



RESPONSE TO REQUESTS FOR REVIEW

Bureau Veritas Certification had performed the validation of the CDM Project No. 1693 – "HITECH CDM CPP".

Subsequently, there have been two requests for review.

We thank the CDM Executive Board and the Secretariat for giving us the opportunity to clarify about our considerations in validating the said project.

Our responses to the queries are given below:

Review point 1:

1. Further clarification is required on how the DOE has validated the economic comparison, in particular, a 10 MW coal based power plant (with 95% PLF) with the 4.5 MW project activity (with 66% PLF) given the different levels of production from these two options.

Bureau Veritas Certification's response:

We have agreed that the economic comparison between a 10 MW coal based power plant (with 95% PLF) and the 4.5 MW project activity (with 66% PLF) is appropriate though the levels of electricity generation from these two options are different. The reasons are as follows:

As already described in Section B.3 of the PDD, the project consists of one common turbine of 10MW for which steam is being supplied from WHRBs and AFBC through a common header. In the absence of the project activity, the 5.5 MW coal based boiler would be scaled to 10 MW capacity. This is the most obvious option considering the capacity of the turbine. The cost of a single boiler of 10 MW will also be much lesser than two independent boilers of 5.5 MW and 4.5 MW capacities. Therefore cost involved in setting up a 10MW CPP with a single boiler and turbine configuration is more conservative compared to independent power plants of 5.5 MW and 4.5 MW capacities.

Variation of waste gas/heat supply gas supply to WHRB, which is dependent on the performance of the DRI Kilns and its effect on the production of steam, has already been described in the Validation Report. The capacity of steam generation from WHRB is based on the best average flow volume of waste flue gases and at the best available temperature. With a steady supply of waste gas, the WHRB will provide its full rated quantity of steam and therefore enthalpy to the steam turbine to produce 4.5MW power. With full quantity of steam from WHRBs and AFBC, power generation will be maximum, i.e. 10MW (4.5MW due to enthalpy supplied by WHRBs and 5.5 MW due to the enthalpy supplied by AFBC). However since the operation of WHRBs is fraught with several operational problems as already explained in the Validation Report, PLF (or in other term the boiler capability for delivering its rated steam generation) has been analysed and it has been concluded that on an annualised average basis, it can be at about 66%. This however does not mean that the power generation would be at a constant PLF of 66% through out the year. This is also the reason why backup power is required. PDD described the need for dependence on grid power in Section A.2. *"The generated power will firstly meet its present and future requirement of captive power. The balance back up or standby support power required to meet the fluctuating power generation from WHRB, would be drawn from the local grid. In case of Surplus the unit will wheel the surplus power to the Grid"*.

Therefore when WHRBs are delivering their full rated steam, along with AFBC, electricity generation would be equivalent to that of 10 MW coal plant. However, it may be noted that the levelised cost has been calculated at 66% PLF of the WHRBs.

Based on these considerations, approach for calculation of levelised costs could have been either:

- A comparison between installed capacities of the power plants of same capacities
OR
- Comparison of hypothetical situation of a coal based power plant and WHRB power plant generating the same quantity of electricity.

In other terms the following were the possibilities:

1. Compare 4.5 MW WHRB based power plant with an equivalent 4.5 MW Coal Based Power Plant (considering peak load performance of the WHRB),
2. Compare power plant based on 4.5 MW WHRB working in tandem with a 5.5 MW Coal based boiler with a 10 MW Coal Based Power Plant,
3. Compare power plant based on 4.5 MW WHRB at 66% PLF working in tandem with a 5.5 MW Coal Based Power Plant with a 8.63 MW Coal Based Power Plant (both would generate the same quantity of electricity),
4. Compare 4.5 MW WHRB based power plant with a 10 MW Coal based Power plant.

These were plausible scenarios. But validation team agreed and accepted that in reality project proponent would have commissioned a 10 MW AFBC in the absence of the 4.5 MW WHRB. We have considered this option as most realistic and therefore compared the two options.

Please refer below the levelised costs. As seen the levelised cost of a 10 MW Plant is the least and that of 4.5 MW WHRB plant is higher.

#	Scenario	Levelized Cost (Rs/MWh)
1.	Power generation from 10 MW coal based Power plant	1372.86
2.	Power generation from 8.63 MW coal based power plant	1400.64 ¹
3.	Power generation from 4.5 MW WHRB based power plant	1458.46
4.	Power generation from 10 MW power plant based on combination of 4.5 MW WHRB + 5.5 MW coal based boilers	1513.58 ²

The validation team therefore reconfirms that the project activity is considered additional.

Review point 2:

2. Further clarification is required how the DOE has validated that the range of variation of PLF in the sensitivity analysis is reasonable.

Bureau Veritas Certification's response:

During validation process, project participant informed the validation team that the annualised average PLF of WHRB and hence the power plant will be about 66%. Project participant explained that this is mainly on account of the problems in the sponge iron process leading to lesser availability of gas.

The validation team checked the data of verified CDM projects based on WHRB based power plants. The verification data of the following projects with reference numbers: 515, 526, 556, 678, 696 were checked. From this data, it was noted that the monitored generation equates to a PLF of 52% over 322 working days. At 350 working days, this PLF amounts to 56%.

¹ Appendix 1

² Appendix 2

For performing sensitivity analysis, project proponent has considered a range of +/- 5% of PLF (i.e. 63 to 69%). Validation team, considering the above stated data available on other similar plant performances, agreed that the annual average PLF is unlikely to be more than that considered for the base case. The validation team therefore agreed that a range of 5% was a reasonable variation for the purpose of sensitivity and that a 10% variation as discussed in the guidance document by EB is not applicable in this case.

We hope that the explanation provided above is satisfactory and request CDM EB to kindly register the project.