




**Validation report form for renewal of crediting period for
CDM project activities
(Version 02.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	La Vuelta and La Herradura Hydroelectric Project UNFCCC Ref. Number: 0735
Number and duration of the next crediting period	Crediting period: 3 01/01/2019 – 31/12/2025
Version number of the validation report for RCP	1.0
Completion date of the validation report for RCP	11/04/2019
Version number of PDD to which this report applies	20
Project participants	Empresas Públicas de Medellín E.S.P. (Colombia) MGM Carbon Portfolio, S.a.r.l. (Switzerland)
Host Party	Colombia
Applied methodologies and standardized baselines	ACM0002: Grid-connected electricity generation from renewable sources – version 19.0
Mandatory sectoral scopes linked to the applied methodologies	1
Conditional sectoral scopes linked to the applied methodologies	-
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	84,221 tCO _{2e}
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited UNFCCC Ref. Number: E-0066
Name, position and signature of the approver of the validation report for RCP	 Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

Brief summary of the project activity

The project activity consists in two operational hydro power plants located in the municipalities of Cañasgordas, Frontino and Abriaquí in the north-western part of Antioquia department, in Colombia (geographical coordinates: La Vuelta – latitude: 6.7304 N and longitude: 76.0883 W and La Herradura – latitude: 6.8028 N and longitude: 76.0814 W).

Both plants are connected to the Colombian National Interconnected System (SIN).

Technical description and equipment:

La Vuelta

- 01 turbine – Uralhydromash – Francis – Capacity: 12,400 kW – Serial # 46499;
- 01 generator – Synchronous horizontal axis – Capacity: 14,000 kVA – Power factor: 0.85 – Serial # 210.

La Herradura

- 02 turbines – Uralhydromash – Francis – Capacity (each): 10,540 kW – Serials # 46497 and 46498;
- 02 generators – Synchronous horizontal axis – Capacity (each): 12,000 kVA – Power factor: 0.85 – Serial #s: 29200 and 29206.

Total installed capacity of generators of both plants: 33.48 MW.

The lifetime of the main equipment is 50 years (by technical literature). EPM works with a conservative internal assumptions considering 40 years for turbines and 30 for the generators.

The estimated ERs of the project activity is 84,221 tCO₂e/y and 589,547 tCO₂e for the entire crediting period.

Scope of validation

Empresas Públicas de Medellín E.S.P. has contracted ESPL to conduct the validation of the renewal of the crediting period of the project activity “La Vuelta and La Herradura Hydroelectric Project”.

The scope of the validation is to establish that:

- the PA is in accordance with all relevant CDM rules and requirements;
- the PA is in accordance with conditions of the latest version of applied methodology ACM0002: Grid-connected electricity generation from renewable sources – version 19.0;
- the validation of the renewal of crediting period is in accordance with requirements of CDM methodological tool “TOOL11 – Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period” – version 03.0.1.

Validation process

The validation process involved the following:

- contract with Empresas Públicas de Medellín E.S.P. for the scope of validation of the renewal of the crediting period of the project activity;
- desk review;
- physical on-site inspection;
- issuance of validation findings;
- reporting, calculation checks, QA/QC and resolution of findings;
- issuance of draft validation report;
- independent technical review of the project documentation;
- issuance of the final validation report;
- submission of the request for renewal, as appropriate.

Conclusion

ESPL has performed the validation of the renewal of the crediting period of the CDM PA “La Vuelta and La Herradura Hydroelectric Project” (UNFCCC Ref. Number: 0735).

The validation team has confirmed that it is in accordance with all relevant CDM rules and requirements and conditions of the latest version of applied methodology ACM0002 – version 19.0. In addition, it was confirmed that the monitoring system is feasible and the estimated emission reductions are conservatively calculated.

The PA is expected to generate an annual average of 84,221tCO₂e in the third crediting period.

A site visit has not been performed for the validation of the renewal of the crediting period, in accordance with CDM validation and verification standard for project activities – version 02.0 – paragraph 31. All information has been fully assessed by pictures, videos, manual of equipment and video-conferences with PP representatives and plant operators. In addition, the PA is fully documented at UNFCCC website, as the project is being renewed to the 3rd crediting period and nine verifications have already taken place.

Therefore, the request for renewal of the crediting period of the PA is being submitted in accordance with the CDM procedures.

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/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	OR	Cruz	Sergio	Verifit	Y	N	Y	Y
2.	Local Expert	OR	Lopes	Ricardo	Verifit	Y	N	N	Y
3.	Methodological Expert	OR	Cruz	Sergio	Verifit	Y	N	Y	Y
4.	Technical Expert	OR	Cruz	Sergio	Verifit	Y	N	Y	Y

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Gautam	Ashok	Central Office
2.	Technical Expert	IR	Gautam	Ashok	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Means of validation

C.1. Desk/document review

A desk review was conducted by the validation team that included:

- a review of the data and information presented to assess its completeness;
- a review of the registered project activity, the applied methodology including applicable tool(s) and, where applicable, the applied standardized baseline;
- a review of supporting documents.

A complete list of documents/evidences reviewed is included as Appendix 3.

C.2. On-site inspection

Duration of on-site inspection: 07/12/2018 and 11/12/2018				
No.	Activity performed on-site	Site location	Date	Team member
-	-	-	-	-

A site visit has not been performed for the validation of the renewal of the crediting period, in accordance with CDM validation and verification standard for project activities – version 02.0 – paragraph 31, as the estimated annual average of ERs is below 100,000 tCO₂e and as this is the validation of renewal of the third crediting period, there is no pre-project information that is relevant to the requirements for registration of the project activity and may not be traceable after the registration.

In addition, the PPs have provided evidences to show the facilities and equipment (e.g. pictures, equipment manuals) and PPs' representatives have been interviewed and operation personnel have provided all necessary information for a clear and precise understanding of the project activity, which has been considered sufficient by the validation team for the purpose of the present validation.

Moreover, FAR 12 has been raised in order to have all technical data thoroughly checked, to confirm their consistency with presented information, during the next verification of the project activity.

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Giraldo Ospina	Isabel	EPM	07/12/2018 11/12/2018	- General aspects - CDM aspects - EF calculation - ER calculation	Sergio Cruz
2.	Fernandez	Óscar	EPM	07/12/2018 11/12/2018	- General aspects - Historical view of PA - CDM aspects - EF calculation - ER calculation - Monitoring and operation	Sergio Cruz

As no site visit has been performed (refer to Section C.2 above), all interviews have been performed by video-conference between PPs' representatives in Medellín (PP's office – Colombia) and Cañasgordas, Frontino and Abriaquí (plants location – Colombia) and validation team in São Paulo (Brazil).

C.4. Sampling approach

Not applicable as no sampling has been used during the validation.

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

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	2	-	-
Application and selection of methodologies and standardized baselines	1	1	-
Validity of original baseline or its update	-	1	-
Estimated emission reductions or net anthropogenic removals	1	2	-
Validity of monitoring plan	1	1	-
Crediting period	-	-	-
Project participants	1	-	-
Post-registration changes	-	-	-
Others (please specify): PA technical features	-	-	1
Total	6	5	1

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

Means of validation	The PDD was crosschecked with the CDM-PDD-FORM template available at the UNFCCC website and with the instructions for filling it out.
Findings	CL 01; CL 06
Conclusion	The latest version of the PDD template (CDM-PDD-FORM – version 10.1) available at the UNFCCC website has been used. It has been filled out in accordance with the instructions.

D.2. Application and selection of methodologies and standardized baselines

Means of validation	The PA applies approved methodology ACM0002: Grid-connected electricity generation from renewable sources – version 19.0, which is latest one available at UNFCCC website. The PA also applies the methodological tools: a. TOOL07 – Tool to calculate the emission factor for an electricity system – version 07.0; b. TOOL11 – Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period – version 03.0.1. The methodology and tools are from UNFCCC CDM website.	
Findings	CL 03; CAR 07	
Conclusion	All applicability conditions of the applied methodology are met:	
	Applicability Criteria – ACM0002 – v. 19.0	Assessment
	a) Install a Greenfield power plant; b) Involve a capacity addition to (an) existing plant(s); c) Involve a retrofit of (an) existing operating plants/units; d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or e) Involve a replacement of (an) existing plant(s)/unit(s).	The PA complies with the condition (a) as it was a greenfield power plant
	The methodology is applicable under the following conditions: a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The PA complies with the condition (a) as it is composed by two hydro power plant/unit
	In case of hydro power plants, one of the following conditions shall apply:	The PA complies with the condition (c) as both plants have a new single reservoir

	<p>a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or</p> <p>b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (3), is greater than 4 W/m²; or</p> <p>c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m²; or</p> <p>d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m², all of the following conditions shall apply:</p> <ol style="list-style-type: none"> The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m²; Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be: <ol style="list-style-type: none"> Lower than or equal to 15 MW; and Less than 10 per cent of the total installed capacity of integrated hydro power project. 	and the power densities are greater than 4 W/m ²
	<p>In the case of integrated hydro power projects, project proponent shall:</p> <ol style="list-style-type: none"> Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity. 	Not applicable, as the PA is not an integrated hydro power project
	The methodology is not applicable to:	The PA is not a project activity that involves

	a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;	switching from fossil fuels to renewable energy, neither a biomass fired power plant/unit
	b) Biomass fired power plants/units.	
	In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The PA is not a project with retrofit, rehabilitation, replacement, or capacity addition
	The applicability conditions included in the tools referred to also apply.	All applicability conditions included in the tools are accomplished by the PA

D.3. Validity of original baseline or its update

Means of validation	<p>The baseline scenario is given by applied methodology ACM0002 – version 19.0: "The baseline scenario is the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in "TOOL07: Tool to calculate the emission factor for an electricity system".</p> <p>In addition, in accordance with the directives for the renewal of the crediting period of a registered CDM project activity, the validity of the current baseline shall be reassessed using the latest version of the "Tool to assess the validity of the original/ current baseline and to update the baseline at the renewal of a crediting period" (version 03.0.1).</p> <p><u>Step 1: Assess the validity of the current baseline for the next crediting period</u></p> <p><i>Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies:</i> the current baseline scenario complies with all relevant mandatory national/sectoral legislation.</p> <p><i>Step 1.2: Assess the impact of circumstances:</i> the current baseline emissions identified at the time of requesting renewal of crediting period are not impacted by any circumstances. The conditions used to determine the baseline emissions in the previous crediting period are still valid.</p> <p><i>Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested:</i> the baseline scenario identified at the validation of the project activity was the continuation of BAU, which is the electricity that would be supplied by the power grid in the absence of the project activity. Therefore, the power grid, as an electricity system, could maintain its technical possibility for a much longer time than the crediting period of the project activity.</p> <p><i>Step 1.4: Assessment of the validity of the data and parameters:</i> the fixed parameters were changed for the 3rd commitment period in accordance with new calculations and new version of applied methodology and tools.</p> <p>The application of Steps 1.1, 1.2, 1.3 and 1.4 above confirmed that the current baseline remains valid for the subsequent crediting period and that fixed parameters have been changed due to changes presented above.</p> <p>As there are parameters that were updated for the 3rd crediting period, Step 2 is assessed below:</p> <p><u>Step 2: Update the current baseline and the data and parameters</u></p>
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	<p><i>Step 2.1: Update the current baseline:</i> although the current baseline is valid, the baseline emissions were updated in accordance with the stated above in Step 1.4.</p> <p><i>Step 2.2: Update the data and parameters:</i> all fixed parameters required by applied methodology and tools were updated with values of the new version of applied methodology and tools.</p>
Findings	CAR 08
Conclusion	The baseline scenario is the one given by the applied methodology ACM0002 – v. 19.0, which is valid for the new crediting period.

D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	<p>All equations, formulas and assumptions were correctly applied as per the applied methodology (ACM0002 – 19.0) and tools.</p> <p>The baseline emissions are calculated by the multiplication of the electricity supplied by the project activity to the grid by the combined margin of CO₂ emission factor.</p> <p>No project emissions or leakage are considered by the applied methodology for the type of project activity.</p> <p>The parameters used to calculate the emission reductions are conservative, traceable and from official, public and reliable sources.</p> <p>All fixed ex-ante parameters necessary for the project activity are listed at the Section B.6.2 of PDD, in accordance with the applied methodology and tools. They are:</p> <ul style="list-style-type: none"> - $EG_{m,y}$ and $EG_{k,y}$: Net electricity generated and delivered to the grid by power unit m or k in year y; - $EF_{CO2,i,y}$, $EF_{EL,m,i,y}$ and $EF_{EL,k,i,y}$: Emission factor of fossil fuel type i for power plant m or k in year y; - $\eta_{m,y}$ and $\eta_{k,y}$: Average net energy conversion efficiency of power unit m of k in year y; - $EF_{grid,OM,y}$: Operation margin CO₂ emission factor for grid connected power generation in year y (the value is the average of years 2015-2017); - $EF_{grid,BM,y}$: Build margin CO₂ emission factor for grid connected power generation in year y (the value used is the same of the 2nd crediting period, i.e. from 2010); - $EF_{grid,CM,y}$: Combined margin CO₂ emission factor for grid connected power generation in year y; - <i>The percentage share of total installed capacity of the specific technology;</i> - <i>The total installed capacity of the technology.</i>
Findings	CL 04; CAR 09; CAR 10
Conclusion	The methodology and tools were correctly applied in order to calculate the estimates of emission reductions, with reliable and conservative parameters.

D.5. Validity of monitoring plan

Means of validation	<p>The PDD sets a monitoring plan, which is feasible and in accordance with the applied methodology and tools.</p> <p>The management structure and roles and responsibilities are established for data collection, calibration frequency of meters, data report and data archiving.</p> <p>Moreover, there are procedures set for crosschecking the monitored data.</p> <p>No sampling plan is set to monitor the parameter.</p> <p>The parameters to be monitored necessary for the project activity are listed at the PDD, in accordance with the applied methodology and tools.</p> <p>The parameters required for monitoring are contained in the monitoring plan:</p> <ul style="list-style-type: none"> - $EG_{facility,y}$: Quantity of net electricity supplied by the project plant/unit to the grid in year y; - Cap_{PJ}: Installed capacity of the hydro power plant after the implementation of the project activity - A_{PJ}: Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Findings	CL 05; CAR 11
Conclusion	<p>The monitoring plan of the PA is in accordance with the approved monitoring methodology and the means of monitoring of the parameters contained in the monitoring plan are feasible.</p> <p>The management structure and roles and responsibilities are set for data collection, calibration frequency of monitoring equipment, data report and data archiving. In</p>

	addition, procedures for quality assurance and quality control are be set, as well as specific training for involved personnel. There is no sampling plan set to monitor the parameters.
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D.6. Crediting period

Means of validation	The crediting period is 7 years renewable. This is the 3 rd crediting period and its start date is 01/01/2019, which is the first date after the end of the 2 nd crediting period.
Findings	-
Conclusion	The 3 rd crediting period is from 01/01/2019 to 31/12/2025 – the notification of the intention to request a renewal of the crediting period was sent by the PP on 03/07/2018. In addition, as per paragraph 32 (iv) of Meeting Report: CDM Executive Board one hundredth meeting, “the grace period for the submission of renewal request for the existing registered project activities whose crediting period has expired but has not been renewed (i.e. overdue for renewal) is to be by 31 December 2019.” Therefore, the project activity is in accordance with CDM requirements and EB directives.

D.7. Project participants

Means of validation	The project participants are: - Empresas Públicas de Medellín E.S.P. (Colombia) - MGM Carbon Portfolio, S.a.r.l. (Switzerland)
Findings	CL 02
Conclusion	The names of the project participants included in the updated PDD were assessed in accordance with the applicable validation requirements related to the renewal of crediting period. All information is in accordance with UNFCCC website.

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines	N	-	-
Corrections	N	-	-
Change to the start date of the crediting period of the project activity	N	-	-
Inclusion of a monitoring plan	N	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools	N	-	-
Changes to the project design	N	-	-
Changes specific to afforestation and reforestation project activities	N	-	-

SECTION E. Internal quality control

The draft validation report that is prepared by validation team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by ESPL were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements.

The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope to which the project activity is related. All members of technical review team are independent of the validation team.

During the technical review process, additional findings may be identified or the closed-out findings may be opened, which needs to be satisfactorily resolved before the request for the renewal of the crediting period is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same, in such case, providing the comments/findings/issues that needs to be resolved by the validation team. The decision taken by the technical reviewer is final and is authorized on behalf of ESPL.

SECTION F. Validation opinion

ESPL, contracted by Empresas Públicas de Medellín E.S.P., has performed the independent validation of the renewal of crediting period of the project “La Vuelta and La Herradura Hydroelectric Project”, with UNFCCC Ref. Number: 0735.

ESPL commenced the validation based on the baseline and monitoring methodology ACM0002 – version 19.0, the registered PDD – version 15 (from previous crediting period) and draft PDD (for the 3rd crediting period).

ESPL’s validation approach is based on the understanding of the risks associated with reporting the project activity, estimates of GHG emission data and the controls to be implemented to mitigate these. ESPL planned and performed the validation by obtaining evidence, other information and explanations that ESPL considered necessary to give reasonable assurance that the estimated GHG emission reductions are fairly to be achieved.

The validation team confirms, based on final version of revised PDD for the 3rd crediting period, that:

- the original baseline is still valid as it is given by the applied methodology;
- the project additionality is valid for the renewal of the crediting period. No regulatory surplus has been identified. The project is in accordance with all applicable regulations and legislations;
- the project description is in accordance with the characteristics identified on site;
- the monitoring plan is adequate to the project activity and it is in accordance with the applied methodology;
- at this 3rd crediting period, the project activity is likely to achieve the estimated of 84,221tCO₂e per year.

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CP	Crediting Period
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
kW	kilo Watt
kWh	kilo Watt hour
LoA	Letter of Approval/Authorization
MoC	Modalities of Communication
MP	Monitoring Plan
MW	Mega Watt
MWh	Mega Watt hour
OM	Operating Margin
PA	Project Activity
PCP	Project Cycle Procedure
PDD	Project Design Document
PE	Project Emission
PLF	Plant Load Factor
PP	Project Participant
PS	Project Standard
tCO ₂ e	Tonnes of Carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VT	Validation Team
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Sergio Bonanno Cruz		
Country	Brazil		
Education	Post Graduate Diploma in Environment		
Experience	25 Years		
Field	Environmental Law, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	ACM0001, ACM0002, AM0026, ACM0006, AMS-I.D		
Local expert	Brazil, Chile		
Financial Expert	Yes		
Technical Reviewer	Yes		
TA Expert	1.2, 13.1		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

Competence Statement			
Name	Ricardo Lopes		
Country	Brazil		
Education	Technical Diploma in Data Processing		
Experience	12 years		
Field	CDM, Energy, Environment		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	ACM0001, ACM0002, AM0026, AMS-I.D, AMS-III.H		
Local expert	Brazil, Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Honduras, Mexico, Nicaragua, Uruguay		
Financial Expert	Yes		
Technical Reviewer	Yes		
TA Expert	1.2, 13.1		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

Competence Statement		
Name	Ashok Gautam	
Country	India	
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)	
Experience	16 Years +	
Field	Energy, Climate Change & Environment	
Approved Roles		
Team Leader	Yes	
Validator	Yes	
Verifier	Yes	
Methodology Expert	AMS-I.D, AMS-I.A, AMS-I.C, AMS-I.E, AMS-II.D, AMS-II.G, AMS-III.E, AMS-III.H, AMS-III.Q, AMS-III.Z, AMS-III.AV, AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B	

Local expert	India		
Financial Expert	Yes		
Technical Reviewer	Yes		
TA Expert	1.1, 1.2, 3.1, 13.1		
Reviewed by	Shreya Garg	Date	25/01/2019
Approved by	Anshika Gupta	Date	25/01/2019

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	UNFCCC	Standard: CDM PS for PA	version 02.0	Other
2.	UNFCCC	Standard: CDM PCP for PA	version 02.0	Other
3.	UNFCCC	Standard: CDM VVS for PA	version 02.0	Other
4.	UNFCCC	Form: CDM-PDD-FORM	version 10.1	Other
5.	UNFCCC	Project design document (registered)	version 15 – 16/06/2014	PP
6.	PP	Project design document (draft)	version 16 – 03/07/2018	PP
7.	PP	Project design document (revised)	version 17 – 21/01/2019 version 18 – 15/02/2019 version 19 – 06/03/2019	PP
8.	PP	Project design document (final)	version 20 – 11/04/2019	PP
9.	PP	ER Spreadsheet (draft) EF calculation Spreadsheet Jul 2018	version 1 version 1	PP
10.	PP	ER and EF calculation Spreadsheet (revised)	version 2 version 3 version 4	PP
11.	PP	ER and EF calculation Spreadsheet (final)	version 5	PP
12.	UNFCCC	Methodology: ACM0002 – Grid-connected electricity generation from renewable sources	version 19.0	Other
13.	UNFCCC	Methodological tools: - TOOL07 – Tool to calculate the emission factor for an electricity system	version 07.0	Other
		- TOOL 11 – Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period	version 03.0.1	
14.	PP	Notification about the intention to renew the crediting period: - E-mail of notification about the intention to renew the crediting period of the project activity	03/07/2018	PP
15.	Ministry of the Environment	Environmental license: - La Vuelta – Resolution 159397 - La Herradura – Resolution 194197	21/08/1997 24/10/1997	PP

16.	Hermond Brekke Carolina Bonilla Lizeth González EPM	<u>Project Lifetime:</u> - Technical literature "Hydraulic Turbines – Design, Erection and Operation" - Technical literature "Structure, Finance and Valuation of Small Hydroelectric power plants in Colombia by Real Options" - Internal assumption: "EPM Assets lifetime ranges"	2001 2017 -	PP
17.	PP PP PP PP	<u>Technical description:</u> - Pictures of plant - Pictures of energy meters - Technical characteristics of generators - Calibration certificates of meters	Dec/2018 Dec/2018 Dec/2004 04 and 05/12/2017	PP
18.	XM	<u>Lamba Calculation:</u> - Operations reports - Generation reports	- 2015 / 2016 / 2017	PP
19.	-	XM Compañía de Expertos en Mercados S.A. E.S.P	https://www.xm.com.co/Paginas/Home.aspx#	Other
20.	-	DNA of Colombia	http://www.minambiente.gov.co/	Other
21.	-	IPCC publications	www.ipcc-nggip.iges.or.jp	Other
22.	-	UNFCCC	http://cdm.unfccc.int	Other

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

Table 1. CLs from this validation

CL ID	01	Section no.	D.1	Date: 13/12/2018
Description of CL				
<p>According to the instructions to filled up the PDD, the following sections are not correctly filled up:</p> <ul style="list-style-type: none"> a. Section A.1: it is missing the information of the annual average and total ERs for the crediting period; b. Section A.3 – it is missing: <ul style="list-style-type: none"> i. the information of the monitoring equipment and its location in the system; ii. age and lifetime of equipment; iii. summary of baseline scenario; c. Section A.6: it is missing the necessary information; d. Section B.3: it is missing a flow diagram of project boundary; e. Section C.2: the lifetime is not correctly described, nor referenced; f. Section C.3.1: it is missing the information if the crediting period is the first, second or third; g. Appendix 1: it is necessary the information for each PP listed in Section A.4. 				
Project participant response				Date: 21/01/2019
The listed sections have been filled up in the new version of PDD.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17; EPM Assets lifetime ranges.				
DOE assessment				Date: 24/01/2019
All sections of the PDD have been correctly filled up.				

CL ID	02	Section no.	D.7	Date: 13/12/2018
Description of CL				

<i>The list of PPs at the front page is not in accordance with latest version of MoC presented at UNFCCC website.</i>	
Project participant response	Date: 21/01/2019
The list of PPs has been checked and corrected at the front page in the new version of PDD, according to the DOE observations. The list of PPs is in accordance with latest version of MoC presented at UNFCCC website.	
Documentation provided by project participant	
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.	
DOE assessment	Date: 24/01/2019
The list of PPs at the front page is now in accordance with latest version of MoC presented at UNFCCC website: Empresas Públicas de Medellín E.S.P. and MGM Carbon Portfolio, S.a.r.l.	

CL ID	03	Section no.	D.2	Date: 13/12/2018
Description of CL				
<i>Not all conditions of applied methodology have been correctly discussed in Section B.2.</i>				
Project participant response				Date: 21/01/2019
All conditions of the methodology ACM0002 "Grid-connected electricity generation from renewable sources" (version 19.0), were checked. The calculation of project density for each small hydropower project were included.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.				
DOE assessment				Date: 24/01/2019
All conditions of applied methodology have been fully discussed. Refer to D.2 of the present report for the full assessment of the conditions.				

CL ID	04	Section no.	D.4	Date: 13/12/2018
Description of CL				
<i>In Section B.6.1, it is not demonstrated why project emissions are not considered for the project activity.</i>				
Project participant response				Date: 21/01/2019
All Section B.6.1 is revised according to the TOOL07 and the methodology ACM0002. The explanation about why project emissions are not considered for La Vuelta and La Herradura Hydroelectric Project is included in section B.6.1.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.				
DOE assessment				Date: 24/01/2019
It is now clear that project emissions are not considered for the project activity as the power densities of both plants are greater than 10 W/m ² , i.e. PD _{La Vuelta} = 3,332.44 W/m ² and PD _{La Herradura} = 10,409.88 W/m ² .				

CL ID	05	Section no.	D.5	Date: 13/12/2018
Description of CL				
<i>In Section B.7.1, it is not clear how the values of parameter EG_{facility} will be cross-checked.</i>				
Project participant response				Date: 21/01/2019
The section was completed, explaining with details how the values of parameter EG _{facility} will be cross-checked.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.				
DOE assessment				Date: 24/01/2019
It is still not clear how the values will be crosschecked as the values of the National Dispatch Center (CND) also appear as the main monitoring.				

Project participant response #2	Date: 15/02/2019
Source of Data refers just to electricity meters read by Empresas Públicas de Medellín; instead, QA/QC refers to the crosschecking with net electricity generation registered by the Colombian National Dispatch Center (CND).	
Documentation provided by project participant #2	
La Vuelta and La Herradura Hydroelectric Project PDD, version 18.	
DOE assessment	Date: 18/02/2019
It is now clear that the main monitoring is done by the meters of the plants, which are operated by EPM and the cross-check is done by CND's system.	

CL ID	06	Section no.	D.1	Date: 13/12/2018
Description of CL				
<i>It is not clear the information given in Appendix 7 about the changes as they are not in accordance with PRC already approved for the project activity.</i>				
Project participant response				Date: 21/01/2019
Appendix 7 in PDD version 17 is already in accordance with PRC. The information of each "turbine capacity" (MW) of La Herradura Hydroelectric subproject was corrected.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.				
DOE assessment				Date: 24/01/2019
Appendix 7 is now in accordance with the PRC already approved for the project activity and also already incorporated in the new PDD version.				

Table 2. CAR from this validation

CAR ID	07	Section no.	D.2	Date: 13/12/2018
Description of CAR				
<i>The applied version of methodology ACM0002 and TOOL07 are not the latest ones available at UNFCCC website.</i>				
Project participant response				Date: 21/01/2019
Latest versions of methodology ACM0002 and TOOL07 were included in PDD version 17. TOOL11 "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" (version 03.0.1), has been added.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.				
DOE assessment				Date: 24/01/2019
The version of ACM0002 and TOOL07 are the latest ones available at the UNFCCC website.				

CAR ID	08	Section no.	D.3	Date: 13/12/2018
Description of CAR				
<i>In Section B.4, the assessment of the validity of the baseline has not been correctly performed as per the Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period – version 03.0.1.</i>				
Project participant response				Date: 21/01/2019
The TOOL11 "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" (version 03.0.1), was applied in order to demonstrate the validity of the original baseline.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.				
DOE assessment				Date: 24/01/2019

The assessment of the validity of the baseline has been correctly performed as per the Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period – version 03.0.1, demonstrating that the original baseline scenario is still valid.

CAR ID	09	Section no.	D.4	Date: 13/12/2018
Description of CAR				
<i>In Section B.6.2, the list of parameters fixed ex-ante is not in accordance with applied methodology and tool.</i>				
Project participant response				Date: 21/01/2019
Parameters such as the percentage share of total installed capacity of the specific technology and the total installed capacity of the technology, as well as other applicable, have been already included in the new version of PDD.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.				
DOE assessment				Date: 24/01/2019
The list of parameters fixed ex-ante is now in accordance with applied methodology and tool. Nevertheless, the value used for $EF_{grid,BM,y}$ is not the same used for the second crediting period.				
Project participant response				Date: 15/02/2019
The year for the parameter $EF_{grid,BM,y}$ was corrected in the spreadsheet named “Combined Grid EF” of the file “LV LH combined_OM_BM_EF_Lambda_method_2017”.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 18. LV LH combined_OM_BM_EF_Lambda_method_2017.				
DOE assessment				Date: 18/02/2019
The calculation of $EF_{grid,BM,y}$ has now been made for 2010, which is the same year used at the 2 nd crediting period. All calculations have been revised accordingly.				

CAR ID	10	Section no.	D.4	Date: 13/12/2018
Description of CAR				
<i>The calculation of $EF_{grid,OM,y}$ has not been done in accordance with the applied tool.</i>				
Project participant response				Date: 21/01/2019
Calculation of EF_{OM} has been done in accordance with the applied tool. The emission factor for the operating margin was adjusted to 2017, with 2015-2017 data available.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17; Combined_OM_BM_EF_Lambda_method_2017, sheet “Combined grid EF”				
DOE assessment				Date: 24/01/2019 21/02/2019
The calculation of $EF_{grid,OM,y}$ has now been done in accordance with the applied tool and correct vintage has been used. Nevertheless, the following points of the calculations have to be clarified and/or revised:				
1. <u>Tab “2017 lambda”</u>				
a. it is not clear why two lambdas have been calculated (Cell M30 and Cell M2561);				
b. the daily cross-point value considered in column E is not correct;				
2. <u>Tab “2017 EFOM Plants”</u>				
a. the information included from lines 3 to 22 is not clear;				
b. it is not clear why two different lambdas are being applied in the EF_{OM} calculations (Cell B28);				
c. at Cell B28; it is not clear why the calculation of 1 st term takes into account the total generation instead of non LCMR generation;				

- d. the sources of the values of cells B23, B24 and B26 are not clear:
- e. it is not clear why cogeneration plants are not treated as LCMR (EF >0);

3. Tab “2016 EFOM Plants”

- a. the information included from lines 3 to 22 is not clear;
- b. at Cell B28; it is not clear why the calculation of 1st term takes into account the total generation instead of non LCMR generation;
- c. the sources of the values of cells B23, B24 and B26 are not clear:
- d. it is not clear why cogeneration plants are not treated as LCMR (EF >0);

4. Tab “2015 EFOM Plants”

- a. the information included from lines 3 to 22 is not clear;
- b. at Cell B28; it is not clear why the calculation of 1st term takes into account the total generation instead of non LCMR generation;
- c. the sources of the values of cells B23, B24 and B26 are not clear:
- d. it is not clear why cogeneration plants are not treated as LCMR (EF >0).

Project participant response #2

Date: 04/03/2019

The aspects questioned by the DOE have been clarified or revised in the following way. All of them refer to the file named “LV LH combined_OM_BM_EF_Lambda_method_2017 v3”:

1. Spreadsheet “2017 lambda”

- a. We calculated 2017 Lambda, having a calculation made by a third party as a base. We forgot to eliminate the information in cell M30. 2017 Lambda corresponds to the information in cell M2561, which is the crossing point.
- b. Values of daily cross-point considered from cell C2559 to up and down were corrected.

2. Spreadsheet “2017 EFOM Plants”

- a. The empty lines 3 to 22 were eliminated, because they were part of a previous year’s calculation table. This elimination does not modify the information related to thermal generation, thermal emissions, neither low-cost must-run.
- b. Both terms of the EF_{OM} calculation (nowadays cell B7) take 2017 lambda, which is kept in cell M2561.
- c. Cell B6 (equivalent to cell B27 before) was calculated as a product of the SIN 2017 emission factor (cell B5, equivalent to cell B26 before) multiplied by total electricity system generation (cell B4, equivalent to cell B25 before). SIN 2017 emission factor (cell AB374 of file named “2017 Colombian emission factor”) is the summation of each thermal plant generation multiplied by its own emission factor, divided by total generation.
- d. Sources of the values of cell B2 (total thermal generation, cell B23 before), cell B3 (total LCMR, cell B24 before) and cell B5 (emission factor, cell B26 before) are quoted. All of this information is provided by XM, which is the Colombian Electricity System Operator.
- e. Energy generation from cogeneration plants in Colombia was less than 1% for 2017 (see cell E8765 of the file named “2017 SIN hourly generation”).

3. Spreadsheet “2016 EFOM Plants”

- a. The empty lines 3 to 22 were eliminated, because they were part of a previous year’s calculation table. This elimination does not modify the information related to thermal generation, thermal emissions, neither low-cost must-run.
- b. Cell B6 (equivalent to cell B27 before) was calculated as a product of the SIN 2016 emission factor (cell B5, equivalent to cell B26 before) multiplied by total electricity system generation (cell B4, equivalent to cell B25 before). SIN 2016 emission factor is the summation of each thermal plant generation multiplied by its own emission factor, divided by total generation.
- c. The values of cell B2 (total thermal generation, cell B23 before), cell B3 (total LCMR, cell B24 before) and cell B5 (emission factor, cell B26 before) were provided by XM, which is the Colombian Electricity System Operator, at the first beginning of 2017. Unfortunately, we did not keep the files; nowadays the official information published by XM defers a bit (for instance, we have in the calculation that 2016 total electricity generation was 65,291,291 MWh. Nowadays, the official information published is 65,940,300 MWh).
- d. Energy generation from cogeneration plants in Colombia was 0.91% in 2016 (see page 8 of the file named “Informe_Operacion_SIN_2016”).

4. Spreadsheet “2015 EFOM Plants”

- a. The empty lines 3 to 22 were eliminated, because they were part of a previous year’s calculation table. This elimination does not modify the information related to thermal generation, thermal emissions, neither low-cost must-run.
- b. Cell B6 (equivalent to cell B27 before) was calculated as a product of the SIN 2015 emission factor (cell B5, equivalent to cell B26 before) multiplied by total electricity system generation (cell B4, equivalent to cell B25 before). SIN 2015 emission factor is the summation of each thermal plant generation multiplied by its own emission factor, divided by total generation.
- c. The values of cell B2 (total thermal generation, cell B23 before), cell B3 (total LCMR, cell B24 before) and cell B5 (emission factor, cell B26 before) were provided by XM, which is the Colombian Electricity System Operator, at the first beginning of 2016. Unfortunately, we did not keep the files; nowadays the official information published by XM defers a bit (for instance, we have in the calculation that 2015 total electricity generation was 65,953,909 MWh. Nowadays, the official information published is 66,548,500 MWh).
- d. Energy generation from cogeneration plants in Colombia was 0.72% in 2015 (see page 8 of the file named “Informe_Operacion_SIN_2016”).

Documentation provided by project participant

“LV LH combined_OM_BM_EF_Lambda_method_2017 v3”

“2017 Colombian emission factor”

“2017 SIN hourly generation”

“Informe_Operacion_SIN_2016”

DOE assessment #2**Date:** 08/03/2019

The Lambda calculation has been revised.

Nevertheless, some points are still not OK:

1. Tab “2017 EFOM Plants”
 - a. it is not clear why cogeneration plants are not treated as LCMR (EF >0);
2. Tab “2016 EFOM Plants”
 - a. the sources of the values of cells B23, B24 and B26 are not clear:
 - b. it is not clear why cogeneration plants are not treated as LCMR (EF >0);
3. Tab “2015 EFOM Plants”
 - a. the sources of the values of cells B23, B24 and B26 are not clear:
 - b. it is not clear why cogeneration plants are not treated as LCMR (EF >0).

Project participant response #3**Date:** 15/03/2019

The aspects questioned by the DOE have been clarified or revised in the following way. All of them refer to the file named “LV LH combined_OM_BM_EF_Lambda_method_2017 v4”:

1. Spreadsheet “2017 lambda”

- a. We have modified the calculation of 2017 Lambda, having the information source given directly by the Colombian Electric System Operator. 2017 Lambda corresponds to the information in cell M2561, which is the crossing point.
- b. Values of daily cross-point considered from cell C2558 to up and down were corrected.

2. Spreadsheet “2017 EFOM Plants”

- a. The empty lines 3 to 22 were eliminated, because they were part of a previous year’s calculation table. This elimination does not modify the information related to thermal generation, thermal emissions, neither low-cost must-run.
- b. Both terms of the EF_{OM} calculation (cell B7) take 2017 lambda, which is kept in cell M2561.
- c. Cell B6 was calculated as a product of the SIN 2017 emission factor (cell B5) multiplied by total electricity system generation (cell B4). SIN 2017 emission factor (cell AB374 of file named “2017 Colombian emission factor”) is the summation of each thermal plant generation multiplied by its own emission factor, divided by total generation.
- d. Sources of the values of cell B2 (total thermal generation), cell B3 (total LCMR) and cell B5 (emission factor) are quoted. It is important to confirm that this new file considers in LCMR the solar generation in 2017 in Colombia. All of this information was provided by XM, which is the Colombian Electricity System Operator

<http://informacioninteligente10.xm.com.co/oferta/Paginas/HistoricoOferta.aspx>

- e. Even though energy generation from cogeneration plants in Colombia was 0.95% for 2017 (see cell B5 of the spreadsheet “Resumen año” in the file named “2017 SIN hourly generation”), it was considered and treated as LCMR. Total value of LCMR (cell I4) of the file “2015 SIN hourly generation” that sums cogeneration, eolic, hydraulic and solar energy was taken and put in cell B3 (total LCMR) of the file “LV LH combined_OM_BM_EF_Lambda_method_2017 v4”.

3. Spreadsheet “2016 EFOM Plants”

- The empty lines 3 to 22 were eliminated, because they were part of a previous year’s calculation table. This elimination does not modify the information related to thermal generation, thermal emissions, neither low-cost must-run.
- Cell B6 was calculated as a product of the SIN 2016 emission factor (cell B5) multiplied by total electricity system generation (cell B4). SIN 2016 emission factor is the summation of each thermal plant generation multiplied by its own emission factor, divided by total generation.
- Sources of the values of cell B2 (total thermal generation), cell B3 (total LCMR) and cell B5 (emission factor) are quoted. All of this information was provided by XM, which is the Colombian Electricity System Operator.
- Even though energy generation from cogeneration plants in Colombia was 0.91% in 2016 (see cell B6 of the spreadsheet “Resumen año” in the file named “2016 SIN hourly generation”), it was considered and treated as LCMR. Total value of LCMR (cell I5) of the file “2016 SIN hourly generation” that sums cogeneration, eolic and hydraulic energy was taken and put in cell B3 (total LCMR) of the file “LV LH combined_OM_BM_EF_Lambda_method_2017 v4”.

4. Spreadsheet “2015 EFOM Plants”

- The empty lines 3 to 22 were eliminated, because they were part of a previous year’s calculation table. This elimination does not modify the information related to thermal generation, thermal emissions, neither low-cost must-run.
- Cell B6 was calculated as a product of the SIN 2015 emission factor (cell B5) multiplied by total electricity system generation (cell B4). SIN 2015 emission factor is the summation of each thermal plant generation multiplied by its own emission factor, divided by total generation.
- Sources of the values of cell B2 (total thermal generation), cell B3 (total LCMR) and cell B5 (emission factor) are quoted. All of this information was provided by XM, which is the Colombian Electricity System Operator.
- Even though energy generation from cogeneration plants in Colombia was 0.79% in 2015 (see cell B5 of the spreadsheet “Resumen año” in the file named “2015 SIN hourly generation”), it was considered and treated as LCMR. Total value of LCMR (cell I6) of the file “2015 SIN hourly generation” that sums cogeneration, eolic and hydraulic energy was taken and put in cell B3 (total LCMR) of the file “LV LH combined_OM_BM_EF_Lambda_method_2017 v4”.

Documentation provided by project participant

“LV LH combined_OM_BM_EF_Lambda_method_2017 v4”
 “2017 SIN hourly generation”
 “2016 SIN hourly generation”
 “2015 SIN hourly generation”
 “Informe_Operacion_SIN_2016”
 “LV LH_PDD version 20”
 “LV LH_PDD version 20 clean”
 “2017 Colombian emission factor”

DOE assessment #3

Date: 18/03/2019

The Lambda calculation has totally been revised.

Nevertheless, some points are still not OK:

1. Tab “2017 EFOM Plants”

- cell B5: The source informed in cell D5 leads to a document referring to the year 2016, which does not inform the mentioned value;
- cell B7: the plants LCMR (cogeneration) have an emission factor associated, as per tab “Emission Factors per Plant” – cells F46 to F56. Thus, it is not correct to consider result of $EG_k \times EF_{EL,k} = 0$ as it is being considered;

2. Tab “2016 EFOM Plants”

a. cell B5: the determination of this value is not traceable; b. cell B7: the plants LCMR (cogeneration) have an emission factor associated, as per tab “Emission Factors per Plant” cell F46 to F56. Thus, it is not correct to consider result of $EG_k \times EF_{EL,k} = 0$ as it is being considered;	
3. <u>Tab “2015 EFOM Plants”</u> a. cell B5: the determination of this value is not traceable; b. cell B7: the plants LCMR (cogeneration) have an emission factor associated, as per tab “Emission Factors per Plant” – cells F46 to F56. Thus, it is not correct to consider result of $EG_k \times EF_{EL,k} = 0$ as it is being considered.	
Project participant response #4	Date: 11/04/2019
The aspects questioned by the DOE have been clarified or revised in the following way. All of them refer to the file named “LV LH combined_OM_BM_EF_Lambda_method_2017 v5”.	
Documentation provided by project participant	
“LV LH combined_OM_BM_EF_Lambda_method_2017 v5” “LV LH_PDD version 20” “LV LH_PDD version 20 clean”	
DOE assessment #4	Date: 11/04/2019
The Lambda calculation has totally been revised and all points are closed and in accordance with presented evidences from official sources.	

CAR ID	11	Section no.	D.5	Date: 13/12/2018
Description of CAR				
<i>In Section B.7.1, the list of parameters to be monitored is not in accordance with applied methodology and tool.</i>				
Project participant response				Date: 21/01/2019
The list of parameters to be monitored in section B.7.1 was completed with two new parameters: Cap _{PJ} and A _{PJ} , according to the methodology and tool.				
Documentation provided by project participant				
La Vuelta and La Herradura Hydroelectric Project PDD, version 17.				
DOE assessment				Date: 24/01/2019
The list of parameters to be monitored is now in accordance with applied methodology and tool.				

Table 3. FAR from this validation

FAR ID	12	Section No.	C.2	Date: 13/12/2018
Description of FAR				
<i>As no site visit has been performed during the validation of the renewal of the 3rd crediting period and all validation of technical data of equipment has been done based on documents, pictures and interviews, the verifier shall reconfirm the technical data.</i>				
Project participant response				Date: 21/01/2019
During the site visit of the next verification, all equipment and manuals will be presented to the verifier.				
Documentation provided by project participant				
-				
DOE assessment				Date: 24/01/2019
As everything will be presented to the verifier, all data will be thoroughly checked to confirm their consistency.				

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory		
Document Type: Form		
Business Function: Renewal of crediting period		
Keywords: crediting period, project activities, validation report		