
 <p style="text-align: center;">Validation report form for CDM project activities (Version 03.1)</p>	
Complete this form in accordance with the instructions attached at the end of this form.	
BASIC INFORMATION	
Title of the project activity	Puelche Project/Cancura Factory Biomass Boiler for Heat Generation
Version number of the validation report	08
Completion date of the validation report	19/05/2018
Version number of the PDD to which this report applies	13
Date when PDD was uploaded for global stakeholder consultation	18/01/2011
Project participants	Nestlé Chile S.A.
Host Party	Chile
Applied methodologies and standardized baselines	AMS-I.C: "Thermal energy production with or without electricity" version 20.0
Mandatory sectoral scopes linked to the applied methodologies	Scope 1: Energy Industries (renewable/non-renewable).
Conditional sectoral scopes linked to the applied methodologies, if applicable	NA
Estimated amount of annual average GHG emission reductions or GHG removals by sinks	16,333 tCO ₂ e
Name and UNFCCC reference number of the DOE	E-0005: TÜV SÜD South Asia Pvt. Ltd.
Name, position and signature of the approver of the validation report	 Milind Shende Certification Body Manager

SECTION A. Executive summary

TÜV SÜD has performed a validation of the aforementioned CDM project activity. Standard auditing techniques have been used for the validation of the project. An internal validation checklist has been prepared to conduct the validation process in a transparent and comprehensive manner.

Nestlé Chile S.A. is developing and executing a project, which consists in the construction of a highly automated cow milk processing plant in the Osorno Province, Los Lagos Region in Chile. The project will have a maximum production of 30,000 tons a year of powdered milk (final product) and considers the possibility of future production capacity expansions. The thermal energy demand of this processing plant will be satisfied by using a 15 tons/h capacity Biomass Fired Boiler to produce steam. The CDM project activity involves the installation and operation of this biomass fired boiler. Emission reductions attributable to the project are additional to any that would occur in the absence of the project activity. Considering that the project will be implemented as designed, the project is likely to achieve the estimated amount of annual emission reductions of 16,333 tCO₂e (according to the GSP PDD) and a total estimated of 16,333 tCO₂e as specified within the final PDD version for the crediting period.

The List of Findings describes total of 42 findings which include: *Twenty-five (25)* Corrective Action Requests (CARs); *Seventeen (17)* Clarification Requests (CRs); *no* Forward Action Requests (FAR) was raised during this validation; and all findings have been closed satisfactorily.

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 & Validator	IR	Murty	Eswar	TUV SUD	✓	✓	✓	✓
2	Country Expert	EI	Keifer ¹	Lester Saldias			✓	✓	

¹ Left TUV SUD, but was part of the on-site team in March 2011.

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

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	Dutta	Supratik	TUV SUD
2	Technical Expert	IR	Shukla	Atul	TUV SUD
3	Approver	IR	Shende	Milind	TUV SUD

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

The objective of the validation process is to provide an independent assessment by a third party, a Designated Operational Entity (DOE), of a proposed project activity against the applicable CDM requirements. The assessment involves the evaluation whether the proposed project activity complies with the requirements of paragraph 37 of the CDM M&Ps, the applicability conditions of the selected methodology AMS I.C version 20 and any applicable guidance issued by the Board. Validation is part of the CDM project cycle and results in a conclusion by the executing DOE on whether or not a project activity is valid to be submitted for registration to the CDM Executive Board (CDM-EB). The ultimate decision on the registration of a proposed project activity rests with the CDM-EB and the Parties involved.

The information provided by the project participants is assessed by applying the means of validation specified in the “CDM Validation and Verification Standard for project activities, Version 1.0 “(CDM VVS PA v1.0) and where appropriate standard auditing techniques. In the absence of specific means of validation specified in the CDM VVS the standard auditing techniques are applied.

Before the assessment begins a competent team to perform the validation is selected. The team is selected to cover the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the CDM project activity. Once the project is made available for the stakeholder consultation process, members of the team carry out the desk review, follow-up actions, resolution of issues identified, and the preparation of the validation report. The prepared validation report and other supporting documents then undergo an internal quality control by the CB “Environment and Energy” before being submitted to the CDM-EB.

In case the validation team identifies issues that require further elaboration, research or expansion in order to determine whether the project activity meets the CDM requirements, and can achieve credible emission reductions findings are raised as specified in the CDM VVS PA v1.0. To recommend the project activity for registration all CARs and CLs must be resolved.

All CARs, CLs and FARs are found in Appendix 4 to this validation report including the responses provided by the project participants, the means of validation of the responses and references to any resulting changes in the PDD or supporting annexes.

The PDD for the GSP was submitted to the DOE in January 2011. The PDD and additional background documents related to the project design and baseline have been reviewed to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done as an initial step of the validation process. A complete list of all documents and evidence material reviewed is attached as Appendix 3 to this report.

C.2. On-site inspection

Duration of on-site inspection: 17-18 March 2011				
No.	Activity performed on-site	Site location	Date	Team member
1.	Project description, Plant inspection, project boundaries	Plant	17-18 March 2011	Eswar Murty & Lester Saldias
2	Baseline Validation	Plant Office	17-18 March 2011	Eswar Murty & Lester Saldias
3	Additionality including investment analysis, barrier analysis and IRR calculations	Plant Office	17-18 March 2011	Eswar Murty & Lester Saldias
4	CDM consideration, methodology applicability	Plant office	17-18 March 2011	Eswar Murty & Lester Saldias
5	Assessment of estimated emission reduction procedure, emission factors	Plant office	17-18 March 2011	Eswar Murty & Lester Saldias
6	Host country approval and MoC	Plant office	17-18 March 2011	Eswar Murty & Lester Saldias
7	Monitoring aspects and organization structure	Plant office	17-18 March 2011	Eswar Murty & Lester Saldias
8	EIA and Stakeholder consultations	Plant office	17-18 March 2011	Eswar Murty & Lester Saldias

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Ravanal	Patricio	Nestle Chile S.A.	17-18 March 2011	Project description, Plant inspection, project boundaries, Monitoring aspects and organization structure	Eswar Murty & Lester Saldias
2	Waldisberg	Fabian	Nestle Chile S.A.	17-18 March 2011	Project description, Plant inspection, project boundaries, Baseline Validation, Additionality including investment analysis, barrier analysis and IRR calculations	Eswar Murty & Lester Saldias
3	Martinez	Mario	Nestle Chile S.A.	17-18 March 2011	Host country approval and MoC	Eswar Murty & Lester Saldias
4	Ontega	Gonzelo	Nestle Chile S.A.	17-18 March 2011	EIA and Stakeholder consultations	Eswar Murty & Lester Saldias
5	--	Carolina	Nestle Chile S.A.	17-18 March 2011	CDM consideration, methodology applicability	Eswar Murty & Lester Saldias
6	Farah Gonzalez	Maria Luz	Poch (Consultant)	17-18 March 2011	Baseline Validation, Additionality including investment analysis, barrier analysis and IRR calculations, Assessment of estimated emission reduction procedure, emission factors, CDM consideration, methodology applicability	Eswar Murty & Lester Saldias

C.4. Sampling approach

Not applicable.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Demonstration of prior consideration of the CDM		1	
Identification of project type		1	
General description of project activity	4	3	
Application and selection of methodologies and standardized baselines			
- Application of methodologies and standardized baselines		2	
- Deviation from methodology and/or methodological tool			
- Clarification on applicability of methodology, tool and/or standardized baseline			
- Project boundary, sources and GHGs		2	
- Baseline scenario	1	4	
- Demonstration of additionality	4	2	
- Estimation of emission reductions or net anthropogenic removals	3	3	
- Monitoring plan	2	2	
Start date, crediting period type and duration			
Environmental impacts		1	
Local stakeholder consultation		2	
Sustainable development co-benefits		1	
Approval			
Authorization			
Modalities of communication			
Global stakeholder consultation			
Others (please specify)	1 (energy balance) 1 (lifetime equipment) 1 (boiler efficiency)	1 (Biomass)	
Total	17	25	

SECTION D. Validation findings
D.1. Demonstration of prior consideration of the CDM

Means of validation	<p>The starting date of the project activity is determined by project proponent based on the date of issue of purchase order for biomass boiler [# 48]. This is in line with the definition of start date as per CDM Glossary of Terms, as this is the date on which the PP has committed to the expenditures related to CDM project.</p> <p>The starting date of the project has been determined to be 24/11/2009 which is after 02 August 2008, but before the GSP. The DNA and UNFCCC confirm through the document/links that the PPs have informed the entities about the commencement of the project activity. Therefore, it is confirmed that the project complies with the requirements regarding prior consideration of CDM. The PPs presented the following information to the assessment team:</p> <ul style="list-style-type: none"> • Intimation to the UNFCCC and DNA [# 41] • Purchase Order of Biomass based boiler [# 48] • Acknowledgement from DNA [# 42] <p>The original documents presented have been reviewed and verified based on interviews with Mr. Fabian Waldisberg, Project Manager of Nestle</p>
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Chile S.A. Therefore, the documents are considered appropriate to confirm the prior consideration of CDM. Additionally, in order to confirm that the PPs have taken real actions to continue the activity as CDM, activities have been reviewed against the documents provided to the DOE and a timeline of events is shown in the table below:

Timeline of Project Activity

The table below presents the activities that are related to CDM process

Activity	Document	Auditor conclusion
FSR	Purchase order for Feasibility study on Puelche project [# 44]	Verified. The evidence considered as proof for on-going CDM related activity. <input checked="" type="checkbox"/>
FSR	Feasibility Study Report for Puelche Biomass Project [# 6]	Verified. The evidence considered as proof for on-going CDM related activity. <input checked="" type="checkbox"/>
CDM decision making	Board Minutes of meeting of Teleconference to take decision on CDM project [# 46]	Verified. The evidence considered as proof for CDM decision making by the PP. <input checked="" type="checkbox"/>
Appointment of CDM consultant	CDM consultancy services contract [# 47]	Verified. The evidence considered as proof for on-going CDM related activity. <input checked="" type="checkbox"/>
Stakeholder meeting	Minutes of the meeting [# 39]	Verified. The evidence considered as proof for on-going, CDM related activity. <input checked="" type="checkbox"/>
Host Country Approval	LoA [# 13]	Verified <input checked="" type="checkbox"/>
DOE Appointment	Contract with DOE [# 49]	Verified. <input checked="" type="checkbox"/>
Global stakeholder process	UNFCCC webpage	Verified. <input checked="" type="checkbox"/>
Commissioning of the milk processing plant	Commissioning certificate DOE [# 64]	Verified. <input checked="" type="checkbox"/>
Submission of UNFCCC request for registration and subsequent incompleteness	2013-15	Verified. <input checked="" type="checkbox"/>

Findings	<p>CAR 13 has been raised regarding</p> <ul style="list-style-type: none"> a) The relevant chronological events from the date of consideration of CDM till submission of PDD for Global stakeholder consultation process needs to be indicated and supporting documents for the same needs to be submitted b) When did Nestle take a decision to proceed with the CDM project and provide necessary evidence <p>In response to the CAR, the relevant chronological events were included in a timeline. The timeline and supporting evidence are submitted.</p>
Conclusion	This confirms that the project complies with the requirements of CDM VVS PA v1.0 to demonstrate the prior consideration of the CDM.

D.2. Identification of project type

Means of validation	The project activity qualifies as Type I Renewable energy project activity with a maximum output capacity of 15 MW (or an appropriate equivalent), as per the CDM project standard for project activities Version 01.0. Specifically the project activity corresponds to a (iii) biomass project with a limit of 45 MWth of installed capacity of the thermal application equipment.
Findings	CAR3 has been raised regarding the mention of Type and category of the project activity and the same is mentioned by the PP in the revised PDD.
Conclusion	The PDD has been completed using the valid version of the PDD form version 3.0 appropriate to the type of the proposed CDM project activity.

D.3. General description of project activity

Means of validation	<p>The project activity involves the installation of 15 TPH capacity Biomass Fired Boiler to cater the steam energy needs of the milk processing plant of Nestle Chile S.A. The LPG boiler of 15 TPH is also planned to install as a backup in case of emergencies.</p> <p>The cow milk processing plant including the biomass fired boiler is not replacing any existing installations and therefore the project activity is considered as a Greenfield Project. The biomass boiler design allows the use of wood chips, wood shavings and wood sawdust.</p> <p>Wood chips are a well known fuel source and (as concluded in the biomass availability study) they are highly available in the surrounding area of the project activity. Biomass residue includes sawdust, woodchip, bark, planer shavings and the wood chips are considered as the biomass residues in line with paragraph 4 of EB 23 Annex 18, The DOE confirms that woodchips are harvested through sustainable forestry practices through publicly available information. The use of renewable biomass for the project activity follows the national regulations of Chile (General Rules on Environment, Ministry of Environment) IRL # 16. The audit team has further checked the availability of wood chips in abundance in the region based on Forestry Statistics of Los Lagos Region, INFOR, Chile 2008. Page 77, Frame 3.23, "Wood-chip Industry. Hence it is confirmed from DOE that assessed that the biomass to be consumed in the project activity is considered as renewable biomass in line with paragraph 1 and 4 of "Definition of Renewable Biomass" (EB 23 Annex 18).</p> <p>The implementation of the Puelche Project/Cancura Factory biomass boiler represents an initiative by Nestlé Chile S.A. that encourages the implementation of renewable energy generation technologies and resources</p>
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	<p>in the country, particularly associated to industrial processes and facilities. The Plant is located in Osorno Province of Los Lagos region. The information presented in the PDD on the technical design is consistent with the actual planning and implementation of the project activity confirmed in the following ways:</p> <ul style="list-style-type: none"> • A review and cross check of data and information [refer annex 2: IRL# 26, 27, 28, 29, 30, 44, 53]. • An on-site visit with relevant stakeholder and personnel with knowledge of the project in attendance. Also, further cross checks through additional interviews were conducted. • A review of information related to similar projects or technologies which CDM project activity have been cross checked from Ministry of Environment (http://portal.mma.gob.cl/) to validate the accuracy and completeness of the project description.
Findings	<p>CAR 1, CAR 2, CL 1, CL2, CL3 and CL4 have been raised regarding the project activity description. CAR 5 has been raised regarding technology transfer.</p> <p>The above mentioned CARs and CLs have been clarified and resolved and the detailed findings are provided in Appendix 4 of the report.</p>
Conclusion	<p>TÜV SÜD confirms that the project description, as included in the PDD, is sufficiently accurate and complete in order to comply with the paragraph 56 of VVS PA 1.0.</p>

D.4. Application and selection of methodologies and standardized baselines

D.4.1. Application of methodologies and standardized baselines

Means of validation	<p>Assessment:</p> <ol style="list-style-type: none"> 1) The project activity is a renewable biomass fired boiler; it uses renewable sources to generate thermal energy (steam). The project activity supplies thermal energy to the user (in this case an industrial facility) and displaces fossil fuel fired thermal energy generation sources. Since the project activity does not use processed solid biomass fuel, the conditions stated in the methodology AMS-I.C v.20 related to the demonstration on how this is produced (If is produced using solely renewable biomass, or not) are not applicable to this project. Wood chips are a well known fuel source and (as concluded in the biomass availability study) they are highly available in the surrounding area of the project activity. The DOE confirms that woodchips are harvested through sustainable forestry practices and the use of renewable biomass for the project activity follows the national regulations of Chile (General Rules on Environment, Ministry of Environment) IRL # 16. Hence it is confirmed from DOE that assessed that the biomass to be consumed in the project activity is considered as renewable biomass in line with paragraph 1 and 4 of "Definition of Renewable Biomass" (EB 23 Annex 18). Hence, this scenario is applicable to this project. 2) The project activity is not a Biomass-based cogeneration system
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	<p>3) The project activity is not a Biomass-based cogeneration system. Hence, this scenario is not applicable to this project.</p> <p>4) It is a small scale project activity due to its installed capacity, calculated from enthalpy, reaches approximately of 10MW² thermal, less than 45 MW thermal which is the limit value for small scale projects.</p> <p>5) The project activity is not a co-fired system</p> <p>6) The project activity is not a cogeneration system. Hence this clause is not applicable.</p> <p>7) The steam produced in the boiler and heat produced in by-product dryer is within the same facility and is not supplied to any other facility. The contract between supplier and consumer is hence not required.</p> <p>8) The project activity doesn't retrofit or modify an existing facility for renewable energy generation. Hence, this scenario is not applicable to this project</p> <p>9) The project activity doesn't retrofit or modify an existing facility for renewable energy generation. The project does not involve addition of renewable energy units. Hence, this scenario is not applicable to this project</p> <p>10) The project activity does not include charcoal based biomass energy generation and hence para 14 is not applicable to the present project activity.</p> <p>11) The project activity does not include solid biomass fuel and hence para 10 is not applicable to the present project activity.</p> <p>12) This project does not includes type III component of SSC methodology. Hence this clause is not applicable.</p>
Findings	<p>CAR 6, CAR 7 have been raised regarding the baseline scenario.</p> <p>The above mentioned CARs and CLs have been clarified and resolved and the detailed findings are provided in Appendix 4 of the report</p>
Conclusion	<p>The assessment was carried out for each applicability criterion and included, among other checks, a compliance check of the local project setting with the applicability conditions in regard to baseline setting and eligible project measures. This assessment also included the review of secondary sources to demonstrate the compliance with applicability conditions.</p> <p>The methodology-specific protocol, included in Annex 1, documents the assessment process. The results of the compliance check as well as relevant evidence are detailed in the protocol and the information reference list.</p>

²Calculated in function of flow, temperature and pressure of the steam, according to Biomass boiler technical data and using parameters of Perry's Chemical Engineers' Handbook.

	TÜV SÜD confirms that the chosen baseline and monitoring methodology is applicable to the project activity as per p.62 of the VVS PA 1.0.
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D.4.2. Deviation from methodology and/or methodological tool

Means of validation	NA
Findings	NA
Conclusion	NA

D.4.3. Clarification on applicability of methodology, tool and/or standardized baseline

Means of validation	NA
Findings	NA
Conclusion	NA

D.4.4. Project boundary, sources and GHGs

Means of validation	The project boundary was assessed considering information gathered from the physical site inspection, interviews, and secondary evidence received on the design of the project.		
	Aspect of the Boundary (§ 83 – 85)	Onsite Observation	Relevant Documents
	Plant generating heat fired with biomass and one back up LPG fired boiler, Industrial facility, consuming energy generated by the system, grid and the fossil fuel plant and the processes or equipment affected by the project activity.	The project boundary is as per the methodology and the same has been validated based on the document review and on-site visit.	Feasibility Study Report [# 6] Flow diagram for Air, flue gas, fuel and ash process [#18] Flow chart of the Plant [# 30]
Findings	CAR 8, CAR 9 have been raised regarding the baseline scenario. The above mentioned CARs and CLs have been clarified and resolved and the detailed findings are provided in Appendix 4 of the report		
Conclusion	TÜV SÜD confirms that the identified boundary, the selected sources, and gases as documented in the PDD are justified for the project activity and are fully in line with the requirements set by the applied methodology and CDM VVS PA v1.0. Emission sources, not addressed by the applied methodology and expected to contribute more than 1% of the overall expected average annual emission reductions, have not been identified		

D.4.5. Baseline scenario

Means of validation	<p>TÜV SÜD did following steps to assess the requirements for baseline identification:</p> <ul style="list-style-type: none"> • initial document review • on-site visit • view of information from similar projects and/or technologies • Others <p>The following sources of information were used for crosscheck the information contained in the PDD:</p>
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	<p>The baseline scenario is the coal boiler, which would have been used in the absence of the project activity. This is based on preliminary assessment of Nestlé, developed for another existing plant in the country, which concludes that the cheapest alternative for thermal energy is coal, followed by natural gas and then by biomass. The LPG boiler was selected as back up boiler, because it has a high energy value than the coal. The efficiency of LPG is higher than the efficiency of the coal boiler (91% and 85% respectively). As the LPG boiler has higher efficiency than the Coal fired boiler, it is planned to use LPG as backup boiler. However this would be in case of emergencies only.</p> <p>The preliminary assessment report considered all possible alternatives for the development of the project in order to preliminarily determine the most economical alternatives. Among the alternatives included in the preliminary assessment report, the three cheapest alternatives were coal, natural gas and biomass and for these three alternatives, a more detailed financial analysis has been developed, but considering that the natural gas is not available in the region, the remaining alternatives were coal and biomass, for which a detailed investment comparison analysis was developed. The Coal is the cheapest alternative among all the alternatives.</p> <p>The information presented in the PDD has been validated by an initial document review of all data. Further confirmation has been made based on the on-site visit and a review of information from similar projects and/or technologies. The sources referenced in the PDD have been quoted correctly. The information was verified against credible sources, such as the following:</p> <ul style="list-style-type: none"> • Feasibility Study Report [# 6] • Preliminary Assessment Report and presentation [# 17, 51] • Fuel Cost Evaluation sheet [# 21] • Quotation from Coal fired boiler supplier [# 44] • Quotation from Biomass fired boiler supplier [# 53]
Findings	<p>CAR 10, CAR 11, CAR 12, CAR 16, CL 5 have been raised regarding the baseline scenario.</p> <p>The above mentioned CARs and CLs have been clarified and resolved and the detailed findings are provided in Appendix 4 of the report</p>
Conclusion	<p>TUV SUD confirms the following statements:</p> <ol style="list-style-type: none"> All the assumptions and data used by the project participants are listed in the PDD, including their references and sources; All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD; Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence, and can be deemed reasonable; Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD; The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario, and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity. The PDD provides a description of the identified baseline scenario, including a description of the technology that would be employed

	<p>and/or the activities that would take place in the absence of the proposed project activity.</p> <p>The validation team confirms that the proposed project activity meets above requirements. Therefore, the baseline scenario as prescribed in the applied methodology AMS.I.C (version 20) is applicable to the proposed project activity. The validation tool is cognizance of CDM VVS PA v1.0.</p>
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D.4.6. Demonstration of additionality

Means of validation	<p>The additionality of the project has been presented in the PDD as per the Guidelines on the demonstration of additionality of small-scale project activities (EB 68 Annex 27). Investment barrier has been demonstrated using "Guidelines on the assessment of investment analysis"(EB 62 Annex 5), the investment comparison analysis is selected because the alternative requires investment anyhow and baseline emissions are based on that alternative, so the only means to conclude that the project activity is less financially attractive than at least one alternative is to conduct an investment comparison analysis. The project activity applied the investment comparison analysis, using the Net Present Value (NPV) as the financial indicator and hence NPV of two alternatives, coal fired boiler and biomass fired boiler, were compared to determine the most economically feasible alternative.</p> <p>The approach used in the PDD has been assessed initially through the document review, during which the following documents were reviewed:</p> <ul style="list-style-type: none"> • Feasibility Study Report [# 6] • Preliminary Assessment Report and presentation [# 17, 51] • Fuel Cost Evaluation sheet [# 21] • Quotation from Coal fired boiler supplier [# 44] • Quotation from Biomass based boiler [# 53] • Investment analysis calculation spreadsheet [# 34] • Discount rate calculation sheet [# 22] <p>On site, the additionality was discussed principally with Mr. Fabian Waldisberg, Project Manager of Nestle Chile S.A and documents have been reviewed (see Annex 2).</p> <p>Finally, the data, rationales, assumptions, justifications, and documentation provided have been verified using local knowledge as well as sectoral and financial expertise.</p> <p>Identification of Alternatives</p> <p>The output of the project is thermal energy generation.</p> <p>Among the alternatives included in the preliminary assessment report, the three cheapest alternatives were coal, natural gas and biomass and for these three alternatives, a more detailed financial analysis has been developed, but considering that the natural gas is not available in the region, the remaining alternatives were coal and biomass, for which a detailed investment comparison analysis was developed. The Coal is the cheapest alternative among all the alternatives.</p> <p>The list of alternatives to supply the above mentioned outputs presented in the PDD includes the implementation of the project activity without registration as a CDM project. The remaining alternatives presented include all plausible scenarios taking into account the local and sectoral situations for the mentioned outputs. The list of alternatives is considered complete.</p>
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Investment analysis

As per the the Guidelines on the demonstration of additionality of small-scale project activities (EB 68 Annex 27), the project participant has used the investment barrier in order to demonstrate the additionality of the project. The investment barrier has been considered by the PP with respect to the project cost.

The Project Proponent has carried out an investment analysis. The project activity applied the investment comparison analysis, using the Net Present Value (NPV) as the financial indicator and hence NPV of two alternatives, coal fired boiler and biomass fired boiler, were compared to determine the most economically feasible alternative. The Feasibility Study Report (FSR) which is the basis for Nestle Chile's investment decision has been assessed for the input values used in the NPV calculation, which has been presented in the table below [6].

The discount rate which is required to calculate NPV was determined considering an analysis based on the Capital Asset Pricing Model (CAPM). The CAPM is widely used to determine a theoretically appropriate required rate of return of an asset, and its model takes into account the expected return of a theoretical risk-free asset (R_f), the asset's sensitivity to non-diversifiable risk (also known as systematic risk or market risk) represented by Beta (β), the expected risk premium of the market ($R_m - R_f$) and the country risk. The CAPM model discount rate of 12.29% has been checked as per the table below:

Parameter	Source / Cross-check	Auditor Conclusion
Risk-free rate of return. (5.57%)	10-year bond of the Central Bank of Chile (BCP) for 28/08/2009 (date of investment decision). : http://www.abif.cl/tasas.php	<input checked="" type="checkbox"/> Verified from the weblink of the Association of Banks and Financial Institutions of Chile. The link has been checked latest by 20 June 2014.
B (0.65)	Beta factor is obtained from USA stock market information under Food Processing It is estimated by regressing weekly returns on stock against NYSE composite, using 5 years of data or listed period (if less than 5 years). Specifically the information comes from the Damodaran on line web page (http://pages.stern.nyu.edu/~adamodar/) following the "Updated data" link and the	<input checked="" type="checkbox"/> Verified from the Damodaran link. http://pages.stern.nyu.edu/~adamodar/ The link has been checked latest by 20 June 2014.

		"Levered and Unlevered Betas by Industry" for Jan 09). This page has been online since 1998 and the published information is widely use for financial analysis all over the world.	
	(Rm – Rf)	Risk premium estimate for the Chilean market based upon the country ratings among various international and national studies concluding in a value of 7.1%.	<input checked="" type="checkbox"/> Verified from the Damodaran link. http://pages.stern.nyu.edu/~adamodar/ The link has been checked latest by 20 June 2014.
	Rcountry	Country risk shall be included since the analysis uses a value of Beta obtained from the USA Food Processing Industries. For Chile this value is equal to 2.1% when compared to the USA.	<input checked="" type="checkbox"/> Verified from the Damodaran link. http://pages.stern.nyu.edu/~adamodar/ The link has been checked latest by 20 June 2014.

Following the guidelines on the assessment of investment analysis (EB62, Annex 5), the input values for the investment comparision analysis between coal and biomass have been validated as follows:

Coal fired Boiler

Description	Source / Cross-check	Auditor Conclusion
Total Investment Cost(US\$ 3015707)	Feasibility Study Report, Budgetary Offers from Supplier [6, 44]	<input checked="" type="checkbox"/> The investment cost has been verified from FSR and cross checked with budgetary offers from Coal boiler supplier ICP (US\$ 3015707). The values in the FSR have been further cross checked and verified by the local expert based on telephonic interviews and third party data. Hence the accuracy of input values were verified by the audit team in line with

			paragraph 99(b) of CDM VVS PA v1.0.
	Coal Cost(149.3 US\$/dry ton)	CNE prices, Coal price index sheet [35]	<input checked="" type="checkbox"/> Verified from the Coal price index sheet- CNE prices. The coal cost per dry ton is cross checked from the CNE prices index from Aug 2008 to July 2009 and the average value for this period is 149.3. Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.
	Average Coal Consumption (1.534 tons/hour) Max avg 1.019 Min avg 0.515	Feasibility Study Report data, Budgetary Offers from Supplier [6, 44]	<input checked="" type="checkbox"/> Verified from FSR. The values in the FSR have been cross checked with budgetary offers from Coal boiler supplier ICP (Maximum at 9.5t/h and minimum at 4.8 t/h, average consumption values 1.019 and 0.515). The values in the FSR have been further cross checked and verified by the local expert based on telephonic interviews and third party data. Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.
	Finance by Nestle Chile S.A.	Declaration certificate [9]	<input checked="" type="checkbox"/> The project is financed completely by the PP and this has been checked from a self declaration certificate. The information has been cross checked by means of physical interviews with the management of Nestle.

			Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.
	Maintenance Costs annual (US\$ 150,785)	Feasibility Study Report data Budgetary Offers from Supplier [6, 44]	<input checked="" type="checkbox"/> Checked and verified. Maintenance costs have been taken as 5% of the investment costs which has been checked from the FSR. This has been further cross checked with budgetary offers from Coal boiler supplier ICP by taking 5% of investment costs (US\$ 150,785). Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.
	Operational hours (8760) per year	Feasibility Study Report data [6]	<input checked="" type="checkbox"/> The operational hours of 8760 has been verified from FSR. The value is cross checked by audit team based on 365 days per year and 24 hours per day. So the value 8760 is cross checked and verified in line with CDM VVS PA v1.0.
	Labour Costs (US\$ 61320)	Feasibility Study Report data [6]	<input checked="" type="checkbox"/> The labour costs have been verified from FSR. The values in the FSR have been cross checked by local expert based on unit rate of US\$ 7/hr for 8760 operating hours. The labour costs are US\$ 61320. Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.
	Electricity Costs (US\$ 126422)	Feasibility Study Report data [6]	<input checked="" type="checkbox"/>

			The electricity costs have been verified from FSR. The values in the FSR have been cross checked by local expert based on unit rate of US\$ 0.11/kwh and calculated as US\$ 126422. Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.
	NPV (-\$ 14,376,002)	All above sources	<input checked="" type="checkbox"/> The NPV value is verified and cross checked by all the above sources and references mentioned and also based on local and sectoral expertise. Hence the NPV value (-\$ 14,376,002) is cross checked and verified in line with of CDM VVS PA v1.0.
	Biomass fired boiler		
	Description	Source / Cross-check	Auditor Conclusion
	Total Investment Cost(US\$ 5952271)	Feasibility Study Report, Budgetary Offers from Supplier [6, 53]	<input checked="" type="checkbox"/> The investment cost has been verified from FSR and cross checked with budgetary offers from biomass boiler supplier RCR (US\$ US\$ 5952271). The values in the FSR have been further cross checked and verified by the local expert based on telephonic interviews and third party data. Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.

	Forest Biomass Cost(US\$ 69)	Quote from Supplier [10]	<input checked="" type="checkbox"/> Verified from the quote from biomass supplier. The biomass cost per bdmit ton is cross checked from the publicly available data, which shows the average value as US \$ 69. Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.
	Average Biomass Consumption (3.755 tons/hour) Max avg 2475 Min avg 1280	Feasibility Study Report data Budgetary Offers from Supplier [6, 53]	<input checked="" type="checkbox"/> Verified from FSR. The values in the FSR have been cross checked with budgetary offers from biomass boiler supplier RCR (Maximum at 9.5t/h and minimum at 4.8 t/h, average consumption values 2475 and 1280). The values in the FSR and budgetary offer have been further cross checked and verified by local expert based on telephonic interviews. Hence the overall input values were verified by the audit team in line with CDM VVS PA v1.0.
	Finance by Nestle Chile S.A.	Declaration certificate [9]	<input checked="" type="checkbox"/> The project is financed completely by the PP and this has been checked from a self declaration certificate. The information has been cross checked by means of physical interviews with the management of Nestle. Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0.

	Maintenance Costs annual (US\$ 297,614)	Feasibility Study Report data Budgetary Offers from Supplier [6, 53]	<input checked="" type="checkbox"/> Checked and verified. Maintenance costs have been taken as 5% of the investment costs which has been checked from the FSR. This has been further cross checked with budgetary offers from Biomass boiler supplier RCR by taking 5% of investment costs (US\$ 297,614). Hence the accuracy of input values were verified by the audit team in line with paragraph 99(b) of CDM VVS PA v1.0..
	Operational hours (8760) per year	Feasibility Study Report data [6]	<input checked="" type="checkbox"/> The operational hours of 8760 has been verified from FSR. The value is cross checked by audit team based on 365 days per year and 24 hours per day. So the value 8760 is cross checked and verified in line with CDM VVS PA v1.0.
	Labour Costs (US\$ 61320)	Feasibility Study Report data [6]	<input checked="" type="checkbox"/> The labour costs have been verified from FSR. The values in the FSR have been cross checked by local expert based on unit rate of US\$ 7/hr for 8760 operating hours. The labour costs are US\$ 61320. Hence the overall input values were verified by the audit team in line with CDM VVS PA v1.0.
	Electricity Costs (US\$ 187326)	Feasibility Study Report data [6]	<input checked="" type="checkbox"/> The electricity costs have been verified from FSR. The values in the FSR have been cross checked by local expert based on unit rate of US\$ 0.11/kwh and calculated as US\$

			187326. Hence the overall input values were verified by the audit team in line with CDM VVS PA v1.0.
	NPV (-\$ 15,082,764)	All above sources	<input checked="" type="checkbox"/> <p>The NPV value is verified and cross checked by all the above sources and references mentioned and also based on local and sectoral expertise. Hence the NPV value (-\$ 15,082,764) is cross checked and verified in line with CDM VVS PA v1.0.</p>

The NPV of the biomass fired boiler investment is much more negative than the NPV of the coal fired boiler investment. Hence as per the Investment comparison analysis, it was demonstrated by PP that the most economically attractive course of action for Nestlé is the coal fired boiler

Input Values and Cross check

The DOE confirms that the input values applied above are valid at the time of investment decision and the same has been checked and confirmed by our local and sectoral experts. Furthermore, these input values in the FSR have been cross checked by all the above mentioned sources. Hence the input values applied are compared and cross checked and are in line with VVS PA v.1.0

Sensitivity Analysis:

The guidance on assessment of investment analysis requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis. Guidance 20 of Annex 5, EB 62 states, only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation. Guidance 21 states, as a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and -10%. The project developer has identified *investment cost, fuel and O&M cost* as the most critical assumptions. There are no other expenses or costs which could be subjected to variation as all of them have been considered either directly or indirectly in the sensitivity analysis. Though O&M cost does not constitute more than 20% of project revenue, validation team considered appropriate to subject it to sensitivity analysis, which is in conformity with Guidance 20 of Annex 5, EB 62. All the four variables have been subjected to 10% variation. The sensitivity analysis reveals that even under more favourable conditions, the IRR would not cross the benchmark return as given in the following table:

Costs	-10%	0% (NPV of Coal)	+10%
Investment	-\$ 14,074,431	-\$ 14,376,002	-\$ 14,677,572
Fuel	-\$ 13,500,233	-\$ 14,376,002	-\$ 15,251,770
Maintenance	-\$ 14,260,077	-\$ 14,376,002	-\$ 14,491,926

	Operation	-\$ 13,355,896	-\$ 14,376,002	-\$ 15,396,107
	Costs	-10%	0% (NPV of Biomass)	+10%
	Investment	-\$ 14,487,536	-\$ 15,082,764	-\$ 15,677,991
	Fuel	-\$ 14,589,681	-\$ 15,082,764	-\$ 15,575,846
	Maintenance	-\$ 14,853,957	-\$ 15,082,764	-\$ 15,311,570
	Operation	-\$ 14,398,521	-\$ 15,082,764	-\$ 15,767,007
	<p>The sensitivity analysis conducted to test whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions. This is conducted with a 10% variation on Investment costs, fuel costs, Operation and Maintenance costs. The result clearly shows that Coal is still the most attractive alternative and the NPV of biomass has more negative value than that of the Coal at base value.</p>			
Findings	<p>CAR 14, CAR 15, CL 6, CL7, CL8 and CL10 have been raised regarding the investment analysis, assumptions and additionality aspects.</p> <p>The above mentioned CARs and CLs have been clarified and resolved and the detailed findings are provided in Appendix 4 of the report.</p>			
Conclusion	<p>TUV SUD confirms that the investment analysis conducted to demonstrate additionality is as per the guidance provided in EB 68 Annex 27 and VVS PA 1.0 and deemed to be correct.</p> <p>Based on the aforementioned approach, TÜV SÜD confirms that the documentation provided is appropriate for this project.</p>			

D.4.7. Estimation of emission reductions or net anthropogenic removals

Means of validation	<p>TÜV SÜD has assessed the calculations of project emissions, baseline emissions, leakage, and emission reductions. Corresponding calculations have been carried out based on Algorithm and/or formulae provided by the applied methodology and respective emission reduction calculation spreadsheet. The parameters and equations presented in the PDD, as well as other applicable documents, have been compared with the information and requirements presented in the methodology and respective tools. An equation comparison has been made to ensure consistency between all the formulae presented in the calculation files and in the PDD, methodology, and tools.</p> <p>The estimate of the baseline emissions are considered correct as the calculations have been reproduced by the audit team with the attainment of the same results.</p> <p>The project emissions include the CO₂ emissions from on-site consumption of fossil fuels (which in this project activity is only considered when an unplanned failure occurs and an LPG boiler is to be used) and from electricity consumption (which in this case comes from the grid and a fossil fuel fired captive power plant) both cases due to the project activity. The project emissions for onsite electricity consumption are calculated based on the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption". The relevant equations to estimate emissions due to possible use of LPG were included in section B.6.1 of the PDD. This approach is conservative as the project emissions from LPG consumption will be accounted if the back up boiler is operating.</p>
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	The assumptions and data used to determine the emission reductions are listed in the PDD and all the sources have been reviewed. The following sources of information were used for crosscheck the information contained in the PDD:
Findings	<p>CAR 17, CAR 18, CAR 20, CL 11, CL16 and CL17 have been raised regarding the ER calculations.</p> <p>The above mentioned CARs and CLs have been clarified and resolved and the detailed findings are provided in Appendix 4 of the report.</p>
Conclusion	<p>TÜV SÜD confirms the following statements in line with § 99 – 100, VVS:</p> <ul style="list-style-type: none"> (a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources; (b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD; (c) All values used in the PDD are considered reasonable in the context of the proposed project activity; (d) The baseline methodology and corresponding tool(s) have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions; (e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD; (f) Any estimates for monitored data or parameter are reasonable for estimating the emission reductions in the PDD (g) IF applicable: Different options for equations AND parameters are selected appropriately. (h) If applicable: The data AND parameters fixed ex-ante are conservative and appropriate.

D.4.8. Monitoring plan

Means of validation	<p>The monitoring plan presented in the PDD complies with the requirements of the applicable methodology. The assessment team has verified all parameters in the monitoring plan against the requirements of the methodology and no deviations have been found.</p> <p>Parameters determined ex-ante:</p> <ul style="list-style-type: none"> • Quantity of available biomass in the region of the project activity: 35% larger than the quantity of biomass that is utilized including the project activity. (INFOR Statistics 2015: Consumption of logs according the industry location, by region). • Coal boiler efficiency: 85% (Manufacturer specifications) • Average net energy conversion efficiency of power unit <i>m</i> or <i>k</i> in year <i>y</i> (Default values provided in Annex 1 of “Tool to calculate the emission factor of an electricity system” (v.6.0)). • CO₂ emission factor of coal: 0.0895 tCO₂ /GJ (IPCC 2006 Guidelines) • Emission factor for electricity generation for source <i>j</i> in year <i>y</i>: 0.545193 tCO₂/MWh (calculated as per “Tool to calculate the emission factor of an electricity system” (v.6.0))
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- Average technical transmission and distribution losses for providing electricity to source j in year y : 0.2 (Methodological tool to calculate baseline, project and/or leakage emissions)
- from electricity consumption and monitoring of electricity generation, Version 03.0.).
- Emission factor for electricity generation from the generator j in year y : 0.763 tCO₂/MWh (calculated as per quantity of electricity consumed from the generator by the project activity, EG n,t (Project participant), the CO₂ emission factor of diesel oil (IPCC 2006 Guidelines on National GHG Inventories table 1.4 of Chapter 1 of Vol. 2) the net calorific value of diesel oil (Ministry of Energy 16), and the fuel oil consumption of the electricity generator, FC n,i,t)
- Net quantity of electricity generated and delivered to the grid by power unit m/k in year y , Net calorific value of fuel type i in year y : Data from CDEC-SIC
- Amount of fossil fuel type i consumed by power plant unit m/k j in year y -Data from CDEC-SIC Annual Report and CNE Definitive Technical Report (Half-Yearly).
- Net calorific value (energy content) of fuel type i in year y -Based on CNE Annual Energy Balance Report and IPCC 2006.
- CO₂ emission factor of diesel oil in the period t : 0.0748 tCO₂/GJ (IPCC default values)
- CO₂ emission factor of fossil fuel type i used in power unit m in year y (IPCC Guidelines)
- CO₂ emission factor of LPG in year y : 0.0656 tCO₂/GJ (IPCC default values)

The validation team has verified the value used against the above mentioned sources and conclude that all relevant parameters to calculate the GHG emissions reductions of the project have been sufficiently considered and the value of the parameters are real, measureable and conservative. Therefore the parameters determined ex ante by the PP are validated and checked as per p.83 and p.112 (a) of VVS PA v1.0.

Parameters determined ex-post:

The monitoring procedures of the major parameters below has been discussed and verified during site audit.

- Quantity of biomass used in the project activity.
- Steam flow, temperature and pressure to estimate the steam's enthalpy.
- Electricity generated in the captive plant
- Electricity supplied by the grid.
- Amount of fuel consumed by the captive power plant.
- Weighted average net calorific value of fuel type i in year y . (In this case, LPG net calorific value for project emissions calculation).

The procedures have been reviewed by the assessment team through document review and/or interviews with the relevant personnel. The information provided and a physical inspection has allowed the assessment team to confirm that the proposed monitoring plan is feasible within the project design. The relevant points of monitoring plan have been discussed with the PPs. Specifically; these points include the location of meters, data

	management, and the quality assurance and quality control procedures to be implemented in the context of the project.
Findings	CAR 21, CAR 22 have been raised regarding the monitoring aspects. The above mentioned CARs and CLs have been clarified and resolved and the detailed findings are provided in Appendix 4 of the report.
Conclusion	Therefore, the PPs will be able to implement the monitoring plan and the achieved emission reductions can be reported ex-post and verified (conformation to the requirement of Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 03.0) and p.112 (b), p.117 of CDM VVS PA v1.0).

D.5. Start date, crediting period type and duration

Means of validation	The start date of the project activity has been taken as 24/11/2009, which is the date of the purchase order of the biomass boiler (RCR). Renewable crediting period with 7 years duration has been considered by the PP with the starting date as 07/02/2018 or date of registration whichever is later.
Findings	No CAR/CL has been raised.
Conclusion	Hence the PP followed the requirements of CDM VVS PA v1.0

D.6. Environmental impacts

Means of validation	<p>The project participants have conducted an EIA as per Chile Environment National Commission (CONAMA). The Environment National Commission (CONAMA) has developed the Environmental Impact Assessment System (SEIA) as the established instrument to analyze the environmental impact of different project initiatives and prevent the national environment decay. The SEIA relies on defined and specific criteria, as stated on the SEIA Regulations to determine whether a project requires to be subject matter to the system or not. If the project activity requires to be submitted to the SEIA and it results to be authorized, the proper authorities will make public their response through an authorization document (RCA) published on the SEIA web page, and if the project activity does not require to be subject matter to the SEIA, CONAMA elaborates and presents to the project activity developers a written letter expressing this matter [59, 60].</p> <p>Nestlé Chile S.A. submitted to the national authorities all required evidence related to the Puelche Project/Cancura Factory in an Environmental Impact Assessment (EIA) in September 2008 and received its approval in July 2009 [58].</p>
Findings	CAR 23 has been raised regarding EIA and the issue is closed subsequently
Conclusion	Hence the PP followed the requirements of the host country regarding the environmental impacts.

D.7. Local stakeholder consultation

Means of validation	The relevant local stakeholders have been invited via invitation letter and emails sent to all the stakeholders [38]. The assessment team has reviewed the documentation in order to validate the inclusion of relevant stakeholders. Team local expertise has confirmed that the communication method used to invite the stakeholders is appropriate. The summary of comments presented in the PDD has been verified with the documentation of the stakeholder consultation and has been found to be complete [39].
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	Comments presented by the local stakeholders have been taken into account by the PP and has been verified with information obtained during interviews.
Findings	CAR 24, CAR 25 have been raised regarding the local stakeholder consultation. The above mentioned CARs and CLs have been clarified and resolved and the detailed findings are provided in Appendix 4 of the report.
Conclusion	Hence, the local stakeholder consultation has been performed adequately according to the CDM requirements CDM VVS PA v1.0.

D.8. Sustainable development co-benefits

Means of validation	The project activity contributes to local sustainable development by: <ul style="list-style-type: none"> • Using biomass (which is a renewable source) as a fuel for thermal energy generation. • Diversifying energy sources helping to decrease the import and use of fossil fuel from other countries. • Decreasing the greenhouse gas emissions related to the thermal energy generated with by fossil fuel and replacing the fossil fuel consumption by biomass generation which produces zero emissions. • Promoting the development and implementation of biomass energy production knowledge- and technologies • Creating shared value in the region of the project activity (Local employment, Agriculture- and rural development, etc.)
Findings	CAR 4 has been raised regarding sustainable development criteria and the issue is closed subsequently.
Conclusion	Hence, the sustainable development co-benefits are according to the CDM requirements CDM VVS PA v1.0.

D.9. Approval

Means of validation	The authenticity of the letter(s) of approval has been validated by TÜV SÜD validation team. The below table summarizes the project participants and parties involved in the project activity (§ 38 – 52): These LoA(s) are therefore regarded as valid and meeting the VVS requirements.	
	Project participants	Nestle Chile S.A.
	Parties involved	Chile (host)
	APPROVAL	Ministry of Environment
	LoA received	Yes
	Date of LoA	27-09-2011
	Reference to document	112982
	LoA received from	PP
	Validation of authenticity	The LoA has been issued by the host Party's DNA, Ministry of Environment, Government of Chile and hence considered authentic.
	Validity of LoA	Valid
	PARTICIPATION (§ 49 (a))	
	Party is party to Kyoto Protocol	Yes

	Voluntary participation	Yes
	Diversion of official development aid towards host country	No
	<i>Project contribution to Sustainable Development (§ 50, 51, 52, VVS)</i>	Yes
Findings	No CAR/CL has been raised.	
Conclusion	The validation team confirms that the information related to the letter of approval as mentioned in the above table is authentic.	

D.10. Authorization

Means of validation	Please see the section D.9
Findings	Please see the section D.9
Conclusion	Please see the section D.9

D.11. Modalities of communication

Means of validation	TÜV SÜD used notarized documentation to perform due diligence on the Modalities of Communication (MoC) statement [IRL # 14]. The notarized documentation confirms the corporate identity of all project participants and focal points included in the MoC statement, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories.		
	Modalities of Communications	Status	Means of validation
	Is the focal point identified	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See the CR 2 of the LOF
	Is the MOC signed by all project participant (including focal point identified entity/personal)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See the CR 2 of the LOF
	Is the written confirmation obtained by the PP's stating the authorization, specimen signatures and personal details, employment status are valid and accurate?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See the CR 2 of the LOF
	Is MOC received by the validation team from the PP with whom DOE has the contractual relationship?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	DOE has received MoC from the PP (i.e. Nestle Chile S.A.) whom DOE has the contractual relationship
Findings	No CAR/CL has been raised.		
Conclusion	TUV SUD confirms that the MoC statement complies with all relevant forms and requirements mentioned in VVS PA v1.0		

	<ul style="list-style-type: none"> the latest version of the form “Modalities of Communication statement” (F-CDM-MOC) has been used the information required as per the F-CDM-MOC, including its annex 1, is correctly completed the project participant’s authorized signatories signing the F-CDM-MOC correspond to the project participant’s authorized signatories included in F-CDM-MOC, annex 1
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D.12. Global stakeholder consultation

Means of validation	No comments from Global stakeholder consultation.
Findings	Not applicable.
Conclusion	No comments from Global stakeholder consultation

SECTION E. Internal quality control

Internal quality control within the team is assured by means of a technical review process that takes place after the on-site assessment and after closure of findings. The internal quality control in the verification process is given by the final decision (Verification and Certification Conclusion) made by the Certification Body.

SECTION F. Validation opinion

TÜV SÜD has performed a validation of the aforementioned CDM project activity. Standard auditing techniques have been used for the validation of the project. An internal validation checklist has been prepared to conduct the validation process in a transparent and comprehensive manner.

The review of the project design documentation, subsequent follow-up interviews, and further verification of references have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria in the protocol. In the opinion of TÜV SÜD, the project meets all relevant UNFCCC requirements for the CDM if the underlying assumptions do not change. TÜV SÜD recommends the project for registration by the CDM Executive Board.

An analysis, as provided by the applied methodology, demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are additional to any that would occur in the absence of the project activity. Considering that the project will be implemented as designed, the project is likely to achieve the estimated amount of annual emission reductions of 16,333 tCO₂e (according to the GSP PDD) and a total estimated of 114,331 tCO₂e as specified within the final PDD version for the crediting period. The List of Findings describes total of 42 findings which include: *Twenty five (25) Corrective Action Requests (CARs); Seventeen (17)*

Clarification Requests (CRs); *no* Forward Action Requests (FAR) was raised during this validation; and all findings have been closed satisfactorily.

The validation has been performed following the requirements of the latest version of the CDM VVS PA v1.0, PS, other EB requirements and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the CDM project cycle. Based on the work described in this report, nothing has come to our attention that causes us to believe that any project component or issue has not been covered by the validation process.

Appendix 1. Abbreviations

AMS	Approved Methodology Small scale
BM	Build Margin
CAR	Corrective Action Request
CB	Certification Body
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CL	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	GreenHouse Gas(es)
GSP	Global Stakeholder Consultation / Process
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
IRR	Internal Rate of Return
KP	Kyoto Protocol
MP	Monitoring Plan
NGO	Non Governmental Organisation
OM	Operating Margin
PDD	Project Design Document
PP	Project Participant
TÜV SÜD	TÜV SÜD South Asia Pvt Ltd
UNFCCC	United Nations Framework Convention on Climate Change
CDM VVS PA	CDM Validation And Verification Standard for project activities

Appendix 2. Competence of team members and technical reviewers

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	TÜV SÜD	Onsite interviews and Audit carried out by TÜV SÜD	17-18 March 2011	
2.	UNFCCC	Approved SSC methodology AMS I.C. ver.20		
3.	UNFCCC	http://cdm.unfccc.int/Projects/Validation/DB/AGY1LWRJE10A17P7LMIN6F1VNV0RRC/view.html	18.01.2011	
4.	Nestle Chile S.A	GSP PDD version 1: http://cdm.unfccc.int/UserManagement/FileStorage/GF0KXASC2V64OHPNUJ9QIWLBYM7E5I	13.01.2011	Nestle Chile S.A
5.	Nestle Chile S.A	Final PDD, version 13	15.05.2018	Nestle Chile S.A
6.	Beca-POCH S.A	Feasibility Study Report for Puelche Biomass Project	June 2009	Nestle Chile S.A
7.	Nestle Chile S.A.	Letter to CONAMA informing the changes in the plant	30.03.2010	Nestle Chile S.A
8.	CONAMA	Clarification sent to Nestle regarding the additional EIA		Nestle Chile S.A
9.	Nestle Chile S.A.	Declaration certificate for the source of funds for the biomass project	14.03.2011	Nestle Chile S.A
10.	Forestal Rio Pitildeo Ltda	Biomass quotation from supplier	25.03.2009	Nestle Chile S.A
11.	Bossum Commercial	Quotation for supply of forestry biomass	Feb 2011	Nestle Chile S.A
12.	RCR Energy	Letter stating the Technical lifetime of Biomass fired boiler		Nestle Chile S.A
13.	Ministry of Environment	LoA to Nestle Chile S.A for "Puelche Project/Cancura Factory Biomass Boiler for Heat Generation"	27.09.2011	Nestle Chile S.A
14.	Nestle Chile S.A	Modalities of Communication form	21.04.2011	Nestle Chile S.A
15.	EMC	Weigh feeder Instruction manual		Nestle Chile S.A
16.	Ministry of Environment	General Rules on Environment		Nestle Chile S.A
17.	Nestle Chile S.A	Fuel price and cost impact of combustibles internal presentation		Nestle Chile S.A
18.	Nestle Chile S.A	Flow diagram for Air, flue gas, fuel and ash process		Nestle Chile S.A
19.	COPEC	Letter sent to Nestle Chile S.A regarding new fuel prices	16.04.2008	Nestle Chile S.A

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20.	National Energy Commission	National Energy Balance	2008	Nestle Chile S.A
21.	Nestle Chile S.A	Fuel cost evaluation analysis sheet	2008	Nestle Chile S.A
22.	Nestle Chile S.A	Discount rate calculation sheet		Nestle Chile S.A
23.	Association of Banks and Financial Institutions of Chile	http://www.abif.cl/tasas.php		Nestle Chile S.A
24.	Leonard N. Stern School of business - New York Stern University	http://pages.stern.nyu.edu/~adamodar/		Nestle Chile S.A
25.	Ingenieria Proquilab Limitada	Environmental Impact Statement for Nestle Chile S.A. Milk processing plant	Sep 2008	Nestle Chile S.A
26.	Conservative Real Estate	Plant Ownership documents for Nestle Chile S.A		Nestle Chile S.A
27.	RCR	Technical specifications of Backup LPG Boiler		Nestle Chile S.A
28.	RCR	Technical specifications of Biomass Boiler		Nestle Chile S.A
29.	Caterpillar	Technical specifications of Diesel Generator		Nestle Chile S.A
30.	Nestle Chile S.A	Flow chart of the Puelche Plant		Nestle Chile S.A
31.	Nestle Chile S.A	Thermal capacity calculation sheet		Nestle Chile S.A
32.	Nestle Chile S.A	Emission reduction calculation sheet		Nestle Chile S.A
33.	Nestle Chile S.A	Operation hours calculation sheet		Nestle Chile S.A
34.	Nestle Chile S.A	Investment analysis calculation sheet		Nestle Chile S.A
35.	Nestle Chile S.A	Coal Price Index sheet, CNE prices		Nestle Chile S.A
36.	Luz Osorno	Tariff regulation sheet		Nestle Chile S.A
37.	Nestle Chile S.A	Capital expenditures for Biomass Boiler		Nestle Chile S.A
38.	Nestle Chile S.A	Invitation for the Stakeholder meeting		Nestle Chile S.A
39.	Nestle Chile S.A	Minutes and photographs of the Stakeholder consultation	27.07.2010	Nestle Chile S.A
40.	Nestle Chile S.A	E-mail invitation sent for the Regular city council meeting		Nestle Chile S.A
41.	Nestle Chile S.A	Prior CDM consideration form submitted to UNFCCC	20.01.2010	Nestle Chile S.A
42.	CONAMA	Prior consideration form received by Chilean DNA (CONAMA)	02.02.2010	Nestle Chile S.A
43.	Regional Committee for Environment	Puelche Project/Cancura Factory Biomass Boiler environmental approval.	14.07.2009	Nestle Chile S.A
44.	ICP	Quotation from supplier for Coal fired boiler and ancilleries	17.04.2009	Nestle Chile S.A
45.	Nestle Chile S.A	Purchase order to POCH for Feasibility study on Puelche project	12.02.2009	Nestle Chile S.A
46.	Nestle Chile S.A	Board Minutes of meeting of Teleconference to take decision on CDM project	28.08.2009	Nestle Chile S.A

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47.	Nestle Chile S.A	Contract with CDM consultant on consultancy services	07.10.2009	Nestle Chile S.A
48.	Nestle Chile S.A	Purchase Order for supply of Biomass Boiler to RCR	24.11.2009	Nestle Chile S.A
49.	Nestle Chile S.A	Contract with DOE for Validation services	25.10.2010	Nestle Chile S.A
50.	Nestle Chile S.A	Project Implementation schedule chart		Nestle Chile S.A
51.	Nestle Chile S.A	Preliminary Assessment Report for baseline study		Nestle Chile S.A
52.	Vapor Industrial	Quotation from supplier for Coal fired boiler and ancilleries		Nestle Chile S.A
53.	RCR	Quotation from supplier for Biomass based boiler		Nestle Chile S.A
54.	INFOR Statistics 2015	http://wef.infor.cl/estadisticas_regionales/estadisticasregionales.php		Nestle Chile S.A
55.	IPCC	Default Value for Emission factor of Coal	2006	Nestle Chile S.A
56.	IPCC	Default Value for Emission factor of Diesel	2006	Nestle Chile S.A
57.	IPCC	Default Value for Emission factor of LPG	2006	Nestle Chile S.A
58.	Nestle Chile S.A	Puelche Project/Cancura Factory documents submitted for environmental assessment.		Nestle Chile S.A
59.	SEIA regulation	http://transparencia.sea.gob.cl/2016/instructivos/dto_40_12_ago_2013.pdf		Nestle Chile S.A
60.		http://www.e-seia.cl		Nestle Chile S.A
61.	Nestle Chile S.A	Excel Spreadsheet for calculation of biomass usage in the plant	Nov 2012	Nestle Chile S.A
62.	Nestle Chile S.A	Biomass boiler performance data	Nov 2012	Nestle Chile S.A
63.	Ministry of Energy	Market study of Natural Gas between Maule region and Los Lagos- Final report	30 Dec 2010	Nestle Chile S.A
64.	Nestle Chile S.A	Commissioning certificate	April 4 2012	Nestle Chile S.A
65.	Nestle Chile S.A	Revised Emission factor calculation sheet	15.05.2018	Nestle Chile S.A
66.	CNE	CNE Annual Energy Balance Report CDEC-SIC Annual Report and CNE Definitive Technical Report		

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

Table 1. CLs from this validation

CL ID	1	Section no.		Date:	
Description of CL					
PP needs to clarify what are other biomass sources in context of the project activity					
Project participant response					Date:
This project activity will only use wood chips. This CR was clarified in section A.2. of the PDD					
Documentation provided by project participant					
Revised PDD					
DOE assessment					Date:
Hence the issue is closed.					

CL ID	2	Section no.		Date:	
Description of CL					
The translated version of following documents needs to be submitted					
<ol style="list-style-type: none"> 1. Feasibility Study Report dated June 2009: (Page 1, Page 34 (a map), the entire CDM section, the comparison between different quotations submitted during the tendering process) 2. All the letters sent to CONAMA and communication received from CONAMA 3. Certificate of the project's funding by Nestle 4. Quotation with biomass price given by Río Pitilde and Bossur 					
Project participant response					Date:
These documents are submitted.					
Documentation provided by project participant					
FSR, Certificate, CONAMA letters, various quotations					
DOE assessment					Date:
<p>In the document" ME-003, COR-INF-010" –Feasibility report, there is a difference in the NCV values of the investment bids of ICP (Table 6.3 and Table 7.5). Clarify what is the difference between two values used- Design operation costs and NCV for Mackenzie, Thermax, Thermal Engineering, RCR, ICP. The same is case with Coal fired boiler NCV.</p> <p>In response, PP has clarified and the difference is explained because in the table 6.3 the NPV was calculated considering a period of 10 year, instead in the table 7.5 the NPV was evaluated with a period of 21 years.</p> <p>Hence this issue is closed.</p>					

CL ID	3	Section no.		Date:	
Description of CL					
The project activity uses LPG as back up boiler where as the same is not considered in the baseline. Clarify?					
Project participant response					Date:
<p>The project activity uses a LPG as back up boiler because is technically most reliable solution for back up, with a low start up period and a fast reaction time. These CR was clarified in section A.4.2 of the PDD. The LPG boiler was selected as back up boiler, because it has a high energy value than the coal. The efficiency of LPG is higher than the efficiency of the coal boiler (91% and 85% respectively). The most important thing that was considered to select the LPG as back up boiler was that in an emergency the LPG boiler starts up faster in comparison of coal</p>					
Documentation provided by project participant					
Revised PDD					
DOE assessment					Date:

As the LPG boiler has higher efficiency than the Coal fired boiler, it is planned to use LPG as backup boiler. However this would be in case of emergencies only.

Hence the issue is closed.

CL ID	4	Section no.		Date:
Description of CL				
PP needs to clarify the relevance of an Environmental assessment report in the baseline section of the PDD?				
Project participant response				Date:
This CR was clarified in the PDD.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
The PDD has been revised to clarify the relevance of Environmental assessment report. Hence the issue is closed.				

CL ID	5	Section no.		Date:
Description of CL				
The documents evidenced during the site audit presented a different scenario of the baseline alternatives to that of the PDD. The biomass is presented as a cheaper alternative than coal. The inconsistency needs to be clarified.				
Project participant response				Date:
The baseline scenario is the coal boiler, which is the cheapest alternative. This is supported by a preliminary assessment of Nestlé, developed for another existing plant in the country, which concludes that the cheapest alternative for thermal energy is coal, followed by natural gas and then by biomass. The "Preliminary assessment report" was sent previously in Spanish version. Now English version was submitted.				
Documentation provided by project participant				
Preliminary assessment report				
DOE assessment				Date:
The Preliminary assessment report specifies clearly the consideration of coal as the alternative. Hence the issue is closed.				

CL ID	6	Section no.		Date:
Description of CL				
PP needs to clarify how the discount rate has been calculated and provide references for the same in the PDD.				
Project participant response				Date:
The calculation of the discount rate is presented in the PDD, in section B.5 of the PDD. Supporting document is submitted.				
According to EB 62 annex 5 paragraph 19, "If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used". This project activity is applying an investment comparison analysis and no benchmark is being applied. The selected financial indicator is the Net Present Value (NPV), so the NPV of two alternatives, coal fired boiler and biomass fired boiler, are compared to determine the most economically attractive course of action for Nestlé. The discount rate was used to calculate the NPV of each alternative according to the financial mathematics rules. The PDD was modified accordingly to clarify this issue.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
It could be accepted that NPV is the financial indicator used as per Investment analysis guidelines. The Discount rate was calculated based on the WACC method. One issue which is still not clear is how the Discount rate is used to calculate NPV of each alternative? Could you clarify or provide detailed calculation sheets for this?				

Project participant response

The discount rate value is used for the Net Present Value calculation, as shown in the following equation, which was included in the “Additionality 07 06 2011” spreadsheet.

Where:

$$NPV = \sum_{t=1}^n \frac{C_t}{(1+r)^t} + C_0$$

C₀: Initial investment

n: Number of years (25 years)

For the calculation of the first part of the formula: $\sum_{t=1}^n \frac{C_t}{(1+r)^t}$ an Excel function specific for the NPV was applied.

The NPV was calculated using the discount rate p cell B61 of “Info” sheet. The cells that contain the calculation of the NPV using the discount rate are the following cells of the sheet “Inv analysis”: B27 (coal), B39 (biomass), C44, D44, E44, C45, D45, E45, C49, D49, E49, C50, D50, E50, C54, D54, E54, C55, D55, E55, C59, D59, E59, C60, D60, E60 (sensitivity analysis).

DOE Final Assessment

The discount rate calculation has been explained and accordingly the NPV calculation is supported by evidences. Hence the issue is closed.

CL ID	7	Section no.	Date:
Description of CL			
PP needs to clarify the type of investment analysis applied in case of project activity. Also the PP may consider the guidelines given in ‘Best practices to demonstrate additionality as per EB 35, Annex 34.			
Project participant response			Date:
The investment comparison analysis was used. This was clarified in section B.5 of the PDD.			
Documentation provided by project participant			
Revised PDD			
DOE assessment			Date:
<ol style="list-style-type: none"> 1. See our response to CAR 12 above regarding the different alternatives. Please clarify the same. 2. The PDD mentions this as “<i>Following the “Guidelines on the assessment of investment analysis” (v.4, EB 61), the investment comparison analysis is selected because the alternative requires investment anyhow and baseline emissions are based on that alternative, so the only means to conclude that the project activity is less financially attractive than at least one alternative is to conduct an investment comparison analysis</i>”. Why the investment comparison analysis does not consider other baseline options such as Diesel oil, LPG and residual fuel oil? 			
Project participant response			
The investment comparison analysis considers only the coal as baseline option, because the common practice for Nestlé is to use coal fired boiler for thermal energy demand. Also, according to the “Preliminary assessment report” the coal fired boiler is the most cheaper fuel and thus, the most economically attractive course of action for Nestlé, therefore it represents the baseline scenario.			
DOE assessment			
It is still not properly justified as why the investment comparison is not done for LPG and diesel oil since LPG is used as backup boiler. The different alternatives are considered even in the preliminary assessment 2008 report.			
Project participant response			

The preliminary assessment report considered all possible alternatives for the development of the project in order to preliminarily determine the most interesting alternatives. Among the alternatives included in the preliminary assessment report, the three cheapest alternatives were coal, natural gas and biomass and for these three alternatives, a more detailed financial analysis should be developed, but considering that the natural gas is not available in the region, the remaining alternatives were coal and biomass, for which a detailed investment comparison analysis was developed.

On the other hand, even though the project activity considers a biomass boiler, the project requires a back up boiler in order to cover the steam demand temporally in case of unforeseen shutdowns of the biomass fired boiler. A LPG fired boiler is considered as a backup boiler, which although is more expensive, is more efficient than the coal fired boiler and in an emergency situation the LPG boiler starts up faster in comparison of coal.

The PDD was modified accordingly to clarify this issue

DOE assessment

The Coal is the cheapest alternative among all the alternatives. As the LPG boiler has higher efficiency than the Coal fired boiler, it is planned to use LPG as backup boiler. However this would be in case of emergencies only. Hence the issue is closed.

CL ID	8	Section no.		Date:
Description of CL				
Provide evidences for the cost of biomass used in excel spreadsheet and the offers from suppliers.				
Project participant response				Date:
These evidences are submitted.				
Documentation provided by project participant				
Documents in support of biomass cost				
DOE assessment				Date:
Hence the issue is closed.				

CL ID	9	Section no.		Date:
Description of CL				
PP needs to submit				
a) the report of 2008 National Energy Balance				
b) Data of the projects approved from 2001-2008				
Project participant response				Date:
These documents are submitted.				
Documentation provided by project participant				
2008 National Energy Balance report (English), projects data				
DOE assessment				Date:
Hence the issue is closed.				

CL ID	10	Section no.		Date:
Description of CL				
Submit the detailed investment analysis spreadsheet with all references and assumptions. All the formulae and relevant references need to be included and documentary evidences need to be provided to the audit team.				
Project participant response				Date:
The detailed investment analysis spreadsheet with references and assumptions is submitted.				
Documentation provided by project participant				
Spreadsheet				
DOE assessment				Date:
Hence the issue is closed.				

CL ID	11	Section no.		Date:
Description of CL				
The emissions due to possible use of LPG boiler as back up are not considered under project emissions. It is also not clear as to why the LPG boiler is included in the project activity. Please clarify how this approach is conservative in the calculation of emission reductions.				

Project participant response	Date:
The relevant equations to estimate emissions due to possible use of LGP were included in section B.6.1. of the PDD. This approach is conservative as the project emissions from LPG consumption will be accounted if the back up boiler is operating.	
Documentation provided by project participant	
Revised PDD	
DOE assessment	Date:
Hence the issue is closed.	

CL ID	12	Section no.		Date:
Description of CL				
Submit the manufacturer specifications for efficiency of coal fired boiler.				
Project participant response				Date:
These documents are submitted.				
Documentation provided by project participant				
Manufacturer specifications				
DOE assessment				Date:
Hence the issue is closed.				

CL ID	13	Section no.		Date:
Description of CL				
Explain the relevance of inclusion of the parameter- 'Continuous operation of equipment'				
Project participant response				Date:
This parameter was deleted from the monitoring plan.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed				

CL ID	14	Section no.		Date:
Description of CL				
Submit the organization chart of the monitoring personnel involved in the project.				
Project participant response				Date:
The organization chart of monitoring personnel involved in the project is presented in section B.7.2. of the PDD.				
Documentation provided by project participant				
Revised PDD.				
DOE assessment				Date:
Hence the issue is closed.				

CL ID	15	Section no.		Date:
Description of CL				
Submit documentary proofs relating to the lifetime of equipment used in the project activity				
Project participant response				Date:
Submitted.				
Documentation provided by project participant				
Lifetime of equipment supportives.				
DOE assessment				Date:
Hence the issue is closed.				

CL ID	16	Section no.		Date:
Description of CL				
The PP needs to clarify how the value of quantity of biomass is 18000t?				
Project participant response				Date:

18,590 is the net quantity of biomass consumed in the year and was obtained as follows:

Scenario 1		
Operational hours consuming 9.5 t/h steam	6,571	hours/year
Average Consumption at 9,5 t/h steam	2.475	wet ton/h
Biomass consumed in the year	6,571* 2.475	wet tons / years
	16,263	
Scenario 2		
Operational hours consuming 4.8 t/h steam	1,818	hours/year
Average Consumption at 4,8 t/h steam	1.280	wet ton/h
Biomass consumed in the year	1,818 * 1.280	wet tons / years
	2,327	
Scenario 3		
Operational hours consuming 0 t/h steam	371	hours/year
Average Consumption at 0 t/h steam	0	wet ton/h
Biomass consumed in the year	371 * 0	wet tons / years
	0	
Biomass consumed in the year	16,263 + 2,327 + 0	wet tons / years
	18,590	

Documentation provided by project participant

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DOE assessment

Date:

The response from PP could be accepted based on the available data from the plant. Hence the issue is closed.

CL ID

17

Section no.

Date:

Description of CL

In PDD there is a link for the Net Calorific Value: according to IPCC 2006 Guidelines on National GHG Inventories table 1.2 of Chapter 1 of Vol. 2
Solid biofuels, NCV for Wood/Wood Waste" = 15,6 TJ/Gg = 4,343 kWh/kg but not 2,33 kWh/kg as showed in the Excel – tool. The PP shall clarify how the value of 2,33 kWh/kg for biomass is used?

Project participant response

Date:

The source presented in the PDD for NCV_k (Net calorific value of biomass type *k*) was not “IPCC 2006 Guidelines on National GHG Inventories table 1.2 of Chapter 1 of Vol. 2”. That was a mistake, because information of project participant was actually used. Therefore the PDD was corrected, and is attached.

The value 2000 kcal/kg correspond to the Net Calorific Value in wet basis (50%) and was used by the manufacturer in the biomass boiler design. Attached is the datasheet of the boiler, which support the use of the NCV equal to 2000 kcal/kg (same document presented during the audit visit). As the monitoring plan requires the measurement of dry NCV we have converted the NCV from wet to dry basis, in order to put the value in the table of the PDD, using the following formula: $NCV_{dry\ biomass} [TJ/Gg] = (NCV_{wet\ biomass} [TJ/Gg] + 2.44 [TJ/Gg] * Moisture [\%]) / (1 - Moisture [\%])$. Thus, for the project activity the NCV in dry basis is: 4,583 (kcal/kg); or 19.19 (TJ/kg); or 19,188 (GJ/kg); or 5.33 (kWh/kg).

Therefore the PDD was corrected and is attached (in track changes).

Additionally, the following table presents different values of NCV of biomass from different sources:

NCV of biomass (kcal/kg)			
Evidence	Wet basis	Dry basis	Link
PDD	2,000	4,583	Source: Project Participant
Evidence 1		3,726	http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Evidence 2	2,391	4,502	http://www.ecn.nl/phyllis2/Biomass/View/3291
Evidence 3	Lower	4,299	http://cta.ornl.gov/bedb/appendix_a/Heat_Content_Ranges_for_Various_Biomass_Fuels.xls

Documentation provided by project participant

Revised PDD

DOE assessment

Date:

The PP has corrected the value of NCV in the revised PDD. Hence the issue is closed.

Table 2. CARs from this validation

CAR ID	1	Section no.	Date:
Description of CAR			
It needs to be clarified whether the project activity involves construction of milk processing plant or installation of boiler			
Project participant response			Date:
The CDM project activity involves the biomass boiler. This was clarified in section A.2.			
Documentation provided by project participant			
Revised PDD			
DOE assessment			Date:
The revised PDD clarifies that the project activity involves the installation of 15 TPH Biomass fired boiler. Hence the issue is closed.			

CAR ID	2	Section no.	Date:
Description of CAR			
The project description is not clear on the <ul style="list-style-type: none"> a) Present status of the project. b) Whether the project is a Greenfield activity? c) Whether Coal fired boilers are operating / would operate along with the project biomass and LPG boilers or replacing them? 			
Project participant response			Date:
All these issues were clarified in section A.2.			
Documentation provided by project participant			

Revised PDD			
DOE assessment			Date:
The point c is not explained clearly. When the project activity is a green field project, how can the coal fired boilers be considered as a baseline? This needs to be explained clearly in the PDD.			
Project participant response			
Coal fired boilers represent the baseline scenario, because according to a preliminary assessment report of Nestlé, the coal was the cheapest fuel compared to other fuels available in the region, as described in section B.4 of the PDD and therefore the preliminary plan of Nestlé was to use Coal fired boilers for supply the thermal energy demand, and because the use of coal boilers for thermal energy production is the common and well known practice in the southern part of Chile.			
DOE assessment			
The Coal fired boilers were considered as baseline scenario according to the common practice in Chile and also due to the fuel prices. Hence the issue is closed.			

CAR ID	3	Section no.		Date:
Description of CAR				
It needs to be explained as how the project will contribute to sustainable development in Chile.				
Project participant response				Date:
An explanation on how the project will contribute to sustainable development in Chile was included in section A.2.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	4	Section no.		Date:
Description of CAR				
The Type and Category of the small scale project activity needs to be indicated in the PDD.				
Project participant response				Date:
The Type and Category of the project activity are mentioned in section A.4.2.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	5	Section no.		Date:
Description of CAR				
The PP needs to clarify whether there is any technology transfer from Annex 1 countries				
Project participant response				Date:
This issue was covered in section A.4.2.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	6	Section no.		Date:
Description of CAR				
The PP needs to indicate how the thermal energy capacity criterion is fulfilled by the project activity with suitable references.				
Project participant response				Date:
The references were indicated in the PDD. Supporting document was submitted.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
The thermal energy capacity of the project is 10 MW which fulfils the criteria as per SSC projects. Hence the issue is closed.				

CAR ID	7	Section no.		Date:
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Description of CAR	
The justification for all applicability criteria as per methodology needs to be provided.	
Project participant response	Date:
The justification for the applicability criteria of methodology was included in section B.2. of the PDD.	
Documentation provided by project participant	
Revised PDD	
DOE assessment	Date:
Hence the issue is closed.	

CAR ID	8	Section no.		Date:
Description of CAR				
The project boundary diagram needs to be included in the PDD				
Project participant response				Date:
The project boundary diagram was included in section B.3.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	9	Section no.		Date:
Description of CAR				
The project boundary description is not as per the methodology and needs to be revised.				
Project participant response				Date:
The project boundary description was revised in section B.3.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	10	Section no.		Date:
Description of CAR				
The selected baseline needs to be justified as per guidance provided in the methodology AMS I.C. ver.20. The baseline description provided in the PDD is not explicitly stating the relevance of all alternatives.				
Project participant response				Date:
The explanation and justification of the selected baseline is explained in the PDD. Is important to remark that Nestlé Chile has other facilities with coal fired boilers, therefore another similar plant is the most common baseline scenario for Nestlé Chile S.A.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
<p>The PDD identifies Coal as the baseline scenario and also states that “Coal is a cheaper fuel compared to the available fuels in the region, such as a LPG, residual fuel oil (heavy fuel oil) and diesel oil”.</p> <p>How is it demonstrated that coal is cheaper? Please present a detailed cost analysis of all the available alternatives with supporting documents. This is essential as per the paragraphs below</p> <p><i>“If the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, the DOE shall, based on financial expertise and local and sectoral knowledge, determine whether all scenarios that are considered by the project participants and are supplementary to those required by the methodology, are reasonable in the context of the proposed CDM project activity and that no reasonable alternative scenario has been excluded.</i></p> <p><i>The DOE shall determine whether the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used, as described in the PDD. It shall ensure that documents and sources referred to in the PDD are correctly quoted and interpreted. The DOE shall cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if available”.</i></p>				

Project participant response

In the excel file "Costo Comb.03.2008" are presented the prices of different fuels, which demonstrate that the coal is the cheaper fuel compared to the available fuels in the region.

- Coal: As can see in line 9 of the excel file, the coal price is 76.45 \$/Kg. Is important to clarify that the excel cell C9 have a mistake, because the correct date of this price is March 2008, which is present in cell M9. The evidence of this price is presented in excel file "Carbon2008-2009 (3)".
- Fuel Oil N° 5, N° 6 and Diesel Oil 2D: The price of these fuels are also presented in the excel file, and come from COPEC letter sent to Nestlé. This letter is attached.
- Natural gas: As can see in the line 13 of the excel file, the price of natural gas is 242.5, which corresponds to a referential value of year 2007. This price doesn't have an evidence, but anyway this fuel is not an option for be used by Nestlé, because is not available in the region.
- LPG: The LPG price is presented in the cell D17 of the excel file. The support evidence of this value can be seen in the file "LPG price".

DOE assessment

From the analysis submitted, it could be accepted that coal was the cheapest alternative available. Hence the issue is closed.

CAR ID	11	Section no.		Date:
Description of CAR				
The relevant calculation method and sources need to be provided as per option selected to determine baseline efficiency.				
Project participant response				Date:
The sources of the efficiency of baseline units are submitted. Hence the issue is closed.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
The manufacturer specifications are used for coal efficiency value of 85%. Relevant documents have been submitted.				

CAR ID	12	Section no.		Date:
Description of CAR				
It needs to be demonstrated that the baseline scenario identified is in line with all applicable laws and regulations.				
Project participant response				Date:
The identified baseline scenario is in line with all applicable laws and regulations. The valid references to show that are presented in section B.4, and supporting documents are submitted. The documents submitted are the RCA of the project and the Law N° 19.300. The Environmental Qualification Resolution (RCA) is a document issued by Environmental Ministry, when is finished the environmental assessment of a project. This document contains a summary of the project, presents most significant environmental impacts, makes mandatory certain activities and issues technical guidance for implementing the project. The law 19.300, named Environmental General Bases Law, is the legal standard in charge of environmental issues in Chile, from a global perspective and organic, incorporating all public services under a single environmental competence coordination. It was created by CONAMA (National Environmental Commission), now replaced by Environmental Ministry.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
It could be confirmed that the baseline scenario is in line with all the regulations in Chile. Hence the issue is closed.				

CAR ID	13	Section no.		Date:
Description of CAR				

c) Please include The relevant chronological events from the date of consideration of CDM till submission of PDD for Global stakeholder consultation process needs to be indicated and supporting documents for the same needs to be submitted
d) When did Nestle take a decision to proceed with the CDM project and provide necessary evidence
Project participant response
Date:
The relevant chronological events were included in a timeline. The timeline and supporting evidence are submitted.
Documentation provided by project participant
Revised PDD
DOE assessment
Date:
Hence the issue is closed.

CAR ID	14	Section no.		Date:
Description of CAR				
The selection of financial indicator needs to be justified as per investment analysis guidelines.				
Project participant response				Date:
The selection of financial indicator was justified in section B.5 of the PDD				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	15	Section no.		Date:
Description of CAR				
The sensitivity analysis is done with variation of -15 and +15% where as the guideline allows for 10%. Also the operation and maintenance costs are not considered for analysis				
Project participant response				Date:
This issue was revised. The sensitivity was done with variation of -10 and +10%, and the operation and maintenance sensitivity analysis was included.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	16	Section no.		Date:
Description of CAR				
The baseline emissions need to be included in the PDD as per methodology. Please consider revision of the same.				
Project participant response				Date:
The baseline emissions were revised as per methodology in section B.6.1 of the PDD.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	17	Section no.		Date:
Description of CAR				
Clarify why use of fossil fuel is not considered in project emissions in case of LPG boiler as back up				
Project participant response				Date:
This CAR was clarified in section B.6.1 of the PDD. During the regular operation of the cow milk processing plant is not expected the operation of the LPG boiler. However, section B.6.1 includes relevant equations to be used in case of operation of the LPG boiler.				
Documentation provided by project participant				
Revised PDD				

DOE assessment	Date:
The project emissions due to fossil fuel have been presented in B.6.1, in case of use of LPG boiler, though it is not shown in ex ante calculations. Hence the issue is closed.	

CAR ID	18	Section no.		Date:
Description of CAR				
The exclusion of emissions due to biomass transportation needs to be justified with necessary evidences				
Project participant response				Date:
According to the methodology AMS I.C. ver. 20, if biomass residues are transported over a distance of more than 200 kilometers due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected. In this case the distance is 60 kilometers approximately, therefore the emissions due to biomass transportation are not considered. Supporting evidence is provided				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Provide an excel sheet for the different locations from where the biomass is transported to the plant. Also provide supportive for the distance from the plant (by maps). The excel sheet should consist of biomass type, location and distance from the plant.				
Project participant response				
In the excel file "Biomass characterization" are presented the locations from where the biomass is transported to the plant. The maps of these locations, and another details of the forest land where the biomass is purchased, are shown in the file "Bossur biomass provider" (Figure N°1: Location of the forest land which is used for storage and chipping, page 4 and Figure N° 2: Location of Santa Herminia Forest Land (3.500 mr for chipping), page 6).				
DOE assessment				
Hence the issue is closed.				

CAR ID	19	Section no.		Date:
Description of CAR				
Clarify whether the surplus biomass available in the region as ex ante?				
Project participant response				Date:
The biomass available in the region as ex ante value is specified in section B.6.2.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	20	Section no.		Date:
Description of CAR				
The type of fuel considered for emission factor of fossil fuel needs to be specified.				
Project participant response				Date:
Coal is the fuel considered for emission factor of fossil fuel, as shown in section B.6.2. of the PDD.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
a) If the emission factor of coal is a monitoring parameter as per the PDD, why this is shown as an ex ante parameter also? The same is the case with emission factor of diesel oil. Please revise accordingly. b) The section B.6.2 still shows the parameter 'CO ₂ emission factor of fossil fuel type / in year y'. Clarify.				
Project participant response				
These issues were clarified in section B.6.2 and B.7.1.				
DOE assessment				

The above issues have been clarified in the final PDD. Hence the issue is closed.

CAR ID	21	Section no.		Date:
Description of CAR				
Clarify how the thermal energy generated by LPG fired boiler is measured. Also the monitoring procedures in case of use of the back up boiler needs to be explained				
Project participant response				Date:
Clarify how the thermal energy generated by LPG fired boiler is measured. Also the monitoring procedures in case of use of the back up boiler needs to be explained				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
It is no where mentioned in the PDD B.6.2. The thermal energy generated by LPG boiler should be a monitoring parameter, in case of its usage. Please revise and include this parameter with clear description of measurement methods.				
Project participant response				
If the back up fired boiler is used, the emissions of the LPG should be calculated according to the "Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion", using the equation 2 and 3 of the PDD. Therefore, is not necessary to monitor the thermal energy.				
DOE assessment				
The issue has been clarified. Hence the issue is closed.				

CAR ID	22	Section no.		Date:
Description of CAR				
PP needs to explain how the biomass consumed in the project is measured. The measurement methods need to include the description of equipments used .Also the calibration frequency and procedures need to be explicitly mentioned in the PDD				
Project participant response				Date:
The measurement methods and the calibration frequency of the biomass consumed are explained in the section B.7.1. of the PDD. Supporting documents are submitted.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	23	Section no.		Date:
Description of CAR				
PP needs to indicate positive/negative environmental impacts from the EIA in the PDD				
Project participant response				Date:
Positive and negative environmental impacts are submitted in section D.1.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
The PDD mentions two negative impacts as <ul style="list-style-type: none"> • Generation of liquid waste. • Generation of noise and vibration, produced during the construction phase. Explain how these two are not significant impacts and how these are mitigated?				
Project participant response				

The project complies with the applicable environmental legislation in Chile and the impacts generated will be mitigated as follows.

- The liquid waste will be enter in a treatment facility, where according their characteristics, will be treated with a physical chemistry and biological treatment to obtain treated sewage that comply with the Standard of Liquid Waste Emission to Surface Water, establish by D.S.90/2001.

The generation of noise and vibration generated will be mitigated with the following activities: (1) Limiting the heavy vehicle speed, (2) Cutting and polishing material in closed space, (3) Following the procedure of control heavy vehicle that provide services to the work, avoiding the use of vehicles with free escape or body loose that causes metal punches of its structure, (4) Prohibiting accelerations in vacuum, (5) Permitting horn use only in emergencies, (6) Making rubbish evacuation using a system that minimizes noise generation through use of non-metallic sleeves.

DOE assessment

The issues have been addressed and hence the issue is closed.

CAR ID	24	Section no.		Date:
Description of CAR				
PP needs to explain who the relevant stakeholders in the project are and whether they are part of this meeting?				
Project participant response				Date:
The people of the local community, the Mayor of Osorno, the Municipal Secretary, and municipal officials are the relevant stakeholders and they attended the meeting. These representatives signed the act: Orlando Mella Torres, Emeterio Carillo Torres, José Luis Muñoz Uribe, Cecelia Ubilla Pérez, Alexis Casanova Cárdenas, Carlos Joel Vargas Vidal, Alejandro Baeza Soto, Jaime Vertín Valenzuela (Mayor of Osorno) and María Isabel Gallardo Ortega (Municipal Secretary).				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

CAR ID	25	Section no.		Date:
Description of CAR				
a) How the specific comments received from the stakeholders has been addressed by Nestle. Provide the evidences /communication sent to stakeholder. b) The inconsistency in section E.2 and E.3 of the PDD regarding the stakeholder feedback needs to be corrected in the revised PDD.				
Project participant response				Date:
a) Most of the questions were answered during the meeting and it was not necessary to implement any futures actions. One question was answered by e-mail, which is submitted. b) The section E.2 and E.3 were revised, and all the questions and answers are submitted.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				Date:
Hence the issue is closed.				

Table 3. FARs from this validation

FAR ID	NA	Section no.	Date: DD/MM/YYYY
Description of FAR			
Project participant response			Date: DD/MM/YYYY
Documentation provided by project participant			
DOE assessment			Date: DD/MM/YYYY

