



**Verified Carbon
Standard**

GANSU HUANGHE BINGLING HYDROPOWER STATION PROJECT

Project title	Gansu Huanghe Bingling Hydropower Station Project
Project ID	453
Monitoring period	01-January-2016 to 03-August-2018
Original date of issue	23-August-2023
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Prepared by	Carbon Finance Consulting (Gansu) Ltd.

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The Gansu Huanghe Bingling Hydropower Station Project (hereafter referred to as the project) developed by Gansu Diantou Bingling Hydropower Development Co., Ltd. (hereafter referred to as the project proponent) is located at the main stream of the Yellow River at the border of Yongjing County and Jishishan County of Linxia Hui Autonomous Prefecture in Gansu Province, China. The total installed capacity of the project is 240MW, consisting of 5 bulb-type propeller turbines with an individual capacity of 48 MW. The purpose of the project is to utilize the natural water flow of the Yellow River, limited storage capacity (less than one day) and medium head to generate zero emissions electricity for the Gansu Power Grid, which is an integral part of the Northwest China Power Grid (NWCPG). The electricity currently generated by the NWCPG is relatively carbon intensive. The project is therefore expected to reduce GHG emissions by reducing both the need and the needed capacity expansion of fossil fuel-based generation of the NWCPG. The expected net annual power supply to the grid is 954,088 MWh and the estimated emission reductions of the project are 764,452tCO₂e per year.

The main construction activities of the project started in November 2004. The project started commissioning on 04-August-2008 and was put into full operation on 07-July-2009.

The project has operated without any accidental or emergency events that might affect the accuracy and/or implementation of the monitoring activities. The net electricity supplied to the grid by the project during this monitoring period (01-January-2016--03-August-2018) is 2,052,303.021 MWh. The total emission reductions claimed in this monitoring period are 1,743,999 tCO₂e.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	Registration	VCS	SGS United Kingdom Ltd	/
Verification	04-August-2008--11-February-2009	VCS	SGS United Kingdom Ltd	0.53 year
Verification	12-February-2009--29-July-2012	CDM	SGS United Kingdom Ltd	3.46 years
Verification	30-July-2012--31-December-2012	CDM	China Quality Certification Centre	0.42 year
Verification	01-January-2013-31-December-2015	VCS	CTI Certification CO., LTD.	3.00 years

Verification	01-January-2016 to 03-August-2018	VCS	China Society Certification Co. Ltd.	Classification	2.59 years
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1.3 Sectoral Scope and Project Type

Sectoral scope ¹	1: Energy industries (renewable /non-renewable sources);
Project activity type	Renewable energy project;

1.4 Project Proponent

Organization name	Gansu Diantou Bingling Hydropower Development Co., Ltd.
Contact person	Wang Haimin
Title	Project manager
Address	No.60, Huanghe Road of Liujiaxia Town, Yongjing County, Gansu Province, China.
Telephone	+86 930 8879352
Email	gca@gepic.cn

1.5 Other Entities Involved in the Project

Organization name	Carbon Finance Consulting (Gansu) Ltd.
Role in the project	Consultant
Contact person	ZHAO Yonghong
Title	Project Manager
Address	No.4118 of Yantan road, Lanzhou, Gansu, China, 730030
Telephone	Telephone: +86 15393155050
Email	cfc.gs.ltd@outlook.com

¹ Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

1.6 Project Start Date

Project start date	04-August-2008
Justification	The date is the commissioning date of the first turbine generator

1.7 Project Crediting Period

Crediting period	☒ Other: 10-year renewable (renewable twice) (As the project registered as VCS project under VCS2007.1, and completed validation before 19-March-2020, it remains eligible to apply the crediting period requirements under VCS Standard Version 3, according to which the crediting period is applicable to a maximum of 10 years which may be renewed at most twice. Thus, the first renewable crediting period shall be updated from 04-August-2008-11-February-2009 to 04-August-2008-03-August-2018 which covers 10 years.)
Start and end date of first or fixed crediting period	04-August-2008 to 03-August-2018

1.8 Project Location

The Gansu Huanghe Bingling Hydropower Station is located at the main stream of the Yellow River at the border of Yongjing County and Jishishan County of Linxia Hui Autonomous prefecture in Gansu Province. The site location's approximate coordinates are east longitude of 102°59'25" and north latitude of 35°49'27". The nearest city is Lanzhou City, the provincial capital, 75 km northeast of the project location.

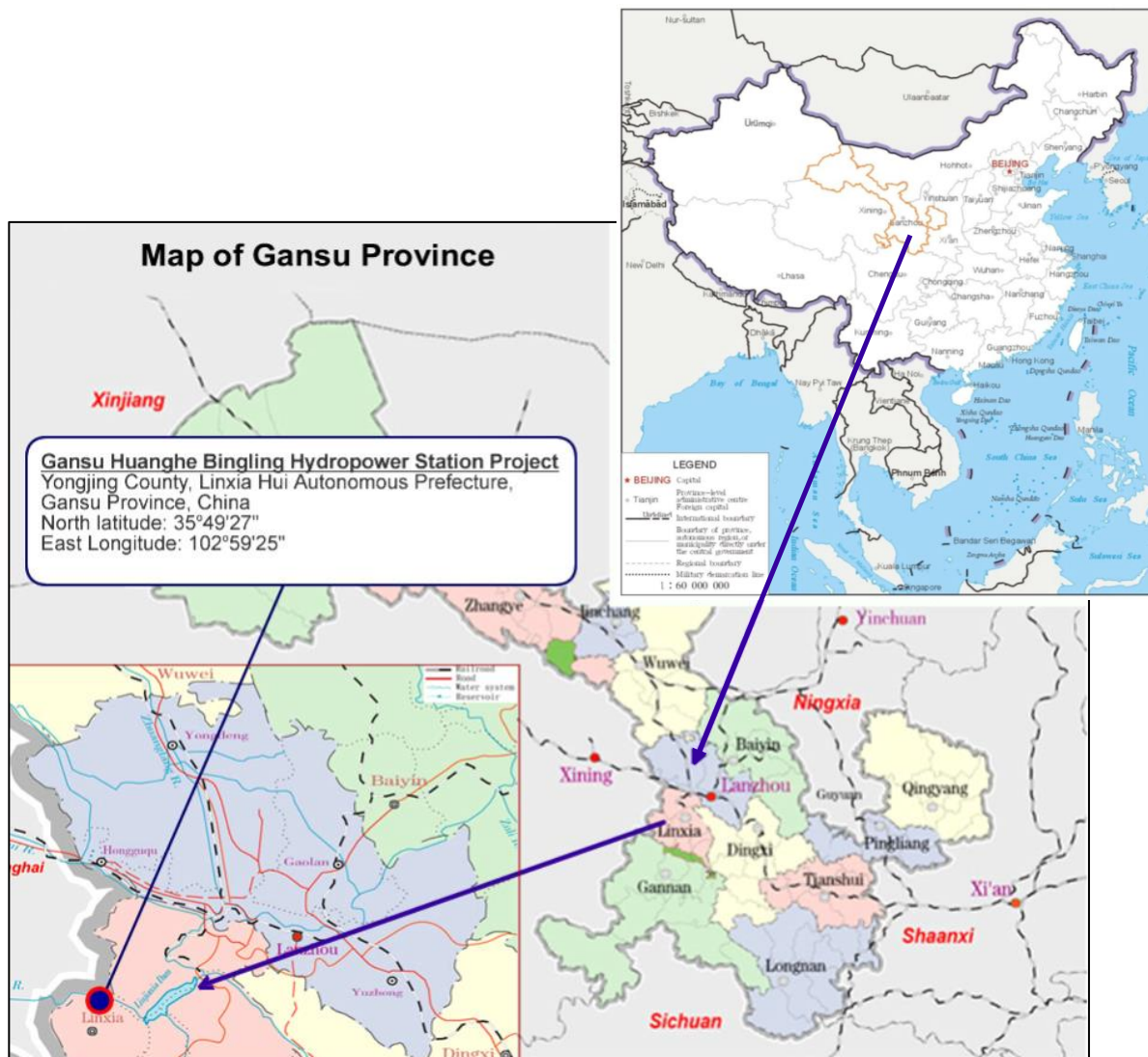


Figure 1.1 The location of the Project

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	ACM0002	Consolidated baseline methodology for grid-connected electricity generation from renewable sources	06
Tool	TOOL01	Tool for the Demonstration and Assessment of Additionality	05

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☒ Yes ☐ No

The project was registered on 12-February-2009 under CDM as well with Ref ID 1985, the during the monitoring period from 04-August-2008 – 03-August-2018, there is no double issuance of carbon credit as checked with VCS and CDM website.

Period	Verified carbon credit	Detail
04-August-2008–11-February-2009	VCUs	https://registry.verra.org/app/search/VCS?programType=ISSUANCE&exactResId=453
12-February-2009–29-July-2012	CERs	https://cdm.unfccc.int/Projects/DB/TUEV-SUED1217926221.96/view
30-July-2012–31-December-2012	CERs	
01-January-2013–31-December-2015	VCUs	https://registry.verra.org/app/search/VCS?programType=ISSUANCE&exactResId=453
01-January-2016–03-August-2018	Pending to be verified as VCUs	-

1.10.2 Registration in Other GHG Programs

Is the project registered or seeking registration under any other GHG programs?

☒ Yes ☐ No

The project was registered on 12-February-2009 under CDM as well with Ref ID 1985 with detail of <https://cdm.unfccc.int/Projects/DB/TUEV-SUED1217926221.96/view>.

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

China has a national emissions trading scheme only cover the high-emission industries, such as thermal power generation, petrochemical, chemical, building materials, iron and steel, non-ferrous, paper, aviation and other key emission industries that emitted at least 26,000 tons of CO₂e/year, not including renewable project.

The project proponent: Gansu Diantou Bingling Hydropower Development Co., Ltd. as an enterprise for renewable energy investment, is not included in the compliance entity list by China national Emission Trading Scheme (ETS). Moreover, the project has not been registered as a CCER (Chinese Certified Emission Reductions) project in China, thus it is not eligible for emission reductions transaction under the China's ETS.

Therefore, the project does not reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading. The net GHG emission reductions generated during this monitoring period have not been used for compliance under such programs or mechanisms.

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

1.12 Sustainable Development Contributions

This project fits with the Chinese government objective to reduce the dependence on exhaustible fossil fuels for power generation, make the energy sector in general and the power sector in particular more sustainable.

The project activity's contributions to sustainable development are:

The project has generated 2,052,303.021 MWh of grid-connected renewable energy during this monitoring period which contributes to SDG 7;

As contributing to SDG 8 Decent Work and Economic Growth, 227 employees (including 55 females in 2016, 59 females in 2017 and 59 females in 2018), are working for the project activity which earns an income higher than the local average level by the end of this monitoring period;

Prevented the release of 1,743,999 tons of CO₂ into the atmosphere during this monitoring period which contributes to SDG 13.

Table 1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	7.2	7.2.1 Renewable energy share in the total final energy consumption	Implemented activities to increase	Generated 2,052,303.021 MWh of grid-connected renewable energy during this monitoring period.	An accumulated 8,760,028.943 MWh of electricity from renewable sources has been supplied to the power grid by end of the reporting period
2)	8.5	Achieve full and productive employment and decent work for all women and men	Implemented activities to decrease	227 people (including 55 females in 2016, 59 females in 2017 and 59 females in 2018) have been employed by the project as long-term employee which have an income rate higher than the local average level.	227 employees (including 55 females in 2016, 59 females in 2017 and 59 females in 2018) have been employed by the project as long-term employee by end of the reporting period.
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	The project has prevented the release of 1,743,999 tCO ₂ e into the atmosphere during the monitoring period.	An accumulated 7,444,105 tCO ₂ e of GHG emission reduction (VCS standard and CDM) has been achieved by the project by end of the reporting period.

1.13 Commercially Sensitive Information

No commercially sensitive information.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification

The following steps were adapted to identify stakeholders.

Step 1: Project Documents Review

Stakeholder Identification was started by reviewing project documents. E.g. project approval, feasibility study report (FSR), environmental impact assessment (EIA), contract documents etc. These documents not only outline the primary objectives and the intended outcomes of the project, but also mention stakeholders impacted by the project and provide initial insights into who the key stakeholders might be. After the documents review, the project team listed down the potential stakeholders impacted by the project through discussion.

Step 2: local stakeholders Survey

Before the local stakeholder's survey was carried out, the project team issues a stakeholder solicitation announcement on Linxia Economic Information network website and the stakeholders can contact the project team through telephone and other means specified in the announcement to express their expectations, concerns and needs. The project team communicate with local residents etc around the project area to collect their opinions in the physical Local stakeholder consultation meeting. Their perspectives help identify concerns and potential stakeholders that may not be immediately obvious.

Step 3: Regulatory and Legal Research

	The project team researched the local and national regulations and laws that pertain to the hydropower projects. This is helpful to identify regulatory bodies, agencies, and government representatives who may be stakeholders due to their role in permitting, compliance, or oversight. Step 4: Stakeholder Catalogue The project team created a stakeholder catalogue. The stakeholders identified: 1: Villagers from the nearby villages 2: Yongjing County and Jishishan County governments 3: The project staff
Legal or customary tenure/access rights	The project is located at the main stream of the Yellow River at the border of Yongjing County and Jishishan County of Linxia Hui Autonomous Prefecture in Gansu Province. As per FSR and its approval, the implementation of the project would result the submerge of 308.67 ha cultivated land, 13.01 ha homestead which is collective owned land and held by local communities, which has been compensated according to relevant local and national regulation, the legal or customary tenure/access rights to territories and resources was protected as per the local and national law/regulations.
Stakeholder diversity and changes over time	Following is the analysis of the social, economic, and cultural diversity within the stakeholder groups involved in the project: 1: Villagers from nearby villages Social Diversity: The local residents' group may comprise a mix of age groups, from young families to elderly individuals. They may have different levels of education, occupations, and family sizes. Economic Diversity: Income levels among this group can vary. Some may rely solely on farming, while others might

	have additional sources of income or employment in non-agricultural sectors. Cultural Diversity: The local area is predominantly inhabited by Han Chinese. This group shares similar background and traditions. Therefore, the cultural diversity within this group is negligible. 2: Yongjing County and Jishishan County governments The staff of the governments come from different backgrounds and have different professional knowledge, however because the functions of different departments of the governments are fixed and the work that they involved have few changes, therefore there are fewer changes within the governments.. 3: The project staff This project is located in a County, primarily employs individuals from the local communities. The social and cultural diversity of this group (project staff) is largely in line with that of the local residents. In terms of economic diversity, while the group of local resident experiences varying income levels due to diverse sources of income, this group (Project staff) all work within the same project, resulting in similar income levels and thus minimal economic diversity among them. The diversity mentioned above is unlikely to change over time. The interactions between these stakeholders are characterized by a mix of cooperation, collaboration, and engagement aimed at addressing shared concerns, achieving common goals, and promoting the well-being of the local community.
Expected changes in well-being	Economic well-being The project has supplied renewable energy to local area, and contribute to the economic growth in the area. Social well-being

	The project generated 227 working opportunities for local residents, and help them improve the incomes and the likelihood. Environmental well-being The project has supplied renewable energy to local area that otherwise have been produced by thermal power generation projects, the implementation of the project would reduce the pollutants of SO₂, NO_x, particulate matter and GHG emission. In summary, the project is expected to bring about a range of positive changes, including economic, environmental, and health benefits. These changes are relative to the baseline scenario of producing electricity mainly from fossil fuel fired power plants, which can be resource-intensive and environmentally harmful.
Location of stakeholders	The project is located at the main stream of the Yellow River at the border of Yongjing County and Jishishan County of Linxia Hui Autonomous Prefecture in Gansu Province. The area in which the project is located is the location of stakeholders.
Location of resources	The project is located at the main stream of the Yellow River at the border of Yongjing County and Jishishan County of Linxia Hui Autonomous Prefecture in Gansu Province. The area in which the project is located is the location of resources.

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	The Project proponent has established a grievance and appeal mechanism, and issued “Measures for the Management of Complaint and Request Handling Case (Provisional)”. A suggestion book is kept at the Project proponent office and a complaint box with phone number on it is placed at the gate of the Project proponent’s office building.
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	Anyone can go there and record their grievance or comment in the book, or put grievance/comment letter in the complaint box. The Project proponent personnel would review and respond to the comments or complaints and record the response in the timely manner. Meanwhile, the local authority has also conducted spot checks on the implementation of the project from time to time as per the request from the local governments' regulations.								
Date(s) of stakeholder consultation	The suggestion book and complaint box are available after the project implementation and constant stakeholder consultations were carried out before the project implementation on 28th December 2005 and during this monitoring period from 2016 to 2018. Before the project implementation, a questionnaire survey which consisted of two separate questionnaires of which one was distributed among public organizations and the other among individuals, which were carried out from the 14th of December 2006 to the 14th of January 2007. As well as a stakeholder consultation meeting was held on 22-December-2006. The questionnaire survey among public organizations consisted of handing out 100 questionnaires among various government and political departments of which 90 were returned. The consulted organizations included: Local government, Forestry Bureau and Resource Bureau, Planning bureau, Environmental Protection Bureau, Bureau of Agriculture Water Conservancy Bureau, Westen China Development Office, Cultural Center and Hydro Affairs Bureaus of Linxia Prefecture, Jishishan County, Yongjiing County and Minhe County. The results of the questionnaire are as follows: <table><tr><th rowspan="2">Questions</th><th colspan="2">Investigation results</th></tr><tr><th>Response</th><th>%</th></tr><tr><td></td><td>Informed</td><td>97%</td></tr></table>	Questions	Investigation results		Response	%		Informed	97%
Questions	Investigation results								
	Response	%							
	Informed	97%							

	Are you informed about the project by media?	Not Informed	3%
	When do you think the construction is started?	As soon as possible	64%
		Near future	36%
	What do you think the impact of the project will be on the income of local residents?	Income will increase	80%
		Income will decrease temporary but will not be affected in the long run	14%
		Will affected	5%
		Income will decrease	2%
	What do you think the impact of the project will be on the standard of living and quality of life of local residents?	Will be upgraded	77%
		No effect	16%
		Will be downgraded	6%
	What do you think the impact of the project will be on employment opportunities	Will be increased	82%
		No effect	36%
		Will be decrease	1%
	What do you think the impact of the project will be on socially vulnerable groups	Positive impact	43%
		No effect	36%
		Negative effect	14%
	What do you think the impact of the project will be on cultural development	Positive impact	65%
		No impact	34%
	What do you think the impact of the project will be on education	Positive impact	54%
		No effect	40%
		Negative effect	3%

What do you think the impact of the project will be on public health	Positive impact	47%
	No effect	32%
	Negative effect	12%
What do you think the impact of the project will be on infrastructure	Positive impact	80%
	No effect	15%
	Negative effect	2%
What do you think the impact of the project will be on demand for the service sector	Positive impact	66%
	No effect	26%
	Negative effect	3%
What do you think the impact of the project will be on customs, minority and religion	Positive impact	35%
	No effect	58%
	Negative effect	2%
What do you think the impact of the project will be on the urbanization process	Positive impact	80%
	No impact	16%

The other survey among individuals were consisted of handing out 160 questionnaires among involved individuals which included various experts, local residents living in the projected reservoir area and local residents living downstream of the dam. The age distribution of respondents covered all ages and the respondents' professions included local government officer, teacher, farmer and student.

The results of the survey are as follows:

Statement	Response		
	Answer	Respondents	%
Do you support the construction	Support	153	97%

	of the project?			
		Not support	3	2%
		No valid response	1	1%
	Do you wish to participate in the project's construction	Would like to participate	128	82%
		Neutral	20	12%
		Do not want to participate	7	4%
		No valid response	2	1%
	The project will improve standard of living	Will improve	122	78%
		No appoints	25	16%
		Will not improve	5	3%
		No valid response	5	3%
	Impact on the local environment	Economy will improve	112	71%
		No significant impact	34	22%
		Economy will deteriorate	3	2%
		No valid response	8	5%
	Power supply condition will be improved	Positive effect	118	75%
		Limited effect	25	16%
		No effect	2	1%
		No valid response	12	8%
	Promote the local economy	Positive effect	129	82%
		Neutral	17	11%
		No significant effect	3	2%

		No valid response	8	5%
	Creation of employment opportunities	Project will create employment opportunities	119	76%
		No opinion	19	12
		Project will not create employment opportunities	2	1%
		No valid response	17	11%
	Are you more concerned about the economy or the environment ?	Environment	43	27%
		Economy and environment	91	58%
		Economy	19	12%
		No valid response	4	3%
	Since the implementation of the Project, the Project proponent has established a complaint/grievance management system to receive complaints/comments from the stakeholder. The stakeholder can submit their complaints/comments through various ways such as comment books, comment boxes, telephone calls and face-to-face visits. And no complaints/comments were received during this monitoring period.			
	Communication of monitored results	There is no grievance or negative comments from the stakeholders before and during this monitoring period. The project proponent has issued the “Measures for the Management of Complaint and Request Handling Case (Provisional)” on 10 December 2012. The detailed handling process of grievance/comment is stipulated in the Measures.		

	Any grievance /comments received will be recorded, processed, and response in a timely manner.
Consultation records	The grievance book and stakeholder consultation records, and the documents created as per “Measures for the Management of Complaint and Request Handling (Provisional)”.
Stakeholder input	There are no negative comments received for the project during this monitoring period. In line with VCS requirements all the processes have been implemented to receive comments from local stakeholders as well as communicate with them at periodic intervals.

2.1.3 Free, Prior, and Informed Consent

Consent	The suggestion book and complaint box were kept on the Project proponent office to gain the feedback from the stakeholder, and a stakeholder consultation were carried out on a regular basis and no negative feedback was received during this monitoring period, the project obtained the informed consent to implement through stakeholder consultation before the project implementation. The relevant villagers with cultivated land and other land submerged had gain the compensation as per the local and national regulations, the results of the compensation has been audited by government departments or the third party auditing organizations, all of them agreed on the compensation, meanwhile all of the stakeholders including the villagers directly impacted by the project are supported the implementation of the projects, as per the result of the suggestion book and the stakeholder consultation, specially the villagers directly impacted by the projects does not have unresolved conflicts happened during the project implementation, which means the project resolved all the conflicts before the project implementation. The project is contributing to the sustainable development from the aspect of social, economic and environmental,
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	therefore the project does not exacerbate nor influence the outcomes of unresolved conflicts. There are no ongoing or unresolved conflicts.
Outcome of FPIC	The project obtained the Project Approval issued by National Development and Reform Commission,15-February-2007. The project obtained the EIA approval issued by State Environmental Protection Administration on 24-September-2004. The relevant stakeholders with the submerge of 308.67 ha cultivated land, 13.01 homestead, all are collective owned land and held by local communities, have gained the compensation according to relevant local and national regulation, the legal or customary tenure/access rights to territories and resources was protected as per the local and national law/regulations, they are all agreed the implementation of the project. The stakeholders all are agreed with the compensations as per the local and national regulations, as well as the implementation of the project, therefore the project does not involve in the situation of the encroached-on land without consent, and forced physical or economic displacement.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
No grievance was received during the monitoring period.	Not applicable. The Project proponent office is located Taping Village, where the main stakeholders are located and easy for them to get access to the suggestion book and the complaint box, or call to proponent to express their grievances and comments regarding the project.

2.1.5 Public Comments

Summary of comments received	Actions taken
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No comments received from stakeholders' consultation and outside of the public comment period.	Not applicable
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2.2 Risks to Stakeholders and the Environment

	Risk identified	Mitigation or preventative measure taken
Risks to stakeholder participation	No risks identified	Not applicable. The implementation of the project has reduced the emission of SO ₂ , NO _x etc., and does not generate any risk to stakeholders, and the stakeholders involved in the project are very supportive of the project.
Working conditions	No risks identified	Not applicable Most of time, the staff work in indoor. In case of working outside, the Project proponent provides safety protection equipment and safety measures to ensure their safety, an internal safety and security rules was established and relevant trainings were held to ensure the project staff strictly followed the rules.
Safety of women and girls	No risks identified	Not applicable China has published "Women's Rights Protection Law ² " to provide support and protection to women and girls, the women/girls staff work for the project are well protection as demonstrated in item of "working conditions".
Safety of minority and marginalized groups, including children	No risks identified	Not applicable China has published "Protection Laws on the Juvenile ³ ", "Labour Law of the People's Republic of China ⁴ ", "Employment Promotion Law of the People's Republic of China ⁵ ". Employment regulations are described in these Laws. The Project requires skilled employees to operate,

² https://www.gov.cn/guoqing/2021-10/29/content_5647634.htm

³ https://www.gov.cn/xinwen/2020-10/18/content_5552113.htm

⁴ https://www.gov.cn/banshi/2005-05/25/content_905.htm

⁵ https://www.gov.cn/guoqing/2021-10/29/content_5647636.htm

		maintain, and manage the facilities/equipment's. Therefore, the project does not employ and is not complicit in any form of child labor, and no risks identified to the safety of to minority and marginalized groups including children.
Pollutants (air, noise, discharges to water, generation of waste, release of hazardous materials)	No risks identified	Not applicable According to the EIA report of the project, as well as Environmental Protection Acceptance Report, environmental impacts caused by the project and corresponding measures adopted by the Project proponent are illustrated as the following: Construction and domestic sewage created in the construction period: The production of construction sewage is due to the cleaning of sand and gravel materials which can be disposed after first treating the sewage with DH high-efficiency purifying equipment and then discharging it into the river. Domestic sewage will be treated with purifying disposal equipment to ensure the water quality is in accordance with the "Sewage Discharge Standards". After treatment the water is discharged into the river or used for irrigation purposes. Water & soil conservation: During the construction phase specific protection measures (such as the erection of soil-retaining walls, water drainage trenches, etc.) will be taken in accordance with the land use of the specific sites in order to prevent water & soil losses. After construction, involved land will be levelled off and trees will be planted to conserve the water & soil. Prevention of dusts & exhaust pollution: A series of prevention and protection measures will be taken which include: using wet straw bags to cover explosion areas (prior to explosions), water spraying methods, tree planting, installing exhaust gas filters, etc. Construction staff will wear masks in order to protect themselves from dust pollution.

		Noise pollution: The following measures will be taken to minimize negative impacts due to noise pollution: application of low-noise equipment during construction, emphasizing proper maintenance of equipment, avoiding explosion at night, limiting driving speed, install warning signs, applying personal protection equipment for construction workers such as helmets and ear plugs. To further prevent negative impacts of noise pollution the project entity plans to plant trees and erect a sound insulating wall at either side of the access road Taping village. Solid waste: The project entity will establish 6 solid waste collection points at the construction site and the temporary living quarters during the construction period. The collected solid waste materials will be transported to a nearby trench where it will be used for backfilling. Domestic waste produced by the staff operating the hydropower plant will be transported to Yongjing county and disposed through the county's solid waste disposal system.
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2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Discrimination and sexual harassment	There is no discrimination and sexual harassment happened during this monitoring period. China has published "Constitution of the People's Republic of China⁶", "Labor Law⁷ " and "Women's Rights Protection Law⁸", "Special Provisions for The Labor Protection of Female Workers⁹", which are the basis of the laws for prevent such kind of phenomena in the workplace. The project abides by the rules of equality and does not involve in any form of discrimination and sexual harassment against the laws.
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⁶ http://www.npc.gov.cn/c2/c30834/201905/t20190521_281393.html

⁷ https://www.gov.cn/banshi/2005-05/25/content_905.htm

⁸ http://www.npc.gov.cn/npc/c2/c30834/202210/t20221030_320091.html

⁹ https://www.gov.cn/zwggk/2012-05/07/content_2131567.htm

Management experience	The project proponent is a local State-owned enterprise (SEO) ¹⁰ , and operated several hydropower projects with total capacity of 1,790MW, who has rich management experience in this regard.
Gender equity in labor and work	Equal opportunities have been provided in the context of gender equity and equal pay for labor and work, the project proponent has strictly followed the regulations of “Constitution of the People's Republic of China”, “Labor Law”. “Employment Promotion Law of the People's Republic of China” and “Women’s Rights Protection Law”.
Human trafficking, forced labor, and child labor	China has published “Constitution of the People's Republic of China”, “Criminal Law of the People's Republic of China ¹¹ ”, “Labor Law” and “Protection Laws on the Juvenile” The project is strictly followed the laws and does not involve in human trafficking, forced labor, and child labor.

2.3.2 Human Rights

The project respects internationally proclaimed human rights. China has its own legislation in place prohibiting the violation of human rights principle and it actively enforces the compliance of such principle. China has ratified two UN human rights treaties--the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social, and Cultural Rights. China has published relevant regulations and practice into line with the treaties, such as “Labor Law”, “Protection Laws on the Juvenile”, etc.

This project does not discriminate with regards to participation and inclusion. The project abides the rules of equality accordingly and does not involve and is not complicit in any form of discrimination. Specific to gender equality, detailed enforcement rules are regulated in “Women’s Rights Protection Law” to provide support and benefits to women.

2.3.3 Indigenous Peoples and Cultural Heritage

There is no cultural heritage or indigenous Peoples at or near the project site as per the EIA report.

2.3.4 Property Rights

Disputes over rights to territories and resources	N/A. There are no disputes over rights to territories and resources (The relevant stakeholders with the submerge of land are migrated, the land all are collective owned land and held by
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¹⁰ <https://www.gepic.cn/ywtz/dlrg/index.html>

¹¹ <http://gongbao.court.gov.cn/details/f8e30d0689b23f57bfc782d21035c3.html>

	local communities, and has gained the compensation according to relevant local and national regulation, the legal or customary tenure/access rights to territories and resources was protected as per the local and national law/regulations.)
Respect for property rights	Not applicable The relevant stakeholders involved in the submerge land etc have gained the compensation before the project implementation. In the implementation stage it does not involve in “Respect for property rights”.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	N/A The relevant stakeholders involved in the submerge land etc were gained the compensation before the project implementation as per the local and national compensation laws, and all the stakeholders agreed on the implementation of the project.
Benefit sharing during the monitoring period	N/A The relevant stakeholders involved in the submerge land etc were gained the compensation before the project implementation as per the local and national compensation laws, and all the stakeholders agreed on the implementation of the project.

2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified	Not applicable. The project proponent has strictly followed the result of EIA report regarding biodiversity and ecosystems eg a minimum ecological waterflow requested and an annually artificial proliferation and release the relevant fish to the other side of yellow river, a regular inspection and investigation

		was carried out to ensure its implementation, which is confirmed by the annual (From 2016 to 2018) Monitoring and Evaluation Report on the Protection of Aquatic Biological Resources and the Effectiveness of Fish Proliferation and Release.
Soil degradation and soil erosion	No risk identified	Not applicable Centralized protection of abandoned waste and planting trees and grass along the two sides of the newly built reservoir and protect the forest land by avoid harvesting tree and reserve the water and soil along the reservoir to avoid soil degradation and soil erosion.
Water consumption and stress	No risk identified	Not applicable The implementation of the project improves the water resource management capacities, which do good to the local communities for daily and agricultural water usage, rather than increase the water consumption and stress.
Usage of fertilizers	No risk identified	Not applicable The implementation of the project does not involve in the usage of fertilizers during this monitoring period, and there is no risk identified.

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	The area where the project located did not involve in habitats for rare, threatened, or endangered species as per the EIA report.
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2.4.2 Introduction of species

As per the EIA report, the implementation of the project does not involve in introduction of species.

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Not applicable	Not applicable	Not applicable	Not applicable

Existing invasive species	Mitigation measures to prevent spread or continued existence of invasive species
No existing invasive species	Not applicable

2.4.3 Ecosystem conversion

The project is a hydropower project, not ARR, ALM, WRC or ACoGS projects, therefore it is not applicable.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project consists of 5 bulb-type propeller turbine-generators with an individual capacity of 48 MW, amounting to a total combined installed capacity of 240MW and the technology employed in the project is conventional hydropower design using the natural water flow of the river and medium head. The powerhouse is integrated in the dam with the turbines installed at the base of the dam in the river bed. The surface area at full reservoir level is measured to be 2,871,999.3 m² and the designed operation period of the project is 30 years.

Table 3.1 Key technological parameters of equipment installed in the project

Turbine	Type	Type number	Capacity	
	Bulb-type propeller	GZ HK-1RT-WP -620	49MW	
	Nominal water flow	Water head		
		Minimum	Nominal	Maximum
	335 M³/s	11.6m	16.1m	25.7m
	Nominal revolutions		Run-away rotation speed	
	107.1rpm		300rpm	
Generator	Type		Capacity	Type number
	Horizontal Integrated (in turbine Bulb)		48MW	SFG48-56/6700
	Nominal Voltage		Nominal current	Power Factor
	13.8kV		2114A	0.95
	Nominal revolutions		Frequency	
	107.1rpm		50Hz	

The main construction activities of the project started in November 2004. The project activity started commissioning on 04-August-2008 and was put into full operation on 07-July-2009. During the monitoring period, the project activity was conducted strictly in compliance with the description in the revised CDM PDD (version 3.0 dated 04-November-2009) approved by CDM EB on 15-April-2010. Monitoring of the required parameters, data recording, collection and recording was in line with the approved revised CDM PDD

During this monitoring period, there were no malfunction, emergencies or special events occurred that may impact the GHG emission reductions or removals and monitoring.

3.2 Deviations

3.2.1 Methodology Deviations

There is no methodology deviations applied to this monitoring period.

3.2.2 Project Description Deviations

There is a deviation for the project crediting period. For the first monitoring period under the VCS program, the project crediting period requested was 04-August-2008 to 11-February-2009. However, as the project registered as VCS project under VCS 2007.1, and completed validation before 19-March-2020, it remains eligible to apply the crediting period requirements under VCS Standard Version 3, according to which the crediting period is applicable to a maximum of 10 years which may be renewed at most two times. Thus, the first renewable crediting period shall be updated from 04-August-2008--11-February-2009 to 04-August-2008--03-August-2018 which covers 10 years.

Since the project crediting period was not renewed within in 2 years after the end of first 10 years, the total VCS crediting period of the project ends on 03-August-2018. This deviation of crediting period has no impact on the applicability of the methodology, additionality, and the appropriateness of the baseline scenario.

A revised PDD has been submitted and approved by CDM-EB on 15-August-2010 due to the changes of the main equipment parameters. The validation opinion agreed that the changes have no impact on additionality, the scale or the applicability and application of the methodology under which the project activity has been registered. Therefore, the project activity still meets all appropriate rules and requirements of VCS standard.

3.3 Grouped Projects

The project is not a group project.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _y
Data unit	tCO ₂ e/MWh
Description	Combined margin CO ₂ emission factor for grid connected power generation in year y
Source of data	The approved revised CDM PDD
Value applied	0.8498
Justification of choice of data or description of measurement methods and procedures applied	Calculated ex ante and fixed for the first crediting period
Purpose of data	Calculation of baseline emissions
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	EG _y
Data unit	MWh
Description	Electricity supplied to the grid by the project (net)
Source of data	Measured values from the electricity meters M2a, M2b and M4
Description of measurement methods and procedures to be applied	EG_y is determined as the difference between: net electricity supplied by the project through the main power lines (ES_y) and the electricity delivered to the project through back-up power line (ED_y). ES_y is continuously measured by meters M2a and M2b owned by project proponent (accuracy class of 0.2S) installed on the two main lines at the project side and it is also measured by meters M3a and M3b owned by grid company (accuracy class of 0.2S) are installed on the two main lines at the grid's side. ED_y is continuously measured by meter M4 owned by project proponent (accuracy class of 0.5) installed on the backup power line at the project side and M5 (accuracy class of 0.5S) owned by grid company installed on the backup power line at the grid's side
Frequency of monitoring/recording	Continuously measured, daily recorded and monthly aggregated.

Value monitored	Accumulated value: 2,052,303.021 MWh during this monitoring period, see Table 5.1 for details.						
Monitoring equipment	Meter	Type	Serial NO.	Accuracy	Calibration frequency	Calibration date	Validity date
	M2a	SL7000	36139071	0.2S	Annually	15-February-2015	14-February-2016
	M3b	SL7000	36139070	0.2S	Annually	12-February-2016	11-February-2017
	M4	DTSD341	20070701110015	0.5	Annually	07-February - 2017	06-February - 2018
	M5	DS862	090106002773	0.5S	Annually	05-February - 2018	04-February - 2019
	M3a	SL7000	36088323	0.2S	Annually	15-February-2015 12-February-2016 07-February - 2017 05-February - 2018	14-February-2016 11-February-2017 06-February - 2018 04-February - 2019
	M2b	DTZ-110	0100881150	0.2S	Annually	15-February-2015 12-February-2016 07-February - 2017 05-February - 2018	14-February-2016 11-February-2017 06-February - 2018 04-February - 2019
QA/QC procedures to be applied	The data were measured through national standard electricity meters which were calibrated annually by authorized third party. Electricity sales records, i.e. sales receipts and billing receipts were crosschecked with measurement records of the project entity. In case of discrepancies the conservative value prevails.						
Purpose of the data	Calculation of baseline emissions						
Calculation method	EG _y = ES _y –ED _y ES _y is the net electricity supplied by the project through the main power lines ED _y is electricity delivered to the project through back-up power line						
Comments	-						

Data / Parameter	Surface area reservoir
Data unit	m ²
Description	Surface area at full reservoir level
Source of data	Measured
Description of measurement methods and procedures to be applied	The surface area of the reservoir was measured by Gansu Provincial Land Resources Planning and Research Institute, who has an authorization from the State Bureau of Surveying and Mapping.
Frequency of monitoring/recording	Once at the start of the project when the reservoir reaches full capacity.
Value monitored	2,871,999.3 m ²
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of project emissions.
Calculation method	-
Comments	-

Data / Parameter	Operational hours of emergency back-up diesel generator
Data unit	Hours
Description	Annual hours that the emergency back-up diesel generator is running either for the purpose of commissioning/maintenance or actual emergencies
Source of data	Measured
Description of measurement methods and procedures to be applied	The project entity records the operational hours in the daily operation logs.
Frequency of monitoring/recording	Recorded and monitored once started.
Value monitored	46.5
Monitoring equipment	Each operation of the back-up diesel generator is recorded manually in the daily operation logs.
QA/QC procedures to be applied	The actual annual emissions associated with the operation of the emergency back-up diesel generator amount to about 0.002% of total emission reductions and were deducted.

	Further QA/QC procedures are therefore not considered Necessary.
Purpose of the data	Calculation of project emissions
Calculation method	-
Comments	-

4.3 Monitoring Plan

1. Organizational and Monitoring Structure

The monitoring of the emission reductions is carried out according to the scheme shown in Diagram 4.1. The vice general manager held the overall responsibility for the monitoring process, but as indicated below parts of the process are delegated. The first step was the measurement of the electrical energy supplied to the grid and reporting of daily operations, which were carried out by the plant operation staff. A monitoring officer was appointed and was responsible for verification of the measurement, collection of sales receipts for electricity supplied by the project and billing receipts for electricity delivered to the project. The monitoring officer prepared operational reports of the project activity, recording the daily operation of the hydropower station including operating periods, electricity generation; electricity delivered to the grid, equipment defects, etc. Finally, the monitoring reports were reviewed by the vice general manager. Monitoring organizational structure, roles and responsibilities have been shown as below.

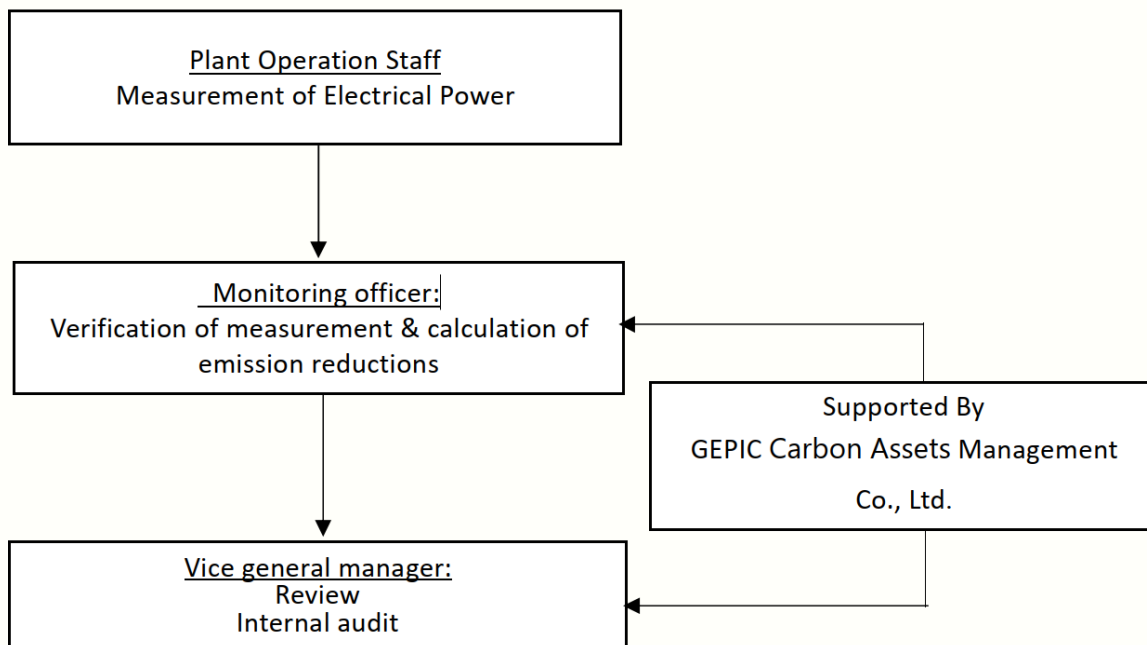


Diagram 4.1. Management structure for monitoring

2. Monitoring System and Data collection

A. Monitoring of electricity data

The project is connected by a 330kV line to the Liujiaxia 330kV Switching Station and through a 110kV power line to the 110kV Jishishan Transformer Station, both of which are connected to the Northwest China Power Grid. The electricity supplied to the grid by the project (net) was monitored by both the project proponent at project site and Grid Company at the grid side:

The net electricity supplied by the project through the two main power line (ES_y) were continuously measured by the project proponent with two bidirectional meters M2a and M2b (both with accuracy of 0.2S) installed on the two main lines at the project side. ES_y is also measured by the grid side's two bidirectional meters M3a and M3b (both with accuracy of 0.2S). Besides, the electricity delivered to the project through back-up power line (ED_y) was continuously measured by the project proponent with the meter M4 (with accuracy of 0.5) installed at the project side and by the grid company with the meter M5 (with accuracy of 0.5S) installed at grid's side. The grid Connection Diagram is shown as below:

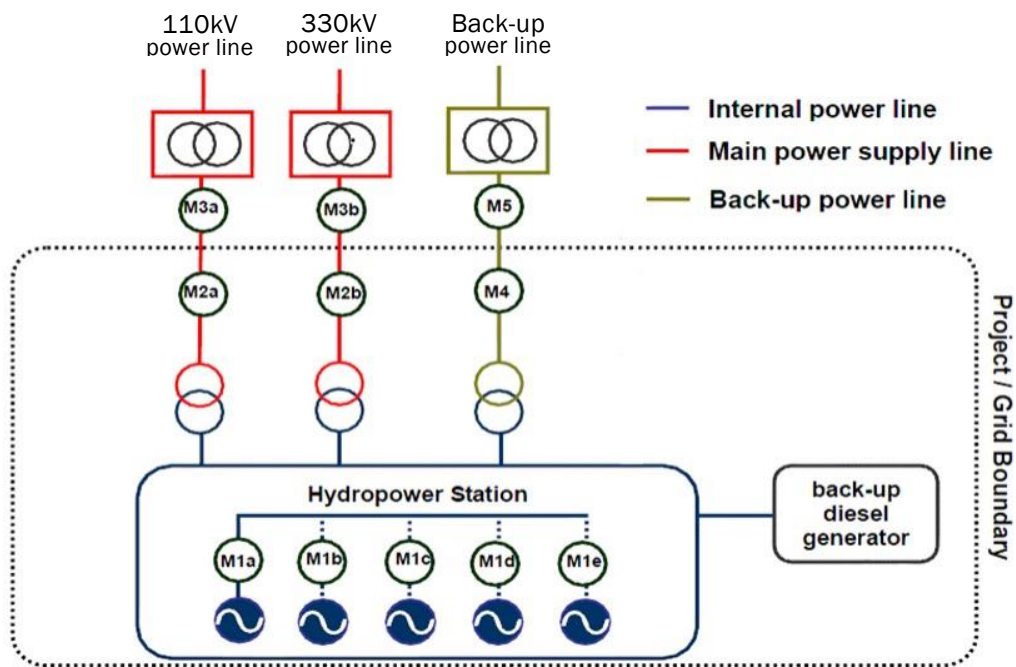


Diagram 4.2: Indicative grid Connection Diagram

ES_y (net electricity supplied by the project through the main power lines) and ED_y (electricity delivered to the project through back-up power line) were measured continuously, recorded daily and aggregated monthly. At the 24:00 of the antepenultimate day of each month, the project proponent recorded the readings ES_y measured by electricity meters M2a and M2b and ED_y measured by M4, and then submitted it to the grid company. After checked with project proponent's readings, the grid company issued sales receipts of ES_y based on readings of M3a

and M3b as well as the billing receipts of ED_y based on the readings of M5. The sales receipts are used for cross-check with the readings of ES_y measured by M2a and M2b while the billing receipts are used to crosscheck the readings of ED_y measured by M4. Data and records are archived for a period of 2 years after the crediting period to which the records pertain.

B. Monitoring of Surface area reservoir

The surface area of the reservoir was measured once at the start of the project when the reservoir reaches full capacity by Gansu Provincial Land Resources Planning and Research Institute, who has an authorization from the State Bureau of Surveying and Mapping. The measurement report has been provided to VVB for verification.

Monitoring of operational hours of back up emergency diesel generator

The emergency back-up diesel generator on site has a capacity of 400kW which is for back emergency use. However, during this period, the diesel generator was only used for regular test operation, of which the operational hours was also monitored and manually logged by the project proponent.

C. Procedures for handling emergencies

Damages to metering equipment:

In case metering equipment is damaged and no reliable readings can be recorded the project proponent will estimate net supply by the proposed project activity according to the following procedure:

- 1). In case metering equipment operated by project entity is damaged only: The metering data logged by the grid company, evidenced by sales receipts will be used as record of net power supplied to the grid for the days for which no record could be recorded.
- 2). In case metering equipment operated by the grid company is damaged only: The metering data recorded by the project entity, evidenced by a print out of electronic records, will be used for the calculation of emission reductions.
- 3). In case both metering equipment operated by project entity and grid company are damaged: The project entity and the grid company will jointly calculate a conservative estimate of power supplied to the grid. A statement will be prepared indicating the background to the damage to metering equipment the assumptions used to estimate net supply to the grid for the days for which no record could be recorded the estimation of power supplied to the grid The statement will be signed by both a representative of the project entity as well as a representative of the grid company. The project entity will furthermore document all efforts taken to restore normal monitoring procedures.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline emissions of the project are calculated according to the following formula:

$$BE_y = EG_y \times EF_y = (ES_y - ED_y) \times EF_y$$

With:

BE_y , the baseline emissions in year y; in tCO₂e;

EG_y , electricity supplied to the grid by the project (net) in year y, (in MWh);

ES_y , net electricity supplied by the project through the main power lines (in MWh);

ED_y , electricity delivered to the project through back-up power line (in MWh);

EF_y , the baseline emission factor, (in tCO₂e/MWh).

Thus, the baseline emissions during this monitoring period are as follows:

Period	ES _y	ED _y	EG _y =ES _y -ED _y	EF _y	BE _y =EG _y *EF _y
	MWh	MWh	MWh	tCO ₂ e/MWh	tCO ₂ e
01/01/2016-31/12/2016	724,768.484	46.920	724,721.564	0.8498	615,868
01/01/2017-31/12/2017	762,592.907	45.620	762,547.287		648,012
01/01/2018-03/08/2018	565,067.910	33.740	565,034.170		480,166
Total	2,052,429.301	126.280	2,052,303.021	-	1,744,046

Net electricity supplied by the Project through the main lines ESy

Period	Net electricity supplied by the Project through the main lines ESy (MWh)		
	Values from Meter Readings [(M2a export - M2a import) + (M2b export -M2b import)] ¹²	Values from Sales Receipts	Conservative values
	A	B	C=Min(A,B)
01/01/2016-29/01/2016*	66401.280	-	0.000
30/01/2016-27/02/2016	58705.680	58682.954	58682.954
28/02/2016-29/03/2016	64607.400	64579.746	64579.746
30/03/2016-28/04/2016	48026.220	47969.328	47969.328
29/04/2016-29/05/2016	76971.180	76939.984	76939.984
30/05/2016-28/06/2016	75501.360	75501.360	75501.360
29/06/2016-29/07/2016	106872.480	106872.480	106872.480
30/07/2016-29/08/2016	79482.480	79482.480	79482.480
30/08/2016-28/09/2016	57251.040	57251.040	57251.040
29/09/2016-29/10/2016	52660.080	52660.080	52660.080
30/10/2016-28/11/2016	55905.300	55869.528	55869.528
29/11/2016-29/12/2016	49003.680	48959.504	48959.504
30/12/2016-31/12/2016*	4287.360	-	0.000
2016 Sub-total	-	-	724768.484
01/01/2017-29/01/2017*	47561.580	-	0.000
30/01/2017-26/02/2017	52909.560	52861.402	52861.402
27/02/2017-29/03/2017	55653.840	55583.615	55583.615
30/03/2017-28/04/2017	48125.880	48092.044	48092.044
29/04/2017-29/05/2017	72042.300	71946.688	71946.688
30/05/2017-28/06/2017	77544.060	77503.492	77503.492
29/06/2017-29/07/2017	95729.040	95668.430	95668.430
30/07/2017-29/08/2017	86712.120	86765.624	86712.120
30/08/2017-28/09/2017	70608.780	70500.540	70500.540
29/09/2017-29/10/2017	56226.720	56250.480	56226.720
30/10/2017-28/11/2017	71637.060	71613.300	71613.300
29/11/2017-29/12/2017	76503.240	75884.556	75884.556
30/12/2017-31/12/2017*	3756.720	-	0.000
2017 Sub-total	-	-	762592.907
01/01/2018-29/01/2018*	61243.380	-	0.000
30/01/2018-26/02/2018	47537.820	47689.026	47537.820
27/02/2018-29/03/2018	50523.000	50350.476	50350.476

¹² The M2a and M2b are able to measure the amount of electricity that delivered to the project from the power grid (i.e. M2a import, M2b import), therefore PP states the case in the MR and ERR sheet.

According the Power Purchase Agreement, the grid company has already deducted the electricity delivered to project from grid via the M2a and M2b when invoicing (i.e. sales receipt). Accordingly, the PP apply a conservative approach in the ERR calculation sheet, that the smaller values (i.e. "Conservative values" in this sheet) of electricity between PP values and Grid Company values(i.e. Sales Receipt) are used to calculate the baseline emissions.

30/03/2018-28/04/2018	67764.840	67792.032	67764.840
29/04/2018-29/05/2018	114915.240	114962.892	114915.240
30/05/2018-28/06/2018	134102.760	134079.066	134079.066
29/06/2018-29/07/2018	150449.640	150420.468	150420.468
30/07/2018-03/08/2018*	9431.400	-	0.000
2018 Sub-total	-	-	565067.910
Total	-	-	2052429.310

*Note:

- 1.The readings of EDs for 01-29 Jan. and 30-31 Dec. of each year are sourced from the daily reading records of meters M2a and M2b.
2. Since the cut-off time of ESy is at 24:00 on the antepenultimate day of each month and the sales receipts are issued monthly, there are no separate sales receipts of ESy for 01-29 Jan and 30-31 Dec of each year. To be conservative, the ESy for the period 01-29 Jan. and 30-31 Dec. of each year are considered as 0. And, the ESy for the period 30/07/2018-03/08/2018 is also considered 0.

Electricity delivered to the Project through the back-up power line EDy

Perios	Electricity delivered to the Project through the back-up power line EDy (MWh)		
	Values from Meter Readings of M4	Values from Billing Receipts	Conservative values
	D	E	F=Max(D,E)
01/01/2016-29/01/2016*	2.800	2.660	2.800
30/01/2016-27/02/2016	3.800	4.220	4.220
28/02/2016-29/03/2016	3.800	4.300	4.300
30/03/2016-28/04/2016	3.000	3.000	3.000
29/04/2016-29/05/2016	3.100	3.320	3.320
30/05/2016-28/06/2016	3.300	3.240	3.300
29/06/2016-29/07/2016	4.500	4.900	4.900
30/07/2016-29/08/2016	4.700	4.320	4.700
30/08/2016-28/09/2016	4.000	3.820	4.000
29/09/2016-29/10/2016	3.600	3.380	3.600
30/10/2016-28/11/2016	2.900	2.820	2.900
29/11/2016-29/12/2016	2.800	2.860	2.860
30/12/2016-31/12/2016*	0.200	3.020	3.020
2016 Sub-total	-	-	46.920
01/01/2017-29/01/2017*	2.900	3.020	3.020
30/01/2017-26/02/2017	3.500	3.420	3.500
27/02/2017-29/03/2017	3.200	3.340	3.340
30/03/2017-28/04/2017	3.000	2.860	3.000
29/04/2017-29/05/2017	3.000	3.000	3.000
30/05/2017-28/06/2017	2.900	2.820	2.900

29/06/2017-29/07/2017	3.200	3.660	3.660
30/07/2017-29/08/2017	4.200	3.740	4.200
30/08/2017-28/09/2017	2.900	2.460	2.900
29/09/2017-29/10/2017	3.500	5.020	5.020
30/10/2017-28/11/2017	3.200	1.460	3.200
29/11/2017-29/12/2017	3.000	3.140	3.140
30/12/2017-31/12/2017*	0.200	4.740	4.740
2017 Sub-total	-	-	45.620
01/01/2018-29/01/2018*	4.600	4.740	4.740
30/01/2018-26/02/2018	2.800	2.900	2.900
27/02/2018-29/03/2018	3.100	2.940	3.100
30/03/2018-28/04/2018	2.900	2.960	2.960
29/04/2018-29/05/2018	3.300	3.280	3.300
30/05/2018-28/06/2018	3.800	4.200	4.200
29/06/2018-29/07/2018	5.600	6.460	6.460
30/07/2018-03/08/2018*	1.200	6.080	6.080
2018 Sub-total	-	-	33.740
Total	-	-	126.280

*Note:

- 1.The readings of EDy for 01-29 Jan. and 30-31 Dec. of each year are sourced from the daily reading records of meter M4.
- 2.Since the cut-off time of EDy at 24:00 on the antepenultimate day of each month and the billing receipts are issued monthly, there are no separate billing receipts for 01-29 Jan. and 30-31 Dec. of each year. To be conservative, for the period 01-29 Jan. and 30-31 Dec. of each year, the whole month's (30 Dec.- 29Jan.) values from the billing receipts of EDy are applied for ER calculations. And, the value of whole August 2018 is applied for the period 30/07/2018-03/08/2018 to.

5.2 Project Emissions

1.Project emissions from the reservoir

The actual measured surface area at full reservoir level is 2,871,999.3m² and the installed capacity is 240MW= 240,000,000W. Thus, the actual power density is calculated as $240,000,000W/2,871,999.3m^2=83.57W/m^2$ which leads to a power density sensibly higher than 10 W/m². Therefore, emissions from the reservoir do not have to be taken into account according to the methodology.

2.Project emissions from the backup diesel generator

The emergency back-up diesel generator on site has a capacity of 400kW and the operation hours during this monitoring period are recorded as 46.5 hours. According to the approved

revised PDD (version 3.0), the emission factor of the diesel generator refers to the AMS-I.D. (version 10) methodology which provides emission factors for diesel generator systems. We apply the highest value listed in the methodology which is 2.4kgCO₂e/kWh (generators below 15 kW), which is conservative considering the size of the generator used on-site. Therefore, the emissions of the diesel generator (tCO₂e) are calculated as the table below:

Period	Installed Capacity of the Diesel Generator	Measured	EF for the Diesel	Emissions of the Diesel
	A	B	C	D=Roundup(A*B*C/1000)
	kW	hour	kg CO ₂ e/kWh	tCO ₂ e
01/01/2016-31/12/2016	400	18	2.4	18
01/01/2017-31/12/2017		18		18
01/01/2018-03/08/2018		10.5		11
Total	-	46.5	-	47

5.3 Leakage Emissions

No leakage in the project according to methodology, i.e. LEy = 0

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCUs (tCO ₂ e)	Removal VCUs (tCO ₂ e)	Total VCUs (tCO ₂ e)
01-Jan-2016 to 31- Dec-2016	615868	18	0	0	-	615850
01-Jan-2017 to 31- Dec-2017	648012	18	0	0	-	647994
01-Jan-2018 to 03- Aug-2018	480166	11	0	0	-	480155
Total	1744046	47	0	0	-	1743999

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
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01-Jan-2016 to 31-Dec-2016	764452	615850	-19.44%	The water flow in 2016 is much lower than the estimated average water flow ¹³ .
01-Jan-2017 to 31-Dec-2017	764452	647994	-15.23%	The water flow in 2017 is much lower than the estimated average water flow ¹⁴ .
01-Jan-2018 to 03-Aug-2018	450293	480155	6.63%	The water flow in 2018 is much higher than the estimated average water flow ¹⁵ .
Total	1979197	1743999	-11.88%	The water flow on average during this monitoring period is less than that of the estimated average water flow, and the actual ERs is 11.88% less than the estimated total ERs based on the Ex-ante estimated emission reductions per year in the registered PDD, which is reasonable in the project scenario.

¹³ According to 2016 Yellow River Water Resources Bulletin, the water flow is lower water flow year, therefore the power generation is much lower than the estimated average.

¹⁴ According to 2017 Yellow River Water Resources Bulletin, the water flow is lower water flow year, therefore the power generation is much lower than the estimated average.

¹⁵ According to 2018 Yellow River Water Resources Bulletin, the water flow is higher water flow year, therefore the power generation is much higher than the estimated average.

APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

No commercially sensitive information.

APPENDIX II: < EVIDENCES OF SUSTAINABLE DEVELOPMENT GOAL >

Evidence for SDG 8.5

Annual Salary Certification of Employees

The Gansu Huanghe Bingling Hydropower Station Project developed by Gansu Diantou Bingling Hydropower Development Co, Ltd, the annual average salary of employees from 2016-2018 is as follows:

Year	Number of employees	Male	Female	Annual average salary
2016	225	55	170	79957Yuan
2017	229	59	170	81627Yuan
2018	227	59	168	105922Yuan

Gansu Diantou Bingling Hydropower Development Co, Ltd

16 July, 2023

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