

VALIDATION REPORT TITLE FOR THREE GORGES NEW ENERGY JIUQUAN CO., LTD GUAZHOU 100MW SOLAR POWER PROJECT



Document Prepared By TÜV NORD CERT GmbH

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Prepared By	TÜV NORD CERT GmbH
Contact	TÜV NORD CERT GmbH JI/CDM Certification Program Langemarckstraße, 20 45141 Essen, Germany Phone: +49-201-825-3335 Fax: +49-201-825-3290 www.tuev-nord.de www.global-warming.de
Approved By	Stefan Winter
Work Carried Out By	Zhao Xuejiao (TL) Li Yongjun (TR)

Summary:

Climate Bridge Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Verified Carbon Standard (VCS) validation of the project, Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project (PL1444) with regard to the relevant requirements of VCS standard version 3.5.

The proposed VCS project activity consistent of a newly built grid-connected photovoltaic power plant with installed capacity of 100MWp which is located in Solar Power Industry Zone, Guazhou County, Jingyuan City, Gansu Province of P. R. China. The approved CDM methodology ACM0002 is applied to quantify the GHG removals achieved by this project. The calculation of the project emission removals is carried out in a transparent and conservative manner, so that the calculated emission removals of 1,262,062 tCO₂e are most likely to be achieved within the first 10-year crediting period (from 2013-12-30 to 2023-12-29).

The validation objective is an independent assessment by a Third Party of a proposed project activity against all defined criteria set for the registration under the VCS. Validation is part of the VCS project cycle and will finally result in a conclusion by the executing VVB whether a project activity is valid to be submitted for registration to VCS registry. The ultimate decision on the registration of a proposed project activity rests with the VCSA.

In the course of the validation 1 Corrective Action Request (CAR) and 1 Clarification Request (CL) were raised and successfully closed.

The review of the project description and additional documents related to baseline and monitoring methodology and subsequent background investigation have provided the TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable of VCS standard version 3.5.

Abbreviations

BAU	Business as usual
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
DNA	Designated National Authority
EB	CDM Executive Board
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NGO	Non-Governmental Organization
NWPG	North West Power Grid
PP	Project Participant
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCS - PD	VCS - Project Description
VCU	Verified Carbon Unit
VVB	Validation, Verification Body
VVM	Validation and Verification Manual

Table of Contents

1	Introduction	5
1.1	Objective	5
1.2	Scope and Criteria	5
1.3	Level of Assurance	6
1.4	Summary Description of the Project	6
2	Validation Process	8
2.1	Method and Criteria	8
2.2	Document Review	8
2.3	Interviews	8
2.4	Site Inspections.....	9
2.5	Resolution of Findings	9
2.6	Forward Action Requests.....	10
3	Validation Findings.....	11
3.1	Project Details	11
3.2	Application of Methodology.....	14
3.2.1	Title and Reference	14
3.2.2	Applicability	15
3.2.3	Project Boundary	15
3.2.4	Baseline Scenario.....	15
3.2.5	Additionality	16
3.2.6	Quantification of GHG Emission Reductions and Removals.....	19
3.2.7	Methodology Deviations	22
3.2.8	Monitoring Plan.....	22
3.3	Non-Permanence Risk Analysis	24
3.4	Environmental Impact	24
3.5	Comments by Stakeholders.....	24
4	Validation conclusion	25
	APPENDIX 1: References.....	26
	APPENDIX 2: Assessment of Applicability Criteria.....	32
	APPENDIX 3: Assessment of Financial Parameters	33

1 INTRODUCTION

Climate Bridge Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the validation of the project:

Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project

with regard to the relevant requirements of the VCS Standard version 3.5^{VCS/}. The validators have reviewed the VCS-PD and relevant evidences.

The applied methodology is CDM methodology ACM0002 “Grid-connected electricity generation from renewable sources” (version 16.0).

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular the project’s baseline, the monitoring plan (MP), and the project’s compliance with

- the requirements of the VCS Version 3.5;
- the requirements of the approved methodology;
- relevant rules, including the host country legislation

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of Verified Carbon Units (VCUs) / Emission reductions.

1.2 Scope and Criteria

The validation scope is given as a thorough independent and objective assessment of the project design including especially: the correct application of the methodology, the project’s baseline study, additionality justification, stakeholder involvement, environmental impacts and monitoring plan, which are included in the VCS PD / other relevant supporting documents, to ensure that the proposed VCS project activity meets all relevant and applicable criteria as follow,

- VCS Program Guide, v3.5
- VCS Standard, v3.5;
- Program Definitions, v3.5

The following documents are also taken into account in the VCS validation, as a CDM methodology was used:

- the Kyoto Protocol, in particular § 12 and modalities and procedures for the CDM;
- further COP/MOP decisions with reference to the CDM (e.g. decisions 4-8/CMP.1);
- decisions and specific guidance by the EB published under <http://cdm.unfccc.int>;
- approved baseline and monitoring methodologies (including GHG inventories).

Further criteria and scope for the VCS validation also include:

- Standard auditing methods for management systems;

- Good practice in the respective technology and sectoral scope, including environmental and social impacts.

The information included in the PD / GHG Report and the supporting documents were reviewed and assessed against the requirements as set out by the VCS Version 3.5.

The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP cannot be held liable by any entities for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

The validation is not meant to provide any consulting to the project participants. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Level of Assurance

The validation has been planned and organized to achieve a

- reasonable level of assurance
- limited level of assurance.

1.4 Summary Description of the Project

The Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project (hereafter “the project”) is located in Solar Power Industry Zone, Guazhou County, Jingyuan City, Gansu Province, P. R. China. The project generates electricity by utilizing renewable solar energy, so no GHG emission will be involved in the project activity. The project consists of polycrystalline silicon solar cell modules, header box, dc-to-ac inverter and 35kV box transformer. The solar cell module is the key component of the project, which converts the solar optical energy into direct current electricity via the photovoltaic effect taking place at the interface of the specific semiconductor material.

The total installed capacity of the grid connected photovoltaic power station is 100MW (100.39MWp of total solar cell modules) which form 100 sets of power generation units (sub-systems). Each of the power generation unit is equipped with 2 inverters (each inverter is 0.5MW). Each power generation unit is equipped with one 35kV box transformer (each box transformer is 1MW). About 399,459 polycrystalline silicon solar cells with fixed bracket were installed. Refer to Table 1-1 for details of the solar cell module, dc-to-ac inverters and box transformer.

Table 1-1: Technical parameters of equipments of the proposed project

Photovoltaic Modules(Polysilicon)		
Manufacturer	Changshu Artes sunshine Power Technology Co., Ltd.	
Type	CS6P-250P	CS6P-255P
Quantity	294,315	105,144
Rated maximum power (Pmax)	250 W	255 W
Rated power voltage (V_{mp})	30.1 V	30.2 V
Rated power current (I_{mp})	8.30 A	8.43 A
Open circuit voltage (V_{oc})	37.2 V	37.4 V
Short circuit current (I_{sc})	8.87 A	9.00 A
Lifetime	25 years	25 years
Decay rate in 25 years	≤ 20%	≤ 20%
Conversion Efficiency	15.54%	15.54%

Inverter			
Manufacturer	Sungrow Power Supply Co., Ltd.	Wuxi Sineng New Energy Co. , Ltd	
Type	SG500MX	EP-0500-A	
Quantity	98	102	
V MPPmax. voltage	850 V	1,000 V	
Max. Input current	1,120 A	1,128 A	
Rated output power	500 kW	500 kW	
Rated output voltage	3-315 V	315V	
Max. Output current	1,008A	1,008A	
Box transformer			
Manufacturer	Ningbo Tian'an Transformer Co., Ltd.	Sunel Transformer Co., Ltd.	Jiangsu Huapeng Transformer Co., Ltd.
Type	ZGS-Z.G-1000/38.5	YBF-1000/40.5	ZGSF11-Z.G-1000/35
Quantity	40	30	30
Rated power	1,000 kVA	1,000 kVA	1,000kVA
Rated voltage	38500±2x2.5/315/315 V	40.5kV	(38.5±2x2.5%)/0.315-0.315 kV
Rated frequency	50 Hz	50 Hz	50 Hz

The electricity generated by solar cell module runs through a header box, then to dc-to-ac inverter, inverters are connected to 35kV box transformers, and then transformed to 110kV through the main transformer before delivered to Bulongji 330kV Substation and finally the power is fed into North West Power Grid of China(NWPG). Interview, background research and document review are used to validate the correctness of the information provided in the PD.

A clear and sufficient description of the project activity is provided in PD, covering all relevant aspects. Precise nature of the project activity and the technical aspects of its implementation are presented in an understandable manner.

The project does not involve the alteration of the existing installation or process. The technology employed is environmentally safe and sound. There is no technology transfer.

The implementation of the project would reduce the GHG emissions for 1,262,062 tCO₂e in the first 10 years, with an average annual GHG emission of 126,206 tCO₂e.

2 VALIDATION PROCESS

2.1 Method and Criteria

The validation of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the VCS project description (VCS PD)^{/PD/}
- A desk review of the VCS PD^{/PD/} submitted by the client and additional supporting documents with the use of customised validation protocol
- Validation planning
- On-Site assessment
- Background investigation and follow-up interviews with personnel of the project developer and its contractors
- Draft validation reporting
- Resolution of corrective actions
- Final validation reporting
- Technical review
- Final approval of the validation.

The main validation steps are described below.

2.2 Document Review

The VCS PD^{/PD/} and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation from the third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this validation are summarized in section 5.

2.3 Interviews

The validation team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

During validation the validation team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in Table 2-1.

Table 2-1: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Local residents Project consultant	<ul style="list-style-type: none"> - Chronological description of the project activity with documents of key steps of the implementation. - Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project - Monitoring and measurement equipment and system. - Financial aspects - Deviations - Crediting period - Project activity starting date - Ownership - Baseline study assumptions - Additionality - Monitoring - Analysis of local stakeholder consultation - Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting - Editorial issues of the VCS - PD

A comprehensive list of all interviewed persons is part of section 5 'References'.

2.4 Site Inspections

The onsite inspection was conducted by members of the assessment team on 2015-05-19 to verify the physical situation and complement the desk based assessment in line with the VCS Standard Version 3.5. See section 3.4 for detailed information.

2.5 Resolution of Findings

Material discrepancies identified in the course of the validation are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this validation is included in the next section 3 of this report.

2.6 Forward Action Requests

There is no FAR raised during the validation process.

3 VALIDATION FINDINGS

3.1 Project Details

Project type, technologies and measures implemented, and eligibility of the project

Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project is a grid connected renewable energy project developed by Three Gorges New Energy Jiuquan Co., Ltd. The objective of the project is to generate the electricity by using of solar power generation technology and sale of the electricity into the NWPG^{/FSR/}. The project lifetime is 25 years^{/EPA&/FSR/}. The proposed project achieves CO₂ emission reduction by replacing electricity generated and dominated by fossil fuel fired power plant connected into the NWPG^{/PPA/}.

The total installed capacity of the grid connected photovoltaic power station is about 100MW which is formed by each power generation unit will be equipped with dc-to-ac inverters and 35kV box transformer. About 399,459 polycrystalline silicon solar cells with fixed bracket were installed. The electricity generated by solar cell module runs through a header box, then to dc-to-ac inverter, inverters are connected to 35kV box transformers, and then transformed to 110kV through the main transformer before delivered to Bulongji 330kV Substation and finally the power is fed into NWPG.

Via checking the FSR^{/FSR/} and FSR approval^{/AFSR/}, and through the on-site investigation^{/PHT/}, it is confirmed that the expected annual supplied electricity in the first operation year is about 158,798 MWh and the accumulative decay rate during the whole lifetime in 25 years is confirmed as $\leq 20\%$ ^{/FSR/}. The expected annual average supplied electricity in the first 10 operation years is 151,855MWh, range from 158,798MWh to 144,654MWh^{/FSR&/XLS/}. Via checking the FSR^{/FSR/} and FSR approval^{/AFSR/}, it is confirmed that the expected annual average supplied electricity in the total 25 operation years is 142,391.4MWh with 1,423.9 operational hours, the PLF is 16.25%(1,423.9h/8760h)^{/FSR&/XLS/}. The estimated annual average emission reductions are thus calculated as 126,206tCO₂e in the first crediting period^{/FSR&/XLS/}.

Project proponent and other entities involved in the project

Project Proponent as per PD is Three Gorges New Energy Jiuquan Co., Ltd.

Other entity involved is Climate Bridge Ltd., the VCU Buyer.

Contact details are provided in the PD. Further entities and organizations related to the project are described in section 1.4 of the PD.

Project start date

The starting date of this project is 2013-12-30 when the activities that lead to the generation of GHG emission removals were first implemented. The validation team confirmed this date by reviewing documents such as the Power Purchase Agreement^{/PPA/}, the Dispatch Instruction Record^{/DIR/} and the Operation Log^{/LOG/} as well as assessment and interviews during the on-site visit that confirmed the dates indicated.

Project crediting period

The first project crediting period is from 30/12/2013 to 29/12/2023, and the total period is 25 years from 30/12/2013 to 29/12/2038.

Project scale and estimated GHG emission reductions or removals

The scale of the project is considered as a normal project, considering that on average of 126,206 tonnes of CO₂e per year (1,262,062 tCO₂e / 10 years).

Project location

The project is located in Solar Power Industry Zone, Guazhou County, Jingyuan City, Gansu Province, P. R. China. The coordinates of the project are Latitude: 40°36'21.40" - 40°37'502.90" N and Longitude: 96°24'6.30" - 96°25'38.30"E. The geographic coordinates of the project activity is confirmed during the onsite visit against GPS measurements^{/GPS/} and satellite images.

Conditions prior to project initiation

The conditions prior to project initiation has been described in the VCS PD to be the same as the baseline scenario identified as below section, i.e., electricity will be supplied by the fossil-fuel based power plans dominated in NWPG. This is confirmed against checking the Feasibility Study Report^{/FSR/} and Power Purchase Agreement^{/PPA/}. Therefore, the project is confirmed not to be implemented to generate GHG emissions for the purpose of their subsequent reduction, removal or destruction.

Project compliance with applicable laws, statutes and other regulatory frameworks

Applicable laws, statutes and regulatory framework are described in the PD and respective documents were reviewed by the validation team^{/AEIA&/AFSR/}. The validation team confirms that no non-compliance with the respective legal framework was found during the validation. The assessment of the legal framework is based on the documents cited also in the PD, as well as interviews and observation during the onsite visit^{/IM01/}.

Ownership and other programs:

- **Right of use**

Business License of Three Gorges New Energy Jiuquan Co., Ltd.^{/BL/}, approval of the FSR^{/AFSR/}, and approval of the EIA^{/AEIA/} were checked for the ownership of the project confirmation. Business License and approvals all indicated that Three Gorges New Energy Jiuquan Co., Ltd. is the owner of this project and responsible for the operation and maintenance of this project. Thus, it is confirmed that the project owner has the ownership of the project.

- **Emissions trading programs and other binding limits**

The project is not attending in any emission trading program and other binding limits as verified through interviews with project proponents during the onsite visit^{/IM01/} and internet research of VCS^{/vcs/}, GS^{/gs/} and CDM databases^{/unfccc/}.

- **Other forms of environmental credit sought or received and eligible to be sought or received**

The project does not apply to any other forms of environmental credits than the Voluntary Carbon Units (VCU's) under the VCS Standard, v3.5 as verified through interviews with project proponents during the onsite visit^{/IM01/} and internet research of VCS^{/vcs/}, GS^{/gs/} and CDM databases^{/unfccc/}.

- **Participation under other GHG programs**

The project is not participating in any other GHG program as verified through interviews with project proponents during the onsite visit^{/IM01/} and internet research of VCS^{/vcs/}, GS^{/gs/} and CDM databases^{/unfccc/}.

• **Rejection by other GHG programs**

The project was not rejected from other GHG programmes, as verified through interviews with project proponents during the onsite visit^{/IM01/} and internet research of VCS^{/vcs/}, GS^{/gs/} and CDM databases^{/unfccc/}.

Additional information relevant to the project, including:

• **Eligibility criteria for grouped projects**

N/A

• **Leakage management**

According to ACM0002, no leakage is considered.

• **Commercially sensitive information**

There is no commercially sensitive information needs to be considered.

Related findings

- No CARs, CLs or FARs have been identified in this context
- The following finding(s) have been addressed:

Finding:	CAR 1		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	In section 1.8, it is observed that <ol style="list-style-type: none"> The description of technical parameters of the equipments including Inverter and Box transformer are missing. Only one type of the Photovoltaic Modules was stated in the PD. However, during the on-site validation, it is observed that there are two types of the Photovoltaic Modules, the relevant information is missing. The actual total installed capacity of the Photovoltaic Modules is not correct via on-site investigation. 		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ol style="list-style-type: none"> The description of technical parameters of inverter and box transformer has been included in the revised PD v02; Both types of PV Modules have been stated in the revised PD v02; The actual total installed capacity of the project have been revised in the revised PD v02, and an explanation of the installed capacity calculation has also been added in the PD. 		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<ol style="list-style-type: none"> Via checking the nameplate of the equipment (Inverter and Box transformer) during on-site investigation^{/PHT/} and through verifying the Equipment Purchase Agreement^{/EPA/}, it is confirmed that the technical parameters of the Inverter and Box transformer in the revised PD are correct and in line with the actual situation of the project activity. Via checking the nameplate of the equipment (Polysilicon Cell) during on-site investigation^{/PHT/} and through verifying the Equipment Purchase Agreement^{/EPA/}, it is confirmed that the technical parameters of the Polysilicon Cell in the revised PD are correct and in line with the actual situation of the project activity. 		

	<p>3. The actual total installed capacity of the Photovoltaic Modules is checked as revised to 100.39MWp. The calculation is confirmed as correct via the actual quantities of the Photovoltaic Modules: Installed capacity of the total Photovoltaic Modules= 250W*294,315 + 255W*105,144 = 100,390,470W = 100.39 MW. Hence, it is confirmed that the installed capacity of the total Photovoltaic Modules is 100.39MW, but the total installed capacity of the inverters is 100MW and the total installed capacity of the Box transformers is 100MW, hence the actual installed capacity of the project is 100MW. Furthermore, via checking the FSR approval and EIA approval, it is confirmed that the installed capacity of the project is 100MW. The actual quantities of the Photovoltaic Modules is checked and confirmed as correct via checking the Arrival, unloading and unpacking acceptance of Photovoltaic Modules issued in Dec. 2013^{/PMA/}. Hence, it is confirmed that the technical information of the main equipments is completed and correct. CAR 1 is closed out.</p>
<p>Conclusion <i>Tick the appropriate checkbox</i></p>	<p><input type="checkbox"/> To be checked during the first periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements</p>

Final Assessment

- The project technology and the description of the same are in line with the applicable VCS criteria.

3.2 Application of Methodology

3.2.1 Title and Reference

CDM Methodology ACM0002 (Version 16.0) “Grid-connected electricity generation from renewable sources” is applied.

Seen from <https://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHLLAR6MJ6VEU83>

The following methodological tools, to which the selected methodology refers to, are used:

“Tool for the demonstration and assessment of additionality” (Version 07.0.0);

“Tool to calculate the emission factor for an electricity system” (Version 04.0)

Seen from <https://cdm.unfccc.int/methodologies/DB/M0CSBFOF8RQG5I84XU5Y4WX0I5LHS1>

By searching the UNFCCC website, it is confirmed that the versions of methodology and tools applied by the project are valid at the time of validation.

3.2.2 Applicability

CDM Methodology ACM0002 (Version 16.0) “Grid-connected electricity generation from renewable sources” is applied by the proposed project, according to the methodology, the applicability criteria is applied to the project as follow,

The Project is the installation of a newly built grid-connected renewable power generation project activity (i.e. solar power) at a location where no other plant was installed. And the project does not involve an on-site switch from fossil fuels to a renewable source. Hence, it is a green field power plant. This has been confirmed via checking the FSR^{/FSR/} and during the on-site investigation.

See the Annex 2 of this report for details.

Hence, the validation team concludes that the chosen baseline and monitoring methodology is applicable to the project activity.

3.2.3 Project Boundary

As stated in the CDM Methodology ACM0002 Ver.16.0, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

The PD has been checked as in line with the Methodology ACM0002. The project boundary is confirmed during the on-site investigation and via checking the official data sources for Grid Emission Factor (NWPG Grid) published by the Chinese DNA^{/GEF/}.

The electricity generated by the project is delivered to NWPG through Gansu Provincial Power Grid. NWPG is a regional grid, which includes Shaanxi Province, Gansu Province, Qinghai Province, Ningxia Hui Autonomous Region and Xinjiang Uyghur Autonomous Region power grids^{/GEF/}. Therefore, the physical, geographical site of the project and the NWPG grid are defined as the project boundary.

All sources and GHGs required by the methodology have been included within the project boundary.

3.2.4 Baseline Scenario

The description of baseline identification in the PD is transparent, verifiable and in accordance to the methodology.

The project is a newly built grid-connected solar power generation project activity, which is checked through the FSR and confirmed during on-site investigation. In the methodology, the baseline scenario is the amount of electricity delivered to the grid by the project activity that would have been otherwise generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system” Ver.04.0.

Hence, the baseline for this project activity is the amount of electricity (kWh) supplied to the grid multiplied with the emission factor of NWPG.

The methodology provided no other plausible alternative for the baseline scenario.

3.2.5 Additionality

The steps taken and sources of information used, to cross-check the information contained in the VCS PD on this matter are described below:

“Tool for demonstration and assessment of additionality” (version 7.0.0) has been utilized to demonstrate additionality. Following the requirements of the methodology, the baseline scenario has been determined in the methodology, no need to identify the alternatives. Following this, investment analysis and common practice analysis were used to demonstrate the additionality of the project.

Identifications of alternatives

The baseline scenario is determined in the methodology ACM0002 Ver.16.0.

Investment analysis

The project investment analysis is demonstrated by applying the “Tool for the demonstration and assessment of additionality” (version 07.0.0) according to ACM0002 and latest version of the Guidance on the Assessment of Investment Analysis (Version 05.0).

A step-wise assessment is presented in Table 3-2.

Table 3-2 Investment Analysis

Step	Argument by PP	Assessment of the validation team
a	<p>Option III: benchmark analysis is selected for the investment analysis.</p> <p>According to the Additionality Tool, Option II or Option III can be selected if Option I is not applicable.</p> <p>Simple cost analysis (Option I) is not applicable because this project will produce financial/economic benefits other than VCUs related income, through sale of generated electricity to the Northeast China Power Grid.</p> <p>In this case the investment comparison analysis (Option II) is not applicable because baseline scenario isn't a specific investment project.</p>	<p>In accordance with the Additionality Tool, the option III benchmark analysis is selected and the options I and II were not applied.</p> <p>Compared to other solar power projects already registered under VCS the applied approach option III is usually chosen.</p> <p>The exclusion of option I and II is reasonable and hence assessed as OK.</p>
b	<p>The financial indicator “Equity Internal Rate of Return (Equity IRR)” post tax for Chinese power industry is 10% as defined in the “Interim rule on Economic Assessment of Electric Engineering Retrofit Projects”^{/IREA/}.</p> <p>It has been identified as a financial indicator for benchmark analysis.</p>	<p>The “Interim Rule on Economic Assessment of Electric Engineering Retrofit Projects” is valid since 2002^{/IREA/} and is widely used in China for financial evaluation of grid connected power generation project. The choice of benchmark as 10% for newly constructed grid connected solar power plant is assessed to be appropriate, since it is in compliance with national regulation and applied for many registered VCS solar projects in the past.</p>

Step	Argument by PP	Assessment of the validation team
c	<p>The Equity IRR post-tax (without VCU revenue) is 7.94% which is less than the identified benchmark of 10%.</p>	<p>PP has calculated Equity IRR in spreadsheet for the project activity on post-tax basis and compared the same with the benchmark 10%.</p> <p>PP has demonstrated that the Equity IRR is lower than the benchmark and hence the project is not financially attractive.</p> <p>The Equity IRR calculation was reproduced by the validation team.</p> <p>The parameters used for the Equity IRR calculation were derived from the FSR, which was approved by local government^{/AFSR/}. The assumptions stated in the report are assessed to be reasonable.</p> <p>Each parameter is assessed individually by the validators in Annex 3.</p> <p>The assessment is strictly following the latest Guidelines on the Assessment of Investment Analysis.</p>
d	<p>The sensitivity analysis was demonstrated through two manners:</p> <p>1. Varying $\pm 10\%$ of four critical parameters (Total static investment, Annual electricity delivered to the grid, Electricity tariff and Annual O&M cost). The selection is checked as in line with the requirements in Guidelines on the assessment of investment analysis (version 05.0) of “Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation”, the Total static investment is checked as constitutes more than 20% of total project costs. The product of electricity tariff and Annual electricity delivered to the grid is checked as constitute more than 20% of the total revenue of the project. The total O&M throughout the project lifetime is checked as accounts for more than 20% of the project cost.</p> <p>2. Threshold analysis by varying the above four parameters to make the Equity IRR meet benchmark 10%.</p> <p>Based above, it can confirm that the financial unattractiveness of the project is robust.</p>	<p>The sensitivity analysis concludes that the project activity is unlikely to be financially attractive. Threshold analysis is also used in sensitivity analysis. The sensitivity analysis was reproduced by the validation team and evaluated to be correct.</p> <p>The sensitivity analysis and threshold analysis of each parameter is assessed individually by the validation team in Annex 3.</p>

Common practice analysis

The common practice analysis was checked strictly followed “Tool for the demonstration and assessment of additionality” (version 07.0.0) and “Guidelines on common practice” (Ver02.0, EB69 Annex08).

Step 1: calculate applicable capacity or output range as +/-50% of the design capacity or output of the proposed project activity

The installed capacity of the wind power project is 100MW, so the range will be 50~150MW.

Step 2: identify similar projects (both CDM/VCS and non-CDM/VCS) which fulfill all of the following conditions:

- (a) The projects are located in the applicable geographical area;
- (b) The projects apply the same measure as the proposed project activity;
- (c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;
- (d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;
- (e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;
- (f) The projects started commercial operation before the project design document (VCS-PD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

Demonstration as follow,

- (a) The region selected for common practice of Gansu Province is assessed as appropriate and reasonable. A province is the second administrative level of China after central government and it is authorized to execute administrative examination and approval for construction projects considering local regulations^{/CEPY/};
- (b) Same measures is defined as measure (b) Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies (example: energy efficiency improvements, power generation based on renewable energy);
- (c) Project uses solar energy source;
- (d) Project for power generation;
- (e) Out range from 50MW to150MW;
- (f) Commercial operation started before 2013-12-30.

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

Thus, the projects operated before 2013-12-30 with an installed capacity of between 50MW to150MW in Gansu Province are determined as “ N_{all} ”. Projects have been applied to CDM/VCS were excluded.

The information source CDM website^{/unfccc/}, GS website^{/gs/}, VCS website^{/vcs/}, China Solar Photovoltaic Industry Authority Data Information Centre^{/cspi/} and China Electric Power Yearbook 2013^{/CEPY/} for the common practice analysis are publicly available and checked by the validation team. The information used is evaluated to be credible.

There is no project operated before 2013-12-30 with an installed capacity of between 50MW to150MW in Gansu Province not applying CDM/VCS. Hence $N_{all}=0$.

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

$N_{all}=0$, hence, $N_{diff} = N_{all} = 0$.

Step 5: calculate factor $F=1-N_{diff}/N_{all}$ 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.

For this project, $F=1-1/1=1-1=0<0.2$. It can be concluded that the project is not a common practice.

The statistics presented above clearly indicates that the project is not a common practice in this appropriate region at the time of PD preparation.

3.2.6 Quantification of GHG Emission Reductions and Removals

Algorithm and/or formulae used to determine emission reductions

As per ACM0002, the ER_y of the project activity during the crediting period is the difference between the baseline emission (BE_y) and project emission (PE_y). The GHG emission reduction is calculated as per ACM0002 with the following equations:

$$ER_y = BE_y - PE_y$$

Where:

ER_y Emissions reductions of the project activity during the year y (tCO₂e/yr)

BE_y Baseline emissions during the year y (tCO₂e/yr)

PE_y Project emissions during the year y (tCO₂e/yr)

According to ACM0002, project emission is zero for solar power projects. And leakage emission is not considered.

Baseline emissions

The baseline emissions BE_y are to be calculated as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂e/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 (tCO₂e/MWh)

The proposed project is the installation of a new grid-connected solar power plant at a site where no

renewable power plant was operated prior to the implementation of the project activity, hence:

$$EG_{P,j,y} = EG_{facility,y}$$

Where:

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

According to the methodology ACM0002 (Version 16.0), $EG_{facility,y}$ is the quantity of net electricity generation supplied by the project plant/unit to the grid. It shall be determined as the difference between quantity of the electricity delivered to the grid by the project and quantity of electricity consumed by the project which is imported from the grid.

For this proposed project

$$EG_{facility,y} = EG_{export,y} - EG_{import,y}$$

Where,

$EG_{export,y}$ = quantity of the electricity delivered to the grid by the project in year y (MWh/yr).

$EG_{import,y}$ = quantity of the electricity imported from the grid by the project in year y (MWh/yr).

The grid emission factor is determined ex-ante and estimated as a combined margin emission factor ($EF_{grid,CM,y}$) which is a combination of the operating margin emission factor ($EF_{grid,OM,y}$) and the built margin emission factor ($EF_{grid,BM,y}$)

The calculation method of the $EF_{grid,OM,y}$ and $EF_{grid,BM,y}$ is derived from the guidance of OM and BM calculation issued by the Chinese DNA. The National Development and Reform Commission of People's Republic of China calculates OM and BM for each sub-grid and renews the results every year. The project was published for GSP on 2015-05-11. The latest data published on 2015-02-04¹ prior to PD-GSP were used for the OM and BM calculation^{1/efl}.

It is also confirmed that there is no electricity power exchange between the NWPG to other power grid, hence, the $EF_{grid,CM,y}$ is calculated in line with the "Tool to calculate the emission factor for an electricity system".

According to the public data issued by China's DNA on 2015-02-04, <http://cdm.ccchina.gov.cn/archiver/cdmcn/UpFile/Files/Default/20150204155537627092.pdf>, the calculated results are as follow:

$$EF_{grid,OM,y} = 0.9578 \text{ tCO}_2\text{e/MWh,}$$

$$EF_{grid,BM,y} = 0.4512 \text{ tCO}_2\text{e/MWh}$$

¹The BM calculation is recalculated by NDRC and the new value was issued on 2015-05-11, <http://cdm.ccchina.gov.cn/Detail.aspx?newsId=51651&TId=3>

$$\begin{aligned} \text{Thus, } EF_{grid,CM,y} &= 0.75 \times EF_{grid,OM,y} + 0.25 \times EF_{grid,BM,y} \\ &= 0.8311 \text{ tCO}_2\text{e/MWh} \end{aligned}$$

The grid emission factor $EF_{grid,CM,y}$ will be fixed in the first crediting period.

The “Tool to calculate the emission factor for an electricity system” is used to calculate the emission factor and it is consistent with the latest version.

The validation team is convinced of the result of the emission factor calculation. It is deemed to be adequate and transparent. All data required for the emission factor calculation were derived from publicly available data of the Chinese government^{/GEF/}.

Thus, the calculation of the grid emission factor is in compliance with the requirements of the “Tool to calculate the emission factor for an electricity system (Version 04.0)” and in line with the VVS^{/VVS/}.

BE_y is calculated by multiplying the electricity baseline emission factor or grid emission factor ($EF_{grid,CM,y}$) and the quantity of net electricity generation supplied by the project to the grid NWPG ($EG_{facility,y}$). The average annual net electricity exported to the NWPG from the project in the first 10 crediting period is estimated to be 151,855MWh as defined in the FSR^{/FSR/}.

$$\begin{aligned} \text{So, } BE_y &= EF_{grid,CM,y} \times EG_{facility,y} \\ &= EF_{grid,CM,y} \times (EG_{export,y} - EG_{import,y}) \\ &= 0.8311 \text{ tCO}_2\text{e/MWh} \times (151,855 - 0) \text{ MWh} \\ &= 126,206 \text{ tCO}_2\text{e/yr} \end{aligned}$$

Project emission

The proposed project is a newly built solar power project, in compliance with ACM0002 Ver.16.0, project emissions can be neglected.

Leakage

In compliance with ACM0002 Ver.16.0, the leakage is ignored.

Emission reduction

ER_y of the project activity during the crediting period is the difference between baseline emission (BE_y) and project emission (PE_y). The calculated result is as follows:

$$\begin{aligned} ER_y &= BE_y - PE_y \\ &= 126,206 \text{ tCO}_2\text{e/yr} - 0 \\ &= 126,206 \text{ tCO}_2\text{e/yr} \end{aligned}$$

The emission reduction calculation was checked by the validation team. Altogether the project activity reduces emissions of 1,262,062 tCO₂e over the 1st renewable crediting period (10 years).

It is confirmed by the validation team via cross-checking the whole calculation process^{/XLS/} against all referenced data sources and the requirements of the applied methodology and methodological tools that:

- a) All data sources and assumptions used are listed and referenced in the PD and are appropriate. Calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimation of the emission reductions;
- b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PD;
- c) All values used in the PD are considered reasonable in the context of the proposed CDM project activity;
- d) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PD. Therefore, the GHG emission reduction calculation is assessed to be correct.

3.2.7 Methodology Deviations

No deviations from the procedures indicated by the methodology have been made.

3.2.8 Monitoring Plan

According to ACM0002 Ver.16.0, the monitoring plan covers the following parameters required to be monitored,

- Quantity of electricity delivered to the grid by the project $EG_{export,y}$,
- Quantity of electricity imported from the grid by the project $EG_{import,y}$,
- Quantity of net electricity generation supplied by the project plant to the grid in year y $EG_{facility,y}$

The Quantity of net electricity generation supplied by the project plant to the grid ($EG_{facility,y}$) will be determined by means of calculating the $EG_{export,y} - EG_{import,y}$. The monitoring of $EG_{export,y}$ and $EG_{import,y}$ and calculation of $EG_{facility,y}$ will be conducted at project site.

Two bi-directional meters M1 (main meter) and M2 (back-up meter) have been installed to monitor the electricity delivered to the grid by the project ($EG_{export,y}$) and the electricity imported from the grid by the project ($EG_{import,y}$). M1 is installed on the onsite 110kV substation at the project site and M2 is installed in the Bulongji 330kV substation to measure $EG_{export,y}$ and $EG_{import,y}$. When M1 is out of order, the readings from meter M2 will be used. The meters have been installed in accordance with the national standard. The calibration of the meters will be annually conducted by a qualified organization and in compliance with the national standard.

The data will be archived during the crediting period and two years after the end of last crediting period.

The monitoring plan can be implemented with regard to the description of measurement methods and QA/QC procedures. All the monitoring arrangements are feasible within the project design.

The monitoring plan is in compliance with the requirements in ACM0002. The validation team is convinced that the monitoring plan will be properly carried out and is sufficient to ensure the monitoring of emission reductions.

Related findings

- No CARs, CLs or FARs have been identified in this context
- The following finding(s) have been addressed:

Finding:	CL 2		
Classification	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	In section 2.5, it is observed that the sensitivity analysis is not demonstrated sufficiently.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>In the revised PD v02, the sensitivity analysis has been fully demonstrated. The following description has been added:</p> <p>Total static investment A fall of this significant decrease is impossible as the project has already finished construction, and the statistics of all project contracts shows that totally 914.722 million CNY have been spent.</p> <p>Annual Electricity delivered to grid The theoretical electricity generation of this project was calculated using the past 30 years' historical data (from 1979 to 2008) of the solar resources in this region, and the annual net electricity supplied to the grid was estimated considering the influence of accumulative decay rate, so this value is reasonable and the errors will not be great. Therefore, the electricity delivered to the grid is unlikely to increase by 7.92%. Moreover, as per the sales receipts of the project, the total electricity delivered to the grid by the project in 2014 is 127,856.161MWh, which is much lower than the expected annual electricity delivered to the grid.</p>		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>The sensitivity analysis for the two parameters, Total static investment and Annual Electricity delivered to grid, has been added in the PDD. It shows that it is unlikely that the benchmark will be crossed. All the supporting documents are checked by the validation team, refer to Appendix 3 of this report for details. Thus, it can be concluded that the sensitivity analysis is valid, and the values which are derived from the FSR are reasonable.</p> <p>For detailed information and assessment about the sensitivity analysis, refer to Appendix 3 of this report.</p> <p>Thus, TÜV NORD concluded that the sensitivity analysis is reasonable, and the range of variation is reasonable in the specific context of the project activity, taking into consideration historic trends in the business sector.</p> <p>CL 2 is closed out.</p>		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements		

Final Assessment

- The project technology and the description of the same are in line with the applicable VCS criteria.

3.3 Non-Permanence Risk Analysis

As the project is not an AFOLU project, therefore, non-permanence risk analysis is not applicable to the project.

3.4 Environmental Impact

The EIA of the project was carried out in accordance with the national regulation requirement of the *Law of the People's Republic of China on Appraising of Environment Impacts* released on 2002-10-28 and approved by Gansu Environment Protection Bureau on 2013-12-24^{/AEIA/}.

The potential environmental impacts identified in EIA have been sufficiently described in the VCS-PD, which include the impacts of air, noise, solid waste and waste water. No adverse environmental impacts as well as trans-boundary impacts have been envisaged from this project activity according to the EIA.

3.5 Comments by Stakeholders

Relevant stakeholders (including local residents, government officials and project participants) have been directly asked to comment on the project through questionnaire investigation^{/SHCP/}.

The stakeholder consultation process was conducted through questionnaires consultation. The questionnaires contained several questions and were distributed to local residents. The local stakeholder consultation process is assessed as adequate.

The validation team also conducted stakeholder interviews during the on-site validation. The stakeholders all supported the construction of the project and no negative comments were received.

4 VALIDATION CONCLUSION

Climate Bridge Ltd. has commissioned the TÜV NORD JI / CDM Certification Program to carry out the validation of the Project Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project in P. R. China with regard to the requirements of VCS Version 3.5 Standard.

The proposed VCS project activity conducts a newly built grid-connected photovoltaic power plant with installed capacity of 100MWp which is located in Solar Power Industry Zone, Guazhou County, Jingyuan City, Gansu Province of P.R.China. The approved CDM methodology ACM0002 is applied to quantify the GHG removals achieved in this project. The calculation of the project emission removals is carried out in a transparent and conservative manner, so that the calculated emission removals of 1,262,062 tCO₂e are most likely to be achieved within the first crediting period (from 2013-12-30 to 2023-12-29).

In the course of the draft validation 1 Corrective Action Request (CAR) and 1 Clarification Request (CL) were successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology and subsequent background investigation have provided the TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- A reasonable level of assurance has been applied.
- All data and information used for ex-ante calculation of emission reductions is of projected and/or hypothetical nature.
- The project is in line with all relevant host country legislation incl. its GHG assertions, where applicable.
- The project additionality is sufficiently justified in the VCS-PD.
- The monitoring plan is transparent and adequate.
- Deviations from the applied CDM methodology have sufficiently been addressed and justified.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 1,262,062 tCO₂e are most likely to be achieved within the first crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation/ GHG Report, is in line with all criteria applicable for the validation against the VCS Version 3.5 standard without any qualifications or limitations.

Shanghai, 2015-06-01



Zhao Xuejiao
TÜV NORD JI/CDM Certification Program
Validation Team Leader

Essen, 2015-06-01



Stefan Winter
TÜV NORD JI/CDM Certification Program
Final Approval

APPENDIX 1: REFERENCES
Table 1-1: Documents provided by the project participant

Reference	Document
/AEIA/	Approval of Environment Impact Assessment EIA was approved by Gansu Province Environmental Protection Bureau on 2013-12-24 [Ganhuanshenbiaofa [2013] No.80] and assessed by the experts from relevant local sections.
/AFSR/	Approval of Feasibility Study Report FSR was approved by Gansu Province Development and Reform Committee dated 2013-12-06 [Ganfagainengyuan(Bei)[2013] No.71.
/BL/	Business Licence of Three Gorges New Energy Jiuquan Co., Ltd.
/CC/	<ol style="list-style-type: none"> 1. Construction Contract of Section I (30MW) of the project signed between Three Gorges New Energy Jiuquan Co., Ltd. and Yangguang Power Co., Ltd. dated in Sep. 2013. 2. Construction Contract of Section II (30MW) of the project signed between Three Gorges New Energy Jiuquan Co., Ltd. and Zhongyi Construction Co., Ltd. dated in Sep. 2013. 3. Construction Contract of Section III (40MW) of the project signed between Three Gorges New Energy Jiuquan Co., Ltd. and Beijing Kenuoweiy Science Technology Co., Ltd. dated in Sep. 2013. 4. 110kV booster station and power delivery engineering EPC contract of the project signed between Three Gorges New Energy Jiuquan Co., Ltd. and Gansu Power Design Institute& Gansu Power Institute Power Equipment Co., Ltd.
/CSB/	Contract Standing Book of the project including all the main contracts signed by the project owner.
/DIR/	Dispatching Instruction Record indicates the project started operation on 2013-12-30
/EBS/	Monthly Electricity Balance Sheets of year 2014
/EIA/	<ol style="list-style-type: none"> 1. Environment Impact Assessment, compiled by Gansu Province Environment Science Design Institute in Oct. 2013. 2. The entity has the qualification certificate Class-B on environmental impact assessment issued by Ministry of Environmental Protection of People's Republic of China on 2013-04-01, valid to 2014-01-23. Certificate no. GuoHuanPingZheng A3702.
/EPA/	Equipment Purchase Agreement <ol style="list-style-type: none"> 5. Photovoltaic Module purchase agreement (Section I) signed between Three Gorges New Energy Jiuquan Co., Ltd. and Changshu Artes sunshine Power Technology Co., Ltd. dated in Oct. 2013.

Reference	Document
	<ol style="list-style-type: none"> 6. Photovoltaic Module purchase agreement (Section II) signed between Three Gorges New Energy Jiuquan Co., Ltd. and Changshu Artes sunshine Power Technology Co., Ltd. dated in Oct. 2013. 7. Inverter purchase agreement (Section I) signed between Three Gorges New Energy Jiuquan Co., Ltd. and Yangguang Power Co., Ltd. dated in Oct. 2013. 8. Inverter purchase agreement (Section II) signed between Three Gorges New Energy Jiuquan Co., Ltd. and Wuxi Shangneng New Energy Co., Ltd. dated in Oct. 2013. 9. Power Generation System Integration (including 35kV box transformer purchase agreement (Section I)) signed between Three Gorges New Energy Jiuquan Co., Ltd. and Yangguang Power Source Co., Ltd. dated in Sep. 2013. 10. Power Generation System Integration (including 35kV box transformer purchase agreement (Section II)) signed between Three Gorges New Energy Jiuquan Co., Ltd. and Zhongyi Construction Co., Ltd. dated in Sep. 2013. 11. Power Generation System Integration (including 35kV box transformer purchase agreement (Section III)) signed between Three Gorges New Energy Jiuquan Co., Ltd. and Beijing Kuonuo Weiye Technology Co., Ltd. dated in Sep. 2013.
/FSR/	<ol style="list-style-type: none"> 1. Feasibility Study Report, completed by China Hydropower Advisory Group Northwest Survey and Design Institute, dated in Aug. 2013. 2. The entity has the qualification certificate Class-A on Engineering Design, Engineering Consultation and Municipal Engineering, issued by National Ministry of Housing and Urban-Rural on 2013-02-19. Certificate no. A161000186, valid to 2018-02-19.
/GCA/	Grid Connected Approval issued by Gansu Province Power Grid Company dated 2013-12-18.
/IRR/	Equity Internal Return Rate calculation spreadsheet(version 01, 2015-05-05)
/LOG/	Operation log of the project plant from the project started operation on 2013-12-30
/PD/	<p>Draft Project Description named “Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project ” dated 2015-05-05</p> <p>Final Project Description named “Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project ” dated 2015-05-22</p>
/PMA/	Arrival, unloading and unpacking acceptance of Photovoltaic Modules issued in Dec. 2013
/PPA/	Power Purchase Agreement signed between Three Gorges New Energy Jiuquan Co., Ltd. and Gansu Province Power Grid Company in Dec. 2013.
/SHCP/	<p>Stakeholder consultation process evidences:</p> <p>Sample copy of Questionnaires including the brief description of the project, eight objective questions and one subjective question.</p>
/TA/	Tariff Approval of the project issued by Gansu Province Development and Reform Committee dated 2014-03-03 [Ganfagaishangjia [2014] No.289.

Reference	Document
/XLS/	ER calculation sheet(version 01, 2015-05-05)

Table 1-2: Background investigation and assessment documents

Reference	Document
/ACM0002/	Approved CDM Methodology ACM0002 ‘Grid-connected electricity generation from renewable sources’ (version 16.0)
/CDM M&P/	CDM Modalities and Procedures
/CEPY/	China Electric Power Yearbook 2006-2013
/CESY/	China Energy Statistics Yearbook 2006-2013
/CPEE/	Construction project economic evaluation methods and parameters (Version3), issued by NDRC and Ministry of Construction
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/CSY/	China Statistics Yearbook 2006-2013
/GCT/	Glossary of CDM terms (Ver.8)
/GEF/	Official data sources for Grid Emission Factor published by the Chinese DNA dated 2015-02-04 and updated on 2015-05-11 for BM calculation.
/GPLF/	Guidelines for the reporting and validation of plant load factors (version01)
/GPS/	GPS control coordinates of project sites, as gathered by auditor during on-site investigation
/IPCC-GP/	IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000
/IPCC-RM/	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual
/IPCES/	Gansu Province Interim Provisions on the Collection of Educational Surcharges issued by General Office of People’s Government of Gansu Province on 2010-05-19. Ref No. Ganzhengbanfa[2010/107

Reference	Document
/IRCM/	Interim Regulations on City Maintenance and Construction Tax of the People's Republic of China (promulgated on Document [1985] No. 19 of the State Council on 1985-02-08.
/IREA/	Interim rule on Economic Assessment of Electric Engineering Retrofit Projects, China Electric Power Press, Beijing, 2003.
/IRVAT/	Interim Regulation of the People's Republic of China on Value Added Tax issued by National Government to go into effect after 2009-01-01
/ITL/	Enterprise Income Tax Law of the People's Republic of China (promulgated on Document Order of the President of the People's Republic of China (No. 63) on March 16, 2007)
/JJG/	Verification regulation of electric watt-hour meters (JJG596-1999)
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7))
/NAGT/	Notification about adjusting the grid-in tariff of power generation company issued by NDRC dated 2013-09-30. Ref No. Fagaijiage[2013]1942.
/NAPI/	Notification of accelerate the PV industry to be developed healthy through the lever effect issued by NDRC dated 2013-08-26. Ref. No Fagaijiage[2013]1638.
/NDVAT/	Notice of the Deduction of Fixed Assets Input VAT ref no. Cai Shui[2009]113 issued by State Tax Administration on 2009-09-09
/PDT/	VCS Project Description Template version 3.2
/PHT/	<ol style="list-style-type: none"> 1. Photograph of project site, equipment, Central Control Room and DCS System took by audit team during the onsite validation 2. Field note recorded by audit team during the onsite validation
/PS/	CDM Project Standard(version 09.0)
/RIP/	VCS Registration and Issuance Process, version 3.5
/SCAIP/	Decision of the State Council on Amending the Interim Provisions on the Collection of Educational Surcharges (promulgated on Document Order of the State Council No. 448 on August 20, 2005)
/SERC/	Electric Power Supervision Report 2007 published by the State Electricity Regulatory Commission(SERC) in April 2008

Reference	Document
<i>/TDA/</i>	Tool for the demonstration and assessment of additionality (Ver. 07.0.0).
<i>/TEF/</i>	Tool to calculate the emission factor for an electricity system Ver.04.0
<i>/TFPP/</i>	Tech-economics Foundation of Power Project issued by China Electricity Power Press(Ver.2)
<i>/TRLE/</i>	Tool to determine the remaining lifetime of equipment (Version 01, EB50, Annex 15)
<i>/VAT/</i>	“ VAT Policy on Comprehensive Utilization of Resource and Other Products” CaiShui [2008] No.156 dated 9 Dec. 2008
<i>/VCS/</i>	Verified Standard version 3.5
<i>/VRT/</i>	VCS Validation Report Template, v3.3
<i>/VVS/</i>	CDM Validation and Verification Standard (version 09.0)

Table 1-3: Websites used

Reference	Link	Organisation
<i>/cd4cdm/</i>	www.cd4cdm.org	UNEP Riso Centre
<i>/cspi/</i>	http://www.pvnews.cn/	China Solar Photovoltaic Industry Authority Data Information Centre
<i>/der/</i>	http://tzs.ndrc.gov.cn/xkxmqj/xkxmyj/t20060802_78919.htm	National Development and Reform Commission
<i>/dna/</i>	http://cdm.ccchina.gov.cn/english/index.asp	National Development and Reform Commission (DNA of China)
<i>/ef/</i>	http://cdm.ccchina.gov.cn/zyDetail.aspx?newsId=46143&TId=161	Emission Factor issued by National Development and Reform Commission (DNA of China)
<i>/gs/</i>	http://www.goldstandard.org	Gold Standard
<i>/InRt/</i>	http://www.pbc.gov.cn/publish/zhengcehuobisi/631/2014/20141128101510852816551/20141128101510852816551_.html	Interest rate in China

Reference	Link	Organisation
<i>/ipcc/</i>	www.ipcc-nggip.iges.or.jp	IPCC publications
<i>/npi/</i>	http://www.hg.org/articles/article_805.html	Notice on the Printing and Issuing of the Implementing Measures for the Reform of Electricity Tariffs
<i>/unfccc/</i>	http://cdm.unfccc.int	UNFCCC
<i>/vcs/</i>	http://www.vcsprojectdatabase.org/	Verified Carbon Standard

Table 1-4: List of interviewed persons

Reference	Mol ¹		Name	Organisation / Function
<i>/IM01/</i>	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Ding Xiao	Three Gorges New Energy Jiuquan Co., Ltd./ Office Director
<i>/IM01/</i>	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms	Su Yixuan	Three Gorges New Energy Jiuquan Co., Ltd./ Office Director
<i>/IM01/</i>	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Zhao Hongwei	Three Gorges New Energy Jiuquan Co., Ltd./Plant Duty Chief
<i>/IM01/</i>	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Zeng Zhixiong	Three Gorges New Energy Jiuquan Co., Ltd./ Plant Vice Duty Chief
<i>/IM02/</i>	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Lin Keming	Climate Bridge Ltd./Project Manager

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)

APPENDIX 2: ASSESSMENT OF APPLICABILITY CRITERIA

Table 2-1: Assessment of Applicability Criteria

Applicability Criteria	Evidence used	met	not met	N/A	Assessment of validation team (results and means of assessment)
This methodology 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 retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).	/FSR/ /EIA/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	By means of checking the FSR and EIA, it is confirmed that the project is a green field solar power generation project and the project will supply power to NWPG.
The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	/FSR/ /EIA/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	By means of checking the FSR and EIA, it is confirmed that the project is installation of a solar power plant.
In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	/FSR/ /EIA/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	By means of checking the FSR and EIA, it is confirmed that the project is installation of a solar power plant, does not involve in capacity additions, retrofits, rehabilitations or replacements.
The methodology is not applicable to: (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; (b) Biomass fired power plants/units.	/FSR/ /EIA/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	By means of checking the FSR and EIA, it is confirmed that the project activity do not involve switching from fossil fuels to renewable energy sources at the site of the project activity and the project is not a biomass fired power plant.

APPENDIX 3: ASSESSMENT OF FINANCIAL PARAMETERS

Assessment of Financial Parameters (VVS / in case financial parameters stem from FSR)

<input type="checkbox"/>	No financial parameters are used for additionality justification
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT																						
					Correctness of value applied	Comment																					
Total static investment	940.3715	Million CNY	Feasibility Study Report/ Page 15-1	/FSR/ /AFSR/ /CSY/ /CC/ /EPA/ /CSB/	<input checked="" type="checkbox"/>	<p>L1: The value has been derived from the FSR and Approval of FSR. The unit cost of the proposed project is 9,404CNY/kW according to FSR.</p> <p>L2: The real expenditure of 914.72 million CNY accounted for 97.27% of the total static investment according to the Contract Standing Book^{/CSB/} of Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project.</p> <p>L3: According to the statistic of all registered Solar CDM projects in Gansu conducted by DOE as below table, unit cost of these projects ranges from 12,207CNY/kW to 19,045CNY/kW. The unit cost of the project below the range can be considered as reasonable and conservative.</p> <table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Installed Capacity(MW)</th> <th>Unit cost per kW(CNY/kW)</th> </tr> </thead> <tbody> <tr> <td>Project activity</td> <td>100</td> <td>9,404</td> </tr> <tr> <td>9788</td> <td>50</td> <td>12,207</td> </tr> <tr> <td>9667</td> <td>50</td> <td>12,413</td> </tr> <tr> <td>9173</td> <td>40</td> <td>19,045</td> </tr> <tr> <td>8968</td> <td>50</td> <td>14,736</td> </tr> <tr> <td>7530</td> <td>50</td> <td>18,877</td> </tr> </tbody> </table> <p>A threshold analysis was conducted by the PP showing that if</p>	Ref. No.	Installed Capacity(MW)	Unit cost per kW(CNY/kW)	Project activity	100	9,404	9788	50	12,207	9667	50	12,413	9173	40	19,045	8968	50	14,736	7530	50	18,877
Ref. No.	Installed Capacity(MW)	Unit cost per kW(CNY/kW)																									
Project activity	100	9,404																									
9788	50	12,207																									
9667	50	12,413																									
9173	40	19,045																									
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7530	50	18,877																									

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						the Total static investment decreases by 7.31%, the benchmark of 10% will be reached. The Static Investment Price Index (SIP index) has kept rising during the recent years by means of checking the China Statistic Yearbook ^{/CSY/} . And the actual expenditure of the project is 914.72 million CNY accounted for 97.27% of the total static investment. Therefore, it is unlikely to improve the economic attraction due to the decrease of Total static investment.
Annual Electricity delivered to grid	142,391	MWh	Feasibility Study Report/ Page 15-2	/FSR/ /AFSR/ /GPLF/ /EBS/	☒	<p>L1: Annual Electricity delivered to grid has been elaborated in the FSR^{/FSR/}. The FSR has been approved by the local DRC^{/AFSR/}.</p> <p>Annual Electricity delivered to grid (142,391MWh) is estimated based on historical 30 years (1979-2008) solar source data from local meteorological stations in project location^{/FSR/}.</p> <p>The average annual electricity generation is calculated by a software to assess solar resources based on the relevant data (e.g. solar radiation and solar cell rake angle). In conclusion, the data used to calculate the average annual power generation is from the exact assessment on solar resource and the calculation method is widely used in China.</p> <p>L2: The average annual utilization hour is calculated as 1,423.9 hours, and equivalent power load factor is 16.25%. According to the “Guidelines for the reporting and validation of plant load factors (PLF) (version01)” issued by EB48 as Annex11, validation team verified the following documents:</p> <ul style="list-style-type: none"> a) Feasibility study report carried out by China Hydropower Advisory Group Northwest Survey and Design Institute ; b) Approval of Feasibility study report issued by Gansu Province Development and Reform Committee dated 2013-12-06; c) The certification of China Hydropower Advisory Group

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT																						
					Correctness of value applied	Comment																					
						<p>Northwest Survey and Design Institute. Furthermore, the project was operated in Dec. 2013, via checking the monthly electricity balance sheets of year 2014, it is confirmed that the total annual Electricity delivered to grid in 2014 is 128,162.1MWh, which is lower than the expected value in the FSR.</p> <p>L3: Moreover, according to the statistic of all registered Solar CDM projects in Gansu conducted by DOE as below table, PLF of these projects ranges from 15.88% to 17.86%. The utilization hour of the project is among the range, thus considered as reasonable.</p> <table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Installed Capacity(MW)</th> <th>PLF (%)</th> </tr> </thead> <tbody> <tr> <td>Project activity</td> <td>100</td> <td>16.25%</td> </tr> <tr> <td>9788</td> <td>50</td> <td>16.59%</td> </tr> <tr> <td>9667</td> <td>50</td> <td>16.23%</td> </tr> <tr> <td>9173</td> <td>40</td> <td>17.78%</td> </tr> <tr> <td>8968</td> <td>50</td> <td>15.88%</td> </tr> <tr> <td>7530</td> <td>50</td> <td>17.86%</td> </tr> </tbody> </table> <p>A critical value analysis was conducted by that PP showing that if the Annual Electricity delivered to grid increases by 7.92%, the benchmark of 10% will be reached. As the annual operating hours is calculated by a qualified third party design institute based on information covering the last 30 years and also being approved by local DRC, it is not likely that the Annual net electricity supplied to the grid in average over the project lifetime (i.e. continuously) will increase by 7.92% to reach the benchmark.</p>	Ref. No.	Installed Capacity(MW)	PLF (%)	Project activity	100	16.25%	9788	50	16.59%	9667	50	16.23%	9173	40	17.78%	8968	50	15.88%	7530	50	17.86%
Ref. No.	Installed Capacity(MW)	PLF (%)																									
Project activity	100	16.25%																									
9788	50	16.59%																									
9667	50	16.23%																									
9173	40	17.78%																									
8968	50	15.88%																									
7530	50	17.86%																									
Electricity tariff (including VAT)	0.9 for first 20 years	CNY /kWh	Feasibility Study Report/ page 15-2	/FSR/ /NAPI/ /NAGT/	<input checked="" type="checkbox"/>	<p><i>Description:</i> L1: The applied tariff is derived from the FSR and the Tariff Approval of the project issued by Gansu Province Development</p>																					

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
	and 0.3343 for the rest years			/TA/ /npi/		<p>and Reform Committee dated 2014-03-03 [Ganfagaishangjia [2014] No.289.</p> <p>In China, the electricity tariffs are categorized into Government Fixed Price and Government Guidance Price, i.e. tariffs are under the control of government.</p> <p>L2: According to NDRC Notice for Development of Solar Sector by utilizing feed-in Tariff Policy (FaGaiJiaGe [2013] No.1638) issued by NDRC on 26/08/2013^{/NAPI/}, it is stipulated that the projects with project located in type I resource region approved after 2013-09-01, the electricity tariff is 0.90CNY/kWh (VAT included). As for the proposed project, FSR had been approved by Gansu DRC on 2013-12-06, and located in type I resource region, the feed-in tariff of 0.9 CNY/kWh used in the FSR is appropriate.</p> <p>Furthermore, according to the Notification of accelerate the PV industry to be developed healthy through the lever effect by NDRC^{/NAPI/}, the Electricity tariff for the first 20 operation years (including VAT) is 0.9CNY/kWh, and according to Notification about adjusting the grid-in tariff of power generation company issued by NDRC^{/NAGT/}, Electricity tariff for the rest operation years (including VAT) is 0.3343CNY/kWh.</p> <p>L3: The sensitivity analysis shows that if the tariff increases by 7.92% (the tariff should be 0.97 CNY/kWh), the Equity IRR would hit the benchmark of 10%. The tariff of this project is addressed in the approved FSR and tariff approval^{/TA/}. Meanwhile, the electricity tariff of 0.9 CNY/kWh (including VAT) for first 20 years and 0.3343CNY/kWh (including VAT) for the rest years was fixed according to the Notification issued by NDRC^{/NAGT/&NAPI/}.</p> <p>In addition, the tariff is determined by the national government, if the tariff is determined, it is not likely to change frequently. And in this Notification issued by NDRC on 2013-08-26^{/NAPI/}, the</p>

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						<p>tariff of solar projects decreased. Hence, it is unlikely for the tariff to increase to 0.97CNY/kWh during each year in the whole project lifetime.</p> <p>In addition, through checking the Notice on the Printing and Issuing of the Implementing Measures for the Reform of Electricity Tariffs on 28 March 2005^{/npi/}, it is confirmed that the tariff of the project is controlled by the government and the substantial change of the tariff is unlikely to happen. Hence, it is unlikely for the tariff of the project to increase by 7.92%.</p>
Annual O&M cost (Average Value)	17.02	Million CNY	Feasibility Study Report/ page 15-2	/FSR/ /unfccc/ /CSY/ /CPEE/	☒	<p>L1: The Annual O&M cost is derived from the FSR. It encompasses sub-items of maintenance cost, wage & welfare, insurance premium of fixed assets, material fee as well as miscellaneous costs.</p> <p>The rates of the repair & maintenance cost rate of 1% (of the fixed assets) is assessed as reasonable with the common repair & maintenance of the solar cells, and the rates are confirmed had been widely used in the solar power project through checking the other registered CDM solar projects^{/unfccc/}.</p> <p>The insurance premium is calculated as 0.25% (insurance rate) of the fixed asset. Material and other costs are calculated as 15CNY/kW and 25CNY/kW respectively. These fees are checked to be widely used in solar power projects.</p> <p>The annual salary is 55,000 CNY/person. The total employees are 25 persons. The welfare is calculated as 52.2% of the salary which is in compliance with the common practice.</p> <p>L2: The values are assessed to be appropriate based on experiences made in validations of several Chinese solar projects and after the consultation of the respective Chinese guidance (Construction project economic evaluation methods and parameters (Version3), issued by NDRC and Ministry of Construction^{/CPEE/}), which provides the way of calculating the financial figures.</p>

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT																						
					Correctness of value applied	Comment																					
						<p>L3: Moreover, according to the statistic of all registered Solar CDM projects in Gansu conducted by DOE as below table, O&M cost/investment of these projects ranges from 0.4% to 2.3%. The ratio of the project 1.8% is among the value, thus considered as reasonable.</p> <table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Installed Capacity(MW)</th> <th>O&M cost/ Investment</th> </tr> </thead> <tbody> <tr> <td>Project activity</td> <td>100</td> <td>1.8%</td> </tr> <tr> <td>9788</td> <td>50</td> <td>2.3%</td> </tr> <tr> <td>9667</td> <td>50</td> <td>1.5%</td> </tr> <tr> <td>9173</td> <td>40</td> <td>0.4%</td> </tr> <tr> <td>8968</td> <td>50</td> <td>1.2%</td> </tr> <tr> <td>7530</td> <td>50</td> <td>0.7%</td> </tr> </tbody> </table> <p>Furthermore, as shown in the threshold analysis, the benchmark will be reached when the annual O&M cost decrease by 48.96%, thus the O&M cost is not very sensitive impacting the IRR to reach the benchmark. Considering the increase of material price and labour cost in China^{/CSY/}, the decrease of O&M by 48.96% is not likely to occur.</p>	Ref. No.	Installed Capacity(MW)	O&M cost/ Investment	Project activity	100	1.8%	9788	50	2.3%	9667	50	1.5%	9173	40	0.4%	8968	50	1.2%	7530	50	0.7%
Ref. No.	Installed Capacity(MW)	O&M cost/ Investment																									
Project activity	100	1.8%																									
9788	50	2.3%																									
9667	50	1.5%																									
9173	40	0.4%																									
8968	50	1.2%																									
7530	50	0.7%																									
Benchmark	10	%	Feasibility Study Report / page 15-4	/FSR/ /IREA/ /unfccc/	<input checked="" type="checkbox"/>	<p>L1: The benchmark of 10% is derived from the FSR.</p> <p>L2: The project supplies electricity to the grid; therefore, the benchmark of Equity IRR of 10% (after tax) for grid connected power plant was properly applied according to the “Interim Rule on Economic Assessment of Electric Engineering Retrofit Projects”^{/IREA/}. The applied data source is relevant and suitable for the purpose of benchmark determination.</p> <p>L3: It is commonly applied for other power projects in China^{/unfccc/}.</p>																					
Value added tax (VAT)	17	%	Feasibility Study Report/ page 15-	/FSR/ /VAT/	<input checked="" type="checkbox"/>	<p>L1: The tax rate is derived from the FSR.</p> <p>L2: It is in line with the tax policy^{/VAT/}. In the tax policy, VAT half-exemption is available for energy production using solar power,</p>																					

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
			2	/unfccc/		fuel gangue, fuel mud, and oil shale. L3: This policy is commonly used by other power projects.
City maintenance & construction tax (of VAT)	5	%	Feasibility Study Report/ page 15-2	/FSR/ /IRCM/ /unfccc/	<input checked="" type="checkbox"/>	L1: The tax rate is derived from the FSR. L2: The tax rate is mandatory and applicable since 1985. According to this tax regulation, if the project is located in the Zone, County and town, the rate of the tax is 5%. The proposed project is located in Solar Power Industry Zone, Guazhou County, thus the tax rate of 5% is correct and reasonable. L3: This rate is widely used by other registered PV projects in China.
Educational surtax (of VAT)	5	%	Feasibility Study Report/ page 15-2	/FSR/ /SCAIP/ /IPCES/ /unfccc/	<input checked="" type="checkbox"/>	L1: The tax rate is derived from the FSR. L2: 3% is determined by National policy "Decision of the State Council on Amending the Interim Provisions on the Collection of Educational Surcharges" which effective since 2005. Another 2% is determined by Provincial policy "Gansu Province Interim Provisions on the Collection of Educational Surcharges" ^{/IPCES/} . Hence it is relevant for the purpose of the Educational surtax determination. L3: This rate is widely used by other registered Gansu Solar projects in China.
Income Tax	25 (0 for the first 3 years, half for the second 3 years)	%	Feasibility Study Report/ page 15-3	/FSR/ /ITL/ /unfccc/	<input checked="" type="checkbox"/>	L1: The value has been derived from the FSR. L2: It is stated that the rate of Income tax is 25%, this is in accordance with the <i>Enterprise Income Tax Law of the People's Republic of China</i> ^{/ITL/} (promulgated on Document Order of the President of the People's Republic of China (No. 63) on March 16, 2007). The applied Income tax Law is effective since 01/01/2008. Hence it is relevant for the Purpose of the income tax determination. And the tax of 0 for the first 3 years, half for the second 3 years is considered as conservative and in line with the national regulation for solar projects. L3: The policy is favourable compared to formerly used 33% tax

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						rate before 01/01/2008 and is more conservative. This rate is widely used by other registered PV projects in China.
Depreciation rate	4.75	%	Feasibility Study Report/ page 15-2	/FSR/ /TFPP/ /CPEE/ /ITL/ /unfccc/	☒	<p>L1: The depreciation has been derived from the FSR which has been approved by the local DRC.</p> <p>L2: It is calculated as the depreciation time of 20 years with 5% residual value which is in line with “Economic Assessment Method and Parameters for Construction Projects”(Ver.03)^{/CPEE/}. 20 years is derived from the FSR. According to <i>Enterprise Income Tax Law of the People’s Republic of China</i>^{/ITL/}(promulgated on Document Order of the President of the People’s Republic of China (No. 63) on March 16, 2007), the minimum depreciation year for production equipment is 10 years. Hence, 20 years is checked as appropriate.</p> <p>L3: By cross-checking other CDM solar projects in Gansu region, it has been observed that the 20 years depreciation time is widely used for solar projects^{/unfccc/}. Hence, the DOE concludes that the depreciation time and the residual value of 5% are correct and appropriate.</p>
Residual rate of fixed assets	5	%	Feasibility Study Report/ page 15-2	/FSR/ /NIARVR/ /unfccc/	☒	<p>L1: The Residual rate of fixed assets has been derived from the FSR which has been approved by the local DRC.</p> <p>L2: It is prescribed in the Notice on Implementation of Adjustment for Residual Value Rate of Fixed Assets that the residual value rate of fixed assets for the projects after the issue date should use 5%. Moreover, the 5% residual value of the project activity assets has been included as a cash inflow in the final year at the end of the assessment period.</p> <p>L3: By cross-checking other CDM PV projects in China, it has been observed that the 5% residual rate of fixed assets is widely used for PV projects^{/unfccc/}.</p>
Installed Capacity	100	MW	Feasibility Study Report/ Page 15-1	/FSR/ /AFSR/	☒	L1: The value is derived from the FSR. The total installed capacity of the solar cells is nearly 100.39MWp. Hence, it is confirmed that the installed capacity of the total Photovoltaic

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						<p>Modules is 100.39MW, but the total installed capacity of the inverters is 100MW and the total installed capacity of the Box transformers is 100MW, hence the actual installed capacity of the project is 100MW.</p> <p>L2: The capacity is approved^{/AFSR/} by local authority based on the provided FSR^{/FSR/}.</p> <p>L3: The validation team is of the opinion that both data sources are credible, reliable and relevant in the context of the considered parameter.</p>
Project Lifetime	25	year	Feasibility Study Report/ page 15-1	/FSR/	<input checked="" type="checkbox"/>	<p>L1: The value is derived from the FSR.</p> <p>L2: 25 years is a typical lifetime of solar power projects.</p> <p>L3: The applied value is in line with the data sources, and the data sources have been assessed by the validation team as authentic and credible.</p>
Interest rate of long-term loan	6.55	%	Feasibility Study Report/ page 15-1	/FSR/ /InRt/	<input checked="" type="checkbox"/>	<p>L1: The interest rate of 6.55% and the loan principle applied in the PDD is derived from the FSR.</p> <p>L2: This value is in line with the actual loan interest as justified by the searching of website (http://www.pbc.gov.cn/publish/zhengcehuobisi/631/2014/20141128101510852816551/20141128101510852816551_.html) interest rate in China^{/InRt/} when compiling the FSR in Aug. 2013.</p> <p>L3: The applied value is in line with provided data sources and deemed to be appropriately justified.</p>
Interest rate of short-term loan	6	%	Feasibility Study Report/ page 15-1	/FSR/ /InRt/	<input checked="" type="checkbox"/>	<p>L1: The interest rate of 6% and the loan principle applied in the PDD is derived from the FSR.</p> <p>L2: The interest rate of 6% is the prevailing commercial (http://www.pbc.gov.cn/publish/zhengcehuobisi/631/2014/20141128101510852816551/20141128101510852816551_.html) interest rate in China^{/InRt/} when compiling the FSR in Aug. 2013.</p> <p>L3: The applied value is in line with provided data sources and</p>

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						deemed to be appropriately justified.
Liquidity	3.015	Million CNY	Feasibility Study Report/ page 15-1	/FSR/ /unfccc/ /CPEE/	<input checked="" type="checkbox"/>	L1: The liquidity of 3.015 Million CNY applied in the PDD derives from the FSR. L2: This value is calculated by installed capacity(100.39MWp) multiplied with the 30CNY/kW. This value has been considered as cash in-flow in the last year which is in line with the financial regulation "Economic Assessment Method and Parameters for Construction Projects"(Ver.03) ^{/CPEE/} . L3: 30CNY/kW is derived from the FSR and checked as widely used for solar projects by means of checking the project listed in the UNFCCC ^{/unfccc/} .
Debt/equity ratio	70/30	-	Feasibility Study Report / page 15-1	/FSR/ /der/	<input checked="" type="checkbox"/>	L1: The debt/equity ratio is derived from FSR. L2: It is cross-checked with the national regulation ^{/der/} issued by State Council. The equity ratio in power industry project should be no less than 20%. Hence, 30% is appropriate. L3: The ratio applied in the proposed project is considered as appropriate and in line with national regulation.