



Validation report form for post-registration changes for component project activities

(Version 02.0)

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

BASIC INFORMATION

Title and UNFCCC reference number of the component project activity (CPA)	Title: PV power plants project on collective housing of 2011-<2011-LH-001-01457> UNFCCC ref. no.: 9247-P1-0001-CP1
Version number of the validation report	1.1
Completion date of the validation report	25/10/2019
Version number of PoA-DD and CPA-DD applicable to this validation report	PoA-DD version 09.0 CPA-DD version 10.0
Title and UNFCCC ref. no. of the registered PoA into which the CPA is included	Title: Programme of Activities to introduce renewable energy system into collective housing, Republic of Korea UNFCCC ref. no.: 9247
Type(s) of CPA PRCs	<input checked="" type="checkbox"/> Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of monitoring plan <input type="checkbox"/> Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents <input type="checkbox"/> Changes to the project design <input type="checkbox"/> Changes specific to afforestation and reforestation activities
Coordinating/managing entity (CME)	Korea Land & Housing Corporation
Host Parties	Republic of Korea
Applied methodologies and standardized baselines	AMS-I.F. (version 02.0) - Renewable electricity generation for captive use and mini-grid No standardized baseline (s) applicable
Mandatory sectoral scopes	1 : Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	No conditional sectoral scope (s) linked to the applied methodology
Name and UNFCCC reference number of the DOE	Name: Korean Foundation for Quality (KFQ) Reference number: E-0025
Name, position and signature of the approver of the validation report	Yu Shim JEONG, Technical Managing Director <i>Y S JEONG</i>

SECTION A. Executive summary

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Korea Land & Housing Corporation (LH corporation) has commissioned Korean Foundation for Quality (KFQ) to carry out first verification of the CDM Programme of Activities (PoA) "Programme of Activities to introduce renewable energy system into collective housing, Republic of Korea" (UNFCCC Registration Ref. No.9247) for the period from 27/12/2012 to 31/12/2018.

During the verification, KFQ has also performed the validation of post-registration changes to the component project activity (CPA) of the PoA, titled "PV power plants project on collective housing of 2011-<2011-LH-001-01457>" (UNFCCC Ref. No. 9247-P1-0001-CP1).

The CPA is composed of 15 photovoltaic (PV) power plant sites. PV modules are located on the roof of the national rental houses managed by LH corporation. Electricity generated by the PV plants is supplied to the national rental houses and displaces electricity from an electricity distribution system.

There were a post-registration changes (PRC) such as temporary deviation to the registered monitoring plan and corrections identified in the course of verification for the monitoring period from 27/12/2012 to 31/12/2018. The request for approval of PRC is submitted with the discretion of the coordinating/managing entity (CME) as per the CDM Project Standard for Programme of Activities (CDM PS for PoA).

Validation process

The validation process includes desk review of PRC and other supporting documents. Further, onsite assessments and interviews with those involved in project management and operations are conducted. This is followed by preparation of draft validation report summarizing desk review and on-site assessment findings (i.e. CARs, CLs, and FARs). Upon successful closing of the CARs and CLs raised (if any), the final validation report is prepared. The final report then undergoes a technical review and final approval according to KFQ's internal quality assurance procedures.

The information provided by the CME was assessed by review of the detailed project documentation as well as interviews with personnel at LH corporation. This has enabled the validation team to assess and determine that the correction to project information and temporary deviation from the registered monitoring plan are in compliance with CDM PS for PoA and relevant guidance provided by the CDM Executive Board.

General description of the CPA

Title of PoA in which this CPA is included	Programme of Activities to introduce renewable energy system into collective housing, Republic of Korea
UNFCCC reference number of PoA	9247
CME	Korea Land & Housing Corporation
Title of CPA	PV power plants project on collective housing of 2011-<2011-LH-001-01457>
UNFCCC reference number of CPA	9247-P1-0001-CP1
CPA implementer	Korea Land & Housing Corporation
Inclusion date	27/12/2012
Crediting period	27/12/2012 to 26/12/2019 (7 years)
Included CPA-DD	Version 09.0 of 21/04/2016 Version 10.0 of 27/09/2019, submitted with this PRC validation report

Details of PRC are below:

- 1) Temporary deviation
Conservative approach to calculate the electricity generation applied in emission reduction (ER) calculation during the deviation period from 27/12/2012 to 31/12/2018
- 2) Corrections
Addresses & GPS coordinates of PV plant sites

Conclusion

As a result of our assessment, KFQ confirms that correction to project information is an accurate reflection of actual information and temporary deviation from the registered monitoring plan is in accordance with the relevant requirements of CDM PS for PoA, CDM Validation and Verification Standard for Programme of Activities (CDM VVS for PoA) and applied methodology. As per paragraph 249~251 of CDM PS for PoA (version 02.0), the CME decided to submit request for approval of PRC with the request for issuance of CERs for this monitoring period.

SECTION B. Validation team, technical reviewer and approver

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B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Document review	On-site inspection	Interviews	Validation findings
1.	Team Leader (*)	IR	KANG	Yeonggyeong	KFQ	√	√	√	√
2.	Validator (*)	IR	LEE	Mi Jung	KFQ	√	√	√	√
3.	Validator (*)	IR	PARK	Su Hyun	KFQ	√	√	√	√
4.	Validator (*)	IR	JANG	Pyung Hee	KFQ	√	√	√	√

(*) means personnel with technical expertise in technical area 1.2

B.2. Technical reviewer and approver of the validation report on CPA PRCs

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	CHO	Jin Seok	KFQ
2.	Approver	IR	JEONG	Yu Shim	KFQ

Please refer to Appendix 2 below for demonstration of how the team meets the competence required for the validation.

SECTION C. Means of validation**C.1. Document review**

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KFQ's validation is based on the revised CPA-DD and other supporting documents provided by the CME. Those were reviewed as initial step of the validation process as for the post registration changes

Over the whole validation period, validation team reviewed the applied baseline and monitoring methodology and any other information and references relevant to the post registration changes. A complete list of all documents reviewed is shown in Appendix 3 of this validation report. KFQ's validation process takes into consideration all the CDM Rules and Guidances applicable to the project activity, e.g. Clean Development Mechanism Validation and Verification Standard, Clean Development Mechanism Project Standard, Clean Development Mechanism Project Cycle Procedure, Post Registration Changes and Request for Issuance: Completeness checklist, Post

Registration Changes and Request for Issuance: Information and reporting checklist and relevant decisions, clarifications and guidance from the CMP and the CDM EB.

C.2. On-site inspection

On-site inspection related to this validation of the PRC from the registered CPA-DD and applied methodology was performed during the site visit on 19/08/2019-23/08/2019. During the on-site assessment, the personnel were interviewed or assisted the validation team.

The main activity performed on-site are summarized in the table below:

Duration of on-site inspection: 19/08/2019 to 23/08/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Confirmation of information to the project activity and the correct & complete implementation.	Yangsan	19/08/2019	Pyung Hee Jang & Su Hyun Park
		Anyang	21/08/2019	Pyung Hee Jang & Su Hyun Park
		Yeongam,	22/08/2019	Mi Jung Lee
		Chungju	22/08/2019	Su Hyun Park
2.	Verification of the information provided in the revised CPA-DD	Same as above	Same as above	Same as above
3.	Confirmation of information to the project activity and the correct & complete implementation.	Gwangmyeong-Siheung Business Division	23/08/2019	Yeonggyeong Kang, Mi Jung Lee, Su Hyun Park

C.3. Interviews

A list of the persons interviewed during this validation activity is included in table below.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Kim	Sun Kyung	Korea Land & Housing Corporation	23/08/2019	General support	Yeonggyeong Kang, Mi Jung Lee, Su Hyun Park
2.	Cho	Jung Hyun	Same as above	Same as above	Same as above	Same as above
3.	Kim	Jin Woo	Yangsan	19/08/2019	Plant operation	Pyung Hee Jang & Su Hyun Park
4.	Kim	Sang Hoon	Chungju	22/08/2019	Plant operation	Su Hyun Park
5.	Kim	Dong Jun	Yeongam,	22/08/2019	Plant operation	Mi Jung Lee
6.	Hwang	Sung Soo	Anyang	23/08/2019	Plant operation	Su Hyun Park
7.	Park	Sung Jae	Same as above	Same as above	Same as above	Same as above
8.	Ha	Taesang	Green Pulse	19/08/2019-23/08/2019	General support, data management	Yeonggyeong Kang, Mi Jung Lee, Su Hyun Park, Pyung Hee Jang
9.	Lee	Gun Hyung	Same as above	Same as above	Same as above	Same as above

C.4. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with CPA-DD form	0	0	0
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	0	0	0
Corrections	0	0	0
Changes to the start date of the crediting period	0	0	0
Inclusion of monitoring plan	0	0	0
Permanent changes to the registered monitoring plan, or	0	0	0

permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents			
Changes to the project design	0	0	0
Changes specific to afforestation and reforestation activities	0	0	0
Others (please specify)	0	0	0
Total	0	0	0

SECTION D. Validation findings

D.1. Compliance with CPA-DD form

Means of validation	Compliance with CPA-DD form is validated by the document review of CPA-DD form (version 09.0) and the revised CPA-DD (version 10.0)
Findings	The change to the project information of the CPA has been observed during document review and on-site visit. The CME has provided a revised CPA-DD (version 10.0) inclusive of all post registration changes. The CME used the latest version of the CPA-DD form (version 09.0).
Conclusion	<p>The validation team confirms that:</p> <ul style="list-style-type: none"> • The revised CPA-DD (version 10.0) are in compliance with the latest CPA-DD form (version 09.0) and the instructions therein; and • The information transferred to the later version of the CPA-DD form is materially the same as that in the registered CPA-DD besides those changes are highlighted and assessed under this report.

D.2. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

Means of validation	The proposed temporary deviation is verified by the validation team as per paragraph 251-255 of CDM VVS for PoA (version 02.0). The KFQ validation team checked whether the temporary deviation applied conservative assumptions to the calculations to ensure that GHG emission reductions would not be overestimated as a result of the deviation. It was also checked the exact period to which the deviation applies.
Findings	<p><u>The reason of the temporary deviation</u></p> <p>The CPA includes 15 PV power plants located on the roof of the National Rental House in Republic of Korea. The quantity of electricity generated by the CPA was supposed to be monitored by electricity meters of each power plant and recorded monthly as per the registered CPA-DD (version 09.0).</p> <p>However, the CME could not provide monthly electricity generation records for monitoring period from 27/12/2012 to 31/12/2018. Accordingly, the CME proposed a conservative approach to calculate the electricity generation applied in ER calculation during the deviation period from 27/12/2012 to 31/12/2018.</p> <p><u>Description of the temporary deviation</u></p> <p>The proposed temporary deviation is to deduct electricity generation prior to the start date of the monitoring period (27/12/2012), from accumulated electricity generation up to the end date of monitoring period (31/12/2018).</p> <p>Regarding accumulated electricity generation up to 31/12/2018, the CME has checked and recorded the accumulated electricity generation on 31/12/2018 through electricity meters installed at each power plant.</p> <p>Regarding electricity generation prior to the start date of the monitoring period (27/12/2012), the CME estimated it using PV power capacity, operating time and plant load factor since the CME could not provide electricity generation record for the period.</p> <p>As per the temporary deviation, total quantity of electricity generated during deviation period in the site i ($EG_{ACC_DP,i}$) used in calculation $EG_{BL,y}$ is estimated as below:</p>

[Equation]

$$EG_{ACC_DPI} = EG_{ACC_total,i} - EG_{ACC_SD,i}$$

- $EG_{ACC_total,i}$ = Accumulated electricity generation up to the end date of the monitoring period (31/12/2018)
- $EG_{ACC_SD,i}$ = Accumulated electricity generation prior to start date of monitoring period (27/12/2012)

$$EG_{ACC_SD,i} = PP_{inst,i} \times OD_i \times 24 \times PLF$$

- $PP_{inst,i}$ = Installed capacity of PV power in the site i, MW
- OD_i = Plant operation dates of PV plant i prior to the start date of monitoring period (27/12/2012), i.e. from the operating start date of PV plant i up to the start date of monitoring period
- 24 = hours of a day
- PLF = Plant load factor, % (15.7% is applied in a conservative approach)

[Plant load factor]

To apply conservative estimate, the CME considered the highest PLF that can be checked in publicly available official statistics and the highest PLF of the PV plants of the CPA and has applied the higher PLF between both as below.

The CPA was included on 27/12/2012 and PV plants of the CPA had been operated from December 2011. PLFs of all PV plants connected to grid in the Republic of Korea can be found in Statistics of Electric Power in Korea issued by Korea Electric Power Corporation (KEPCO). The CME found the highest PLF among them as of 2012 which corresponds to the period from the operating start dates (December 2011) of the PV plants of the CPA to the start date of monitoring period (27/12/2012). Even the PV plants were operated from December 2011, PLFs in 2011 were not considered because the operating times that belong to 2011 are short.

The plant load factor of all photovoltaic plants in 2012 was investigated through Statistics of Electric Power in Korea issued by Korea Electric Power Corporation (KEPCO). It was found that the highest value among plant load factors of the photovoltaic plants in 2012 was 15.7%.

In addition, PLFs of 15 PV power plants of the CPA for the period from the date of PV plant operation to 31/12/2018 were calculated to find the highest PLF. It shows that the highest plant load factor among 15 photovoltaic power plants is 14.9 %.

<Plant load factors of the CPA for the deviation period>

No.	PV Plant sites	Capacity (kW)	Generated electricity (kWh)	Plant load factor (%)	Remark
1	Hoengseong Eupha	60.48	534,768	14.3	
2	Anyang Gwanyang (A1BL)	126.72	1,096,786	14.0	
3	Osan Cheongho(1,2BL)	129.60	1,151,770	14.3	
4	Jecheon Gangjeo(A2BL)	60.48	543,892	14.6	
5	Chungju Yeonsu(2)	172.80	1,470,093	13.8	
6	Seosan Daesan	34.56	311,508	14.6	
7	Hongseong Namjang(2BL)	83.52	765,119	14.8	
8	Gwangju Seonun(8-1,2BL)	247.68	1,987,918	12.9	
9	Yeongam Yongang(2)	46.08	422,489	14.8	
10	Jangheung Geonsan(2)	40.32	351,334	14.1	
11	Yeongcheon Mangjeong	80.64	740,760	14.9	Highest
12	Yangsang Gachon	77.76	688,538	14.3	
13	Changwon Bongnim(A1BL)	109.44	754,886	11.2	
14	Changwon Bongnim(A2BL)	92.16	762,904	13.4	
15	Busan Jisa(2)	95.04	606,803	10.3	

As the comparison of 15.7% and 14.9%, applying 15.7% as plant load factor is considered to estimate conservative emission reductions. Therefore, the CME proposed the application of PLF (15.7%) for the calculation of " $EG_{ACC_SD,i}$ ", accumulated electricity generation prior to start date of monitoring period

	(27/12/2012). The validation team confirms that the application of plant load factor (15.7%) is conservative through review of "Statistics of Electric Power in Korea" and "Plant load factors of 15 photovoltaic power plants of the CPA during its operation". Consequently the emission reductions will not be overestimated compared to actual emission reductions as a result of the deviation.
Conclusion	The validation team confirms that: <ul style="list-style-type: none"> The proposed temporary deviation has applied conservative assumptions or discount factors to the calculations to the extent required to ensure that GHG emission reductions will not be overestimated as a result of the deviation; The period to which the proposed temporary deviation applies is from 27/12/2012 to 31/12/2018.

D.3. Corrections

Means of validation	Corrections have been validated by means of document review, on-site inspection and review of registered and revised CPA-DD.																																										
Findings	<p>The validation team has checked all of addresses and GPS coordinates for 15 PV plant sites through document review and on-site inspection.</p> <p>The validation team identified that addresses of PV plant sites indicated in the registered CPA-DD were slightly different from the actual locations. It was also found that locations of some photovoltaic power plant sites were not appropriately stated in order of street name and district/city area name.</p> <p>After the CME submitted actual location information of all PV plants and revised the CPA-DD, the validation team confirms that the addresses of the 15 PV plant sites have been accurately corrected in the revised CPA-DD (version 10.0) by means of review of documents for pre-operational inspection certificates, and cross-check with a map as well as on-site inspection.</p> <p>Therefore, there are no inconsistencies between the CPA-DD (version 10.0) and the actual locations and the corrected information is as below:</p> <table border="1"> <thead> <tr> <th>No.</th><th>Site</th><th>Location in the CPA-DD (version 09.0)</th><th>Actual location (CPA-DD version 10.0)</th></tr> </thead> <tbody> <tr> <td>1</td><td>Hoengseong Eupha</td><td>172, Eupari, Hoengseong-eup, Hoengseong-gun, Gangwon-do</td><td>34, Apdeulseo 2-ro, Hoengseong-eup, Hoengseong-gun, Gangwon-do</td></tr> <tr> <td>2</td><td>Anyang Gwanyang (A1BL)</td><td>Anyang Gwanyang site A-1BL, Gwanyang-dong, Dongan-gu, Anyang-si, Gyeonggi-do</td><td>120, Dongpyeon-ro, Dongan-gu, Anyang-si, Gyeonggi-do</td></tr> <tr> <td>3</td><td>Osan Cheongho (1,2BL)</td><td>149, Cheongho-dong, Osan-si, Gyeonggi-do</td><td>486-23, Nambu-daero, Osan-si, Gyeonggi-do</td></tr> <tr> <td>4</td><td>Jecheon Gangjeo(A2BL)</td><td>Gangjeo site 2-danji, Gangjeo-dong, Jecheon-si, Chungcheongbuk-do</td><td>110, Cheongpungho-ro 7-gil, Jecheon-si, Chungcheongbuk-do</td></tr> <tr> <td>5</td><td>Chungju Yeonsu(2)</td><td>1228, Yeonsu-dong, Chungju-si, Chungcheongbuk-do</td><td>24, Jugong-gil, Chungju-si, Chungcheongbuk-do</td></tr> <tr> <td>6</td><td>Seosan Daesan</td><td>90-6, Daesan-ri, Daesan-eup, Seosan-si, Chungcheongnam-do</td><td>834-6, Mangilsan-ro, Daesan-eup, Seosan-si, Chungcheongnam-do</td></tr> <tr> <td>7</td><td>Hongseong Namjang(2BL)</td><td>San 99, Namjang-ri, Hongseong-eup, Hongseong-gun, Chungcheongnam-do</td><td>10, Namjangjung-ro, Hongseong-eup, Hongseong-gun, Chungcheongnam-do</td></tr> <tr> <td>8</td><td>Gwangju Seonun (8-1,2BL)</td><td>Seonun site 8-1BL, Seonam-dong, Gwangsan-gu, Gwangju-si</td><td>68, Seonunjangang-ro, Gwangsan-gu, Gwangju</td></tr> <tr> <td>9</td><td>Yeongam</td><td>193-2, Yongang-ri,</td><td>222, Samhojungang-ro,</td></tr> </tbody> </table>			No.	Site	Location in the CPA-DD (version 09.0)	Actual location (CPA-DD version 10.0)	1	Hoengseong Eupha	172, Eupari, Hoengseong-eup, Hoengseong-gun, Gangwon-do	34, Apdeulseo 2-ro, Hoengseong-eup, Hoengseong-gun, Gangwon-do	2	Anyang Gwanyang (A1BL)	Anyang Gwanyang site A-1BL, Gwanyang-dong, Dongan-gu, Anyang-si, Gyeonggi-do	120, Dongpyeon-ro, Dongan-gu, Anyang-si, Gyeonggi-do	3	Osan Cheongho (1,2BL)	149, Cheongho-dong, Osan-si, Gyeonggi-do	486-23, Nambu-daero, Osan-si, Gyeonggi-do	4	Jecheon Gangjeo(A2BL)	Gangjeo site 2-danji, Gangjeo-dong, Jecheon-si, Chungcheongbuk-do	110, Cheongpungho-ro 7-gil, Jecheon-si, Chungcheongbuk-do	5	Chungju Yeonsu(2)	1228, Yeonsu-dong, Chungju-si, Chungcheongbuk-do	24, Jugong-gil, Chungju-si, Chungcheongbuk-do	6	Seosan Daesan	90-6, Daesan-ri, Daesan-eup, Seosan-si, Chungcheongnam-do	834-6, Mangilsan-ro, Daesan-eup, Seosan-si, Chungcheongnam-do	7	Hongseong Namjang(2BL)	San 99, Namjang-ri, Hongseong-eup, Hongseong-gun, Chungcheongnam-do	10, Namjangjung-ro, Hongseong-eup, Hongseong-gun, Chungcheongnam-do	8	Gwangju Seonun (8-1,2BL)	Seonun site 8-1BL, Seonam-dong, Gwangsan-gu, Gwangju-si	68, Seonunjangang-ro, Gwangsan-gu, Gwangju	9	Yeongam	193-2, Yongang-ri,	222, Samhojungang-ro,
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		Yongang(2)	Samho-eup, Yeongam-gun, Jeollanam-do	Samho-eup, Yeongam-gun, Jeollanam-do		
	10	Jangheung Geonsan(2)	688, Geonsan-ri, Jangheung-eup, Jangheung-gun, Jeollanam-do	3, Bukbu-ro, Jangheung-eup, Jangheung gun, Jeollanam-do		
	11	Yeongcheon Mangjeong	373, Mangjeong-dong, Yeongcheon-si, Gyeongsangbuk-do	80, Mangjeong-ro, Yeongcheon-si, Gyeongsangbuk-do		
	12	Yangsang Gachon	Yangsang Gachon site, Gachon-ri, Mulgeum-eup, Yangsang-si, Gyeongsangnam-do	155, Gachon-ro, Mulgeum-eup, Yangsang-si, Gyeongsangnam-do		
	13	Changwon Bongnim(A1BL)	A-1BL, Bongnim-dong, Uichang-gu, Changwon-si, Gyeongsangnam-do	50, Sobong-ro, Uichang-gu, Changwon-si, Gyeongsangnam-do		
	14	Changwon Bongnim(A2BL)	A-2BL, Bongnim-dong, Uichang-gu, Changwon-si, Gyeongsangnam-do	25, Daebong-ro, Uichang-gu, Changwon-si, Gyeongsangnam-do		
	15	Busan Jisa(2)	1183-1, Jisa-dong, Gangseo-gu, Busan-si	35, Gwahaksandan 2-ro 20beon-gil, Gangseo-gu, Busan		
	It was also checked that GPS coordinates of the PV plant sites had been corrected in the revised CPA-DD (version 10.0) to provide more precise location information as below:					
	No.	Site	GPS coordinate in the CPA-DD (version 09.0)		GPS coordinate (CPA-DD version 10.0)	
			Latitude	Longitude	Latitude	Longitude
	1	Hoengseong Eupha	No change			
	2	Anyang Gwanyang (A1BL)	37.403702°	126.334072°	37.411870	126.967333
	3	Osan Cheongho (1,2BL)	No change			
	4	Jecheon Gangjeon(A2BL)	37.117533°	128.218617°	37.121313	128.206828
	5	Chungju Yeonsu(2)	36.988275°	127.935643°	36.988566	127.937102
	6	Seosan Daesan	36.941371°	126.438644°	36.941238	126.437659
	7	Hongseong Namjang(2BL)	36.591473°	126.667312°	36.58829	126.66960
	8	Gwangju Seonun (8-1,2BL)	35.144714°	126.778568°	35.146516	126.779424
	9	Yeongam Yongang(2)	34.744395°	126.476091°	34.744688	126.473785
	10	Jangheung Geonsan(2)	34.683625 °	126.903325°	34.684449	126.903669
	11	Yeongcheon Mangjeong	No change			
	12	Yangsang Gachon	35.318312°	128.994753°	35.323603	128.995823
	13	Changwon Bongnim(A1BL)	35.253513°	128.683598°	35.254215	128.670106
	14	Changwon Bongnim(A2BL)	35.252435°	128.683093°	35.251079	128.665657
	15	Busan Jisa(2)	No change			
Conclusion	The validation team confirms that: <ul style="list-style-type: none">· The changes do not affect the design of the CPA;· The validation team confirms that the corrected information reflects actual project information.					

D.4. Changes to the start date of the crediting period

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

D.5. Inclusion of monitoring plan

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

D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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

D.7. Changes to the project design

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

D.8. Changes specific to afforestation and reforestation activities

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

SECTION E. Internal quality control

>>

According to KFQ's Procedure for deciding whether to proceed request for post registration changes, the final validation report and validation findings underwent a technical review before being submitted to the CME. The technical review was performed by technical review team composed of a person qualified in accordance with KFQ's qualification scheme for CDM validation and verification.

SECTION F. Validation opinion

>>

Korean Foundation for Quality (KFQ) has performed a validation for post registration changes of "PV power plants project on collective housing of 2011-<2011-LH-001-01457>" (UNFCCC ref. no.: 9247-P1-0001-CP1). During the validation, temporary deviations from the registered monitoring plan and corrections have been identified. The post registration changes to registered CPA have been validated in line with all relevant UNFCCC requirements for the CDM.

The validation is based on registered CPA-DD (version 09.0), revised CPA-DD (version 10.0) and the information made available to the validation team. The review of the revised CPA-DD, relevant supporting documents, and the subsequent follow-up interviews have been conducted to determine the post-registration changes of the CPA meet all relevant UNFCCC requirements for the CDM.

As a result of our assessment, the validation team confirms the alternative measure for deviation from the monitoring plan and methodology is appropriate under existing situation, and the emission reductions will not be over-estimated compared to actual emission reductions as a result of the deviation. The request for approval of PRC is submitted according to the choice of the CME. It is also confirmed that the deviation complies with the relevant requirements related to the temporary deviation from the registered monitoring plan and applied methodology. In addition, the validation team confirms the CME has corrected the information of this CPA according to the actual information of the CPA in the revised CPA-DD (version 10.0), and the changes do not affect the design of the CPA.

Therefore, KFQ recommends for approval of the post-registration changes as justified above.

Signed on behalf of the Korean Foundation for Quality

Signature : 

Name: Yu Shim JEONG, Technical Managing Director

Date: 25/10/2019

Appendix 1. Abbreviations

Abbreviations	Full texts
AMS	Approved Methodology Small scale
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification Request
CMP	COP/MOP Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CPA	Component project activity
CPA-DD	Component project activity design document
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GPS	Global Positioning System
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KFQ	Korean Foundation for Quality
MP	Monitoring Plan
MR	Monitoring Report
N/A	Not applicable
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PRC	Post-registration change
QA/QC	Quality Assurance and Quality Control
UNFCCC	United Nations Framework Convention on Climate Change

Appendix 2. Competence of team members and technical reviewers



CERTIFICATE OF COMPETENCE

Name: Yeonggyeong KANG

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.2 Renewables
- 5.2 Captolactam, Nitric acid, Adipic acid
- 13.1 Solid waste and wastewater
- 15.1 Agriculture

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 5 July 2019.

Sustainability Management Institute
Mi Jung LEE



CERTIFICATE OF COMPETENCE

Name: Mi Jung LEE

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.1 Thermal energy generation
- 1.2 Renewables
- 3.1 Energy demand
- 5.1 Chemical Industry
- 5.2 Caprolactam, nitric and adipic acid
- 11.1 Emission of Fluorinated gases
- 11.2 Refrigerant gas production
- 13.1 Solid waste and wastewater
- 13.2 Manure

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 5 July 2019.

Sustainability Management Institute
Yu Shim JEONG



CERTIFICATE OF COMPETENCE

Name: Su Hyun PARK

Qualification:

	Validation	Verification
-Lead auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

1.2 Renewables

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 11 January 2018.

Sustainability Management Institute
Mi Jung LEE



CERTIFICATE OF COMPETENCE

Name: Pyung-Hee JANG

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.1 Thermal energy generation
- 1.2 Renewables

He is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 31 March 2016.

Sustainability Management Institute
Sang Yeon PARK



CERTIFICATE OF COMPETENCE

Name: Jin Seok CHO

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.1 Thermal energy generation
- 1.2 Renewables
- 13.1 Solid waste and wastewater
- 13.2 Manure
- 5.2 Captolactam, Nitric acid, Adipic acid

He is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 11 March 2019

Sustainability Management Institute
Mi Jung LEE

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	CME	CDM programme design document · Version 09.0	From 21/04/2016 Published under: https://cdm.unfccc.int/PRCContainer/DB/prcp697494014/view	Others
2	CME	CDM component project activity design document · Version 09.0 · Version 10.0	From 21/04/2016 Published under: https://cdm.unfccc.int/PRCContainer/DB/prcp697494014/view 27/09/2019	Others
3	Korean Standard Association	Validation report of PoA · Version 04.3	From 27/12/2012 Published under: https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/EF8U4V2Z6KS3RB5MC1T9OYX7GPNLIQ/TXA8HEJ105R3INQMY6GK4LF72WU9OP/view	Others
4	Korean Standard Association	Validation report of CPA · Version 03.1	From 16/12/2012 Published under: https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/EF8U4V2Z6KS3RB5MC1T9OYX7GPNLIQ/TXA8HEJ105R3INQMY6GK4LF72WU9OP/view	Others
5	Korea Testing & Research Institute	Post-registration validation report of PoA (PRC-9247-001) · Version 02.0	From 20/05/2016 Published under: https://cdm.unfccc.int/PRCContainer/DB/prcp697494014/view	Others
6	Korea Electrical Safety Corporation	Pre-operational inspection certificate for PV power plants	From 2011 to 2016	CME
7	CME	Addresses and GPS coordinates information on each of PV power plant	From 2011 to 2018	CME
8	Korean Electric Power Corporation	2013 Statistics of Electric Power in Korea	From May 2013	CME
9	CDM Executive Board	Methodology and Tools · Methodology AMS-I.F. “Renewable electricity generation for captive use and	From 03/06/2011	Others

		mini-grid" (version 02.0)		
		<ul style="list-style-type: none"> Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation Tool to determine the mass flow of a greenhouse gas in a gaseous steam (version 03.0) 	From 22/09/2017 Published under: https://cdm.unfccc.int/methodologies/view?ref=AMS-I.F .	
		Standards, Procedures & Checklists		
		<ul style="list-style-type: none"> Standard – CDM validation and verification standard for programme of activities (Version 02.0) 	From 29/11/2018	
		<ul style="list-style-type: none"> Standard – CDM project standard for programme of activities (Version 02.0) 	From 29/11/2018	
		<ul style="list-style-type: none"> Standard – Sampling and surveys for CDM project activities and programme of activities (Version 07.0) 	From 04/05/2017	
		<ul style="list-style-type: none"> Procedure – CDM project cycle procedure for programme of activities (Version 02.0) 	From 29/11/2018	
		<ul style="list-style-type: none"> Guideline – Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0) 	From 16/10/2015	
		Forms		
		<ul style="list-style-type: none"> Form - Component project activity design document form (version 09.0) 	From 31/05/2019	
		<ul style="list-style-type: none"> Form - Validation report form for post-registration changes for component project activities (version 02.0) 	From 31/05/2019 All published under: https://cdm.unfccc.int/reference/index.html	

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

Table 1. CLs from this validation

CL ID	n/a	Section no.	n/a	Date: n/a
Description of CL				
n/a				
CME's response				Date: n/a
n/a				
Documentation provided by CME				
n/a				
DOE assessment				Date: n/a
n/a				

Table 2. CARs from this validation

CAR ID	n/a	Section no.	n/a	Date: n/a
Description of CAR				
n/a				
CME's response				Date: n/a
n/a				
Documentation provided by CME				
n/a				
DOE assessment				Date: n/a
n/a				

Table 3. FARs from this validation

FAR ID	n/a	Section no.	n/a	Date: n/a
Description of FAR				
n/a				
CME's response				Date: n/a
n/a				
Documentation provided by CME				
n/a				
DOE assessment				Date: n/a
n/a				

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN);• Make editorial improvements.
01.0	29 December 2017	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Registration Keywords: post-registration change, component project activity, validation report		