

**GOLD STANDARD – VOLUNTARY EMISSION REDUCTION
MONITORING REPORT:**

MONITORING PERIOD: 07/10/2007 – 06/10/2008

**PROJECT GS 628:
TONK BIOMASS PROJECT, INDIA**

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SECTION A. General project activity information

A.1 Title of the project activity:

Tonk Biomass Project, India

A.2. GS registration:

Registration number: GS 628
Registration date: 19/06/2009

A.3. Short description of the project activity:

The following proposed Gold Standard project activity is located in the State of Rajasthan, India. The project involves the implementation of a biomass-based power generation plant using direct combustion boiler technology by Kalpataru Power Transmission Ltd. (KPTL), a leading firm in the implementation of power transmission and distribution systems. The installed capacity of the plant is 8 MW_{el}. The fuel used is primarily mustard crop residue, which is abundantly available in the vicinity of the site. The electricity generated will be sold primarily to the state grid.

A.4. Monitoring period:

Monitoring period covered by this report: 07/10/2007 – 06/10/2008 (both days are included)

Please note that this monitoring report covers the period of one year prior to the CDM registration at the UNFCCC. Therefore this project is in compliance with the Gold Standard rules on pre-CDM VERs. The final PDD for the CDM validation has been submitted to the DOE prior to June 26, 2007¹.

A.5. Methodology applied to the project activity:

The reference for Baseline and Monitoring methodology is the following approved small-scale methodology:

AMS-I.D - 'Grid connected renewable electricity generation' (Version 11; Scope: 1; 18/05/2007)²

A.6. Status of implementation including time table for major project parts:

The project installation is finished according to the description in the PDD and completely operational. The most important milestones are included in the following table:

Date	Milestone
November 2006	Start of operation of Tonk
07 October 2008	Registration of project activity at the UNFCCC
19 June 2009	Registration of project activity at Gold Standard

¹ http://www.netinform.net/KE/Wegweiser/Guide2_3.aspx?ID=3238&Ebene1_ID=26&Ebene2_ID=980&mode=0

² http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_UYF1PQNDY5FZ4VH4HZ28FYAP13S19W

A.7. Intended deviations or revisions to the registered PDD or monitoring plan:

No deviations to the monitoring procedure documented in the registered monitoring plan occurred.

A.8. Changes since last verification:

N/A

A.9. Person(s) responsible for the preparation and submission of the monitoring report:

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SECTION B. Key monitoring activities according to the monitoring plan for the monitoring period stated in A.4.

B.1. Monitoring equipment:

B.1.1. Table providing information on the equipment used:

Device	Manufacturer	Model	Serial number	Date of last calibration
Main electricity meter	Secure Meter Limited, Udaipur	E3M021-3PH-4 Wire	TNU 01883	26/07/2008
Back-up electricity meter	Secure Meter Limited, Udaipur	E3M021-3PH-4 Wire	TNU 01884	26/07/2008
Weigh bridge	Leotronics Scales Ltd.	Class III 40 Mt.	2005/340	28/04/2008

B.1.2. Calibration procedures:

The calibration of the monitoring equipment was carried out according to the information provided in the PDDs. The main and backup electricity meters as well as the weigh bridge were inside the acceptable limits of accuracy and therefore no need for a re-calibration was given.

B.2. Data collection (accumulated data for the whole monitoring period):

B.2.1. List of fixed default values:

Parameter	Default value	Unit	Description
EF _{CM}	793.2	tCO ₂ /GWh	Emission factor for northern India's interconnected grid; ex-ante calculation
SFC _{b,1}	1347	Dry tonnes of biomass/GWh	Specific fuel consumption for biomass fuel category 1 (Mustard crop residues)- on a dry basis
SFC _{b,2}	1018	Dry tonnes of biomass/GWh	Specific fuel consumption for biomass fuel category 2 (Juli-Flora residues) - on a dry basis
SFC _{b,3}	1083	Dry tonnes of biomass/GWh	Specific fuel consumption for biomass fuel category 3 (Wood chips) - on a dry basis

B.2.2. Data concerning GHG emissions by sources of the project activity:

No greenhouse gases except from renewable biomass were emitted by the project activity.

B.2.3. Data concerning GHG emissions by sources of the baseline:

Data variable	Unit	Description
$E_{t,y}$	GWh/year	Total measured electricity generation from the CDM project activity during the year y
$E_{pl,y}$	GWh/year	Total annual electricity for internal consumption of the power plant during the year y
$BC_{y,i}$	Dry tonnes of biomass/year	Total consumption of dry biomass i for year y.
FC_y	Tonnes	Total consumption of fossil fuel in year y

For conservativeness reasons the project's emission reduction calculations are based on the net electricity delivered to the grid ($E_{t,y}$) and the gross electricity imported ($E_{pl,y}$). Both values are measured at the grid sub-station that is located around 2-3 km distance from the plant site. At the sub-station are two meters located (please see B.1.1 for details on the meters); one main meter and one back-up meter of the same make and model. As stated in the CDM PDD both meters are under a straight maintenance and control regime. The electricity data is read every first day of the month for the previous month. Please find detailed explanations of the reading procedure in the CDM PDD in the monitoring section.

B.2.4. Data concerning leakage:

No leakage occurred. As this project activity uses biomass it is to follow the "General guidance on leakage in biomass project activities (Version 02)" of the UNFCCC. Fulfilling the requirements of the guidance it is shown that the project activity uses a surplus of the biomass. The amount of available biomass in the region is at least 25% larger than the biomass used in the project activity. Evidence will be available to the DOE. Data that was available to the DOE states that the project activity used in the respective monitoring period around 50% of the total available amount of mustard crop residues, leaving a surplus of another 50% for other uses. Further details on the surplus of biomass as well as detailed numbers can be found under ID GS 6.

B.3. Data processing and archiving:

Data handling was carried out according to the description in the PDD. Furthermore documentation showing procedures for data handling and archiving were available to the DOE on-site.

B.4. Special event log:

Date	Special event
10/12/07 until 11/12/07	Outage due to boiler cleaning
05/04/08 until 06/04/08	Outage due to transformer maintenance
03/05/08	Outage due to boiler and superheater zone cleaning
22/05/08 until 23/05/08	Outage due to boiler and superheater zone cleaning
02/06/08	Outage due to boiler feed pump maintenance
18/08/08 to 25/08/08	Shutdown of plant due to annual overhauling and maintenance
04/09/08	Shutdown of plant for maintenance

SECTION C. Quality assurance and quality control measures

C.1. Documented procedures and management plan:

C.1.1. Roles and responsibilities:

The Senior Vice President is in charge of the CDM project activity. The second and third level of responsible persons comprises the deputy managers and managers of the departments. The Electrical Manager Assistant is in charge of the troubleshooting and data recording procedures relating to the electricity meters. The deputy manager commercial and accounts is in charge of all procedures related to the biomass procurement.

A detailed explanation of the roles and responsibilities can be found in the monitoring manual that is available to the DOE.

C.1.2. Trainings:

The responsible personnel for the CDM project activity participated diverse trainings. Evidence will be available to the DOE during the on-site visit.

C.2. Involvement of Third Parties:

Support and consultancy regarding the CDM obligations is provided by OneCarbon International B.V..

C.3. Internal audits and control measures:

Electricity measurements:

Monthly joint measurements with the utility authorities for the import and export of electricity are mandatory for the sale of electricity to the utility. Furthermore, invoices to RVPN will be used as backup to compare the dispatched electricity declared in the monitoring plan, as part of the annual audit reports carried out by accountants. Regularly main meter and backup meter are tested by representative of metering division, Rajasthan Power Procurement Center (RPPC).

Biomass quality:

Random checks are carried out to monitor the quality of the biomass fuels received (moisture content, purity of the material).

Data quality and records:

RVPN and KPTL keep complete and accurate records and all other data required by each of them for the purposes of proper operation of the Project. Among such other records and data, KPTL maintain an accurate and up-to-date operating log at the Project site with records of:

- a. hourly logs of real and reactive electricity generation, frequency, transformer tap position, bus voltage(s) and any other data mutually agreed;
- b. Any unusual conditions found during operation/inspections; and
- c. Chart and printout of event loggers, if any, for system disturbances/outages.

Weigh bridge:

Annually the weighbridge is tested by the Inspector of Weighing and Measurement Department.

C.4. Troubleshooting procedures:

Electricity meter:

The back-up electricity meter will be used in case the main meter fails or is offline due to maintenance.

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When the Main Meter and/or Backup Meter and/or component thereof is found to be outside the acceptable limits of accuracy or otherwise not functioning properly, it shall be repaired, re-calibrated or replaced by RVPN and/or KPTL, as the case may be, as soon as possible.

SECTION D. Calculation of GHG emission reductions

D.1. Table providing the formulas used:

The greenhouse gas emission reduction achieved by the project activity is calculated based on the formulae as extracted from the PDD:

	Formula	Description
1.	$ERp_y = BEp_y - PEp_y - Lp_y$	Ex-post emission reductions
2.	$BEp_y = (CEG_y - E_{pl,y}) \cdot EF_{CM}$	Ex-post baseline emissions
3.	$CEG_y = \text{Min}(TEG_{\text{projectplant},y}, \sum_i \frac{BC_{i,y}}{SFC_{b,i}})$	Calculation of electricity produced based on the biomass consumption and the specific fuel consumption of the biomass
4.	$TEG_{\text{projectplant},y} = E_{t,y} - EGFF_y$	Electricity production in case fossil fuel was used
5.	$TEG_{\text{projectplant},y} = E_{t,y}$	If no fossil fuel is consumed
6.	$EGFF_y = \frac{FC_y}{SFC_{ff}}$	Electricity generation from fossil fuel consumption
7.	$PE_{p,y} = 0$	Ex-post project emissions
8.	$LP_y = 0$	Leakage

Where:

ERp_y	Ex- post estimation for emission reductions for year y (tCO ₂ /yr).
BEp_y	Ex- post estimation for baseline emissions for year y (tCO ₂ /yr).
PEp_y	Ex- post estimation for project emissions for year y (tCO ₂ /yr).
Lp_y	Ex- post estimation for leakage for year y (tCO ₂ /yr).
CEG_y	Conservative total electricity generation based on exclusively biomass sources for the year y (GWh/year).
$E_{pl,y}$	Total annual electricity for internal consumption of the power plant in the year y (GWh).
EF_{CM}	Resultant combined margin for the grid, <u>based on ex-ante estimations</u> as per the PDD (tonnes CO ₂ /GWh).
$TEG_{\text{projectplant},y}$	Total electricity generation using only biomass fuels (GWh/year)
$BC_{i,y}$	Total consumption of biomass i for year y (Tonnes of biomass/year)
$SFC_{b,i}$	Specific fuel consumption of biomass i (Tonnes of biomass/GWh)
$E_{t,y}$	Total annual electricity generated by the power plant in the year y (GWh)
$EGFF_y$	Energy generation during the year y due to fossil fuels co-fired by the generation facility (GWh/year)
SFC_{ff}	Specific fuel consumption for fossil fuel (tonnes/GWh).
FC_y	Total consumption of fossil fuels in year y (tonnes).

D.2. GHG emission reductions (referring to B.2. of this document):

D.2.1. Project emissions:

No project emissions occurred during this monitoring period. The complete electricity generation was based on renewable biomass input and no fossil fuel was used.

Based on the current equipment of the plant the use of a fuel different from biomass is not possible. For the use of coal as the only fossil fuel to be realistically fired together with biomass, expensive and extensive modifications are necessary. These modifications are not implemented and are also not planned for the future.

Following this, the parameter **FC_y equals zero**.

The net exported electricity already includes the emissions from imported electricity which are deducted from the gross exported electricity.

D.2.2. Baseline emissions:

The baseline emissions consist of the net amount of electricity produced solely by biomass and exported to the grid multiplied with the ex-ante defined emission factor for the respective grid.

As defined in the PDD the exported and imported electricity are monitored and used for the emission reduction calculation. The imported electricity is discounted from the exported electricity and result in the actual exported amount of electricity

According to the baseline methodology AMS-I.D version 11 the amount of electricity generated using exclusively biomass fuels needs to be compared with the amount of electricity generated calculated using specific fuel consumption and the amount of each type of biomass fuel used. The lower of the two values will be used to calculate ex-post emission reductions. The equation to be applied is as follows:

$$CEG_y = \text{Min}(TEG_{\text{projectplant},y}, \sum_i \frac{BC_{i,y}}{SFC_{b,i}})$$

Where

TEG_{projectplant,y} : Total electricity generation using only biomass fuels (GWh/year)

BC_{i,y} : Total consumption of biomass i for year y (Tonnes of biomass/year)

SFC_{b,i} : Specific fuel consumption of biomass i (Tonnes of biomass/GWh)

The parameter SFC was determined during validation. The total electricity generation and the biomass consumption are monitored on a yearly basis as defined in the registered PDD. During the validation process of the project it turned out to be the only reliable option to monitor the biomass consumption on a yearly basis. The biomass residues used by the project originate mainly from mustard crop. These mustard crop residues are available in the region only during the harvesting period once in a year between March and June. During the remaining months of the year only minor amounts are available to be procured for the project. The biomass residues have to be stored and consumed until the next harvesting period starts in order to assure the availability of biomass during the one year period from one harvesting season to another.

The table below provides the comparison between the electricity generated using exclusively biomass fuels with the amount of electricity generated calculated using specific fuel consumption. The basis for the amount of available biomass is the procurement data that is measured at the weigh bridge as per the PDD.

The review of the biomass data provides evidence that the amount of electricity generated using exclusively biomass fuels is lower than the amount of electricity generated calculated using specific fuel

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consumption. Furthermore provides the table evidence on the amount of biomass that was procured during the monitoring period.

Period	Biomass type	SFC: specific fuel consumption [t/GWh]	BC: biomass consumption [t]	theoretical electricity production [GWh]	actual electricity production [GWh]	CEG: conservative electricity generation; MIN (theoretical, actual) [GWh]
07/10/2007 - 6/10/2008	Mustard crop residues	1347	133369.59	99.01		
	Wood chips	1083	18.14	0.02		
	Juli Flora	1018	3.15	0.00		
	SUM		133390.88	99.03	56.14	56.14

Furthermore the DOE will be provided with data in order to crosscheck that the amount of biomass fed to the boiler and weighted by the feeding system is fully consistent with the amount of electricity generated.

The above was considered in the following table showing the baseline emissions of the project activity calculated as per the PDD:

Month	Gross electricity generated [MWh]	Auxiliary electricity usage [MWh]	Net electricity exported [MWh]	Net electricity imported [MWh]	Net electricity exported - Net electricity imported [MWh]	Baseline emissions [tCO2]
Oct-07	3479.64	343.84	3135.80	3.00		
Nov-07	4724.92	450.52	4274.40	22.70		
Dec-07	5265.43	444.13	4821.30	15.60		
Jan-08	5803.95	491.15	5312.80	4.10		
Feb-08	5256.63	480.64	4806.40	12.60		
Mar-08	5215.56	461.06	4754.50	21.40		
Apr-08	4571.94	413.84	4158.10	18.30		
May-08	4849.42	447.22	4402.20	31.00		
Jun-08	4681.85	462.15	4219.70	33.20		
Jul-08	4884.34	493.94	4390.40	15.00		
Aug-08	2610.72	312.62	2298.10	40.90		
Sep-08	3934.26	410.26	3524.00	34.70		
Oct-08	863.60	93.80	769.80	2.00		
			50867.5	254.5	50613	40146.2

The baseline emission factor of the grid (ex-ante) used for the calculations above, as per the PDD, is 0.7932 tCO₂/MWh.

D.2.3. Leakage:

Leakage is considered to be zero (see also section B.2.4).

D.2.4. Summary of the emissions reductions during the monitoring period:

According to the general equation

$$ER_y = BE_y - (PE_y + L_y)$$

$$Emission\ reduction = Baseline\ emissions_{total} - (0 + 0)$$

It can be followed that the emission reductions of the project activity is equal to the baseline emissions. The emission reductions for the period which is covered by this monitoring report is therefore

40,146 t CO_{2e}.

Please find in the table below an overview of the emission reductions achieved per year:

Period	Baseline emissions [tCO₂]
07.10.2007 – 31.12.2007	9,669
01.01.2008 – 06.10.2008	30,477
Summary:	40,146

It can be seen that the amount of emission reductions achieved is higher than expected in the PDD. We would like to discuss this fact in a transparent manner in the following:

1. The Tonk project is the second CDM project of the KPTL company. The first project named "Ganganagar" was registered at the UNFCCC already on May 23, 2005³. Ganganagar faced several severe problems during its implementation phase due to the new technology used. These facts are explained in detail in the Tonk PDD. Based on this experience a conservative estimate of the plant load factor of 65% was made.
2. The fuel used at the project involves several difficulties:
 - a. The availability of the fuel is only given during a short period of time between March and June of every year. In case the procured fuel catches fire or is in another way destroyed after the mentioned period the operation of the plant will be strongly influenced.
 - b. Droughts will result in a major problem for the continuous operation of the plant as the supply with fuel will be limited and this will likely result in a lower plant load factor during this period.
 - c. Due to environmental influence the quality of the fuel can be subject to changes. Disadvantageous climate can influence the energy content of the fuel what would lead to a lower plant load factor due to the lower energy yield.

The above mentioned difficulties had to be considered for the emission reduction estimate in the PDD. Given the experience from Gangangar and one year of full operation before this monitoring period, KPTL was able to minimise the technical problems. Furthermore the quality and the quantity available during this monitoring period was very good. Resulting from this the project performed much better than expected during the phase of the PDD writing.

³ <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1112801052.32/view>

Annex 1

Definitions and acronyms

CDM	→	Clean Development Mechanism
DOE	→	Designated Operational Entity
GHG	→	Greenhouse Gases
IPCC	→	Intergovernmental Panel on Climate Change
KPTL	→	Kalpataru Power Transmission Ltd.
PDD	→	Project Design Document
RPPC	→	Rajasthan Power Procurement Center
RVPN	→	Rajasthan Rajya Vidyut Prasaran Nigam Limited
SFC	→	Specific Fuel Consumption

Annex 2

Gold Standard monitoring report

According to the requirements of the Gold Standard, the project activity must be assessed against a matrix of sustainable development indicators. The contribution of the proposed project activity to the sustainable development of the country is based on indicators of local/global environmental sustainability, social sustainability & development and economic & technological development.

Five indicators were added to the monitoring plan. All documents regarding these additional parameters will be present to the DOE during the on-site visit:

ID GS 1: Water Quality

Description: No negative impact on the water quality is given. The dosing of chlorine is minimal and within the limits of regulations. This is verified during the yearly inspection by the Officers of the Rajasthan Pollution Control Board. A consent to operate under water is issued or extended in case all requirements are fulfilled.

The plant fulfilled the requirements of the regulations regarding water quality. As a consequence, the plant was granted the consent to operate under water under the provisions of section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974. The compliance with the requirements was checked during the yearly inspections of the responsible authority. The operation of the plant was in compliance with the prescriptive limits which can be found below.

Parameters	Limits
pH	Between 5.5 to 9.0
Total suspended solids	Not to exceed 100 mg/L
Oil and grease	Not to exceed 10 mg/l
BOD at 27 °C, 3 days	Not to exceed 30 mg/l
COD	Not to exceed 250 mg/l
Boiler Blow Down:	
Temperature	Not more than 5 °C higher than the intake water temperature
Copper (Total)	Not to exceed 1.0 mg/l
Iron (Total)	Not to exceed 1.0 mg/l
Cooling Tower Blow Down:	
Free available Chlorine	Not to exceed 0.5 mg/l
Phosphate	Not to exceed 5 mg/l
Zinc	Not to exceed 1.0 mg/l
Chromium (Total)	Not to exceed 0.2 mg/l

The related consent is valid for the period from 01.08.2007 until 31.07.2010. During the construction of the plant as sustainable solution for the used water was developed. The water is, after its usage at the plant, used for irrigation purposes.

ID GS 2: Air Quality

Description: The project leads to a drastic reduction of air pollution. The emission of particles and CO is reduced by the controlled burning of the biomass in the boiler instead of the open burning on fields. Furthermore the use of an electrostatic precipitator reduces the amount of particles to a minimum. The project owner is forced to comply with Indian air quality standards. This is verified during the yearly inspection by the Officers of the Rajasthan Pollution Control Board. A consent to operate under air is issued or extended in case all requirements are fulfilled.

As the consent to operate under air under the provisions of section 21 (4) of the Air (Prevention & Control of Pollution) Act- 1981 was granted for the plant hence it can be concluded that the plant fulfilled the legal requirements concerning the air quality. The compliance is furthermore tested during the yearly inspections of the responsible authority. The operation of the plant was in compliance with the prescriptive limits which can be found below.

Pollutant	Ambient Air	Stack emissions
Suspended particulate matter	500 µg/m ³	150 mg/m ³ particulate matter
SO ₂	120 µg/m ³	
NO _x	120 µg/m ³	
CO	5000 µg/m ³	
Respirable suspended particulate matter	150 µg/m ³	

The related consent is valid for the period from 01.08.2007 until 31.07.2010.

There are sometimes windy conditions at the plant site. In order to lower the raising of dust from the biomass storage area, a plan was developed to establish plantations around the plant as windscreens.

ID GS 3: Livelihood of the poor

Description: Sales of residues is seen as an indicator of the contribution to income generation and therefore the contribution to livelihood of the poor.

The mustard crop residues (MCR) are mainly bought from farmers of the surrounding villages of the Tonk plant site. The MCR is a new income for the farmers that was unexplored before the start of the project activity as the MCR was mainly burnt or left for decay on the fields in the past. As the amount of biomass that is bought from the farmers is not limited are even families with a low amount of MCR allowed to deliver to the plant. Furthermore are the deliveries to the plant shared by several families. Due to this fact it can be seen that the wealth is widely spread throughout the local society. The number of deliveries is more than 20,000 in the monitoring period covered by this report. Assuming that each delivery is shared by several families the amount of people that benefit from the project activity is 3-5 times higher than the amount of deliveries. Please note that the procurement period is short, around 3 months per year. Furthermore it takes for many people days to deliver the biomass to the plant. Resulting from this, multiple deliveries by one family are unlikely. Furthermore the factor 3 is seen as conservative as the number of persons is expected to be higher. It is conservative to suggest that a family comprises 3 persons and given the explanations before, it is also conservative that each family delivers once per year. The team of auditors was able to check single receipts of deliveries that state the name of the deliveryman. An estimation of the people that benefit from the project is around the number of 60,000.

ID GS 4: Employment numbers

Description: Number of employment created for maintenance and operation of the facility.

The project activity established a considerable number of jobs at the project site. The average number of employees that are working for the Tonk plant is 140. Evidence in form of work contracts will be available on-site. Typical jobs range from the quality check of the biomass, the guarding of the biomass storage areas, the plant operation, the plant maintenance or the administration.

ID GS 5: Technological self reliance

Description: Amount of engineers trained in order to implement, operate and maintain the technology deployed by the project activity

It could be shown that the project activity induces technology transfer to India and increases the technological self reliance. During the first months of operation of the plant the training on the job was more intense due to the teething troubles of the new facility. Minor issues had to be developed and measures for a smooth operation had to be taken. This process is almost completely finished during the respective monitoring period. However, the engineers at the plant still attend a constant training process on the job. Furthermore the engineers are sent to the KPTL headquarter or other offices in order to be trained on specific topics related to their jobs. 47 employees were trained during the respective period.

ID GS 6: Resource competition

Description: Quantity of biomass residue type n used for heat generation as a result of the project activity during the year y and for which leakage cannot be ruled out.

The comparison of the available amount of biomass in the region and the amount of biomass used by the project shows that the project activity is using a surplus of biomass and therefore no leakage due to resource competition is considered. The amount of available mustard crop residue in the region during the respective monitoring period from 2007 until 2008 is 265756 tons. As mentioned above the amount of mustard crop residue procured by the project during the respective period is 133390.88 tons.

The District Statistical Data Book published by Economical & Statistical Directorate, Government of Rajasthan, Jaipur is used as source for the evidence of the surplus of biomass used. The area in 50 km radius is seen as appropriate for the check as the mustard crop residues are provided from this area. Due to the limited infrastructure in Rajasthan and the fact that the deliveries are happening via tractors and by foot a bigger distance is not seen as representative. The area comprises parts of the Districts of Tonk, Sawai Madhopur and Bundi. The detailed chart is available to the DOE and the Gold Standard.

The amount of mustard crop residues cannot be determined directly but indirectly based on the amount of mustard seed produced in the specified area. This amount multiplied by the factor of 1.5 gives an estimate of the amount of available mustard crop residues as stated above.

The data concerning the amount of available biomass in the region was available to the DOE and the GS for review.

A competitive use of the biomass can be ruled out. Indeed the mustard crop residues are partly used for other purposes as e.g. cooking; however the main part of the biomass was burned or left on the fields in the past. As the amount of the biomass used as a fuel for the plant is significantly lower than the amount of biomass available for the use as a fuel. According to a published study⁴ 67% of the total amount of

⁴ "Quick Biomass Assessment Study" by Progressive Research Aids, Pune, 2005. Please note that this reference was submitted to the Gold Standard.

mustard crop residues is available as a fuel; however the Tonk plant used only 50%, leaving an additional surplus of 17% for other purposes. The overall surplus of available biomass is therefore 50%.