

VOLUNTARY EMISSION REDUCTION PROJECT



MONITORING REPORT

KEBAN 5 MW HYDROPOWER PLANT, TURKEY

Preparation Date: 15/05/2009
Monitoring Period: 09/05/2007 - 31/12/2008
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Monitoring Report

Title of the Project Activity:	<i>KEBAN 5 MW HYDROPOWER PLANT, TURKEY</i>
Scope:	<i>Voluntary Emission Reduction Project</i>
Standard:	<i>Voluntary Carbon Standard (VCS) 2007.1</i>
Project Type:	<i>Small Scale Renewable Energy Project</i>
Reference:	<i>Project Design Document</i>
Period:	<i>09/05/2007 – 31/12/2008</i>

Project Background

The *KEBAN 5 MW HYDROPOWER PLANT, TURKEY* Project is a renewable energy project located in *Turkey*, which is in operation since *May 9th, 2006*. The Project Activity has been validated by the DOE according to the *VCS 2007.1*. Further background on this Project Activity can be found in the PDD and associated Project documents.

This report is the *1st* monitoring report of the Project Activity for the *initial VCU* issuance.

Project Participants

Project Participants of the Project are:

Company Legal Name	Role
<i>Tektug Elektrik Uretim A.S.</i>	<i>Project owner</i>
<i>Mavi Sürdürülebilir Kalkınma Proje ve Danışmanlık Hiz. Ltd. Sti.</i>	<i>Carbon Consultant</i>

Contact details of project participants can be found in the PDD and associated Project documents.

Monitoring Background

Emission reductions have been calculated in the *Section 4 “GHG Emission Reductions”* of the VCS PDD. The methodology used for calculations is the *UNFCCC methodology AMS I.D. Grid connected renewable electricity generation, v.13*. The grid emission factor has been calculated with the *Tool to calculate the emission factor for an electricity system, v1*.

The monitoring has been explained in the *Section 3 “Monitoring”* of the VCS PDD. Accordingly, a monitoring spreadsheet has been prepared for annual monitoring purposes. The filled-in spreadsheet has been submitted to the verifying DOE as a separate file and is also attached to the Annex of this report.

There is no remaining open issue to monitor after the completion of Project validation. The crediting period of the Project started on May 9th, 2007.

According to the validated PDD, the following parameters are to be monitored:

- *Net electricity generation of the Project [MWh]*

Monitoring Results

Monitoring Period :

The monitoring period is from *09/05/2007* to *31/12/2008* inclusively.

Emission Reductions:

The Project resulted in the following emission reductions during the monitoring period;

Vintage	Emission Reductions [tCO₂]	Period
<i>2007</i>	<i>14,145</i>	<i>09/05/2007 – 31/12/2007</i>
<i>2008</i>	<i>19,856</i>	<i>01/01/2008 – 31/12/2008</i>

Presentation of the Monitoring Results:

All monitoring data is available on the spreadsheet *“VCS-Monitoring-Keban.xls”* file. This file has multiple worksheets for each monitoring year. The monthly electricity generation and consumption data of the Project are stored in the same worksheets and the emission reductions are calculated with the emission factor calculated in the PDD. As explained in the PDD, the generation and consumption data are acquired from the web portal (PMUM) of the public electricity buyer TEIAS, which are also submitted to the DOE as evidence along with the spreadsheet file.

Calculation Methodology

Emission reductions are calculated based on the following formulae:

1. Emission Reductions = Baseline Emissions – Project Emissions – Leakage
Project Emissions and Leakage are zero according to the used methodology.
2. Baseline Emissions = Net Electricity Generated * Grid Emission Factor
3. Net Electricity Generated = Gross Electricity Generated – Electricity Consumed

The following calculation steps are applied for calculating the emission reductions;

1. The grid emission factor is taken from the baseline calculations as a constant parameter.
2. Amount of gross electricity generated and gross electricity consumed by the Project are obtained from the public grid operator TEIAS's web portal PMUM.
3. Monthly PMUM data are aggregated in a spreadsheet. As the available data have a breakdown into 3 time periods during day (T1, T2, T3 for peak, normal and low demand periods), the monthly data are stored accordingly.
4. The net electricity generation is found by:
 - a. Subtracting monthly gross consumption from the monthly gross generation for each of the daily time periods T1, T2 and T3
 - b. Adding up the T1, T2 and T3 net electricity generation breakdowns for each month to obtain the annual net electricity generation.
 - c. Multiplying the annual net electricity generation with the grid emission factor.

ANNEX I – Calculation Of Emission Reductions

2007 Emission Reductions



Project Name: Keban 5 MW HEPP, Turkey
Period start 09.05.2007
Period end 31.12.2007
Data Source PMUM, <http://pmum.teias.gov.tr>
Explanation Please fill in blue cells (copy-paste from PMUM website) and attach printouts of monthly PMUM reports to this summary

	T1			T2			T3			1	T1			T2			T3			2	3 (= 1 - 2)	4	5 (= 3 x 4)
Period	Gross Energy Generation, GEG				Self Consumption, SEC				Net Electricity Generation, EG	Emission Factor	Emission Reductions												
[Month]	T1 [kWh]	T2 [kWh]	T3 [kWh]	T1+T2+T3 [kWh]	T1 [kWh]	T2 [kWh]	T3 [kWh]	T1+T2+T3 [kWh]	[kWh]	[tCO ₂ /MWh]	[tCO ₂]												
January				0				0	0	0.616	0.00												
February				0				0	0	0.616	0.00												
March				0				0	0	0.616	0.00												
April				0				0	0	0.616	0.00												
May	1,106,578	499,986	795,272	2,401,836	31	51	61	143	2,401,693	0.616	1,478.80												
June	1,441,407	660,050	1,091,019	3,192,476	61	41	0	102	3,192,374	0.616	1,965.65												
July	1,487,056	680,472	1,092,776	3,260,304	0	0	0	0	3,260,304	0.616	2,007.47												
August	1,387,026	635,624	1,010,906	3,033,556	112	31	112	255	3,033,301	0.616	1,867.70												
September	1,051,599	502,477	785,351	2,339,427	449	265	500	1,214	2,338,213	0.616	1,439.71												
October	1,302,680	611,486	999,420	2,913,586	51	10	0	61	2,913,525	0.616	1,793.95												
November	1,281,924	601,446	961,552	2,844,922	10	0	0	10	2,844,912	0.616	1,751.70												
December	1,363,739	625,008	999,104	2,987,851	51	0	10	61	2,987,790	0.616	1,839.68												
Total	10,422,009	4,816,549	7,735,400	22,973,958	765	398	683	1,846	22,972,112	0.616	14,145												

2008 Emission Reductions



Project Name: Keban 5 MW HEPP, Turkey
Period start: 01.01.2008
Period end: 31.12.2008
Data Source: PMUM, <http://pmum.teias.gov.tr>
Explanation: Please fill in blue cells (copy-paste from PMUM website) and attach printouts of monthly PMUM reports to this summary

	T1	T2	T3	1	T1	T2	T3	2	3 (= 1 - 2)	4	5 (= 3 x 4)
Period	Gross Energy Generation, GEG				Self Consumption, SEC				Net Electricity Generation, EG	Emission Factor	Emission Reductions
[Month]	T1 [kWh]	T2 [kWh]	T3 [kWh]	T1+T2+T3 [kWh]	T1 [kWh]	T2 [kWh]	T3 [kWh]	T1+T2+T3 [kWh]	[kWh]	[tCO ₂ /MWh]	[tCO ₂]
January	1,318,175	604,402	956,803	2,879,380	10	0	0	10	2,879,370	0.616	1,772.92
February	1,185,899	542,558	852,320	2,580,777	31	10	10	51	2,580,726	0.616	1,589.04
March	1,356,320	619,616	994,917	2,970,853	10	0	10	20	2,970,833	0.616	1,829.24
April	1,307,877	605,743	971,102	2,884,722	71	0	0	71	2,884,651	0.616	1,776.17
May	1,376,854	624,801	1,004,379	3,006,034	0	10	0	10	3,006,024	0.616	1,850.90
June	1,247,444	576,332	919,612	2,743,388	112	31	82	225	2,743,163	0.616	1,689.05
July	1,302,552	591,358	949,253	2,843,163	10	0	0	10	2,843,153	0.616	1,750.62
August	1,181,223	545,480	872,112	2,598,815	133	61	102	296	2,598,519	0.616	1,599.99
September	1,111,174	520,526	830,124	2,461,824	71	0	0	71	2,461,753	0.616	1,515.78
October	1,085,944	497,669	813,261	2,396,874	0	0	0	0	2,396,874	0.616	1,475.83
November	1,084,291	505,970	787,390	2,377,651	20	0	0	20	2,377,631	0.616	1,463.98
December	1,146,569	523,208	836,146	2,505,923	31	0	10	41	2,505,882	0.616	1,542.95
Total	14,704,322	6,757,663	10,787,419	32,249,404	499	112	214	825	32,248,579	0.616	19,856