



Green Power

4th MONITORING REPORT

July 12, 2010

Version 1

**Monitoring the period:
April 1, 2009 – March 31, 2010**

TROJES HYDROPOWER PROJECT

Registration Number 0649

Project Site Address

Cortina Baja Presa Trojes,
Municipality of Pihuamo,
State of Jalisco
Mexico

Prepared by

Hidroelectricidad del Pacífico S. de R.L. de C.V.

Homero 1343, 3rd Floor
Col. Chapultepec Morales
Mexico City, 11570
Mexico

Table of contents

1. Introduction.....	3
2. Description of the Project Activity	3
3. Project Participants.....	5
4. Current status of the project.....	6
5. Data monitored	6
6. Emission Reduction Calculation	8

Mexico City, July 12, 2010

1. Introduction

The objective of this Monitoring Report is to show the calculation of the emission reductions (ERs) achieved by the project activity under the Clean Development Mechanism (CDM) and verified by a Designated Operational Entity.

The monitoring period is from 01/04/2009 to 31/03/2010 (both days included). The report also shows the Monitoring Plan for data collection and auditing followed by the project developer in order to determine real and credible emission reductions. The monitoring plan is based on the CDM registered project design document Trojes Hydropower Project Version 3 – 19/04/2006, which uses existing baseline and monitoring methodologies (AMS-I.D. ver. 8), which have been approved and made publicly available by the CDM Executive Board. The methodology is designated "Grid connected renewable electricity generation".

2. Description of the Project Activity

The Trojes Hydropower Project¹ was developed by Impulsora Nacional de Electricidad S. de R.L. de C.V. (INELEC) and Hidroelectricidad del Pacífico S. de R.L. de C.V. (HPA), both registered as Project Participants. INELEC is a subsidiary of Energía Nueva Energía Limpia S. de R.L. de C.V. (Enel Mexico), entity responsible for the preparation of this monitoring report.

Trojes Project is located at the Trojes Dam in the Barreras River, 50 Km south-east of the city of Colima within the state of Michoacan. The Trojes project generates clean electricity in a rural area located in the Municipality of Pihuamo, State of Jalisco and the nearest city to the proposed project is Coalcoman, in the state of Michoacan.

The Trojes project has an existing dam at the site. The power plant has a capacity of 8.7 MW, using the existing pattern of irrigation flow to generate

¹ Trojes Hydroelectric Project is the name of the Project activity used in the registered PDD. The UNFCCC has identified the project as *Project 0649: Trojes Hydropower Project*, so this is the name that will be used in this Monitoring Report in order to avoid any misunderstanding with the UNFCCC, as this was the name used in the previous Monitoring Reports.

Green Power

electricity. The existing dam is a rock filled dam with an impervious clay core center and has been built with the intent to construct future hydroelectric plant on-site. The power house is located at 18° 57'55" North Latitude and 103° 23'48.0" West Longitude.

The actual installed capacity of the project is in line with the generation permit granted by the Comisión Reguladora de Energía. According to this permit, the capacity of the project is defined as 8 MW, which is the maximum amount allowed to be delivered to the national grid. This permit can be verified by the DOE onsite.

The amount of ERs calculated during the monitoring period is not affected in any way by the 0.7 MW above the capacity stated in the registered PDD, because the CERs are calculated according to the approved baseline and monitoring methodology AMS-I.D. ver. 8, using the maximum amount of electricity supplied by the project to the national grid, according to the generation permit and measured by Comisión Federal de Electricidad (CFE). The operation of the project during the monitoring period has been done in full compliance with the permits and licenses granted to the project.

The Trojes Hydropower Project is therefore characterized by an authorized capacity of 8 MW, and a nominal capacity of 8.7 MW, which is 0.7 MW above of the capacity mentioned in the permit. The authority is aware of the situation and on this regards they applied actions on the payment of the overdue energy delivered. However, as this energy generated is exported to the grid and the only action undertaken by the authority is the not accepting the total electricity in the period which will be bought in the next year period. Therefore, the ERs are calculated based on the energy recognized by the authority and actually delivered to the grid.

Table 1: Technical Equipment

Equipment	Characteristics
Generator	ALSTOM No. G0N019 Type: SH 217/68/18 Year: 2002 Cos ϕ 0.95 nominal P= 8,760 kVA V = 8,600 V I= 505 A f:= 60 Hz 3 phases v= 400 rpm
Turbine	ALSTOM Francis 7040 KW Year: 2002 Serial No.:2017

	P= 10.5767 kW Q = 17.37 m ³ /s n= 400 rpm
Metering 1 (Main)	Comissioning date: March 2003 Instrument Type: Electricity meter, one way Serial Number: S/N PR-0506A068-02 Manufacturer Model Nr.: ION 8400 Specific Location: Trojes Power Plant, CFE's Substation, Presa Trojes
Metering 2 (Backup)	Comissioning date: March 2003 Instrument Type: Electricity meter, one way Serial Number: N/S AR-0012A368-02 Manufacturer Model Nr.: ION 8400 Specific Location: Trojes Power Plant, CFE's Substation, Presa Trojes

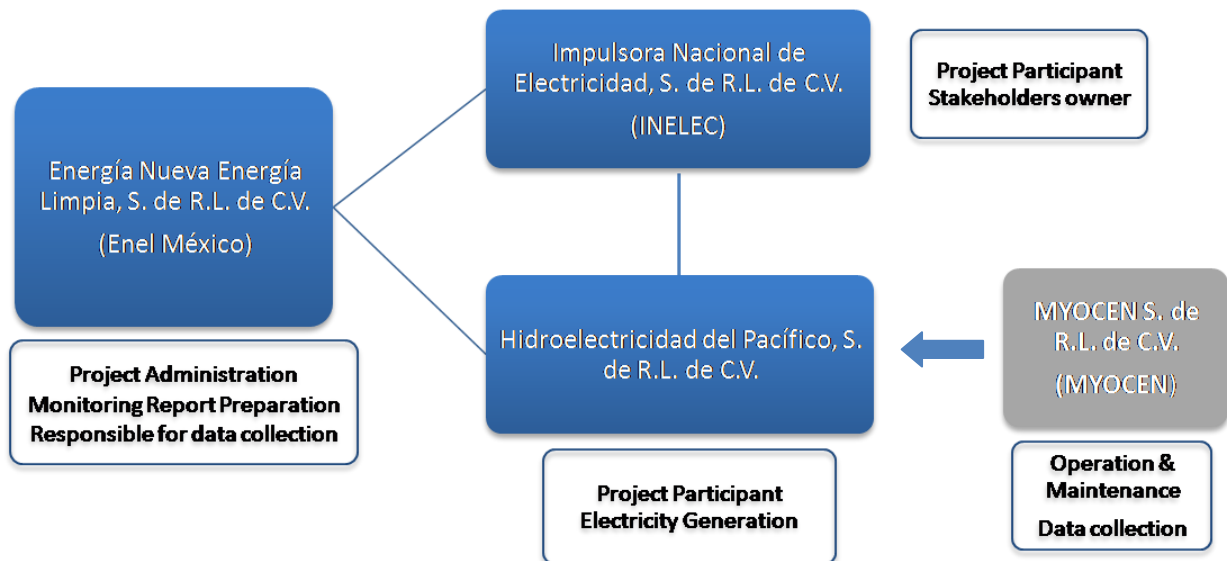
3. Project Participants

Organization:	Hidroelectricidad del Pacífico S. de R. L. de C.V.
Street/P.O. Box:	Homero 1343, 3 rd Floor, Col. Chapultepec Morales
City:	Mexico
Post/ZIP:	11570
Country:	Mexico
Telephone:	+52 (55) 5280 9361
FAX:	+52 (55) 5280 9371
URL:	N.A.

Organization:	Impulsora Nacional de Electricidad S. de R.L. de C.V.
Street/P.O. Box:	Homero 1343, 3rd Floor, Col. Chapultepec Morales
City:	Mexico
Post/ZIP:	11570
Country:	Mexico
Telephone:	+52 (55) 5280 9361
FAX:	+52 (55) 5280 9371
URL:	N.A.

Organization:	BNP Paribas S.A.
Street/P.O. Box:	10 Harewood Avenue
City:	London
Post/ZIP:	NW1 6AA
Country:	United Kingdom
Telephone:	+44 (207) 595 5251
FAX:	+44 (207) 595 8506
URL:	www.bnpparibas.com

Table 2: Organizational Chart



4. Current status of the project

The Project was registered as a CDM Project activity on 04/11/2006. The crediting period is 7 years starting from the commercial operation date, 01/04/2003, and can be renewed for two more 7 year periods. Up to date, 85,400 CERs have been issued.

The project is operated by an external company called MYOCEN S. de R.L. de C.V. according to international standards. MYOCEN is responsible of executing any corrective action recommended by INELEC, who determines the amount of electricity to be generated according to the annual program and Comisión Nacional del Agua (CNA) guidelines and allowed Volumes. INELEC is also responsible of recommending corrective actions that would be implemented by MYOCEN in the case of encountering Generation Deviations.

5. Data monitored

The monitoring methodology used by the project activity consists of metering the electricity generated by the renewable technology.

MYOCEN team supports Enel Mexico to collect the needed information to complete the monitoring report. The Auxiliary Technician is in charge of collecting the data related to the plant operation; the Superintendent collects and develops the generation reports and other specific administrative

Green Power

documents to backup the information presented in the monitoring report. The rest of the data is collected by the Business Developer of Enel Mexico.

Table 3: Data to be monitored

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1	Electricity Generated by the Project Delivered to Grid (net of parasitic consumption)	CFE and Project Operator	MWh	<i>m</i>	yearly	all	Electronic and paper	Data will be archived for Two (2) years following the end of the Crediting Period

Net generation Quality Control and Quality Assurance are undertaken through double measurement:

- at Trojes power plant instruments and checked by the operating company MYOCEN, and
- by Comision Federal de Electricidad (CFE) measurement devices and procedures.

MYOCEN's meter is only used for internal purposes. CFE is the responsible entity of charging for the wheeling cost of the project, therefore it is CFE who officially establishes the electricity generated by the project and that is actually billed to the consumer partners.

The Interconnection Agreement signed with CFE defines the calibration periods for the official meters that record the energy delivered to the grid, which has to be checked annually for accuracy and is CFE's sole responsibility. The metering equipment shall have sufficient accuracy so that any error resulting from such equipment shall not exceed 0.2% of full-scale rating.

The metering equipment are calibrated and checked annually for accuracy. The net energy output registered by the meters alone will suffice for the purpose of billing and emission reduction verification as long as the error in the meters is within the agreed limits.

Table 4: Dates of calibrations of monitoring equipment

Equipment	Date of calibration
N/S AR-0012A368-02	05/12/08
	27/06/09
S/N PR-0506A068-02	05/12/08
	05/11/09

6. Emission Reduction Calculation

The emission factor of the electric national grid and used for this project was fixed ex-ante as a result of the calculation of the Operating Margin (OM) using the simple OM method and the Build Margin as established in the AMS-I.D. ver. 8. This emission factor will be valid during the crediting period of the project. For the current crediting period, the emission factor is 0.531 tCO₂/MWh.

The total emission reductions achieved by the project activity through the monitoring period is equal to **10,543** tCO₂e. The following tables show the values obtained during the monitoring period.

Since the monitoring of emission reduction is achieved through the measurement of net electricity generation, no special operational and management structure is needed apart from normal electricity generation O&M structure. The Table 5 contains the electricity generation of the project during the monitoring period.

Table 5: Electricity generation in MWh (CFE meter) from April 1, 2009 to March 31, 2010

Period	2009	2010	TOTAL
January	-	2,440.19	2,440.19
February	-	2,022.36	2,022.36
March	-	3,481.19	3,481.19
April	3,728.12	-	3,728.12
May	3,263.62	-	3,263.62
June	2,161.03	-	2,161.03
July	0.00	-	0.00
August	0.00	-	0.00
September	42.45	-	42.45
October	53.15	-	53.15
November	836.64	-	836.64
December	1,972.09	-	1,972.09
Total	2,861.88	7,943.74	20,000.84

The electricity consumed from the grid is taken from the CFE invoices sent every month to the plant in order to charge for the electricity bill. The detailed consumption of the auxiliary electricity is shown in Table 6.

Table 6: Auxiliary Electricity Used in MWh from April 1, 2009 to March 31, 2010

Period	2009	2010	TOTAL
January	-	10.83	10.83
February	-	10.44	10.44
March	-	8.71	8.71
April	1.80	-	1.80
May	5.93	-	5.93
June	9.53	-	9.53
July	17.99	-	17.99
August	18.63	-	18.63
September	19.02	-	19.02
October	15.06	-	15.06
November	15.58	-	15.58
December	11.96	-	11.96
Total	115.50	29.98	145.48

The Net electricity generation by the Trojes project is the result of the Electricity generated minus the electricity consumed from the National Grid, as shown in Table 7.

Table 7: Net Electricity Generation (MWh) from April 1, 2009 to March 31, 2010

Period	2009	2010	TOTAL
January	-	2,429.36	2,429.36
February	-	2,011.92	2,011.92
March	-	3,472.49	3,472.49
April	3,726	-	3,726.32
May	3,258	-	3,257.69
June	2,152	-	2,151.50
July	-18	-	-17.99
August	-19	-	-18.63
September	23	-	23.43
October	38.09	-	38.09
November	821.06	-	821.06
December	1,960.13	-	1,960.13
Total	11,941.60	7,913.76	19,855.37

MYOCEN delivers to INELEC operating reports in a daily basis according to the MONITORING requirements established in the Monitoring Plan of the registered PDD.

Green Power

The emission reductions resulting from the project are calculated considering an Emission Factor of 0.531 TCO₂e/MWh calculated *ex ante*, as established in the baseline methodology, and the Net Electricity Generation indicated in the Table 7.

As a result, we obtain Table 8 showing the ERs obtained during the monitoring period.

Table 8: Emission Reduction (0.531tonCO₂e/MWh) from Electricity Generation (MWh)

Period	2009	2010	TOTAL
January	-	1,289.99	1,289.99
February	-	1,068.33	1,068.33
March	-	1,843.89	1,843.89
April	1,978.68	-	1,978.68
May	1,729.83	-	1,729.83
June	1,142.45	-	1,142.45
July	-9.55	-	-9.55
August	-9.89	-	-9.89
September	12.44	-	12.44
October	20.22	-	20.22
November	435.98	-	435.98
December	1,040.83	-	1,040.83
Total	6,340.99	4,202.21	10,543.20

A comparison between the ERs actually generated during the monitoring period (1 year) and the ERs estimated in the registered PDD is given in Table 9.

Table 9: Emission Reduction Comparison PDD vs MR (tCO₂e)

Period (1.2yr)	TOTAL
PDD	20,550
Monitoring Report	10,543
Difference	10,007
Difference (%)	48.6%

The amount of ERs generated by the project will vary annually according to the metered net generation output from Trojes. The estimations in the PDD are based on a grid emission rate of 0.531tCO₂e/MWh and an expected 38,700 MWh of electric-energy output per year. The actual annual generation for the period under consideration was 20 GWh. It is important to mention that the electricity generation of the project is conditioned mainly by 2 factors: 1) the water flow available as determined on the annual irrigation program of the

Green Power

CNA, as explained in section 4, and 2) the rainy season. For this monitoring period, the rainy season was not favorable, reporting a diminution of the generation and, therefore a decrease of 48.6% of the expected CERs in the PDD.

For further details see the monitoring spreadsheet "4 Monitoring Report Trojes v1".

Report Elaborated by:



Casiopea Ramírez
Business Developer
Enel Mexico
Email: casiopea.ramirez@latinamerica.enel.it