

# JAPAN CONSULTING INSTITUTE

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Date : 29 November 2011

Ref. No.: JCI-CDM-C-11-171

CDM Executive Board

c/o Secretary to the CDM Executive Board

Subject : DOE Response to Request for registration incomplete for "Shaanxi Haiyan Coke Making Group 24MW Waste Coke Oven Gas (COG) Based Electricity Generation Plant" - Ref No. 00004630

Dear Sirs,

Please find the attached document which shows JCI's response to the request for registration incomplete for the above CDM project / Reference No.4630.

It has been reflected to the revised PDD and Validation Report.

If you have any further question or request, please let us know.

Yours sincerely,



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## DOE's Response to Request for registration incomplete

Project title: Shaanxi Haiyan Coke Making Group 24MW Waste Coke Oven Gas  
(COG) Based Electricity Generation Plant

Reference No.: 4630

Project Participants: (1) Shaanxi Haiyan Coke Making (Group) Co., Ltd.  
(2) Tepia Corporation Japan Co., Ltd.  
(CDM consultant: Shanghai Tepia Environmental Protection Co., Ltd)

DOE: Japan Consulting Institute, JCI

### **Issue 1:**

*The DOE is requested to describe in detail how the parameters used in any financial calculations have been validated in line with para 114(a) of VVM v1.2, in particular; (i) depreciation period; (ii) residual value; (iii) tax rates (income tax, VAT and additional education and construction tax).*

### **Response of JCI:**

#### **(i) Depreciation period**

JCI has consulted the related laws and regulations on the depreciation period and found two official documents: one is “Pretax Deduction Method for Enterprise Income Tax” issued by the State Administration of Taxation on 16 May 2000/Attachment-1.1/ and the other is “Implementing Regulations for the Law of Enterprise Income Tax of People's Republic of China” issued by the State Council on 6 December 2007/Attachment-1.2/. Both of them stipulate the depreciation period of 20 years or more for the buildings and 10 years or more for the train, ship and machinery facilities while the FSR of the proposed project is completed in December 2007 and the investment decision was made on 28 December 2007. Furthermore, the project operation time (excluding 1.5 years construction period) of the proposed project is 15 years which is described in the PDD/2/. Therefore 15 years of the depreciation period is selected by the proposed project. As the longer depreciation period makes the IRR rate after tax lower, the trial IRR calculation was conducted under the 10 years of the depreciation period. The result shows the IRR rate after tax changes from 5.2 % (15 years of the depreciation period) to 5.5 % (10 years) which is still lower than the benchmark of 8%.

JCI has validated and concluded the depreciation period of 15 years selected by the proposed project is appropriate.

#### **(ii) Residual value**

JCI has consulted the related laws and regulations on the residual value and found two official documents: one is “Detailed Rules for the Implementation of the Provisional Regulations on Enterprise Income Tax of the People's Republic of China” issued by the Ministry of Finance on 4 February 1994/Attachment-1.3/ and the other is “Notification on

determination of residual rate for enterprise fixed asset” issued by the State Administration of Taxation on 14 September 2005/Attachment-1.4/. They stipulate the residual values of 5 % or less and of uniform 5 % respectively. Therefore 5 % of the residual value is selected by the proposed project. In accordance with paragraph 4 of the Guidelines on the Assessment of Investment Analysis (Version 05), the trial IRR calculation was conducted under the 20 % of the residual value for confirmation. The result shows the IRR rate after tax changes from 5.2 % (5 % of the residual value) to 5.4 % (20 %) which is still lower than the benchmark of 8%. Furthermore the trial IRR calculation was conducted under the 10 years of the depreciation period and 20 % of the residual value. The result shows the IRR rate after tax changes from 5.2 % (15 years of the depreciation period and 5 % of the residual value) to 6.1 % (10 years and 20 %) which is still lower than the benchmark of 8%. JCI has validated and concluded the residual value of 5 % selected by the proposed project is appropriate.

(iii) Tax rates ( income tax, VAT and additional education and construction tax)

As shown at footnotes 10 to 13 of the PDD/2/, JCI has validated and concluded that 25 % income tax, 17 % VAT, 3 % additional tax for education and 7 % additional tax for city development, which are selected by the proposed project, are appropriate because they are consistent with laws and regulations respectively. That is, the 25 % income tax is consistent with “Law of Enterprise Income Tax of the People's Republic of China” issued as the President Decree on 16 March 2007/Attachment-2.1/. The 17 % VAT is consistent with “Interim Statute of Value Added Tax of the People’s Republic of China” issued by the State Council on 13 December 1993/Attachment-2.2/. The 3 % additional tax for education is consistent with “Provisional Regulations of Education Tax” amended by the State Council on 20 August 2005/Attachment-2.3/. The 7 % additional tax for city development is consistent with “Interim Rules of Additional Tax for City Development of the People's Republic of China” issued by the State Council on 8 February 1985/Attachment-2.4/. Such laws and regulations are still effective at present.

JCI has validated and concluded that such tax rates selected by the proposed project are appropriate.

**Issue 2:**

*The PP/DOE is requested to include monitoring parameter  $EC_{PJ,y}$  (Additional electricity consumed in year y for project related equipment) in the list of data and parameters to be monitored as required by pg 48 of ACM0012 v3.2 methodology.*

**Response of PP/JCI:**

PP has included the monitoring parameter  $EC_{PJ,y}$  (Additional electricity consumed in year y for project related equipment) in sections B.6.1.2, B.7.1 and B.7.2 of the PDD/2/ as required by pg 48 of ACM0012 v3.2 methodology.

JCI has validated and concluded the  $EC_{PJ,y}$  is correctly included in the PDD/2/.

**Issue 3:**

*The PP/DOE is requested to indicate how the net electricity  $EG_{i,j,y}$  delivered to the grid will be cross checked and verified as required by pg 40 of ACM0012 v3.2 methodology.*

**Response of PP/JCI:**

PP has included the monitoring parameter  $EG_{gen,y}$  (Electricity generated by the proposed project) in sections B.7.1 and B.7.2 of the PDD/2/ for the cross check of the net electricity  $EG_{i,j,y}$  delivered to the grid in combination with the  $EC_{PJ,y}$ . That is, the difference between the  $EG_{gen,y}$  and  $EC_{PJ,y}$  is a cross check data for the  $EG_{i,j,y}$ . In addition, PP has added a sentence of “Sales receipts shall be used for verification.” in section B.7.1 of the PDD/2/ for the verification of the  $EG_{i,j,y}$ .

JCI has validated and concluded the  $EG_{gen,y}$  and “Sales receipts shall be used for verification.” are correctly incorporated in the PDD/2/ for the cross check and verification of the net electricity  $EG_{i,j,y}$  delivered to the grid.

**Issue 4:**

*The DOE is requested to describe in detail how  $f_{cap}$  have been validated following the steps mentioned in ACM0012 v3.2, in particular; (i) why method 1 and 2 was not chosen for calculation of  $f_{cap}$ ; (ii) how the value of  $Q_{OE,BL}$ , sourced from FSR, is conservative given that the methodology requires to estimate the theoretical recoverable energy based on manufacturer's specification or technical assessment prepared by qualified/certified external expert. In addition, please provide a spreadsheet on calculation of  $f_{cap}$ .*

**Response of JCI:**

(i) Why method 1 and 2 was not chosen for calculation of  $f_{cap}$

As described in IV. 5.4.2) (d) of the validation report, since there is no historical data available in Method 1, Method 2 was originally selected in the PDD/1/, and then Case-1 in Method 3 is finally adopted to calculate the  $f_{cap}$  in the PDD/2/ based on the discussion during the site-visit and the CL-20. The discussion and the CL-20 have clarified the technical limitations in direct monitoring of waste heat of waste energy carrying medium (WECM) as follows:

- 1) No historical data available in Method 1
- 2) Direct measurable data of electricity, while indirect measurements of waste energy and enthalpy in Method 2, that is, which is derived from the temperature, the pressure and the gas flow in the larger diameter of the waste gas pipe.
- 3) Reliable data of electricity because of direct measurable and accumulative data without any effects caused by the instantaneous operational fluctuation and also by properties of the waste heat/gas which would bring easier damages of the instruments.
- 4) Final output of electricity, while intermediate data of the waste energy and enthalpy in

Method 2 and Case-2 of Method 3 which would require a substantial additional instruments and investment.

5) Electricity amount calculated by Design Institute qualified and certified

6) Generated electricity reducing the CO<sub>2</sub> emission by NWPG, while the intermediate data may not be exactly equal to the CO<sub>2</sub> emission reductions.

Therefore, JCI has validated and concluded that the Case-1 in Method 3 is appropriate for the proposed project.

- (ii) How the value of  $Q_{OE,BL}$ , sourced from FSR, is conservative given that the methodology requires to estimate the theoretical recoverable energy based on manufacturer's specification or technical assessment prepared by qualified/certified external expert. In addition, please provide a spreadsheet on calculation of  $f_{cap}$ .

As shown in section A.4.3 of the PDD/2/ and the CL-5, the installed capacity of the generator units is calculated under conditions such as the waste gas enthalpy based on the actual monitoring records/19/, the actual coke production records/18/, the boiler specifications/97/, etc. which is summarized in the below table with JCI's Judges.

Based on the above theoretical recoverable energy, 24 MW (=12 MW \* 2 units) is selected as the installed capacity although 25 MW is theoretically calculated. And then the electricity delivered to the grid of  $Q_{OE,BL}$ , 163,800 MWh/year, is correctly estimated using the installed capacity of 24 MW, the operation hours of 7,500 and the auxiliary electricity consumption rate of 9 %, which JCI validated and concluded as appropriate including the crosscheck with the 8 registered CDM projects in PRC (please refer to P36, P41 to P44 of the validation report). In addition,  $Q_{OE,y}$  is estimated as same as  $Q_{OE,BL}$  as an ex-ante. Therefore,  $f_{cap}$  is 1 as an ex-ante.

JCI has validated and concluded the  $Q_{OE,BL}$  of 163,800 MWh/year is conservatively estimated and appropriate.

A spreadsheet on calculation of  $f_{cap}$ /Attachment-3/ has been uploaded.

	Unit	Value	JCI's cross check	Judge
Total amount of waste gas	Nm <sup>3</sup> /h	40,000	Monitoring report of COG by Hancheng City Environment Monitoring Station on 18 November 2007/19/	OK
Load factor of normal operation	%	86.5%	Annual coke production records/18/	OK
Re-use in the coke making process	Nm <sup>3</sup> /h	12,600	Monitoring report of COG by Hancheng City Environment Monitoring Station on 18 November 2007/19/	OK
Temperature of smoke gas	deg C	150	FSR P13	OK
Enthalpy of smoke gas	kJ/Nm <sup>3</sup>	1,016	Correctly calculated	OK
Enthalpy of COG	kJ/Nm <sup>3</sup>	16,614	Enthalpy correctly calculated. Monitoring report of COG by Hancheng City Environment Monitoring Station on 18 November 2007/19/.	OK

COG amount for power generation	Nm <sup>3</sup> /h	22,000	Correctly calculated	OK
Enthalpy of smoke gas per hour	kJ/h	22,344,000	Correctly calculated	OK
Enthalpy of COG burning per hour	kJ/h	365,508,000	Correctly calculated	OK
Burning enthalpy per hour	kJ/h	343,164,000	Correctly calculated	OK
Rated evaporation of two sets of boiler	t/h	150	Purchase agreement/97/	OK
Enthalpy of steam with a medium temperature/medium pressure	kJ/kg	1,075	Correctly calculated	OK
Enthalpy of the boiler feed water with temperature, 150 deg C	kJ/kg	632.2	Correctly calculated	OK
Enthalpy loss of boiler draining	%	2.0%	Confirmed by manufacturer/97/	OK
Enthalpy loss of boiler draining per hour	kJ/h	1,328,400	Correctly calculated	OK
Boilers' efficiency	%	93%	Confirmed by manufacturer/97/	OK
Enthalpy of the overheating steam with temperature, 450 deg C	kJ/kg	3,331.7	Enthalpy correctly calculated	OK
Steam amount of the boilers producing per hour	t/h	117.7	Correctly calculated	OK
Loss and leakage of overheating steam in total	t/h	3.53	Confirmed by manufacturer/97/	OK
Steam amount to turbine and generator	t/h	114.2	Correctly calculated	OK
Unit steam consumption	kg/kWh	4.568	Confirmed with GB50049-1994	OK
Rated capacity of steam turbines	MW	25.0	Correctly calculated	OK
Rated capacity of steam turbine	MW/unit	12.0	Purchase agreement/98/	OK
Annual operation hours	hrs/year	7,500	Longer than 8 registered CDM projects (P36, P41 to P44 of VR)	OK
Self consumption rate	%	9.0%	Longer than 8 registered CDM projects (P36, P41 to P44 of VR)	OK
Electricity generated	MWh/year	180,000	Appropriate (P36, P41 to P44 of VR)	OK
Electricity delivered to the grid = $Q_{OE,EL}$	MWh/year	163,800	Appropriate (P36, P41 to P44 of VR)	OK
Quantity of actual output = $Q_{OE,y}$	MWh/year	163,800	Appropriate as same as the above	OK
<b>f<sub>cap</sub></b>		1.0	Correctly calculated	OK

## Attachment list

### Attachment-1: Depreciation in PRC

1. Pretax Deduction Method for Enterprise Income Tax issued by the State Administration of Taxation on 16 May 2000
2. Implementing regulations for the Law of Enterprise Income Tax of People's Republic of China issued by the State Council on 6 December 2007 and effective from 1 January 2008 ([http://www.gov.cn/zwggk/2007-12/11/content\\_830645.htm](http://www.gov.cn/zwggk/2007-12/11/content_830645.htm))
3. Detailed Rules for the Implementation of the Provisional Regulations on Enterprise Income Tax of the People's Republic of China (Cai Fa Zi [1994] No.3) issued by the Ministry of Finance on 4 February 1994
4. Notification on determination of residual rate for enterprise fixed asset issued by the

State Administration of Taxation on 14 September 2005  
(<http://www.wh12366.gov.cn/cms/whgs02/0201more/2005092206.html>)

Attachment-2: Taxes in PRC

1. Law of Enterprise Income Tax of the People's Republic of China issued as the President Decree on 16 March 2007 and effective from 1 January 2008  
(<http://www.js-n-tax.gov.cn/Page/StatueDetail.aspx?StatuteID=7488>)  
([http://www.gov.cn/flfg/2007-03/19/content\\_554243.htm](http://www.gov.cn/flfg/2007-03/19/content_554243.htm))
2. Interim Statute of Value Added Tax of the People's Republic of China issued by the State Council (No. 134) on 13 December 1993 and effective from 1 January 1994  
([http://www.gov.cn/banshi/2005-08/19/content\\_24733.htm](http://www.gov.cn/banshi/2005-08/19/content_24733.htm))
3. Provisional Regulations of Education Tax amended by the State Council on 20 August 2005 and effective from 1 October 2005  
([http://www.chinacourt.org/flwk/show1.php?file\\_id=104821](http://www.chinacourt.org/flwk/show1.php?file_id=104821))
4. Interim Rules of Additional Tax for City Development of the People's Republic of China issued by the State Council on 8 February 1985 and effective from 8 February 1985  
([http://www.gov.cn/banshi/2005-08/19/content\\_24817.htm](http://www.gov.cn/banshi/2005-08/19/content_24817.htm))

Attachment-3: Spreadsheet on calculation of fcap