



**Verification and certification report form for
CDM project activities
(Version 02.1)**

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	Itezhi Tezhi Hydro Power UNFCCC reference number: 10188
Version number of the verification and certification report	05
Completion date of the verification and certification report	26/09/2018
Monitoring period number and duration of this monitoring period	01; 24/05/2016 to 31/05/2017 (inclusive of both the dates)
Version number of the monitoring report to which this report applies	Version: 4.0 Dated: 27/08/2018
Crediting period of the project activity corresponding to this monitoring period	24/05/2016 to 23/05/2026
Project participants	Itezhi Tezhi Power Corporation (ITPC)
Host Party	Zambia
Applied methodologies and standardized baselines	ACM0002 - Grid-connected electricity generation from renewable sources (Version 16.0) ASB0001: Grid emission factor for the Southern African power pool (version 01.0)
Mandatory sectoral scopes linked to the applied methodologies	1: Energy industries (renewable-/non renewable sources)
Conditional sectoral scope(s) linked to the applied methodologies	N/A
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	602,163 tCO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	660,733 tCO ₂ e
Name and UNFCCC reference number of the DOE	E-0052: Carbon Check (India) Private Ltd.

Name, position and signature of the approver of the verification and certification report



Vikash Kumar Singh, Compliance Officer

SECTION A. Executive summary

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Introduction:

The Project Participant (PP), Itezhi Tezhi Power Corporation (GITPC), has appointed the DOE, Carbon Check (India) Private Ltd. (CC IPL) to perform an independent verification of the CDM Project Activity “Itezhi Tezhi Hydro Power” in Zambia (hereafter referred to as “Project Activity”). The Project Activity involves installation and operation of a new grid connected 120 MW hydropower plant at the existing Itezhi Tezhi dam on Kafue river in Zambia. This project activity is connected to the Southern African Power Pool (SAPP) grid system and the net power generated will be exported to the SAPP grid system. This will reduce and replace the equivalent amount electricity generated from the carbon intensive SAPP grid system thus helps in reducing the GHG emissions.

This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM Modalities & Procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings and resolutions from the verification and a certification statement for the certified emission reductions.

Objective:

Verification is the periodic independent review and ex-post determination of both quantitative and qualitative information by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the project activity for the period 24/05/2016 to 31/05/2017 (including both the days).

The purpose of verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data, and used to confirm the reductions in anthropogenic emissions by sources, is sufficient, definitive and presented in a concise and transparent manner. CC IPL’s objective is to perform a thorough, independent assessment of the registered project activity.

In particular, the monitoring plan, monitoring report and the project’s compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the component project/s has/have been implemented in accordance with the previously registered/included component project design and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the registered PDD and the approved monitoring methodology.

Scope:

The scope of the verification is:

- To verify the project implementation and operation with respect to the registered PDD
- To verify the implemented monitoring plan with the registered PDD or approved revised PDD and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

The verification comprises a review of the monitoring report over the monitoring period from 24/05/2016 to 31/05/2017 and based on the registered PDD /B04/ in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant.

On-site visit and interviews are also performed as part of the verification process.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification 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	Interviews	Verification findings
1.	Team Leader / Verifier / Technical Expert		Anand	Amit	CCIPL	X	X	X	X

B.2. Technical reviewer and approver of the verification and certification 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	Agarwalla	Sanjay Kumar	CCIPL
2.	Approver	IR	Singh	Vikash Kumar	CCIPL

SECTION C. Application of materiality

The Project is a large-scale CDM project activity achieving total emission reductions of more than 500,000 tons of CO₂e per year; as such, a 0.5% materiality threshold is applied /B01-1/. Accordingly, the materiality threshold is 3,304 tons of CO₂e. The materiality thresholds have been calculated in accordance with the § 329 (a) of CDM VVS for project activities (version 01.0) /B01-1/.

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human error in the quantification of emissions	Low	<p>According to the monitoring plan and the Monitoring Report, there are QA/QC procedures applied for monitoring parameters and data management/information flow.</p> <p>Calculation spread-sheets are used to determine the emissions reductions. Further data collected are through calibrated meters and automated system.</p>	<p>Verification team of CCIPL has focused on assessment of the following:</p> <ul style="list-style-type: none"> • Procedure of raw data collection/ Monitoring procedures. • Data & information flow with a special focus on any material mistake • Calculation spreadsheets. • Procedures/QA/QC established to detect and correct any error or omission in monitoring parameters. • Quality control for monitored parameters and metering systems. <p>Complete verification (100 % data) of all the monitoring records (measurement records, invoices and the calibration certificates) was done by the verification team and compared with the values indicated in the emission reduction spread-sheet. No risk identified.</p>

C.2. Consideration of materiality in conducting the verification

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In line with Guidelines for Application of materiality in verifications /B03/, a reasonable level of assurance is defined for the verification of the project by complete verification of all the monitoring records (measurement records, invoices and the calibration certificates) was done by the verification team and compared with the values indicated in the emission reduction spread-sheet.

Some mistakes were identified and subsequently finding was raised. These findings are detailed in Appendix 4 and they were successfully closed. Therefore, related identified mistakes as listed in findings in Appendix 4 to this report have been determined to be immaterial. And thus, it is confirmed that there are no material errors, omissions or misstatements and a reasonable level of assurance is established.

SECTION D. Means of verification**D.1. Desk/document review**

The verification was performed primarily based on the review of the Monitoring report /1/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan and monitoring methodology. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

D.2. On-site inspection

Duration of on-site inspection: 19/02/2018 to 20/02/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PDD	Itezhi Tezhi, Zambia	19/02/2018	Amit Anand
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters	Itezhi Tezhi, Zambia	19/02/2018	Amit Anand
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD	Itezhi Tezhi, Zambia	19/02/2018; 20/02/2018	Amit Anand
4.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources	Itezhi Tezhi, Zambia	20/02/2018	Amit Anand
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology and corresponding tool(s), where applicable	Itezhi Tezhi, Zambia	19/02/2018	Amit Anand
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions	Itezhi Tezhi, Zambia	20/02/2018	Amit Anand
7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Itezhi Tezhi, Zambia	20/02/2018	Amit Anand

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Chijikwa	Royd	ITPC	19/02/2018 & 20/02/2018	Project technical specification and operation including metering and QA/QC	Amit Anand
2.	Kakoma	Mufalali	ITPC	19/02/2018 & 20/02/2018	Project technical specification and operation including metering and QA/QC	Amit Anand
3.	Maske	Sachin	ITPC	19/02/2018 & 20/02/2018	Metering and QA/QC	Amit Anand
4.	Sammur	Francois	Carbon Limits	Via Skype 15/03/2018 25/04/2018 18/05/2018 11/06/2018 13/06/2018	Project operation, CER calculation and completeness of monitoring report, Quality Assurance – Management and operating	

					system, compliance of monitoring plan with monitoring methodology and CPA-DDs.	
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D.4. Sampling approach

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Not Applicable

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	01	01	--
Compliance of the project implementation and operation with the registered PDD	01	01	--
Post-registration changes	--	--	--
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	--	02	--
Compliance of monitoring activities with the registered monitoring plan	--	01	--
Compliance with the calibration frequency requirements for measuring instruments	01	01	--
Assessment of data and calculation of emission reductions or net removals	--	03	--
Assessment of reported sustainable development co-benefits	--	--	--
Global stakeholder consultation	--	--	--
Others (Editorial)	--	01	--
Others (UNFCCC completeness check comments)		02	
Total	03	12	--

SECTION E. Verification findings**E.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	DR
Findings	CL 01 CAR 01, 02, 08 and 10. Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	CC IPL had made the version 01, dated 15/12/2017 of the Monitoring report /02/, covering the monitoring period from 24/05/2016 to 31/05/2017 (both days inclusive) publicly available on 24/01/2018 through its dedicated interface on the UNFCCC website /B05/. The MR /01/ uses the latest form available at UNFCCC website. The MR /01/ is complete and meets all requirements of the Instructions for filling out the monitoring report form (version 06.0) /B05/ and CDM PS for project activities (version 01.0) /B01-2/. This confirms compliance with the §355 and §356 of CDM VVS for project activities, (version 01.0) /B01-1/.

E.2. Remaining forward action requests from validation and/or previous verifications

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This is the first periodic verification and there are no forward action requests from validation of the project activity.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	DR, I and OSV
Findings	CL 02 and 03. CAR 01, 08 and 10. Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	<p>As verified during the on-site inspection and document review, the project is a 120 MW (2x60 MW) /05/ hydropower plant located at the existing Itzhi Tezhi dam on Kafue river in Zambia, producing electricity and supplying /06/, /14/ to the SAPP grid. The electricity generated by the project replaces grid electricity generated from fossil fuels and reduce GHG emissions for the duration of the project. The hydropower project was commissioned /05/ on 24/05/2016. During the reported monitoring period, the project has supplied 685,152 MWh /07/, /08/, /09/ of electricity to the grid and the same has been monitored by calibrated bi-directional electricity meters /10/.</p> <p>The current project design involves changes compared to the project design in the registered project activity /B04/. The revised project description in the revised PDD now includes a 33kV transmission line (also called Kataba line) which supplies a part of generated electricity to the nearby town of Kataba. This 33 kV transmission line is separate from the existing 220 kV transmission line which is Mumbwa 220 kV single circuit transmission line that originates from a 220 kV substation on the South bank of the Kafue River at the Itzhi Tezhi dam, located about 100m from the power house and supplies electricity to Mumbwa substation.</p> <p>The metering arrangement for electricity exported to Kataba town using this 33 kV transmission line is totally separate from the electricity exported to the SAPP grid using 220 kV transmission line. Furthermore, the export of electricity to Kataba town is not covered under the existing PPA /06/ signed between ZESCO and ITPC and is also not considered for the calculation of emission reduction achieved by the project activity.</p> <p>The project has been implemented as described in the registered PDD /B04/ as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification. The verification team took cognizance of §341 (b)(i), §357, §358 and §359 of CDM VVS for project activities (version 01.0) /B01-1/.</p> <ul style="list-style-type: none"> • The implementation status and equipment installation of the Project are consistent with the registered PDD /B04/; • The actual operation of the Project is as per the registered PDD /B04/; • Information (data and variables) provided in the monitoring report is in accordance with that stated in the registered PDD /B04/.

E.4. Post-registration changes**E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines**

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Not Applicable.

E.4.2. Corrections

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Not Applicable.

E.4.3. Change to the start date of the crediting period of the project activity

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The start date of the crediting period of the project activity had been revised from 08/09/2015 to 24/05/2016 (date of commissioning of hydropower plant).

The revision in the start date of the crediting period was initiated by PP through direct communication with UNFCCC secretariat in accordance with paragraph 128 of PCP for CDM project activities (version 01.0) /B01-3/.

The change became effective from 21/03/2018 as confirmed through review of confirmation mail /18/ sent by CDM registration team to PP.

E.4.4. Inclusion of a monitoring plan

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Not Applicable.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other applied standards or tools

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Not Applicable.

E.4.6. Changes to the project design

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The current project design involves changes compared to the project design in the registered project activity /B04/. The project design changes to the project activity is:

The current project design involves changes compared to the project design in the registered project activity /B04/. The revised project description in the revised PDD now includes a 33kV transmission line (also called Kataba line), which supplies a part of generated electricity to the nearby town of Kataba. This 33 kV transmission line is separate from an existing 220 kV transmission line which is Mumbwa 220 kV single circuit transmission line that originates from a 220 kV substation on the South bank of the Kafue River at the Itezhi Tezhi dam, located about 100m from the power house and supplies electricity to Mumbwa substation.

The metering arrangement for electricity exported to Kataba town using this 33 kV transmission line is totally separate from the electricity exported to the SAPP grid using 220 kV transmission line. Furthermore, the export of electricity to Kataba town is not covered under the existing PPA /06/ signed between ZESCO and ITPC and is also not considered for the calculation of emission reduction achieved by the project activity.

The actual changes in the project design as compared to the description of project design as provided in the registered PDD has been assessed in accordance with §309 (a) of VVS for project activities (version 01.0) /B01-1/ and the validation team confirms that this change is in accordance with the §242 of the CDM project Standard for Project Activities (version 01.0) /B01-2/. The validation team further confirms that this project design change does not have any adverse impact on the compliance of the monitoring plan, the level of accuracy of the monitoring activity, the applied monitoring methodology including applicable tool(s) thereby complying with paragraph 302 of VVS for project activities (version 01.0) /B01-1/.

Further in line with §309 (b) of VVS for project activities (version 01.0) /B01-1/, the VT based on OSV interviews with PP and its representatives confirms that the changes to the project design occurred during the implementation stage and these changes were not known/anticipated prior to the registration of the CDM project activity. It was also clearly explained by PP to VT that reasons for making these changes is to remove any ambiguity between project design as stated in the

registered PDD and the actual implemented design and to simplify the monitoring procedures and ER estimation (by not considering electricity exported via 33 kV Kataba line for ER estimation). Furthermore, the VT based on the assessment of revised PDD /01/ also confirms that these changes would have no impact on the overall operation/ability of the CDM project activity to deliver emission reductions as stated in the revised PDD /01/.

Further in line with paragraph 309 (c) of VVS for project activities (version 01.0) /B01-1/, the validation team has assessed the effect of the project design change as below:

(i) **Additionality of the registered CDM project activity:**

The change in the project design involves addition of information in the PDD / on an existing 33kV transmission line (also called Kataba line) which supplies a part of generated electricity to the nearby town of Kataba /03/. The export of electricity to Kataba town is not considered for the calculation of emission reduction and is not covered under the existing PPA /06/ signed between ZESCO and ITPC. The additionality of the project was demonstrated using Step 3: Barrier Analysis, especially Investment Barrier (access to capital) in accordance with § 51 (a) of the methodological tool: "Tool for the demonstration and assessment of additionality" (Version 07.0) and the same arguments are valid even after the design change.

(ii) **Scale of the registered CDM project activity:**

The project is a large-scale project activity and the project design change does not adversely affect the scale of the project activity.

(iii) **Applicability and application of the approved baseline methodology under which the CDM project activity has been registered:**

The applicability conditions of the applied methodology ACM0002 (version 16.0) are demonstrated as below:

Applicability Criteria	Justification / Assessment
<p><i>This methodology is applicable to grid-connected renewable energy power generation project activities that:</i></p> <p>(a) <i>Install a Greenfield power plant;</i></p> <p>(b) <i>Involve a capacity addition to (an) existing plant(s);</i></p> <p>(c) <i>Involve a retrofit of (an) existing operating plants/units;</i></p> <p>(d) <i>Involve a rehabilitation of (an) existing plant(s)/unit(s); or</i></p> <p>(e) <i>Involve a replacement of (an) existing plant(s)/unit(s).</i></p>	<p>The proposed project activity is installation of a Greenfield power plant. The dam was originally built in the 1970s and was used for seasonal stream flow regulation. The closest existing power plant is the Kafue gorge upper hydro project which is situated 230 km downstream of the existing dam. The project activity involves installation of a Greenfield power plant (new grid connected renewable power plant (hydropower) at a site where no renewable power plant was operated prior to the implementation of the project activity).</p> <p>Conclusion: The design change has no impact on the fulfilment of thus applicability criterion of the methodology by the project activity.</p>
<p><i>The methodology is applicable under the following conditions:</i></p> <p>(a) <i>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;</i></p>	<p>(a) The project activity involves installation of a hydro power plant using an existing reservoir/dam.</p>

<p>(b) <i>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.</i></p>	<p>(b) The project activity involves installation of a Greenfield power plant. Although using an existing reservoir/dam, no capacity additions, retrofits or replacements are involved, thus this condition is not applicable.</p> <p>Conclusion: The design change has no impact on the fulfilment of thus applicability criterion of the methodology by the project activity.</p>
<p>§ 5: <i>In case of hydro power plants, one of the following conditions shall apply:</i></p> <p>(a) <i>The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or</i></p> <p>(b) <i>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</i></p> <p>(c) <i>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</i></p> <p>(d) <i>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:</i></p> <p>(i) <i>The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m²;</i></p> <p>(ii) <i>Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity;</i></p> <p>(iii) <i>Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be:</i></p> <p>a. <i>Lower than or equal to 15 MW; and</i></p> <p>b. <i>Less than 10 per cent of the total installed capacity of integrated hydro power project.</i></p>	<ul style="list-style-type: none"> • The project activity is implemented in the existing reservoir (Itezhi Tezhi dam) and no change in reservoir volume is planned. • Since the project activity does not imply the construction of a new dam or increase in existing dam volume, but rather utilization of the existing dam, power density is not considered. The project activity does not involve an integrated hydro power project. <p>Conclusion: The design change has no impact on the fulfilment of thus applicability criterion of the methodology by the project activity.</p>
<p><i>In the case of integrated hydro power projects, project proponent shall:</i></p> <p>(a) <i>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</i></p> <p>(b) <i>Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and</i></p>	<p>The project activity uses the existing single reservoir, not multiple reservoirs. Thus, not applicable.</p> <p>Conclusion: The design change has no impact on the fulfilment of thus applicability criterion of the methodology by the project activity.</p>

<p><i>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.</i></p>	
<p><i>The methodology is not applicable to:</i></p> <p>(a) <i>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;</i></p> <p>(b) <i>Biomass fired power plants/units.</i></p>	<p>(a) The project activity involves the installation of new hydropower plant and does not involve switching from fossil fuels to renewable energy sources at the site of the project.</p> <p>(b) The project activity is the development, installation and operation of a hydropower plant and no biomass fired power plants are involved.</p> <p>Conclusion: The design change has no impact on the fulfilment of thus applicability criterion of the methodology by the project activity.</p>
<p><i>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"</i></p>	<p>The proposed project activity involves implementation of a Greenfield 120 MW hydro power generation plant thus this applicability criterion is not applicable.</p> <p>Conclusion: The design change has no impact on the fulfilment of thus applicability criterion of the methodology by the project activity.</p>
<p><i>In addition, the applicability conditions included in the tools referred to below apply</i></p>	<p>All applicability criteria of the tools mentioned were checked and found to be correctly being included and thus accepted.</p> <p>This is noteworthy that the additionality for the proposed project activity has been demonstrated based on the Tool for the demonstration and assessment of additionality (version 07.0.0.).</p> <p>Conclusion: The design change has no impact on the fulfilment of thus applicability criterion of the methodology by the project activity.</p>

(iv) **The compliance of the monitoring plan with the applied monitoring methodology:**

The validation team confirms that due to the project design change, there is no change in the monitoring plan of the registered PDD /B04/ and the monitoring methodology /B02/. Hence the original monitoring plan is being retained. This is appropriate and deemed acceptable.

(v) **The level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan:**

The validation team confirms that due to the project design change, there is no change in the monitoring plan of the registered PDD /B04/. Hence, there is no change in the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan.

The verification team confirms that PP has submitted the revised PDD in the latest valid applicable PDD Form as per the requirement of paragraph 230 of PS for Project Activities (version 01.0) /B01-2/ and paragraph 279 of VVS for Project Activities (version 01.0) /B01-1/ for the applicable project design change for the project activity. The verification team also confirms that information transferred to the later valid version of the PDD form is materially the same as that in the registered PDD /B04/ in line with paragraph 280 of VVS for project activities (version 01.0) /B01-1/.

E.4.7. Changes specific to afforestation and reforestation project activities

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Not Applicable.

E.5. Compliance of the registered monitoring plan with the methodology including applicable tools and standardized baselines

Means of verification	Dr, I and OSV
Findings	CAR 03 and 04. Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	<p>The verification team has checked the actual monitoring plan against the latest approved monitoring plan and monitoring methodology and applicable tools. Furthermore, the verification team has checked monitoring system during the onsite inspection by means of comparison with the information given in the monitoring plan and monitoring methodology. The monitoring plan is completely in accordance with the approved methodology /B02/ applied by the registered PDD /B04/.</p> <p>All the parameters need to be monitored and corresponding monitoring approach have been discussed in the monitoring plan in the registered PDD /B04/ and QA/QC procedure has been stipulated.</p> <p>The verification team confirms that the monitoring plan complies with the applied methodology /B02/ and the monitoring system and all applied procedures are completely in compliance to the latest approved monitoring plan and the methodology ACM0002 (version 16.0) /B02/.</p> <p>The verification team took cognizance of §360, §361 and §362 of CDM VVS for project activities (version 01.0) /B01-1/.</p>

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	DR, I					
Findings	- -					
Conclusion	The verification team's assessment of each data and parameter fixed ex-ante is provided below:					
	Parameter	Description	Value	Unit	Source	Assessment
	EF _{grid, CM, y}	"Combined margin CO ₂ emission factor for the	0.9644	tCO ₂ /MWh	ASB0001: Grid emission factor for the Southern	The value is consistent with registered PDD /B06/ and fixed ex-

	project electricity system applicable to all project activities other than wind and solar for the first crediting period"			African power pool (version 01.0) /B06/	ante for the duration of the crediting period of the project activity.
	<p>The value is consistent with the registered PDD /B04/ and defined fixed ex-ante for the duration of the crediting period of the project activity. The fixed ex-ante data and parameter has been listed in the monitoring report and confirmed by the verification team as correct and consistent with that stated in the registered PDD /B04/.</p> <p>The verification team took cognizance of §363 of CDM VVS for project activities, (Version 01.0) /B01-1/.</p>				

E.6.2. Data and parameters monitored

Means of verification	DR, I				
Findings	CAR 05. Please refer to Appendix 4 for the detailed closure of the verification findings.				
Conclusion	All relevant monitoring parameters (as listed in section B. 7.1 of the PDD /B04/ and D.2 of the MR /01/) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures.				
	Parameter	Description	Value	Unit	Source
	EG _{facility,y}	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	685,152	MWh	Energy meters
					The value for the period June 2016 to May 2017 have been verified through review of joint meter reading reports /07/, /08/ and electricity sales invoice /09/. For the month of May 2016, only 8 days of this month are considered in this MP (from 24/05/2016 to 31/05/2016). For these 8 days the value of net electricity exported has been verified by VT through review of daily generation log sheet /07/. During the course of on-site visit, the VT witnessed the daily meter reading procedure being conducted at the site by power plant staff from the calibrated energy meters, which are

						the same meters used for JMR readings. The daily generation log provides a more accurate and correct value of the electricity exported by the project activity and hence is deemed acceptable by the VT.
	$FC_{i,j,y}$	Quantity of fuel type i combusted in process j during the year y	9.78	m^3	Purchase invoice	The value has been verified through review of diesel purchase invoice /11/.
	$NCV_{i,y}$	Net calorific value of diesel	43.3	TJ/Gg	Default Value	The value has been verified through review of Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories /15/.
	$EF_{CO_2,i,y}$	Emission factor for diesel in year y	74.8	tCO_2/TJ	Default Value	The value has been verified through review of Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories /15/.
	$P_{i,y}$	Density of diesel in year y	0.000842	t/L	Regional Default Value	The value has been verified through review of Worldwide Winter Diesel Fuel Quality Survey 2014 /16/.
<p>The verification team took cognizance of §363, §364 and 367 of CDM VVS for project activities (version 01.0) /B01-1/.</p> <ul style="list-style-type: none"> The monitoring has been carried out in accordance with the monitoring plan in the registered PDD /B04/. All parameters required by the monitoring plan have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements. 						

E.6.3. Implementation of sampling plan

Means of verification	Not Applicable
Findings	Not Applicable.
Conclusion	The PDD does not have any provision of sampling.

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	DR, I
Findings	CAR 06 Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	The verification team confirms that all the energy meters have been installed in the project activity as per the registered PDD /B04/.

In summary, the verification team is able to verify that the accuracy of the monitoring equipment was set according to the approved monitoring plan. During this monitoring period, new energy meters were installed which were calibrated by the manufacturer before installation. However, PP couldn't provide the initial calibration test reports of the energy meters to the VT.

Furthermore, in accordance with the PPA /06/ signed between ITPC and ZESCO, the accuracy tests for the energy meters have to be conducted annually. However, the accuracy tests of the energy meter were not conducted annually but were delayed and conducted after the end date of the monitoring period.

Hence, in accordance with guidelines under Appendix-Calibration" of VVS for CDM project activities (version 01.0) the electricity export and import data have been adjusted by applying maximum permissible error of 0.2% (as provided by the equipment supplier) to calculate the net exported electricity and the emission reductions accrued by the project activity. The maximum permissible error of 0.2% as provided by the equipment supplier) was applied as the error identified (0.033%) in the delayed calibration is smaller than the maximum permissible error. The same is in accordance with the guideline provided under Appendix-Calibration" of VVS for CDM project activities (version 01.0) /B01-1/. VT deems this approach adopted by PP to address the issue of delayed calibration acceptable.

Main Meter

Type: Wasion DTSD341-9D Three Phase High Accuracy Gateway Meter

Accuracy class: 0.2

Serial number: 1408241739000005

Calibration frequency: At least once every ten (10) years as per PPA /06/

Meter accuracy tests: Annual

Date of last test: /10/: 31/07/2017

Validity: 30/07/2017

Note: There is no change in the main meter during the reported monitoring period.

Backup meter:

Type: Wasion DTSD341-9D Three Phase High Accuracy Gateway Meter

Accuracy class: 0.2

Serial number: 1408241739000001

Calibration frequency: At least once every ten (10) years as per PPA /06/

Meter accuracy tests: Annual

Date of last test: /10/: 31/07/2017

Validity: 30/07/2017

Note: There is no change in the backup meter during the reported monitoring period.

Verification team confirms that the accuracy of monitoring equipment is assured. The verification team took cognizance of §368 of CDM VVS for project activities (version 01.0) /B01-1/.

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	DR, I
Findings	CAR 07 Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	Baseline emissions are the product of the baseline emission factor ($EF_{grid, CM, y}$) times the net electricity supplied by the project activity to the grid ($EG_{facility, y}$).

$$BE_y = EG_{\text{facility},y} \times EF_{\text{grid, CM, y}}$$

The registered PDD /B04/ has selected ex-ante option for grid emission factor and the value for the same is fixed for the crediting period. The MR has accordingly used the grid emission factor fixed ex-ante. $EF_{\text{grid, CM, y}}$ of the proposed project in the registered PDD is 0.9644 tCO₂/MWh, which has been verified through review of ASB0001: Grid emission factor for the Southern African power pool (version 01.0) /B06/.

$EG_{\text{facility},y}$ is the net electricity generation supplied to the grid, which is determined by the electricity supplied to the grid minus the imported electricity from the grid. The electricity exported to and imported from the grid was derived from the main meter in monitoring period and cross-checked by the sale invoices /08/ by the verification team.

Sl. No.	Items	Description	Units	Values
1.	$EG_{\text{facility},y}$	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	MWh	685,152 (after adjustment)
2.	$EF_{\text{grid, CM, y}}$	"Combined margin CO ₂ emission factor for the project electricity system applicable to all project activities other than wind and solar for the first crediting period"	tCO ₂ /MWh	0.9644
3.	BE_y	Baseline emission in a year y	tCO ₂ /yr	660,760

The verification team has checked all the monthly electricity generation statements /JMR /07/, /08/ and invoices /09/ applicable for the monitoring period and found all the parameters are monitored and recorded as per the monitoring plan in the registered PDD /B04/. The verification team has cross-checked the ER sheet /04/ and monitoring report data with the electricity generation statements/JMR /07/, /08/ and invoices /09/ and found all the values are matching.

The verification took cognizance of § 375 of CDM VVS for project activities (version 01.0) /B01-1/ and confirms that:

- A complete set of data for the monitoring period is available.
- Information on the baseline GHG emission calculation provided in the monitoring report has been cross-checked with other sources.
- Calculations of baseline emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology.
- Appropriate emission factor values have been correctly applied
- No errors, miscalculations, omissions, misstatements or incomplete information has been identified.

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	DR, I
Findings	CAR 08 Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	<p>The PP has considered project emissions as:</p> $PE_y = PE_{\text{HP},y} + PE_{\text{FC},j,y}$ <p>Where:</p> <p>$PE_{\text{HP},y}$ = Emission from reservoir</p> <p>$PE_{\text{FC},j,y}$ = Emission from fossil fuel consumption in year y. It is the emission from diesel generator which is used in emergency purposes and it is calculated by "Tool to calculate project or leakage CO₂ emission from fossil fuel consumption".</p>

Emission from reservoir (PE_{HP,y}):

The proposed project activity is implemented in the existing reservoir with no change in the volume of reservoir. Therefore, project activity shall not account for CH₄ and CO₂ emissions from the reservoir. So, PE_{HP,y} = 0.

Emission from fossil fuel consumption (PE_{FC,i,y}):

The project emissions on account of diesel consumption used during exigencies and emergencies. Emission from the operation of a backup system in process j during the year y is calculated as follows:

$$PE_{FC,i,y} = \sum FC_{i,j,y} \times COEF_{i,y}$$

Where:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$

The value of project emissions from fuel combustion and the parameters used to calculate the same are as:

Parameter	Description	Value	Unit	Source	Assessment
FC _{i,j,y}	Quantity of fuel type i combusted in process j during the year y	9.78	m ³	Purchase invoice	The value has been verified through review of diesel purchase invoice /11/.
NCV _{i,y}	Net calorific value of diesel	43.3	TJ/Gg	Default Value	The value has been verified through review of Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories /15/.
EF _{CO2,i,y}	Emission factor for diesel in year y	74.8	tCO ₂ /TJ	Default Value	The value has been verified through review of Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories /15/.
P _{i,y}	Density of diesel in year y	0.000842	t/L	Regional Default Value	The value has been verified through review of Worldwide Winter Diesel Fuel Quality Survey 2014 /16/.
PE _{FC,j,y}	Emission from fossil fuel consumption in year y.	26.92	tCO ₂	Calculated	Based on the above verified values and ER sheet /04/.

The verification took cognizance of § 375 of CDM VVS for project activities (version 01.0) /B01-1/ and confirms that:

- A complete set of data for the monitoring period is available.
- Information on the baseline GHG emission calculation provided in the monitoring report has been cross-checked with other sources.
- Calculations of baseline emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology.
- Appropriate emission factor values have been correctly applied
- No errors, miscalculations, omissions, misstatements or incomplete information has been identified.

E.8.3. Calculation of leakage GHG emissions

Means of verification	DR, I
Findings	- -
Conclusion	The leakage from the project is zero, thus is in accordance with ACM0002 (version 16.0) /B02/, registered PDD /B04/.

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	DR, I																									
Findings	CAR 07 and 08. Please refer to Appendix 4 for the detailed closure of the verification findings.																									
Conclusion	<p>The verification team assessed whether the calculation of GHG emission reductions as presented in the monitoring report /02/ and the ER spread-sheet /04/ are in accordance with the formulae and methods described in the registered PDD /B04/.</p> <p>According to the applied methodology, the emission reductions are calculated as:</p> $ER_y = BE_y - PE_y - LE_y$ <table><tr><th>Sl. No.</th><th>Parameters</th><th>Description</th><th>Units</th><th>Values</th></tr><tr><td>1.</td><td>E_y</td><td>Emission reductions in year y</td><td>tCO₂/yr</td><td>660,760</td></tr><tr><td>2.</td><td>BE_y</td><td>Baseline emission in a year y</td><td>tCO₂/yr</td><td>660,760</td></tr><tr><td>3.</td><td>PE_y</td><td>Project emission in a year y</td><td>tCO₂/yr</td><td>27</td></tr><tr><td>4.</td><td>LE_y</td><td>Leakage emission in a year y</td><td>tCO₂/yr</td><td>660,733</td></tr></table> <p>The verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from registered PDD/B04/. The total number of CERs achieved during the monitoring period is 660,733 tCO₂e.</p> <p>According to § 375 of CDM VVS for project activities (version 01.0) the verification team confirms that:</p> <ul style="list-style-type: none">• A complete set of data for the monitoring period is available.• Information provided in the monitoring report has been cross-checked with other sources, electricity sales receipts;• Calculations of baseline emissions and emission reduction has been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology.• Appropriate/correct emission factor value has been applied	Sl. No.	Parameters	Description	Units	Values	1.	E _y	Emission reductions in year y	tCO ₂ /yr	660,760	2.	BE _y	Baseline emission in a year y	tCO ₂ /yr	660,760	3.	PE _y	Project emission in a year y	tCO ₂ /yr	27	4.	LE _y	Leakage emission in a year y	tCO ₂ /yr	660,733
Sl. No.	Parameters	Description	Units	Values																						
1.	E _y	Emission reductions in year y	tCO ₂ /yr	660,760																						
2.	BE _y	Baseline emission in a year y	tCO ₂ /yr	660,760																						
3.	PE _y	Project emission in a year y	tCO ₂ /yr	27																						
4.	LE _y	Leakage emission in a year y	tCO ₂ /yr	660,733																						

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	DR, I
Findings	CAR 09 Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	<p>The actual emission reductions in the monitoring period are 660,733 tCO₂e which is more than the estimated emission reductions 602,163 tCO₂e (for an equivalent period of 373 days) as per the registered PDD /B04/.</p> <p>The verification team has checked all the monthly electricity generation statements/JMR /07/, /08/ and invoices /09/ applicable for the monitoring period confirmed the net electricity exported to the grid is correct and consistent. Therefore, the actual emission reductions from 24/05/2016 to 31/05/2017 (both days inclusive) are calculated correctly and are more than the estimated emission reduction.</p> <p>According to § 375 of CDM VVS for project activities (version 01.0) the verification</p>

	team confirms that a comparison of actual GHG emission reductions or net anthropogenic GHG removal of the project activity achieved during this monitoring period with the estimates in the registered PDD has been provided.
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E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	DR, I
Findings	CAR 10 Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	<p>The actual emission reductions in the monitoring period are 660,733 tCO₂e which is more than the estimated emission reductions 602,163 tCO₂e (for an equivalent period of 373 days) as per the registered PDD /B04/ i.e., there is an increase of 9.94% in volume of ERs achieved as against the estimated volume of ERs for the equivalent period.</p> <p>The increase in GHG emission reductions achieved compared to the amount based on the ex-ante estimation in the registered PDD /B04/ is due to favourable hydrological conditions during the monitoring period (which is beyond the control of PP) as compared to the projected hydrological conditions used for estimation of emission reductions during the feasibility study. The same was verified through review of hydrological data sheet for daily inflow of water in Itezhi Tezhi reservoir and reservoir level for average year (1987-88), below average year (1995-96), previous year (2015-16) and current year (2016-17) /20/. The inflow data of average year was checked from the inflow data (table 5.2) provided in the FSR /21/ and for the current year the same was checked through review of records kept at power plant during the on-site visit.</p> <p>From the review and comparison of the data it was concluded that the measured ERs during the monitoring period were above the estimated in the PDD due to favorable hydrological conditions compared to the projected hydrological conditions used for the feasibility study.</p> <p>Furthermore, the VT confirms that there has been no increase in installed capacity of the plant during the monitoring period. VT deems the same acceptable.</p> <p>The verification took cognizance of § 359 (d) of CDM VVS for project activities (version 01.0) /B01-1/.</p>

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	DR, I
Findings	CAR 07 and 08. Please refer to Appendix 4 for the detailed closure of the verification findings.
Conclusion	CERs achieved from 1 st January 2013 onwards – 660,733 tCO ₂ e.

E.9. Assessment of reported sustainable development co-benefits

Means of verification	Not Applicable
Findings	- -
Conclusion	Not Applicable.

E.10. Global stakeholder consultation

Means of verification	Not Applicable
Findings	- -
Conclusion	Not Applicable.

SECTION F. Internal quality control

The final verification report passed a technical review before being submitted to the UNFCCC Executive Board. A technical reviewer qualified in accordance with CCIPL's qualification scheme for CDM validation and verification performed the technical review.

SECTION G. Verification opinion

>>

Carbon Check (India) Private Ltd. (CCIPL) has performed the first (01st) verification of the registered CDM Project Activity "Itezhi Tezhi Hydro Power" in Zambia having UNFCCC reference number 10188.

The verification team assigned by the DOE concludes that the project activity as described in the registered PDD (version 8.0; dated 13/07/2015) /B04/, revised PDD (version 9.0; Dated: 13/04/2018) /19/, and the monitoring report (version 4.0 dated 27/08/2018) /02/, meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM Modalities & Procedures, the modalities and procedures for CDM Executive Board (Marrakesh Accords) and subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the requirements of VVS for CDM project activities (version 01.0) /B01-1/.

Verification methodology and process

The verification team confirms the contractual relationship signed on 02/01/2018 between the DOE, Carbon Check (India) Private Ltd. And Project Participant (Itezhi Tezhi Power Corporation). The team assigned to the verification meets the CCIPL's internal procedures including the UNFCCC requirements for the team composition and competence. The verification team has conducted thorough review as per UNFCCC and CCIPL's procedures and requirements.

The verification has been performed as per the requirements described in the VVS for CDM project activities (version 01.0) /B01-1/ and constitutes the review and completion of the following steps:

- Reviewing the registered PDD (version 8.0; dated 13/07/2015) /B04/ and revised PDD (version 9.0; Dated: 13/04/2018) /19/
- Publication of the MR (Version 01 dated 15/12/2017) /01/ on the UNFCCC website on 24/01/2018;
- Desk review of the MR /01/ and other relevant documents;
- Review of the applied monitoring methodology (ACM0002, Version 16.0) /B02/;
- Review of any CMP and EB decisions, clarifications and guidance;
- On-site assessment (19/02/2018 – 20/02/2018)
- Resolution of CARs and CLs raised during verification
- Issuance of Verification Report

The project activity was correctly implemented according to the selected monitoring methodology and registered PDD /B04/. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review an on-site visit the verification team confirms that the project activity has resulted in 660,733 tCO₂e emission reductions during the first (01st) monitoring period.

The break-up of emission reduction up to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to	Emission reductions from
Version 02.1		Page 22 of 42

	31 December 2012	1 January 2013 onwards
Emission reductions (t CO₂e)	0	660,733

CCIPL therefore pleased to issue a positive verification opinion expressed in the attached Certification statement.

SECTION H. Certification statement

>>

Carbon Check (India) Private Ltd., the DOE, has performed the first (01st) verification of the registered project activity “Itezhi Tezhi Hydro Power” in Zambia having UNFCCC Registration Number 10188. The Project Activity involves installation and operation of a new grid connected 120 MW hydropower plant at the existing Itezhi Tezhi dam on Kafue river in Zambia. This project activity is connected to the Southern African Power Pool (SAPP) grid system and the net power generated will be exported to the SAPP grid system. This will reduce and replace the equivalent amount electricity generated from the carbon intensive SAPP grid system thus helps in reducing the GHG emissions.

The PP is responsible for collection of data in accordance with the monitoring plan and the reporting of GHG emission reductions. It is DOE's responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered PDD/B04/. The verification is carried out in-line with the VVS for CDM project activities (version 01.0) /B01-1/ requirements.

The verification was performed to identify the compliance with implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions, through obtaining evidence and information on-site that included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

The verification is based on:

- Registered PDD (version 8.0; Dated 13/07/2015), revised PDD (version 9.0; Dated: 13/04/2018) and the corresponding validation report;
- ACM0002 “Grid-connected electricity generation from renewable sources” (version 16.0);
- Monitoring report (version 01; Dated 15/12/2017).
- Monitoring report (version 4.0 dated 27/08/2018).

This statement covers verification period from 24/05/2016 to 31/05/2017 (including both dates).

The DOE had raised twelve (12) corrective action requests (CARs) and three (03) clarification request (CL), all of which have been resolved by the PP. There is no FAR from the validation and no FAR has been raised during this verification.

The DOE considers it necessary to give reasonable assurance that the reported GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology and the monitoring plan contained in the registered PDD /B04/ are fairly stated.


The DOE hereby certifies that the project activity achieved emission reductions by sources of GHG equal to 660,733 tCO₂ equivalent and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records. The break-up of emission reduction up to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO₂e)	0	660,733

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CA	Corrective Action/ Clarification Action
CER	Certified Emission Reduction
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DOE	Designated Operational Entity
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
FA	Final Approval
FAR	Forward Action Request
FVR	Final Verification Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
IPCC	Intergovernmental Panel on Climate Change
ITPC	Itezhi Tezhi Power Corporation
JMR	Joint Meter Reading
LE	Leakage Emissions
MP	Monitoring Period
MR	Monitoring Report
MWh	Mega Watt Hour
OSV	On Site Visit
PE	Project Emissions
PP(s)	Project Participant(s)
PPA	Power Purchase Agreement
PRC	Post registration change
QC/QA	Quality Control/ Quality Assurance
SAPP	South African Power Pool
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
VT	Verification team
ZESCO	Zambia Electricity Supply Corporation Limited

Appendix 2. Competence of team members and technical reviewers



Carbon Check (India) Private Ltd.

Amit Anand

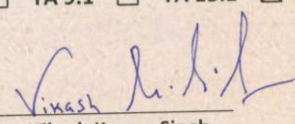
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator	<input checked="" type="checkbox"/>	Team Leader	<input checked="" type="checkbox"/>	Technical reviewer	<input checked="" type="checkbox"/>
Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Expert ¹	<input checked="" type="checkbox"/>

In the following Technical Areas:

TA 1.1	<input type="checkbox"/>	TA 3.1	<input checked="" type="checkbox"/>	TA 5.2	<input type="checkbox"/>	TA 9.2	<input type="checkbox"/>	TA 13.2	<input type="checkbox"/>
TA 1.2	<input checked="" type="checkbox"/>	TA 4.1	<input type="checkbox"/>	TA 8.1	<input checked="" type="checkbox"/>	TA 10.1	<input type="checkbox"/>	TA 14.1	<input checked="" type="checkbox"/>
TA 2.1	<input type="checkbox"/>	TA 5.1	<input type="checkbox"/>	TA 9.1	<input type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		



Mr. Vikash Kumar Singh
Compliance Officer

Date of Approval
24/12/2017

Valid Till
23/12/2018

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision
24/12/2017	Annual Revision

¹India, South Africa

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Carbon Check (India) Private Ltd.

Sanjay Agarwalla

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator	<input checked="" type="checkbox"/>	Team Leader	<input checked="" type="checkbox"/>	Technical reviewer	<input checked="" type="checkbox"/>
Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Expert ¹	<input checked="" type="checkbox"/>

In the following Technical Areas:

TA 1.1	<input checked="" type="checkbox"/>	TA 3.1	<input checked="" type="checkbox"/>	TA 5.2	<input checked="" type="checkbox"/>	TA 9.2	<input checked="" type="checkbox"/>	TA 13.2	<input type="checkbox"/>
TA 1.2	<input checked="" type="checkbox"/>	TA 4.1	<input checked="" type="checkbox"/>	TA 8.1	<input type="checkbox"/>	TA 10.1	<input type="checkbox"/>	TA 14.1	<input type="checkbox"/>
TA 2.1	<input checked="" type="checkbox"/>	TA 5.1	<input checked="" type="checkbox"/>	TA 9.1	<input checked="" type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

Date of Approval
24/12/2017

Valid Till
23/12/2018

Revision History of the Document

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24/12/2017	Annual Revision

¹India

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
01.	Carbon Limits	Final version of the Monitoring Report	Version 4.0; Dated 27/08/2018	PP
02.	Carbon Limits	Interim versions of the Monitoring Report	Version: 1.0; Dated: 15/12/2017 Version: 1.0; Dated: 16/05/2018 Version 3.0; Dated 08/06/2018	PP
03.	Carbon Limits	ER sheet corresponding to /1/	Calculation of emission reductions ITT_May 2018.xlsx	PP
04.	Carbon Limits	ER sheet corresponding to /2/: 1. Calculation of emission reductions ITT.xlsx 2. Calculation of emission reductions ITT_May 2018_2.xlsx	N/A	PP
05.	ZESCO	Commissioning certificate for both the units of the hydropower plant.	Ref. No.: MD/227/2016 Dated: 15/07/2016	PP
06.	ZESCO	Power Purchase Agreement between ZESCO and ITPC	Dated: 27/10/2014	PP
07.	ITPC	Daily generation log for the month of May 2016	N/A	PP
08.	ITPC/ZESCO	Joint Meter Reading Reports	June 2016 – May 2017	PP
09.	ITPC	Electricity Sales Invoice	May 2016 – May 2017	PP
10.	ZESCO	Test reports for main and check meter of ITPC Main Meter: 1408241739000005 Check Meter: 1408241739000001	31/07/2017	PP
11.	ITPC/ZESCO	Diesel Purchase Invoices: 1. Invoice No.: 4996 2. Invoice No.: 9452 3. Invoice No.: 9682 4. Invoice No.: 11355 5. Invoice No.: 11764 6. Invoice No.: 12514 7. Invoice No.: 12750 8. Invoice No.: 13150 9. Invoice No.: 13536 10. Invoice No.: 13899 11. Invoice No.: 14231 12. Invoice No.: 14247 13. Invoice No.: 14559 14. Invoice No.: 21085	Dated: 1. 08/07/2016 2. 07/09/2016 3. 09/09/2016 4. 03/10/2016 5. 07/10/2016 6. 17/10/2016 7. 21/10/2016 8. 28/10/2016 9. 03/11/2016 10. 09/11/2016 11. 15/11/2016 12. 16/11/2016 13. 22/11/2016 14. 27/03/2017	PP
12.	ALSTOM	Technical Specifications of generator	N/A	PP
13.	ALSTOM	Technical Specifications of turbine	N/A	PP
14.	ITPC	Single line diagram showing transformers, feeders of the wind farm and the evacuation of electricity to the grid at 220 kVA	Ref. No.: ITT-00-WIG-FS-001 Dated: 06/09/2013	PP
15.	IPCC	2006 IPCC Guidelines for National Greenhouse Gas Inventories – Volume 2; Chapter 1	2006	DOE
16.	Infineum	Worldwide Winter Diesel Fuel Quality	2014	PP

		Survey 2014		
17.	Wasion	Technical Specifications of Energy Meters	N/A	PP
18.	CDM Registration Team	Mail confirming change in the start date of the crediting period for the project activity from 08/09/2015 to 24/05/2016	21/03/2018	PP
19.	Carbon Limits	Revised PDD	Version 9.0; Dated: 13/04/2018	
20.	ITPC/ZESCO	Hydrological Data (Inflow and reservoir level data) for average year and the current year	N/A	PP
21.	Tata Consulting Engineers	Feasibility Study report (hydrological data)	January 2008	PP
/B01/	UNFCCC	1. CDM VVS for project activities (version 01.0) 2. CDM PS for project activities (version 01.0) 3. CDM PCP for project activities (version 01.0)	https://cdm.unfccc.int/	UNFCCC website
/B02/	UNFCCC	ACM0002: Consolidated methodology for grid-connected electricity generation from renewable sources (version 16.0)	https://cdm.unfccc.int/	UNFCCC website
/B03/	UNFCCC	Guideline: Application of materiality in verifications version 02.0	https://cdm.unfccc.int/	UNFCCC website
/B04/	CC IPL	PDD (version 8.0; Dated 13/07/2015) and the corresponding validation report	https://cdm.unfccc.int/	UNFCCC website
/B05/	UNFCCC	Attachment. Instructions for filling out the monitoring report form version 06.0	https://cdm.unfccc.int/	UNFCCC website
/B06/	UNFCCC	ASB0001: Grid emission factor for the Southern African power pool (version 01.0)	https://cdm.unfccc.int/	UNFCCC website

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

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
<i>Not Applicable</i>				
Project participant response				Date: DD/MM/YYYY
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Documentation provided by project participant				
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DOE assessment				Date: DD/MM/YYYY
Not Applicable.				

Table 2. CL from this verification

CL ID	01	Section no.	E.1	Date: 10/03/2018
Description of CL				
<i>The date of completion of MR provided on the cover page of MR is before the end date of the monitoring period under verification.</i>				
<i>PP shall justify whether the MR was prepared approximately four (04) days before the end of the monitoring period and shall also justify the appropriateness of the date provided.</i>				
Project participant response				Date: 28/05/2018
<i>Date of completion of second version of MR has been corrected to 16 May 2018 (earlier date of 15 January 2017 was a typo). MR was therefore prepared after end of monitoring period</i>				
Documentation provided by project participant				
<i>Revised MR</i>				
DOE assessment				Date: 04/06/2018
The completion date of the MR has been revised.				
Finding is closed.				

CL ID	02	Section no.	E.3	Date: 10/03/2018
Description of CL				
<i>In accordance with paragraph 198 (b) of Project Cycle Procedure for project activities (version 01.0), the monitoring period for the project activities shall be consecutive.</i>				
<i>In light of the above requirement PP shall clarify, why the emission reductions have been reported for the period from 01/06/2016 to 31/05/2017 as this is the first monitoring period and no MR or issuance requested have been submitted to UN for the earlier period i.e., from 08/09/2015 to 31/05/2016.</i>				
Project participant response				Date: 28/05/2018
<i>A request was sent on 19/03/2018 to the UNFCCC secretariat requesting a change to the date for the start of the crediting period from 8 September 2015 to 24 May 2016 as the latter is the date of commissioning of the plant, and should therefore also be the start date of the first monitoring period. This is in accordance with paragraph 128 of Project Cycle Procedure (PCP) for CDM project activities (version 01.0). Confirmation of implementation of this change by the CDM registration team was received on 21/03/2018.</i>				
Documentation provided by project participant				
<i>Confirmation of change of date by CDM registration team forwarded to DOE</i>				
DOE assessment				Date: 04/06/2018
The start date of crediting period of the project activity has been revised from 08/09/2015 to 24/05/2016. The same has been cross-checked through review of project page on UNFCCC website. Accordingly, the duration of monitoring period has been revised and the new monitoring period is from 24/05/2016 to 31/05/2017.				
Finding is closed.				

CL ID	03	Section no.	E.7, E.8.2	Date: 10/03/2018
Description of CL				

The PP shall provide following supporting documents/evidences to VT for review:

1. *Initial calibration test reports for ITPC and ZESCO energy meters on Nambala Line.*
2. *Periodic calibration reports for ITPC and ZESCO energy meters on Nambala Line.*
3. *Soft copy of original purchase invoices for Diesel for all the months (covering the entire monitoring period i.e., from September 2015 to May 2017)*
4. *Technical specification sheet for the project energy meters both of ITPC and ZESCO on 220kV Nambala line.*
5. *Electricity sale invoice for the following months of the monitoring period: September' 15, October' 15, November' 15, December' 15, January' 16, February' 16, March' 16, April' 16, May' 16, June' 16, July' 16, August' 16, September'16, October' 16, November' 16 and December' 16.*
6. *Joint meter reading report (electricity exported) for 220kv Nambala line for the month of July 2016.*

Project participant response

Date: 28/05/2018

1. *No calibration of ITPC and ZESCO energy meters on Nambala Line have been carried out during the monitoring period since meters installed.*
2. *Periodic calibration reports for ITPC and ZESCO energy meters on Nambala Line are provided.*
3. *Soft copy of original purchase invoices for Diesel for Genset are available, although only three purchases were made for Genset only. Other Genset diesel purchases were combined with vehicle fleet and are not reported separately.*
4. *Four technical specification sheets for the project energy meters both of ITPC and ZESCO on 220kV Nambala line are available.*
5. *All electricity sale invoices Jan16 to Dec 16 are available and provided. It is assumed that September 16 to December 16 no longer required as now confirmed that start of the crediting period is 24 May 2016 (see CL2)*
6. *Joint meter reading report (electricity exported) for 220kv Nambala line for the month of July 2016 is available.*

Documentation provided by project participant

1. *No documentation provided*
2. *Four periodic calibration reports for ITPC and ZESCO energy meters on Nambala Line provided as part of the technical specification sheet (see point 4).*
3. *Soft copy of all original purchase invoices for Diesel for Genset only provided (covers both monitoring period and period after May 2017)*
4. *4 Technical specification sheets for the project energy meters both of ITPC and ZESCO on 220kV Nambala line are provided.*
5. *All electricity sale invoices provided for the following months: January' 16, February' 16, March' 16, April' 16, May' 16, June' 16, July' 16, August' 16, September'16, October' 16, November' 16 and December' 16.*
6. *Joint meter reading report (electricity exported) for 220kv Nambala line for the month of July 2016 provided.*

DOE assessment

Date: 04/06/2018

1. The initial calibration reports for ITPC and ZESCO meters on Nambala line are not available with the PP and hence not provided to DOE for this MP. However, PP has provided annual test reports for the above-mentioned meters of Nambala line. These test reports are dated 31/07/2017 i.e., the test have been performed after the end date of the MP under assessment. These test reports indicate that the meters are working fine, and that the errors are within the accuracy class of the meters.

Hence, in accordance with guidelines under Appendix-Calibration" of VVS for CDM project activities (version 01.0) the electricity export and import data have been adjusted by applying maximum permissible error of 0.2% (as provided by the equipment supplier) to calculate the net exported electricity and the emission reductions accrued by the project activity. The maximum permissible error of 0.2% as provided by the equipment supplier) was applied as the error identified in the delayed calibration is smaller than the maximum permissible error. The same is in accordance with the guideline provided under Appendix-Calibration" of VVS for CDM project activities (version 01.0) /B01-1/. VT deems this approach adopted by PP to address the issue of delayed calibration acceptable. The CL point is closed.

2. Periodic calibration reports for ITPC and ZESCO energy meters (both main and check energy meters) on

Nambala Line (dated 31/07/2017) have been provided to DOE. The CL point is closed.
3. Soft copy of original purchase invoices for Diesel for all the months (covering the entire monitoring period) have been provided to DOE. The CL point is closed.
4. Technical specification sheet for the project energy meters both of ZESCO and ITPC have been provided to DOE. The CL point is closed.
5. Electricity sales invoice for the entire monitoring period has been provided to DOE. The CL point is closed.
6. Joint meter reading report (electricity exported) for 220kv Nambala line for the month of July 2016 has been provided to DOE. The CL point is closed.
Finding is closed.

Table 3. CAR from this verification

CAR ID	01	Section no.	E.1 & E.3	Date: 10/03/2018
Description of CAR				
<i>The following findings have been raised in the Monitoring Report regarding non-compliance with the guidelines for completing CDM-MR-FORM (version 06.0):</i>				
<i>a) On the title page, the completion date of the monitoring report is not as per the required DD/MM/YYYY format.</i>				
<i>b) On the title page and section E.5 of MR, value provide for the amount of GHG emission reductions estimated ex ante for this monitoring period is an annual value and has not been adjusted to provide the exact value for the exact duration of the monitoring period</i>				
<i>c) In section A.4, exact UNFCCC website references of the applied methodologies, tools and standardized baselines applied by the project activity have not been provided.</i>				
<i>d) Section B.1 of the MR is incomplete and doesn't provide information on the following:</i>				
<i>i. Description of the installed technology, technical processes and equipment (including but not limited to make, model, type, rated capacity and output);</i>				
<i>ii. Information on the implementation and actual operation of the project activity, relevant dates (e.g. construction, commissioning, start of operation), including any deviation or the proposed or actual changes in the implementation or operation of the project activity</i>				
<i>e) In section B.2.1, the information provided is not in accordance with the form filling guidelines for this section.</i>				
Project participant response				Date: 28/05/2018
<i>a) The completion date is now reported in the required DD/MM/YYYY format.</i>				
<i>b) The amount of GHG emission reductions estimated ex ante for this monitoring period has been adjusted to provide the exact value for the exact duration of the monitoring period (373 days)</i>				
<i>c) UNFCCC website references of the applied methodologies, tools and standardized baselines applied by the project activity have been provided, but should be noted that versions have been updated since validation of the project.</i>				
<i>d) Section B.1 of the MR has been updated. Further information has been provided on:</i>				
<i>i. Description of the installed technology, technical processes and equipment (including but not limited to make, model, type, rated capacity and output) provided in revised MP. Technical data sheets from manufacturers and photos of name plates provided separately;</i>				
<i>ii. Information on the implementation and actual operation of the project activity, relevant dates (e.g. construction, commissioning, start of operation), including any deviation or the proposed or actual changes in the implementation or operation of the project activity provided in the revised MR</i>				
<i>e) "Description of the installed technology(ies), technical process and equipment" was erroneously presented in section B.2.1. This text has been moved to section B.1, and section B.2.1 has been completed appropriately</i>				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 04/06/2018

a) On the title page, the completion date of the monitoring report has been revised as per the required DD/MM/YYYY format. The revised completion date of the MR is 16/05/2018. CAR point is closed.
b) On the title page and section E.5 of MR, value provide for the amount of GHG emission reductions estimated ex ante for this monitoring period has been revised to provide the exact value for the exact duration of the monitoring period i.e., for a period of 373 days. CAR point is closed.
c) Section A.4 of the MR has been revised to provide exact UNFCCC website references of the applied methodologies, tools and standardized baselines applied by the project activity. CAR point is closed.
d) Section B.1 of the MR has been revised to provide information on the make, model, type, rated capacity and output of the installed equipment/technology and technical processes. Furthermore, information has been provided on implementation and actual operation of the project activity, relevant dates (e.g. construction, commissioning, start of operation). Moreover, there has been a change in project design which is installation of a dedicated 33kV transmission line to supply electricity to the nearby Kataba town. The same was not a part of the project description as provided in the registered PDD and a PRC is being undertaken for the same. The same is acceptable to the VT. CAR point is closed.
e) section B.2.1 of the MR has been revised to remove the irrelevant information which was provided in this section and which was not in accordance with the form filling guidelines for this section. CAR point is closed.
Finding is closed.

CAR ID	02	Section no.	E.1	Date: 10/03/2018
Description of CAR				
<i>In section A.3 of MR, the name of host party is not mentioned in the table provided for "Parties and Project Participants".</i>				
Project participant response				Date: 28/05/2018
<i>In section A.3 of MR the name of host party (Zambia) has now been mentioned in the table provided for "Parties and Project Participants".</i>				
Documentation provided by project participant				
<i>Revised MR</i>				
DOE assessment				Date: 05/06/2018
Section A.3 of the MR has been revised to provide the name of host party (Zambia) in the table provided for "Parties and Project Participants".				
Finding is closed.				

CAR ID	03	Section no.	E.5	Date: 10/03/2018
Description of CAR				
<i>The description of monitoring system as provided in section C of the MR with regards to monitoring organization structure (roles and responsibilities) is not in accordance with the information provided in the registered PDD.</i>				
Project participant response				Date: 28/05/2018
<i>The organization structure presented in the MP reflected the organization structure of the plant and not specifically the CDM project. This has been updated to confirm that the organization structure presented in the PDD continues to be valid. This section also presents how the organization structure of the CDM project relates to the organization structure of the plant.</i>				
Documentation provided by project participant				
<i>Revised MR</i>				
DOE assessment				Date: 05/06/2018
Section C of the monitoring report has been revised to provide the monitoring organization structure (roles and responsibilities) consistent with the information provided about the same in the registered PDD. Furthermore, additional information has been provided on the power plant organization structure and interlinkages between the power plant organization structure and the CDM monitoring organization structure. The same is acceptable to the VT.				
Finding is closed.				

CAR ID	04	Section no.	E.5	Date: 10/03/2018
Description of CAR				

The description provided in section C of the MR refers to a part of the generated electricity being exported to Kataba town via a dedicated 33kV transmission line and the schematic diagram of metering points for the project activity provided in the section c of the MR also provided information on the meter location and its calibration frequency. The VT also witnessed the same during the OSV.

However, the registered PDD contains no information on the export of electricity to Kataba town via a dedicated 33kV transmission line either in the project description or in the monitoring plan as described in section B.7.3. Furthermore, the export and sale of electricity to Kataba town is not covered within the PPA signed between ITPC and ZESCO.

Project participant response	Date: 28/05/2018
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The updated PDD now details the electricity exported to the neighbouring Kataba town via a dedicated 33kV transmission line, and specifies that in order to be conservative these exports to Kataba town will not be included in the calculation of emission reductions.

Documentation provided by project participant
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Revised PDD

DOE assessment	Date: 05/06/2018
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The PDD has been updated and a PRC (project design change) has been proposed by the PP with regards to the export of electricity to Kataba town via a dedicated 33kV transmission line. The export of electricity via 33kV transmission line to Kataba is not a part of PPA signed between ITPC and ZESCO and the exported electricity is metered using a set of energy meters different from the project energy meters. Moreover, this electricity exported to Kataba line is not included for calculation of emission reductions. The same is deemed conservative by the VT and hence, acceptable.

However, information on this PRC as proposed by the PP has not been provided in section B.2.6 of the revised MR.

Finding is not closed.

Project participant response	Date: 10/06/2018
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Changes in project design now included in section B.2.6 (description of 33kV Kataba line) and change in start date of crediting period to 24/05/2016 in section B.2.3.

Documentation provided by project participant
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Revised MR

DOE assessment	Date: 14/06/2018
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Section B.2.6 of the MR has been revised to correctly provide information on proposed PRC regarding export of electricity to Kataba town via a dedicated 33kV transmission line.

Furthermore, information on change in start date of the crediting period from 08/09/2015 to 24/05/2016 has been provided in section B.2.3 of revised MR. The revision in the start date of the crediting period has been initiated by PP through direct communication with UNFCCC secretariat in accordance with paragraph 128 of PCP for CDM project activities (version 01.0) /B01-3/.

The change became effective from 21/03/2018 as confirmed through review of confirmation mail /18/ sent by CDM registration team to PP.

Finding is closed.

CAR ID	05	Section no.	E.6.2	Date: 10/03/2018
Description of CAR				

<p>a) In the tables of the monitoring parameters '$EF_{CO2,i,y}$' and '$\rho_{i,y}$' no response has been provided against the row titled 'Measure/calculated/default'.</p> <p>b) In section D.2, in the monitoring table for the parameter '$FC_{i,j,y}$' the unit of the data value provided under row 'Value(s) of monitored parameter' is not consistent with the unit established in the PDD and stated under the row 'Unit' above.</p> <p>c) In section D.2, in the monitoring table for the parameter '$NCV_{i,y}$' the value provided under row 'Measured/calculated/default' is not consistent with the value provided subsequently under row 'Value(s) of monitored parameter' and the cited reference document (IPCC default value).</p> <p>d) In section D.2, in the monitoring table for the parameter '$EF_{CO2,i,y}$' the unit of the data value provided under row 'Value(s) of monitored parameter' is not consistent with the unit established in the PDD and stated under the row 'Unit' above.</p> <p>e) In section D.2, in the monitoring table for the parameter '$\rho_{i,y}$' the unit of the data value provided under row 'Description' is not consistent with the unit established in the PDD and stated under the row 'Unit' above.</p> <p>f) In section D.2 of the MR, actual source of data used during this monitoring period shall be provided for the monitored parameters '$FC_{i,y}$', '$NCV_{i,y}$', '$EF_{CO2,i,y}$' and '$\rho_{i,y}$'.</p>	
Project participant response	Date: 28/05/2018
<p>a) Tables updated accordingly and row titled 'Measure/calculated/default' completed</p> <p>b) Unit amended to be consistent with row above</p> <p>c) Value amended so that both rows are consistent and in agreement with IPCC default value</p> <p>d) Value amended so that both rows are consistent and in agreement with IPCC default value</p> <p>e) Value amended so that both rows are consistent and in agreement with unit stated in the PDD</p> <p>f) Actual sources of data provided</p>	
Documentation provided by project participant	
Revised MR	
DOE assessment	Date: 05/06/2018
<p>a) In the tables of the monitoring parameters:</p> <ol style="list-style-type: none"> For parameter '$EF_{CO2,i,y}$' it has been clearly stated in the row titled 'Measure/calculated/default' that the value used for this parameter is a default value. CAR point is closed. For parameter '$\rho_{i,y}$' it has been clearly stated in the row titled 'Measure/calculated/default' that the value used for this parameter is a measured value. However, PP shall clarify how can the value be considered as measured if it is taken from fuel suppliers' invoice? CAR point is open. <p>b) In section D.2, in the monitoring table for the parameter '$FC_{i,j,y}$' the unit of the data value provided under row 'Value(s) of monitored parameter' has been revised to m³/yr and is now consistent with the unit established in the PDD and stated under the row 'Unit' above. CAR point is closed.</p> <p>c) In section D.2, in the monitoring table for the parameter '$NCV_{i,y}$':</p> <ol style="list-style-type: none"> Information provided under row titled 'Measured/calculated/default' is incorrect and not in accordance with the MR filling guidelines. CAR point is open. <p>d) In section D.2, in the monitoring table for the parameter '$EF_{CO2,i,y}$':</p> <ol style="list-style-type: none"> Unit provided is not consistent with the registered PDD. CAR point is open. Data value provided under row 'Value(s) of monitored parameter' is not as per Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories. Furthermore, the unit stated is not consistent with registered PDD. CAR point is open. <p>e) In section D.2, in the monitoring table for the parameter '$\rho_{i,y}$':</p> <ol style="list-style-type: none"> 'Description' provided for the parameter is not in accordance with the MR filling guidelines. CAR point is open. The source of data is stated as values provided by the fuel supplier in invoices. PP shall provide a copy of fuel supplier's invoice as proof for the value used to DOE. CAR point is open. <p>f) In section D.2 of the MR, actual source of data used during this monitoring period have been provided for the monitored parameters '$FC_{i,y}$', '$NCV_{i,y}$', '$EF_{CO2,i,y}$' and '$\rho_{i,y}$'. CAR point is closed.</p>	
Finding is not closed.	
Project participant response	Date: 10/06/2018

a) ii. Default value now used, and "default" now chosen in table
c) i. table corrected and "Default" now included
d) i. Unit corrected to correspond to PDD
d) ii. Data value now as in 2006 IPCC guidelines
e) i. Description changed to correspond to MR guidelines
e) ii. Source of data corrected, and is now "default"
Documentation provided by project participant
<i>Revised MR</i>
DOE assessment Date: 14/06/2018
For parameter 'p _{i,y} ' the description in the row titled 'Measure/calculated/default' has been revised to "Default". The provided value of 0.000842 t/L is a regional default value and has been taken from Worldwide Winter Diesel Fuel Quality Survey 2014. VT deems the same acceptable. CAR point is closed.
Furthermore, the description for this parameter has also been revised to make it consistent with the registered PDD. The source for the value has also been revised to Worldwide Winter Diesel Fuel Quality Survey 2014. VT deems the same acceptable. CAR point is closed.
For parameter 'NCV _{i,y} ' the description in the row titled 'Measure/calculated/default' has been revised to "Default". The provided value of 43.3 TJ/Gg has been taken from table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories. VT deems the same acceptable. CAR point is closed.
For parameter 'EF _{CO_{2,i,y}} ' the data unit has been revised to make it consistent with the registered PDD and the value for the parameter has also been revised to make it consistent with the value provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories. VT deems the same acceptable. CAR point is closed.
Finding is closed.

CAR ID	06	Section no.	E.7	Date: 10/03/2018
Description of CAR				
<i>The information provided in table 1 (section c) of MR on calibration frequency and party responsible for calibration of energy meters are incorrect and not in accordance with PPA signed between ITPC and ZESCO.</i>				
<i>Moreover, in the same section it is also stated, "The meters ... will be calibrated by an authorized calibration agency after two years of operation and every two years thereafter." The same is also not in accordance with the PPA.</i>				
Project participant response				Date: 28/05/2018
<i>Amendment made to reflect what is stated in the PPA, which defines frequency of meter checks to be carried out by third party (without specifying identity of third party)</i>				
Documentation provided by project participant				
<i>Revised MR</i>				
DOE assessment				Date: 05/06/2018
Table 1 (section C) of the MR has been revised to clearly state that the project energy meters are to be calibrated by 3 rd party and the calibration tests are to be done annually (in accordance with section 14.2 of PPA).				
Furthermore, the energy meters on 33kV Kataba line are also calibrated annually by a 3 rd party but the calibration of the energy meters on this line is not governed by the PPA and the electricity exported to Kataba Town is not considered for calculation of emission reductions.				
VT deems the same correct and acceptable.				
Finding is closed.				

CAR ID	07	Section no.	E.8.1	Date: 10/03/2018
Description of CAR				

In Section E.1 of Monitoring Report (MR):			
<p>a) The start date of monitoring period has been stated as 01/06/2016, which is incorrect and not consistent with the information provided on the cover page of the MR.</p> <p>b) The annual monitoring periods stated in Table 2 of MR and also the table provided in ER sheet is incorrect as they are not in the required format (DD/MM/YYYY to DD/MM/YYYY) as per the guidelines for completing CDM-MR-FORM (version 06.0).</p> <p>c) The value of net electricity used for calculation of baseline emissions is actually a sum of electricity exported using 220kV Nambala Line (covered by the PPA between ITPC and ZESCO) and electricity exported via 33kV Kataba Line (neither covered by the PPA between ITPC and ZESCO nor described as a part of the project design as per registered PDD). Furthermore, the section C of MR states, "In order to be conservative, these exports to Kataba town are not included in calculation of emission reductions".</p>			
Project participant response			Date: 28/05/2018
<p>a) The start date of the monitoring period has been changed to be consistent with the information provided on the cover page of the MR</p> <p>b) Format changed to DD/MM/YYYY to DD/MM/YYYY as per the guidelines for completing CDM-MR-FORM (version 06.0).</p> <p>c) Value for net electricity used for calculation has now been corrected and only includes electricity exported using 220kV Nambala Line (covered by the PPA between ITPC and ZESCO). Exports to Kataba are no longer included</p>			
Documentation provided by project participant			
Revised MR			
DOE assessment			Date: 05/06/2018
In Section E.1 of Monitoring Report (MR):			
<p>a) The start date of monitoring period has been correctly revised to 24/05/2016 and is now consistent with the information provided on the cover page of the MR. CAR point is closed.</p> <p>b) The annual monitoring periods stated in Table 2 of MR has been revised in the required DD/MM/YYYY format and is in accordance with the guidelines for completing CDM-MR-FORM (version 06.0). However, the monitoring period in table provided in ER sheet is not in the required format (DD/MM/YYYY to DD/MM/YYYY). CAR point is open.</p> <p>c) The value of net electricity used for calculation of baseline emissions has been revised in the ER sheet and the value used now actually is for the electricity exported using 220kV Nambala Line (covered by the PPA between ITPC and ZESCO). However, the value of exported electricity used for the months of December 2016 and May 2017 are incorrect as they don't match with the joint meter reading reports for these months. CAR point is open.</p>			
Finding is not closed.			
Project participant response			Date: 10/06/2018
<p>b) Monitoring period in table in ER sheet now in correct format</p> <p>c) Values for December 2016 and May 2017 corrected</p>			
Documentation provided by project participant			
Revised ER sheet			
DOE assessment			Date: 14/06/2018
<p>b) The dates for the monitoring period has been revised to DD/MM/YYYY format in the revised ER sheet. CAR point is closed.</p> <p>c) the value of exported electricity used for the months of December 2016 and may 2017 have been revised and are now consistent with the joint meter reading reports for these months. CAR point is closed.</p>			
Finding is closed.			
CAR ID	08	Section no.	E.8.2
Date: 10/03/2018			
Description of CAR			
<p>In accordance with the guidelines for completing CDM-MR-FORM (version 06.0), sample calculations for all formulae used to calculate project GHG emissions or actual net GHG removals, applying actual values have been provided in section E.2 of MR.</p> <p>Moreover, the ER sheet doesn't contain full calculations of project GHG emissions for this monitoring period.</p>			

Project participant response	Date: 28/05/2018
<i>Sample calculation provided in the MR and full calculation provided in ER sheet</i>	
Documentation provided by project participant	
<i>Revised MR and ER sheet</i>	
DOE assessment	Date: 05/06/2018
The revised ER sheet doesn't provide calculation of project emission due to consumption of diesel in back-up DG set. Furthermore, in the estimation of emission reduction the project emission on account of diesel consumption has not been subtracted from the baseline emissions in both the ER sheet and relevant sections of MR.	
Finding is not closed.	
Project participant response	Date: 10/06/2018
Calculation of project emissions due to diesel use now included in ER sheet. Project emissions now subtracted from baseline and new emission reduction calculated	
Documentation provided by project participant	
<i>Revised ER sheet Revised MR</i>	
DOE assessment	Date: 14/06/2018
The ER sheet has been revised to provide calculation of project emission due to consumption of diesel in back-up DG set. Furthermore, the estimation of emission reduction has now been revised by deducting the project emission on account of diesel consumption from the baseline emissions in both the ER sheet and relevant sections of MR.	
Finding is closed.	

CAR ID	09	Section no.	E.8.5	Date: 10/03/2018
Description of CAR				
<i>In the given table in section E.5 of MR, the value provided under both columns 'Amount achieved during this monitoring period (tCO₂e)' and 'Amount estimated ex ante (tCO₂e)' are incorrect and not consistent with the values provided in the section E.4 and title page of the MR respectively.</i>				
<i>Furthermore, the ex-ante estimated emission reduction as mentioned in section E.5 and on the cover page of MR is not correct as the value provided is not mentioned for equivalent days as considered for the monitoring period.</i>				
Project participant response				Date: 28/05/2018
Table in section E.5 of MR corrected and values amended				
<i>Ex-ante estimated emissions have been corrected for equivalent days as considered for the monitoring period.</i>				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 05/06/2018
The table in section E.5 of the MR has been revised to provide correct values for 'Amount achieved during this monitoring period (tCO ₂ e)' and 'Amount estimated ex ante (tCO ₂ e)' and make it consistent with values provided in the section E.4 and title page of the MR respectively.				
Furthermore, on the title page and section E.5 of MR, value provide for the amount of GHG emission reductions estimated ex ante for this monitoring period has been revised to provide the exact value for the exact duration of the monitoring period i.e., for a period of 373 days.				
Finding is closed.				

CAR ID	10	Section no.	Others (Editorial)	Date: 10/03/2018
Description of CAR				
<i>a) In section A.1, the end date of monitoring period and start of first crediting period as provided in the activities table is not consistent with title page, the information provided in subsequent paragraph of MR.</i> <i>b) PP is requested to rectify all the inconsistencies in the font size and type throughout the MR.</i> <i>c) In section B.2.1, the start and end dates of monitoring period are not consistent with the with title page and section A1 of MR.</i> <i>d) In section E.6 of MR the increase percentage (111%) mentioned is incorrect.</i>				
Project participant response	Date: 28/05/2018			

- a) *All dates have been amended in order to be consistent taking into account the change to the date for the start of the crediting period*
- b) *All text reviewed and inconsistencies in font and type have been corrected*
- c) *No start and end dates are included in section B.2.1*
- d) *The increase percentage has been recalculated and reported*

Documentation provided by project participant*Revised MR***DOE assessment****Date:** 05/06/2018

- a) The activities table in section A.1 of the MR has been revised to provide correct dates for the start of the crediting period and end of the monitoring period. However, several inconsistencies in dates and values of ER still remain throughout the MR, such as:
- i. Version number of the MR is incorrect.
 - ii. Duration of monitoring period is incorrect.
 - iii. Monitoring report number for this monitoring report is incorrect and not in accordance with MR filling guidelines.
 - iv. Value of ER provided in section A.1 is incorrect.
 - v. In section A.5 start date of crediting period and dates provided for length of crediting period are incorrect.
 - vi. Spelling of construction in section B.1 is incorrect.

CAR point is open.

- b) The MR has been revised to address all the inconsistencies in the font size and type throughout the MR. CAR point is closed.
- c) Section B.2.1, of the MR has been revised to provide the correct dates for the start and end of monitoring period. CAR point is closed.
- d) Section E.6 of MR has been revised and the revised increase percentage of ERs during this monitoring period as compared to ex-ante estimated value is provided as 109%, which is still incorrect. CAR point is open.

Finding is not closed.

Project participant response**Date:** 10/06/2018

- (a)
- i. Version number of the MR is updated.
 - ii. Duration of monitoring period is corrected.
 - iii. Monitoring report number now in accordance with MR filling guidelines (not applicable).
 - iv. Value of ER provided in section A.1 is corrected.
 - v. In section A.5 start date of crediting period and dates provided for length of crediting period is corrected.
 - vi. Spelling of construction in section B.1 is corrected.

(b)

Section E.6 revised and corrected

Documentation provided by project participant*Revised MR***DOE assessment****Date:** 14/06/2018

<p>a) The MR has been revised:</p> <ul style="list-style-type: none"> i. Version number of the MR has been corrected. ii. Duration of monitoring period has been corrected. iii. Monitoring report number for this monitoring report has been corrected and is now in accordance with MR filling guidelines. iv. Value of ER provided in section A.1 has been corrected. v. Start date of crediting period and dates provided for length of crediting period in section A.5 of the MR have been corrected. vi. Spelling of construction in section B.1 has been corrected. <p>e) Section E.6 of MR has been revised and the increase percentage of ERs during this monitoring period as compared to ex-ante estimated value has been revised to 9.94%. The same is correct and acceptable to VT.</p> <p>Finding is closed.</p>
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CAR ID	11	Section no.	UNFCCC Clarification	Date: 24/08/2018
Description of CAR				
<p><i>The monitoring report does not describe the equipment used to monitor each parameter, including details on accuracy class, and calibration information (frequency, date of calibration and validity), if applicable as per the registered monitoring plan.</i></p> <p><i>The monitoring plan explains, on table D.2, that the value of the parameter $EG_{facility,y}$ was adjusted due to calibration delays, however the monitoring report does not indicate which were the calibration dates and the comparison between the delayed calibration and the maximum permissible error of the instruments.</i></p>				
Project participant response				Date: 27/08/2018
<p>The monitoring report includes details of accuracy class of the main and check meters and meter in section D.2., and frequency of meter checking (and calibration if necessary) in section C, table 1. In addition, further information has been added to section D.2. related to the model of the meter and link to manufacturers website where all technical details of the meters can be found. A new figure has also been added showing a photo of both the main and check meters at the hydro power plant so that identification details can be confirmed.</p> <p>The main meter was checked by ZESCO on 31 July 2017, and the error found to be 0.033% (below the error limit of 0.2%).</p>				
Documentation provided by project participant				
Report from checking of main meter dated 31 July 2017				
DOE assessment				Date: 27/08/2018
<p>The monitoring report has been revised by PP to provide information on equipment used to monitor parameter $EG_{facility,y}$ (Quantity of net electricity generation supplied by the project plant/unit to the grid in year y), including details on model, make, serial number and accuracy class. However, no information has been provided with regards to the calibration of energy meters viz., calibration frequency, meter accuracy tests, date of calibration and validity etc.,</p> <p>Furthermore, the revised MR doesn't provide information on which were the calibration dates and the comparison between the delayed calibration and the maximum permissible error of the instruments.</p> <p>Finding not closed.</p>				
Project participant response				Date: 29/08/2018
<p>The MR has been updated to provide more information on calibration frequency, frequency of meter accuracy tests, date and validity of accuracy test delayed accuracy test. Further information has also been provided on the adjustment of the electricity export and import data to calculate the net exported electricity and the emission reductions accrued by the project activity, in accordance with paragraph 369 of the CDM VVS for project activities (version 01.0).</p>				
Documentation provided by project participant				
Revised monitoring report				
DOE assessment				Date: 04/09/2018
<p>The MR has been revised to provide information calibration of energy meters viz., calibration frequency, meter accuracy tests, date of calibration and validity etc.,</p> <p>Furthermore, in section D.2, the table for parameter $EG_{facility,y}$ has been revised to provide information on the</p>				

calibration dates and the comparison between the delayed calibration and the maximum permissible error of the instruments.
Finding is closed.

CAR ID	12	Section no.	UNFCCC Clarification	Date: 24/08/2018
Description of CAR				
<i>The monitoring report indicates, in section E.6, that the measured ERs during the monitoring period were above the estimated in the PDD due to favorable hydrological conditions compared to the projected hydrological conditions used for the feasibility study.</i>				
<i>Furthermore, PP shall provide documentary evidences to clearly demonstrate and establish the changes in hydrological conditions as compared to design stage.</i>				
Project participant response				Date: 27/08/2018
The monitoring report has been amended and a new figure added which includes a hydrograph of water inflow into the Itezi Tezhi reservoir which shows increased water inflow during the monitoring period compared to the "Average Year" used for estimating annual electricity production in the feasibility study and therefore the PDD. This is backed up by local press reports which also refer to favourable hydrological conditions.				
Documentation provided by project participant				
Revised monitoring report				
DOE assessment				Date: 27/08/2018
The monitoring report has been revised and a daily hydrograph has been provided in section E.6, which clearly indicates that the water inflow during the monitoring period (2016-17) is significantly higher than recorded historically for "average year" (1987-88), which was used to calculate the electricity generation from the project activity during the feasibility study.				
However, PP shall provide the raw data sheet (excel-sheet) which has been used for comparison of the water inflow between average year and monitoring year.				
Finding is not closed.				
Project participant response				Date: 29/08/2018
Raw data sheet (excel-sheet) has been provided to DOE.				
Documentation provided by project participant				
Raw data sheet (excel-sheet)				
DOE assessment				Date: 04/09/2018
PP has provided raw data sheet for daily inflow of water in Itezi Tezhi reservoir and reservoir level for average year (1987-88), below average year (1995-96), previous year (2015-16) and current year (2016-17). The inflow data of average year was checked from the inflow data (table 5.2) provided in the FSR and for the current year the same was checked through review of records kept at power plant during the on-site visit.				
From the review and comparison of the data it was concluded that the measured ERs during the monitoring period were above the estimated in the PDD due to favorable hydrological conditions compared to the projected hydrological conditions used for the feasibility study.				
Finding is closed.				

Table 4. FAR from this verification

FAR ID	xx	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

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
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: Issuance Keywords: project activities, verifying and certifying		