

**Korea Water Resources Corporation
(KOWACO) small-scale hydroelectric
power plants project**

(the Andong-dam, the Seongnam, the
Jangheung-dam small-scale hydroelectric power
plants construction project)

MORNITORING REPORT

From 01/01/2007 to 31/12/2007

Dated: 1 April 2008

1. Title of the project activity:

Korea Water Resources Corporation (KOWACO) small-scale hydroelectric power plants project (the Andong-dam, the Seongnam, and the Jangheung-dam small-scale hydroelectric power plants construction project)

- Date of Registration of project: 06 Oct. 2006

- UNFCCC Registration Number: 584

2. Introduction:

This proposed project activity consists in 2.64 MW of facility capacity and power generation of 15,473,000KWh per year from the bundled three small-scale hydroelectric power plants - the Andong-dam, the Seongnam, and the Jangheung-dam small scale hydro power plant. None of these three plants are part of a large project, according to Appendix C of the simplified modalities and procedures for small-scale CDM project activities.

KOWACO small-scale hydroelectric power plants project, which will substitute the fossil fuel fired plants by generating 15,473 MWh, has sought a 7 years renewable crediting period starting from 01/01/2007.

3. General Description of the project:

3.1 Project Activity

Small-scale hydroelectric power plants operated by KOWACO generate electricity. Hydro potential generate GHG emission-free electricity and displace an equivalent proportion of electricity generation using fossil fuel.

This project activity is a 2.64 MW hydro electric project. Thus this will approximately bring in 9,689 tons of CO₂ emission reduction annually for 7 years.

This proposed project bundled three small-scale hydroelectric power plants - the Andong-dam, the Seongnam, and the Jangheung-dam small scale hydro power plant in accordance with Appendix C of the simplified modalities and procedures for small-scale CDM project activities.

The commercial operation of each plant has been started as follows:

- The Andong-dam small-scale hydroelectric power plant: 08/09/2003
- The Seongnam small-scale hydroelectric power plant: 16/12/2004
- The Jangheung -dam small-scale hydroelectric power plant: 30/11/2005

Starting date & Credition Period: 01/01/2007 (7 Years)

3.2 Type and Category

The project falls under ‘Renewable energy project’ of Type I of ‘Appendix B of the simplified modalities and procedures for small-scale CDM project activities’ in that KOWACO small-scale hydroelectric power plants project utilizes renewable energy source. Additionally, the project falls under category D of ‘Electricity generation of a grid’, because electricity generated by renewable energy source is grid-connected.

Project type: Renewable energy projects

Category: D – Grid connected renewable electricity generation

3.3 Technical description of the project

Location of project activity: each power plant of this project is located at the following region.

- The Andong-dam small-scale hydroelectric power plant: Andong city, Gyeongsangbuk-do
- The Seongnam small-scale hydroelectric power plant: Seongnam city, Gyeonggi-do
- The Jangheung -dam small-scale hydroelectric power plant: Janheung-gun, Jeollanam-do

<Technology description of the small-scale hydroelectric power plants>

Classification		The Andong-dam small-scale hydroelectric	The Seongnam small- scale hydroelectric	The Jangheung-dam small-scale hydroelectric
Wheel	Type	Propeller (Tubular)	Vertical Francis	Horizontal Francis
	Output power	493 KW	372 kW	800 kW
	Rotation	225 RPM	450 RPM	514 RPM
	Unit	3	1	1

Generator	Type	Concentrating induction	Three-phase induction (horizontal acxis)	Three-phase induction (horizontal acxis)
	Output power	500 KW	340 kW	800 kW
	Rotation	225 RPM	450 RPM	514 RPM
Transformer	Type	Mold type	Mold type	Mold type
	Capacity	2,000 kVA	500 kVA	1,000 kVA
	Volatage	3.3 kV / 22.9 kV	380 V / 22.9 kV	3.3 kV / 22.9 kV
	Connection type	△-Y	△-Y	△-Y
	Unit	1	1	1

4. Monitoring methodology & Plan:

The parameter to be monitored is:

Data Type	Data variable	Data Unit	Measured(m), Calculated(c), Estimated(e)	Recording frequency	Proportion of data to be monitored	The method of data achived	The term of data archived
Electricity supplied to the electricity grid	Electiricity	kWh	M	Monthly	100%	Electronic	Two years beyond Crediting period

For a small scale CDM project activity the only set of data to be monitored is the net electricity output from the project.

1) Electricity meter to be monitored

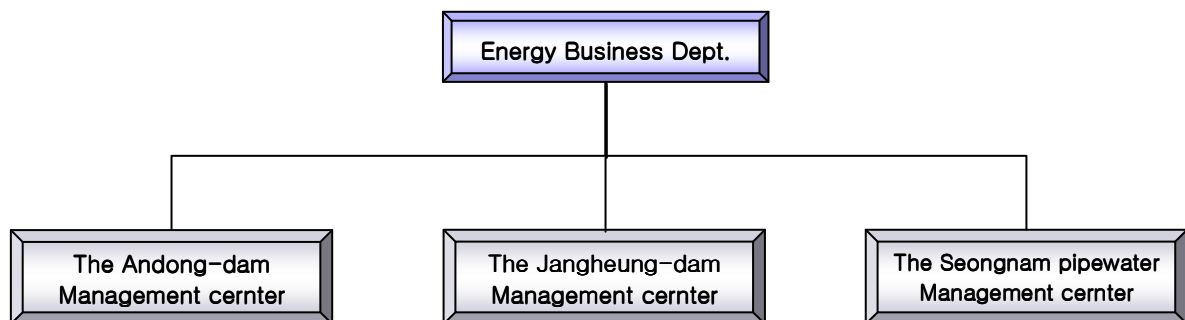
Electricity meter has been set up transparently in accordance with “Law regarding measurement” and “Act on operation of electricity market” and measuring electricity is

monitored in confirmation of Korea Power Exchange.

Electricity connected to the power-grid is measured by electricity meter installed for power trading system of Korea Power Exchange (KPX). And measured data is submitted to KPX for record-keeping.

And the reporting system is as follows:

<Operational and management structure>



Responsible department and persons for the monitoring are as follows:

- Department in charge of monitoring: the Andong-dam management center, the Seongnam pipewater management center, the Jangheung -dam management center
- Responsible department: Energy Business Dept.

5. Calculations of annual emission reductions:

To prove accuracy and consistency of monitored data, measured electricity data of Korea Power Exchange is compared with data measured by a generation meter of each facility. Energy Business Dept. of the headquarters collected and archived those data filed and given by each management center.

From doing such a thing, the below monitored results of electricity table is completed based on the amount of power transmission of Korea Power Exchange (KPX).

Calculating annual emission reductions is completed according to the PDD.

OM is 0.7807 ton CO₂ eq/kWh and BM is 0.4718 ton CO₂ eq/kWh

$$EF_y = (EF_{OM,y} + EF_{BM,y})/2$$

According to the above calculations, EF(Emission factor) is 0.6262 ton CO₂ eq/kWh.

Then, based on the following table that calculated the net emission reductions, the total CERs are 8,449 tons.

< Electricity Output & Emissions Reductions >

Section	Andong-dam	Seongnam	Jangheung-dam	Baseline Emission Factor	Net Emission Reductions
	Electricity(kWh)	Electricity(kWh)	Electricity(kWh)		
Jan. 2007	603,237	98,850	415,634	0.6262	700
Feb.	457,245	99,079	356,712	0.6262	572
Mar.	554,167	122,241	404,070	0.6262	677
Apr.	575,624	141,308	383,915	0.6262	689
May	661,987	176,953	387,687	0.6262	768
Jun.	723,580	166,076	358,962	0.6262	782
Jul.	384,368	165,538	402,920	0.6262	597
Aug.	574,533	180,326	453,877	0.6262	757
Sep.	497,099	178,616	555,573	0.6262	771
Oct.	453,531	177,181	587,379	0.6262	763
Nov.	302,454	157,527	559,457	0.6262	638
Dec.	463,064	154,439	556,790	0.6262	735
Total	6,250,888	1,818,133	5,422,976	0.6262	8,449

* Electricity output of each facility is based on the data of Korea Power Exchange.