




**Validation report form for post-registration changes for  
CDM project activities  
(Version 02.0)**

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

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	<ul style="list-style-type: none"> <li>• Title : Bundled Hadong-Busan photovoltaic Power Project of The Korea Southern Power Corporation (1MW Hadong Photovoltaic Power + 0.39MW Busan Photovoltaic Power, Bundling Project)</li> <li>• Ref. No.: 3827</li> </ul>
<b>Process track</b>	<input type="checkbox"/> Prior approval <input checked="" type="checkbox"/> Issuance <input type="checkbox"/> Renewal of crediting period
<b>Version number of the validation report on PRCs</b>	<ul style="list-style-type: none"> <li>• 01.1</li> </ul>
<b>Completion date of the validation report on PRCs</b>	<ul style="list-style-type: none"> <li>• 07/01/2018</li> </ul>
<b>Type(s) of PRCs</b>	<input checked="" type="checkbox"/> Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan <input checked="" type="checkbox"/> Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools <input checked="" type="checkbox"/> Changes to the project design <input type="checkbox"/> Changes specific to afforestation and reforestation project activities
<b>Version number of PDD to which this report applies</b>	<ul style="list-style-type: none"> <li>• Version: 08, dated 05/01/2018</li> </ul>
<b>Project participants</b>	<ul style="list-style-type: none"> <li>• Korea Southern Power CO.,LTD.(KOSPO)</li> </ul>
<b>Host Party</b>	<ul style="list-style-type: none"> <li>• Republic of Korea</li> </ul>
<b>Applied methodologies and standardized baselines</b>	<ul style="list-style-type: none"> <li>• Applied methodology: AMS.I.D. ver.15 (Grid connected renewable electricity generation)</li> <li>• No standardized baseline(s) applicable</li> </ul>
<b>Mandatory sectoral scopes linked to the</b>	<ul style="list-style-type: none"> <li>• 1</li> </ul>

<b>applied methodology</b>	
<b>Conditional sectoral scopes linked to the applied methodologies</b>	<ul style="list-style-type: none"> <li>• 13, 15</li> </ul> (※ As for the project, sectoral scope 1 alone applies)
<b>Name and UNFCCC reference number of the DOE</b>	<ul style="list-style-type: none"> <li>• Name : Korean Foundation for Quality (KFQ)</li> <li>• Ref. No.: E-0025</li> </ul>
<b>Name, position and signature of the approver of the validation report on PRCs</b>	Soon Hong YEOM  Managing Director of Sustainability management institute

**SECTION A. Executive summary**

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Korean Foundation for Quality (KFQ) has performed periodic verification of the CDM project 'Bundled Hadong-Busan photovoltaic Power Project of The Korea Southern Power Corporation (1MW Hadong Photovoltaic Power + 0.39MW Busan Photovoltaic Power, Bundling Project)', UNFCCC Registration Ref. No. 3827 for the period from 18/12/2010 to 31/12/2016. There were post-registration changes (PRCs) identified in the course of verification for this monitoring period. The PRCs are in line with Appendix of CDM Project Standard for project activities (ver. 01.0), hence, a request for approval of the PRCs is submitted under this issuance track.

**Validation process**

The validation process includes desk review of the revised PDD and other supporting documents. Further, on-site 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 inspection 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 presented by the PP was assessed by review of the detailed project documentation as well as interviews with personnel at KOSPO. This has enabled the validation team to assess and determine that the PRCs are in compliance with CDM Project standard and relevant guidance provided by the Board.

[General description of the project activity]

Project Title	Bundled Hadong-Busan photovoltaic Power Project of The Korea Southern Power Corporation (1MW Hadong Photovoltaic Power + 0.39MW Busan Photovoltaic Power, Bundling Project)
UNFCCC Ref. No.	3827
Project Participant	Korea Southern Power CO.,LTD.(KOSPO)
Date of registration	18/12/2010
Registered PDD	Version: 07, dated 15/04/2010
Revised PDD	Version: 08, dated 05/01/2018 (revised from above mentioned registered PDD since PRC underwent during this verification)
Crediting period	18/12/2010 ~ 17/12/2020 (Fixed)
Monitoring period of this verification	18/12/2010 to 31/12/2016

**Conclusion**

As a result of our assessment, KFQ confirms the PRCs complies with the relevant requirements in the 'CDM project standard for project activities (ver. 01.0)'.

Hence KFQ recommends for an approval of PRCs for the project activity "Bundled Hadong-Busan photovoltaic Power Project of The Korea Southern Power Corporation (1MW Hadong Photovoltaic Power + 0.39MW Busan Photovoltaic Power, Bundling Project)".

**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			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader	IR	CHO	Jin Seok	KFQ	√	√	√	√
2.	Verifier	IR	LEE	Mi Jung	KFQ	√	-	-	√

**B.2. Technical reviewer and approver of the validation report on 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	JANG	Pyung Hee	KFQ
2.	Approver	IR	YEOM	Soon Hong	KFQ

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

**SECTION C. Means of validation****C.1. Desk/document review**

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KFQ's validation is based on the revised PDD and other supporting documents provided by the PP. Those were reviewed as initial step of the validation process as for the post registration changes. Also, over the whole validation period, validation team reviewed 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, and relevant decisions, clarifications and guidance from the CMP and the CDM EB.

**C.2. On-site inspection**

Detailed validation of PRCs was performed during the site visit on 24/10/2017 and 25/10/2017. During the on-site assessment, the personnel were interviewed or assisted the validation team. The main topics of the discussion are summarized in the table below.

<b>Duration of on-site inspection:</b> 24/10/2017 and 25/10/2017
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No.	Activity performed on-site	Site location	Date	Team member
1	Check temporary deviations from the monitoring plan in the registered PDD and the applied methodology.	Hadong Photovoltaic Power	24/10/2017	Jin Seok CHO
		Busan Photovoltaic Power	25/10/2017	Jin Seok CHO
2	Check any corrections to project information or parameters fixed at validation, as described in the registered PDD.	Same as above	Same as above	Same as above
3	Check permanent changes to the registered monitoring plan, or whether the monitoring permanently deviates from the applied methodologies.	Same as above	Same as above	Same as above
4	Check proposed or actual changes to the project design of a registered CDM project activity.	Same as above	Same as above	Same as above

### C.3. Interviews

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

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
I. Hadong Photovoltaic Power						
1.	Park	Ah Young	KOSPO	24/10/2017	General support, Maintenance	Jin Seok CHO
2	Kim	Ji Hyeon	KOSPO	24/10/2017	General support, Maintenance	Jin Seok CHO
3	Kim	Su Jeong	KOSPO	24/10/2017	General support, Maintenance	Jin Seok CHO
4	Kim	Yong Dae	KOSPO	24/10/2017	General support, Maintenance	Jin Seok CHO
5	Park	Cheong San	KOSPO	24/10/2017	General support, Maintenance	Jin Seok CHO
6	Jeong	Da Jeong	Ecoeye Co., Ltd.	24/10/2017	CDM Coordination	Jin Seok CHO
II. Busan Photovoltaic Power						
1	Kong	Chang Tae	KOSPO	25/10/2017	General support, Maintenance	Jin Seok CHO
2	Lee	Seung Hyun	KOSPO	25/10/2017	General support, Maintenance	Jin Seok CHO
3	Jeong	Da Jeong	Ecoeye Co., Ltd.	25/10/2017	CDM Coordination	Jin Seok CHO

### C.4. Sampling approach

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No sampling approach used during the validation.

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

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	0	0	0
Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines	0	1	0
Corrections	0	0	0
Changes to the start date of the crediting period	0	0	0

Inclusion of a monitoring plan	0	0n/a	0
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools	0	0	0
Changes to the project design	0	0	0
Changes specific to afforestation and reforestation project activities	0	0	0
Others (please specify)	0	0	0
<b>Total</b>	0	1	0

## SECTION D. Validation findings

### D.1. Compliance with PDD form

<b>Means of validation</b>	Compliance with PDD form is validated by the document review, review of PDD template and instruction for completing PDD form, review of registered PDD (ver. 07) and review of revised PDD (ver. 08).
<b>Findings</b>	The change to the project information of the registered project activity has been observed during document review and on-site visit. The project participant has provided a revised PDD (ver. 08) inclusive of all post registration changes. The project participants used the latest version of the PDD form for the revised PDD. The PP has provided the PDD in VVS track in clean and track change version and same has been checked and found to be correct.
<b>Conclusion</b>	The validation team has reviewed the revised PDD and it is observed that the revised PDD is completed by using the latest form, Project Design Document form (version 10.1). By means of checking updated PDD with the latest applicable and available PDD template form, the validation team can confirm that the information transferred to the later version of the PDD form is materially the same as that in the registered PDD and those changes are assessed under this report.

### D.2. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

<b>The reason for deviation</b>	There is one type of temporary deviations found as below;	
	<b>I. Pusan site</b>	
	Reason for deviation	'Net electricity supplied to the grid by renewable technology in the year y (EG <sub>y</sub> )' shall be monthly recorded as per the monitoring plan in the registered PDD. Accordingly, 'the quantity of electricity consumption' (hereinafter referred to as 'electricity consumption') shall be monthly recorded. However, it is identified that the internal meter for the electricity consumption was installed on 07/08/2013 after the starting date of 1 <sup>st</sup> monitoring period (18/12/2010). In addition, the PP did not record the data in a defined frequency. Therefore, it is decided to proceed a temporary deviation for 'the electricity consumption' during the data missing period under the issuance track as per CDM project standard (ver. 01.0).
	Applied period for the temporary deviation	18/12/2010 ~ 31/12/2016
	Application of conservative assumption	The PP sought a conservative approach with regard to the application of the electricity consumption during the deviation period by applying the values assuming that the source of GHG emissions is operated at the maximum capacity for the entire non-conforming monitoring period and also added 10 per cent to account for transmission and distribution losses as per CDM Project Standard (ver.01).

Means of validation	The KFQ validation team checked, whether this explanation for the reason of deviation is reliable through review of relevant documents and interviews with project participant.				
Findings	As indicated above, the PP did not record ‘the quantity of electricity consumption’ monthly as per the registered PDD during the temporary deviation period (18/12/2010 ~ 31/12/2016) at Busan site. Thus, the PP sought a conservative approach during the deviation period by applying the values assuming that the source of GHG emissions is operated at the maximum capacity for the entire non-conforming monitoring period and also added 10 per cent to account for transmission and distribution losses as per CDM Project Standard (ver.01).				
	The source of GHG emissions and power consumption during temporary deviation period were checked through on-site inspection and ‘management register of electronic equipment at Busan site’. However, it is found the source of GHG emissions for calculation of the imported electricity are not correctly identified. (Refer to Appendix 4 / CAR ID 01). After the PP has submitted the MR (v. 2) and ER Spreadsheet (v. 2), it is found that the source of GHG emissions for calculation of the imported electricity are correctly identified as below;				
	Equipment	Model	Power consumption	Quantity	Power consumption (kWh/day)
	Digital relay	Gipam 2200	30.0W	4	2.88
	Inverter	c350s	157.91W	2	7.57968
		c3100s	379.49W	3	27.32328
	Air-conditioner	LP-552CS5	1,307kWh/month	1	43.566
		CP-505AX	988.3kWh/month	1	32.943
	Computer	A60RH	160.0W	1	3.84
	light	FL 32W/2	32.0W	12	9.216
EL 20W/1		20.0W	12	5.76	
HAL 12V/50W		50.0W	6	7.2	
Total power consumption per day (kWh/day)					140.309
The deviations are likely to lead to a reduction in the accuracy of the calculation of emission reductions, thus, the PP sought conservative approaches during temporary deviation periods. The validation team confirms the alternative measures suggested by the PP during the temporary deviation periods are conservative, and consequently the emission reductions will not be over-estimated compared to actual emission reductions as a result of the temporary deviations.					
The proposed temporary deviations from the registered monitoring plan do not require a revision of monitoring plan since the deviations are temporary non-compliance. In addition, the temporary deviations are in line with Appendix of Project Standard (ver. 01.0), hence, request for approval of the temporary deviation is submitted under this issuance track.					
Conclusion	The validation team confirms the alternative measures for temporary deviations from the monitoring plan are appropriate under existing situation, and the emission reductions will not be over-estimated compared to actual emission reductions as a result of the deviation. It is also confirmed that the deviations comply with the relevant requirements related to the temporary deviation from the registered monitoring plan and applied methodology in the ‘CDM project standard for project activities (ver. 01.0)’ The raised CAR (ID 01) has been completely resolved.				

**D.3. Corrections**

Means of validation	Corrections to the project information have been validated by document review, on-site inspection and review of registered and revised PDD.																									
Findings	There are typographical errors identified with regard to specifications on ‘the capacity and cooling type of transformer’ at Busan site in the registered PDD.																									
	The validation team has checked out information on ‘the capacity and cooling type of transformer’ at Busan site through ‘inspection report for power facility’ and ‘testing certificate of the equipment’ as well as on-site assessment. And it is confirmed that the PP has corrected the information in the revised PDD according to the actual installation, and the corrected information is as below;																									
	I. Busan site																									
	<table><tr><td rowspan="3"></td><td rowspan="3">Item</td><td rowspan="3">Type</td><td colspan="2">Specifications</td></tr><tr><td colspan="2">Busan Photovoltaic Power</td></tr><tr><td>Area A</td><td>Area B</td></tr><tr><td>Registered PDD (ver.07)</td><td rowspan="2">Transformer</td><td rowspan="2">Capacity</td><td colspan="2">1,250kVA</td></tr><tr><td>Revised PDD (ver. 08)</td><td colspan="2">500kVA</td></tr><tr><td>Registered PDD (ver.07)</td><td rowspan="2">Transformer</td><td rowspan="2">Cooling type</td><td colspan="2">Forced wind cooling</td></tr><tr><td>Revised PDD (ver. 08)</td><td colspan="2">Self-cooling</td></tr></table>		Item	Type	Specifications		Busan Photovoltaic Power		Area A	Area B	Registered PDD (ver.07)	Transformer	Capacity	1,250kVA		Revised PDD (ver. 08)	500kVA		Registered PDD (ver.07)	Transformer	Cooling type	Forced wind cooling		Revised PDD (ver. 08)	Self-cooling	
					Item	Type	Specifications																			
							Busan Photovoltaic Power																			
		Area A	Area B																							
	Registered PDD (ver.07)	Transformer	Capacity	1,250kVA																						
	Revised PDD (ver. 08)			500kVA																						
	Registered PDD (ver.07)	Transformer	Cooling type	Forced wind cooling																						
Revised PDD (ver. 08)	Self-cooling																									
The PP only corrected typographical errors with regard to specifications on ‘the capacity and cooling type of transformer’ at Busan site in the revised PDD. Therefore, the corrections to the project information mentioned above affect neither the estimated ER in the registered PDD nor the design of the project activity. Accordingly, request for approval of the corrections is submitted under the issuance track since the corrections are in line with Appendix of CDM Project Standard (ver. 01).																										
Conclusion	The validation team confirms the PP has corrected the information on ‘the capacity and cooling type of transformer’ at Busan site according to the actual installation in the revised PDD (ver. 08), and the changes do not affect the design of the project activity. The validation team confirms that the corrected information reflects actual project information in line with para. 288 of VVS (ver. 01.0).																									

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

<b>Means of validation</b>	N/A
<b>Findings</b>	N/A
<b>Conclusion</b>	N/A

**D.5. Inclusion of a monitoring plan**

<b>Means of validation</b>	N/A
<b>Findings</b>	N/A
<b>Conclusion</b>	N/A

**D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools**

<b>Means of validation</b>	Permanent changes to the registered monitoring plan have been validated by document review, on-site inspection and review of registered and revised PDD.
<b>Findings</b>	There are permanent changes to the registered monitoring plan identified as below.



**1. Calibration frequency of export and import meter**

"EG<sub>y</sub> (Net Electricity supplied to the grid by renewable technology in the year y)" is the only parameter to be monitored for the project activity. For monitoring this parameter, two meters were installed; One is electricity export meter to the grid and the other is electricity import meter from the grid. Nevertheless, the meter's information (accuracy and calibration frequency) in the monitoring plan of the registered PDD is not specifically indicated for the export and import meters.

**1) Calibration frequency of export meter**

The calibration frequency of export meter was set as 3 years in the registered PDD. However, the installation and maintenance of export meter should be in compliance with the related National regulation, "Act on operation of electricity market" published by KPX, in Republic of Korea. According to "Act on operation of electricity market", an export meter which less than 1MW capacity is exempted from periodic calibration. As for the project activity, capacities of each site (Hadong site, Busan site) are 0.9984 MW and 0.39 MW respectively which are less than 1MW capacity. Thus, periodic calibration of export meter is exempted for Hadong site and Busan site as per "Act on operation of electricity market".

However, the validity period of electricity meter's verification is set as 7 years as per "Law regarding measurement". Accordingly, the calibration frequency of export meter is determined as 7 years.

The validation team has accessed that the calibration frequency for the export meter with 7 years is applicable as per "Act on operation of electricity market" and "Law regarding measurement".

**2) Calibration frequency of import meter**

The calibration frequency of import meter was not specifically indicated in the monitoring plan of the registered PDD. The calibration frequency of import meter is set as 7 years according to "Law regarding measurement".

The validation team has accessed that the calibration frequency for the import meter with 7 years is applicable as per "Law regarding measurement".

Item	Calibration frequency of export and import meters	
	Registered PDD (ver. 07)	Revised PDD (ver. 08)
EG <sub>y</sub>	3 years	7 years

**2. Allowable error of import meter**

The allowable error of import meter was not specifically indicated in the monitoring plan of the registered PDD. The allowable error for electricity meter can be within  $\pm 2.0\%$  if equipment capacity is less than 500kW or can be within  $\pm 1.0\%$  if equipment capacity is more than 500kW or less than 10,000kW according to "Act on operation of electricity market". Accordingly, the allowable error of import meter is determined as  $\pm 1.0\%$  since capacities of Busan and Hadong sites are less than 1,000kW respectively. The validation team has accessed that the allowable error of import meter with  $\pm 1.0\%$  is applicable as per "Act on operation of electricity market".

Item	Allowable error for the electricity meters	
	Registered PDD (ver. 07)	Revised PDD (ver. 08)
EG <sub>y</sub>	$\pm 0.5\%$	<ul style="list-style-type: none"> <li>Export meter: <math>\pm 0.5\%</math></li> <li>Import meter: <math>\pm 1.0\%</math></li> </ul>

**3. Addition of 'data/ parameter fixed ex ante' (EF<sub>CO2, combined cycle power plant</sub>)**

As for Busan site, the electricity is imported from the Busan combined cycle power plant, and the Busan combined cycle power plant is also connected to the electricity grid. It is checked through electricity system diagram at Busan site and on-site assessment. Thus, the scenario C (Case C.III) is applicable to the Busan site as per "Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (ver. 03.0)". The

	<p>project activity applies an emission factor of 1.3 tCO<sub>2</sub>/MWh for electricity consumption sources for Busan site only as a conservative simplification.</p> <p>The validation team has accessed that an emission factor of 1.3 tCO<sub>2</sub>/MWh for electricity consumption sources for Busan site is applicable as per “Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (ver. 03.0)”.</p> <p>In summary, the permanent changes on ‘the calibration frequency of export and import meter’ and ‘allowable error of import meter’ are in compliance with national regulations as mentioned above. Also the addition of ‘data/ parameter fixed ex ante’ (EF<sub>CO2, combined cycle power plant</sub>) is in compliance with “Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (ver. 03.0)”.</p> <p>Therefore, the validation team confirms that the changes to the registered monitoring plan described in the revised PDD are in compliance with the applied methodology (AMS-I.D._ver.15) and tool. Also the changes do not reduce the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan.</p> <p>The validation team confirms the permanent changes to the registered monitoring plan are not likely to lead to a reduction in the accuracy of the calculation of GHG emission reductions or net anthropogenic GHG removals.</p> <p>The permanent changes to the registered monitoring plan are in line with Appendix of CDM Project Standard for project activities (ver. 01.0), hence, request for approval of the permanent is submitted under this issuance track.</p>
<b>Conclusion</b>	<p>The validation team confirms the permanent changes to the registered monitoring plan are correctly reflected in the revised PDD (ver. 08).</p> <p>The validation team confirms the permanent changes comply with the relevant requirements related to the permanent changes to the registered monitoring plan, in the “CDM project standard for project activities” (ver. 01.0).</p>

#### D.7. Changes to the project design

Means of validation	Changes to project design have been validated by document review, on-site inspection and review of registered and revised PDD.																											
Findings	There are changes to project design of the project activity identified at Busan site as below.																											
	<b>I. Description of the changes to the project design</b>																											
	1. Temporary requidation of photovoltaic modules at Busan site																											
	Busan photovoltaic power plant is located on the parking lot of rooftop in Busan gas turbine power plant. A part of modules was demolished on 05/02/2015 because of Busan city's plan for underground tunnel construction. Demolished module will be relocated above the tunnel and it will be finished by 2018. Demolished module will be put at the current location. The validation team checked it through “the implementation plan of temporary requidation of photovoltaic modules at Busan site” issued on 01/08/2014, “the completion report of temporary requidation of photovoltaic modules at Busan site” issued on 05/02/2015 and on-site inspection.																											
	The detailed no. of photovoltaic modules requidation is as below;																											
	<table><tr><th rowspan="2"></th><th colspan="2">Registered PDD</th><th colspan="2">Requidation*</th><th colspan="2">Remains**</th></tr><tr><th>Area A</th><th>Area B</th><th>Area A</th><th>Area B</th><th>Area A</th><th>Area B</th></tr><tr><td>Number of modules</td><td>1,428</td><td>736</td><td>680</td><td>340</td><td>748</td><td>396</td></tr><tr><td>Capacity</td><td>0.24MW</td><td>0.15MW</td><td>0.113MW</td><td>0.071MW</td><td>0.127MW</td><td>0.079MW</td></tr></table>		Registered PDD		Requidation*		Remains**		Area A	Area B	Area A	Area B	Area A	Area B	Number of modules	1,428	736	680	340	748	396	Capacity	0.24MW	0.15MW	0.113MW	0.071MW	0.127MW	0.079MW
	Registered PDD		Requidation*		Remains**																							
	Area A	Area B	Area A	Area B	Area A	Area B																						
Number of modules	1,428	736	680	340	748	396																						
Capacity	0.24MW	0.15MW	0.113MW	0.071MW	0.127MW	0.079MW																						
	* Requidation was completed on 05/02/2015																											
	** Remains will be put the current location by 2018																											

**II. Assessment on the changes to the project design****1. Assessment on the time and reason the changes occurred:**

The changes to the project design is due to Busan city's plan for underground tunnel construction. In the course of underground tunnel construction by Busan city, a part of modules at Busan site was needed to be demolished. Accordingly, "the implementation plan of temporary requidation of photovoltaic modules at Busan site" was made on 01/08/2014 and the temporary requidation of photovoltaic modules at Busan site was completed on 05/02/2015.

In summary, "temporary requidation of photovoltaic modules at Busan site" has been planned since 01/08/2014 and was completed on 05/02/2015 after the registration date of the project activity (18/12/2010). Therefore, the change was not considered at the time of the project registration and it was occurred after the registration date (18/12/2010).

**2. Assessment on how the changes would impact on the overall operation/ability of the project activity to deliver emission reductions as stated in the PDD:**

The change does not impact the overall operation/ability of the project activity to deliver emission reductions as stated in the PDD, since the demolished modules will be reinstalled at the current location. However, the installed capacity at Busan site would decrease to 0.206 MW from 0.39 MW during the requidation period of photovoltaic modules. Thus, emission reductions are adjusted in the revised PDD during the requidation period considering the capacity of demolished modules.

**3. Assessment whether the changes would adversely affect the conclusion of the validation report of the registered PDD with regard to:****(a) Additionality of the registered CDM project activity**

The additionality of the project activity was established using by 'Tool for the demonstration and assessment of additionality (v.05.2) and 'Attachment A of Appendix B of the simplified modalities and procedures for small scale CDM project activity'. The additionality of the project activity had demonstrated by improving the investment barrier of the project.

According to the registered PDD and its validation report, KFQ have checked that the NPV of the project activity including CERs revenue is lower than zero which shows the project is not financially attractive.

The validation team could check that NPV of the project activity would be much lower than zero when considering the extra cost for requidation and reinstallation of photovoltaic modules. Thus, the validation team confirms that the change has no impact on the additionality of the project activity.

**(b) Scale of the registered CDM project activity;**

The total installed capacity of the project activity is 1.39 MW (Hadong site: 1 MW, Busan site: 0.39) in the registered PDD. The installed capacity at Busan site would decrease to 0.206 MW from 0.39 MW during the requidation period of photovoltaic modules. Also the demolished modules will be reinstalled at the current location by 2018. Thus, the validation team confirms that the change has no impact on the scale of the project activity.

**(c) Applicability and application of the approved methodologies under which the CDM project activity has been registered;**

The project has applied the approved baseline methodology of AMS-I.D (ver.15.0), which is 'Grid connected renewable electricity generation'. The change of the project activity does not lead to change the applied methodology and does not impact the applicability of the methodology, AMS-I.D (ver.15.0). Also, this change does not need to apply the latest version of the methodology. Thus, the validation team confirms that the change has no impact of applicability and application of the applied baseline methodology and it does not need to change as the later valid version of the methodology.

	<p>(d) The compliance of the monitoring plan with the applied methodologies.</p> <p>The project has applied the approved baseline methodology of AMS-I.D (ver.15.0), which is 'Grid connected renewable electricity generation'. The change of the project activity does not result in revising the monitoring plan. According to the monitoring plan of registered PDD, the only parameter to be monitored is 'Net Electricity supplied to the grid (EG<sub>y</sub>)' and it needs two meters which are export meter and import meter. The change of the project activity has no impact on the export meter and import meter, and no impact on the monitoring plan.</p> <p>Thus, the validation team confirms that the change has no impact on the monitoring plan in the registered monitoring plan and thus, no impact on the compliance of the monitoring plan with the applied monitoring methodology.</p> <p>(e) The level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan.</p> <p>As mentioned above, this change does not impact the registered monitoring plan. Thus, the validation team confirms that the change does not impact the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan.</p> <p>The changes to the project design are in line with Appendix of CDM Project Standard for project activities (ver. 01.0), hence, request for approval of the permanent is submitted under this issuance track.</p>
<b>Conclusion</b>	<p>The validation team confirms the changes to the project design are correctly reflected in the revised PDD (ver. 08).</p> <p>The validation team confirms the changes comply with the relevant requirements related to the changes to the project design, in the "CDM project standard for project activities" (ver. 01.0).</p> <p>The validation team specifically confirms the changes would not adversely affect the conclusions of the validation report of the registered PDD with regard to:</p> <ul style="list-style-type: none"> <li>(a) The additionality of the registered CDM project activity;</li> <li>(b) The scale of the registered CDM project activity;</li> <li>(c) The applicability and application of the applied methodology which the project activity has been registered;</li> <li>(d) The compliance of the monitoring plan with the applied methodology;</li> <li>(e) The level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan.</li> </ul>

#### D.8. Changes specific to afforestation and reforestation project activities

<b>Means of validation</b>	N/A
<b>Findings</b>	N/A
<b>Conclusion</b>	N/A

#### SECTION E. Internal quality control

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

**SECTION F. Validation opinion**

&gt;&gt;

Korean Foundation for Quality (KFQ) has performed a validation of the post-registration change of CDM project Ref. No. 3827: 'Bundled Hadong-Busan photovoltaic Power Project of The Korea Southern Power Corporation (1MW Hadong Photovoltaic Power + 0.39MW Busan Photovoltaic Power, Bundling Project)'. The validation was performed on the basis of UNFCCC criteria for the CDM and host country criteria, as well as criteria given to provide for the consistent project operation, monitoring and reporting.

The validation is based on the information made available to us and the engagement conditions. The review of the revised PDD, relevant supporting documents and the subsequent follow-up interviews has conducted with sufficient evidences to determine the fulfilment of all stated criteria. In our opinion, post-registration changes of the project activity meet all relevant UNFCCC requirements for the CDM.

The validation team confirms the alternative measure for the temporary 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 temporary deviation.

The validation team confirms the PP has corrected the information of the project according to the actual installation in the revised PDD. The corrections to the project information do not affect the design of the project activity.

The validation team confirms that the permanent changes to the registered monitoring plan described in the revised PDD are in compliance with the applied methodology (AMS-I.D.\_ver.15) and applied tool. The validation team confirms the permanent changes to the registered monitoring plan are not likely to lead to a reduction in the accuracy of the calculation of GHG emission reductions or net anthropogenic GHG removals.

Also, we confirm that the changes to the project design do not impact;

- (a) The additionality of the project activity
- (b) The scale of CDM project activity
- (c) The applicability and application of approved baseline methodology under which the project activity has been registered
- (d) The compliance of the monitoring plan with the applied monitoring methodology
- (e) The level of accuracy of the monitoring contained in the registered monitoring plan

The verification team confirms that the revised PDD submitted in the latest format has been verified and other description except the changes dealt in this report is materially the same as the information in the registered PDD.

Therefore, KFQ requests the approval of post-registration changes of the project activity as justified above.

**Signed on behalf of the Korean Foundation for Quality**

Signature : 

Name : Soon Hong YEOM, Managing Director

Date : 07 January 2018

## Appendix 1. Abbreviations

Abbreviations	Full texts
AMS	Approved small scale methodology
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 <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
DOE	Designated Operational Entity
FAR	Forward Action Request
EB	Executive Board
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KFQ	Korean Foundation for Quality
KPX	Korea Power Exchange
KEPCO	Korea Electric Power Corporation
KOSPO	Korea Southern Power CO., Ltd.
MoV	Means of verification
MP	Monitoring Plan
PDD	Project Design Document
PP	Project participant
PS	Clean Development Mechanism Project Standard
QMS	Quality Management System
EMS	Environment Management System
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Clean Development Mechanism Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



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

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

A handwritten signature in black ink, appearing to be 'S. Y. Park'.



## 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
- 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 14 September 2017.

Sustainability Management Institute  
Yu Shim JEONG





## 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

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Project participant	CDM Project Design Document : · Version 07	17/12/2009 <a href="https://cdm.unfccc.int/Projects/DB/Korean%20Standards%20Association1277812861.11/view">https://cdm.unfccc.int/Projects/DB/Korean%20Standards%20Association1277812861.11/view</a>	Others
		· Version 08	05/01/2018	Project participant
2	Project participant	Estimated emission reduction sheet (ver. 02)	05/01/2018	Project participant
3	KSA	CDM Validation Report: · Report No. 2009-05 (Rev. 04.1)	29/06/2010 <a href="https://cdm.unfccc.int/Projects/DB/Korean%20Standards%20Association1277812861.11/view">https://cdm.unfccc.int/Projects/DB/Korean%20Standards%20Association1277812861.11/view</a>	Others
4	Project participant	Monitoring report: · Version 1 · Version 2	25/09/2017 08/01/2018	Project participant
5	Project participant	ER Spreadsheet: · Version 1 · Version 2	15/09/2017 04/01/2018	Project participant
6	Project participant	Installation report of electricity import meter at Busan site	08/08/2013	Project participant
7	Project participant	Management register of electronic equipment at Busan site (ver. 02)	28/11/2017	Project participant
8	LS Industrial Systems Co., Ltd.	Specifications on Digital relay (Gipam 2200)	January 2008	Project participant
9	Korea Testing Certification	Testing certificates · c350s · c3100s	20/03/2014 20/08/2014	Project participant
10	Korea Energy Agency	Energy Efficiency Rating label on Air-conditioner · LP-552CS5 · CP-505AX	-	Project participant

11	LG Electronics	Specifications on computer (A60RH)	-	Project participant
12	PEP Green Limited.	Lighting floor plan	February 2008	Project participant
13	Project participant	Electricity system diagram at Busan site	February 2008	Project participant
14	Project participant	The implementation plan of temporary photovoltaic modules of requidation at Busan site	01/08/2014	Project participant
15	Project participant	The completion report of temporary requidation of photovoltaic modules at Busan site	05/02/2015	Project participant
16	KPX	Act on operation of electricity market	September 2015 <a href="https://www.kpx.or.kr/www/selectBbsNttView.do?key=29&amp;bbsNo=114&amp;nttNo=3877&amp;searchCnd=all&amp;searchKwd=&amp;pageIndex=1&amp;integrDeptCode=">https://www.kpx.or.kr/www/selectBbsNttView.do?key=29&amp;bbsNo=114&amp;nttNo=3877&amp;searchCnd=all&amp;searchKwd=&amp;pageIndex=1&amp;integrDeptCode=</a>	Others
17	Ministry of Trade, Industry and Energy	Law regarding measurement	22/09/2017 <a href="http://www.law.go.kr/%EB%B2%95%EB%A0%B9/%EA%B3%84%EB%9F%89%EC%97%90%20%EA%B4%80%ED%95%9C%20%EB%B2%95%EB%A5%A0">http://www.law.go.kr/%EB%B2%95%EB%A0%B9/%EA%B3%84%EB%9F%89%EC%97%90%20%EA%B4%80%ED%95%9C%20%EB%B2%95%EB%A5%A0</a>	Others
18	CDM Executive Board	Methodology: AMS.I.D. ver.15 (Grid connected renewable electricity generation)	<a href="https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK">https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK</a>	Others
19	CDM Executive Board	Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (ver. 03.0)	<a href="https://cdm.unfccc.int/Reference/tools/index.html">https://cdm.unfccc.int/Reference/tools/index.html</a>	Others
20	CDM Executive Board	CDM Forms · Project Design Document form (Ver. 10.1) · Validation report form for post registration changes for CDM project activities (Ver. 02.0)	<a href="https://cdm.unfccc.int/Reference/PDDs_For/index.html">https://cdm.unfccc.int/Reference/PDDs_For/index.html</a>	Others

21	CDM Executive Board	CDM Standards <ul style="list-style-type: none"> <li>· CDM project standard for project activities (Ver. 01.0)</li> <li>· CDM validation and verification standard for project activities (Ver. 01.0)</li> </ul>	<a href="https://cdm.unfccc.int/Reference/Standards/index.html">https://cdm.unfccc.int/Reference/Standards/index.html</a>	Others
22	CDM Executive Board	CDM Procedure <ul style="list-style-type: none"> <li>· CDM project cycle procedure for project activities (Ver. 01.0)</li> </ul>	<a href="https://cdm.unfccc.int/Reference/Procedures/index.html">https://cdm.unfccc.int/Reference/Procedures/index.html</a>	Others

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

**Table 1. CLs from this validation**

<b>CL ID</b>	n/a	<b>Section no.</b>	n/a	<b>Date:</b> n/a
<b>Description of CL</b>				
n/a				
<b>Project participant response</b>				<b>Date:</b> DD/MM/YYYY
n/a				
<b>Documentation provided by project participant</b>				
n/a				
<b>DOE assessment</b>				<b>Date:</b> n/a
n/a				

**Table 2. CARs from this validation**

<b>CAR ID</b>	01	<b>Section no.</b>	D.2	<b>Date:</b> 31/10/2017
<b>Description of CAR</b>				
As for the calculation of the imported electricity at Busan site, the imported electricity is calculated by applying the values assuming that the source of GHG emissions is operated at the maximum capacity during the whole monitoring period. Also 10% is additionally applied to the values to account for transmission and distribution losses. However, the source of GHG emissions for calculation of the imported electricity are not correctly identified.				
<b>Project participant response</b>				<b>Date:</b> 05/01/2018
Illuminations were not correctly included in the list of the source of GHG emissions for calculation of the imported electricity at Busan site. Accordingly, the list is revised including illuminations. The imported electricity was conservatively calculated by applying the values assuming that the source of GHG emissions is operated at the maximum capacity for the entire non-conforming monitoring period and also added 10 per cent to account for transmission and distribution losses as per CDM Project Standard (ver.01).				
<b>Documentation provided by project participant</b>				
<ul style="list-style-type: none"> <li>• ER Spreadsheet (ver. 02)</li> <li>• Management register of electronic equipment at Busan site (ver. 02)</li> <li>• Specifications on Digital relay (Gipam 2200)</li> <li>• Testing certificates on inverters</li> <li>• Energy Efficiency Rating label on Air-conditioner</li> <li>• Specifications on computer</li> <li>• Lighting floor plan</li> </ul>				
<b>DOE assessment</b>				<b>Date:</b> 06/01/2018
<p>'Net electricity supplied to the grid by renewable technology in the year y (EG<sub>y</sub>)' shall be monthly recorded as per the monitoring plan in the registered PDD. Accordingly, 'the quantity of electricity consumption' shall be monthly recorded, but it is identified that the PP did not record the data in a defined frequency.</p> <p>Therefore, the PP sought a conservative approach with regard to the application of the electricity consumption during the deviation period. However, it is found that illuminations were not correctly included in the list of the source of GHG emissions for calculation of the imported electricity at Busan site. The revised electronic equipment list at Busan site is crosschecked with 'Management register of electronic equipment at Busan site (ver. 02)', 'Specifications on Digital relay (Gipam 2200)', 'Testing certificates on inverters', 'Energy Efficiency Rating label on Air-conditioner', 'Specifications on computer', 'Lighting floor plan including illuminations' and on-site assessment.</p> <p>The validation team confirms that 'the list of the source of GHG emissions for calculation of the imported electricity at Busan site' is fully identified. Also the imported electricity was conservatively calculated by applying the values assuming that the source of GHG emissions is operated at the maximum capacity for the entire non-conforming monitoring period and also added 10 per cent to account for transmission and distribution losses as per CDM Project Standard (ver.01).</p>				

**Table 3. FARs from this validation**

<b>FAR ID</b>	n/a	<b>Section no.</b>	n/a	<b>Date:</b> n/a
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<b>Description of FAR</b>	
n/a	
<b>Project participant response</b>	<b>Date:</b> n/a
n/a	
<b>Documentation provided by project participant</b>	
n/a	
<b>DOE assessment</b>	<b>Date:</b> n/a
n/a	