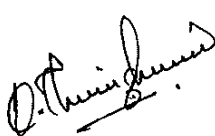
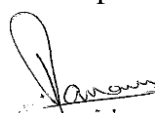
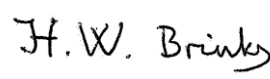




Validation opinion for post registration changes

Title of project activity:		
Demand side energy efficiency programmes for specific technologies at ITC Bhadrachalam pulp and paper making facility in India		
CDM reference number:	DNV project No.:	
0806	PRJC-383862-2012-CCS-IND	
Date:	Validation of the changes were conducted:	
3 March 2014	<input type="checkbox"/> Prior to the commencement of a verification of the project activity <input checked="" type="checkbox"/> When performing a verification of the project activity	
Work carried out by (name & signature):	Work verified by (name & signature):	Approved by (name & signature):
Thamizharasi Kaliapeumal 	Kakaraparthi Venkata Raman 	Hendrik W. Brinks 

Overview of post registration changes

Type of post registration change		Are the changes of a type specified in Appendix 1 of the CDM Project Standard? Note: In case of "No", prior approval by the EB is required
A: Temporary deviations from the registered monitoring plan and/or monitoring methodology (refer to section A)		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No post registration change of this type
Applicable period for proposed deviations (inclusive):	From 1 September 2010 start date of the earliest included deviation to 31 December 2011 end date of the latest included deviation)	
B: Corrections (refer to section B)		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No post registration change of this type
C: Changes to the start date of the crediting period (refer to section C) <i>Prior approval by the CDM EB is not required in case of (a) bringing forward the start date up to one year earlier or (b) postponing the start date by up to one year (by up to two years for project activities in LDCs).</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No post registration change of this type
Proposed start date of the crediting period:	DD/MM/YYYY (changed from DD/MM/YYYY)	
D: Permanent changes from the registered monitoring plan or applied methodology		<input type="checkbox"/> Yes

(refer to section D)	<input type="checkbox"/> No <input checked="" type="checkbox"/> No post registration change of this type
E a): Changes to the project design of a registered project activity (refer to section E)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No post registration change of this type
E b): Changes to the programme design of a registered PoA (refer to section E)	Note: All changes to the programme design of a registered PoA require prior approval by the EB. <input checked="" type="checkbox"/> No post registration change of this type
F. Changes specific to afforestation or reforestation project activities (refer to section F)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No post registration change of this type

A. Temporary deviations from the registered monitoring plan and/or monitoring methodology

A.1 Description of deviation (including the reason for requesting a deviation)

Project activity consists of 29 energy efficiency measures (combination of replacement and retrofits).

Out of these 29 measures, temporary deviation was observed for one of the measures “Installation of capacitor banks at SFT A&B to improve power factor and reduce distribution losses” or the monitoring period (from 1 September 2010 to 31 December 2011) – due to the fact that secondary fiber treatment plant (SFT) – A & B together could not be operated on a continuous basis at full load for 3 days during the monitoring period and hence baseline data could not be captured. Since baseline data could not be captured, emission reduction from this measure could not be calculated for this monitoring period. During the monitoring period, the mill has been shifted from recycled fibre based boards to wood fibre based boards due to market demand.

A.2 Assessment of deviation

Assessment that the deviation does not require a revision of monitoring plan or the changes from the project activity as described in the registered project design document

The above mentioned deviation does not require a revision in the existing monitoring plan, as the deviation was temporary due to the shift from recycled fibre based boards to wood fibre based boards due to market demand during the monitoring period. Because of the shift the secondary fiber treatment plant – A & B could not be operated continuously for 3 days to capture baseline data.

Assessment of the impact of the deviation on the estimates of the emissions reductions for the proposed project activity with the use of approved methodology as existing and with the deviation

Since the secondary fiber treatment plant (SFT) – A & B together could not be operated on a continuous basis at full load for 3 days during the monitoring period, baseline data for this measure for the monitoring period could not be captured. Since baseline data could not be captured, emission reduction from this measure was not calculated for this monitoring period and hence defined as zero.

B. Corrections

B.1 Description of corrections

Following are the corrections observed for the project activity with respect to the registered PDD.

Sr No	Description	Details in the registered PDD	Actual details
1	Paper machine 1 – number of vacuum fans and the specification	13 numbers, with specifications of old pumps as 42 m ³ /h, 700 mmwc and new pumps as 14 m ³ /min, 1100 mmwc.	12 numbers with specifications of old pumps as 42 m ³ /h, 500 mmwc and new pumps as 42 m ³ /min, 700 mmwc.
2	Number of reciprocating Compressors.	10	9
3	Specification of capacitor banks at secondary fiber treatment (SFT) - A&B and at new fiber line (NFL).	Specification of new capacitor banks at SFT A&B: 6 * 75 kvar Specification of new capacitor banks at NFL: 10 * 75 kvar	Specification of new capacitor banks at SFT A&B: 7 * 50 kvar Specification of new capacitor banks at NFL: 7 * 50 kvar
4	Change in the date of completion of several measures	Written incorrectly on account of typographical errors	Corrected dates are provided in the revised PDD.
5	Correction in the net savings in GWh and in turn ERs	13.38 GWh/annum and 21 505 tCO ₂ /annum	13.049 GWh/annum 20 967 tCO ₂ /annum
6	Correction in the project participant's representative name as per the MoC	Mr Pradeep Dhobale.	Mr Sanjay Singh

The above corrections have been effected in the revised PDD, version 04, dated 14 February 2014 and verified by DNV.

B.2 Assessment of corrections

Actual details of above corrections have been verified from the CAPEX report (proposal report) of the project activity and the specifications details of the equipment. Calculations of net energy savings and in turn estimated emission reductions have been verified and found to be correct.

C. Changes to the start date of the crediting period

Not applicable.

D. Permanent changes from the registered monitoring plan or applied methodology

Not applicable.

E. Changes to the project or programme design of a registered project activity or PoA

E.1 Description of the changes as compared to the description in the registered PDD and description of the changes to the monitoring plan

Following are the changes observed for the project activity with respect to the details provided in the registered PDD.

- a. The measure “replacement of fan pumps of paper machine (PM) 1 by energy efficient pumps” was under discussion at the time of PDD preparation but was later dropped and not implemented. The fan pumps supply pulp to the paper machine at a high flow rate of 660 m³/h. Due to this high flow rate there is an enormous risk associated with the increment of the pump head from 13 m to 15 m in terms of disturbance in formation of sheets in the paper machine. Due to apprehension of such downstream disturbances, this initiative, though considered during PDD preparation was not implemented afterwards.
- b. The measure “replacement of machine chest pump of paper machine (PM) 3” was under discussion at the time of PDD preparation but was later dropped and not implemented. Machine chest pump of PM3 has a rated power savings of 2.67 kW and energy savings to the tune of 20 MWh. Monitoring of this minimal savings would have been extremely difficult and hence the project participant had decided not to go for the implementation of the initiative.
- c. Although the harmonic filter was installed at PM1, the energy savings from the same is being included in the energy savings obtained from the measure “Change of drives from DC to AC during machine rebuilt”. The role of the harmonic filters is to reduce the harmonics in the distribution lines from the transformer to the drives and hence reducing the distribution losses ultimately resulting in reduced power consumption by the drives. Again, conversion from DC to AC power supply also has effect on reduction of power consumption by the drives and it is practically not possible to separately monitor and distinguish the reduction in power consumption by the drives due to the installation of the harmonic filters. Hence the project participant has not considered the emission reductions due to the implementation of harmonic filters separately.
- d. Electricity from diesel generator (DG): There are 3 DG sets installed for emergency purpose. The energy from diesel is being used for power generation and the same is considered in the emission factor calculation.

- e. Addition of new boiler firing biomass in the plant energy mix. This boiler was commissioned in February 2010.

E.2 Assessment of the changes to the project design (*applicable to project activities only*)

Assessment of when the changes occurred

- a. Replacement of fan pumps of paper machine (PM) 1 by energy efficient pumps: As discussed above (E.1 a), this initiative, though considered during PDD preparation was not implemented afterwards due to the risks associated with the paper mill operation.
- b. Replacement of machine chest pump of paper machine (PM) 3: As discussed above (E.1 b), this measure was under discussion at the time of PDD preparation but was later dropped and not implemented due to the difficulty in monitoring the resultant energy saving.
- c. Installation of harmonic filter at PM1: This measure has been implemented as envisaged in the PDD but the energy savings from this measure could not be captured separately in practical. The energy savings from this measure are monitored together with the energy savings from the measure “Change of drives from DC to AC during machine rebuilt”, as detailed above (E.1 c).
- d. Electricity from diesel generator (DG): There are 3 DG sets installed for emergency purpose in 1988 / 1989 and runs sparingly. Hence monitoring of DG power was not envisaged in the monitoring plan as the generation accounts for only 0.05% of the total electricity generation in the plant. However the electricity from the DG sets is monitored as a normal operational practice and the same is considered in the *ex-post* calculation of the emission factor. This is acceptable as per VVS version 5, clause 87, as this will not increase the overall emission reductions beyond 1%.
- e. Addition of new boiler firing biomass in the plant energy mix. This boiler was commissioned in February 2010, post project registration, firing biomass waste from captive plants (which are renewables in nature). Since the electricity generated from this boiler is considered green, addition of biomass firing boiler in fact decreases the electricity emission factor and hence contributes to lowering the emission reductions from the project activity. The emission factor is according to the original PDD determined *ex-post*.

Assessment of the reasons for these changes taking place

- a. Replacement of fan pumps of paper machine (PM) 1 by energy efficient pumps: As discussed above (E.1 a), this initiative, though considered during PDD preparation was not implemented afterwards due to the risks associated with the paper mill operation.
- b. Replacement of machine chest pump of paper machine (PM) 3: As discussed above (E.1 b), this measure was under discussion at the time of PDD preparation but was later dropped and not implemented due to the difficulty in monitoring the resultant energy saving.
- c. Installation of harmonic filter at PM1: This measure has been implemented as envisaged in the PDD but the energy savings from this measure could not be captured separately in practical. The energy savings from this measures are monitored together with the energy savings from the measure “Change of drives from DC to AC during machine rebuilt”, as detailed above (E.1 c).

- d. Electricity from diesel generator (DG): There are 3 numbers of DG sets installed for emergency purpose in 1988 / 1989 and runs sparingly. Hence monitoring of DG power is not envisaged in the monitoring plan as the generation accounts for only 0.05% of the total electricity generation in the plant. However the electricity from the DG sets is monitored as a normal operational practice and the same is considered in the emission factor calculation. This is acceptable as per VVS version 5, clause 87, as this will not increase the overall emission reduction beyond 1%.
- e. Addition of new boiler firing biomass in the plant energy mix. This boiler was commissioned in February 2010, post project registration, firing biomass waste from captive plantations (which are renewables in nature). Since the electricity generated from this boiler is considered green, "addition of biomass firing boiler" in fact decreases the electricity emission factor and hence contributes in conservative estimation of emission reductions from the project activity.

Assessment of whether the changes would have been known to the project participants prior to registration of the project activity

The above mentioned changes were not known to the project participant prior to the registration of the project activity.

Assessment of how the changes may impact the overall operation/ability of the project activity to deliver emission reductions as stated in the PDD

The above mentioned changes do not have impact on the overall operation / ability of the project activity to deliver emission reductions as stated in the PDD.

E.3 Assessment of the impact of the changes to the project design (*applicable to project activities only*)

In the case of a project activity, do the changes adversely impact any of the following?

- ☐ The applicability and application of the applied methodology under which the project activity has been registered
- ☐ The additionality of the project activity
- ☐ The scale of the project activity
- ☒ None of the above

Assessment of impacts of the changes on the applicability and application of the applied methodology under which the project activity has been registered

The above mentioned changes do not have impact on the applicability and application of the applied methodology under which the project activity has been registered.

Assessment of impacts of the changes on the additionality of the project activity

The above mentioned changes do not have impact on the additionality of the project activity as the project activity's additionality is based on barrier analysis, which still holds good irrespective of the above mentioned changes.

Assessment of impacts of the changes on the scale of the project activity

The above mentioned changes do not have impact on the scale of the project activity.

E.4 Assessment of the change to a PoA (*applicable to PoAs only*)

Not applicable.

F. Changes specific to afforestation or reforestation project activities

Not applicable.

Validation opinion

It is DNV's opinion that:

- The proposed PRCs ensure that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the proposed revisions.
- The proposed PRCs are in accordance with the approved monitoring methodologies AMS-II.D, version 7 and AMS-I.D, version 9, applicable to the project activity whilst maintaining the conservativeness of the emission reductions.

Hence, DNV recommends the approval of the PRCs submitted by the project participant.

Also DNV states that the transfer of information from the old form of the registered PDD (VVM mode version 03 dated 28 August 2006) to the new form (VVS mode, version 04 dated 14 February 2014) is correct and materially the same, except for the revisions as detailed in the above sections.

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