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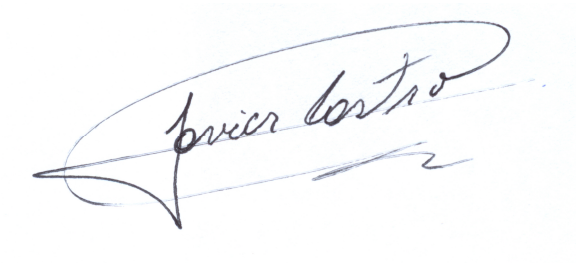
Javier Castro	Javier.castro@tuev-sued.de			

Request for Review

Dear Sirs,

Please find below the response to the review formulated for the CDM project with the registration number 1670. In case you have any further inquiries please let us know how we can kindly assist you.

Yours sincerely,



Javier Castro
Carbon Management Service

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Response to the CDM Executive Board

Question 1

Further clarification is required on how the DOE has validated the existence of the investment and technological barriers.

Response by PP

This principal mechanism for demonstration of additionality for this project is through the use of an investment analysis. As such the barrier analysis need not to be applied and the project participant agrees to the removal of this section.

Response by DOE

The additionality of the project has been demonstrated through Investment analysis. Earlier the barriers were validated through anecdotal evidence. Further since the additionality is convincingly demonstrated through investment analysis, the PP agrees to remove the barrier analysis from the revised PDD.

Question 2

The DOE shall confirm how it has validated that the input values of the IRR meet the requirements of EB 38 paragraph 54 (c).

Response by PP

The input values applied in the investment analysis are derived from the FSR of the project. The FSR was undertaken by Anshan Iron and Steel Group (AISG) Design and Research Institute which is an independent design authority[1,2]. The FSR was approved by the government authority which is Anshan City Development and Reform Commission[3].

All the input values applied in IRR calculation are from FSR. The key input values taken from the FSR are detailed and evidenced as follows:

1. Total fixed asset investment[4]

	Value in FSR (Million RMB)
Construction Cost	62.826
Key Equipment Cost	220.8535
Installation Cost	50.2046
Other Construction Engineering Costs (including land and other construction costs, duty and surcharge for imported	20.033

[1] Qualification rank: A. No.060005-sj, issued by National Ministry of Construction of P.R China
[2] FSR of Anshan Iron and Steel Group CDQ Power Generation Project
[3] FSR Approval of Anshan Iron and Steel Group CDQ Power Generation Project ,No.Anfagaifa(2006)180
[4] Total investment estimate table p83, FSR of Anshan Iron and Steel Group CDQ Power Generation project

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equipments)	
Contingency cost	28.3134
TOTAL	**382.2305**

As stated in FSR, above estimates are based on following information[5]:

The construction cost and Installation cost and is in accordance with the guidance for Liaoning province. The construction cost is estimated based on the guidelines for the projects with similar size and the installation cost is estimated based on the guidelines for installation charges of projects with similar size.

All purchase cost for equipments refer to the factory price or quoted prices.

Other Construction Engineering Cost is estimated according to the regulation for the components of total investment and other cost, issued by the National Supervising Association of Construction Engineering Cost that gives reference to the specific situation of the proposed project.

2. Components of Revenue

The revenue includes the cost saving in power generation and steam supply. In the analysis this is presented as the revenue from the cost savings in net power generation (total generation minus self consumption) plus the other revenues (revenues from steam supply and cost saving for self-consumption). Therefore, the total revenue is based on gross power consumption.

Revenue = Cost savings in net electricity supply + other revenue

Where, other revenue = Steam revenue + revenue from cost saving in self-consumption

a) Revenue from the power cost saving in the production of iron and steel for the AISG.

The project could supply AISG with a net annual electricity of 138,680 MWh[6] which would be purchased from the ECPG in absence of the project.

Cost Savings in Net Electricity Supply = 138.68 GWh*0.427RMB/KWh
= 59.216x10^{6}RMB

b) Other revenue including revenue from steam and revenue from the power cost saving in self-consumption of electricity which is consumed by the CDQ system and power generation system

Annual steam supply by the project is 65.28 tonnes, equivalent to 1,775,600GJ. The steam is utilized in the production of iron and steel of AISG. This revenue was included in other revenue in the PDD and IRR calculation.

In order to recover waste heat for power generation, the CDQ project demands to consume 43.32GWh per year[7].In IRR calculation, this revenue was included in other revenue which should be excluded.

[5] P83, FSR of Anshan Iron and Steel Group CDQ Power Generation Project
[6] P85 FSR of Anshan Iron and Steel Group CDQ Power Generation Project

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Self-consumption = Consumption in CDQ system
+ Consumption in power generation system

= (18.025x106+18.025x106)[8]+((4.334x106KWh(No.5&No.6)[9]
+2.936X106kwh (No.7&No.8)[10])
= 43.32x106GWh

Other revenue = steam revenue + revenue from cost saving in self-consumption

= 1.7756*10^6GJ*30RMB/GJ+43.320 GWh *0.427RMB/KWh
= 71.766x10^6RMB

Total Revenue = cost saving in net electricity supply+ other revenue
=59.216x10^6RMB+71.766x10^6 RMB
=130.982x10^6RMB

3. Power generation

The designed capacity is 2X12MW. The annual power capacity of both generators is 11.137 MW and 11.172MW, power generation is estimated based on operation hours of 8160 hours that gives the annual power generation of 182GWh [11]. Only 600 hours (25days) is for maintenance and repairs of Coke oven and generator. From the applied operation time, it can be seen that the project almost run full year. Therefore, the power generation applied in IRR calculation is very conservative. The self-consumption (for CDQ heat recovery system and power generation system) is 43, 320(MWh)[12], but the revenues in the investment analysis uses the gross power generation. In order to reconcile this, self consumption is treated as a cost in the O&M costs as shown below.

4. Tariff rate

The power tariff (exclusive) is 0.419RMB/KWh in the FSR[13]. This tariff gives an IRR of 8.39% as shown in the PDD submitted for registration. The purchase rate shown in the invoices for 2006 is 0.427 RMB/kWh. As such the investment analysis has been amended to reflect this value. The IRR is now 8.61% and still below the benchmark.

Steam price is 30RMB/GJ.

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[7] Electricity Balance Table, p46,p47 FSR of Anshan Iron and Steel Group CDQ Power Generation Project; The key operation indicators for power system of No.5,6,7,8 coke oven, p29,p30 FSR of Anshan Iron and Steel Group CDQ Power Generation Project;
[8] Electricity Balance Table, p46,p47 FSR of Anshan Iron and Steel Group CDQ Power Generation Project;
[9] The key operation indicators for power system of No.5,6 coke oven, p29,p30 FSR of Anshan Iron and Steel Group CDQ Power Generation Project;
[10] The key operation indicators for power system of No.5,6 coke oven, p29,p30 FSR of Anshan Iron and Steel Group CDQ Power Generation Project;
[11] The key operation indicators for power station of No. 7,8 coke oven, p29,p30 FSR of Anshan Iron and Steel Group CDQ Power Generation Project
[12] Electricity Balance Table, p46,p47 FSR of Anshan Iron and Steel Group CDQ Power Generation Project; The key operation indicators for power system of No.5,6,7,8 coke oven, p29,p30 FSR of Anshan Iron and Steel Group CDQ Power Generation Project;
[13] P 85, FSR of Anshan Iron and Steel Group CDQ Power Generation Project

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5. O & M Costs

O&M cost accounted for 69.05 million

All O&M costs applied in the IRR calculation are taken from the FSR. A full breakdown of these costs has been showed in the table below. The costs include raw material cost(coke loss during coke dry quenching process), auxiliary material(phosphate, hydrazine), power and fuel including self consumption of electricity, fresh water, steam, nitrogen and compressed air, coke oven gas), labor, repair and maintenance, and other expenses covering administration and over-head costs which include office expenses, training cost, travel cost, sharing cost of the board, payment of national insurance, medical treatment insurance, unemployment insurance, housing fund for employees, property tax, payment of environment protection fee and other sundries.

O & M Cost Table[14]

No.	item	unit	quantities	Price	Amount (yuan0000 •
1	**material expenditure**				**1671.10**
1.1	Coke loss during coke dry quenching	t	19660.00	850.00	1671.10
2	**auxiliary material**				**0.52**
2.1	phosphate	kg	2000.00	1.80	0.36
2.2	hydrazine	kg	193.20	8.50	0.16
3	**Fuel and power**				**1540.39**
3.1	electricity	MWh	26218.40	419.00	1098.55
3.2	fresh water	km^3	1371.00	2520.00	345.49
3.3	steam	GJ	4569.60	30.00	13.71
3.4	compressed air	km^3	1365.60	63.00	8.60
3.5	nitrogen	km^3	3916.80	80.00	31.33
3.6	coke over gas	GJ	17078.88	25.00	42.70
4	**Recovery of coke powder**	**t**	**4500.00**	**315.00**	**(141.75)**
5	**labour**	**Person/year**	**106**	**41040**	**435.02**
6.	**repairs and maintenance**				**2500.00**
7	**other expenses**				**900.00**
	Total O & M(1+2+3-4+5+6+7)				**6905.26**

All of the tariff rates above are estimated in accordance with the average tariff rate of Liaoning province in 2006.

[14] Production cost table, p85,-p86 FSR of Anshan Iron and Steel Group CDQ Power Generation Project;

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The loss due to Coke Dry Quenching process is estimated based on 0.7% of annual Coke output amount.

As described above the revenues for the project include the self-consumption of electricity, it must therefore be included in the costs to reconcile this. A further clarification is made that the total self-consumption of the project should be 43,320 MWh as stated in FSR, however the amount of self-consumption applied in the O&M costs is 26218.40 MWh. This is a mistake in the IRR calculation of FSR. The costs for electricity are too low in this analysis, which has resulted in a higher IRR. This is conservative.

Maintenance and repairs are estimated in 6.54% of fixed assets investment.

Response by DOE

We understand that as per requirement of EB 38 paragraph 54(c), the CDM EB requires us to provide confirmation that input values from FSR are valid and applicable at the time of the investment decision. In order to provide further clarification to substantiate that this has been done by the audit team, we identify the following sources of information, which formed the basis for our decision:

1. The values used in the PDD and the FSR are fully consistent. The input values used in the investment analysis are consistent with the FSR The relevant sections of the FSR are being submitted as Annexure-1

2. The FSR has been prepared by a Government approved qualified design institute - Anshan Iron and Steel Group (AISG) Design and Research Institute. Certificates of the same are being submitted as Annexure-2.

3. Total Investment: The FSR was approved by the Government body (Anshan DRC) on 17th October 2006 wherein the total investment in the project has been stated as 382.23 Million RMB which is consistent with the FSR and the PDD. The approval letter is being submitted as Annexure-3.

4. Net electricity generation/Operating hours: The operating hours assumed as 8160 hours and the downtime as 600 hours (25 days) for maintenance and repairs, which are fairly reasonable values.

5. Tariff: The tariff stated as 0.419RMB/KWh was cross-checked with the grid power purchase price. The actual grid price from February 2006 is slightly higher (0.427 RMB/kWh) which leads to a slightly higher IRR of 8.61 %, which is still below the benchmark of 13%. The supporting document is being submitted as Annexure-4.

6. O&M costs: The O&M costs are coming out to be around 18% of the total investment. The O&M costs consist of all the costs related to operating the plant including the employee expenditure and auxiliary consumption. Therefore the O&M costs are assumed to be reasonable and acceptable.

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Question 3

If the barriers to the project activity cannot be further substantiated, an economic comparison of the proposed baseline and the project activity without the CDM must be conducted to determine the baseline scenario.

Response by PP

According to the methodology ACM0004, there are three steps to identify alternatives to the project activity:

1. Identification of alternative baseline scenarios.

2. Excluding baseline options that do not comply with legal and regulatory requirements or depend on key resources such as fuels, materials or technology that are not available at the project site.

3. Identifying that among the alternatives that do not face any prohibitive barriers, the most economically attractive alternative should be considered as the baseline scenario

Also, the methodology ACM0004, the following five scenarios are identified as baseline alternatives for the proposed project:

(1) The proposed project activity not undertaken as a CDM project activity;

(2) The continuation of the current situation, import of electricity from NEPG grid;

(3) Existing or new captive power generation on-site, using other energy sources than waste heat and/or gas, such as coal, diesel, natural gas, hydro, wind, etc;

(4) A mix of options (2) and (3), in which case the mix of grid and captive power should be specified

(5) Other uses of the waste heat and waste gas

Section B.4 of the PDD eliminates (3), (4) and (5) due to prohibitive barriers and a lack of demand for other uses of the waste heat. Therefore the only options left to consider are options (1) and (2).

Option (1) is eliminated since it is proven to be economically unattractive and therefore additional. Option (2) is considered to be economically attractive since it is the current business as usual option for AISG. Furthermore, the savings from not purchasing power from the grid are already included in the economic analysis presented in the PDD and it is clearly demonstrated from this that it is not financially attractive to stop purchasing power in favour of investing in the CDQ project

However to further elaborate this point the project participant has prepared a cost comparison of the two options. This has been done through a Net Present Value of the costs of scenarios (1)

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and (2) over a 15-year lifetime and a subsequent evaluation of the levelised cost of both scenarios.

The project supplies with the electricity and steam (both of the electricity revenue and steam revenue were included in the IRR calculation, but the only ERs generated from power supply was included in the PDD).The cost applied in IRR calculation represented the full cost for power generation and steam generation. For the comparison of cost of power procurement, only the cost for power generation in scenario 1 was considered in the calculation of levelised cost.

This is presented below in the tables below.

Power Generation

		Reference	1	2	3	4	5	6	7	8	9	10	11
Annual Power Supply (MWh)	A	FSR	0	-	138,680	138,680	138,680	138,680	138,680	138,680	138,680	138,680	138,680
Discount Factor	B	= 1 / (1 + DR)^{n}	1	0.88496	0.78315	0.69305	0.61332	0.54276	0.48032	0.42506	0.37616	0.33288	0.29459
Present Value of Annual Generation (MWh)	C	= A x B	-	-	108,607	96,112	85,055	75,270	66,611	58,947	52,166	46,164	40,854
Total Present Value of Annual Generation (MWh)	D	= Sum (C$_i$)	793,101										
Power Price (RMB/MWh)	E	FSR	427										

		Reference	12	13	14	15	16	17					
Annual Power Generation (MWh)	A	FSR	138,680	138,680	138,680	138,680	138,680	138,680					
Discount Factor	B	= 1 / (1 + DR)^{n}	0.26070	0.23071	0.20416	0.18068	0.15989	0.14150					
Present Value of Annual Generation (MWh)	C	= A x B	36,154	31,995	28,313	25,057	22,174	19,623					
Total Present Value of Annual Generation (MWh)	D	= Sum (C$_i$)											
Power Price (RMB/MWh)	E	FSR											

Total revenue of the project		FSR			129,526,000								
where: revenue from steam		FSR			53,268,000								
revenue from power generation		FSR			76,258,000								
proportion of the power generation		calculation			0.5887								
proportion of steam supply		calculation			0.4113								

Scenario 1. CDQ

		Reference	1	2	3	4	5	6	7	8	9	10	11
Capital Cost	F	FSR	112,518,495	112,518,495	-								
Depreciation	G	FSR	-	-	12,333,654	12,333,654	12,333,654	12,333,654	12,333,654	12,333,654	12,333,654	12,333,654	12,333,654
Amortization	H	FSR	-	-	2,359,108	2,359,108	2,359,108	2,359,108	2,359,108	-	-	-	-
O&M Cost	I	FSR	-	-	40,654,134	40,654,134	40,654,134	40,654,134	40,654,134	40,654,134	40,654,134	40,654,134	40,654,134
Residue	J	FSR											
Income Tax saved (@ 33%)	k	= (F+G+H+I-J) x 0.33	37,131,103	37,131,103	18,264,476	18,264,476	18,264,476	18,264,476	18,264,476	17,485,970	17,485,970	17,485,970	17,485,970
Total Cost	L	= F + I - K	75,387,391	75,387,391	22,389,659	22,389,659	22,389,659	22,389,659	22,389,659	23,168,164	23,168,164	23,168,164	23,168,164
Discount Factor	M	= 1 / (1 + DR)^{n}	1.0000	0.8850	0.7832	0.6931	0.6133	0.5428	0.4803	0.4251	0.3762	0.3329	0.2946
Present Value of Total Annual Cost	N	= LxM	75,387,391	66,714,826	17,534,461	15,517,153	13,732,025	12,152,211	10,754,201	9,847,860	8,714,937	7,712,219	6,825,110
Total Present Value of Annual Costs	**O**	**= Sum (N$_i$)**	273,494,661										
Levelised Cost (RMB/MWh)	**P**	**= O / D**	345										

		Reference	12	13	14	15	16	17					
Capital Cost	F	FSR											
Depreciation	G	FSR	12,333,654	12,333,654	12,333,654	12,333,654	12,333,654	12,333,654					
Amortization	H	FSR	-	-	-	-	-	-					
O&M Cost	I	FSR	40,654,134	40,654,134	40,654,134	40,654,134	40,654,134	40,654,134					
Residue	J	FSR						28,236,643					
Income Tax saved (@ 33%)	k	= (F+G+H+I-J) x 0.33	17,485,970	17,485,970	17,485,970	17,485,970	17,485,970	8,167,878					
Total Cost	L	= F + I - J	23,168,164	23,168,164	23,168,164	23,168,164	23,168,164	32,486,257					
Discount Factor	M	= 1 / (1 + DR)^{n}	0.2607	0.2307	0.2042	0.1807	0.1599	0.1415					
Present Value of Total Annual Cost	N	= LxM	6,039,940	5,345,127	4,730,012	4,186,024	3,704,358	4,596,805					
Total Present Value of Annual Costs	**O**	**= Sum (N$_i$)**											
Levelised Cost (RMB/MWh)	**P**	**= O / D**											

Scenario 2. Power Purchase

		Reference	1	2	3	4	5	6	7	8	9	10	11
Capital Cost	F	FSR											
Cost of power purchase	G	FSR	-	-	59,130,960	59,130,960	59,130,960	59,130,960	59,130,960	59,130,960	59,130,960	59,130,960	59,130,960
Income Tax saved (@ 33%)	H	= G x 0.33			19,513,217	19,513,217	19,513,217	19,513,217	19,513,217	19,513,217	19,513,217	19,513,217	19,513,217
Total Cost	J	= F + G - H	-	-	39,617,743	39,617,743	39,617,743	39,617,743	39,617,743	39,617,743	39,617,743	39,617,743	39,617,743
Discount Factor	K	= 1 / (1 + DR)^{n}	1	0.88496	0.78315	0.69305	0.61332	0.54276	0.48032	0.42506	0.37616	0.33288	0.29459
Present Value of Total Annual Cost	L	= J x K	-	-	31,026,636	27,457,077	24,298,354	21,502,926	19,029,194	16,839,918	14,902,610	13,187,954	11,670,991
Total Present Value of Annual Costs	**M**	**= Sum (L$_i$)**	226,571,100										
Levelised Cost (RMB/MWh)	**N**	**= M / D**	286										

		Reference	12	13	14	15	16	17					
Capital Cost	F	FSR											
Cost of power purchase	G	FSR	59,130,960	59,130,960	59,130,960	59,130,960	59,130,960	59,130,960					
Income Tax saved (@ 33%)	H	= G x 0.33	19,513,217	19,513,217	19,513,217	19,513,217	19,513,217	19,513,217					
Total Cost	J	= F + G - H	39,617,743	39,617,743	39,617,743	39,617,743	39,617,743	39,617,743					
Discount Factor	K	= 1 / (1 + DR)^{n}	0.26070	0.23071	0.20416	0.18068	0.15989	0.14150					
Present Value of Total Annual Cost	L	= J x K	10,328,346	9,140,210	8,088,358	7,158,134	6,334,481	5,605,911					
Total Present Value of Annual Costs	**M**	**= Sum (L$_i$)**											
Levelised Cost (RMB/MWh)	**N**	**= M / D**											

For comparison of these two scenarios the different tax situations have been considered. This is due to the fact that scenario 1 includes a capital investment and scenario 2 does not. For scenario 1 there is a capital allowance for the depreciation and amortization of the capital cost. For both scenarios 1 and 2 income tax will be due. Income tax is due on net income and in scenarios 1 and 2 this will be different and there is a tax benefit in having higher annual costs i.e. less tax will be paid. In other words net annual income will be less when there are higher annual costs and therefore income tax will also be less. Conversely, when net annual income is higher then so are the taxes, which is the case for Scenario 1.

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Tables 6 and 7 above show that the levelised cost of power generation obtained for scenario 2 (286 RMB / MWh) is less than the levelised costs for scenario 1 (345 RMB / MWh).

Furthermore, when you compare the two scenarios there is no risk or indeed effort required to purchase power from the grid, whereas there are enormous risks associated with the investment of a new technology in the industry that is reliant on an unstable fuel source. Therefore the rational decision is to do nothing rather than risk capital on something that does not bring about any additional benefits. As such it can be confirmed that the baseline is indeed purchase of power from the grid and not the proposed project undertaken without the CDM.

Response by DOE

According to "Tool for the demonstration and assessment of additionality /Version 03", benchmark analysis was used for the investment analysis of this project. As far as alternatives 1, the IRR without CDM revenues is lower than the benchmark value. Thus it was concluded that the project is not attractive from a financial point of view.
Alternative 2 is the continued situation of the present state. It needs no additional investment and faces no prohibitive barrier and is also most economically attractive, so it is considered as the baseline scenario.

Further the levelized cost analysis has also been submitted by the PP for the two alternatives. The analysis has been validated and shows that buying power from grid is cheaper than the project activity based power. Thus the baseline scenario would be grid based power. The levelized cost analysis is being submitted (Annexure-5).