Validation report form for CDM project activities

(Version 01.0)

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

VALIDATION REPORT	
Title of the project activity	Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")*
Version number of the validation report	1.5 Aa
Completion date of the validation report	12/10/2016
Version number of PDD to which this report applies	Version 4.4 of 17/06/2016
Date when PDD was uploaded for global stakeholder consultation	05/10/2012
Project participant(s)	Centrais Elétricas Brasileiras S/A – ELETROBRÁS São Pedro Energia S/A Carangola Energia S/A Calheiros Energia S/A São Simão Energia S/A Funil Energia S/A São Joaquim Energia S/A Caparaó Energia S/A Jataí Energética S/A Irara Energética S/A Bonfante Energética S/A Monte Serrat Energética S/A Santa Fé Energética S/A
Host Party	Brazil
Estimated annual average GHG emission reductions or net removals in the crediting period (tCO2e)	650,438 tCO_2e annual average
Sectoral scope(s) and selected methodology(ies)	Sectoral Scope: 1 - Energy industries (renewable - / non-renewable sources). ACM0002: "Grid-connected electricity generation from renewable sources" (version 16.0.0).
Name of DOE	RINA Services S.p.A. (RINA)
Name, position and signature of the approver of the validation report	Laura SEVERINO – Sector Manager Sustainability, Environment & Climate Change

SECTION A. Executive summary

Purpose and general description of the project activity.

The primary objective of the Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")* is to increase the renewable energy sources share in the Brazilian electricity market, thus contributing to a greater environmental sustainability. In order to achieve such goals, the Brazilian government has designated Eletrobrás (Centrais Elétricas Brasileiras) to act as the primary off-taker of electricity by entering into long-term Power Purchase Agreements (PPAs). The project activity consists of the implementation of 12 (twelve) hydropower plants . According to the the Brazilian legislation 30 MW is the limit capacity to be classified as Small Hydro Power Plant (SHPP). The authorizations issued by ANEEL considered all the 12 plants as SHPP. Nevertheless, the power density calculated using the total installed capacity of each plant is greater than 4 W/m2, which is in accordance with the applicability of the large ACM0002 methodology, even though the project is considered SHHP in Brazil. The plants are located in the States of Espírito Santo, Minas Gerais, Rio de Janeiro, Goiás and Mato Grosso do Sul, totalizing 275.6 MW installed capacity. The proposed CDM project activity is not a CPA that has been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs. The project activity falls under Project category "Grid-connected electricity generation from renewable sources" and Sectoral Scope 1- Energy industries (renewable/non-renewable sources).

Scope of validation

The validation scope is to review the PDD against the UNFCCC criteria for CDM. UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board. Validation is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

Validation process

Validation was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The validation consisted of the following three phases: Document review; Follow-up actions; the resolution of outstanding issues and the issuance of the final validation report.

Conclusion

RINA Services S.p.A. (RINA), commissioned by Centrais Elétricas Brasileiras S/A – ELETROBRÁS, has performed the validation of the project activity Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")* in Brazil, with regard to the relevant requirements for CDM activities. In conclusion, it is RINA's opinion that the project activity Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")*, in Brazil, as described in the PDD Version 4.4 of 17/06/2016, meets all relevant requirements for CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002: "Grid-connected electricity generation from renewable sources" (version 16.0.0).

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	Principe Branco Saettoni	Geisa Maria	RINA Brazil	x	x	x	x
2.	Team Leader CDM (until 25/02/2014)	IR	Poll Herrmann	Lilian Cristine	RINA Brazil	x			
3.	Validator/ Technical Expert	IR	De Lima Carvalho	Thaís	RINA Brazil	x	x	x	
4.	Financial Expert (until 17/03/2015)	IR	Varkulya	Américo	RINA Brazil		x	x	
5.	Financial Expert	IR	Rocha	Mayra	RINA Brazil				x

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Valoroso	Rita	RINA Central Office
2.	Approver	IR	Severino	Laura	RINA Central Office

SECTION C. Means of validation

C.1. Desk review

The PDD, Version 4.4 of 17/06/2016 and previous versions /01/, in particular the applicability of the methodology, the baseline determination, the additionality of the project activity, the starting date of the project, the monitoring plan, the emission reduction calculations provided in the form of a spreadsheet, “Eletrobras_Estimated CERs_v 5_2016 05 30.xlsnd previous versions /2/, were assessed as part of the validation. The table in Appendix 3 lists the documentation that was reviewed during the validation.

C.2. On-site inspection

Duration of on-site inspection: 14-15-16-21-29-30/01/2013				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Document review; interview; cross check data	Eletrobrás in Rio at Rua do Ouvidor, 107 and the small hydro-power plants of São Pedro, Carangola, Calheiros, São Simão, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat and Santa Fé	13/03/2013	Geisa Maria Principe Branco Saettoni
2	Site inspection, equipment's installed, document review; interview; cross check data		14/03/2013	Américo Varkulya
3	Site inspection, equipment's installed, document review; interview; cross check data		15/03/2013	Thaís De Lima Carvalho

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Laubenbacher Sampaio	Lilian -	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012	Managers and Project Members: Additionality; Project timeline; CDM consideration; equipments description	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
2.	Oliveira Camargo	Jorge	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012		Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
3.	Figueiredo Rocha	Tadeu	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012		Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
4.	Rigamonti	Rafael	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012	Analist senior: Baseline and project emissions; Project boundaries Clarifications on establishment of baseline, monitoring plan and emission reduction calculations Resources, training needs and procedures for operation and maintenance Monitoring Plan / Records (backups) Maintenance program (calibration)	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
5.	Corga Cardinot	Flavio	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012		Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
6.	Modenesi Pitta Pinheiro	Ricardo	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012		Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
7.	de Souza Teixeira da Silva-	André Luiz	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012		Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
8.	Pernes Monsores	Natasha	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012		Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
9.	Rodrigues Ribeiro Silva	Anibal	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012	Project Members (environmental area): Environmental licenses	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
10.	Soares Pessoa	Flávia	Centrais Elétricas Brasileiras S.A-	6-7/11/2012		Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe

			Eletrobrás			Branco Saettoni

11.	Monteiro Neves	Frederico	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012		Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
12.	Miranda	Vinicius	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012	Analyst: Local stakeholder consultation	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
13.	Nascimento	Renato	Centrais Elétricas Brasileiras S.A-Eletrobrás	6-7/11/2012	Eletric Engineer: Equipments installed, operation, monitoring, maintenance; energy generation	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
14.	Pereira de Souza	João	Brasil PCH	14/01/2013	Monitoring; energy generation	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
15.	Eidi Ozawa	Willian	Brasil PCH	14/01/2013	Monitoring; energy generation	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
16.	Pinheiro	Ricardo	Centrais Elétricas Brasileiras S.A-Eletrobrás	14/01/2013	Monitoring; energy generation	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
17.	Andrade	Ateles José	Brasil PCH	15/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
18.	Benetti	Evandro Roberto	Brasil PCH	16/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
19.	Copano	Diego Alfonso	Brasil PCH	21/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
20.	Pernes Monsores	Natasha	Centrais Elétricas Brasileiras S.A-	21/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe

			Eletrobrás			Branco Saettoni
21.	Baliza	José Altair	Brasil PCH	21/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
22.	Marcelo	Marques-Maintenance	Brasil PCH	21/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
23.	Carneiro	Atila	Brasil PCH	21/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
24.	Miranda	Eduardo	Brasil PCH	21/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
25.	Abrev	Tiago	Brasil PCH	29-30/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
26.	Rosostolato	Bruno	Centrais Elétricas Brasileiras S.A-Eletrobrás	29-30/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni
27.	Wackert	Eric	Brasil PCH	29-30/01/2013	Site visit and monitoring	Thaís De Lima Carvalho Américo Varkulya Geisa Maria Principe Branco Saettoni

C.4. Sampling approach

N/A

C.5. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Global stakeholder consultation	-	01	-
Approval	-	-	-
Authorization	-	-	-
Contribution to sustainable development	-	-	-
Modalities of communication	-	01	-
Project design document	-	02	-
Description of project activity	02	-	-
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	02	03	-

- Deviation from methodology	-	-	-
- Clarification on applicability of methodology, tool and/or standardized baseline	-	-	-
- Project boundary	-	01	-
- Establishment and description of baseline scenario		01	
- Demonstration of additionality	01	06	
- Emission reductions	01	04	
- Monitoring plan	-	04	-
Duration and crediting period	-	01	-
Environmental impacts	-	02	-
Local stakeholder consultation	-	01	-
Others (please specify)			
Total	06	27	0

SECTION D. Validation findings

D.1. Global stakeholder consultation

Means of validation	The PDD version 1 of 09/11/2012 /01/ was made publicly available on the CDM UNFCCC website and Parties, stakeholders and NGOs through the CDM website (https://cdm.unfccc.int/Projects/Validation/DB/LTU09FBC00HRURZ11HCOYQ5Q80VVA0/view.html) invited to provide comments during a 30 days period from 05/10/202 – 03/11/2012 ,
Findings	N/A
Conclusion	No comments were received during the Global stakeholder consultation. It is RINA's opinion that the changes in the PDD during the validation process does not required the publication of the revised PDD for global stakeholder consultation.

D.2. Approval

Means of validation	The project's host Party is Brazil. The project participant are Centrais Elétricas Brasileiras S/A – ELETROBRÁS; São The project participant are Centrais Elétricas Brasileiras S/A – ELETROBRÁS (public entity) and São Pedro Energia S/A, Carangola Energia S/A, Calheiros Energia S/A, São Simão Energia S/A, Funil Energia S/A, São Joaquim Energia S/A, Caparaó Energia S/A, Jataí Energética S/A, Irara Energética S/A, Bonfante Energética S/A, Monte Serrat Energética S/A, Santa Fé Energética S/A that are private entities the project is a unilateral project and hence the host country (Brazil) is the only Party involved in the proposed project activity. Brazil fulfils the requirements to participate in the CDM, having ratified the Kyoto Protocol on 23/08/2002 and establishing as DNA the Interministerial Commission Global Climate Change (CIMGC) which is under the umbrella of the Ministério da Ciência, Tecnologia e Inovação - MCTI (from the Portuguese Ministry of Science, Technology and Innovation) as per the UNFCCC website /12/. The project participants are correctly listed in table A.4 of the PDD and the information is consistent with the contact details provided in Appendix 1 of the PDD /1/. The DNA of Brazil issued a Letter of Approval on 05/09/2016, authorizing Centrais Elétricas Brasileiras S/A – ELETROBRÁS (public entity) and São Pedro Energia S/A, Carangola Energia S/A, Calheiros Energia S/A, São Simão Energia S/A, Funil Energia S/A, São Joaquim Energia S/A, Caparaó Energia S/A, Jataí Energética S/A, Irara Energética S/A, Bonfante Energética S/A, Monte Serrat Energética S/A, Santa Fé Energética S/A as project participants and confirming that the project assists in achieving sustainable development and the CDM project activity contributes to the sustainable development of the Host Country /90/. The Letter of Approval was received from Centrais Elétricas Brasileiras S/A – ELETROBRÁS /91/, and refers to the precise project proposed project activity in the PDD submitted for registration /1/. The authenticity of the letters of approval has been validated by verifying Brazilian DNA email /90//91/. The letter has been issued by the Brazilian DNA for the specific proposed project activity and RINA has not found reason to doubt their authenticity By checking the above documents /90//91/.RINA considers the LoA in accordance

	with paragraphs 39-42 of the CDM-VVS /9/. The proposed project does not involve any public funding from an Annex I Party, and the validation did not reveal any information that indicated that the project could be seen as a diversion of official development assistance (ODA) funding towards the host country.
Findings	N/A
Conclusion	By checking the above documents /70/ /71/ RINA considers the LoA in accordance with paragraphs 44-48 of the CDM-VVS /9/. The validation report was updated (Revision 1.5) to reflect the receipt of the letter of approval and that is the only change that has been made compared to the version (Revision 1.4Aa, dated 05/07/2016) listed in the Brazilian DNA letter of approval dated 05/09/2016.

D.3. Authorization

Means of validation			
	Project participants	Centrais Elétricas Brasileiras S/A – ELETROBRÁS São Pedro Energia S/A Carangola Energia S/A Calheiros Energia S/A São Simão Energia S/A Funil Energia S/A São Joaquim Energia S/A Caparaó Energia S/A Jataí Energética S/A Irara Energética S/A Bonfante Energética S/A Monte Serrat Energética S/A Santa Fé Energética S/A	No Annex 1
	Parties involved	Brazil	-
	APPROVAL		
	LoA received	Yes /90/	-
	Date of LoA	05/09/2016	-
	LoA received from	Yes /91/	-
	Validation of authenticity	Yes /91/	-
	Validity of LoA	Yes /90/	-
	PARTICIPATION		
	Party is party to Kyoto Protocol	Yes	-
	Voluntary participation	Yes /90/	-
	Project contribution to SD	Yes /90/	-
Findings	N/A		
Conclusion	RINA confirms that the DNA of Brazil issued a Letter of Approval on 05/09/2016, authorizing Centrais Elétricas Brasileiras S/A – ELETROBRÁS São Pedro Energia S/A, Carangola Energia S/A, Calheiros Energia S/A, São Simão Energia S/A, Funil Energia S/A, São Joaquim Energia S/A, Caparaó Energia S/A, Jataí Energética S/A, Irara Energética S/A, Bonfante Energética S/A, Monte Serrat Energética S/A, Santa Fé Energética S/A as project participant /90/ and as described in § D.2 of the report there is no doubt validating the authenticity of the letter of approval by verifying Brazilian DNA email /91/		

D.4. Contribution to sustainable development

Means of validation	The PDD section A.1 describes that the implementation of small hydroelectric power plants ensures renewable energy generation, reduces the national electric system demand, avoids negative social and environmental impact caused by the construction of large hydropower plants with large reservoirs and fossil fuel thermo power plants, and drives regional economies, increasing quality of life in local communities. Therefore the project has reduced negative environmental impacts and has developed the regional economies, resulting, consequently, in better quality of life. In other words, environmental sustainability combined with social and economic justice, undeniably contribute to the host country's sustainable development
Findings	CAR 2: the PDD did not explain how the project activity contributes to sustainable development. To close out this CAR, the PDD was revised following the latest version of the PDD template.
Conclusion	RINA confirms that the DNA of Brazil issued a Letter of Approval on 05/09/2016, confirming that the project assists in achieving sustainable development and the CDM project activity contributes to the sustainable development of the Host Country /90/

D.5. Modalities of communication

Means of validation	The MoC dated 10/03/2014 /64/ was provided by Centrais Elétricas Brasileiras S/A - ELETROBRÁS with whom RINA has a contractual relationship confirmed by the request of services signed on 29/05/2012 /54/. The corporate identity of all PPs and focal points included in the MoC statement /62/ /63/, as well the personal identities /62/, the signatures and the related authorized signatures, and the employment status have been cross-checked by RINA /64/. RINA confirms that the MoC statement provided by the PP(s) /64/ is based on the currently valid form "Modalities of Communication Statement" (F-CDM-MOC) /65/, the information required by the form including its Annex 1 is correctly completed, and the PP(s) authorized signatories signing the MoC correspond to the PP(s) authorized signatories included in Annex 1.
Findings	CAR 4: PP did not provide the MOC and support documents. To close out CAR 4 PP has provided the MOC and support documents.
Conclusion	RINA confirms that the MoC statement provided by the PP(s) /37/ is based on the currently valid form "Modalities of Communication Statement" (F-CDM-MOC) /38/, the information required by the form including its Annex 1 is correctly completed, and the PP(s) authorized signatories signing the MoC correspond to the PP(s) authorized signatories included in Annex 1. In conclusion, RINA confirms that the MoC statement provided by the PP(s) is in accordance with the requirements in para 61-68 as well it is in accordance with the requirements in para 66 of the CDM-VVS version 9 /8/.

D.6. Project design document

Means of validation

The PDD for the project activity "Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("bundling")", in "Brazil", PDD Version 4.4 of 17/06/2016 and previous versions /1/, submitted by the Centrais Elétricas Brasileiras S/A - ELETROBRÁS, have been the basis for the validation process.

The main changes between the PDD version 1 of 11/09/2012 published for GSC and the PDD Version 4.4 of 17/06/2016 submitted for registration are the following:

Section of the PDD	Description and reason for changing the information in that section
Section A	The guidelines for completing PDD was updated
	Update the CDM-PDD template version
Section B	Methodology version and related tools were updated
	Additionality was revised: the barrier analysis was excluded and

		it was applied the investment analysis
		Common practice was revised to attend the Guidelines on common practice
		The project start date was revised considering the date of PPA.
		Revision of emission reduction calculations
	Section C	The starting date of the crediting period was revised.
	Section E	The local Stakeholders consultation were redone in order to attend the DNA resolution nº 10, art. 1.
Findings	CAR 01 and CAR 02: The PDD has not been completed according to the latest "Guidelines for Project Design Document (CDM-PDD)" version 01.0. In order to close out CAR01 and CAR02, PP has provided the revised PDD in the latest template available.	
Conclusion	RINA confirms that the Version 4.4 of 17/06/2016 is based on the currently valid PDD template version 07.0 and is completed in accordance with the Instructions for filling out the project design form for CDM project activities.	

D.7. Description of project activity

Means of validation

The project activity falls under Project category "Grid-connected electricity generation from renewable sources" and Sectoral Scope 1- Energy industries (renewable/non-renewable sources).The project activity consists of the implementation of 12 (twelve) hydropower plants . According to the the Brazilian legislation 30 MW is the limit capacity to be classified as Small Hydro Power Plant (SHPP). The authorizations issued by ANEEL considered all the 12 plants as SHPP. Nevertheless, the power density calculated using the total installed capacity of each plant is greater than 4 W/m2, which is in accordance with the applicability of the large ACM0002 methodology, even though the project is considered SHHP in Brazil. The plants are located in the States of Espírito Santo, Minas Gerais, Rio de Janeiro, Goiás and Mato Grosso do Sul, totalizing 275.6 MW installed capacity.

According to the Brazilian regulation, small scale hydropower plants are defined as plants with installed capacities between 1MW and 30MW and reservoir areas no greater than 3km2 (ANEEL Resolution # 652/2003) /45/. Although the installed capacity of São Pedro small hydropower plant surpasses 30 MW (the eligibility criteria to be classified as small hydropower plant according to ANEEL Resolution # 394/1998) /45/, all power plants included in the proposed project activity are considered as small hydropower plant ("PCH" from the Portuguese Pequena Central Hidrelétrica) by the Brazilian government and were elegible to PROINFA. The small hydropower plants were developed in the context of the Brazilian Program of Incentives to Alternative Energy Sources ("PROINFA" in a free translation from the Portuguese "Programa de Incentivo às Fontes Alternativas de Energia Elétrica"). The main goal of the program is to increase the renewable energy sources share in the Brazilian electricity market, thus contributing to a greater environmental sustainability. In order to achieve such goals, the Brazilian government has designated Eletrobrás (Centrais Elétricas Brasileiras) to act as the primary off-taker of electricity by entering into long-term Power Purchase Agreements (PPAs).

The total GHG emission reductions from the "Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")* are estimated to be 6,504,377 tCO2e during the fixed 10 years crediting period, resulting in an annual average emission reductions of 650,438 tCO2e / year.

The Assured Energy of the power plants were confirmed in the ANEEL web site (information public available, as described in the table below:

SHP	Assured energy (MW-ave)	Cross check

São Pedro	18.41	MME Resolution 118, of 22/03/2004 /69/
Carangola	9.63	Confirmed in the ANEEL web site /68/
Calheiros	10.92	
São Simão	15.2	
Funil	13.09	
São Joaquim	13.28	
Fumaça IV	2.61	
Jataí	19.25	
Irara	18.21	
Bonfante	13.48	
Monte Serrat	18.28	
Santa Fé	16.40	

It is important to highlight that the plant load factor is issued by ANEEL (Brazilian Electric Energy Agency), and the calculations were established in the Resolution nº 169, of 3rd May 2001 /71/. Historical data is used in the calculus and the plant load factor is specific for each power plant. The Assured Energy of a hydroelectric plant is issued by ANEEL (Brazilian Electric Energy Agency), and serves essentially two purposes:

(i) to establish an upper limit for energy supply contracts (PPAs), and
(ii) to define the share of each generating plant on the total amount of energy generated in the system by hydro plants.
The Assured Energy of the Brazilian electric system is defined as the maximum energy production that can be delivered almost continuously by hydroelectric plants throughout the years, simulating the occurrence of each one of the thousands of possibilities of statistically created flow sequences, admitting certain risk of not attendance to the load, that is, in determined percentile of the simulated years some rationing is allowed up to a limit considered acceptable by the system. The determination of the Assured Energy is associated to the conditions in the long term that each plant can supply to the system assuming an specific risk criteria of non-attendance to the market (risk of deficit), considering mainly the hydrologic variability to which the plant is submitted.

Project location. The project is located in Brazil. The municipalities and states location of the SHPs were confirmed in the ANEEL/SIGEL web site /66/, publicity available, as described below:

SHP	**Municipality**
São Pedro	Domingos Martins
Carangola	Carangola
Calheiros	Bom Jesus de Itabapoana (RJ) and São José do Calçado (ES)
São Simão	Alegre
Funil	Dores de Guanhães
São Joaquim	Alfredo Chaves
Fumaça IV	Caiana (MG) and Dores do Rio Preto (ES)
Jataí	Jataí
Irara	Rio Verde
Bonfante	Simão Pereira (MG) and Comendador Levy Gasparian (RJ)
Monte Serrat	Simão Pereira (MG) and Comendador Levy Gasparian (RJ)

Santa Fé	Comendador Levy Gasparian and Três Rios (RJ) and Santana do Deserto (MG)

The geographical coordinates were confirmed in the ANEEL Resolutions listed below:

SHP	Latitude (S)	Longitude (W)	Reference
São Pedro	20º19' 30”	40º38' 05”	Resolution ANEEL 604/03, dated 18/11/2003 /67/
Carangola	20º42'	42º04'	Resolution ANEEL 356/99, dated 22/12/1999 /67/
Calheiros	21º01'	41º43'	Resolution ANEEL 12/00, dated 13/01/2000 /67/
São Simão	20º37’	41º29’	Resolution ANEEL 84/01 dated 22/03/20001 /67/
Funil	19° 05’	42° 51’	Resolution ANEEL 361/99, dated 22/12/1999 /67/
São Joaquim	20° 36'	40° 48 '	Resolution ANEEL 404/00, dated 18/10/2000 /67/
Fumaça IV	20° 45'	41° 52 '	Resolution ANEEL 369/99, 29/12/1999 /67/
Jataí	17°53' 36”	51°43' 24”	Resolution ANEEL 2686/06, dated 16/11/2006 /67/
Irara	18° 04' 03”	51° 10 ' 03”	Resolution ANEEL 525/02, dated 24/09/2002 /118/
Bonfante	22° 00’ 32”	43°15'55”	Resolution ANEEL 357/01, dated 27/08/2001 /67/
Monte Serrat	22° 01' 11”	43° 18 ' 08”	Resolution ANEEL 356/01, dated 27/08/2001 /67/
Santa Fé	22° 01' 23”	43°09'46”	Resolution ANEEL 608/02, dated 05/11/2002 /67/

Scenario existing prior to the implementation of the project activity. Prior to the implementation of the project activity no small hydropower plants were operational in the location where the projects were developed. The project activity reduces GHG emissions by avoiding electricity generation from fossil fuel sources, which would be generated (and emitted) in the absence of the project. In conclusion, the baseline scenario and the scenario without the project activity are the same.

According to ACM0002, in the project activity scenario, there are emissions of methane (CH_4) from the water reservoir of hydropower plants. However, since the power densities of the small hydropower plants included in this PDD are greater than 10 W/m^2, there are no GHG emissions involved in the project activity.

Detailed description of each power plant presented in the following tables.

Equipment	Specification	São Pedro	Carangola	Calheiros
Generator	Quantity	2	2	2
	Nominal power (kVA)	16,700	8,500	10,700
	Nominal tension (V)	6,900	13,800	13,800

	Power factor	0.9	0.9	0.9
	Frequency (Hz)	60	60	60
	Rotation (rpm)	600	900	327.3
	Manufacturer	Alstom	WEG	Voith Siemens
	Year of Manufacture	2008	2007	2007
Turbine	Quantity	2	2	2
	Nominal power (kW)	15,464	7,730	9,794
	Type	Francis - Horizontal Axle	Francis - Horizontal Axle	Francis - Horizontal Axle
	Rotation (rpm)	600	900	327.3
	Manufacturer	Alstom	Voith Siemens	Voith Siemens
	Year of Manufacture	2008	2008	2008
Electric Meter (Master)	Location	Connection	Connection	Connection
	Manufacturer	Power Measurement	ELO	ACTARIS
	Serial Number	PT-0901A254-01	90004410	37103629
	Model /type	ION 8600	2180SP	SL7000
Electric Meter (Rearward)	Location	Connection	Connection	Connection
	Manufacturer	Power Measurement	ELO	ACTARIS
	Serial Number	PT-0901A265-01	90002795	37103628
	Model /type	ION 8600	2180SP	SL7000

Equipment	Specification	Fumaça IV	Jataí	Irara
Generator	Quantity	2	3	3

	Nominal power (kVA)	2,500	11,110	11,110
	Nominal tension (V)	6,900	13,800	13.8
	Power factor	0.9	0.9	0.9
	Frequency (Hz)	60	60	60
	Rotation (rpm)	900	327	360
	Manufacturer	WEG	WEG	WEG
	Year of Manufacture	2007	2007	2007
Turbine	Quantity	2	3	3
	Nominal power (kW)	2,340	10,299	10,467
	Type	Francis - Horizontal Axle	Francis - Horizontal Axle	Francis - Horizontal Axle
	Rotation (rpm)	900	327.27	360
	Manufacturer	Energy Power	Brumazi - Vatech Hydro	Vatech Hydro
	Year of Manufacture	2007	2008	2008
Electric Meter (Master)	Location	Connection	Connection	Connection
	Manufacturer	Power Measurement	SCHULUMBERGER	ITRON
	Serial Number		31681514	50712519
	Model /type	ION 8600	Q1000	Q1000
Electric Meter (Rearward)	Location	Connection	Connection	Connection
	Manufacturer	Power Measurement	SCHULUMBERGER	ITRON
	Serial Number		31681514	50712522
	Model /type	ION 8600	Q1000	Q1000

Equipment	Specification	Bonfante	Monte Serrat	Santa Fé
Generator	Quantity	1	2	2
	Nominal power (kVA)	19,200	14,150	16,700
	Nominal tension (V)	6,900	6.9	13,800
	Power factor	0.95	0.95	0.9
	Frequency (Hz)	60	60	60
	Rotation (rpm)	514	500	327
	Manufacturer	Alstom	Alstom	Alstom
	Year of Manufacture	2007	2007	2007
Turbine	Quantity	1	2	2
	Nominal power (kW)	19,390	12,990	15,540
	Type	Kaplan - Horizontal Axle	Kaplan - Horizontal Axle	Kaplan - Horizontal Axle
	Rotation (rpm)	135	175	327.27

	Manufacturer	Alstom	Alstom	Alstom
	Year of Manufacture	2007	2007	2007
Electric Meter (Master)	Location	Connection – SE Itegração	Connection	Connection
	Manufacturer	Power Measurement	SCHNEIDER	Power Logic
	Serial Number	PT0707A403-01	PT-0707A403-01	PT-0612A235-01
	Model /type	ION 8600	ION8600-4Q	ION8600C
Electric Meter (Rearward)	Location	Connection – SE Itegração	Connection	Connection
	Manufacturer	Power Measurement	SCHNEIDER	Power Logic
	Serial Number	PT0707A403-01	PT-0707A404-01	PT-0612A235-01
	Model /type	ION 8600	ION8600-4Q	ION8600C

Since Brazil has a large hydropower potential, the know-how used in the project activity has been transferred to the Host Country already. Therefore, the main equipment used in the project activity was manufactured in Brazil. This contributes for the energy sector development (resulting in more research) and for the capacity increase of the industrial sector within the Host Country.

Project implementation. The starting date of the project activity, i.e. the moment of when real action began, is the date of the PPA signature under PROINFA /24/. It has been verified by RINA that the starting date of 30/06/2004 is the earliest date at which either the implementation or construction or real action of a CDM project activity begins in accordance with the definition stated in the Glossary of CDM Terms /16/. PPA terms/penalties can be regarded as a firm commitment and real action from PPs towards project implementation and associated expenses. At the time of the site visit, project power plants were implemented and operational.

Crediting period and estimated Emission Reductions. The expected operational lifetime of the project activity is 27 years (0 months), and deemed reasonable. PDD describes the project lifetime in accordance with ANEEL Resolution nº 474 dated 07/02/2012 /68/. A fixed crediting period of 10 years was selected starting on 01/01/2016 or registration date on CDM, upon which takes place later. The length of the crediting period is clearly defined and deemed reasonable for this project activity. The total GHG emission reductions from the "Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")*" are estimated to be 6,504,377 tCO2e during the crediting period, resulting in an annual average emission reductions of 650,438 tCO2e / year.

Contribution to sustainable development. The PDD describes that the implementation of small hydroelectric power plants ensures renewable energy generation, reduces the national electric system demand, avoids negative social and environmental impact caused by the construction of large hydropower plants with large reservoirs and fossil fuel thermo power plants, and drives regional economies, increasing quality of life in local communities. Therefore the project has reduced negative environmental impacts and has developed the regional economies, resulting, consequently, in better quality of life. In other words, environmental sustainability combined with social and economic justice, undeniably contribute to the host country's sustainable development.
The contribution to sustainable development will be confirmed by the Brazilian DNA.

Findings	CL 01: The assured energy published by ANEEL for 2 of the SHPP has

	discrepancies. CL 06: The installed capacities observed during site visit for all SHPs are greater than the ones checked in the ANEEL and are different from the description in the PDD To close out CL 1 and CL 06 the PDD revised the installed capacity of all SHPP.
Conclusion	RINA was able to verify all the documented evidence during the validation process and can confirm that data and considerations are complete and accurate. Moreover RINA confirms that the description of the proposed CDM project activity, as contained in the PDD sufficiently covers all relevant elements, is accurate and complete and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity.

D.8. Application of selected baseline and monitoring methodology and selected standardized baseline

D.8.1. Applicability of methodology and standardized baseline

Means of validation	The project correctly applies the approved baseline and monitoring methodology ACM0002, “Grid-connected electricity generation from renewable sources”, 16.0 of 28/04/2014 /10/.. The applicability criteria condition listed in the approved methodology was assessed against criteria contained in the PDD /1/. The proposed project activity meets the criteria defined in the baseline methodology as it ensures that: The applied baseline methodology is justified as it has been demonstrated that the project activity ensures that: • The project activity consists of installation of 12 (twelve) greenfield and grid-connected small hydropower plants resulting in 275.6 MW of installed capacity which was verified in the ANEEL authorization for energy generation /21/; • Being greenfield the small hydropower plants do not involve any switching from fossil fuel to renewable energy at the project sites, this information was cross-checked against environmental licenses /48/-/52/ and verified during the site visit. • The proposed project activity substitutes grid electricity and the OM, BM and CM are estimated, applying the Tool to calculate the emission factor of an electricity system /15/, when calculating the baseline emissions. • The proposed project is connected to the Brazilian National Interconnected System (SIN), the electricity grid of Brazil, for which the geographical and system boundaries are clearly identified and information on the characteristics of this grid is made available by the Brazilian National Grid Operator /88/. The project activity applies the following methodological tools: • Methodological Tool for the demonstration and assessment of additionality, version 7.0.0, dated 23/11/2012 /13/. The Tool for the demonstration and assessment of additionality is addressed in baseline methodology ACM0002 version 16.0 of 28/04/2014, thus its application to this project activity is mandatory. • Methodological Tool to calculate the emission factor for an electricity system version 5.0.0 of 27/11/2015 /15/. The Tool to calculate the emission factor for an electricity system is applied by Brazilian DNA for the calculation of grid emission factor and meets the defined criteria as it ensures that: • The electric energy would be supplied by Brazilian grid in the absence of the project activity; • The grid emission factor did not included off-grid power plants and the calculation of build margin emission factor and operating margin emission factor was done by Brazilian DNA;

	• All the grid for the emission factor calculation is included in Brazil, which is not Annex I host country; • The emission from energy generated by biofuels is zero.
Findings	CAR06: PDD version 1 is neither using the latest available tool to calculate the emission factor for an electricity system nor the latest available tool for the demonstration and assessment of additionality CAR07: Section B.2 of the PDD version 1 does not state the type of the reservoirs. Furthermore, it also does not state whether the reservoirs were new or existing reservoirs, single or multiple reservoirs, with increase or without change in water volume CAR15 Neither section B.6.1 nor B.6.3 of the PDD justify the values adopted for Cap_{BL} or $A_{BL.}$ CL06: The installed capacities observed during site visit for all SHPs are greater than the ones checked in the ANEEL and are different from the description in the PDD To close out CAR 6, PDD was revised and tools used were updated. To close out CAR 07, CAR 15 evidences regarding reservoir areas of all small hydropower plants were provided. And to close CL06 the installed capacity used is the capacity observed in the equipment tag, as per the methodology.
Conclusion	RINA confirms that the selected baseline and monitoring methodology has been previously approved by the CDM Executive Board and is applicable to the project activity which complied with all the applicability conditions therein as well as the applicable methological tools.

D.8.2. Deviation from methodology

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.8.3. Clarification on applicability of methodology, tool and/or standardized baseline

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.8.4. Project boundary

Means of validation

According to the approved baseline and monitoring methodology ACM0002, “Grid-connected electricity 1. generation from renewable sources”, version 16.0 of 28/04/2014 /10/ the project boundary includes the proposed project’s boundary (spatial extent) encompass the project power plant and all power plants physically connected to the national electricity system (SIN-National Interconnected System) that the proposed project activity is connected to. The diagram of the project boundary presented in section B.3 of the PDD version 4.4 of 17/06/2016, includes the project power plants and all the power plants connected physically to SIN, and describes the gases included in the project boundary and monitoring variables. The delineation of Brazilian National Interconnected System is provided by National Grid Operator on Brazilian /88/, in line with applied baseline methodology ACM0002 version 16.0 of 28/04/2014 /10/.

Emissions sources included in the project boundary are shown in the table below:

	GHGs involved	Description
Baseline emissions	CO_2	Emissions from electricity generation in fossil fuel power plants connected to the national grid that is displaced due to the project activity.
Project emissions	N/A	Since the power density of the project activity is greater than 10

			W/m2, project emissions are regarded equal to zero according to the approved methodology ACM0002 /10/.
	Leakage	N/A	The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use. As defined by the applied methodology /10/, these emissions sources are neglected (no leakage needs to be considered).
	Emission sources which are not addressed by the applied methodology and which are expected to contribute more than 1% of the overall expected average annual emissions reduction have not been identified.		
Findings	CAR 25: PDD version 1 describes the project boundary as "The spatial extension of the project limit includes the power plant and all power plants connected physically to the electrical system defined for the CDM project", however it does not specify the power plant(s). To close out CAR 25 The boundary was revised in accordance with ACM0002.		
Conclusion	By checking the information and evidences available through ANEEL documents /21/, environmental licenses /48/ - /52/ and by the physical site, RINA confirms that all the emission sources and gases have been included in the project boundary and the description in the PDD is accurate and complete, and also that the selected sources and gases are justified for the proposed project activity.		

D.8.5. Establishment and description of baseline scenario

Means of validation	According to the approved baseline methodology ACM0002 version 16.0 of 28/04/2014 /10/ the baseline scenario is the "Electricity delivered to the grid by the project activity would have otherwise been generate by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system", version 5.0, dated 27/11/2015/15/. The prescribed baseline scenario is applicable to the project activity whether is in compliance with the national and/or sectorial policies as verified on ANEEL documents /24/ /45/ /67/. RINA was able to verify all the documented evidence and can confirm that: • Regarding the applied grid emission factor, as per Ministry of Science and Technology – MCT, the National Interconnected System is defined as a single electricity system to calculate the CO_2 emission factor. The grid emission factor is provided by Brazilian DNA and will be monitored *ex-post* during the crediting period /87/. • All data used to calculate the emission factor provided in the PDD was cross-checked with credible sources provided by Brazilian DNA /87/. According to the approved baseline methodology ACM0002 version 16.0 of 28/04/2014 /10/ the following alternative scenarios to the proposed project activity have been considered and discussed for the baseline scenario: • Scenario 1: The alternative to the project activity is the continuation of the current (previous) situation of electricity supplied by the existing power plants from the interconnected system; • Scenario 2: The proposed project activity undertaken without being registered as a CDM project activity. The approved baseline methodology ACM0002 version 16.0 of 28/04/2014 /10/ has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence

	of the proposed CDM project activity.
Findings	CAR 8: The baseline scenario was not described in accordance with the methodology ACM0002. To close out CAR 8 the PDD was revised to apply the latest version of the "Tool for the demonstration and assessment of additionality"..
Conclusion	The approved methodology has been correctly applied and RINA confirms that the assumptions and data used in the identification of the baseline scenario are justified appropriately and the confirmed baseline scenario reasonably represents what would occur in the absence of the proposed project activity.

D.8.6. Demonstration of additionality

Means of validation

According to the approved baseline and monitoring methodology "ACM0002" /10, the additionality of the project has been established applying the Tool for the demonstration and assessment of additionality, version 07.0.0, dated 23/11/2012 /13/. The above opinion of RINA to the additionality of the proposed project is further explicitly explained in the following steps.

Prior consideration of the clean development mechanism. It has been demonstrated that CDM was seriously considered before the decision to go ahead with the proposed project, in accordance with the "Guidelines on the demonstration and assessment of prior consideration of the CDM" /20/. Evidence for the serious consideration of CDM can be demonstrated through the issuance of the Brazilian Decree # 5,025 dated March 30th, 2004, which regulates the Law # 10,438/2002. This Decree states that PROINFA aims for the reduction of greenhouse gases as established by the United Nations Framework Convention on Climate Change (UNFCCC) under Kyoto Protocol, contributing to sustainable development. Therefore, the program is clearly a "Type E-" policy. Furthermore, Article 16 of the Decree # 5,025/2004 determines the creation of PROINFA account, which is administrated by Eletrobrás (energy buyer), and is composed of revenues and costs related, among others, from the CDM project activities. In order to participate in the program, project sponsor must satisfy all the requirements presented in the "PROINFA Claiming Guide" ("Guia de Habilitação") under Law # 10,438/2002 and its regulatory Decrees. Carbon credits are clearly mentioned in PROINFA Decrees, one could argue that the government had indeed expectation of receiving such values and thus they were considered in the contracted price. On the other hand, project sponsors were aware of the requirements under the program, and that carbon credit revenues would help overcome the technological and financial barriers existent at that time. The starting date of the project activity is 30/06/2004, corresponding to date when PPAs were signed /24/. At the time of the PPA signature, project sponsors knew and were aware about the conditionings and requirements established under their participation in PROINFA. Under its responsibility, the Brazilian government has demonstrated its commitment and efforts to get the PROINFA projects registered under CDM. The following timeline of key milestones was elaborated based on the verifiable evidence collected during the validation process. The information is consistent with the timeline provided in the PDD and all events show a logic sequence, which is in line with the CDM requirements and rules.

	Date	Milestone activities verified
1	26/04/2002	Publication of Law # 10,438 which creates the Alternative Electricity Sources Incentive Program (PROINFA) /55/.
2	30/03/2004	Publication of Decree # 5,025 which regulates Law # 10,438 stating that PROINFA aims for the reduction of greenhouse gases as established by the United Nations Framework Convention on Climate Change (UNFCCC) under Kyoto Protocol, contributing to sustainable development /56/.
3	30/06/2004	Signature of the Power Purchase Agreements of the project activity with Eletrobrás /24/.
4	30/08/2004	Technical Note # 006/2004 from Eletrobrás Environment Department. It presents discussion regarding CDM and carbon credit markets

				framework and Eletrobrás insertion under CDM.	
		5	13-17/06/2005	Participation of Eletrobrás team on CDM training course promoted by the Center of Wind and Solar Energy - Sério de Salvo Brito ("CRESESB" from the Portuguese Centro de Referência para Energia Solar e Eólica Sérgio de Salvo Brito).	
		6	02/08/2005	Technical Note # 007/2005 from Eletrobras Environmental Department. It presents discussion regarding carbon credits ownership and detailed analysis regarding PROINFA projects registration under CDM.	
		7	09-11/11/2005	VIII ENGEMA ("ENGEMA" from the Portuguese Encontro Nacional sobre Gestão Empresarial e Meio Ambiente). National Meeting conducted by Eletrobrás and Fundação Getúlio Vargas (FGV) regarding advantages of CDM projects in Brazil. It presented the benefits from CDM and risks associated with uncertainties after 2012.	
		8	11/11/2005	Eletrobrás internal meeting for the creation of a Technical Group regarding Kyoto Protocol and carbon credit markets.	
		9	16/11/2005	Discussion from the Technical Group created to discuss carbon credits under CDM of PROINFA projects.	
		10	17/01/2006	Official Letter # MDL/02/2006/CIMGC. Clarifications provided by the Brazilian DNA regarding starting date and retroactive carbon credits to the Mines and Energy Ministry. The Brazilian DNA informed that PROINFA projects were not allowed to receive retroactive credits, since projects eligible for retroactive credits should start operation from 01/01/2000 to 18/11/2004, which was not case of PROINFA projects.	
		11	01/06/2007	Report "PROINFA – Grupo Executivo dos Créditos de Carbono do Proinfa" prepared for presentation to Eletrobras Executive Board. The report presented estimation of emission reductions and revenues associated. It concludes with a proposal of creating internal departments for the management of CDM matters regarding PROINFA projects.	
		12	12/06/2007	2183th Eletrobrás Executive Board Meeting for discussion of Report "PROINFA – Grupo Executivo dos Créditos de Carbono do Proinfa". It creates Coordination Departments for the management, development and commercialization of carbon credits under CDM of PROINFA projects.	
		13	30/10/2008	Eletrobrás provision of CDM costs (personnel training, validation, registration fee, verification and advisory company contracting) to be included in the 2009 Annual PROINFA Plan ("PAP" from the Portuguese Plano Anual do Proinfa).	
		14	25/03/2009	Technical note DE/UEP # 108/2009 issued by PROINFA Management Unit (from the Portuguese Unidade Gestora do PROINFA) request to include in the provision of expenses related to the CDM development for PROINFA projects in the PROINFA Annual Plan ("PAP" from the Portuguese Plano Anual do Proinfa) /60/	
		15	01/02-18/02/2010	Eletrobrás internal discussions regarding the possibility of signature of a cooperation agreement with Rio de Janeiro University (COPPE/UFRJ) and	

		fulfillment of legal/normative requirements associated.
16	26/05/2010	Report prepared for presentation to the Eletrobrás Executive Board regarding the signature of a Cooperation Agreement between Eletrobrás and Rio de Janeiro University (UFRJ), scope, modules and provision of costs.
17	31/08/2010	Draft of Cooperation Agreement between Eletrobrás and Rio de Janeiro University (COPPE/UFRJ) for technical training of Eletrobrás and COPPE/UFRJ teams regarding CDM methodologies and procedures to be used in PROINFA projects.
18	07-11/2011	Publication of PDDs in Portuguese for public consultation.
19	05/10/2012	CDM validation starting with the PDD publication for Global Stakeholder Consultation at the UNFCCC's website.

In conclusion, in accordance with the requirements of the VVS /9/, RINA can confirm that the CDM was considered seriously in the decision to implement the project activity.

Identification of alternatives. According to the approved baseline methodology ACM0002 version 16.0 of 28/04/2014 /10/, as this project consists on the implementation of 12 (twelve) new grid-connected renewable power plants/units the baseline scenario is defined as "Electricity delivered to the grid by the project activity would have otherwise been generate by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

From ACM 0002, the project is applicable to grid-connected renewable energy power generation project activities that:

(a) Install a greenfield power plant;

(b) Involve a capacity addition to an existing plant(s);

(c) Involve a retrofitting of (an) existing operating plant(s)/unit(s);

(d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or

(e) Involve a replacement of (an) existing plant(s)/unit(s).

Confirmed during site visit and ANEEL licenses /21/ that the proposed project activity, option (a) is applicable.

Furthermore, the methodology is applicable under the following conditions:

(a) The project activity may include renewable energy power plant/unit 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.

The proposed project activity consists of the installation of 12 (twelve) small hydropower plants /21/.

(b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects): the existing plant 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.

Not applicable, since only new project/unit(s) is considered in the proposed project activity.

In case of hydro power plants, one of the following conditions shall apply:

(a) The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or

(b) The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of the reservoirs is increased and the power density calculated using equation (3) is greater than 4 W/m^2; or

(c) The project activity results in new single or multiple reservoirs and the power density calculated using equation (3) is greater than 4 W/m^2; or

(d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m2 , all of the following conditions shall apply:

(i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m2 ;

(ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity;

(iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m2 shall be:

a. Lower than or equal to 15 MW; and

b. Less than 10 per cent of the total installed capacity of integrated hydro power project.

In the case of the proposed project activity, option (c) is applied since the small hydropower plants result in new single reservoir with power density greater than 4 W/m^2 /20/.

SHP	**Installed Capacity (MW)**	**Reservoir Area (km^2)**	**Power Density (W/m^2)**
São Pedro	30.06	0.11	273.27
Carangola	15.30	0,0059	2,593.22
Calheiros	19.26	0.26	74.08
São Simão	27.00	0.72	37.50
Funil	22.68	1.5	15.12

São Joaquim	21.60	0.063	342.86
Fumaça IV	4.50	0.04	112.50
Jataí	30.00	0.425	70.58
Irara	30.00	2.58	11.63
Bonfante	18.24	0.55	33.16
Monte Serrat	26.89	0.55	48.88
Santa Fé	30.06	1.278	23.52

In the case of integrated hydro power projects, project proponent shall:

(a) 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

(b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.

Not applicable, since the proposed project activity is not an integrated project type.

Additionally, the methodology is not applicable to the following:

(a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site

Not applicable, since all small hydropower plants included in the proposed project activity are grid-connected power projects.

(b) Biomass fired power plants;

Not applicable, since only small hydropower plants were included in the proposed project activity

.

. The project proponent has justified the selection of the baseline scenario in line with the applied methodology and the same is deemed reasonable.
Investment analysis.
Choice of approach: Project participants applied the Option III Benchmark Analysis, in line with the applied additionality tool /12/ and with the “Guidelines on the Assessment of Investment Analysis” /14/. The simple cost analysis is not applicable because the project will generate financial and economic benefits (from electricity sales) other than CDM related income. The investment comparison analysis is not

applicable because the only alternative to the project activity is the supply of electricity from a grid, which is not to be considered a similar investment project. The financial/economic indicator used for each small hydropower plant included in the proposed project activity is the Net Present Value (NPV). The NPV of the projects were calculated considering the benchmark of the electric sector: the Weighted Average Cost of Capital (WACC).

***Benchmark selection*: t**he selected benchmark is calculated based on weighted average costs of capital (WACC) which is appropriate benchmark for the project activity and complies with the "Guidelines on the Assessment of Investment Analysis" version 5.0 /14/, as per the guidelines the project benchmark needs to be calculated based on bond rates. The WACC calculation uses data before June 2004 as the investment decision was made in 30/06/2004 /18/- /44/ The weighted average cost of capital is calculated as follows: **WACC = Wd x Kd + We x Ke**

We and **Wd** are, respectively, the weights of equity and debt typically observed in the sector. The weights were derived from the "*Guidelines on the assessment of investment analysis*", which considers a default value for CDM projects: 50% debt (**Wd**) and 50% (**We**) equity are assumed as a default value. **Kd** and **Ke** are, respectively, the cost of debt and cost of equity.

The calculation of the cost of debt Kd is given by the formula following formula:

$$Kd = [1 + (a + b + c) \times (1 - t)] / [(1 + \pi) - 1]$$

Where:

- a is the financial cost calculated as 10.97% based on the long term interest rate given by the BNDES on a 5-year average range /78/;
- b is the spread calculated as 2.50% based on the BNDES spread, as per the credit policy for power generation activities /79/;
- c is the credit risk rate calculated as 1.50%.The reference value used is the maximum credit risk defined by BNDES /80/.
- π is the inflation forecast in Brazil, calculated as 5.5% /81/;
- t is the marginal tax rate assumed to be zero since the project IRR calculation is based on assumed profit, according to Brazilian tax regulation, is not applicable /82/.

Thus, the cost of debt after tax is calculated to be 8.97%.

The Cost of Equity **Ke** represents the rate of return for equity investments, and is given by the formula:

$$K_e = ((1+R_f)/(1+I)-1)+ ß * (R_m – R_f) +R_c$$

Where:

- Rf (risk free rate): calculated based on the average of return rates of American Bond (TBond), in accordance with "Guidelines on the assessment of investment analysis" version 5.0 /14/, considering the average of values of from 1999 to 2003, the value achieved is 5.42%, in accordance with investment period and crosschecked with data available at Federal Reserve website, RINA cross-checked the values presented with the Federal Reserve home page /83/.
- R_m (equity risk premium): calculated as 6.54%, based on the historical difference between the S&P 500 returns and the long term US bonds returns. RINA cross-checked the values presented with the Damodaran home page /84/;
- R_c (estimated country risk premium): calculated as 9.71%, based on Brazilian Risk Premium for the period between 1999 and 2003. RINA cross-checked the values presented with the JP Morgan data available at IPEA home page /85/;
- ß (adjusted industry beta): calculated as 0.89%, based on the covariance of the daily return of power industries listed on S&P500 of year 2004. Beta when re-levered used the conditions of presumed (or assumed) profit regime, for which tax rate is zero when releveraging beta. The power industry type companies were selected for calculation of beta /84/ ;

- (I) US expected inflation: considered as 2.02%, assuming that relative to the US risk-free debt market EMBI+ is 0, then Brazil's EMBI+ would calculate for the added or reduced risk relative of Brazils debt markets to the US /86/.

Thus, K_e is calculated to be 18.84%.

Considering the values presented above, we have the following:

WACC = 50% x 8.97% + 50% x 18.84%

WACC = 13.91%

This benchmark is not specific to the project participants, since it was calculated based on public data considering the risks faced by any Small Hydroelectric Plants project in Brazil. Although CAPM model is generally used to calculate a benchmark on an equity basis, in this case it is accepted to be applied for a benchmark on a project basis, because it was adapted to the project using re-levered beta for condition of a presumed (or assumed) profit regime, for which tax rate is zero in re-levering.

RINA also compared the benchmark demonstrated in the PDD with a benchmark estimated by the Brazilian government at the time of PROINFA release. In order to determine the subsidized energy price for the different types of renewable projects, the Mines and Energy Ministry established 14.89% per year as the minimum economic return required for power projects. This value was made publicly available for public call and, after the public call, the final result was 13.91% per year. Although there is no information available regarding parameters considered and its calculation, this value is the same as the benchmark of the electric sector calculated by project participants.
Moreover, RINA also checked the benchmark estimated by Getúlio Vargas Foundation (FGV) for the Cost of Capital to Small Hydroelectric Plants /87/, FGV is a renowned and trustable independent centre of economic studies in Brazil, in the estimation developed by FGV the calculation of the benchmark is performed in the same way as of the above mentioned, also founded on official sources (BNDES) and specific literature. The benchmark estimated by Getúlio Vargas Foundation for a theoretical hydro power plant of up to 50 MW in Brazil are 14.7% in the year of 2005, 13.96% in 2006, 12.52% in 2007, 11.45% in 2008 and 11.88% in 2009 /87/. All these values are higher than the value of the benchmark calculated by the project participant.
RINA confirmed that the assumptions taken and the values considered for the benchmark calculation are reasonable.
Input parameters: RINA has validated the input parameters used in the investment analysis and the following steps have been followed to assess the investment analysis:

Assessment of the period between the time of the investment decision and the starting date of the proposed project activity. All the data used for the investment analysis were available at the time of the investment decision. The investment decision and the starting date of project activity are 30/06/2004 as per Power Purchase Agreements signed with ELETROBRÁS under PROINFA /24/. All data applied in the spreadsheet of investment decision were assessed by Rina and it will be explained on the table below.

The input parameters used in the financial analysis were cross-checked and all the data sources used for crosschecking were checked during the validation process. The following is carried out:

Input value	Assessment
Investment – CAPEX in R$ **JATAÍ** 77.726.750 **FUMAÇA IV** 12.526.630 **SÃO SIMÃO** 74.468.670 **BONFANTE** 102.307.160 **IRARA** 77.115.070 **MONTE SERRAT** 75.872.040 **SÃO PEDRO** 85.986.740 **CARANGOLA** 44.992.760 **CALHEIROS** 51.061.680 **FUNIL** 67.512.620 **SÃO JOAQUIM** 61.462.030	RINA compared and verified the input parameters used in the financial analysis with the parameters stated in the Eletrobras Default Budget ("OPE" from the Portuguese Orçamento Padrão Eletrobrás) submitted by each small hydro power plant in order to participate in PROINFA program /5/ and in the signed PPAs /24/.

SANTA FÉ	62.814.519

Installed Capacity in MW:

JATAÍ	30.00
FUMAÇA IV	4.50
SÃO SIMÃO	27.00
BONFANTE	19.00
IRARA	30.00
MONTE SERRAT	25.00
SÃO PEDRO	30.00
CARANGOLA	15.00
CALHEIROS	19.00
FUNIL	22.50
SÃO JOAQUIM	21.00
SANTA FÉ	30.00

RINA compared and verified the input parameters used in the financial analysis with the parameters stated in the Eletrobras Default Budget ("OPE" from the Portuguese Orçamento Padrão Eletrobrás) submitted by each small hydro power plant in order to participate in PROINFA program /5/ and in the signed PPAs /24/.

Plant Load Factor:

JATAÍ	64.17%
FUMAÇA IV	59.78%
SÃO SIMÃO	56.30%
BONFANTE	70.95%
IRARA	60.70%
MONTE SERRAT	73.00%
SÃO PEDRO	61.37%
CARANGOLA	64.20%
CALHEIROS	57.47%
FUNIL	64.62%
SÃO JOAQUIM	63.24%
SANTA FÉ	87.00%

RINA compared and verified the input parameters used in the financial analysis with the parameters stated in the Eletrobras Default Budget ("OPE" from the Portuguese Orçamento Padrão Eletrobrás) submitted by each small hydro power plant in order to participate in PROINFA program /5/ and in the signed PPAs /24/.

Power Output in MWh/year:

JATAÍ	168,630
FUMAÇA IV	23,564
SÃO SIMÃO	133,152
BONFANTE	118,085
IRARA	159,520
MONTE SERRAT	159,870
SÃO PEDRO	161,272
CARANGOLA	84,359
CALHEIROS	95,659
FUNIL	127,370
SÃO JOAQUIM	116,333
SANTA FÉ	228,636

Calculated based on 8,760 hours per year.

Energy Price: 76.92 R$/MWh

Rina verified the average of the results of the 1st Energy Auction conducted by the Brazilian government in 2003 and the adjust made to reflect the expected operation startup of the project based on Brazilian inflation targeting /81/.

Operational Costs (R$/year):

JATAÍ	3,886,338
FUMAÇA IV	626,332
SÃO SIMÃO	3,723,434
BONFANTE	5,115,358
IRARA	3,855,754

Rina verified the values through the evidence Eletrobras/Mines and Energy Ministry: "Guidelines for studies and projects for small hydropower plants" /61/.

MONTE SERRAT	3,793,602
SÃO PEDRO	4,299,337
CARANGOLA	2,249,638
CALHEIROS	2,553,084
FUNIL	3,375,631
SÃO JOAQUIM	3,073,102
SANTA FÉ	3,140,726

Connection System Cost - TUSD/TUST (R$/kW month)	Rina verified the connection fee established by the Brazilian Power Regulatory Agency (ANEEL) through its Resolutions and ANEEL Ordinance nr. 1,005 of 24/12/2003 /73/.

JATAÍ	1.56
FUMAÇA IV	1.57
SÃO SIMÃO	1.57
BONFANTE	2.77
IRARA	1.56
MONTE SERRAT	2.39
SÃO PEDRO	1.57
CARANGOLA	2.77
CALHEIROS	2.39
FUNIL	2.77
SÃO JOAQUIM	1.57
SANTA FÉ	2.39

ANEEL Inspection Fee (R$/kW.year): 284.81 R$/year	Rina verified the ANEEL Inspection Fee as per Law 9427/1996, Decree 2410/1997 /73/.
Operational lifetime of the equipment - 50 years	Rina verified the value through the evidence Eletrobras Default Budget ("OPE" from the Portuguese Orçamento Padrão Eletrobrás) submitted by each small hydro power plant in order to participate in PROINFA program /5/.
PIS - Social Contribution - 0.65%	Rina verified the Brazilian Law 10.637/2002 /74/.
COFINS - Social Security - 3.00%	Rina verified Brazilian Law 10.637/2002 /76/.
Assumed Income for Income Tax - 8.00%	Rina verified Decree No. 3.000 dated 26/03/1999 /75/.
Assumed Income for Social Tax - 12.00%	Rina verified Law No. 8.981 dated 20/01/1995 /75/.
IR - Income Tax - 25%	Rina verified Law No. 8.541 dated 23/12/1992/75/.
CSLL - Social Contribution on Net Profit - 9%	Rina verified Law No. 105 dated 10/01/2001 /75/.

Based on the information verified, RINA was able to confirm that the input parameters used in the investment analysis are reasonable and adequately represent the economic situation of the project activity at the time of the investment decision.

Calculation and conclusion: The IRR calculations were provided in the financial analysis spreadsheet: "Eletrobras_FCF_" /4/. The calculation were verified and found to be correct by RINA as well as the assumptions used in the calculation were deemed to be correct. The project NPV of the projects without CDM are negative at the time of the investment decision, as can be seen in the table below, which demonstrates that the project activity is not financially attractive to investor, which confirms that the proposed project activity in absence of the CDM benefits and compared to the benchmark 13.91% is not financially attractive.

Project	NPV
São Pedro	-77,248,723
Carangola	-40,393,244
Calheiros	-48,668,477
São Simão	-70,870,553
Funil	-60,369,666
São Joaquim	-54,100,479
Fumaça IV	-11,324,496
Jataí	-22,273,500
Irara	-68,589,649
Bonfante	-94,493,936
Monte Serrat	-60,650,266
Santa Fé	-29,712,262

Sensitivity analysis: A sensitivity analysis has been carried out for parameters contributing more than 20% revenues and costs, to demonstrate the robustness of the financial analysis. Reasonable variations of the Investment, net power, energy price and O&M costs have been considered by varying the parameters +/- 10%. The result of sensitivity analysis is presented in table below:

Scenario	São Pedro	Carangola	Calheiros	São Simão	Funil	São Joaquim
Original	-77,248,723	-40,393,244	-48,668,477	-70,870,553	-60,369,666	-54,100,479
Increase in the energy price	-71,312,063	-37,287,864	-45,147,111	-65,969,019	-55,680,962	-49,818,086
Increase in the project plant load factor (PLF)/energy assured	-71,312,063	-37,287,864	-45,147,111	-65,969,019	-55,680,962	-49,818,086
Reduction in operational costs	-75,042,756	-39,238,966	-47,358,502	-68,960,079	-58,637,648	-52,523,687
Reduction in project investment	-68,248,913	-35,684,072	-43,324,101	-63,076,283	-53,303,452	-47,667,550

Scenario	Fumaça IV	Jataí	Irara	Bonfante	Monte Serrat	Santa Fé
Original	-11,324,496	-22,273,500	-68,589,649	-94,493,936	-60,650,266	-29,712,262
Increase in the energy price	-10,457,054	-16,065,965	-62,717,483	-90,147,049	-54,765,201	-21,295,812
Increase in the project plant load factor (PLF)/energy assured	-10,457,054	-16,065,965	-62,717,483	-90,147,049	-54,765,201	-21,295,812
Reduction in operational costs	-11,003,129	-20,279,440	-66,611,282	-91,869,272	-58,703,789	-28,100,771
Reduction in project investment	-10,013,396	-14,138,222	-60,518,393	-83,785,948	-52,709,112	-23,137,774

The sensitive analysis above shows that even when parameters change in favour of the project, the NPV of the small hydropower plants of the proposed project activity without being registered under CDM are negative. In conclusion, the investment

	analysis and sensitivity assessment have shown that the proposed project is not financially attractive. ***Barrier analysis***: the additionality was demonstrated only through the investment analysis. ***Common practice analysis***: According to the "*Tool for the demonstration and assessment of additionality",* version 7.0.0*,* the common practice analysis is carried out on similar projects which are considered to be in the same region, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. For the common practice analysis, PP has compared others activities that are operational and similar to the proposed project activity, including in the analysis SHPPs located in same states of the proposed project activity, i.e. Espírito Santo, Minas Gerais, Rio de Janeiro and Goiás (geographical area), the region was chosen based on the different climate conditions of this regions of Brazil, in the specific environmental regulatory framework, the energy price subdivision per markets and different values of TUSD/TUST and it is appropriate. Since power generation is based on renewable energy the proposed project activity applies option (b) of the "Guidelines on common practice" related to the Measure: "Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies". The output produced by the proposed project activity is the renewable electricity generated by grid-connected hydropower power plants. According to the Brazilian regulation, small scale hydropower plants are defined as plants with installed capacities between 1MW and 30MW and reservoir areas no greater than 3km2 (ANEEL Resolution # 652/2003). Small hydropower plants have specific regulations regarding environment and electricity legislation/regulation, including taxes. Since the project activity is inserted in the context of the Brazilian legislation, it is reasonable to compare the proposed project activity with other small hydropower plants according to the Host Country definition of small scale power plants (and not to the CDM-EB definition of small scale). Considering that no large scale hydropower plants as defined by ANEEL was considered in this common practice analysis. Therefore, the technology that delivers the same output of the proposed project activity in the context of the measure and applicable geographical area is the electricity generation by grid-connected small hydropower plants. Large scale hydropower plants have to be considered as having different technology to the proposed project activity. **Step 1: calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.** The proposed project activity encompasses 12 (twelve) small hydropower plants resulting in 275.6 MW installed capacity. This would result in a range of 137.8 MW and 413.4 MW. However, in spite of the "Guidelines on common practice" that clearly states that step 1 shall be applied for the "project activity", PPs analyzed the installed capacity of small hydropower plants included in the proposed project activity for a conservative approach. Therefore, a range of 2.25 MW and 45.09 MW was considered. **STEP 2: Identify similar projects (both CDM and non-CDM).** Project participant considered Grid-connected renewable energy projects located in the states of Espírito Santo, Minas Gerais, Rio de Janeiro and Goiás. As the "start date" of the project activity is 30/06/2004 date when PROINFA PPAs were signed, only projects with commercial operation start-up before 30/06/2004 were considered for the purpose of common practice analysis. A total of 71 power plants, including CDM and non-CDM projects were identified. The quantity of power plants were verified trough ANEEL's data base /72/. **STEP 3: within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number Nall.** As verified on UNFCCC website, 05 projects were excluded from the list of projects identified on the Step 2 above, thus N_{all} = 66. **Step 4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number Ndiff.** As verified on ANNEL website, between the 66 projects considered, the only small hydropower plant that can be considered similar to the proposed project activity is Cachoeira do Lavrinha (former known as São Patrício), since is a small hydropower plant with 3 MW installed capacity, located in Goiás State, and started operations in April 2004 (after the new regulatory framework of the electric

	sector and before the starting date of the project activity). Therefore, N_{diff} = 65 **Step 5: Calculate factor F=1-Ndiff/Nall representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.** $N_{all} – N_{diff} = 1 < 3$ and $F = 1 – N_{diff}/N_{all} = 0.01 < 0.2$ Outcome: The proposed project activity would be a common practice within a sector in the applicable geographical area if the factor F is greater than 0.2 and Nall - Ndiff is greater than 3. As demonstrated above, the project activity is not common practice in the applicable geographical area.
Findings	CAR06 and CAR 10; : The latest version of the additionality tool was not being used in the version 1 of the PDD. CAR 9: The PDD version 1 section B.5 mentions Decree No. 5025 of 30/03/2004 which mentions that PROINFA also aims to reduce GHG emissions in the terms of the Kyoto Protocol and the UNFCCC. The PDD did not transparently explain or provide evidence that the benefits of CDM were a decisive factor in the decision to proceed with the project activity as required by VVS paragraph 108 (a). CAR 11; The dates of investment decision for each plant is not provided by the PP CAR 12; The argumentation on common practice presented in the PDD version 1 section B.5 does not follow the Guidelines on Common Practice version 02.0 CAR 26: The energy price considered for the investment analysis is not considering the inflation as stated. CL 5; It is not clear how the contracts (PPA) considered as project starting date comply with the definition of project starting date given by the CDM Glossary of Terms RINA can confirm that all data, rationales, assumptions, justifications and documentation provided by the project participants to support demonstration of additionality were update and are credible and reliable in the latest version of the PDD /1/.
Conclusion	By assessing the evidences presented and cross-checking the information contained in, RINA considers the reasonings for the proposed project additionality demonstration is credible and reasonable i.e. the proposed project has the ability to reduce anthropogenic emissions of greenhouse gases by sources below those that would have occurred in the absence of the registered CDM project activity.

D.8.7. Emission reductions

Means of validation	The formulas and factors used in the project's emissions calculations are in accordance to the approved baseline and monitoring methodology ACM0002 - "Grid-connected electricity generation from renewable sources" version 16.0 of 28/04/2014 /9/. In accordance with the applied methodology, emission reductions are calculated as follows: ERy= BEy-PEy, where: ERy – emissions reductions; BEy – baseline emissions; PEy – project emissions As in case of proposed project neither project's emissions nor leakage are accounted for the project activity: PEy= 0, thus ERy= BEy, All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration, and the mentioned data sources have been verified by RINA. **Baseline emissions.** The baseline calculations are in line with ACM0002 - "Grid-connected electricity generation from renewable sources" version 16.0 of 28/04/2014 /9/, which states that, in case of new hydro power plants, the electricity generated and delivered by the project activity to the grid, would been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations. Thus, the baseline emissions considers CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated through the following equations, properly applied by project participants: BEy = EG PJ,y * EF grid, CM,y , where: • BEy - Baseline emissions in year y (tCO2/yr); • EG PJ,y - Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr) • EF grid, CM,y - Combined margin CO2 emission factor for grid connected power generation in year y **Ex-ante calculation of emission reductions** The value of Combined margin grid emission factor was calculated based on build margin emission factor (EFgrid,BM,y) of 0.2963 tCO2/MWh and average of monthly values of operation margin emission factor (EFgrid,OM-DD,y) of 0.5837 tCO2/MWh, Considering the applied weights of 0.5 the combined grid emission factor results in EFgrid,CM,y = 0.4400 tCO2/MWh. The values of build margin and operating margin emission factor are provided by the Brazilian DNA /87/ , considering a single electricity system (National Interconnected System – from Portuguese: "Sistema Interconectado Nacional" – SIN) to calculate the CO2 emission factor, and calculated according to the "Tool to calculate the emission factor for an electricity system" /15/ applying data referent to 2014. **Ex-post calculation of emission reductions** The combined margin emission factor (EFgrid,CM,y) will be calculated ex-post using the CO2 emission factors for the build margin and the operating margin that are provided by the Brazilian DNA /15/. CO2 emission factors for the build margin and the operational margin for electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System

Operator (ONS).

Project emissions

In case of the proposed project, the project emissions, as per applied baseline methodology ACM002 - "Grid-connected electricity generation from renewable sources" version 16.0 /9/, are associated to emissions from water reservoirs of hydro power plants (PEHP,y) and are calculated according to following equation:

$P_{EHP,y} = EF_{Res} * TEG_y/1000$, where:

• $P_{EHP,y}$ - Project emissions from water reservoirs (tCO2e/yr);

• EF_{Res} - Default emission factor for emissions from reservoirs of hydro power plants in year y
(kgCO2e/MWh);

• TEG_y - Total electricity produced by the project activity, including the electricity supplied to the
grid and the electricity supplied to internal loads, in year y (MWh)

Also as defined by applied baseline methodology ACM002 version 16.0 /9/, in cases where power density is larger than 10 W/m2, the project emissions are assumed as zero. The power density (PD) is calculated according to following equation:

$PD = (Cap_{PJ} – Cap_{BL})/(A_{PJ} – A_{BL})$, where:

• PD - Power density of the project activity (W/m_2);

• Cap_{PJ} – Installed capacity of the hydro power plant after the implementation of the project activity (W);

• Cap_{BL} - Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero;

• A_{PJ} – Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m_2);

• A BL - Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m2). For new reservoirs, this value is zero.

For determining if there are project emissions involved in the proposed project activity, the power densities of the small hydropower plants were calculated as follows:

Project	**Cap_{PJ} (MW)**	**A_{PJ} (km^2)**	**PD (W/m^2)**
São Pedro	30.06	0.11	273.27
Carangola	15.30	0,0059	2,593.22
Calheiros	19.26	0.26	74.08
São Simão	27.00	0.72	37.50
Funil	22.68	1.5	15.12
São Joaquim	21.60	0.063	342.86
Fumaça IV	4.50	0.04	112.50
Jataí	30.00	0.425	70.58
Irara	30.00	2.58	11.63
Bonfante	18.24	0.55	33.16
Monte Serrat	26.89	0.55	48.88
Santa Fé	30.06	1.278	23.52

Since the power densities of the small hydropower plants included in the project activity are higher than 10 W/m^2, there are no project emissions involved in the

	proposed project activity. **Leakage** As per ACM0002 - "Grid-connected electricity generation from renewable sources" version 16.0 of 28/04/2014 /10/ no leakage emissions are considered.
Findings	CAR 13; The PDD version 1 does not describe the methods used by the Brazilian DNA to calculate the emission factor in that same section. Moreover, no records are included in section B.6.1 and B.6.3 whether the BM and OM are were calculated ex-post or ex-ante as per "Guidelines. CAR 14; CERs spreadsheets version 1 presented by the PP to the validation team did not contain formulae used and the PDD does not specify the year of data used by the Brazilian DNA for the emission factor CAR 15; Neither section B.6.1 nor B.6.3 of the PDD justify the values adopted for Cap_{BL} or $A_{BL.}$ Furthermore the ERs spreadsheets do not show formulae used in the calculation of PE. All formulae in ERs calculations must be opened for validation CL01: A resolution publish by ANEEL /8/ states that the guaranteed energy for Caçador SHP is of 13.53MW average, however Despacho N°2.755 of 29/08/2007 /13/ states that the basic project for Caçador SHP was revised to increase its installed capacity from the initial 15MW seen in Resolução N°670 from 26/12/2001 /15/ to 22.5MW. CAR 13; The PDD version 3 /1/ clearly describes the methods used by the Brazilian DNA to calculate the emission factor CAR 14; The CERs spreadsheets version 3 presented by the contain formulae used and the PDD specify the year of 2014 as data used by the Brazilian DNA for the emission factor. CAR 15; Values used for Cap_{BL} or A_{BL} in the section B.6.1 nor B.6.3 of the PDD version 3 are justified and deemed to be reasonable. CAR 27: The PDD version 3 corrected the Estimated amount of annual average GHG emission reductions as 215,363 tCO2e. CL01: PP provided official email dated 19 february 2016 from ANEEL stating the assured energy for Cotiporã and Caçador.
Conclusion	It is RINA's opinion that the equations and parameters applied in the PDD and CERs spreadsheet estimative to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the applied methodology ACM0002", "Grid-connected electricity generation from renewable sources /10/ and applicable tools.

D.8.8. Monitoring plan

Means of validation

The approved baseline and monitoring methodology ACM0002 "Grid-connected electricity generation from renewable sources" /10/ has been applied.

RINA has checked all the parameters presented in the monitoring plan against the requirements of the methodology; no deviations relevant to the project activity have been found in the plan.

Parameters determined ex-ante

The ex-ante parameters that are mentioned in the methodology are included in the PDD and are provided in compliance with the methodology:

	Data/parameter	Unit	Value applied	Assessment
1	EF_{Res}	$kgCO_2e/MWh$	90	Default emission factor for emissions from reservoirs, As per applied baseline methodology ACM0002 "Grid-connected electricity generation from renewable sources", version 16.0.0 of 28/11/2014 /10/.
2	*CapBL*	W	0	As per applied baseline

				methodology ACM0002 “Grid-connected electricity generation from renewable sources”, version 16.0.0 of 28/11/2014 /10/, CapBL for new hydro power plants are considered 0, which is the case of this project activity, as verified during the site visit and checked trough environmental /6/
3	A_{BL}	m^2	0	As per applied baseline methodology ACM0002 “Grid-connected electricity generation from renewable sources”, version 16.0.0 of 28/11/2014 /10/, ABL for new hydro power plants are considered 0, which is the case of this project activity as verified during the site visit and checked trough environmental licenses /48/.

Parameters monitored ex-post

The ex-post parameters that are mentioned in the methodology are included in the PDD and are provided in compliance with the methodology, and they will be monitored during the crediting period:

	Parameter	Description/Assessment
1	*EGfacility,y* - The net electricity delivered to the grid will be checked through the electricity meters (one main and one back-up), in accordance with national standards defined by ONS /89/.	Quantity of net electricity generation supplied by the proposed project activity to the grid in year y. This value is calculated based on assured energy of each SHP, provided by ANEEL /70/, which multiplied by 8760 hours/year, resulted in the following amounts of electricity generation by each SHP per year. The quantity of electricity delivered to the grid will be cross-checked with records for sold electricity. The quantity of electricity supplied by the project plant/unit will be measured by electricity meters that will follow ONS Grid Procedures with accuracy class 0.2 /88/.
2	*EFgrid,CM,y* - The	Combined Margin CO2 emission factor for grid

Project	$EG_{facility,y}$ (MWh/yr)
São Pedro	161,272
Carangola	84,359
Calheiros	95,659
São Simão	133,152
Funil	114,668
São Joaquim	116,333
Fumaça IV	22,864
Jataí	168,630
Irara	159,520
Bonfante	118,085
Monte Serrat	160,133
Santa Fé	143,664

		combined margin CO2 emission factor is calculated as per latest version of the “Tool to calculate the emission factor for an electricity system”, based on values of CO2 Operating Margin emission factor and values of CO2 Build Margin emission factor of the grid, which are made public available by the Brazilian DNA. Thus, the monitoring of this parameter will be ex post through periodic access to data provided by DNA /87/.	connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” of 0.4400 tCO2/MWh. Calculated based on latest values of Brazilian grid emission factor made publicly available at Brazilian DNA website /87/.
	3	*Cap*$_{PJ}$ – monitored based on ANNEL documents	Installed capacity of the hydro power plant after the implementation of the project activity. Based on nameplates of electric generation equipment /6/.

Project	**Cap_{PJ} (W)**
São Pedro	30,060,000
Carangola	15,300,000
Calheiros	19,260,000
São Simão	27,000,000
Funil	22,680,000
São Joaquim	21,600,000
Fumaça IV	4,500,000
Jataí	29,997,000
Irara	29,997,000
Bonfante	18,240,000
Monte Serrat	26,885,000
Santa Fé	30,060,000

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	4	*A*$_{PJ}$ – topographical surveys, maps, satellite pictures	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m2), based on environmental licenses /48/-/52/. The reservoir area will be monitored through topographical data in the location of the project activity (made once at the time of the project design) and the reservoir level monitored yearly by the project sponsor.

Project	**A_{PJ} (m^2)**
São Pedro	110,000

Carangola	5,900
Calheiros	260,000
São Simão	720,000
Funil	1,500,000
São Joaquim	63,000
Fumaça IV	40,000
Jataí	425,000
Irara	2,580,000
Bonfante	550,000
Monte Serrat	550,000
Santa Fé	1,278,000

Management system and quality assurance

The net electricity delivered to the grid will be hourly measurement and monthly recording and checked through the electricity meters (one main and one back-up) installed in each SHP. The meters must comply with national standards stated by ONS module 12.2 (which can be viewed through the link: http://www.ons.org.br/procedimentos/modulo_12.aspx) /88/, and industry regulation to ensure the accuracy. The calibration of meters will be conducted by a qualified organization that must comply with national standards and industrial regulations /88/ to ensure the system accuracy. The periodicity of the calibration will follow the Procedure 12.3 of ONS. According to the ONS procedures the meter's calibration shall occur every two years within the requirements of the SSC guideline. After calibration, the meters must be sealed for safety and the calibration certificates must be recorded with other monitoring records. The class of accuracy of the equipment that will be used in the project activity is under the national standards (NBR 14519 from *Associação Brasileira de Normas Técnicas* – Brazilian Association of Technical Standards).It can be viewed in the Procedure 12.2 of ONS /88/.

The electricity meters located at the substation measures the net electricity generated by the project activity, i.e. the electricity dispatched to the grid. This data are used for emission reductions calculation. Electricity dispatched to the grid can be cross-checked with sales receipt (records for sold electricity) or/and internal control. Calibration of meters located in the "connection point" of the grid shall be made every 2 years as required by ONS Grid Procedures /88/. Besides electricity measurements performed by the project owners, all the energy generated by the small hydro power plants are also monitored online by CCEE meters, also in line with Brazilian grid procedures /88/.The measurement system of CCEE has a communication system that has the function of sending the data from dispatched electricity to the grid to the CCEE. The CCEE is responsible for the monthly readings and keeping the records of the energy dispatched.

Findings

CAR 16: Section B.6.2. of the PDD version 1 does not reflect parameters ex-ante used by PPs for CERs calculations according to applied methodology.

CAR 17: The monitoring plan described in the PDD version 1 does not comply with requirements of the ACM0002 nor "Guidelines for Project Design Document (CDM-PDD)" version 01.0

CAR 18: Sections B.7.2 and B.7.3 are not completed in accordance with the requirements of Guidelines for completing the project design form

CAR 19: The PDD version 1 is not transparently indicating responsibilities and institutional arrangements for data collection, recording, archiving and reporting as required by the "Guidelines for Project Design Document (CDM-PDD)" version 01.0. and ACM0002

To close out CAR 16, 17, 18 and 19: The PDD version 3 /1/ was revised in accordance with methodology and the "Guidelines for completing the Project Design Document Form".

Conclusion

The monitoring plan is in accordance with the monitoring methodology; the monitoring plan will give opportunity for real measurement of achieved emission reductions.

RINA confirms that the monitoring arrangements described in the monitoring plan

	are feasible within the project design, and the means of implementation of the monitoring plan are sufficient to ensure the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

D.9. Duration and crediting period

Means of validation	As per published PDD (version 1), a fixed crediting period of 10 years 0 months was selected starting on 01/01/2016 or registration date on CDM, upon which takes place later.
Findings	CAR 20: The starting date of the crediting period defined in the PDD version 1 (01/01/2013) is not in line with the validation timeline. The starting date of the crediting period was revised to 01/01/2016 or registration date on CDM, upon which takes place later. CAR 20 was closed.
Conclusion	It is RINA's opinion that the project start date, expected operational lifetime, type and duration of the crediting period and star date of the crediting period described in the PDD are in accordance with the provisions of the Project Standard.

D.10. Environmental impacts

Means of validation	The potential impacts caused by the project activity implementation were analyzed in the environmental licensing phases of the related projects, being considered in the elaboration of environmental studies for the attainment of the licenses. In order to mitigate and/or compensate these impacts, the following programs and measures were implemented: **Bonfante.** Restoration of degraded areas; Monitoring of water and ichthyo fauna quality; Compensation for Mining Activities; Groundwater Level Monitoring; Banks Restoration and Erosion Process Control; Properties compensation and population improvements and management; Environmental sanitation; Recreation and leisure; Social Communication; Environmental plan for the construction; Historical heritage; Environmental Plan for Preservation and Reservoir Area Use; Reservoir Cleaning. **Calheiros.** Basic Infrastructure Project; Reservoir Silting Monitoring Program; Erosion Process Monitoring Program for the Reservoir Banks; Removal Plan for Directly Affected Areas; Restoration of Degraded Areas; Mitigation Measures for Areas with Reduced Flow; Program for Ichthyofauna Rescue; Monitoring Plan; Fauna Rescue Program; Water Quality and Limnological Monitoring Plan; Community Relationship - Social Communication Program; Municipalities Support Program; Labor Health Care Program; Archaeological Prospection Project; Land Negotiation Project; Environmental Plan for Preservation and Use of Surrounding Areas of the Reservoir; Environmental Management; Preservation Unit Strengthening Program; Amphibians and Reptiles Monitoring Program. **Carangola.** Construction Site Control Program; Restoration of Degraded Areas Program; Riparian Forest Restoration Program; Flora Rescue Program; Deforestation Program; Water Quality Monitoring Program; Ichthyofauna Preservation Program; Ichthyofauna Rescue and Monitoring Program; Transposition Mechanism Implantation Subprogram; Social Communication Program; Environmental Education Program; Negotiation Program; Recovery of the Affected Infrastructure Program; Strengthening Action Program for Community and Public Services; Socio-Environmental Monitoring Plan; Security Program; Heritage Education/Archaeological Rescue Program; Environmental Plan for the Preservation and Use of Surrounding Areas of the Reservoir; Environmental Coordination Program; Tourism and Leisure Activities Support Program; Social Assistance Plan. **Fumaça IV.** Wastewater and Waste Control Program at the Construction Site; Erosion Process Control Program; Restoration of Degraded Areas Program; Water Quality and Limnological Monitoring Plan; Riparian Forest Restoration Program; Deforestation Program; Environmental Compensation Program; Ichthyo fauna Conservation Program; Fauna Rescue Program; Monitoring Program; Social Communication Program; Environmental Education Program; Archaeological Prospection Program; Land Negotiation Program; Heritage Education Program; Strengthening Action Program for Community and Public Services; Program for

	Registration of Fumaça Waterfall Memory; Emília Waterfall Restoration Program; Environmental Plan for the Preservation and Use of Surrounding Areas of the Reservoir; Environmental Coordination Program. **Funil.** Environmental Control Program at the Construction Site; Monitoring Program for Reservoir Erosion Process; Restoration of Degraded Areas Program; Flora Rescue Program; Deforestation Program; Riparian Forest Restoration Program; Ichthyo fauna Preservation Program; Water Quality Monitoring Plan; Birds Monitoring Program; Fauna Rescue Program; Environmental Education Program; Social Communication Program; Land Negotiation Program; Heritage Education Program; Archaeological Prospection; Strengthening of Community and Public Services Support Program; Health Care Program; Social Assistance Plan; Environmental Plan for the Use of the Surrounding Areas; Socio-Economic Monitoring Plan; Reservoir Silting Monitoring Plan; Environmental Coordination Program. **Irara.** Environmental Management; Environmental Information Project; Environmental Education Project; Security; Health Care; Archaeological Heritage Rescue; Land Negotiation; Master Plan for the Reservoir and Surrounding Areas; Upstream and Downstream Flows Monitoring; Reservoir Cleaning Program; Flora Rescue Program; Riparian Forest Restoration Incentive; Fire Prevention and Fighting Program; Fauna Rescue; Ichthyofauna Rescue; Avifauna, Amphibians, Reptiles and Mammals Monitoring Program; Ichthyofauna Monitoring Program; Water Quality Monitoring Program; Aquatic Macrophytes Monitoring and Control; Creation of Preservation Units. **Jataí.** Environmental Education and Labor Health Care Program; Flora Rescue and Landscape Restoration; Fauna Monitoring and Management Program; Linear Park Creation Program; Insects Control and Monitoring Program; Restoration of Degraded Areas Program; Birds Monitoring and Management Program; Ichthyofauna Conservation and Rescue Program; Environmental Management Program; Silting Control Program; Camping and Installation Control Program; Environmental Control in the Area of Reduced Outflow; Program of Land and Improvements Negotiation; Institutional Support Program; Environmental Plan for the Preservation and Use of the Surrounding Areas of the Reservoir; Water Quality Monitoring Program; Environmental Information for the Population of the Surrounding Areas; Archaeological Heritage Survey and Rescue Program; Prevention of Accidents with Poison Animals Program. **Monte Serrat.** Restoration of Degraded Areas Program; Ichthyofauna and Water Quality Monitoring Program; Compensation for Mining Activities; Monitoring of Groundwater Level; Restoration of Banks and Erosion Processes Control; Indemnity of Properties and Management of Resettled Population; Environmental Sanitation Program; Recreation and Leisure Program; Social Communication Program; Environmental Plan for the Construction; Historical Heritage Program; Environmental Plan for the Preservation and Use of the Reservoir; Reservoir Cleaning. **SHP Santa Fé.** Restoration of Degraded Areas Program; Reservoir Cleaning and Vegetation Suppression; Environmental Compensation Program; Infrastructure Reorganization Program; Indemnity of Properties and Management of Resettled Population; Protection of River Banks and Reservoirs Program; Archaeological Heritage Preservation and Studies Program; Archaeological Heritage Survey and Rescue; Heritage Valuation Program; Recreation and Leisure Activities Support Program; Fauna and Flora Preservation Program; Ichthyofauna Conservation and Monitoring Program; Silting and Flow Monitoring Program; Limnological and Water Quality Monitoring Program; Social Communication Program; Environmental Education Program; Groundwater Monitoring Program; Mining Rights Monitoring Program; Program for Preservation and Use of the Reservoir Area. **São Joaquim.** Climate Monitoring Program; Hydrological Monitoring Program; Characterization of the Salt Water Intrusion in the Anchieta Region; Watershed Restoration Program; Restoration of Degraded Areas Program; Ichthyofauna

Monitoring Plan; Fauna Rescue Program; Social Communication Program; Leisure and Tourism Development Program; Program of Reforestation of the Surrounding Areas of the Reservoir; Local Labor Priority Program; Flora Preservation Program; Environmental Plan for the Construction; Preservation Unit Implementation Program; Archaeological Prospection Program; Land Negotiation Program.

São Pedro. Erosion Processes Prevention, Control and Monitoring Program; Water Resources Qualitative and Quantitative Monitoring Plan; Polluting Loads Survey Program for Córrego do Gordo and Jucu Braço Norte Rivers; Atmospheric Emission Control; Seeds Collection and Seeding Production Program; Flora Rescue Program; Restoration of Degraded Areas Program; Reforestation of the Surrounding Areas of the Reservoir Program; Fauna Rescue Program; Monitoring Program Ichthyofauna, Amphibians, Reptiles and Birds; Planktonic Communities Qualitative and Quantitative Monitoring Plan; Environmental Plan for the Preservation and Use of the Surrounding Areas of the Reservoir; Preservation Unit Creation Program; Environmental Education; Program; Tourism and Recreation Incentive Program; Archaeological Prospection Program.

São Simão. Environmental Education Program; Erosion Process Prevention; Control and Monitoring Program; Water Resources Qualitative and Quantitative Monitoring Plan; Restoration of Degraded Areas Program; Seeds Collection and Seeding Production Program; Flora Rescue Program; Program for the Reforestation of the Surrounding Areas of the Reservoir; Monitoring Program of Ichthyofauna, Amphibians, Reptiles, Birds and Mammals; Preservation Units Creation Program; Fauna Rescue Program; Tourism and Recreation Incentive Program; Accidents Prevention program; Archaeological Prospection Program.

All projects included in the proposed project activity are operational and have the environmental licenses presented in the table below. In cases which operational license has expired, renewal protocol is presented demonstrating that project developers requested the renewal of license and is under renewal process in environmental agency.

Operating licenses issued for the small hydropower plants included in the proposed project activity

SHP	Environmental Agency	Operation License (LO) Number	Date of LO issuance	LO Validity	Renewal Protocol
São Pedro	Instituto Estadual de Meio Ambiente e Recursos Hídricos do Espírito Santo (IEMA)	197/2014	06/08/2014	06/08/2018	Yes
Carangola	Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável de Minas Gerais (SEMAD)	089/ZM	22/10/2007	22/10/2013	Yes
Calheiros	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	686/2007	31/10/2011	31/10/2021	No
São Simão	Instituto Estadual de Meio Ambiente e Recursos Hídricos do Espírito Santo (IEMA)	273/2014	13/11/2014	13/11/2018	Yes
Funil	Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável de Minas Gerais	378/2007	27/12/2007	27/12/2011	Yes

	(SEMAD)				
São Joaquim	Instituto Estadual de Meio Ambiente e Recursos Hídricos do Espírito Santo (IEMA)	299/2012	08/11/2012	08/11/2016	No
Fumaça IV	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	739/2008	04/01/2016	04/01/2022	No
Jataí	Secretaria de Meio Ambiente e dos Recursos Hídricos de Goiás (SEMARH)	3359/2011	21/12/2011	21/12/2015	sim
Irara	Secretaria de Meio Ambiente e dos Recursos Hídricos de Goiás (SEMARH)	1185/2010	22/12/2010	10/01/2020	No
Bonfante	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	756/2008	26/06/2013	26/06/2018	Yes
Monte Serrat	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	811/2008	05/08/2014	05/08/2024	Yes
Santa Fé	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	702/2007	13/06/2013	13/06/2018	No

Since licenses were issued for the implementation of projects as mentioned above, environmental studies were conducted during the licensing process and impacts for the project implementation were considered minor, otherwise, licenses would not be issued. Copy of licenses and receipt of renewal request are available with the Project Participants and were presented to DOE during validation.

Findings	CAR 22: The date of issue and expiry date of the last operational license for Calheiros, Fumaça IV and Monte Serrat SHPs are not correct in the PDD version 1. Furthermore, most recent operational licenses or the protocol of the renewal of the operational licenses for Funil, Caçador, Jataí, Santa Fé and Bonfante SHPs were not provided. To close out CAR 22 PP provided Operating Licenses as well as confirmation of receipt of license renewal requests
Conclusion	. RINA verified that environmental aspects of the project activity were analyzed by the environmental agency when it issued the licenses /47/48/49//50/.

D.11. Local stakeholder consultation

Means of validation	Invitation letters were sent to the some of the stakeholders in August 2011, in the case of the impossibility to prove the invitation letters sent to stakeholder consultation in accordance with CIMGC Resolution # 7/2008, CIMGC Resolution # 10 dated 22/05/2013 /89/ determines that public hearings shall be conducted with the stakeholders missing. Since invitation letters were missing to some entities identified, invitation letters for the public consultation were sent to the following stakeholders in May 2014: • Government of the states of Espírito Santo, Minas Gerais, Rio de Janeiro and Goiás; • Legislative assembly of the states of Espírito Santo, Minas Gerais, Rio de Janeiro and Goiás;

- The environmental agency of Rio de Janeiro state ("INEA" from the Portuguese Instituto Estadual do Ambiente);
- Brazilian NGO Forum and Social Movements for the Environment and Development – FBOMS
- The State Attorney Generals of Goiás State (Ministério Público do estado de Goiás).

However, during the CDM validation there were doubts and misunderstandings regarding the 2nd public hearing conducted by the PPs, since not all listed stakeholders mentioned in CIMGC Resolution # 7/2008 were invited, but the missing entities involved in the project only. Furthermore, there were doubts regarding the entities to be considered in the stakeholder consultation process since there are projects included in the PDD which are located in more than one state and there are projects located in a single state of the Host Country. Also, RINA demonstrated some concerns regarding the public meeting held in May 2014, since it was centralized in Rio de Janeiro and it was not conducted in other municipalities/states were the project activity has been developed. For this reason, several consultations were made to the Brazilian DNA as demonstrated in the table below:

Date	Sender	Content
03/12/2012	Eletrobrás	Clarification request to CIMGC regarding the possibility of local stakeholder consultation ("LSC") by electronic proof of receipt.
17/12/2012	CIMGC	Non-acceptance of the consultation by electronic means and confirmation for the stakeholder consultation 15 days before the start of the CDM validation process ("GSP", Global Stakeholder Start). The Project Participant request was analyzed during the 14th Extraordinary Meeting held on 11/12/2012.
17/12/2012	Eletrobrás	The Project Participant informed to CIMGC that the CDM validation process of the proposed project activity started on 05/10/2012 and, therefore, a procedure to conducting the LSC was required.
22/07/2014	Eletrobrás	The Project Participant informed the status of the LSC process at that time, i.e. invitation letters sent in August 2011 and public meeting held in May 2014 with the missing entities not invited in August 2011.
23/07/2014	CIMGC	Confirmation that public meeting should be conducted with all stakeholders listed in CIMGC Resolution #10/2013.
07/08/2014	Eletrobrás	The Project Participant requested clarification if the public meeting could be held in one single location with all stakeholders, since resolution was not clear about this possibility.
12/08/2014	CIMGC	CIMGC confirmed that the request made by the Project Participant would be analyzed in during the 82nd Extraordinary Meeting on 26/09/2014.
10/09/2014	-	Meeting with the Project Participant (Eletrobras), the Mines and Energy Ministry ("MME", Ministério de Minas e Energia), the Environment Ministry ("MMA", Ministério do Meio Ambiente) and the Ministry of Science, Technology and Innovation ("MCTI", Ministério de Ciência, Tecnologia e Informação) to discuss the LSC held for the proposed project activity.
18/09/2014	Eletrobrás	The Project Participant sent a formal letter informing the status of the proposed project activity and the contribution of these projects to the Host Country sustainability. Also, it informed that all stakeholders listed in CIMGC Resolution #7/2008 participated somehow in the consultation process during August 2011 to May 2014.
30/09/2014	CIMGC	CIMGC suggested the temporary standstill of the CDM validation process for the preparation of invitation for local stakeholder comments following CIMGC

			Resolution #7/2008. The validation process shall start after 15 days of the invitation for local stakeholder comments at least, by the publication of the most recent version of the PDD at the UNFCCC website for consultation. In this case, the DOE shall arrange the republication of the PDD at the UNFCCC's website by explaining the reasons presented by the Brazilian DNA.
	17/10/2014	DOE	Clarification request to the CDM Team for the re-publication of the PDD at the UNFCCC's website considering the Brazilian DNA suggestion on 30/09/2014.
	04/11/2014	UNFCCC	The CDM Team confirms that amendments/corrections under the Brazilian DNA requirements could be done during the CDM validation after re-conducting the LSC without re-publishing the PDD for GSP.
	18/11/2014	Eletrobrás	The Project Participant forwarded the CDM Team response to CIMGC.
	24/11/2014	CIMGC	CIMGC confirms that the description of the new LSC process shall be included in the PDD and in the Validation Report. It informed that, although no re-publication would be done at the UNFCCC's website, all documented evidence of the new LSC shall be made public available at the UNFCCC's website during the project registration.
	08/12/2014	Eletrobrás	The Project Participant conducted a new stakeholder consultation through letters sent for comments invitation to all stakeholders listed in CIMGC Resolution CIMGC Resolution #7/2008.
	As presented in the table above, Project Participants conducted a new LSC in December 2014 by the invitation for comments of the applied stakeholders listed in CIMGC Resolution #7/2008 as indicated by CIMGC.		
Findings	CAR 23: PP presented some ARs of the local stakeholder consultation already carried out but it was not presented in a clear manner that the audit team could trace ARs to letters sent. To close out CAR 23: PP has revised the latest version of the PDD to include all the actions taken for the local stakeholder consultation, in accordance with CIMGC requirements. The ARs (Acknowledge Receipts) and the letter were provided.		
Conclusion	RINA can confirm that the process is adequate and credible for local stakeholder consultation and in compliance with the Brazilian requirements in place for the local stakeholder consultation.		

SECTION E. Internal quality control

All the revisions of the validation report before being submitted to UNFCCC for request of registration were subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent RINA instructions.
The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

SECTION F. Validation opinion

RINA Services Spa (RINA) has performed validation of the project activity "Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")*" in Brazil, with regard to the relevant requirements for CDM activities.
The review of the project design document and the subsequent follow-up interviews have provided RINA with sufficient evidence to determine the fulfillment of the stated criteria.
The host Party is Brazil. Brazil fulfills the requirements to participate in the CDM. The project is an unilateral project thus no Annex I Party is identified. The project participants are Centrais Elétricas Brasileiras S/A – ELETROBRÁS São Pedro Energia S/A, Carangola Energia S/A, Calheiros Energia S/A, São Simão Energia S/A,Funil Energia S/A, São Joaquim Energia S/A, Caparaó Energia S/A, Jataí Energética S/A, Irara Energética S/A, Bonfante Energética S/A, Monte Serrat Energética S/A, Santa Fé Energética S/A The DNA from Brazil confirmed that the project assists in achieving sustainable development.
The project correctly applies the approved baseline and monitoring methodology ACM0002: "Grid-connected electricity generation from renewable sources" (version 16.0.0)/ /10/.
By generating renewable energy from hydropower plant the project results in reduction of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.
The total emission reductions from the "Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")*" are estimated to be on an average 650,438 tCO_{2e} per year over the selected 10 years fixed crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.
The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is RINA's opinion that the project participants are able to implement the monitoring plan.
In conclusion, it is RINA's opinion that the project activity "Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group ("*bundling")*" in Brazil, as described in the PDD version 4.4 of 17/06/2016, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002: "Grid-connected electricity generation from renewable sources" (version 16.0.0) /10/.

Appendix 1. Abbreviations

Abbreviations	Full texts
ANEEL	Nacional Electrical Energy Agency (from the Portuguese Agência Nacional de Energia Elétrica)
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CDM-PCP	Clean Development Mechanism Project Cycle Procedure
CDM-PS	Clean Development Mechanism Project Standard
CDM-VVS	Clean Development Mechanism Validation and Verification Standard
CER(s)	Certified Emission Reduction(s)
CH_4	Methane
CL	Clarification Request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CRT	Coordination and Technical Control Staff
DCI	Certification Division of RINA Services Spa
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MoV	Means of Verification
MOC	Modalities of Communication Statement
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
SSC	Small Scale
UNFCCC	United Nations Framework Convention on Climate Change

Appendix 2. Competence of team members and technical reviewers

RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: / *We declare that Mr/Mrs/Ms:* — **Geisa Maria Principe Branco Saettoni**

è qualificato come[1]: / *is qualified as:* — **CDM-TEC, VAL, VER, TL**

per le seguenti aree tecniche: / for the following technical areas: — **1.1, 1.2, 13.1**

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.1	Thermal Energy generation	1
1.2	Energy generation from renewable energy sources	1
13.1	Waste Handling and Disposal	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	27-08-2009	-
9	17-07-2015	Updating qualification according AS version 6

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Lilian Cristine Poll Herrmann**
è qualificato come[1]: *is qualified as:*	**CDM (TEC, VAL, VER, -TL, FIN-EXP) VCS, GS (TEC, VAL, VER, TL, FIN-EXP) JI,SCS (TEC, FIN-EXP)**
per le seguenti aree tecniche: for the following technical areas:	**13.1, 13.2, 15.2**

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
13.1	Waste Handling and Disposal	13
13.2	Animal waste management	13
15.2	Animal waste management	15

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	06-03-08	-
10	03/06/2013	Annual revision

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms: **Thais De Lima Carvalho**

è qualificato come[1]:
is qualified as: **CDM -TEC, -VAL, -VER, -TL**

per le seguenti aree tecniche:
for the following technical areas: **1.1, 1.2, 2.1, 13.1**

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.1	Thermal energy generation	1
1.2	Renewables	1
2.1	Electricity distribution	2
13.1	Solid waste and wastewater	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	19-08-2009	-
12	15-01-2015	Added TA 2.1

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard
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TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

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RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: **Americo Junior Varkulya**

We declare that Mr/Mrs/Ms:

è qualificato come[1]: **CDM –TEC, -VAL,-VER,-TL, -FIN EXP**
is qualified as:

per le seguenti aree tecniche: **1.1, 1.2**
for the following technical areas:

AREE TECNICHE *TECHNICAL AREAS*	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.1	Thermal energy generation	1
1.2	Renewables	1

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	30-01-2009	-
13	22-12-2014	Update qualification according to AS v6.0

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:* **Mayra Rocha**

è qualificato come[1]: *is qualified as:* **CDM-FIN EXP, CDM-TEC**

per le seguenti aree tecniche: *for the following technical areas:* 1.2

AREE TECNICHE *TECHNICAL AREAS*	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.2	Renewable Energy	1

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	05-08-2015	First issue

Il Resp. QPT
Head of QPT

Rosa Scorno

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operative Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Rita Valoroso**
è qualificato come1: *is qualified as:*	**CDM -TEC, -VAL, -VER, -TL TECHNICAL REVIEWER**
per le seguenti aree tecniche: for the following technical areas:	**1.2, 3.1, 13.1**

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.2	Renewables	1
3.1	Energy demand	3
13.1	Solid Waste and waste water	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	18-01-10	-
10	06/04/2016	Update qualification TA 3.1

Il Resp. QPT
Head of QPT

Rosa Scuzzo

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
/1/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	CDM-PDD for project activity Small Hydroelectric Power Plants Projects: São Pedro, Carangola, Calheiros, São Simão, Funil, São Joaquim, Fumaça IV, Jataí, Irara, Bonfante, Monte Serrat, Santa Fé, hereafter referred to as group (“*bundling”)* in Brazil	version 01 of 11 September 2012, and version 4.1 dated 12 June 2015; version 4.2 dated 03/12/2015; version 4.2 of 30/05/2016; version 4.3 of 30/05/2016, version 4.4 of 17/06/2016	PP
/2/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	CERs calculation spreadsheets	Eletrobras_Estimated CERs_v 5_2016 05 30.xls Eletrobras_Estimated CERs_v.4_2015.05.26.xls Eletrobras_Estimated CERs_v.3_2014.07.18.xls Eletrobras_Estimated CERs_v.2_2014.05.09.xls parametros_mdl.xlsx of 07/11/2012	PP
/3/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	Benchmark calculation spreadsheet:	“WACC ElectricGen_2004” 01 of 11 11/09/2014 and version 2 09 May 2014 and version 3 dated 26 May 2015.	PP
/4/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	Financial analysis spreadsheet:	“Eletrobras_FCF_”, version 1 version 1 dated 11 September 2012 and version 2 dated 26 May 2015.	PP
/5/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	Eletrobras Default Budget ("OPE" from the Portuguese Orçamento Padrão Eletrobrás) submitted by each small hydro power plant in order to participate in PROINFA program:	• OPE bonfante.pdf • OPE Jatai.pdf • OPE Fumaça iv.pdf • OPE São Simão.pdf • OPE Irara.pdf • OPE Monte Serrat.pdf • OPE São Pedro.pdf • OPE Carangola.pdf • OPE Calheiros.pdf • OPE Funil.pdf • OPE São Joaquim.pdf • OPE Santa Fé.pdf	PP
/6/	EQAO	Pictures of generator´s nameplate Pictures of turbines nameplates	No date	
/7/	CDM Executive Board:	Clean Development Mechanism Project Cycle Procedure,	version 07 of 01/06/2014	Other
/8/	CDM Executive Board:	Clean Development Mechanism Project Standard,	version 07 of 01/06/2014	Other
/9/	CDM Executive Board:	Clean Development Mechanism Validation and Verification Standard,	version 07 of 01/06/2014	Other
/10/	CDM Executive Board:	Baseline and monitoring methodology “ACM0002”, “Grid-connected electricity	version 13.0.0 of 11/05/2012 and version and	Other

		generation from renewable sources",	version 16.0 of 28/04/2014	
/11/	CDM Executive Board:	F-CDM-PDD – Project Design Document form"	version 06.0.0 http://cdm.unfccc.int/Reference/PDDs_Forms/index.html#reg	Other
/12/	CDM Executive Board: website	Status of ratification available at < http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php>.	accessed on 14/08/2015	Other
/13/	CDM Executive Board:	Tool for the demonstration and assessment of additionality,	version 7.0.0, dated 23/11/2012	Other
/14/	CDM Executive Board:	"Guidelines on the Assessment of Investment Analysis"	version 5.0.0, dated 15/07/2011	Other
/15/	CDM Executive Board:	Tool to calculate the emission factor for an electricity system	version 02.2.0 dated 03/06/2011 and version 05.0, dated 27/11/2015.	Other
/16/	CDM Executive Board	Glossary of CDM terms	version 07, dated 23/11/2012	Other
/17/	CDM Executive Board:	Guidelines on Common Practice	version 02.0, dated 13/09/2012	Other
/18/	CDM Executive Board:	Guidelines for the Reporting and Validation of Plant Load Factors	version 01, dated 17/07/2009.	Other
/19/	CDM Executive Board:	Tool to determine the remaining lifetime of equipment	version 01 of 16/10/2009	Other
/20/	CDM Executive Board	"Guidelines on the demonstration and assessment of prior consideration of the CDM" (EB62 - Annex 13"	version 04, dated 15/07/2011.	Other
/21/	ANEEL:	Authorization for energy generation: • Authorising Resolution N° 36 of 31/01/2005 issued to SHP Jataí. • Authorising Resolution N°120 de 28/03/2005 issued to SHP Irara • Authorising Resolution N°191 de 23/05/2005 issued to SHP Funil • Authorising Resolution N°233 de 27/06/2005 issued to SHP Fumaça IV • Authorising Resolution N°132 de 11/04/2005 issued to SHP Bonfante • Authorising Resolution N°133 de 11/04/2005 issued to SHP Monte Serrat • Authorising Resolution N°121 of 28/03/2005 issued to SHP Santa Fé I • Authorising Resolution N° 234 of 28/03/2005 issued to SHP São Simao • Authorising Resolution N° 296 of 28/03/2005 issued to SHP São Pedro • Authorising Resolution N° 235 of 28/03/2005 issued to SHP Calheiros • Authorising Resolution N°236	accessed on 13/08/2015	Other

		of 28/03/2005 issued to SHP Carangola • Authorising Resolution N° 237 of 28/03/2005 issued to SHP São Joaquim		
/22/	ANEEL:	Dispatch No.2,686 of 16/11/2006 issued to SHP Jataí From the Portuguese: ANEEL: Despacho N°2.686 de 16/11/2006	accessed on 13/08/2015	Other
/23/	ANEEL:	ANEEL: Resolution No.575 of 28/10/2003 issued to SHP Jataí From the Portuguese: Resolução N°575 from 28/10/2003	accessed on 13/08/2015	Other
/24/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	Power Purchase Agremeents (PPA): • Contrato de Compra e Venda de Energia 022/2004 com Araguaia Centrais Elétricas S.A. (SHP Jataí) PPA between Eletrobrás and Araguaia Centrais Elétricas S.A. celebrated on 30/06/2004 • Contrato de Compra e Venda de Energia 024/2004 com Araguaia Centrais Elétricas S.A.(SHP Irara) PPA between Eletrobrás and Araguaia Centrais Elétricas S.A. celebrated on 30/06/2004 • Contrato de Compra e Venda de Energia 018/2004 com Eletroriver S.A. (SHP Fumaça IV) PPA between Eletrobrás and Eletroriver S.A. celebrated on 30/06/2004 • Contrato de Compra e Venda de Energia 041/2004 com BSB Energética S.A. (SHP Bonfante) PPA between Eletrobrás and BSB Energética S.A. celebrated on 30/06/2004 • Contrato de Compra e Venda de Energia 042/2004 com BSB Energética S.A.(SHP Monte Serrat) PPA between Eletrobrás and BSB Energética S.A. celebrated on 30/06/2004 • Contrato de Compra e Venda de Energia 043/2004 com BSB Energética S.A. PPA between Eletrobrás and BSB Energética S.A. celebrated on 30/06/2004	dated 30/06/2004	PP
/25/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	Addendum 005/2008 to PPA 022/2004 between Eletrobrás and Jataí Energética S.A., (SHP Jataí) From the Portuguese: Eletrobrás: Termo Aditivo 005/2008 ao Contrato 022/2004 com Jataí Energética S.A., de 12/03/2008.	dated 12/03/2008	PP

/26/	ANEEL:	Resolution No.460 of 09/09/2003 issued to SHP Irara From the Portuguese: Resolução N°460	from 09/09/2003	Other
/27/	Eletrobrás:	Addendum 005/2008 to PPA 024/2004 between Eletrobrás and Irara Energética S.A., From the Portuguese: Termo Aditivo 005/2008 ao Contrato 024/2004 com Irara Energética S.A., de 12/03/2008.	dated 12/03/2008.	Other
/28/	ANEEL:	Resolution No.361 issued to SHP Funil From the Portuguese: Resolução N°361 de 22/12/1999	of 22/12/1999	Other
/29/	ANEEL:	Resolution No.449 issued to SHP Funil From the Portuguese: Resolução N°449 de 02/09/2003	of 02/09/2003	Other
/30/	ANEEL:	Resolution No.65 issued to SHP Fumaça IV – includes Anex I From the Portuguese: Resolução N°65 from 25/05/2004 – com Anexo I	of 25/05/2004	Other
/31/	ANEEL:	Dispatch No.527 issued to SHP Fumaça IV From the Portuguese: ANEEL: Despacho N°527 de 02/03/2007	of 02/03/2007	Other
/32/	ANEEL:	Dispatch No.1,775 issued to SHP Fumaça IV From the Portuguese: ANEEL: Despacho N°1.775 de 21/06/2010	of 21/06/2010	Other
/33/	ANEEL:	Addendum 005/2008 to PPA 018/2004 between Eletrobrás and Caparaó Energia S.A., (SHP Fumaça IV) From the Portuguese: Termo Aditivo 005/2008 ao Contrato 018/2004 com Caparaó Energia S.A., de 12/03/2008.	dated 12/03/2008.	Other
/34/	ANEEL:	Resolution No.410 issued to SHP Bonfante From the Portuguese: Resolução N°410 from 06/08/2002	of 06/08/2002	Other
/35/	ANEEL:	Dispatch No.2,613 issued to SHP Bonfante From the Portuguese: ANEEL: Despacho N°2.613 de 08/11/2006	of 08/11/2006	Other
/36/	ANEEL:	Dispatch No.3,623 issued to SHP Bonfante, SPH Monte Serrat and SPH Santa Fé I From the Portuguese: ANEEL: Despacho N°3.623 de 14/12/2007	of 14/12/2007	Other

/37/	ANEEL:	Addendum 005/2008 to PPA 041/2004 between Eletrobrás and Bonfante Energética S.A.,. From the Portuguese: Eletrobrás: Termo Aditivo 005/2008 ao Contrato 041/2004 com Bonfante Energética S.A., de 12/03/2008.	dated 12/03/2008	Other
/38/	ANEEL:	Resolution No.409 issued to SHP Monte Serrat From the Portuguese: Resolução N°409 from 06/08/2002	of 06/08/2002	Other
/39/	ANEEL:	Dispatch No.125 issued to SHP Monte Serrat From the Portuguese: ANEEL: Despacho N°125 de 20/02/2004	of 20/02/2004	Other
/40/	ANEEL:	Addendum 005/2008 to PPA 042/2004 between Eletrobrás and Monte Serrat Energética S.A.,. From the Portuguese: Eletrobrás: Termo Aditivo 005/2008 ao Contrato 042/2004 com Monte Serrat Energética S.A., de 12/03/2008.	dated 12/03/2008	Other
/41/	ANEEL:	Resolution No.448 of 02/09/2003 issued to SHP Santa Fé From the Portuguese: Resolução N°448	from 02/09/2003	Other
/42/	ANEEL:	Dispatch No.183 issued to SHP Santa Fé From the Portuguese: ANEEL: Despacho N°183 de 07/04/2003	of 07/04/2003	Other
/43/	ANEEL:	Addendum 005/2008 to PPA 043/2004 between Eletrobrás and Santa Fé Energética S.A. From the Portuguese: Eletrobrás: Termo Aditivo 005/2008 ao Contrato 043/2004 com Santa Fé Energética S.A., de 12/03/2008.	dated 12/03/2008	Other
/44/	ANEEL:	Resolution # 652/2003 and Resolution # 394/1998	No date	Other
/45/	Eletrobras:	Site visit plan Brasil PCHs.pdf.	No date.	Other
/46/	AS Notícias_online	Itabiranos of Juca Rosa were wounded in BR-381 accident in Sabará, Minas Gerais From the Portuguese: Itabiranos do Juca Rosa ficam feridos em acidente na BR-381 em Sabará, Minas Gerais Website: http://asnoticiasonline.com.br/pg.php?id_cat=54&&id=3490 see also AS Notícias_online.com.br.pdf. Argument: News about accident in BR-381 which made Funil SHP inaccessible during planned site visit to	Retrieved on: 02/01/2013	Other

		the plants. Language: Portuguese						
/47/	IEMA:		São Pedro	Instituto Estadual de Meio Ambiente e Recursos Hídricos do Espírito Santo (IEMA)	197/2014	06/08/2014	06/08/2018	Other
			São Simão	Instituto Estadual de Meio Ambiente e Recursos Hídricos do Espírito Santo (IEMA)	273/2014	13/11/2014	13/11/2018	
			São Joaquim	Instituto Estadual de Meio Ambiente e Recursos Hídricos do Espírito Santo (IEMA)	299/2012	08/11/2012	08/11/2016	
/48/	SEMAD:		Carangola	Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável de Minas Gerais (SEMAD)	089/ZM	22/10/2007	22/10/2013	Other
			Funil	Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável de Minas Gerais (SEMAD)	378/2007	27/12/2007	27/12/2011	
/49/	IBAMA:		Calheiros	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	686/2007	31/10/2011	31/10/2021	Other
			Fumaça IV	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	739/2008	04/01/2016	04/01/2022	
			Bonfante	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	756/2008	26/06/2013	26/06/2018	
			Monte Serrat	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	811/2008	05/08/2014	05/08/2024	
			Santa Fé	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)	702/2007	13/06/2013	13/06/2018	
/50/	Agência Ambiental de Goiás:	• Installation License No113/2004 of 14/05/2004 issued to Araguaia Centrais Elétricas S.A. • Installation License No183/2006 of 23/05/2006 issued to Jataí Energética S.A.				Several dates		Other
/51/	SEMARH:		Jataí	Secretaria de Meio Ambiente e dos Recursos Hídricos de Goiás (SEMARH)	3359/2011	21/12/2011	21/12/2015	Other
			Irara	Secretaria de Meio Ambiente e dos Recursos Hídricos de Goiás (SEMARH)	1185/2010	22/12/2010	10/01/2020	
/52/	Ministry of Environment	*Resolution CONAMA nº 237, about Environmental Impact Assessment.* Available at:				of 19 December 1997		Other

		http://www.mma.gov.br/port/conama/res/res97/res23797.html.		
/53/	Eletrobrás and Rina:	Signed Contract for Validation Services	of 29/05/2012	Other
/54/	Presidência da República:	Lei N°10,438, de 26/04/2002 Republic Presidency: Law N° 10,438 of 26/04/2002 Creates PROINFA	accessed on 03/07/2015	Other
/55/	Presidência da República:	Decreto N° 5,025, de 30/03/2004 Republic Presidency: Decree # 5,025 of 30/03/2004 which regulates Law # 10,438.	accessed on 03/07/2015	Other
/56/	Presidência da República: .	Decreto N°5163, de 30/07/2004 Republic Presidency: Decree No.5163, of 30/07/2004 http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2004/decreto/d5163.htm Regulates the commercialization of electric energy, the process of concessions and of authorisation of eletric energy generation and other matters	accessed on 03/07/2015	Other
/57/	Presidente da República:	Lei N°10762, de 11/11/2003 Republican President: Law No.10762, of 11/11/2003 http://www.aneel.gov.br/cedoc/lei200310762.pdf Provides for the creation of the Emergency and Exceptional Support to the Concessionaires of Public Services of Electric Energy Program, alters law No.10438 and other matters.	accessed on 03/07/2015	Other
/58/	Presidência da República:	Decreto N°3.371, de 24/02/2000 Republic Presidency: Decree No.3.371, of 24/02/2000 http://www.planalto.gov.br/ccivil_03/decreto/D3371.htm Establishes, under the Ministry of Mines and Energy, the Thermoeletric Priority Program and other matters.	accessed on 03/07/2015	Other
/59/	Presidência da República:	PROINFA Annual Plan (“PAP”). The preparation of PAP was established by Decree # 5,025/2004.	accessed on 03/07/2015	Other
/60/	Eletrobras/Mines and Energy Ministry:	"Guidelines for studies and projects for small hydropower plants"	accessed on 03/07/2015	Other
/61/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	RES-811/2013, dated 14/11/2013, nominating Ms. Lilian Laubenbacher Sampaio and Mr. Jorge de Oliveira Camargo as the Eletrobras representatives to act together with UNFCCC, signing the documents, etc (Eletrobras_Representantes assinatura.pdf)	dated 14/11/2013	PP
/62/	Brasil PCH:	Minutes of meetings nominating the Directors Mr. Leonardo de Pinho Tavares and Mr. Abelardo Martins de Mello for the special purpose companies – SPCs São Simão Energia S/A; São Pedro Energia S/A; São Joaquim Energia S/A; Funil Energia S/A; Calheiros Energia S/A; Carangola	dated 14/02/2014	PP

		Energia S/A; Caparaó Energia S/A and nominating the Directors Mr. Leonardo de Pinho Tavares and Mr. Walter Nunes Seijo Neto for the special purpose companies – SPCs Jataí Energética S/A; Irara Energética S/A; Bonfante Energética S/A; Monte Serrat Energética S/A; Santa Fé Energética S/A (Brasil PCH-Representantes assinatura.pdf). Personal identity: Documento de Lilian Sampaio.pdf; Documento de Abelardo Martins.pdf; Documento de Jorge de Oliveira Camargo.pdf; Documento de Leonardo Pinheiro.pdf; Documento de Márcio Barata.pdf; Documento de Walter Seijo Neto.pdf		
/63/	Brasil PCH:	MoC signed by Centrais Elétricas Brasileiras S/A - ELETROBRÁS, São Pedro Energia S/A, Carangola Energia S/A, Calheiros Energia S/A, São Simão Energia S/A, Funil Energia S/A, São Joaquim Energia S/A, Caparaó Energia S/A, Jataí Energética S/A, Irara Energética S/A, Bonfante Energética S/A, Monte Serrat Energética S/A, Santa Fé Energética S/A,	dated 10/03/2014	Other
/64/	CDM Executive Board:	F-CDM-MOC (Modalities of Communication Statement) form	Version 02.3, dated 22/05/2015	Other
/65/	ANEEL/SIGEL	data base of the SHPs, available in Portuguese at <http://sigel.aneel.gov.br/sigel.html>	accessed on 02/07/2015	Other
/66/	ANEEL	Resolutions for geographical coordinates: • nº 604/03, dated 18/11/2003 (geographical coordinates of São Pedro) • nº 356/99, dated 22/12/1999 (geographical coordinates of Carangola) • nº 12/00, dated 13/01/2000 (geographical coordinates of Calheiros) • nº 84/01 dated 22/03/20001 (geographical coordinates of São Simão) • nº 361/99, dated 22/12/1999 (geographical coordinates of Funil) • nº 404/00, dated 18/10/2000 (geographical coordinates of São Joaquim) • nº 369/99, 29/12/1999 (geographical coordinates of Fumaça IV) • nº 2686/06, dated 16/11/2006 (geographical coordinates of Jataí) • nº 525/02, dated 24/09/2002 (geographical coordinates of	accessed on 02/07/2015	Other

		Irara) • nº 357/01, dated 27/08/2001 (geographical coordinates of Bonfante) • nº 356/01, dated 27/08/2001 (geographical coordinates of Monte Serrat) • nº 608/02, dated 05/11/2002 (geographical coordinates of Santa Fé)		
/67/	ANEEL	Resolution nº 474 dated 07/02/2012, Available in Portuguese at <http://www.aneel.gov.br/cedoc/aren2009367_2.pdf accessed on 12/01/2016 Resolution # 652/2003 Available in Portuguese at: http://www2.aneel.gov.br/aplicacoes/leitura_arquivo/arquivos/res2003652.pdf	accessed on 12/01/2016	Other
/68/	MME	Resolution 118, establishes the assured energy of the SHP São Pedro, available in Portuguese at <http://www.jusbrasil.com.br/diarios/509935/pg-111-secao-1-diario-oficial-da-uniao-dou-de-24-03-2004> accessed on 01/07/2014	of 22/03/2004	Other
/69/	ANEEL web site	information on the Assured Energy, available in Portuguese at < http://www.aneel.gov.br/aplicacoes/capacidadebrasil/energiaassegurada.asp>	accessed on 01/07/2014	Other
/70/	ANEEL	Resolution nº 169	dated 3/05/2001	Other
/71/	ANEEL:	Spreadsheets with power plants implementation available in Portuguese at: http://www.aneel.gov.br/area.cfm?idArea=37&idPerfil=2 accessed by Rina on 12/01/2016	accessed on 12/01/2016	Other
/72/	ANEEL	Ordinance nr. 1,005 of 24/12/2003 and Law 9427/1996, Decree 2410/1997 available at: http://www.aneel.gov.br/cedoc/dsp20031005.pdf	accessed on 12/01/2016	Other
/73/	Presidência da República	Law # 10.637 dated 30/12/2002: <http://www.receita.fazenda.gov.br/Legislacao/leis/2002/lei10637.htm	accessed on 12/01/2016	Other
/74/	Brazilian National Treasury	*Normative Instruction nº 10.637, dated 21 November 2002. About PIS/PASEP and Cofins taxes,* available at: http://www.receita.fazenda.gov.br/legislacao/ins/2002/in2472002.htm	accessed on 12/01/2016	Other
/75/	Brazilian National Treasury ,	*Information on legislation about presumed profit companies,* available at: • Law No. 8.981 dated 20/01/1995: <http://www.receita.fazenda.gov.br/aliquotas/ContribCsll/ApuracaAnualRecMensBascalcEst.htm>. • Law No. 8.541 dated	accessed on 12/01/2016	Other

		23/12/1992: http://www.planalto.gov.br/ccivil_03/LEIS/L8541.htm#art20 • Decree No. 3,000 dated 26/03/1999: <http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr517a555.htm>. • Law No. 105 dated 10/01/2001: <http://www.receita.fazenda.gov.br/aliquotas/ContribCsll/Aliquotas.htm>.		
/76/	Brazilian National Treasury	*Article 22 of Law nº 10684 from 15 December 1988 and Article 3 of Law nº 11727 from 23 January 1995, for social contribution on net profit,* available at: http://www.receita.fazenda.gov.br/aliquotas/ContribCsll/Default.htm	accessed on 12/01/2016	Other
/77/	Centrais Elétricas Brasileiras S/A – ELETROBRÁS	Letter sent to local steakholders dated 03/11/2011 AR from all local steakholders stating that the letter were received	accessed on 12/01/2016	PP
/78/	BNDES:	*Long Term Interest Rate, from January 1999 to December 2003*, available at: http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Custos_Financeiros/Taxa_de_Juros_de_Longo_Prazo_TJLP/index.html	accessed on 12/01/2016	Other
/79/	BNDES:	*Spread - remuneration for energy projects,* available at: http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/bnset/Set2901.pdf	accessed on 12/01/2016	Other
/80/	BNDES:	*Long term loans in Brazil for renewable energy*, available at: http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/energias_alternativas.html	accessed on 12/01/2016	Other
/81/	Central Bank of Brazil:	*Target inflation in Brazil:* Available at: http://www.bcb.gov.br/pec/metas/inflationtargetingtable.pdf	accessed on 12/01/2016	Other
/82/	Brazilian National Treasury	*Note 517 for information on legislation about presumed profit companies,* available at: http://www.receita.fazenda.gov.br/Publico/perguntao/dipj2011/CapituloXIII-IRPJ-LucroPresumido2011.pdf And dated June 2004, available at: http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr517a555.htm Normative Instruction #480 dated 15 December 2004, available at: http://www.receita.fazenda.gov.br/legislacao/ins/2004/in4802004.htm	accessed on 12/01/2016	Other
/83/	US Federal	*20-year US Treasury Yield, period*	accessed on 12/01/2016	Other

	Reserve	1977 - 2015. Available at: http://www.federalreserve.gov/econresdata/researchdata.htm		
/84/	Damodaran website	S&P500 vs 10-year T.Bond Yield, available at: http://pages.stern.nyu.edu/~adamodar/	accessed on 12/01/2016	Other
/85/	Advanced Economic Research Institute (IPEA)	*Country risk premium (EMBI+Brazil).* Select macroeconomic data, then "source JP Morgan". Available at: http://www.ipeadata.gov.br/	accessed on 12/01/2016	Other
/86/	US Federal Reserve	*TIPS Yields for 10 years,* dated 31 December 2010. Available at: http://www.federalreserve.gov/econresdata/researchdata.htm	accessed on 12/01/2016	Other
/87/	Brazilian DNA CIMGC	CO2 emission factors for electricity generation in Brazil at http://www.mct.gov.br/index.php/content/view/333605.html#ancora.	accessed on 21/06/2016	Other
/88/	ONS:	Grid Procedures available in Portuguese at:http://extranet.ons.org.br/operacao/prdocme.nsf/principalPRedeweb?openframeset,	accessed on 12/01/2016	Other
/89/	CIMGC Resolutions:	Resolution 10th January 2006 available at: http://www.normasbrasil.com.br/norma/resolucao-7-2008_109093.html Resolution n 10 dated 22/05/2013 available at: http://www.mct.gov.br/upd_blob/0226/226477.pdf	accessed on 12/01/2016	Other
/90/	Brazilian DNA	Letter of approval dated 05/09/2016 "Carta de Aprovação MCTIC - CIMGC - em Inglês - Tranche Brasil PCH.pdf"; "Carta de Aprovação MCTIC - CIMGC - em Português - Tranche Brasil PCH.pdf"	05/09/2016	Other
/91/	Eletrobras	Email with LoA.pdf	07/10/2016	PP

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

Table 1. CL from this validation

CL ID	1	**Section no.**	D.7	**Date:** 20/09/2015
Description of CL				
It was not justified the difference between the installed capacity observed from plant photographs and site visit, and installed capacity given in ANEEL's documentation for: 1) SHP Funil (installed from equipment specification: 22.68MW, installed capacity from ANEEL documentation: 22.5MW /24/ /26/); *2) SHP Bonfante (installed capacity from equipment specifications: 18.24MW, installed capacity from ANEEL documentation: 19MW /37/).* *3) SHP Monte Serrat (installed capacity from equipment specification: 25.98MW (turbines), installed capacity from ANEEL documentation: 25MW /43/)* *4) SPH Carangola the installed capacity calculated from equipment specification is 15.30MW and the one reported in PDD is 15MW (please note that documentation from ANEEL regarding their authorization has been asked below).* *5) SPH São Joaquim the installed capacity calculated from equipment specification is 21.6MW and the one reported in the PDD is 21MW.* *Furthermore, evidences of the contracted energy reported in table 14 section A.3. of the PDD version 1 for São Pedro, Carangola, Calheiros, São Simão, Funil and São Joaquim were not available. Also, no evidence of the assured energy from ANEEL were provided, in that same table, authorization of the installed capacity and transmission lines by ANEEL and project ownership (specific purpose partnership) reported on section A.3 of the PDD version 1 have not been provided for all of the SHPs mentioned above in this paragraph except Funil.*				
Project participant response				**Date:** 22/12/2015
Considering discrepancies between installed capacity observed on site-visit (equipment tag) and ANEEL documentation, the PPs clarify that differences are due to the availability of equipment at the time of purchase and reduction of the project costs/investment. In the case of hydropower plants, turbines and generators are not manufactured for a particular project design ("tailor made") as it is the case of a retrofit. Therefore, standardized equipment and structure available are used than a specific equipment customized for a project with higher cost. The slight difference of installed capacity between the sum of generating units installed at the project site and the ones authorized by ANEEL is well known in the market and acceptable by ANEEL. *According to ACM0002, installed capacity is the "installed power generation capacity of a power unit is the capacity, expressed in Watts or one of its multiples, for which the power unit has been designed to operate at nominal conditions. The installed power generation capacity of a power plant is the sum of the installed power generation capacities of its power units". Considering the ACM0002 definition, the installed capacity of SHPs was revised in the new version of the PDD (version 2) based on equipment installed capacity.* *Furthermore, the estimated electricity generation presented in PDD was revised considering the authorized assured energy of the small hydropower plants (and not the amount agreed in the PPA). Consequently, calculation of emission reductions was revised either.* *All documented evidence related to installed capacity and assured energy is publicly available as presented in the second version of the CER spreadsheet and PDD.* *Evidence regarding ownership of the small hydropower plants is also public available the Brazilian Power Regulatory Agency: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/GeracaoTipoFase.asp?tipo=5&fase=3* *PPs second response:* *PDD and CER spreadsheet were revised to consider the installed capacity of power plants based on the equipment according to equipment tag. Please also refer to the PPs response in CAR 25.*				
Documentation provided by project participant				
PDD and CER spreadsheet.				
DOE assessment				**Date:** 21/03/2016

Installed capacity and equipment's description : considering the definitions of ACM0002, the revised PDD does not consider the installed capacity (as per the equipment's specification) of the SHP Santa Fé (2 generators of 16,700 kVA).This CL remains open. (Santa Fé installed capacity) 2nd round PDD was revised and considers the installed capacity in accordance with the equipment's specification. This CL is closed.

CL ID	2	**Section no.**	D.7	**Date:** 20/09/2015
Description of CL				
Evidences of the coordinates for the SHPs São Pedro, Carangola, Calheiros, São Simão, São Joaquim, Monte Serrat and Santa Fé were not provided. *The name of the municipalities differ sometimes in sections A.2.3 and A.2.4. The precise names and the complete set of municipalities and states where which plant is located is not consistent throughout the PDD. The SHP of Irara, for example, appears in two municipalities in the IL 153/2006 /82/, and the SHP of Santa Fé appears in 4 municipalities in the IBAMA licenses /95/. Moreover there is an inconsistency into the operation license No295/2008 /65/, where it states that the municipalities where the SHP of São Simão is found are Alegre and Muniz Freire.* *Moreover, the geographical co-ordinates reported in the PDD version 1 for São Simão and Funil SHP are not complete set and no evidence was provided..*				
Project participant response				**Date:** 22/12/2015
The PP clarifies that authorizations, permits and licenses are issued by different entities. Regarding the projects location, the PP cannot clarify discrepancies between ANEEL authorization and the environmental licenses. In order to harmonize information presented in the PDD, the project location (including geographical coordinates and municipalities) was revised based on ANEEL information. Please refer to the second version of the document. *The PPs clarify that ANEEL Resolutions / Ordinances are public available and can be downloaded at: <http://biblioteca.aneel.gov.br/index.html>.*				
Documentation provided by project participant				
ANEEL website: *ANEEL Resolutions / Ordinances are public available and can be downloaded at: <http://biblioteca.aneel.gov.br/index.html>.*				
DOE assessment				**Date:** 21/03/2016
PP has revised the PDD, the municipalities and geographical coordinates are in accordance with ANEEL. *This CL is closed.*				

CL ID	3	**Section no.**	A.3	**Date:** 20/09/2015
Description of CL				
It is not clear in the PDD version 1 if there is know-how and technology transferred from Annex I Parties. Moreover, the PDD did not describe whether the technology would result in a significantly better performance than any commonly used technologies in the host Country				
Project participant response				**Date:** 22/12/2015
Since Brazil has a large hydropower potential, the know-how to be used in the project activity have been transferred to the Host Party already. Therefore, the main equipment used in the project activity (turbines and generators) were manufactured in Brazil. This contributes for the energy sector development (resulting in more research) and for the capacity increase of the industrial sector within the Host Country. *Section A.3. of the PDD was revised to include information above, following the "Guidelines for completing the Project Design Document Form". Please refer to the second version of the document.*				
Documentation provided by project participant				
Turbines and generators suppliers list.				
DOE assessment				**Date:** 21/03/2016
PDD was revised and included the information that equipment's were manufactured in Brazil. This CL is closed.				

CL ID	4	**Section no.**	A.5	**Date:** 20/09/2015
Description of CL				
PDD version 1 section A.5 states that public funding is not applicable to the project activity, however no evidence about the source of funding were presented to the DOE.				
Project participant response				**Date:** 22/12/2015

Section A.5 of the PDD was revised to include source of financing from small hydropower plants of the proposed project activity. As can be seen in the new version of the PDD (version 2), all small hydropower plants were financed by the Brazilian Development Bank ("BNDES" from the Portuguese Banco Nacional de Desenvolvimento Econômico Social). BNDES, a governmentally backed entity, is the major provider of long-term loans in the country, which lacks alternatives to long term loan providers other than governmental entities. Long-term loans are scarcely provided by commercial banks, and in general, these entities do not have competitive rates compared to the BNDES.
More information is available at: <http://www.bndes.gov.br/>.
Since the implementation of the small hydropower plants were financed by BNDEs, there is no public funding from Parties included in Annex I countries of the United Nations Framework Convention on Climate Change and the proposed project activity does not result in a diversion of Official Development Assistance (ODA).

Documentation provided by project participant

MME website: *http://www.mme.gov.br/programas/proinfa/menu/programa/programa_apoio_financeiro_bndes.html*

DOE assessment | **Date:** 21/03/2016

RINA verified in the PROINFA web site that the projects under PROINFA are financed by BNDES accessed on 18/01/2016.This CL is closed

CL ID	5	**Section no.**	C.1.1	**Date:** 20/09/2015

Description of CL

Evidences of the reported year of the start of operation of the SHPs in table 19, section B.5 of the PDD were not provided

Project participant response | **Date:** 22/12/2015

ANEEL Resolutions indicating the operation start-up of the generating units were included in the new version of the PDD (version 2) and are attached to this response. The PPs clarify that ANEEL Resolutions / Ordinances are public available and can be downloaded at: http://biblioteca.aneel.gov.br/index.html

PPs second response:

Dates of the operation startup of São Simão, Jataí and Fumaça IV were corrected based on ANEEL dispatches. Please refer to the third version of the PDD.

Documentation provided by project participant

ANEEL Ordinances authorizing the operation startup of the small hydropower plants included in the proposed project activity.

DOE assessment | **Date:** 21/03/2016

Rina verified the following ANEEL Dispatch to confirm the authorization to commercial startup of the SHPs

The dates presented in the PDD do not match the ANEEL resolution:

-SHP São Simão

-SHP Fumaça IV

-SHP Jataí (Resolution nº 2,798 of 29/07/2008)

This CL remains open.

2nd round

PDD was revised in accordance with ANEEL evidences. *This CL is closed.*

CL ID	6	**Section no.**	A.3	**Date:** 20/09/2015

Description of CL

Evidences of the area of the reservoirs São Pedro, Carangola, São Simão, Funil, São Joaquim and evidences that the areas for the reservoirs of all SHPs are measured at its surface at full capacity as requested by ACM0002 version 3 were not provided, since licenses N°686/2007, N° 183/2006 and 811/2008 /60/ /78/ /91/ and dispatches N°527 and N°2,687 /31/ /20/ do not have this information. The value of APJ for SHP Bonfante and Santa Fé in PDD do not use the exact units given in the applied methodology for all parameters of all plants

Project participant response | **Date:** 22/12/2015

Documented evidence regarding reservoir areas of small hydropower plants is publicly available. Please refer to the references mentioned in the PDD and CER spreadsheet (version 2). Tables presented in sections B.6.2 and B.7.1 were revised according to ACM0002 and the "Guidelines for completing the Project Design Document Form".

Documentation provided by project participant

the ANEEL/SIGEL web site

DOE assessment	Date: 21/03/2016
RINA has cross checked the information about the reservoir areas in the ANEEL/SIGEL web site public available at http://sigel.aneel.gov.br/sigel.html accessed on 02/07/2014. This CL is closed	

Table 2. CAR from this validation

CAR ID	01	Section no.	A.1.2	Date: 20/09/2015
Description of CAR				
The PDD has not been completed according to the latest "Guidelines for Project Design Document (CDM-PDD)" version 01.0 *For example, the PDD has been filled in with some information in Portuguese, date formatting are not according to "Guidelines" (see date of completion of PDD) and some sections were wrongly added to the PDD (see section A.3 entitled "Participants of the Project" in page 3 of the PDD version 1). The PDD must be completed in English and it must be completed using the same format without modifying its font, headings or logo, and without any other alteration to the form.*				
Project participant response				**Date:** 22/12/2015
According to decision 17/CP.7, paragraph 6 (c) (i), small scale project activities, in the case of renewable energy projects, are project activities with a maximum output capacity equivalent to up to 15 megawatts: *https://cdm.unfccc.int/Reference/COPMOP/08a01_abbr.pdf* As described in the PDD (version 1), the proposed project activity encompasses 12 (twelve) small hydropower plants, resulting in an installed capacity higher than 15 MW. Therefore, ACM0002 "Grid-Connected Electricity Generation from Renewable Sources" is applied and, thus, the "Guidelines for completing the Project Design Document form for small-scale CDM project activities" is not applicable to the proposed project activity. In spite of the above mentioned information, the PDD was revised to consider only information in English and applying the "Guidelines for completing the Project Design Document Form" (version 1.0). Please refer to the second version of the PDD. PPs second response: The PDD was revised considering the latest PDD form, version 5.0, made available in June 2014 at the UNFCCC's website. Furthermore, the PPs revised the PDD to consider the latest version of ACM0002 (version 15.0). PPs third response: The starting date of the crediting period was revised in the new version of the PDD. The latest version of ACM0002 (version 16.0.0) was also considered in this revision. Please refer to the PDD and CER spreadsheet attached to this response.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				**Date:** 21/03/2016
PDD version 4.1 is applying the latest version of the PDD template. This CAR is closed.				

CAR ID	02	Section no.	A.2.1	Date: 20/09/2015
Description of CAR				
Sections A.1, A.2.4, A.4. and A.5 of the PDD have not been filled in accordance to "Guidelines for completing the Project Design Document form for small-scale CDM project activities", version 01.0,. For example section A.1 of the PDD is not clearly describing the purpose of the project activity or explaining how the project activity will reduce GHG emissions (as requested in the "Project Standard" cited in the "Guidelines") or a brief description of the baseline as required by the "Guidelines" itself. As already raised in CAR 1 the whole PDD should be reviewed and revised as appropriate in order to comply with the "Clean Development Mechanism Project Standard, version 01.0. *Furthermore, the PDD did not explain how the following sustainable development claims is showing that the project activity contributes to sustainable development. Moreover, evidences were not available.*				
Project participant response				**Date:** 22/12/2015
As mentioned in the Project Participant (PP) response in CAR 1, the "Guidelines for completing the Project Design Document form for small-scale CDM project activities" is not applicable to the proposed project activity, since it is a large scale project. *Therefore, the PDD was revised in the light of the "Guidelines for completing the Project Design Document Form" and the "Clean Development Mechanism Project Standard". Information on how the GHG emission reduction is achieved with project activity implementation and its contribution for sustainable development, as well as the baseline scenario were included in PDD (version 2).*				
Documentation provided by project participant				

Revised PDD	
DOE assessment	**Date:** 21/03/2016
PDD version 3 is applying the latest version of the PDD template. This CAR is closed.	

CAR ID	03	**Section no.**	A.4	**Date:** 20/09/2015
Description of CAR				
The project participants listed in section A.4 of the PDD version 1 are not in accordance with Appendix 1. Also the table in section A.4. does not indicate whether some of the participants are private or public companies. Furthermore, it is sometimes indicated that the Party involved wishes to be considered a Project Participant and sometimes indicated that it does not wish to be considered a PP.				
Project participant response				**Date:** 22/12/2015
The cover page, section A.4 and Annex 1 of PDD were revised to indicate the corrected Project Participants of the proposed project activity. Please refer to the second version of the PDD."				
Documentation provided by project participant				
DOE assessment				**Date:** 21/03/2016
The latest PDD version was revised accordingly. Centrais Elétricas Brasileiras-ELETROBRÁS is a public entity and the others entities are private. Party is not considered Project Participant. Table 4 matches Appendix 1. *This CAR is closed.*				

CAR ID	04	**Section no.**	A.4	**Date:** 20/09/2015
Description of CAR				
The PP did not provide a filled in F-CDM-MOC and related supporting evidences to enable the DOE to check corporate and personal identities as per paragraphs 53 to 58 of the VVS.				
Project participant response				**Date:** 22/12/2015
The F-CDM-MOC is attached to this response together with documented evidence confirming that the representatives of companies listed in F-CDM-MOC are authorized to sign on behalf of the companies. *PPs second response:* *The documents of the MOC and evidences that the legal representatives of this company are authorized to sign on behalf of Brasil PCH were provided and are attached to this response..* *The F-CDM-MOC was updated and documented evidence to confirm specimen signatures of the F-CDM-MOC are attached to this response.*				
Documentation provided by project participant				
Revised PDD				
DOE assessment				**Date:** 21/03/2016
PP has provided the MOC and the evidences confirming that the representatives of companies are authorized to sign on behalf of the company (Eletrobras: RES-811/2013, dated 14/11/2013, nominating Ms. Lilian Laubenbacher Sampaio and Mr. Jorge de Oliveira Camargo as the Eletrobras representatives to act together with UNFCCC, signing the documents, etc <Eletrobras_Representantes assinatura.pdf> .// Brasil PCH: Minutes of meetings, dated 14/02/2014, nominating the Directors Mr. Leonardo de Pinho Tavares and Mr. Abelardo Martins de Mello for the special purpose companies – SPCs São Simão Energia S/A; São Pedro Energia S/A; São Joaquim Energia S/A; Funil Energia S/A; Calheiros Energia S/A; Carangola Energia S/A; Caparaó Energia S/A and nominating the Directors Mr. Leonardo de Pinho Tavares and Mr. Walter Nunes Seijo Neto for the special purpose companies – SPCs Jataí Energética S/A; Irara Energética S/A; Bonfante Energética S/A; Monte Serrat Energética S/A; Santa Fé Energética S/A <Brasil PCH-Representantes assinatura.pdf>) *However, the documents to confirm the specimen signatures were not provided, in accordance with VVS para.54. This CAR remains open* *2nd round* *PP has provided the documents to confirm the specimen signatures:* *- Professional identity of Mr. Walter Seijo Neto (Documento de Walter Seijo Neto.pdf)* *- Identity of Mr. Mr. Leonardo de Pinho Tavares (Documento de Leonardo Pinheiro.pdf)* *- Professional identity of Mr. Abelardo Martins de Mello (Documento de Abelardo Martins.pdf)* *- Identity of Ms. Lilian Laubenbacher Sampaio (Documento de Lilian Sampaio.pdf)* *- Identity of Mr. Jorge de Oliveira Camargo (Documento de Jorge de Oliveira Camargo.pdf)* *This CAR is closed.*				

CAR ID	05	**Section no.**	A.5	**Date:** 20/09/2015
Description of CAR				

DD version 1 states that the expected operational lifetime of the project activity is 25 years. No evidence of the stated operational lifetime for each of the plants was provided to the assessment team nor stated in the PDD as required by the latest "Tool to determine the remaining lifetime of equipment".

Project participant response | **Date:** 22/12/2015

According to the "Guidelines for completing the Project Design Document Form", section C.1.2 shall state the expected operational lifetime of the project activity in years and months. As described in the PDD, the proposed project activity applies ACM0002. Although ACM0002 does not refer to the "Tool to determine the remaining lifetime of equipment", the PP used this tool for determining the operational lifetime of the project activity as required by DOE.

Since the operational lifetime of a project is directly related to the equipment lifetime, the technical lifetime of the equipment is considered as the operational lifetime of the proposed project activity in this analysis.

According to the above mentioned tool, PP may use one of the following options to determine the (remaining) lifetime of the equipment:

Use manufacturers information on the technical lifetime of equipment and compare to the date of first commissioning;

Obtain an expert evaluation;

Use default values.

Since the proposed project activity encompasses 12 (twelve) small hydropower plants with different equipment manufacturers, option (a) is not a feasible alternative.

While analyzing option (b), the study Economical Lifetime Study and Depreciation Rates (in a free translation from the Portuguese "Estudo de Vida Útil Econômica e Taxa de Depreciação") was considered. This study was prepared by the Brazilian Power Regulatory Agency ("ANEEL" from the Portuguese Agência Nacional de Energia Elétrica), Study Center of Energy and Natural Resources ("CERNE" from the Portuguese Centro de Estudos em Recursos Naturais e Energia) and Engineering Federal School of Itajubá ("EFEI" from the Portuguese Escola Federal de Engenharia de Itajubá).

Table 2 – Hydroelectric equipment / installations lifetime based on ANEEL, CERNE and EFEI study

Equipment	Lifetime (years)
Generator	30
Power house installation	50
Penstock	30
Dam	50
Reservoir	45-100
Hydraulic turbine	40
Water intake equipment	30
Water intake structure	50

Regarding option (c), PP analyzed default data under the electric sector regulations. ANEEL Resolution nr. 367 dated 2/06/2009 approves the Equity Position Control Manual of the Electric Sector ("MPCSE" from the Portuguese Manual de Controle Patrimonial do Setor Elétrico) to be used for power utilities, authorized entities and authorized electric energy companies which have goods and installations likely to be reverted to the federal government, as it's the case of small hydropower plants in the end of the concession/authorization. MPCSE main goal is to assess assets and evaluate electric goods and installations inside Brazilian boundaries.

ANEEL Resolution nr. 474 dated 7/02/2012 establishes new depreciation rates for MPCSE as presented in the table below.

Table 3 – Hydroelectric equipment / installations lifetime based on ANEEL Resolution nr. 474/2012

Equipment	Lifetime (years)
Generator	30
Power house installation	50
Penstock	32
Dam	50
Reservoir	50
Hydraulic turbine	40
Water intake equipment	27
Water intake structure	35-50

According to the "Tool to determine the remaining lifetime of equipment", "for project activities that involve

several equipment, project participants can either determine the remaining lifetime for each equipment or determine the remaining lifetime as the most conservative of the individual remaining lifetimes of the equipment by applying any one of the options (a) to (c)". Therefore, the lifetime considered for the technical lifetime of the project activity is 27 (twenty-seven) years, i.e. the most conservative lifetime from equipment analyzed under options (b) and (c).
Documentation provided by project participant
Hydroelectric equipment / installations lifetime based on ANEEL Resolution nr. 474/2012
DOE assessment **Date:** 21/03/2016
The expected operational lifetime of the project activity is 27 years (0 months), and deemed reasonable. Revised PDD describes the project lifetime in accordance with ANEEL resolution ANEEL Resolution nº 474 dated 07/02/2012, described in its annex available at *http://www.aneel.gov.br/cedoc/aren2009367_2.pdf* , accessed on 02/07/2014. *This CAR is closed.This CAR is closed.*

CAR ID	06	**Section no.**	B.1.2	**Date:** 20/09/2015
Description of CAR				
PDD version 1 is neither using the latest available tool to calculate the emission factor for an electricity system nor the latest available tool for the demonstration and assessment of additionality. Also the titles of the tools are not exactly reported on PDD version 1.				
Project participant response				**Date:** 22/12/2015
The PDD was revised to apply the latest versions of ACM0002 methodology and referred tools. Titles were also corrected. Please refer to the second version of the document. *PPs second response* *The PDD was revised and updated the last available tools to calculate the emission factor for an electricity system (version 5) and combined tool to identify the baseline scenario and demonstrate additionality (version 6). Please refer to the third version of the PDD.*				
Documentation provided by project participant				
Revised PDD.				
DOE assessment				**Date:** 21/03/2016
PDD was revised considering the updated version of the methodology. However the latest PDD is neither using the latest available tool to calculate the emission factor for an electricity system (version 5) nor the latest available combined tool to identify the baseline scenario and demonstrate additionality (version 6). This CAR remains open. *The latest version of the PDD was revised and the last available tools were used. This CAR is closed.*				

CAR ID	07	**Section no.**	B.2	**Date:** 20/09/2015
Description of CAR				
Section B.2 of the PDD version 1 does not state whether the reservoirs are run-of-the-river or accumulation reservoirs. Furthermore, it also does not state whether the reservoirs were new or existing reservoirs, single or multiple reservoirs, with increase or without change in water volume. Since the PP has calculated in the PDD a power density, it is understood by the validation team that it is either a new reservoirs or an existing reservoirs with change in water volume but this, as well as the information on whether they are single or multiple reservoirs, run-of-the-river or accumulation, needs to be clearly stated and evidenced in section B.2 of the PDD. *The PDD did not justify all applicability condition of the methodology(ies). The documentation included in Appendix 3 of the PDD was not provided to validation team.*				
Project participant response				**Date:** 22/12/2015
Section B.2 of the PDD was revised to include applicability conditions of the latest version of ACM0002 and how the proposed project activity satisfies these applicability conditions. Please refer to the second version of the document.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				**Date:** 21/03/2016
Revised PDD describes the applicability conditions of the methodology ACM0002. Power plants are Greenfield with new single reservoir. This CAR is closed.				

CAR ID	08	Section no.	B.5	Date: 20/09/2015
Description of CAR				
According to the "Tool for the demonstration and assessment of additionality" version 07.0.0 /51/, paragraph 8, project activities that apply this tool in context of approved consolidated methodology ACM0002, only need to identify that there is at least one credible and feasible alternative that would be more attractive than the proposed project activity. *The baseline scenario is described in the applied methodology and no further analysis is required as per paragraph 115 of the VVS. The PDD version 1 correctly described the baseline scenario in section B.4. However, section B.5 of the PDD version 1 does not seem to be applying this requirement and a list of different alternatives (including investment in bonds, stock markets or other which do not supply comparable services to the project activity) is reported when applying step 1 of the "Tool".*				
Project participant response				**Date:** 22/12/2015
Section B.5 of the PDD was revised to apply the latest version of the "Tool for the demonstration and assessment of additionality". Please refer to the latest version of the document.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				**Date:** 21/03/2016
PDD was revised accordingly. The baseline scenario is described in accordance with the methodology ACM0002. In accordance with VVS para122. where the baseline scenario is prescribed in the approved methodology, no further analysis is required. This CAR is closed.				

CAR ID	09	Section no.	B.5	Date: 20/09/2015
Description of CAR				
The PDD version 1 section B.5 mentions Decree No. 5025 of 30/03/2004 which mentions that PROINFA also aims to reduce GHG emissions in the terms of the Kyoto Protocol and the UNFCCC. *The PDD did not transparently explain or provide evidence that the benefits of CDM were a decisive factor in the decision to proceed with the project activity as required by VVS paragraph 108 (a). That is, who were the decision makers of the project and how did the benefits of CDM impact on their decision to proceed with the project activity. According to the PDD page 14, Paragraph c) of item I of Article 16 of Decree No. 5025 of March 2004, as amended by Decree No. 5882 of August 2006, foresees the use of the resources of CDM as a component for the formation of PROINFA account used for payment of power purchase from projects contracted by the Program. However, in examining Decrees No. 5025 and No.5882 the validation team only sees that the amended Decree states that the revenues from CDM are administered by Eletrobrás in the PROINFA account and that Eletrobrás is responsible for the payment of energy producers under the program. Article 16 of the Decree does not explicitly say that the benefits of CDM will be used to pay for the purchase of power from projects contracted by the Program as stated in the PDD pages 14 and 15. Furthermore the amendment to the Decree No.5025 given by the Decree No.5882 was only carried out in 2006, which is after the claimed start date of the Project Activity in the PDD version 1 (30/06/2004).* *Furthermore, about the starting date of the project activity the PP has not demonstrated with evidences awareness of CDM, prior to the project's starting date*				
Project participant response				**Date:** 22/12/2015

The latest version of the CDM Project Standard (version 5.0) states:

"If the start date of a proposed CDM project activity, as determined in paragraph 57 below, is prior to the date of publication of the PDD for the global stakeholder consultation, project participants shall demonstrate that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity".

The "start date" of proposed project activity is considered as the date when the PROINFA PPAs were signed between the project sponsors (special purpose companies – SPCs) and Eletrobras. This event must be considered as the project "start date", since SPCs committed to deliver the amount of electricity established in the contract, and in the case of non-performance, it would incur in relevant penalties.

In order to demonstrate CDM consideration and continuing real actions to secure the CDM status, the PP analyzed the events regarding PROINFA legislation / regulation and selected projects.

Since 2001, the government has stated its strong support for renewable energy sources. On April 26th, 2002, it approved Law nr. 10,438, creating the Alternative Electricity Sources Incentive Program (PROINFA). The creation of PROINFA clearly indicates that, without specific support, the renewable sources and the small projects would hardly otherwise be implemented.

Evidence for the serious consideration of CDM can be demonstrated through the issuance of the Brazilian Decree nr. 5,025 dated March 30th, 2004, which regulates the Law nr. 10,438. This Decree states that PROINFA aims for the reduction of greenhouse gases as established by the United Nations Framework Convention on Climate Change (UNFCCC) under Kyoto Protocol, contributing to sustainable development. Therefore, the program is clearly a "Type E-" policy. Furthermore, Article 16 of the Decree nr. 5,025/2004 determines the creation of PROINFA account, which is administrated by Eletrobrás (energy buyer), and is composed of revenues and costs related, among others, from the CDM project activities.

In order to participate in the program, project sponsor must satisfy all the requirements presented in the "PROINFA Claiming Guide" ("Guia de Habilitação") under Law nr. 10,438/2002 and its regulatory Decrees.

Carbon credits are clearly mentioned in PROINFA Decrees, one could argue that the government had indeed expectation of receiving such values and thus they were considered in the contracted price. On the other hand, project sponsors were aware of the requirements under the program, and that carbon credit revenues would help overcome the technological and financial barriers existent at that time.

Further evidence of CDM consideration is the signature of the PPA. Regulations that rules PROINFA PPAs are Law nr 10,438/2002 and regulatory Decrees. The PROINFA PPAs were signed in 2004. In the case of the proposed project activity, PPAs were signed on 30/06/2004, i.e. after the publication of Decree nr. 5,025/2004.

Therefore, at the time of the PPA signature, project sponsors knew and were aware about the conditionings and requirements established under their participation in PROINFA.

On the other hand, the Brazilian government has demonstrated its commitment and efforts to get the PROINFA projects registered under CDM since the program was launched.

Considering information presented above, the investment decision of the proposed project activity were taken by the project developers (special purpose companies – SPCs) motivated by the PROINFA incentives, which included CDM revenues. SPCs are/were aware and in line with the PROINFA rules and requirements, and the Brazilian government demonstrated continuing efforts to get the PROINFA projects registered under CDM since the creation of the program.

The PPs also revised the PDD to include a timeline of events in order to demonstrate that continuing and real actions were taken to secure the CDM status.

The demonstration of additionality was revised in the light of step 2 "Investment Analysis" of the latest version of the "Tool for the demonstration and assessment of additionality" (version 7.0.0) and "Guidelines on the assessment of investment analysis" (version 5). Please refer to the second version of the document. The PPs also attached spreadsheets of project cash flow and benchmark calculation, and respective documented evidence.

Documentation provided by project participant	
timeline of events in order to demonstrate that continuing and real actions were taken to secure the CDM status.	
DOE assessment	**Date:** 21/03/2016

PP has included a timeline in the revised PDD, with the evidences to demonstrate the CDM consideration, considering that the project starting date is before August 2008. *This CAR is closed.*

CAR ID	10	**Section no.**		**Date:** 20/09/2015
Description of CAR				

The demonstration of the eight barriers mentioned in the PDD does not comply with the Tool for the demonstration and assessment of additionality version 07.0.0, the Guidelines for Objective Demonstrations and Assessment of Barriers version 01 and the "Guidelines for completing the project design document form" version 1.

With regards to the barrier entitled "Regulatory Framework for Renewable Energy before Proinfa and CDM" the PDD mentions in this item some regulations which would have minimized some barriers. No argumentation on any specific barrier was presented.

With regards to the barrier entitled "Typicality and Constraints of Purchase and Sale of Energy Contracts" the PDD refers to a higher competitiveness of natural gas thermal power plants in relation to the renewable technologies, due to the benefits given to the thermoelectric sector by the Brazilian government Thermoeletric Priority Program established in 2000 /57/ during the severe energy crisis in Brazil. According to VVS version 3, paragraph 93 (a) "National and/or sectoral policies or regulations that give comparative advantages to more emissions-intensive technologies or fuels over less emissions-intensive technologies or fuels, otherwise known as policies that increase GHG emissions, and are called type E+. For this type of national and/or sectoral policies or regulations, only those that have been implemented before adoption of the Kyoto Protocol by the COP (decision 1/CP.3, 11 December 1997) shall be taken into account when identifying a baseline scenario. If such national and/or sectoral policies were implemented since the adoption of the Kyoto Protocol, the baseline scenario shall refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place. Therefore this policy can not be considered when carrying out the barrier analysis when identifying the baseline scenario.

The claimed barrier number 3, entitled "Financing funds", starts in the PDD version 1 by describing the barriers caused by the international crisis and the domestic macroeconomic environment to the energy sector in Brazil. However, it seems that these barriers are common to both the project activity being implemented and to the alternative scenario established by the methodology although the thermoelectric plants of the latter had incentives introduced in 2000 which, as seen above in the barrier called "Typicality and Constraints of Purchase and Sale of Energy Contracts", are considered E+ policies and only those that have been implemented before adoption of the Kyoto Protocol by the COP (decision 1/CP.3, 11 December 1997) can be taken into account when identifying a baseline scenario. Furthermore, it seems that the PDD is trying to explain an investment barrier however it does not explicitly state what the barrier to the type of the project activity is.

The validation team understands that the claimed barriers number, number 4 ("Conditions of Pricing and Energy Sales Deadline"), number 5 ("Transaction Costs and Conditions of Order of the NSO"), number 6 ("Absolute cost advantages in favor of larger-scale technologies in the national electrical matrix" – please also note that in this section of the PDD the PP seems to mistake wind energy with SHP energy generation) and number 8 ("Reduction of technological barriers…") can all be monetized and therefore their demonstration should follow the guidance 4 of the Guidelines for Objective Demonstrations and Assessment of Barriers. According to this guidance, they should not be identified as barriers for implementation of the project while conducting the barrier analysis, but rather should be considered in the framework of investment analysis.

With regards to the claimed barrier number 7 ("Risk Reduction through the CDM and PROINFA") it is not clear and it has not been evidenced in the PDD version 1 how the risks cited represent a barrier particular to the type of project being implemented.

Furthermore, this section of the PDD talks about how PROINFA alleviates these risks but the role of CDM in alleviating the barriers (which is the actual requirement of the additionality tool and the guidelines for the objective demonstration and assessment of barriers) is not transparently justified and evidenced.

Project participant response	**Date:** 22/12/2015

The demonstration of additionality was revised in the light of step 2 "Investment Analysis" of the latest version of the "Tool for the demonstration and assessment of additionality" (version 7.0.0) and "Guidelines on the assessment of investment analysis" (version 5). Please refer to the second version of the document. The PPs also attached spreadsheets of project cash flow and benchmark calculation, and respective documented evidence.

Documentation provided by project participant	
DOE assessment	**Date:** 21/03/2016

Barrier analysis was excluded in the revised PDD. PDD version 2 applies the investment analysis. *This CAR is closed*

CAR ID	11	Section no.	B.4.6.2	Date: 20/09/2015
Description of CAR				
The dates of investment decision for each plant is not provided by the PP.				
Project participant response				**Date:** 22/12/2015
The investment decision of the proposed project activity is considered as the “start date”, since the project sponsors committed themselves to deliver the electricity amount agreed under PPAs, otherwise, it would incur in relevant penalties established in the contract.				
Documentation provided by project participant				
DOE assessment				**Date:** 21/03/2016
PP has considered the signature of the Power Purchase Agreement, as the project start date. PPA terms/penalties can be regarded as a firm commitment and real action from PPs towards project implementation and associated expenses. This CAR is closed.				

CAR ID	12	Section no.	B.4.6.4	Date: 20/09/2015

Description of CAR

The argumentation on common practice presented in the PDD section B.5 neither follows paragraph 57 of the Tool for the Demonstration and Assessment of Additionality version 07.0.0 nor the Guidelines on Common Practice version 02.0. Present the common practice argumentation describing how each step of the "Tool" and the "Guideline" is applied, providing evidences and the outcome of each step as required by the "Guidelines for completing the project design document form" version 1.

Project participant response **Date:** 22/12/2015

According to the "Tool for the demonstration and assessment of additionality", the "Guidelines on common practice" shall be applied while conducting the common practice analysis.

Therefore, the common practice analysis was revised in the new version of the PDD (version 2) following the latest version of the "Tool for the demonstration and assessment of additionality" (version 7.0.0) and the "Guidelines on common practice" (version 2.0) as described above.

Spreadsheet of common practice information were attached to this response.

Documentation provided by project participant

Spreadsheet of common practice analysis

DOE assessment **Date:** 21/03/2016

The common practice was revised in the second version of the PDD in accordance with the "Tool for the demonstration and assessment of additionality" (version 7.0.0) and the "Guidelines on common practice" (version 2.0).

- The project "start date" is the date when PROINFA PPAs were signed, i.e 30/06/2004. The GSP started on 05/10/2012. Therefore, only projects with commercial operation start-up before 30/06/2004 (the earliest date) are considered for the purpose of common practice analysis.

In the analysis PP has found 72 SHPs, however "Areia Branca" has started operation in 2010 after the start date of the project.

RINA has cross checked the information in the ANEEL web site (http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoGeracaoTipo.asp?tipo=1&ger=Hidro&principal=Hidro) and the spreadsheet for common practice.

Step 3: within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}

-In this analysis 5 SHPs were excluded, confirmed in the UNFCCC web site.

Step 4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff}.

The N_{diff} was calculated considering the different technologies:

- projects which use other source of electricity generation than water

- projects classified as large scale under Brazilian regulation (projects with installed capacity up to 30 MW installed capacity and/or reservoir area greater than 3km^2), as per ANEEL Resolution # 652/2003

- projects with operation start-up in the old regulatory framework of the electric sector (before March 2004). (legal regulations)

The of the source of electricity generation had been already considered in the step 2 and therefore does not need to be included in the Step 4.

The only small hydropower plant that can be considered similar to the proposed project activity is Cachoeira do Lavrinha (former known as São Patrício), since is a small hydropower plant with 3 MW installed capacity, located in Goiás State, and started operations in April 2004 (after the new regulatory framework of the electric sector and before the starting date of the project activity).

Due to the correction in the step 2 the factor F=1-Ndiff/Nall has to be updated.

This CAR remains open.

2nd response

PP has revised the PP and excluded the Power Plant Areia Branca.

Nall = 66 and Ndiff = 65. Therefore:

Nall – Ndiff = 1 < 3 and

F = 1 – Ndiff/Nall = 0.01 < 0.2

As factor F is lower than 0.2 and Nall-Ndiff is lower than 3, it can be concluded that the proposed project activity is not common practice.This CAR is closed

CAR ID	13	Section no.		Date: 20/09/2015
Description of CAR				
The option for the calculation of EGPJ,y applied in the project activity was not documented in the PDD version 1, section B.6.1, as required by page 11 of the applied methodology and section B.6.1 of the "Guidelines for completing the project design document form" version 1 . *Furthermore, the PDD version 1 does not describe the methods used by the Brazilian DNA to calculate the emission factor in that same section. Moreover, no records are included in section B.6.1 and B.6.3 whether the BM and OM are were calculated ex-post or ex-ante as per "Guidelines.*				
Project participant response				**Date:** 22/12/2015
The PDD was revised to include explanation of methodological choices and assumptions for EGPJ,y parameter calculation according to the "Guidelines for completing the Project Design Document Form" and following ACM0002. *The PP clarifies that data published by the Brazilian DNA was considered for determination of the CO2 emission factor of the grid. In the case of the operating margin (OM), the Brazilian DNA considers option (c) "dispatch data analysis OM", which does apply for historical data and, thus, requires hourly monitoring. Therefore, the ex-post data vintage is used in the proposed project activity. Detailed description regarding CO2 emission factor of the grid choices and equations were included in the PDD (version 2).*				
Documentation provided by project participant				
Revised PDD and the Eletrobras_Estimated CERs spreadsheet.				
DOE assessment				**Date:** 21/03/2016
PDD was revised and included the assumptions for the calculation of $EG_{PJ,y}$. Data for the emission factor was included in accordance with the guidelines.This CAR is closed.				

CAR ID	14	Section no.	B.7.1	Date: 20/09/2015
Description of CAR				
Further explanation is required about uncertainties of the generation in the project activity since it is not clear who the surplus of electricity generated over and above the contracts (if this happens) will be sold to or how the surplus of electricity generated will be treated. These issues were not clear in the appropriate sections of the PDD (B.5., B.6.3. and B.7). *Moreover the ERs spreadsheets presented by the PP to the validation team did not contain formulae used and the PDD does not specify the year of data used by the Brazilian DNA for the emission factor as required by the Tool to calculate the emission factor for an electricity system version 3.*				
Project participant response				**Date:** 22/12/2015
Considering the DOE comments, the electricity dispatched to the grid and, consequently, the emission reduction generation were revised to apply the assured energy of power plants, and not the amount established in the signed Power Purchase Agreements (PPAs), Please refer to the second version of the PDD and CER spreadsheet. *Documented evidence for the assured energy is publicly available as presented in the CER spreadsheet and the PDD (version 2).* *Detailed description regarding the methodological choices and source of data for the calculation of the CO2 emission factor of the grid was included in the second version of the PDD.* *PPs second response* *Since the Brazilian DNA has recently published 2013 data of the CO2 emission factor of the operating and build margin, the calculation of estimated emission reductions was updated. Please refer to the third version of the CER spreadsheet and PDD.*				
Documentation provided by project participant				
Revised PDD and the Eletrobras_Estimated CERs spreadsheet.				
DOE assessment				**Date:** 21/03/2016
PDD version 2 presents the parameters Cap_{BL} and A_{BL} in accordance with the applied methodology.This CAR is closed				

CAR ID	15	Section no.	B.6.3	Date: 20/09/2015
Description of CAR				
Neither section B.6.1 nor B.6.3 of the PDD justify the values adopted for CapBL or ABL. Furthermore the ERs spreadsheets do not show formulae used in the calculation of PE. All formulae in ERs calculations must be opened for validation (i.e. auditable) and all sources of data as well as assumptions should be mentioned in PDD section B.6.3. Moreover, the ERs spreadsheets is not completely available in English language				

Project participant response	**Date:** 22/12/2015
According to ACM0002 methodology, Cap_{BL} and A_{BL} parameters are considered 0 (zero) in the case of new hydropower plants, which is the case of the proposed project activity. *Detailed description of calculation of baseline emissions, project emissions and leakage were included in the PDD (version 2). CER spreadsheet was also revised.*	
Documentation provided by project participant	
PDD (version 2). CER spreadsheet.	
DOE assessment	**Date:** 21/03/2016
PDD version 2 presents the parameters Cap_{BL} and A_{BL} in accordance with the applied methodology.This CAR is closed	

CAR ID	16	**Section no.**	B.6.2	**Date:** 20/09/2015
Description of CAR				
Section B.6.2. does not reflect parameters ex-ante used by PPs for ERs calculations according to applied methodology and "Guidelines for Project Design Document (CDM-PDD)" version 01.0				
Project participant response				**Date:** 22/12/2015
Section B.6.2 of the PDD was revised according to the "Guidelines for completing the Project Design Document Form". Please refer to the second version of the document.				
Documentation provided by project participant				
Revised PDD				
DOE assessment				**Date:** 21/03/2016
Section B.6.2 was revised in accordance with the "Guidelines for completing the Project Design Document Form". This CAR is closed.				

CAR ID	17	**Section no.**	B.7.1	**Date:** 20/09/2015
Description of CAR				
The monitoring plan described in the PDD version 1 does not comply with requirements of the ACM0002 version 13 nor "Guidelines for Project Design Document (CDM-PDD)" version 01.0. For example, the applied methodology requires EGfacility,y to be continuously measured and recorded at least monthly and section B.7.1 of the PDD version 1 only states that the "monitoring frequency" of this parameter is monthly. The parameters CAPPJ and APJ are not included in the list of parameters monitored. Furthermore, some aspects are not clearly described in section B.7.1 (for example, it is not described how the energy imported from the grid will be monitored; it is not clear how the PPs will use "receipt" for crosschecking sold electricity) - nor in section B.7.2 (i.e. the measurement points and meter locations - main and backup; the fact that the plants are monitored from a central office - as observed during site visit) for each of the SHPs in the PDD version 1.				
Project participant response				**Date:** 22/12/2015
The PDD was revised to include detailed description regarding monitored parameters required by ACM0002. Please refer to the second version of the document.				
Documentation provided by project participant				
Revised PDD.				
DOE assessment				**Date:** 21/03/2016
Parameters CAP_{PJ} and A_{PJ} were included in the monitored parameters. For the parameter $EG_{facility,y}$ methodology requires the "Cross check measurement results with records for sold electricity" However, PDD describes that the cross will be done only if available, not in accordance with the methodology.This CAR remains open. 2nd response The PDD was revised and the cross check is described in accordance with the methodology (Cross check measurement results with records for sold electricity). However, the methodology was updated and the updated version describes the $EG_{facility,y}$ should be either monitored using bi-directional energy meter or calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid; and (b) the quantity of electricity the project plant/unit from the grid. This CAR remains open. The monitoring plan presented in the revised PDD considered the latest version of ACM0002 (version 16.0.0). This CAR is closed.				

CAR ID	18	**Section no.**	B.7.3	**Date:** 20/09/2015
Description of CAR				

Sections B.7.2 and B.7.3 are not completed in accordance with the requirements of : "Guidelines for completing the Project Design Document form for small-scale CDM project activities", version 01.0".	
Project participant response	**Date:** 22/12/2015
The PDD was revised following the Guidelines for completing the Project Design Document Form". Please refer to the second version of the document.	
Documentation provided by project participant	
Revised PDD.	
DOE assessment	**Date:** 21/03/2016
PDD was revised in accordance with the "Guidelines for completing the Project Design Document Form". This CAR is closed.	

CAR ID	19	**Section no.**		**Date:** 20/09/2015
Description of CAR				
It is not clear into the PDD the institution and the department which will be responsible for the "electronic media at the operational system to be installed" to store data collected, as per : "Guidelines for completing the Project Design Document form for small-scale CDM project activities", version 01.0".. Also it is not clear in PDD whether "All data collected as part of monitoring should be archived electronically and kept at least for two years after the end of the last crediting period." as per ACM0002 version 13.0.0				
Project participant response				**Date:** 22/12/2015
Information regarding recording period of monitored data was included in the PDD (version 2) as required by ACM0002. *PPs second response:* *Considering the DOE comments, the PPs revised the Monitoring Plan presented in the PDD in order to include information regarding data archiving for two years after the end of the crediting period or the last issuance of CERs as required by ACM0002. Please refer to the second version of the document.*				
Documentation provided by project participant				
Revised PDD.				
DOE assessment				**Date:** 21/03/2016
It is not clear in the revised PDD The provisions to ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later; in accordance with para 64 (b) of Project Standard version 7.This CAR remains open *2nd round:* *Revised PDD describes the archiving time in accordance with the applied methodology.This CAR is closed.*				

CAR ID	20	**Section no.**	B.7.3	**Date:** 20/09/2015
Description of CAR				
The starting date of the crediting period defined in the PDD version 1 (01/01/2013) is not in line with the validation timeline.				
Project participant response				**Date:** 22/12/2015
The starting date of the crediting period was revised for the expected date of registration under CDM, i.e. 01/01/2015. Please refer to the second version of the PDD and CER spreadsheet.				
Documentation provided by project participant				
Revised PDD and CER spreadsheet.				
DOE assessment				**Date:** 21/03/2016
Documents were revised considering the date of 01/01/2015.*This CAR is closed.*				

CAR ID	21	**Section no.**	C.1.1	**Date:** 20/09/2015
Description of CAR				
Documentation referent to the EIA was not provided and therefore the audit team could not check whether it is sufficiently described in the PDD				
Project participant response				**Date:** 22/12/2015

According to CONAMA Resolution nr. 1 dated January 23rd, 1986, the Environmental Impact Study ("EIA" from the Portuguese Estudo de Impacto Ambiental) and the Environmental Impact Report ("RIMA" from the Portuguese Relatório de Impacto Ambiental) are required for the issuance of licenses of hydropower projects with installed capacity greater than 10 MW.
The latest Operating Licenses of the small hydropower plants included in the proposed project activity are presented in the table below. It is important to mention that some projects are under license renewal process and, therefore, according to CONAMA Resolution nr. 237/97, the validity of license is extended until manifestation of the environmental agency.
São Pedro: renewal process nr. 23653698 of LO nr. 030/08;
São Joaquim: LO nr. 299/2012 issued on 08/11/2012 and valid up to 07/11/2016;
Santa Fé: LO nr. 702/2007 issued on 13/06/2013 and valid up to 12/06/2018;
Monte Serrat: renewal process of LO nr. 818/2012;
Jataí: LO nr. 3359/2011 issued on 21/12/2011 up to 20/12/2015;
Irara: LO nr. 1185/2010 issued on 22/12/2010 valid up to 10/01/2020;
Funil: renewal process nr. 00177/1999/005/2011 of LO nr. 378/2007;
Carangola: renewal process of LO nr. 089/ZM;
Fumaça IV: LO nr. 739/2008 issued on 07/12/2012 valid up to 06/12/2018;
Calheiros: LO nr. 686/2007 issued on 31/10/2011 valid up to 30/10/2021;
Bonfante: renewal process 02001.000736/06-05 of LO nr. 758/06;
São Simão: declaration nr. 197/12-GCA/SAIA.
Operating Licenses as well as confirmation of receipt of license renewal request are attached to this response.
Since all small hydropower plants included in the proposed project activity have Operating Licenses issued, all of them had to present the environmental impact assessment and study. However, the PPs attached to this response, environmental studies of the small hydropower plants included in the proposed project activity.

Documentation provided by project participant	
Revised PDD and CER spreadsheet	
DOE assessment	**Date:** 21/03/2016
PP has provided the operation license and the renewal protocol (when operation license is expired) for the SHPs. Moreover, the EIA delivered to the Enviromental agencies in order to obtain the licenses were also provided.This CAR is closed.	

CAR ID	22	**Section no.**	D.1.1	**Date:** 20/09/2015
Description of CAR				
The date of issue and expiry date of the last operational license for Calheiros, Fumaça IV and Monte Serrat SHPs are not correct in the PDD version 1. Furthermore, most recent operational licenses or the protocol of the renewal of the operational licenses for Funil, Caçador, Jataí, Santa Fé and Bonfante SHPs were not provided..				
Project participant response				**Date:** 22/12/2015
Please refer to the PP response in CAR 21 above. Operating Licenses as well as confirmation of receipt of license renewal requests are attached to this response.				
Documentation provided by project participant				
Operating Licenses issued and environmental studies of the small hydropower plants included in the proposed project activity.				
DOE assessment				**Date:** 21/03/2016
PDD was revised and evidences provided.This CAR is closed.				

CAR ID	23	**Section no.**	D.1.3	**Date:** 20/09/2015
Description of CAR				
Section E of the PDD version 1 has no information about local stakeholder consultation as required by : "Guidelines for completing the Project Design Document form for small-scale CDM project activities", version 01.0".. Moreover PP presented some evidence of the local stakeholder consultation already carried out but it was not presented in a manner that the audit team could trace ARs to letters sent in accordance with the Brazilian DNA requirements (Interministerial Commission on Global Climate Change (CIMGC) Resolution 7 for the Local stakeholder consultation, dated 05/03/2008).				
Project participant response				**Date:** 22/12/2015

The PP clarify that The Brazilian Designated National Authority "Comissão Interministerial de Mudanças Globais do Clima", requests comments from local stakeholders, and the validation report issued by an authorized DOE according to the Resolution nr. 7, issued on March 5th, 2008, in order to provide the Letter of Approval.
This Resolution determines that direct invitation for comments shall be sent by the project proponents at least 15 days before the Global Stakeholder Process (GSP) to the following agents:
Government of each state or Federal District involved;
Legislative assembly of each state involved, or in the case of the Federal District, the Legislative Chamber;
Federal environmental body;
State environmental bodies involved;
Brazilian Forum of NGOs and Social Movements for Environment and Development;
National entities whose purposes are direct or indirectly related to the project activity;
The State Attorney Generals of the states involved, or, depending on the case, the Attorney General for the Federal District and Territories;
Federal Attorney General.
In case letters were not sent to the stakeholders, CIMGC Resolution nr. 10 dated 22/05/2013 determines that public hearings shall be conducted with stakeholders.
In the case of the proposed project activity, letters were sent to the following stakeholders as can be checked in the confirmation of receipt attached to this response:

- *The Brazilian Institute of Environment and Renewable Natural Sources ("IBAMA" form the Portuguese Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis);*
- *The environmental agency of Minas Gerais state ("SEMAD" from the Portuguese Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável de Minas Gerais);*
- *The environmental agency of Goiás state ("SEMARH" from the Portuguese Secretaria de Meio Ambiente e dos Recursos Hídricos de Goiás);*
- *The environmental agency of Espírito Santo state ("IEMA" from the Portuguese Instituto Estadual de Meio Ambiente e Recursos Hídricos do Espírito Santo);*
- *State of Attorney for the Public Interest of Rio de Janeiro (Ministério Público do Rio de Janeiro);*
- *State of Attorney for the Public Interest of Espírito Santo (Ministério Público do Espírito Santo);*
- *State of Attorney for the Public Interest of Minas Gerais (Ministério Público de Minas Gerais);*
- *Federal State Attorney for the Public Interest (Ministério Público Federal).*

Regarding the letters missing for the stakeholders mentioned in CIMGC Resolution nr.7/2008, the PPs are conducting public hearings in accordance with CIMGC Resolution nr. 10/2013. As soon as these meetings were conducted, the PPs will provide documented evidence to DOE.
Considering information above, section E of the PDD was revised to include the above mentioned information.

PPs second response:
Considering the DOE comments, section E of the PDD was revised in order to include detailed description of the stakeholder consultation held by the project participant in accordance with the Brazilian DNA instructions. Please refer to version 3.1 of the PDD attached to this response. Documented evidence of the latest stakeholder consultation conducted in December 2014 is attached to this response.

Documentation provided by project participant

Operating Licenses as well as confirmation of receipt of license renewal

DOE assessment	**Date:** 21/03/2016

In accordance with the DNA resolution nº 10, art. 1 PP shall realize a public meeting will all stakeholders mentioned in the Resolution nº 7. This CAR remains open.

2nd response:

PP has revised the PDD version 3.1 to include all the actions taken for the local stakeholder consultation, in accordance with CIMGC requirement described in the email dated 24/11/2014.

The validation process was put on holding (RINA email to PP and CIMGC dated 04/12/2014) in accordance with the requirement of the CIMGC emails dated 30/09/2014 and 24/11/2014 and re-started after the conclusion of the new stakeholder consultation through letters sent for comments invitation to all stakeholders listed in CIMGC Resolution CIMGC Resolution #7/2008. Revised documents were received by RINA on 17/03/2014 (PDD version 3.1 and evidences for the local stakeholder consultation). Letters dated 08/12/2014 were sent and the following ARs (Acknowledge Receipts) were confirmed. This CAR is closed.

CAR ID	24	**Section no.**	E.1.1	**Date:** 20/09/2015
Description of CAR				

The project starting dates are not in accordance with the CDM Glossary of Terms (i.e., the earliest date at which either implementation, or construction or real action began). The project starting dates informed in section C.1.1 are in fact the plants´ operation starting dates however, no argumentation and evidences were provided..

Project participant response	**Date:** 22/12/2015

As described in the PDD, the small hydropower plants of the proposed project activity participate under the Alternative Energy Sources Incentive Program ("PROINFA" from the Portuguese Programa de Incentivo à Fontes Alternativas). Before fully responding CAR 24, the PP would like to explain about PROINFA.
PROINFA is a renewable energy incentive program created by Law nr. 10,438/2002 and regulated by Decree nr. 5,025/2004. One of this initiative's goals is to increase the renewable share of energy sources in the Brazilian electricity market, thus contributing to greater environmental sustainability. In order to achieve such goal, the Brazilian government has designated the federal state-owned power utility Centrais Elétricas Brasileiras S/A - Eletrobrás to act as the primary offtaker of electric energy generated by alternative energy facilities in Brazil, by entering into long-term PPAs with alternative energy producers, at a guaranteed price of at least 80% of the average energy supply tariff charged to end consumers.
The MME Ordinance nr. 45/2004 established a Public Call for selection of projects and signature of PPAs was concluded by ELETROBRAS in the end of June 2004.
The creation of PROINFA clearly indicated that, without specific support, projects involving the implementation of plants using renewable sources to generate electricity would hardly be implemented otherwise. Obviously, if environment with respect to investment climate, access to technology and financing were favourable for renewable electricity generation in Brazil at that time, PROINFA would not exist.
According to the Glossary of CDM Terms, "start date", in the context of a CDM project activity is:
"…the earliest date at which either the implementation or construction or real action of a CDM project activity".
Thus, in the context of the small hydropower plants of the proposed project activity, the signature of the PPA under PROINFA is considered as the project "start date".
According to clause 16, 5th paragraph, of the PROINFA PPA, in case of non-performance or electricity supply, the project owners (SPCs) shall pay the amount of electricity agreed during the 20 years (clause 8) for the subsided price established in the contract (clause 10) considering inflation adjustment (clause 12) for contractual penalties.
In conclusion, several necessary steps to build small hydropower plants, such as the financing contract, which is only obtained after the signature of the Power Purchase Agreement. Nevertheless, if the project owner decides not to build the plant after the signature of the PPA there would be relevant penalties.
Hence, the project developer have committed itself to the terms of the contract assuming that the small hydropower plants were in fact going to be implemented. Therefore, this must be considered the project starting date.
The PPs also attached to this response, ANEEL Ordinances authorizing the operation startup of the small hydropower plants included in the proposed project activity.

PPs second response:
The PPs attached to this response the PPAs and addenda of the São Pedro, Carangola, Calheiros, São Simão, Funil and São Joaquim projects.

Documentation provided by project participant

PPAs

DOE assessment	**Date:** 21/03/2016

Bonfante, PPA 041/2004 /39/

-Monte Serrat, PPA 042/2004 /44/

-Santa Fé, PPA 043/2004 /49/

However the evidences of the SHPs São Pedro, Carangola, Calheiros, São Simão, Funil and São Joaquim were not provided. This CAR remains open

2nd round

PP has provided the PPAs:

-São Pedro, 012/2004 (CCVE-PCH-MRE-012-000.pdf)

- Carangola, 013/2004 (CCVE-PCH-MRE-013-000.pdf)

-Calheiros, PPA 014/2004

- São Simão (CCVE-PCH-MRE-015-000.pdf)

- Funil, PPA 016/2004 (CCVE-PCH-MRE-016-000.pdf)

-São Joaquim, PPA 017/2004 (CCVE-PCH-MRE-017-000.pdf)

This CAR is closed

CAR ID	25	Section no.	B.2.1	Date: 20/09/2015
Description of CAR				
The reported turbine for Fumaça IV in section A.3 of the PDD is Gugler but it was observed on the turbine during site visit the brand Energ Power. Furthermore the manufacturing year for the turbines in this SHP, and others which were checked during site visit, were not reported in the PDD version 1. The description of the turbine for SHP Bonfante in section A.3. of PDD version 1 is also not in accordance with the turbine verified during the site visit. The name of the manufacturer of the generator and turbine are also not correct. The equipment described in the PDD version 1 for the SHP Monte Serrat and SHP Santa Fé are not in accordance with the ones verified during the site visit..				
Project participant response				**Date:** 22/12/2015
Considering DOE comments, equipment description of turbines and generators presented in section A.3 was revised based on turbine/equipment tags checked during site-visit., including manufacturing year. Furthermore, section A.3 of the PDD was revised to include age and average lifetime of equipment as required by the "Guidelines for completing the Project Design Document Form". Please also refer to the PP response in CAR 5. Please refer to the second version of the PDD. PPs second response: *Considering the DOE comments, the PPs revised the technical description of Fumaça IV, Monte Serrat, Bonfante and Santa Fé based on the equipment tag. Please refer to the third version of the PDD and CER spreadsheet.*				
Documentation provided by project participant				
Revised PDD.				
DOE assessment				**Date:** 21/03/2016
PDD are not in accordance with equipment's verified during the site visit: -Fumaça IV: turbines (nominal power) -Bonfante: turbine (nominal power) -Monte Serrat: turbines (nominal power and rotation) -Santa Fé: turbines and generators (nominal power). This CAR remains open 2nd round PDD was revised in accordance with equipment's' specification. This CAR is closed.				

CAR ID	26	Section no.	B.4.1	Date: 20/09/2015
Description of CAR				
PDD version 1 states that "The spatial extension of the project limit includes the electric plant and all electric plants connected physically to the electrical system defined for the CDM project", however it does not specify the power plant(s). *PDD version 1 does not present in addition to the table, a flow diagram of the project boundary, physically delineating the project activity, based on the description provided in section A.3 in accordance with the requirements of the : "Guidelines for completing the Project Design Document form for small-scale CDM project activities", version 01.0*				
Project participant response				**Date:** 22/12/2015
Project boundary was revised in the PDD (version 2) following ACM0002. Section B.3 was also revised to include a flow diagram of equipment/systems and flows of mass and energy, indicating emission sources and GHGs included in the project boundary as well as parameters to be monitored. *PPs second response:* *Considering the DOE comments, the PPs revised table which presents the greenhouse gases (GHG) included in the project activity boundary. Please refer to the third version of the PDD.*				
Documentation provided by project participant				
Revised PDD				
DOE assessment				**Date:** 21/03/2016

The boundary was revised in accordance with ACM0002. The table 8 presents that the emissions in the baseline is CO2 from the electricity generation in fossil fuel fired power plants that are displaced due to the project activity and, in the project activity- For hydro power plants, emissions of CH4 from the reservoir. However, it is described in the section B.6.3 that as power density is higher than 10 W/m2 there are no project emissions in the project activity. This CAR remains open 2nd round PDD was revised in accordance with the applied methodology.This CAR is closed.

CAR ID	27	**Section no.**		**Date:** 20/09/2015
Description of CAR				
The formula applied on calculations of cost of equity and cost of debt described in sub-Step 2b of PDD version 2 differs from formulas described in spreadsheet "WACC ElectricGen_2004.xlsx" applied in calculation of both costs				
Project participant response				**Date:** 22/12/2015
Considering the DOE comments, the PPs revised the PDD and the benchmark spreadsheet in order to uniform equations. *PPs second response:* *The benchmark spreadsheet and the PDD were revised to correct presented formulas. Please note that this revision does not impact the resulted values for WACC, since formula/calculation is correct.* *Furthermore, the PPs included in the PDD the option used to determine the PLF in accordance with the "Guidelines for the reporting and validation of plant load factors".*				
Documentation provided by project participant				
Revised PDD and WACC ElectricGen_2004.xlsx".				
DOE assessment				**Date:** 21/03/2016
Formulas applied on calculations of cost of equity and cost of debt described in sub-Step 2b of PDD version 2 still differs from formulas described in spreadsheet "WACC ElectricGen_2004.xlsx". This CAR remains open *2nd round* *PDD and spreadsheet were revised and equations are uniform.This CAR is closed.*				

Table 3. FAR from this validation

FAR ID	xx	**Section no.**		**Date:**
Description of FAR				
N/A				
Project participant response				**Date:**
Documentation provided by project participant				
DOE assessment				**Date:**

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Document information

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