The project activity seeks to modify an existing facility for renewable energy generation i.e. switch from coal to biomass. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD and in table included in section B.2 of updated PDD and furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#5: As per numeral 5 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The criteria is met as the project involves generation of renewable energy (biomass). It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD and in table included in section B.2 of updated PDD and furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.

Applicability Criteria	Evidence used	met	not met	N/A	Assessment of validation team (results and means of assessment)
#6: As per numeral 6 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the project is not a greenfield project. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#7: As per numeral 7 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The criteria is met as the project has an installed capacity of less than 45 MW thermal. It was assessed by the VT by calculating the power capacity in MW considering 35,000 Kg/Hr, the working pressure 12.7 bar, and the temperature 192°C (Saturated) resp. 275°C (Superheated), which is around 27 MW _{th} . Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#8: As per numeral 8 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the project does not involve co-fire system. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#9: As per numeral 9 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the project does not involve either cogeneration or trigeneration units. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#10: As per numeral 10 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the project is not a new facility either a retrofit project. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD and in table included in section B.2 of updated PDD and furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#11: As per numeral 11 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as no processed biomass are used as fuel. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.

Applicability Criteria	Evidence used	met	not met	N/A	Assessment of validation team (results and means of assessment)
#12: As per numeral 12 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as no processed biomass are used as fuel It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#13: As per numeral 13 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the energy produced by the project is used in the owner's facility It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#14: As per numeral 14 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the project does not involve biogas utilization. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#15: As per numeral 15 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the project does not involve refrigerants.. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD . Furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#16: As per numeral 16 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the project does not involve Charcoal. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA.
#17: As per numeral 17 of the methodology	/TECH/ /LIC/ /IM/ /PDD/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The criteria does not apply as the project does not involve dedicated plantations for biomass. It was assessed by the VT by comparison of the technical information included in project specifications versus information in registered PDD. furthermore interviews with the key personnel of the PA were performed for confirmation of the operation modus and technical features of the PA