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Power generation from waste heat of new DRI kilns at JSPL; Project activity 1292

Response to request for review

Comment number 1
The project was conceived in 2003 and submitted for validation only in 2006; so given that the CDM was considered necessary to overcome the barriers, further clarification is required on the delay in submission.

Response by JSPL

The purpose of the project activity is to recover the sensible heat available from waste hot gases emanating from the high capacity DRI kilns (500 tpd) and to generate power out of it. The project activity results in energy conservation through waste heat recovery and significantly reduces the effect of thermal pollution to atmosphere. The project activity consists of 4 numbers of waste heat recovery boilers (WHRB) connected to 4 high capacity DRI kilns.

Further, JSPL has improvised and modified the design of these DRI kilns to include a provision of interconnection between the various DRI kilns and to suit the Indian raw material characteristics. Any failure in the interconnection damper might result in stoppage of kilns and might lead to production losses.

Also, the electricity generated by the project activity is solely dependent on the waste gases from the high capacity DRI kilns as it does not include steam from any coal / fossil fuel based boiler to provide steam in case of breakdown of DRI kilns or WHR boilers.

The project being unique in its nature faces various barriers. Jindal Steel and Power Limited (JSPL) had taken the decision to implement the project activity, considering the incentive from the CDM, since the inception of the project activity.

Kindly refer to **Annexure 1**: Copy of the Board Resolution to implement the project activity considering CDM benefits (dated 8th May, 2003).

Subsequently, JSPL on regular basis was in contact with CDM consultants for discussing various aspects of the project, CDM and methodological issues.

Please find attached, the initial correspondence with CDM consultants regarding the project activity (**Annexure 2**).

The following section summarizes these correspondences in a chronological fashion:

- Mails dated 9th March, 2004 / 12th October, 2004 / 12th November,2004 / 16th February 2005: Indicates initial correspondence between the CDM consultants and JSPL on CDM aspects
- Mail dated 19th April 2005: Indicates intimation to JSPL about a new methodology already under development by CDM consultants, which would also be applicable to the JSPL project.

- Mail dated 18th July 2005 / 20th July 2005: Indicates intimation from CDM consultants to JSPL about the approval of the above said methodology and requesting formal confirmation for execution of the CDM assignment.

The above section clearly substantiates that CDM was seriously considered by JSPL at various stages of the project activity. Further, as cited above, there was no available approved methodology applicable to the project activity. It was only in July 2005 that the pertinent methodology ACM0004 got approved by UNFCCC.

After approval of the methodology, JSPL has gone ahead with finalisation of the contract with the CDM consultants for preparation of the project design document and compilation of other related documents.

This was followed by finalization and appointment of the validation agency (DOE) in May 2006 and start of validation process (Global Stakeholder Process) – http://cdm.unfccc.int/Projects/Validation/DB/1IB9J7KOJ5DYAFDDM332GLSAJ1NDTQ/view.html

Thus, delay in submission of project documents for validation was primarily on account on unavailability of an approved methodology applicable for the project activity and the preparation of project design documents by the CDM consultants post approval of the methodology ACM0004.

Comment number 2

Further clarification is required on the technological barriers purported to create difficulties to project implementation, as the power generation system is already in operation. Furthermore the Validation Report states that "invested in process development for using the available raw material in the country and compensating the losses due to these technological failures", hence the technological barriers were dealt with, while no information is provided on the extent of so called technological failures nor of the amount of losses referred to.

Response by JSPL

The purpose of the project activity is to generate power using waste gases emanating from high capacity DRI kilns. The sustainability of any power generating unit directly depends upon the quantity of electricity generated by the power plant. Thus, any decrease in electricity generation due to change in any critical parameters linked either to performance of the DRI kiln like flue gas characteristics, flue gas flow etc. or WHRB boiler itself would result in production losses (electricity generation) and subsequently impact the sustainability of the project.

Generally, in WHR power generation systems, there are two ways by which continuous steam availability for power generation is ensured:

a. Integration of waste heat recovery based boilers with fossil fuel based boilers: In such cases, even if any of the critical parameters governing steam generation from the WHR boilers is affected, still there is continuous power supply from the power plant without much disruption, as the steam from the fossil fuel based boilers is used for power generation.

b. Auxiliary fuel firing arrangement: In cases, where the heat content of the waste gas is not sufficient, the waste gas temperatures are increased using auxiliary fuel firing systems, thus causing minimal disruption to the system.

However, in the project activity, the power plant uses steam solely generated by the waste heat recovery boilers and there is no integration of the same with the fossil fuel

based boilers. Since, the project activity does not consume steam from any coal/fossil fuel based boilers; any disruption in the supply of waste gases from the DRI kilns will disrupt the power generation capacity of the project activity.

Moreover, there are no inbuilt provisions in the project activity to increase waste gas temperatures through auxiliary fuel firing. Hence, if the heat content or the flow of the waste gas is not sufficient, the project activity will be directly affected.

During project inception and design stage itself, several technological issues were anticipated that posed risk to the WHR based power plant. The technological barriers faced by the project activity are as follows:

1. The project activity is based on an indigenous technology developed by JSPL, called as Jindal technology which is also acknowledged to be unique by third parties like Sponge Iron Manufacturer's Association (SIMA), India and Department of Scientific and Industrial Research (DSIR), India (Refer to reply of Comment No. 3 for details of these bodies). The uniqueness of this technology lies in:
    i. Optimization of Process Parameters like C/Fe (carbon/iron) Ratio, Non Mag & Fixed Carbon in Char etc.
    ii. Change in the chemistry of air-tubes and control of frequent thermal shocks.
    iii. Reduction in Frequency of Transfer Chute Jamming to Improve the Availability and Production.
    iv. Modification of coal throw facility for improved coal profile to enable use of low grade coal available in India.

2. Since the technology is indigenously developed, various process parameters play a key role in the salubrious operation of the plant. For instance, any variability / instability in parameters of high capacity DRI kilns (as mentioned below) would impact the characteristics / quantum of the waste flue gas generated from the kilns. This would in turn affect the power plant operations.

3. Since the plant operations are based on a continuous process, wherein waste gases from high capacity DRI kilns are supplied to WHR boilers, JSPL anticipated unforeseen risks in operating and maintaining the required parameters of this unprecedented technology.

    i. DRI process is very sensitive to chemical and physical characteristics of raw materials used in the process. The non-coking coal to be used as the reducing agent should have desired characteristics like high fixed carbon content, high volatiles content, low ash content, sulphur and moisture content, high ash fusion point, low coking and swelling indices to be used in the DRI process.

    Since, the coal generally available in India has low carbon and high ash content, JSPL indigenously modified and improved high capacity DRI kilns installed in the project to suit Indian coal characteristics. Further, as mentioned above, JSPL also optimized and standardized the process parameters (reducing C/Fe ratio to 0.42-0.46) to achieve high grade of sponge iron using low quality coal as a reducing agent in DRI process.

However, use of this low quality coal as reductant in the high capacity DRI kiln has its associated problems. The low carbon content of the coal requires firing of more amount of coal to maintain the requisite C/Fe ratio. This results in higher rate of combustion leading to higher velocity of flue gas emanating from the DRI kilns and being fed in to the WHR boilers. Further, this kind of coal (high ash content) augments the particulate load of waste gas.

This high velocity waste-gas, laden with high concentration of particulate matter results in abrasion of the waste heat recovery boiler system resulting in frequent breakdown of WHRB on account of boiler tube leakages, economizer leakages, radiation tube leakages etc.

ii. Since the project activity is entirely dependent on the characteristics / quantum of the waste flue gas generated from the kilns, hence non-availability of waste gas at desired temperature and flow would affect the power generation by the project activity and can result in resulting in decreased / no power generation by the power plant.

Moreover (as explained above) there is no provision of circumventing this problem of non-availability of waste gas at desired temperature and flow, since the project does not have any integrated fossil fuel boiler with WHR boilers / auxiliary fuel firing system. Thus, if any critical parameters of the project activity are affected, the power plant faces the risk of shutdown. This would put a question on the sustainability of the project activity.

As envisaged, since the technology is indigenous in nature, JSPL is already encountering problems to standardize and optimize the key process parameters that govern the kiln operations. Since the process parameters are not yet fully standardized and optimized, their affect on the kiln operation is leading to breakdown and subsequently impacting the power plant operations. Currently, JSPL is carrying out lot of R&D activities to standardize and optimize the kiln parameters. The same has been referred in their recent annual reports, whereby the details provided have been audited by the third party auditors. Please refer to **Annexure 3**, wherein relevant details in extracts from Annual reports (2004-05, 2005-06, 2006-07) disclosing areas of R&D to its stakeholders have been highlighted.

The above reference (Annexure 3) indicates that the company was facing technical challenges in the project activity and was continuously improvising on standardizing the operational / process parameters for the new high capacity (500 tpd) DRI kilns. The CDM revenues from the project activity would help in covering up the R&D costs

4. The gases leaving the kiln have very high particulate load (iron particles being carried away along with the flue gases) that create erosion and fouling problems on the gas side of the boiler tubes. The waste gases emanating from the kilns can cause problems like :
   i. Boiler inlet duct choking (from after burning chamber to WHRB)
   ii. Leakages like economizer tube leakages, radiation tube leakages, convection tube leakages etc,
   iii. Corrosion of downstream equipments such as electrostatic precipitator, fans, dampers and exhaust stack.

The aforesaid problems can result in frequent shutdown of WHR boilers. Since JSPL has no provision of augmentation of steam from fossil fuel based boilers, hence this would impact the power generation of the project activity. This would result in production losses (electricity generation) and subsequently impact the sustainability of the project.

As anticipated before implementation of the project activity, JSPL is already encountering problems like economizer tube leakages, radiation panel failure, convection zone tube failures etc. due to the aforesaid reasons on number of occasions. These have lead to breakdown of the WHR boilers subsequently affecting power plant operations (electricity generation) and in some cases even leading to the shutdown of the plant. This has resulted in loss of production hours (electricity generation) for JSPL. **Annexure 4** details the instances of breakdown of the project activity on account of aforesaid technical problems in the recent few months. As detailed in the annexure, there has been a breakdown of WHR boilers for 975 hours. Thus, there has been a substantial loss of operating hours, equivalent to 40 days of power plant operation.

Since these barriers are exposing JSPL to the risk of the power plant shutdown as well as production losses (being a continuous operation plant), they pose a question on the sustainability of the project activity. The CDM revenues sought would help in meeting the R&D expenses to stabilize the project activity as well as to cover up the technical difficulties faced by the project activity.

Further, in the absence of the project activity, i.e. in the baseline scenario JSPL would have imported electricity from the regional grid or would have implemented a captive coal based power plant. Both the above mentioned sources of power are well established technologies and JSPL would not have faced problems like non availability of waste gas at desired characteristics, abrasion of boiler systems due to high particulate load of waste gas from DRI kilns. In the absence of the project activity JSPL would not have experienced the aforesaid technical barriers linked to the project activity resulting in repeated and substantial loss of operating hours resulting in reduced electricity generation / shutdown of the power plant.

The CDM revenues against sale of carbon credits would account for the sustainability of the project and cover up for the loss in power generation due to technical problems. It can therefore be stated that in the absence of CDM revenues, JSPL would not have implemented the project activity.

Comment number 3

Further information, evidence and justification is required in relation to barriers due to prevailing practice, as the data provided is vague (There are not many high capacity kilns.; .the few units such units operating etc.) or incomplete.

Response by JSPL

A high capacity DRI kilns based WHRB unit for power generation (2 X 25 MW, 4 X 57 tph WHRBs (67 kg/cm^2), 4 X 500 tpd DRI kilns) is not the prevailing practice in the region. The project activity is unique in its nature in the following manner:

1. The power plant uses steam solely generated by waste heat recovery boilers and does not consume steam generated from any coal/fossil fuel based boilers. There are no inbuilt provisions to increase waste gas temperatures through auxiliary fuel firing or steam supply from any other fossil fuel based boiler.

2. The project has an interconnection arrangement between the high capacity kilns which has been developed by JSPL itself and adopted for the first time in sponge iron plants in India.
3. The DRI kilns have been indigenously modified and successfully improved by JSPL to suit the Indian conditions. The uniqueness of this technology lies in:
    iv. Optimization of Process Parameters like C/Fe (carbon/iron) Ratio, Non Mag & Fixed Carbon in Char Etc.
    v. Change in the chemistry of air-tubes and control of frequent thermal shocks.
    vi. Improvement in kiln availability and Production to reduce transfer chute jamming.
    vii. Modification of coal throw facility for improved coal profile to enable the use of low grade coal generally available in India.

The high capacity DRI kilns using aforesaid technology are not common in Indian sponge iron industry. The same has been acknowledged by the following independent bodies in India:

a. Sponge Iron Manufacturers' Association (SIMA): Sponge Iron Manufacturers Association (SIMA), New Delhi, India is the national representative body of all DRI manufacturers in India. It represents the Indian DRI Industry and provides a common platform for regular interface with the Government of India and other regulatory authorities. The Association is a common forum to share and exchange experience, views and problems of DRI manufacturers. The Association concentrates on market development, compilation and dissemination of industrial data and technical and commercial information, essential for decision making in the current fast changing business environment. Kindly refer to the certificate from SIMA (attached herewith as **Annexure 5**), which substantiates the prevailing practice barrier and the project activity is not a common practice in the region. Furthermore, Jindal technology is also referred by an independent expert (Dinesh K Sindwani) in an article on the website of SIMA. Please refer Annexure 5a for the above mentioned article.

b. Department of Scientific and Industrial Research (DSIR): Department of Scientific and Industrial Research (DSIR), is a part of Ministry of Science and Technology, Government of India has a mandate to carry out the activities relating to indigenous technology promotion, development, utilization and transfer. The primary endeavour of DSIR is to promote R&D by the industries, support a larger cross section of small and medium industrial units to develop state-of-the art globally competitive technologies of high commercial potential, catalyze faster commercialization of lab-scale R&D, enhance the share of technology intensive exports in overall exports, strengthen industrial consultancy & technology management capabilities and establish user friendly information network to facilitate scientific and industrial research in the country. Kindly refer to the extract from technical report of DSIR (attached herewith as **Annexure 6**), which substantiates that the technology developed by JSPL is indigenous.

Comment number 4

The DOE states in the Validation Report that the project activity is unique in terms of the technology of the DRI kilns, its size and capacity. Further clarification and substantiation is required.

Response by JSPL

High capacity DRI kilns based WHRB unit for power generation (2 X 25 MW, 4 X 57 tph WHRBs (67 kg/cm^2), 4 X 500 tpd DRI kilns) is not a prevailing practice in the region.

The high capacity DRI kilns installed in the project have been indigenously modified and improved upon by JSPL, to suit Indian raw materials and reducing coals, to be coupled with WHR boilers for power generation. The interconnection arrangement between the high capacity kilns, developed and adopted by JSPL, is first of its kind in sponge iron plants in India. Further, the project activity is solely dependent on waste gas from high capacity DRI kilns and does not involve any steam consumption from auxiliary coal/fossil fuel fired boilers or any auxiliary fuel firing system to support the waste heat recovery boilers.

Kindly refer to the reply of Comment number 3. The Certificate from the Sponge Iron Manufacturing Association (SIMA), acknowledges the project to be unique in the region on account of its scale and capacity. The document substantiates that the project activity is unique and faces prevailing practice barriers.

Comment number 5

The Validation Report states that JSPL has also opted for the project activity after taking CDM into consideration and also have opted for higher-pressure configuration, which results in higher efficiencies and thereby higher power generation. Further clarification is required on whether this configuration is also cost efficient and thus a business as usual decision.

Response by JSPL

The project being a high pressure system, though has higher efficiencies and results in higher power generation, still cannot be the business as usual decision because the project activity faces many technical, prevailing practice and other barriers as explained above in response to comment number 2 and 3.

As mentioned earlier, the technology of high capacity DRI Kilns (500 tpd) has been innovated and modified by JSPL. It is a novel concept developed by JSPL and is not a prevailing practice in the Indian sponge iron industry. The same has been acknowledged by the Sponge Iron Manufacturing Association, New Delhi, India as well as Department of Scientific and Industrial Research (DSIR), Govt. of India. (Refer Annexure 5 and 6).

Further, being an indigenous technology, the project activity has been facing several barriers (as mentioned in reply to comment no. 2 and 3) since the commissioning (Please refer to the breakdown statistics provided in Annexure 4 since the commissioning of the project activity). On account of these, there have been several instances of frequent shutdowns in the DRI kiln, which have subsequently affected the project activity and hence the power generation.

The company has been continuously endeavoring to tackle these barriers by putting in substantial in-house R&D efforts. The same has been reported in the previous year's

annual reports, wherein the company is disclosing areas of R&D to its stakeholders. Please refer to **Annexure 3**, wherein extracts from Annual reports (2004-05, 2005-06) have been provided.

The above reference (Annexure 3) indicates that the company is facing technical challenges in the project activity and was continuously improvising on standardizing the operational / process parameters for the new 500 tpd DRI kilns.

Since these barriers are exposing JSPL to the risk of the power plant shutdown as well as production losses (being a continuous operation plant), they pose a question on the sustainability of the project activity. JSPL had already envisaged these problems and has gone ahead with the project activity anticipating that the CDM revenues sought would help in substantiating the R&D efforts in order to overcome these barriers and other unforeseen risks and thus stabilize the project activity, ensuring its sustainability. Thus, the project activity which is unique and faces the above said barriers cannot be a business as usual decision.

Moreover, the additionality in this case has been proved through the barrier route on account of technical and prevailing practice barriers faced by the project activity and not through the financial route.

Comment number 6

The Validation Report states that the Govt of India has been giving 100%income clarification is required on the meaning of more viable and further substantiation on the impact of the mentioned tax exemption on the financial and economic flows of the project, and on whether this subsidy is the main objective of the project and thus a business as usual decision.

Response by JSPL

The section 80-IA clause (1) and (2) of the Income Tax Act states that any entity in India that generates power or commences transmission or distribution of power is exempted 100% from income tax on the profits and gains derived by the power generation unit. This clause is applicable to all types of power generation / transmission / distribution units (renewable/non-renewable) and is not specific to the project activity.

Thus, as compared to fossil fuel based power plants or other power generation units; the project activity does not accrue any extra cash inflows on account of income tax exemption and is not a business as usual decision.

The exemption from income tax on profits or gains due to project activity, if any, is therefore not the main objective of the project activity.

Moreover, the additionality in this case has been proved through the barrier route on account of technical and prevailing practice barriers faced by the project activity and not the investment analysis route. Thus, it is not business as usual scenario.

Comment number 7

The DOE states in the Validation Report that "The technology being adopted by the project activity (power generation) is well established and no special training is required." Further clarification is required on the consistency of this statement vis a vis the purported technological barriers.

Response by JSPL

The statement "The technology being adopted by project activity (power generation) is well established and no special training is required" refers to the operation of the waste heat recovery boiler and turbine, which is established and does not demand any special training.

Moreover, as the project technology is an outcome of in-house R&D efforts of JSPL, the external trainers from technological suppliers or any other source cannot serve the purpose, as they would not be having any prior experience of operating the high capacity novel DRI kilns coupled with WHR boilers for power generation.

Comment number 8

The Validation Report states that the company is operating the Waste Heat Based power plant for last more than one decade. What is new technology in it. The associate company Monnet Ispat Raipur, also HEG, PRAKASH INDUSTRY (Champa), TATA SPONGE (Keonjhar, Orissa) are operating waste heat power plant in India for over last 8 to 9 years. Further clarification is required on this statement, the associated companies referred to and its meaning.

Response by JSPL

The technology employed in the project is the innovation of JSPL and has been developed by them. JSPL modified the design of high capacity DRI kilns to suit the Indian raw material characteristics and for power generation. The high capacity DRI kilns is a pioneer concept developed by JSPL and is not a prevailing practice in the Indian sponge iron industry.

Further, the project has an interconnection arrangement between the high capacity kilns which has been developed by JSPL itself and adopted for the first time in sponge iron plants in India. Any failure in the interconnection damper would result in stoppage of kilns thereby leading to production losses. Kindly refer to Annexure 5 (certificate from SIMA) as well as replies to Comment No. 3 and 4 to substantiate the uniqueness of the project activity.

The technology implemented by JSPL has been developed indigenously to suit the Indian raw materials and power generation. The DRI coupled WHR unit by HEG Limited on the other hand has been implemented in collaboration with Lurgi, Germany. Further, unlike the project activity the power plant at HEG is augmented by steam from FBC boiler[1]. Thus they are not comparable to the project activity by JSPL as mentioned in the validation report.

The other projects that have been mentioned in the validation report have been implemented only after taking CDM into consideration in case of Monnet Ispat Limited and Tata Sponge Iron Limited as detailed below:

Name of the company	Weblink
Monnet Ispat - Raipur	http://cdm.unfccc.int/UserManagement/FileStorage/58ISI8JFEOBMTD3SE5VZN82TCLMHRN
Tata Sponge Iron Limited – Keonjhar Orissa	http://cdm.unfccc.int/UserManagement/FileStorage/9YMTNG131ND67HWXQKHA73EPQORAFA
Prakash Industries Limited	http://cdm.unfccc.int/Projects/Validation/DB/PTFHXB0KI1EXAS38BTUW4HPJ6L4P01/view.html

[1] http://www.hegltd.com/pp/index.aspx

The CDM revenue to meet the anticipated technical problems has driven JSPL to go ahead with the project activity as it would hedge the risk faced by the project activity on account of anticipated barriers.

Comment number 9

The Validation Report repeatedly states that "There are barriers associated with the project activity. Thus WHRB based power generation is not the baseline." The project activity is not the baseline as it faces barriers as depicted in the PDD. Essentially technological barriers, prevailing practice barriers and other barriers. However, repetition is not in itself a demonstration. Further substantiation is required.

Response by JSPL

A high capacity DRI kilns based WHRB unit for power generation is not the common practice in the DRI industry in the region. The DRI kilns have been indigenously modified and successfully improved by JSPL to suit the Indian conditions. The power plant uses steam solely generated by waste heat recovery boilers and does not consume steam generated from any coal/fossil fuel based boilers. The project has an interconnection arrangement between the high capacity kilns which has been developed by JSPL itself and adopted for the first time in sponge iron plants in India. The project technology is therefore novel and faces prevailing practice barrier. Kindly refer to Annexure 5 (certificate from SIMA) as well as replies to Comment No. 2, 3 and 4 to substantiate the uniqueness of the project activity. Since the project activity faces barriers, it cannot be considered as baseline.

The purpose of the project activity is to generate power using waste gases emanating from high capacity DRI kilns. The sustainability of any power generating unit directly depends on electricity generated by the power plant. Any decrease in electricity generation would affect the power generation and hence the sustainability of the project.

Further, the project faces a number of technical barriers. Non-availability of waste gas at desired temperature and flow can affect the power generation by the project activity and result in complete closure of the project activity. Any failure in the interconnection damper, boiler inlet duct would result in stoppage of kilns thereby leading to production losses. The corrosion of downstream equipments owing to large particulate load of the waste gas at high pressure from high capacity DRI kilns can result in stoppage of power plant resulting in no electricity generation. Kindly also refer response to comment number 2 and 3.

The following documents are being submitted to substantiate that the project activity faces the barriers as stated above.

Annexure 4:	The details of technical problems faced by the project activity (details of shutdown leakage etc post commissioning due to technical problems mentioned above.
Annexure 5:	Certificate from "Sponge Iron Manufacturers Association" stating that the project activity is unique in its nature.

The above documents clearly substantiate the barriers listed in the PDD.

Comment number 10

Further clarification is required on how the baseline has been established and why a less efficient waste heat recovery system than the project activity has not been analyzed as an alternative; including those systems already established in other existing kilns.

Response by JSPL

A less efficient waste heat recovery system than the project activity has not been considered as an alternative to the project activity as the implementation of WHR power systems based on waste gas from DRI Kilns in itself faces barriers. Please refer to Annexure 7, which provides the breakdown statistics for the less efficient WHR systems. This reference indicates that JSPL was facing challenges while running a less efficient system. Since it faces barriers, this cannot be baseline scenario.

Moreover, based on their previous experience, it is unlikely that in the absence of the project activity, a less efficient WHR system based on waste gas from DRI Kilns would have been installed. Hence, the same has not been considered as a baseline alternative to the project activity.

Those that are already established in other similar capacity kilns have also been implemented after taking CDM into consideration as stated in response to comment number 8. Thus, a less efficient system has not been established as the baseline.

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Annexure 2 : Initial correspondence with CDM consultants regarding the project activity.

Annexure 3 : Extract from Annual Reports of JSPL (2004-05, 2005-06 and 2006-07)

Annexure 4 : Instances of breakdown of the project activity on account of aforesaid technical problems for the project activity

Annexure 5 : The Certificate from the Sponge Iron Manufacturers' Association (SIMA), acknowledging the project to be unique in its nature.

Annexure 5(a) : Article by Mr. Dinesh K Sindwani (independent expert) on the website of SIMA regarding DRI industry.

Annexure 6 : Extract from Technical Report, DSIR

Annexure 7 : Breakdown statistics for the less efficient waste heat recovery system.

Further clarification is required on how the baseline has been established and why a less efficient waste heat recovery system than the project activity has not been analyzed as an alternative; including those systems already established in other existing kilns.

Response by JSPL

A less efficient waste heat recovery system than the project activity has not been considered as an alternative to the project activity as the implementation of WHR power systems based on waste gas from DRI Kilns in itself faces barriers. Please refer to Annexure 7, which provides the breakdown statistics for the less efficient WHR systems. This reference indicates that JSPL was facing challenges while running a less efficient system. Since it faces barriers, this cannot be baseline scenario.

Moreover, based on their previous experience, it is unlikely that in the absence of the project activity, a less efficient WHR system based on waste gas from DRI Kilns would have been installed. Hence, the same has not been considered as a baseline alternative to the project activity.

Those that are already established in other similar capacity kilns have also been implemented after taking CDM into consideration as stated in response to comment number 8. Thus, a less efficient system has not been established as the baseline.

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