CDM: Proposed New Methodology
Meth Panel recommendation to the Executive Board

To be completed by UNFCCC Secretariat

Date of Meth Panel meeting:	
Related F-CDM-NM document ID number (electronically available to EB members)	F-CDM-NM0 : " "
Related F-CDM-NMex document ID number(s) (electronically available to EB members)	F-CDM-NMex0 :
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Signature of Meth Panel Chair ……………………………………………..
Date:

Signature of Meth Panel Vice-Chair ……………………………………………..
Date:

Information to be completed by the secretariat

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NM0xxx Version ## (to be completed by UNFCCC)

CLEAN DEVELOPMENT MECHANISM
PROPOSED NEW BASELINE AND MONITORING METHODOLOGIES
(CDM-NM)
(Version 03.1)

CONTENTS

Instructions for using this form

In using this form, please follow the guidance established in the following documents:

- Guidelines for completing the project design document (CDM-PDD) and proposed new baseline and monitoring methodologies (CDM-NM);
- Technical guidelines for the development of new baseline and monitoring methodologies (contained in part III of the above);
- Relevant methodological guidance by the Executive Board.

This guidance can be found at <https://cdm.unfccc.int/Reference/Guidclarif/index.html>

Formatting Instructions:

- The form provides the formatted headings which should be used throughout the document;
- Please note that each paragraph in section C and D should have a paragraph number, as demonstrated through example. When adding further paragraphs, please ensure it is numbered;
- Please use word equation editor to write equations;
- Please format figures, tables and footnotes to update automatically;
- Please note the footnotes have a separate format (Times New Roman - size 10).[1]

Please complete sections B to E. In section C, the text shaded in grey shall not be changed, whereas other text is used as an example and may be changed or deleted.

[1] Format for footnotes.

Section A. Recommendation by the Methodological Panel (to be completed by the Meth Panel)

Recommendation (preliminary or final / approval or rejection / consolidation)

>>

2. Major changes required

>>

3. Minor changes required

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Section B. Summary and applicability of the baseline and monitoring methodology

1. Methodology title (for baseline and monitoring), submission date and version number

>>
Title “Methodology for Project of Producing Crude Steel through direct reduction approach using coke oven gas”
Submission date February 13, 2009
Version number Ver1.0

2. If this methodology is based on a previous submission or an approved methodology, please state the reference numbers (NMXXXX/AMXXXX/ACMXXXX) here. Explain briefly the main differences and their rationale.

>>
NA

3. Summary description of the methodology, including major baseline and monitoring methodological steps

>>

The methodology is adopted for the project of producing crude steel through direct reduction approach using coke oven gas. In the project process, surplus of coke oven gas is collected and used with pellets separately made to produce sponge iron in a direct reduction furnace. Sponge iron is sent to an electric furnace and changed to crude steel.

<u>(a) Baseline scenario determination</u>
As baseline scenarios, realistic and plausible are listed. Among those, these are excluded.
(i) One does not comply with regulations in the host country and/or the region
(ii) One does not emit coke oven gas as surplus
(iii) One does not adopt iron making scenario of blast furnace and converter are connected in a single process
After this screening, the most economically attractive one with the least barriers is to be adopted as a baseline scenario.

(b) Demonstration of additionality
The additionality of the project activity shall be demonstrated and assessed using the latest version of the “Tool for the demonstration and assessment of additionality” agreed by the CDM Executive Board, and available at the UNFCCC website.

(c) Baseline emission calculation
Multiplying the total GHG, emitted from producing 1 ton of crude steel on the baseline scenario, by the product amount of crude steel gives the baseline emissions.

For estimating total emissions of GHGs, materials and energy inputs and surplus of coke oven gas (COG) emission in a baseline scenario are in need.

(d) Project emission calculation

Project emission is estimated with materials and energy inputs, which are in need for producing crude steel in a project case.

(e) Leakage calculation
When surplus of COG is moved to a direct reduction furnace in a long distance, the surplus will be examined whether it should be counted as a leakage.

(f) Emission reduction calculation
GHG abatement is estimated by following formula.

A = B – C + D

A: GHG reduction
B: Baseline emissions
C: Project case emissions
D: Leakage emissions

Section C. Proposed new baseline and monitoring methodology

Draft baseline and monitoring methodology AMXXXX

"Methodology for Project of Producing Crude Steel through direct reduction approach using coke oven gas"

I. SOURCE, DEFINITIONS AND APPLICABILITY

Sources

This baseline and monitoring methodology is not based on any proposed new methodologies:

This methodology also refers to the latest approved versions of the following tools:

- Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion;
- Tool to calculate project emissions from electricity consumption;
- Tool for the demonstration and assessment of additionality;
- Combined tool to identify the baseline scenario and demonstrate additionality;

For more information regarding the proposed new methodologies and the tools as well as their consideration by the Executive Board please refer to http://cdm.unfccc.int/goto/MPappmeth.

Selected approach from paragraph 48 of the CDM modalities and procedures

1. "Existing actual or historical emissions, as applicable"

Definitions: Please provide definitions of key terms that are used in this proposed new methodology

2. For the purpose of this methodology, the following definitions apply:

COG: coke oven gas, obtained as a by-product of the manufacture of coke oven coke for the production of iron and steel.

CSTL: crude steel.

BFG: blast furnace gas.

Applicability conditions

3. This methodology is applicable in the following sectoral scope, as defined in the List of Sectoral Scopes published in the UNFCCC website:

Sectoral Scope 4: Manufacturing industries

4. This methodology applies to project activities that reduce CO2 emissions by means of replacement of production process from conventional integrated steelmaking approach with blast furnace and converter: specifically, utilizing waste COG as reducing agent at direct reduction stage in a direction reduction furnace (DRF) while utilizing sponge iron, the product in the DR process, for crude steel production in an electric furnace.

5. The methodology is applicable under the following conditions:

Condition 1:
The project activity is producing sponge iron through direct reduction approach using coke oven gas as a reducing agent.

Condition 2:
Sponge iron, produced with a direct reduction approach, is utilized for producing crude steel with an electric furnace.

Condition 3:
When there is no project activity, COG, which is to be used for the project activity, should have been flared or used as an alternative of city gas.

When flared, this shall be proven by one of the following:

a. By direct measurements of the amount of COG flared for at least three years prior to the start of the project activity, or as long as the coke plant has been in operation.

b. Energy balance of relevant sections of the coke plant to prove that the COG supplied to the project activity is not a source of energy before the implementation of the project activity. For the energy balance the representative process parameters are required. The energy balance must demonstrate that the COG is not used and also provide conservative estimations of the energy content and amount of COG released.

c. Process plant manufacturer’s original specification/information, schemes and diagrams from the construction of the facility, if endorsement is obtained from a third party expert, can be used as an estimate of quantity and energy content of surplus COG produced for rated plant capacity/per unit of product produced.

When COG is utilised as energy, either of those below should be adopted.

a. After COG is utilised for producing sponge iron with direct reduction approach, it is used for energy resource.
b. After COG is utilised for producing sponge iron with direct reduction approach, it is delivered to energy supplier in the region as an energy resource such as city gas.

That the actual situation corresponds to the specifications must be ascertained through on site checks by a DOE prior to project implementation.

Condition 4:
For the producing process of crude steel in the region where the project is conducted,

a) a blast furnace and converter are connected in a single process is adopted in general,

or

b) the processes of pig iron production, crude steel production and steelmaking are implemented in a single premises or a single industrial estate.

Condition 5:
In a single province or a designated region, the production rate of crude steel with a single process of a blast furnace and converter, connected is over 50%.

To confirm applicability of Condition 1, DOE checks project's feasibility study report and the other supplemental documents and implement site visit.

To confirm applicability of Condition 2, DOE checks project's feasibility study report and the other supplemental documents and implement site visit.

To confirm applicability of Condition 3, DOE checks project's feasibility study report and the other supplemental documents and implement site visit.

To confirm applicability of Condition 4, DOE inspects the documents of public agencies and interviews relevant authorities.

To confirm applicability of Condition 5, DOE inspects the documents of public agencies and interviews relevant authorities.

6. Finally, this methodology is only applicable if the application of the procedure to identify the baseline scenario results in that the following combination is the most plausible baseline scenario.

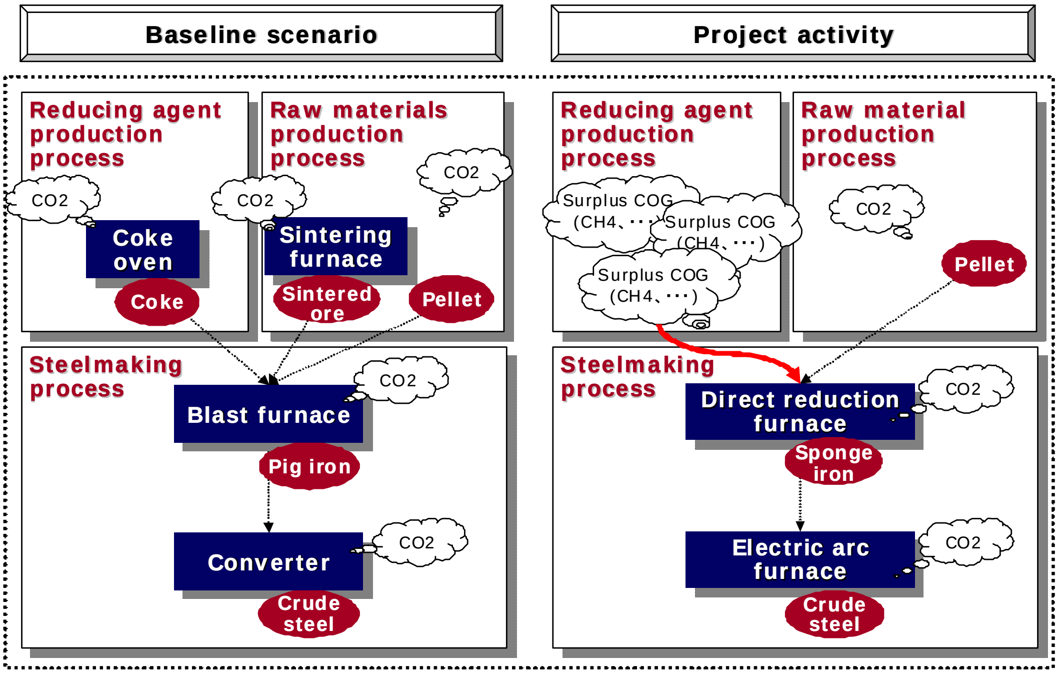
COG treatment/disposal: Continued flaring of COG at the coke production plant.

Baseline of crude steel production: crude steel is produced in the steelmaking process with a single process of a blast furnace and converter, connected.

II. BASELINE METHODOLOGY PROCEDURE

Project boundary

7. The following figure shows the **spatial extent** of the project boundary.



8. The greenhouse gases included in or excluded from the project boundary are shown in **Table 1**.

Table 1: Emissions sources included in or excluded from the project boundary

	Source	Gas	Included?	Justification / Explanation
Baseline	Coke Oven	CO_2	Yes	Main emission source.
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
	Sintering Furnace	CO_2	Yes	Main emission source.
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
	Pellet Furnace	CO_2	Yes	Main emission source.
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
	Blast Furnace	CO_2	Yes	Main emission source.
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
	Converter	CO_2	Yes	Main emission source.
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
Project activity	Pellet Furnace	CO_2	Yes	May be an important emission source.
		CH_4	No	Excluded for simplification. This emission source will be negligible.
		N_2O	No	Excluded for simplification. This emission source will be negligible.
	Direct Reduction Furnace	CO_2	Yes	May be an important emission source.
		CH_4	No	Excluded for simplification. This emission source will be negligible.
		N_2O	No	Excluded for simplification. This emission source will be negligible.
	Electric Furnace	CO_2	Yes	May be an important emission source.
		CH_4	No	Excluded for simplification. This emission source will be negligible.
		N_2O	No	Excluded for simplification. This emission source will be negligible.

Identification of the baseline scenario

9. Project participants shall apply the following steps to identify the baseline scenario:

The baseline scenario for the project activity is identified using a 3-step process.

Step 1: List all realistic credible baseline candidates

As baseline scenarios, realistic and plausible baseline candidates are to be all listed. Options of baseline scenarios to be listed are for the two below respectively.

a) Baseline scenario related to the use of COG

b) Baseline scenario related to the methodology of producing crude steel

Baseline scenario related to the use of COG:

COG-A: Continued flaring of COG at the coke producing facilities.
COG-B: Recovery, processing and distribution of COG into a fuel/a useful product other than DME (e.g. methanol, ammonia, hydrogen, town gas, SNG)
COG-C: COG used for power generation for other specific users.
COG-D: COG used for power generation for supply to the grid.
COG-E: COG used as a thermal energy source by a steel plant or other industrial process.
COG-F: COG used as a reducing agent for the production of sponge iron (not as the CDM project activity).

Baseline scenario related to the methodology of producing crude steel:

CSTL-A: Steelmaking by blast furnace-converter approach using coke
CSTL-B: Electric furnace steelmaking with iron scrap as raw material
CSTL-C: Direct reduction steelmaking (using natural gas as reducing agent)

Step 2: Eliminate candidates which do not comply with applicable laws and regulations

Candidates which do not comply with applicable laws and regulations are eliminated by applying Sub-step 1b of the latest version of the “Tool for demonstration and assessment of additionality”.

Step 3: Eliminate candidates which face prohibitive investment or other barriers

The project participant shall examine each of the candidates that were identified in step 1 less candidates which do not comply with applicable laws and regulations identified in the previous step (step 2) in order to determine the most likely baseline scenario. Step 3 of the latest approved version of the “Tool for determination and assessment of additionality” (the Additionality Tool) should be used to eliminate baseline scenarios which are clearly unattractive or associated with prohibitive barriers. If the remaining candidates number 2 or more, they shall be examined using Step 2 of the Additionality Tool. The most financially or economically attractive candidate is selected as the baseline scenario. If 2 or more baseline scenarios are deemed to be equally financially or economically attractive, then the least emissions intensive scenario shall be deemed to be the baseline.

Data requirements for baseline scenario determination are as stipulated in the relevant steps of the Additionality Tool.

The methodology is only applicable for the following combination of baseline scenarios:

Baseline scenario related to the use of COG: COG-A

Baseline scenario related to the methodology of producing crude steel: CSTL-A

Additionality: Please describe the procedure for demonstrating additionality

13. The additionality of the project is examined through the latest version of the Additionality Tool.

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a. Define alternatives to the project activity

The main plausible alternatives are described in Section 2 above (Baseline scenarios). The same scenarios are to be considered here for the purpose of determining additionality.

Sub-step 1b. Enforcement of applicable laws and regulations

As explained in Section 2 above, this step is also utilized when selecting the most plausible baseline scenario. No modification or additional guidance for this step is offered.

Step 2. Investment analysis

Prospects of profit will be examined, considering the income, outcome, ernings and costs, which comes from the process of purchasing or getting COG, producing crude steel and selling.

When flaring COG, the cost is excluded. That is not included in the estimation above.

Step 3. Barrier analysis

Technology barrier – The steelmaking with COG though direct reduction application, adopted in this project activity, is unprecedently new technology. It would be therefore natural to face a technological barrier when this project activity or a similar one were implemented.

Step 4. Common practice analysis

No additional guidance.

Baseline emissions

14. The baseline emissions in the methodology are GHG emissions in a general producing process of crude steel. For the estimation of the baseline emissions, it is necessary to break down the processes of producing crude steel to identify energy consumption from each process.

15. The difference between baseline emissions and project emissions is the abatement. For estimating the abatement, the difference in the specific emissions per production of crude steel is used. It is thus necessary for estimating baseline emissions to estimate baseline emissions per production of crude steel.

(1) Emissions from coke oven

$$COKEM_{CO2}^{BSL} = COK_{COG\_CO2}^{BSL} + COK_{BFG\_CO2}^{BSL} + COK_{ELE\_CO2}^{BSL} \quad (1)$$

Where:

$COKEM_{CO2}^{BSL}$	kg-CO2/t-coke	CO2 from the coke oven process for producing 1 ton of coke
$COK_{COG\_CO2}^{BSL}$	kg-CO2/t-coke	CO2 from COG combustion for producing 1 ton of coke
$COK_{BFG\_CO2}^{BSL}$	kg-CO2/t-coke	CO2 from BFG combustion for producing 1 ton of coke
$COK_{ELE\_CO2}^{BSL}$	kg-CO2/t-coke	CO2 from electricity consumption for producing 1 ton of coke

CO2 emissions from COG combustion

$$COK_{COG\_CO2}^{BSL} = prm_{COG\_C}^{BSL} / 100 \times COK_{COG}^{BSL} \times 44 / 22.4 \quad (2)$$

Where:

$COK_{COG\_CO2}^{BSL}$	kg-CO2/t-coke	CO2 from COG combustion for producing 1 ton of coke
$prm_{COG\_C}^{BSL}$	%	Carbon content of COG
COK_{COG}^{BSL}	m3-COG/t-coke	COG necessary for producing 1 ton of coke

$$COK_{COG}^{BSL} = prm_{coal\_COG}^{BSL} \times COK_{coal}^{BSL} \quad (3)$$

Where:

COK_{COG}^{BSL}	m3-COG/t-coke	COG necessary for producing 1 ton of coke
$prm_{coal\_COG}^{BSL}$	m3-COG/t-coal	Carbon content of coal
COK_{coal}^{BSL}	t-coal/t-coke	Coal necessary for producing 1 ton of coke

CO2 emissions from BFG combustion

$$COK_{BFG\_CO2}^{BSL} = prm_{BFG\_C}^{BSL} / 100 \times COK_{BFG}^{BSL} \times 44 / 22.4 \quad (4)$$

Where:

$COK^{BSL}_{BFG\_CO2}$	kg-BFG/t-coke	CO2 from BFG combustion for producing 1 ton of coke
$prm^{BSL}_{BFG\_C}$	%	Carbon content of BFG
COK^{BSL}_{BFG}	m3-BFG/t-coke	BFG necessary for producing 1 ton of coke

CO2 emissions from electricity consumption

$$COK^{BSL}_{ELE\_CO2} = EF^{BSL}_{grid} \times COK^{BSL}_{ELE\_grid} + EF^{BSL}_{SG} \times COK^{BSL}_{ELE\_SG} \quad (5)$$

Where:

$COK^{BSL}_{ELE\_CO2}$	kg-CO2/t-coke	CO2 from electricity consumed for producing 1 ton of coke
EF^{BSL}_{grid}	kg-CO2/kWh	CO2 emission coefficient for power grid
$COK^{BSL}_{ELE\_grid}$	kWh/t-coke	Electricity consumed from power grid for producing 1 ton of coke
EF^{BSL}_{SG}	kg-CO2/kWh	CO2 emission coefficient for on-site power generation
$COK^{BSL}_{ELE\_SG}$	kWh/t-coke	Electricity consumed from on-site power generation for producing 1 ton of coke

(2) Emissions from sintering furnace

$$SINEM^{BSL}_{CO2} = SIN^{BSL}_{coal\_CO2} + SIN^{BSL}_{BFG\_CO2} + SIN^{BSL}_{ELE\_CO2} \quad (6)$$

Where:

$SINEM^{BSL}_{CO2}$	kg-CO2/t-sinter ore	CO2 from the sintering furnace process for producing 1 ton of sintered ore
$SIN^{BSL}_{coal\_CO2}$	kg-CO2/t-sinter ore	CO2 from coal combustion for producing 1 ton of sintered ore
$SIN^{BSL}_{BFG\_CO2}$	kg-CO2/t-sinter ore	CO2 from BFG combustion for producing 1 ton of sintered ore
$SIN^{BSL}_{ELE\_CO2}$	kg-CO2/t-sinter ore	CO2 from electricity consumed for producing 1 ton of sintered ore

CO2 emissions from coal combustion

$$SIN^{BSL}_{coal\_CO2} = prm^{BSL}_{SINcoal\_C} / 100 \times SIN^{BSL}_{coal} \times 1000 \times 44/12 \quad (7)$$

Where:

$SIN^{BSL}_{coal\_CO2}$	kg-CO2/t-sinter ore	CO2 from coal combustion for producing 1 ton of sintered ore
$prm^{BSL}_{SINcoal\_C}$	%	Carbon content of coal
SIN^{BSL}_{coal}	t-coal/t-sinter ore	Coal necessary for producing 1 ton of sintered ore

CO2 emissions from combustion of blast furnace gas (BFG)

$$SIN_{BFG\_CO2}^{BSL} = prm_{BFG\_C}^{BSL} / 100 \times SIN_{BFG}^{BSL} \times 44 / 22.4 \quad (8)$$

Where:

$SIN_{BFG\_CO2}^{BSL}$	kg-CO2/t-sinter ore	CO2 from BFG combustion for producing 1 ton of sintered ore
$prm_{BFG\_C}^{BSL}$	%	Carbon content of BFG
SIN_{BFG}^{BSL}	m3-BFG/t-sinter ore	BFG necessary for producing 1 ton of sintered ore

CO2 emissions from electricity consumption

$$SIN_{ELE\_CO2}^{BSL} = EF_{grid}^{BSL} \times SIN_{ELE\_grid}^{BSL} + EF_{SG}^{BSL} \times SIN_{ELE\_SG}^{BSL} \quad (9)$$

Where:

$SIN_{ELE\_CO2}^{BSL}$	kg-CO2/t-sinter ore	CO2 from electricity consumed for producing 1 ton of sintered ore
EF_{grid}^{BSL}	kg-CO2/kWh	CO2 emission coefficient for power grid
$SIN_{ELE\_grid}^{BSL}$	kWh/t-sinter ore	Electricity consumed by power grid for producing 1 ton of sintered ore
EF_{SG}^{BSL}	kg-CO2/kWh	CO2 emission coefficient for on-site power generation
$SIN_{ELE\_SG}^{BSL}$	kWh/t-sinter ore	Electricity consumed for on-site power generation for producing 1 ton of sintered ore

(3) Emissions from pellet production process

$$PELEM_{CO2}^{BSL} = PEL_{BFG\_CO2}^{BSL} + PEL_{ELE\_CO2}^{BSL} \quad (10)$$

Where:

$PELEM_{CO2}^{BSL}$	kg-CO2/t-pellet	CO2 from the process of production for producing 1 ton of pellet
$PEL_{BFG\_CO2}^{BSL}$	kg-CO2/t-pellet	CO2 from BFG combustion for producing 1 ton of pellet
$PEL_{ELE\_CO2}^{BSL}$	kg-CO2/t-pellet	CO2 from electricity consumed for producing 1 ton of pellet

CO2 emissions from combustion of blast furnace gas (BFG)

$$PEL_{BFG\_CO2}^{BSL} = prm_{BFG\_C}^{BSL} / 100 \times PEL_{BFG}^{BSL} \times 44 / 22.4 \quad (11)$$

Where:

$PEL_{BFG\_CO2}^{BSL}$	kg-CO2/t-pellet	CO2 from BFG combustion for producing 1 ton of pellet
$prm_{BFG\_C}^{BSL}$	%	Carbon content of BFG
PEL_{BFG}^{BSL}	m3-BFG/t-pellet	BFG necessary for producing 1 ton of pellet

CO2 emissions from electricity consumption

$$PEL^{BSL}_{ELE\_CO2} = EF^{BSL}_{grid} \times PEL^{BSL}_{ELE\_grid} + EF^{BSL}_{SG} \times PEL^{BSL}_{ELE\_SG} \quad (12)$$

Where:

$PEL^{BSL}_{ELE\_CO2}$	kg-CO2/t-pellet	CO2 from electricity consumed for producing 1 ton of pellet
EF^{BSL}_{grid}	kg-CO2/kWh	CO2 emission coefficient for power grid
$PEL^{BSL}_{ELE\_grid}$	kWh/t-pellet	Electricity consumed from power grid for producing 1 ton of pellet
EF^{BSL}_{SG}	kg-CO2/kWh	CO2 emission coefficient for on-site power generation
$PEL^{BSL}_{ELE\_SG}$	kWh/t-pellet	Electricity consumed from on-site power generation for producing 1 ton of pellet

(4) Emissions from blast furnace

$$BLFEM^{BSL}_{CO2} = BLF^{BSL}_{BFG\_CO2} + BLFBLF^{BSL}_{ELE\_CO2} \quad (13)$$

Where:

$BLFEM^{BSL}_{CO2}$	kg-CO2/t-pig iron	CO2 from blast furnace process for producing 1 ton of pig iron
$BLF^{BSL}_{BFG\_CO2}$	kg-CO2/t-pig iron	CO2 from BFG combustion for producing 1 ton of pig iron
$BLF^{BSL}_{ELE\_CO2}$	kg-CO2/t-pig iron	CO2 from electricity consumed for producing 1 ton of pig iron

CO2 emissions from combustion of blast furnace gas (BFG)

$$BLF^{BSL}_{BFG\_CO2} = prm^{BSL}_{BFG\_C} / 100 \times BLF^{BSL}_{BFG} \times 44 / 22.4 \quad (14)$$

Where:

$BLF^{BSL}_{BFG\_CO2}$	kg-CO2/t-pig iron	CO2 from BFG combustion for producing 1 ton of pig iron
$prm^{BSL}_{BFG\_C}$	%	Carbon content of coke
BLF^{BSL}_{BFG}	t-coke/t-pig iron	BFG necessary for producing 1 ton of pig iron

CO2 emissions from electricity consumption

$$BLF^{BSL}_{ELE\_CO2} = EF^{BSL}_{grid} \times BLF^{BSL}_{ELE\_grid} + EF^{BSL}_{SG} \times BLF^{BSL}_{ELE\_SG} \quad (15)$$

Where:

$BLF^{BSL}_{ELE\_CO2}$	kg-CO2/t-pig iron	CO2 from electricity consumed for producing 1 ton of pig iron
EF^{BSL}_{grid}	kg-CO2/kWh	CO2 emission coefficient for power grid
$BLF^{BSL}_{ELE\_grid}$	kWh/t-pig iron	Electricity consumed by power grid for producing 1 ton of pig iron

EF_{SG}^{BSL}	kg-CO2/kWh	CO2 emission coefficient for on-site power generation
$BLF_{ELE\_SG}^{BSL}$	kWh/t-pig iron	Electricity consumed from on-site power generation for producing 1 ton of pig iron

(5) Emission from converter

$$CVTEM_{CO2}^{BSL} = CVT_{COG\_CO2}^{BSL} + CVT_{ELE\_CO2}^{BSL} \quad (16)$$

Where:

$CVTEM_{CO2}^{BSL}$	kg-CO2/t-crude steel	CO2 from converter process for producing 1 ton of crude steel
$CVT_{COG\_CO2}^{BSL}$	kg-CO2/t-crude steel	CO2 from COG combustion for producing 1 ton of crude steel
$CVT_{ELE\_CO2}^{BSL}$	kg-CO2/t-crude steel	CO2 from electricity consumed for producing 1 ton of crude steel

CO2 emissions from COG combustion

$$CVT_{COG\_CO2}^{BSL} = prm_{COG\_C}^{BSL} / 100 \times CVT_{COG}^{BSL} \times 44/22.4 \quad (17)$$

Where:

$CVT_{COG\_CO2}^{BSL}$	kg-CO2/t-crude steel	CO2 from COG for producing 1 ton of crude steel
$prm_{COG\_C}^{BSL}$	%	Carbon content of COG
CVT_{COG}^{BSL}	m3-COG/t-crude steel	COG necessary for producing 1 ton of crude steel

CO2 emissions from electricity consumption

$$CVT_{ELE\_CO2}^{BSL} = EF_{grid}^{BSL} \times CVT_{ELE\_grid}^{BSL} + EF_{SG}^{BSL} \times CVT_{ELE\_SG}^{BSL} \quad (18)$$

Where:

$CVT_{ELE\_CO2}^{BSL}$	kg-CO2/t-crude steel	CO2 from electricity consumed for producing 1 ton of crude steel
EF_{grid}^{BSL}	kg-CO2/kWh	CO2 emission coefficient for power grid
$CVT_{ELE\_grid}^{BSL}$	kWh/t-crude steel	Electricity consumed by power grid for producing 1 ton of crude steel
EF_{SG}^{BSL}	kg-CO2/kWh	CO2 emission coefficient for on-site power generation
$CVT_{ELE\_SG}^{BSL}$	kWh/t-crude steel	Electricity consumed from on-site power generation for producing 1 ton of crude steel

(6) CO2 emissions on baseline

$$\begin{aligned} EM_{CO2}^{BSL} &= COKEM_{CO2}^{BSL} \times CSTL_{coke}^{BSL} + SINEM_{CO2}^{BSL} \times CSTL_{siore}^{BSL} \\ &+ PELEM_{CO2}^{BSL} \times CSTL_{pellet}^{BSL} + BFL_{CO2}^{BSL} \times CSTL_{pigiron}^{BSL} + CVTEM_{CO2}^{BSL} \end{aligned} \quad (19)$$

Where:

EM_{CO2}^{BSL}	kg-CO2/t-crude steel	CO2 from all process for producing 1 ton of crude steel on baseline
$CSTL_{coke}^{BSL}$	t-coke/t-crude steel	Coke necessary for producing 1 ton of crude steel
$CSTL_{siore}^{BSL}$	t-sintered ore/t-crude steel	Sintered ore necessary for producing 1 ton of crude steel
$CSTL_{pellet}^{BSL}$	t-pellet/t-crude steel	Pellet necessary for producing 1 ton of crude steel
$CSTL_{pigiron}^{BSL}$	t-pig iron/t-crude steel	Pig iron necessary for producing 1 ton of crude steel

Project emissions

16. Project emissions in this methodology are classified into three sources of CO2 shown below.

- Pellet Furnace
- Direct Reduction Furnace
- Electricity Furnace

17. Project emissions are estimated for each amount of crude steel produced in CO2 as the estimation of CO2 emissions in the baseline.

(1) Emissions from pellet production process

$$PELEM_{CO2}^{PRJ} = PEL_{BFG\_CO2}^{PRJ} + PEL_{ELE\_CO2}^{PRJ} \quad (20)$$

Where:

$PELEM_{CO2}^{PRJ}$	kg-CO2/t-pellet	CO2 from pellet production process for producing 1 ton of pellet
$PEL_{BFG\_CO2}^{PRJ}$	kg-CO2/t-pellet	CO2 from BFG combustion for producing 1 ton of pellet
$PEL_{ELE\_CO2}^{PRJ}$	kg-CO2/t-pellet	CO2 from electricity consumed for producing 1 ton of pellet

CO2 emissions from combustion of blast furnace gas(BFG)

$$PEL_{BFG\_CO2}^{PRJ} = prm_{BFG\_C}^{PRJ} / 100 \times PEL_{BFG}^{PRJ} \times 44 / 22.4 \quad (21)$$

Where:

$PEL_{BFG\_CO2}^{PRJ}$	kg-CO2/t-pellet	CO2 from BFG combustion for producing 1 ton of pellet
$prm_{BFG\_C}^{PRJ}$	%	Carbon content of BFG
PEL_{BFG}^{PRJ}	m3-BFG/t-pellet	BFG necessary for producing 1 ton of pellet

CO2 emissions from electricity consumption

$$PEL^{PRJ}_{ELE\_CO2} = EF^{PRJ}_{grid} \times PEL^{PRJ}_{ELE\_grid} + EF^{PRJ}_{SG} \times PEL^{PRJ}_{ELE\_SG} \quad (22)$$

Where:

$PEL^{PRJ}_{ELE\_CO2}$	kg-CO2/t-pellet	CO2 from electricity consumed for producing 1 ton of pellet
EF^{PRJ}_{grid}	kg-CO2/kWh	CO2 emission coefficient for power grid
$PEL^{PRJ}_{ELE\_grid}$	kWh/t-pellet	Electricity consumed by power grid for producing 1 ton of pellet
EF^{PRJ}_{SG}	kg-CO2/kWh	CO2 emission coefficient for on-site power generation
$PEL^{PRJ}_{ELE\_SG}$	kWh/t-pellet	On-site generated power consumption for producing 1 ton of pellet

(2) Emissions from direct reduction furnace

$$DRFEM^{PRJ}_{CO2} = DRF^{PRJ}_{COG\_CO2} + DRF^{PRJ}_{ELE\_CO2} \quad (23)$$

Where:

$DRFEM^{PRJ}_{CO2}$	kg-CO2/t-sponge iron	CO2 from converter process for producing 1 ton of sponge iron
$DRF^{PRJ}_{COG\_CO2}$	kg-CO2/t-sponge iron	CO2 from COG combustion for producing 1 ton of sponge iron
$DRF^{PRJ}_{ELE\_CO2}$	kg-CO2/t-sponge iron	CO2 from electricity consumption for producing 1 ton of sponge iron

CO2 emissions from COG combustion

$$DRF^{PRJ}_{COG\_CO2} = prm^{PRJ}_{COG\_C} / 100 \times DRF^{PRJ}_{COG} \times 44 / 22.4 \quad (24)$$

Where:

$DRF^{PRJ}_{COG\_CO2}$	kg-CO2/t-sponge iron	CO2 from COG combustion for producing 1 ton of sponge iron
$prm^{PRJ}_{COG\_C}$	%	Carbon content of COG
DRF^{PRJ}_{COG}	m3-COG/t-sponge iron	COG necessary to produce 1 ton of sponge iron

CO2 emissions from electricity consumption

$$DRF^{PRJ}_{ELE\_CO2} = EF^{PRJ}_{grid} \times DRF^{PRJ}_{ELE\_grid} + EF^{PRJ}_{SG} \times DRF^{PRJ}_{ELE\_SG} \quad (25)$$

Where:

$DRF^{PRJ}_{ELE\_CO2}$	kg-CO2/t-sponge iron	CO2 from electricity consumed for producing 1 ton of sponge iron
EF^{PRJ}_{grid}	kg-CO2/kWh	CO2 emission coefficient for power grid

$DRF_{ELE\_grid}^{PRJ}$	kWh/t-sponge iron	Electricity consumed by power grid for producing 1 ton of sponge iron
EF_{SG}^{PRJ}	kg-CO2/kWh	CO2 emission coefficient for on-site power generation
$DRF_{ELE\_SG}^{PRJ}$	kWh/t-sponge iron	Electricity consumed from on-site power generation for producing 1 ton of sponge iron

(3) CO2 emissions in electric arc furnace

$$ELFEM_{CO2}^{PRJ} = ELF_{ELE\_CO2}^{PRJ} \quad (26)$$

Where:

$ELFEM_{CO2}^{PRJ}$	kg-CO2/t-crude steel	CO2 from electric furnace process for producing 1 ton of crude steel
$ELF_{ELE\_CO2}^{PRJ}$	kg-CO2/t-crude steel	CO2 from electricity consumed for producing 1 ton of crude steel

CO2 emissions from electricity consumption

$$ELF_{ELE\_CO2}^{PRJ} = EF_{grid}^{PRJ} \times ELF_{ELE\_grid}^{PRJ} + EF_{SG}^{BSL} \times ELF_{ELE\_SG}^{PRJ} \quad (27)$$

Where:

$ELF_{ELE\_CO2}^{PRJ}$	kg-CO2/t-crude steel	CO2 from electricity consumed for producing 1 ton of crude steel
EF_{grid}^{PRJ}	kg-CO2/kWh	CO2 emission coefficient for power grid
$ELF_{ELE\_grid}^{PRJ}$	kWh/t-crdue steel	Electricity consumed by power grid for producing 1 ton of crude steel
EF_{SG}^{PRJ}	kg-CO2/kWh	CO2 emission coefficient for on-site power generation
$ELF_{ELE\_SG}^{PRJ}$	kWh/t-crude steel	Electricity consumed from on-site power generation for producing 1 ton of crude steel

(4) CO2 emissions on the project activity

Regarding CO2 emissions from each process as described in (1) – (3), each value is converted into CO2 emissions per 1 ton crude steel production to obtain CO2 emissions per 1 ton crude steel production on the project activity.

$$EM_{CO2}^{PRJ} = PELEM_{CO2}^{PRJ} \times CSTL_{pellet}^{PRJ} + DRFEM_{CO2}^{PRJ} \times CSTL_{spongeiron}^{PRJ} + ELFEM_{CO2}^{PRJ} \quad (28)$$

Where:

EM_{CO2}^{PRJ}	kg-CO2/t-crude steel	CO2 from all processes for producing 1 ton of crude steel in the project case
$CSTL_{pellet}^{PRJ}$	t-pellet/t-crude steel	Pellet necessary for producing 1 ton of crude steel

$CSTL_{spongeiron}^{PRJ}$	t-sponge iron/t-crude steel	Sponge iron necessary for producing 1 ton of crude steel

Leakage

18. No leakage.

Emission reductions

19. Emission reductions are calculated as follows:

$$ER_y = (EM_{CO2}^{BSL} - EM_{CO2,y}^{PRJ}) \times PRD_{crd\_stl}^{PRJ} - LE_y \quad \textbf{(29)}$$

Where:

ER_y	=	Emission reductions in year *y* (tCO2/yr)
EM_{CO2}^{BSL}	=	CO2 from all processes for producing 1 ton of crude steel in baseline case（tCO2/t-crude steel）
$EM_{CO2,y}^{PRJ}$	=	CO2 from all processes for producing 1 ton of crude steel in project case（tCO2/t-crude steel）
$PRD_{crd\_stl}^{PRJ}$	=	Crude steel produced in project case（t-crude steel/y）
LE_y	=	Leakage emissions in year *y* (tCO2/yr)

Changes required for methodology implementation in 2nd and 3rd crediting periods

20. At the start of the second and third crediting period for a project activity, project participants should address these two issues by following the methodological procedure below.

(1) Assessing the continued validity of the baseline
In assessing the continued validity of the baseline, applicability conditions including a change in the relevant national and/or sectoral regulations between two crediting periods has to be examined at the start of the new crediting period. If the project activity was not mandated by regulations at the first start of the project activity, but at the start of the second or third crediting period regulations are in place that enforce the practice or norms or technologies that are used by the project activity, the new regulation (formulated after the registration of the project activity) has to be examined to determine if it applies to existing plants or not. If the new regulation applies to existing CDM project activities, the baseline has to be reviewed, and if the regulation is binding, the baseline for the project activity should take this into account. This assessment will be undertaken by the verifying DOE;

(2) Updating the baseline
1) For updating the baseline at the start of the second and third crediting period, there shall be no change in the methodology for determining the baseline emissions. However, new data available will be used to

revise the baseline emissions.
2) In the case of baseline where emission factors are determined ex ante (and not updated during a crediting period), the baseline emissions factor shall be updated for the subsequent crediting period. This shall not be necessary for baselines which are constantly updated. In both cases, the CDM project activities are not included in the revised estimation of the baseline emissions;
3) Project participants shall assess and incorporate the impact of new regulations on baseline emissions.

Data and parameters not monitored

21. In addition to the parameters listed in the tables below, the provisions on data and parameters not monitored in the tools referred to in this methodology apply.

(1) Baseline emission

Data / parameter:	$prm_{COG\_C}^{BSL}$
Data unit:	%
Description:	Carbon content of COG
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$prm_{Coal\_COG}^{BSL}$
Data unit:	m3-COG/t-coal
Description:	COG emitted from 1 ton of coal in coke oven
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	COK_{coal}^{BSL}
Data unit:	t-coal/t-coke
Description:	Coal necessary for producing 1 ton of coke
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	COK_{BFG}^{BSL}
Data unit:	m3-BFG/t-coke
Description:	BFG necessary for producing 1 ton of coke
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	EF_{grid}^{BSL}
Data unit:	kg-CO2/kWh
Description:	CO2 emission coefficient for power grid
Source of data:	Data from statistics
Measurement procedures (if any):	Tool to calculate the emission factor for an electricity system
Any comment:	

Data / parameter:	$COK_{ELE\_grid}^{BSL}$
Data unit:	kWh/t-coke
Description:	Purchased electricity from power grid for producing 1 ton of coke
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	EF_{SG}^{BSL}
Data unit:	kg-CO2/kWh
Description:	CO2 emission coefficient for on-site power generation
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$COK_{ELE\_SG}^{BSL}$
Data unit:	kWh/t-coke
Description:	Electricity consumed from on-site power generation for producing 1 ton of coke
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$prm_{SINcoal\_C}^{BSL}$
Data unit:	%
Description:	Carbon content of coal
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	SIN_{coal}^{BSL}
Data unit:	t-coal/t-sinter
Description:	Coal necessary for producing 1 ton of sinter ore
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$prm_{BFG\_C}^{BSL}$
Data unit:	%
Description:	Carbon content of BFG
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	SIN_{BFG}^{BSL}
Data unit:	m3-BFG/t-sinter
Description:	BFG necessary for producing 1 ton of sintered ore
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$SIN_{ELE\_grid}^{BSL}$
Data unit:	kWh/t-sintered ore
Description:	Electricity consumed from power grid for producing 1 ton of sintered ore
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$SIN_{ELE\_SG}^{BSL}$
Data unit:	kWh/t-sintered ore
Description:	Electricity consumed from on-site power generation for producing 1 ton of sintered ore
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	PEL_{BFG}^{BSL}
Data unit:	m3-BFG/t-pellet
Description:	BFG necessary for producing 1 ton of pellets
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$PEL_{ELE\_grid}^{BSL}$
Data unit:	kWh/t-pellet
Description:	Electricity consumed from power grid for producing 1 ton of pellets
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$PEL_{ELE\_SG}^{BSL}$
Data unit:	kWh/t-pellet
Description:	Electricity consumed from on-site power generation for producing 1 ton of pellets
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$prm_{coke\_C}^{BSL}$
Data unit:	%
Description:	Carbon content of coke
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	BLF_{BFG}^{BSL}
Data unit:	m3-BFG/t-pig iron
Description:	BGF necessary for producing 1 ton of pig iron
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$BLF_{ELE\_grid}^{BSL}$
Data unit:	kWh/t-pig iron
Description:	Electricity consumed from power grid for producing 1 ton of pig iron
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$BLF_{ELE\_SG}^{BSL}$
Data unit:	kWh/t-pig iron
Description:	Electricity consumed from on-site power generation for producing 1 ton of pig iron
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	CVT_{COG}^{BSL}
Data unit:	m3-COG/t-crude steel
Description:	COG necessary for producing 1 ton of crude steel
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$CVT_{ELE\_grid}^{BSL}$
Data unit:	kWh/t-crude steel
Description:	Electricity consumed from power grid for producing 1 ton of crude steel
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$CVT_{ELE\_SG}^{BSL}$
Data unit:	kWh/t-crude steel
Description:	Electricity consumed from on-site power generation for producing 1 ton of crude steel
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$CSTL_{coke}^{BSL}$
Data unit:	t-coke/t-crude steel
Description:	Coke necessary for producing 1 ton of crude steel
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$CSTL_{siore}^{BSL}$
Data unit:	t-sintered ore/t-crude steel
Description:	Sintered ore necessary for producing 1 ton of crude steel
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$CSTL_{pellet}^{BSL}$
Data unit:	t-pellet/t-crude steel
Description:	Pellets necessary for producing 1 ton of crude steel
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

Data / parameter:	$CSTL_{pigiron}^{BSL}$
Data unit:	t-pig iron/t-crude steel
Description:	Pig iron necessary for producing 1 ton of crude steel
Source of data:	Data from statistics
Measurement procedures (if any):	Data from statistics and documents from the Iron and Steel Institute of China and public research institutes
Any comment:	

(2) Project emission

Data / parameter:	EF_{grid}^{PRJ}
Data unit:	kg-CO2/kWh
Description:	CO2 emission coefficient for power grid
Source of data:	Data from statistics
Measurement procedures (if any):	Same as EF_{grid}^{BSL}
Any comment:	

Data / parameter:	EF_{SG}^{PRJ}
Data unit:	kg-CO2/kWh
Description:	CO2 emission coefficient for on-site power generation
Source of data:	Data from statistics
Measurement procedures (if any):	Same as EF_{SG}^{BSL}
Any comment:	

III. MONITORING METHODOLOGY

22. All data collected as part of monitoring should be archived electronically and be kept at least for 2 years after the end of the last crediting period. 100% of the data should be monitored if not indicated otherwise in the tables below. All measurements should be conducted with calibrated measurement equipment according to relevant industry standards.

23. In addition, the monitoring provisions in the tools referred to in this methodology apply.

Data and parameters monitored

24.

Data / parameter:	$prm_{BFG\_C}^{PRJ}$
Data unit:	%
Description:	Carbon included in BFG
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	PEL_{BFG}^{PRJ}
Data unit:	m3-BFG/t-pellet
Description:	BFG necessary for producing 1 ton of pellets
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$PEL_{ELE\_grid}^{PRJ}$
Data unit:	kWh/t-pellet
Description:	Electricity consumed from power grid for producing 1 ton of pellets
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$PEL_{ELE\_SG}^{PRJ}$
Data unit:	kWh/t-pellet
Description:	Electricity consumed from on-site power generation for producing 1 ton of pellets
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$prm_{COG\_C}^{PRJ}$
Data unit:	%
Description:	Carbon content of COG
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	DRF_{COG}^{PRJ}
Data unit:	m3-COG/t-sponge iron
Description:	COG necessary for producing 1 ton of sponge iron
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$DRF_{ELE\_grid}^{PRJ}$
Data unit:	kWh/t-sponge iron
Description:	Electricity consumed from power grid for producing 1 ton of sponge iron
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$DRF_{ELE\_SG}^{PRJ}$
Data unit:	kWh/t-sponge iron
Description:	Electricity consumed from on-site power generation for producing 1 ton of sponge iron
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$ELF_{ELE\_grid}^{PRJ}$
Data unit:	kWh/t-crdue steel
Description:	Electricity consumed from power grid for producing 1 ton of crude steel
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$ELF_{ELE\_SG}^{PRJ}$
Data unit:	kWh/t-crude steel
Description:	Electricity consumed from on-site power generation for producing 1 ton of crude steel
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$CSTL_{pellet}^{PRJ}$
Data unit:	t-pellet/t-crude steel
Description:	Pellets necessary for producing 1 ton of crude steel
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$CSTL_{spongeiron}^{PRJ}$
Data unit:	t-sponge iron/t-crude steel
Description:	Sponge iron necessary for producing 1 ton of crude steel
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Monthly data is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by some useful evidences.
Any comment:	

Data / parameter:	$PRD_{crd\_stl}^{PRJ}$
Data unit:	t-crude steel/y
Description:	Crude steel produced in project case
Source of data:	Actual measurement
Measurement procedures (if any):	Monitoring is to be conducted through usual recording method for production, adopted in the factory.
Monitoring frequency:	Daily product volume is recorded and compiled annually.
QA/QC procedures:	The accuracy is checked by evidences such as shipping tickets and receipts.
Any comment:	

IV. REFERENCES AND ANY OTHER INFORMATION

Section D. Explanations / justifications to the proposed new baseline and monitoring methodology

Selected approach from paragraph 48 of the CDM modalities and procedures

25. The baseline approach taken in this methodology is to define the alternatives available to the project developer and to select the most economically attractive course of action, taking into account barriers to investment, as the baseline.

Definitions

26. All definitions are presented in the context of this methodology, and where not standardized, are produced for this methodologies context alone.

Applicability conditions

27. There is no additional reference information regarding applicability conditions.

Project boundary

28. The project boundary includes processes up to crude steel production. Therefore, even in the case that a plant producing sponge iron and a plant using the sponge iron for crude steel production are in different locations, both processes are included in this project boundary.

Identification of the baseline scenario

29. The baseline scenario is identified based on the existing and approved identification tool for baseline scenario.

Additionality

30. Using the "*Tool for the demonstration and assessment of additionality*" will ensure the methodology chosen to demonstrate additionality is in line with recommendations from the Executive Board.

31. The "Tool for demonstration and assessment of additionality" will provide a detailed determination of the baseline scenario.

Baseline emissions

32. Baseline emissions represent GHG emissions from general crude steel production. Baseline emissions are calculated by means of breaking down the crude steel production processes under the baseline scenario and then identifying energy consumption for each process.

Project emissions

33. Project emissions represent GHG emissions from crude steel production process in which COG is utilized as reducing agent. Project emissions are calculated by identifying energy consumption from each process of crude steel production in the project activity, as with calculation of baseline emissions.

Leakage

34. When sponge iron production plant and crude steel production plant are not in the same premises but located separately, a consideration should be given on whether GHG emissions from transport of sponge iron from sponge iron production plant to crude steel production plant would be included in leakage.

Emission reductions

35. Emission reductions are simply the baseline emissions minus project emissions and leakage.

Changes required for methodology implementation in 2nd and 3rd crediting periods

36. Methodology will be changed in the 2nd and the 3rd crediting periods if there is a major development in the crude steel production technology.

Monitoring methodology, including data and parameters not monitored

37. The parameters to be monitored are clear and straight forward and will require only that a very good information and data management system is put in place to track all the required data.

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History of the document

Version	Date	Nature of revision(s)
03.1	20 May 2008	• Second bullet of formatting instructions changed to refer to Sections C and D, rather than Section B; • Change in numbering of paragraphs.
03	EB 38, Annex 6 14 March 2008	• Revision of the structure of the document to reflect the sections of a standard approved baseline methodology. • Section A. Recommendation by the Methodological Panel • Section B. Summary and applicability of the baseline and monitoring methodology • Section C. Proposed new baseline and monitoring methodology • Section D. Explanations / justifications to the proposed new baseline and monitoring methodology
02	EB 32, Annex 17 22 June 2007	• The form "CDM-NM" was merged with the recommendation form "F-CDM-NMmp". The F-CDM-NMmp discontinued to be used. • The change was adopted in line with the revised "Procedures for submission and consideration of a proposed new methodology" in order to simplify and streamline the process of consideration of new methodologies.
01	EB 08, Annex 02 29 September 2006	Initial adoption