MONITORING REPORT FORM (F-CDM-MR)
Version 02.0

MONITORING REPORT

Title of the project activity	Babanpur, Killa and Sahoke Mini Hydroelectric Projects
Reference number of the project activity	0329
Version number of the monitoring report	01
Completion date of the monitoring report	15/11/2012
Registration date of the project activity	30/04/2006
Monitoring period number and duration of this monitoring period	Monitoring period : Sixth (6^{th}) Duration of monitoring period: 01/08/2011 to 31/10/2012
Project participant(s)	Kotla Hydro Power Private Limited
Host Party(ies)	India
Sectoral scope(s) and applied methodology(ies)	Sectoral scope : 01 Methodology : AMS I.D Version 07
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	28,890 tCO_2
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	26,966 tCO_2

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Three Mini Hydroelectric Projects (MHP) aggregating to 3.75 MW at Babanpur, Killa and Sahoke on the Kotla Branch Canal, District Sangrur, Punjab, India have been set up. Mini Hydroelectric Project at Babanpur (1MW) was commissioned in July 2004, Killa (1.75MW) was commissioned in November 2005 and Sahoke (1MW) was commissioned in October 2006. The plants are operating successfully.

The purpose of the project activity is to generate electricity by utilizing water flowing through the existing canal system as a renewable energy resource to meet the ever-increasing demand of energy in the region. The development of the project activity contemplates the production of clean hydroelectric power that will contribute to reduce CO_2 emissions, which would have occurred otherwise, in absence of these projects.

1 MW hydroelectric power plant at Babanpur, 1.75 MW hydroelectric power plant at Killa and 1 MW hydroelectric power plant at Sahoke of this project activity generate electricity and sell it to the State utility i.e. Punjab State Electricity Board.

These three plants are of low head, canal drop based mini hydroelectric projects. The projects are canal based renewable hydroelectric generating plants, which includes forebay, intake, power house, draft tube, turbine, and tailrace. The component plants do not involve any type of displacement, rehabilitation or relocation.

The projects are generating electricity successfully by converting the potential of kinetic energy of the canal water and the renewable electricity produced is fed into the Punjab State Electricity Board Grid thereby replacing the equivalent amount of electricity produced from thermal stations and thus reducing green house gas emission.

A.2. Location of project activity

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MHP Babanpur : The project is located at Kotla Branch Canal

Latitude	: 30˚24 ' 51 N,	Longitude	: 75˚ 52 ' 41 E
Town	: Malerkotla		
District	: Sangrur		
State	: Punjab		
Country	: India		

MHP Killa : The project is located at Kotla Branch Canal

Latitude	: 30˚ 19 ' 37 N,	Longitude	: 75˚ 43 ' 30 E
Town	: Malerkotla		
District	: Sangrur		
State	: Punjab		
Country	: India		

MHP Sahoke : The project is located at Kotla Branch Canal

Latitude : 30˚ 11 ' 16 N, Longitude : 75˚ 34 ' 39 E
Town : Malerkotla
District : Sangrur
State : Punjab
Country : India

A.3. Parties and project participant(s)

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Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Private entity: Kotla Hydro Power Private Limited	No

A.4. Reference of applied methodology

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Type I : Renewal Energy Projects
Category : I.D. Renewable Electricity Generation for a Grid
Version : 07

A.5. Crediting period of project activity

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Crediting period for this project activity is 01/07/2004 to 30/06/2014 (Fixed).

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity
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The projects activities were commissioned on dates as mentioned below while it was registered with CDM EB on 30/04/2006.

SN	Name of the Project	Date of Commissioning
1	Babanpur	July 2004
2	Killa	Nov 2005
3	Sahoke	Oct 2006

The project promoter has installed all monitoring equipment to monitor the parameters which were described in the registered CDM PDD.

The project activity is in continuous operation since the date of commissioning. No special events or change of equipments have taken place during the current monitoring period.

No events occurred during the current monitoring period which may have affected the applicability of the methodology.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology
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Not Applicable

B.2.2. Corrections
>>
Not Applicable

B.2.3. Permanent changes from registered monitoring plan or applied methodology
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Not Applicable

B.2.4. Changes to project design of registered project activity
>>
Not Applicable

B.2.5. Changes to start date of crediting period
>>
Not Applicable

B.2.6. Types of changes specific to afforestation or reforestation project activity
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Not Applicable

SECTION C. Description of monitoring system

For this project activity, the monitoring systems and procedures followed are as described below:

Energy:

1. The Energy exported (kWh) and Energy imported (kWh) at the interconnection points have been measured by the bidirectional meters (i.e. Trivector Meters) installed at the interconnection points at all the 3 (three) project sites.

2. The Net Saleable Energy (Net electricity exported to grid) has been calculated as a difference between energy exported and energy imported. It is based on monthly joint meter readings.

3. Monthly joint meter readings were taken at interconnection points and certified by representatives of Kotla Hydro Power Private Limited (KHPPL) and the purchaser i.e. Punjab State Electricity Board (PSEB).

4. The joint meter readings were used to raise invoice for sale of net energy to PSEB.

5. The energy generated has been measured by the energy meters installed at the generation points on an hourly basis.

6. The auxiliary energy consumption has been measured by the auxiliary energy consumption meters installed at each of the plant sites on an hourly basis.

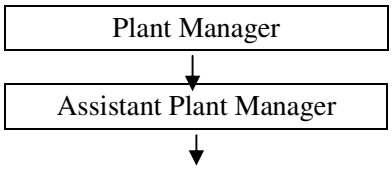
7. The data of the aforesaid parameters are recorded on hourly basis which are summed into a daily reading.

8. The hourly reading of electricity generation and auxiliary consumption were aggregated to daily & monthly electricity figure.

9. Monthly reports stating the energy exported, energy imported, energy generated and auxiliary energy consumption were prepared by shift-in-charge and verified by plant managers.

10. The finance department cross checked the data provided by plant managers.

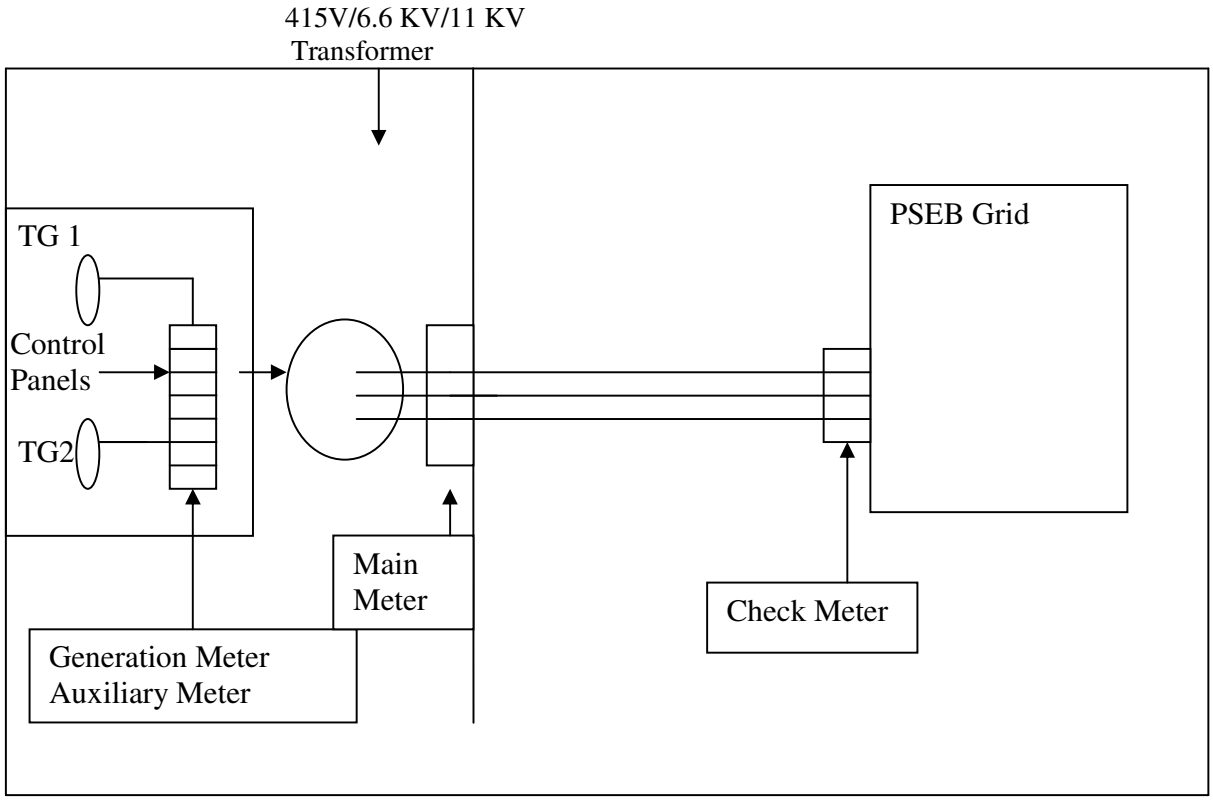
11. The organizational structure responsible for monitoring the various parameters as per Monitoring Plan is as below:-



SHIFT I	SHIFT II	SHIFT III	SHIFT IV
Plant Shift Supervisor	Plant Shift Supervisor	Plant Shift Supervisor	Plant Shift Supervisor
Technical Assistant	Technical Assistant	Technical Assistant	Technical Assistant

The hourly data is monitored and recorded in the log books by the shift staff comprising of Plant Shift Supervisor and Technical Assistant. The daily data is checked and countersigned by the Assistant Plant Manager. The daily and monthly data is checked and verified by the Plant Manager. The data is audited annually by the auditor of the Company having financial background.

The Diagram showing all relevant monitoring points has been displayed as below:



SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	Grid Emission Factor
Unit	kg of CO_2 / kWh
Description	The Grid Emission Factor has been calculated as the weighted average of the operating Margin Emission Factor (EF_{OM}) and the Build Margin Emission Factor (EF_{BM}).
Source of data	Northern Region Grid's permission from Central Electricity Authority
Value(s) applied	0.942
Purpose of data	Baseline emission calculations
Additional comments	This parameter is fixed ex-ante for the full crediting period

D.2 Data and parameters monitored

Data / Parameter:	Energy exported
Unit	kWh
Description	Energy exported to grid
Measured /Calculated /Default:	Measured
Source of data:	Main / Trivector Meter
Value(s) of monitored parameter:	

Babanpur	**Killa**	**Sahoke**	**Total**
7,274,970	13,120,470	8,265,900	28,661,340

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Monitoring equipment

Particulars	**Babanpur**	**Killa**	**Sahoke**
Type	L&T Electronic Bidirectional Trivector Meter	L&T Electronic Bidirectional Trivector Meter	L&T Electronic Bidirectional Trivector Meter
Accuracy class	(±)0.50%	(±)0.50%	(±)0.50%
Serial number	05271088	04223074	04223078
Calibration frequency	6 month	6 month	6 month
Calibrations during monitoring period	26/07/2011 to 25/01/2012 18/01/2012 to 17/07/2012 29/06/2012 to 28/12/2012	26/07/2011 to 25/01/2012 18/01/2012 to 17/07/2012 03/07/2012 to 02/01/2013	01/08/2011 to 31/01/2012 28/01/2012 to 27/07/2012 05/07/2012 to 04/01/2013

Measuring/Reading/ Recording frequency	Monthly
Calculation method(if applicable)	Not Applicable
QA/QC procedures	The power exported by KHPPL is monitored and recorded on the basis of reading of the Main Meter & check meter. Joint Meters reading are based on the Main Meter reading for the export and import of the electricity to and from the Grid. The principles of Frequency, Data recording and Reliability as mentioned in the PDD are strictly adhered to. The Main Meters and Check Meters are test checked for accuracy every six months by the team of PSEB. The Meters installed at generation end are also test checked for accuracy every six months.
Purpose of data	To calculate emission reductions
Additional Comment	Not Applicable

Data / Parameter:	Energy imported
Unit	kWh
Description	Energy imported from grid
Measured /Calculated /Default:	Measured
Source of data:	Main / Trivector Meter
Value(s) of monitored parameter:	**Babanpur**: 9,950 ; **Killa**: 13,150 ; **Sahoke**: 11,690 ; **Total**: 34,790
Monitoring equipment	**Particulars** / **Babanpur** / **Killa** / **Sahoke** Type: Electronic Bidirectional Trivector Meter / Electronic Bidirectional Trivector Meter / Electronic Bidirectional Trivector Meter Accuracy class: (±)0.50% / (±)0.50% / (±)0.50%

	Serial number	05271088	04223074	04223078
	Calibration frequency	6 month	6 month	6 month
	Calibrations during monitoring period	26/07/2011 to 25/01/2012 18/01/2012 to 17/07/2012 29/06/2012 to 28/12/2012	26/07/2011 to 25/01/2012 18/01/2012 to 17/07/2012 03/07/2012 to 02/01/2013	01/08/2011 to 31/01/2012 28/01/2012 to 27/07/2012 05/07/2012 to 04/01/2013
Measuring/Reading/ Recording frequency	Monthly			
Calculation method(if applicable)	Not Applicable			
QA/QC procedures	The main and check meters installed are bidirectional tri-vector meters capable of recording energy exported and energy imported. The same are test check for accuracy every six month. The data of main meter is checked / compared with the data of check meter.			
Purpose of data	To calculate emission reductions.			
Additional comment	Not applicable			

Data / Parameter:	Net saleable energy			
Unit	kWh			
Description	Net salable energy to grid			
Measured /Calculated /Default	Calculated			
Source of data	Main Meter / PSEB Monthly Bills			
Value(s) of monitored parameter:	**Babanpur**	**Killa**	**Sahoke**	**Total**
	7,265,020	13,107,320	8,254,210	28,626,550
Monitoring equipment	As this is calculated, this section is not applicable for this monitoring parameter.			
Measuring/Reading/ Recording frequency	Monthly			

Calculation method(if applicable)	Net Saleable energy = Energy exported – Energy imported
QA/QC procedures	Net Saleable energy is the net exported energy which is the difference of energy exported and energy imported. Joint Meters reading are taken from the Main and Check Meter every month to arrive at Net Saleable energy. Net saleable generation is calculated from main meter. The Main and Check Meters are tested for accuracy every six months.
Purpose of data	To calculate emission reductions
Additional comment	Not applicable

Data / Parameter:	Energy generated
Unit	kWh
Description	Gross energy generated
Measured /Calculated /Default	Measured
Source of data	Generation Meters
Value(s) of monitored parameter	

Babanpur	**Killa**	**Sahoke**	**Total**
7,550,579	13,543,873	8,459,788	29,554,240

Monitoring equipment

Particulars	**Babanpur**	**Killa**	**Sahoke**
Type	Unit 1 & 2:Rishabh Digital Energy Meter	Unit 1: Minsun Digital Energy Meter Unit 2: Selec Digital Energy Meter	Minsun Digital Energy Meter
Accuracy class	(±)0.50%	(±)0.50%	(±)0.50%
Serial No. (Unit-I)	04/12/2288	6851019	68B0511

	Serial No. (Unit-II)	05/09/4126	B:0910	_____
	Calibration Frequency	6 month	6 month	6 month
	Calibration during monitoring period	26/06/2011 to 25/12/2011 24/12/2011 to 23/06/2012 20/06/2012 to 19/12/2012	26/06/2011 to 25/12/2011 24/12/2011 to 23/06/2012 20/06/2012 to 19/12/2012	26/06/2011 to 25/12/2011 24/12/2011 to 23/06/2012 20/06/2012 to 19/12/2012
Measuring/Reading/ Recording frequency	Hourly			
Calculation method (if applicable)	Not Applicable			
QA/QC procedures	The readings of the energy generated are taken from the meters installed at generation point. These are test checked for accuracy every six months.			
Purpose of data	Monitored as mentioned in PDD.			
Additional comment	Not applicable			

Data / Parameter:	Auxiliary energy consumption			
Unit	kWh			
Description	Auxiliary energy consumed for running the plant			
Measured /Calculated /Default	Measured			
Source of data	Auxiliary Meters			
Value(s) of monitored parameter:	**Babanpur**	**Killa**	**Sahoke**	**Total**
	94,181	116,067	96,685	306,933
Monitoring equipment	**Particulars**	**Babanpur**	**Killa**	**Sahoke**
	Type	Rishabh	Enercon	Selec
	Accuracy class	(±)0.50%	(±)0.50%	(±)0.50%

	Serial no.	08/06/0915	57343/1598-3804	B:911	
	Calibration frequency	6 month	6 month	6 month	
	Calibrations during monitoring period	26/06/2011 to 25/12/2011 24/12/2011 to 23/06/2012 20/06/2012 to 19/12/2012	26/06/2011 to 25/12/2011 24/12/2011 to 23/06/2012 20/06/2012 to 19/12/2012	26/06/2011 to 25/12/2011 24/12/2011 to 23/06/2012 20/06/2012 to 19/12/2012	
Measuring/Reading/ Recording frequency	Hourly				
Calculation method (if applicable)	Not Applicable				
QA/QC procedures	Auxiliary energy consumption readings are recorded at the auxiliary meters installed in the panel. These are test check for accuracy every six months.				
Purpose of data	Monitored as mentioned in PDD.				
Additional comment	Not applicable				

D.3. Implementation of sampling plan

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Not applicable

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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SN	Description	Formula	Unit	Value
A	Energy Exported		kWh	28,661,340
B	Energy Imported		kWh	34,790
C	Net Saleable Energy	C = A – B	kWh	28,626,550
D	Carbon Emission Factor as per the baseline adopted		kg CO_2/kWh	0.942
E	Baseline Emissions	E=(C*D) / 1,000	ton CO2	26,966

E.2. Calculation of project emissions or actual net GHG removals by sinks

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No project emissions are associated with the project activity during this monitoring period. This is also in line with the PDD and methodology.

E.3. Calculation of leakage

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As the energy generating equipment is not transferred from another activity or the existing equipment is also not transferred to another activity, leakage is not considered. The same is in line with the methodology and the registered PDD.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

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Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_2e)	Leakage (tCO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO_2e)
Total	26,966	NIL	NA	26,966

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

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Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO_2e)	28,890	26,966

E.6. Remarks on difference from estimated value in registered PDD

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The actual emission reductions during this monitoring period are less than estimated value in the registered PDD for the equivalent time period

Annexure - I

The month wise data on energy generated in given hereunder. The monthly data is based on the hourly reading taken at the meters installed at the generation end

Energy Generated (kWh)

Billing Month	Year	Babanpur	Killa	Sahoke	Total
Aug	2011	436,866	744,568	411,771	1,593,205
Sep	2011	170,944	293,025	227,963	691,932
Oct	2011	546,726	1,039,610	599,641	2,185,977
Nov	2011	467,438	854,071	613,576	1,935,085
Dec	2011	385,640	700,650	437,760	1,524,050
Jan	2012	616,631	1,201,800	808,520	2,626,951
Feb	2012	639,725	1,190,650	693,020	2,523,395
Mar	2012	768,692	1,409,732	918,866	3,097,290
Apr	2012	164,490	323,340	292,384	780,214
May	2012	679,780	1,046,858	601,805	2,328,443
Jun	2012	641,885	1,105,836	724,680	2,472,401
Jul	2012	653,551	1,225,824	721,640	2,601,015
Aug	2012	590,248	1,031,495	639,552	2,261,295
Sep	2012	468,304	805,100	316,440	1,589,844
Oct	2012	319,659	571,314	452,170	1,343,143
Total		**7,550,579**	**13,543,873**	**8,459,788**	**29,554,240**

Annexure - II

The month-wise data on auxiliary energy consumption is given hereunder. The monthly data is based on hourly reading taken at the auxiliary meters installed at the panel:

Auxiliary Energy Consumption (kWh)

Billing Month	Year	Babanpur	Killa	Sahoke	Total
Aug	2011	4,613	7,631	6,281	18,525
Sep	2011	3,184	5,382	5,296	13,862
Oct	2011	5,015	8,590	6,703	20,308
Nov	2011	5,117	6,982	6,382	18,481
Dec	2011	6,415	7,360	5,899	19,674
Jan	2012	6,944	8,360	8,156	23,460
Feb	2012	5,971	6,803	6,056	18,830
Mar	2012	7,136	7,943	7,145	22,224
Apr	2012	3,387	3,294	3,654	10,335
May	2012	8,799	10,838	7,268	26,905
Jun	2012	9,158	10,058	8,955	28,171
Jul	2012	8,937	10,170	7,929	27,036
Aug	2012	8,355	9,334	7,144	24,833
Sep	2012	7,403	8,805	5,416	21,624
Oct	2012	3,747	4,517	4,401	12,665
Total		**94,181**	**116,067**	**96,685**	**306,933**

The energy generated data and auxiliary energy consumption data is not used for calculation of emission reductions as the calculation of emission reductions is based on Net Saleable energy i.e. the difference of energy exported and energy imported.

Annexure - III

Month-wise data on Net Saleable Energy for the monitoring period is given as under:

As per the Project Design Document, Emission reductions are to be calculated based on the energy exported minus energy imported during shut-down and start-ups by the power plant.

Net Saleable Energy (kWh)

Billing Month	Year	Energy Exported				Energy Imported				Net Saleable Energy
		Babanpur	Killa	Sahoke	Total	Babanpur	Killa	Sahoke	Total	
Aug	2011	419,260	720,000	398,960	1,538,220	1,390	1,960	1,420	4,770	1,533,450
Sep	2011	164,270	281,960	221,460	667,690	2,550	3,950	2,400	8,900	658,790
Oct	2011	526,450	1,007,620	583,400	2,117,470	50	20	40	110	2,117,360
Nov	2011	450,820	828,370	597,100	1,876,290	20	30	60	110	1,876,180
Dec	2011	370,560	679,100	423,980	1,473,640	50	20	100	170	1,473,470
Jan	2012	595,860	1,164,360	786,380	2,546,600	30	40	180	250	2,546,350
Feb	2012	618,750	1,154,920	679,340	2,453,010	70	50	260	380	2,452,630
Mar	2012	743,340	1,368,580	902,100	3,014,020	120	50	80	250	3,013,770
Apr	2012	158,560	313,460	286,890	758,910	2,530	2,920	1,680	7,130	751,780
May	2012	655,410	1,010,180	589,820	2,255,410	220	360	920	1,500	2,253,910
Jun	2012	617,630	1,070,880	709,640	2,398,150	180	110	720	1,010	2,397,140
Jul	2012	628,440	1,185,340	706,790	2,520,570	140	50	220	410	2,520,160
Aug	2012	567,680	1,002,670	626,510	2,196,860	1,140	1,160	600	2,900	2,193,960
Sep	2012	449,540	778,910	309,140	1,537,590	120	30	1,640	1,790	1,535,800
Oct	2012	308,400	554,120	444,390	1,306,910	1,340	2,400	1,370	5,110	1,301,800
Total		**7,274,970**	**13,120,470**	**8,265,900**	**28,661,340**	**9,950**	**13,150**	**11,690**	**34,790**	**28,626,550**

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History of the document

Version	Date	Nature of revision
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB66, Annex 20)
01	EB 54, Annex 34 28 May 2010	Initial adoption
Decision Class: Regulatory **Document Type**: Form **Business Function**: Issuance		