Approved baseline methodology AM0032

"Baseline methodology for waste gas or waste heat based cogeneration system"

Source

This baseline methodology is based on NM0107-rev methodology "Baseline methodology for waste gas based cogeneration system for power and steam generation" submitted by Alexandria Carbon Black Co. For more information regarding the proposals and their consideration by the Executive Board please refer to http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html.
This methodology also refers the approved methodology ACM0002, "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* and to the latest version of the "*Tool for the demonstration and assessment of additionality*"[1]

The selected approach from paragraph 48 of the CDM modalities and procedures is:

"Existing actual or historical emissions, as applicable"

Applicability

The methodology is applicable under the following conditions:

- The project activity is cogeneration of steam and electricity utilizing waste gas or waste heat (henceforth referred to as waste gas) as a fuel source;
- The cogeneration plant is installed at the site where waste gas (WG) is produced;
- The waste gas used for cogeneration is surplus and not required to meet on-site energy requirement of the industrial unit where waste gas is produced. The energy generated at the cogeneration plant is primarily for export to user(s) (also referred to as recipient plant(s));
- On-site use of the energy generated by the cogeneration plant, if any, shall not be considered for claiming certified emissions reductions (CERs).

An agreement is signed by the owner's of the project cogeneration plant (henceforth referred to as generator) with the recipient plant(s) that the emission reductions would not be claimed by recipient plant(s) for using a zero-emission energy source.This baseline methodology shall be used in conjunction with the approved monitoring methodology AM0032 ("Monitoring methodology for waste gas or waste heat based cogeneration system").

Project Boundary

The project boundary shall include geographical locations of, both, the generator and recipient plant(s).

The spatial extent of the project boundary comprises the waste heat or gas sources, captive power generating equipment, any equipment used to provide auxiliary heat to the waste heat recovery process,

[1] Please refer to: < http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

the power plants connected physically to the electricity grid that the proposed project activity will affect, and the thermal energy network of the project and the recipients plant..

Spatial extent of the grid is as defined in the "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM0002).

Overview of emission sources included in or excluded from the project boundary is provided in the following table:

	Source	Gas	Included?	Justification / Explanation
Baseline	Grid electricity generation	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
	Boiler for thermal energy	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
	Fossil fuel consumption in cogeneration plant	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
Project Activity				
	Supplemental fossil fuel consumption at the project plant	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification.
		N_2O	Excluded	Excluded for simplification.

The emissions from waste gas incineration are ignored, as the methodology is applicable only to baseline scenario where the waste gas is incinerated before release to the atmosphere.

Identification of the baseline scenario

The baseline scenario is identified as the most plausible baseline scenario among all realistic and credible alternative(s).

Realistic and credible alternatives should be separately determined for:

- Power generation in the absence of the CDM project activity;
- Waste gas/heat use in the absence of the project activity; and
- Steam generatation in the absence of the project activity.

Step 1: Define the most plausible baseline scenario for the generation of heat and electricity using the following baseline options and combinations.

For power generation, the realistic and credible alternative(s) may include, *inter alia:*

P1 Proposed project activity not undertaken as a CDM project activity

P2 On-site or off-site fossil fuel fired cogeneration plant or a captive power plant
P3 On-site or off-site renewable based cogeneration plant or a captive power plant
P4 On-site or off-site fossil fuel based existing plant
P5 Existing and/or new grid-connected power plants

For heat generation, realistic and credible alternative(s) may include, *inter alia*:

H1 Proposed project activity not undertaken as a CDM project activity
H2 On-site or off-site new fossil fuel based cogeneration plant
H3 On-site or off-site existing fossil fuel based cogeneration plant
H4 An existing or new fossil fuel based boilers
H5 An existing or new renewable energy based boilers or cogeneration plant
H6 Any other source such as district heat
H7 Other heat generation technologies (e.g. heat pumps or solar energy)

For the use of waste gas, the realistic and credible alternative(s) may include, *inter alia*:

W1 Waste gas is directly released to atmosphere without incineration
W2 Waste gas is released to the atmosphere after incineration or waste heat is released to the atmosphere
W3 Waste gas or waste heat is sold as an energy source
W4 Waste gas is used for meeting energy requirement of the industrial unit where it is generated

The generator, in consultation with the recipient plant(s), shall consider the above baseline options to develop a scenario matrix based on various combinations of baseline options. Exclusion of any baseline options shall be justified with documented evidence.

STEP 2: Identify the fuel for the baseline choice of energy source taking into account the national and/or sectoral policies as applicable.
Demonstrate that the identified baseline fuel is available in abundance in the host country and there is no supply constraint. In case of partial supply constraints (seasonal supply), the project participants may consider an alternative fuel that result in lowest baseline emissions during the period of partial supply.

Detailed justification shall be provided for the selected baseline fuel. A conservative approach, the lowest carbon intensive fuel such as natural gas through out the period may be used.

STEP 3: Step 2 and/or step 3 of the latest approved version of the "tool for demonstration and assessment of additionality" shall be used to assess to identify the most plausible baseline scenarios by eliminating non feasible options (e.g. alternatives where barriers are prohibitive or which are clearly economically unattractive).

STEP 4: If more than one credible and plausible alternative scenario remain, the alternative with the lowest baseline emissions shall be considered as the most likely baseline scenario.
The heat (or steam) and electricity are the subjects of recipient plant(s) and the waste gas is the subject of the generator. Hence, determination of baseline options, identification of most appropriate baseline scenario, determination of baseline fuel and demonstration and assessment of additionality, shall be carried out bygenerator in consultation with the recipient plant(s). For this purpose, the recipient plant(s) that consumes steam and/or electricity shall be identified at the time of preparation of PDD. The consultations with recipient plant(s) shall be documented.

This methodology is only applicable if the baseline scenario, for all the recipient plant(s) identified, is one of the two scenario's described in Table 1 below. The baseline scenario for all the recipient plant(s) should be the same.

Table 1: Combinations of baseline options and scenarios applicable to this methodology

Scenario	Baseline options			Description of situation
	Waste gas	Power	Heat	
1	W2	P4 or P5	H4	The electricity is obtained from an specific existing plant[2] or from the grid and heat from a fossil fuel based steam boiler
2	W2	P2	H2 / H3	The electricity and/or heat are generated by a fossil fuel based existing[3] / new cogeneration plant

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, available at the UNFCCC CDM website[4].

Baseline Emissions

The baseline emissions for the year *y* shall be determined as follows:

$$BE_y = BE_{Elec,y} + BE_{Ther,y} \quad \textbf{(1)}$$

where:

BE_y are total baseline emissions during the year *y* in tons of CO_2

$BE_{Elect,y}$ are baseline emissions from electricity during the year *y* in tons of CO_2

$BE_{Ther,y}$ are baseline emissions from thermal energy (as steam) during the year *y* in tons of CO_2

The calculation of baseline emissions ($BE_{electricity,y}$ and $BE_{thermal,y}$) depends on the identified baseline scenario.

Baseline emissions for Scenario 1

Scenario 1 represents the situation where the electricity is obtained from a specific existing plant or from the grid and heat from a fossil fuel based steam boiler.

a) Baseline emissions from electricity ($BE_{electricity,y}$) that is displaced by the project activity:

[2] In case operation of an existing plant is identified as the baseline scenario, the remaining lifetime of the existing plant shall be larger than the crediting period chosen.

[3] In case operation of an existing cogeneration plant is identified as the baseline scenario, the remaining lifetime of the existing plant shall be larger than the crediting period chosen.

[4] Please refer to: <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

$$BE_{Elect} = \sum_{i} EG_{i,y} * 3.6 * EF_{Elect,i,y} \qquad \textbf{(2)}$$

where:

$BE_{elect,y}$	are baseline emissions due to displacement of grid electricity during the year *y* in tons of CO_2.
$EG_{i,y}$	is the quantity of electricity supplied to the recipient plant 'i' by the generator during the year *y* in GWh, and
$EF_{elect,i,y}$	is the CO_2 emission factor for the electricity displaced due to the project activity in i^{th} recipient plant during the year *y* in tons CO_2/TJ
3.6	conversion factor expressed in GWh/TJ

If the displaced electricity is generated by an existing plant, the CO_2 emission factor of the displaced electricity shall be determined as follows:

$$EF_{Elect,i,y} = EF_{CO2} \cdot OXID \ / \eta_{Plant,i} \qquad \textbf{(3)}$$

where:

$EF_{CO2,i}$	is the CO_2 emission factor per unit of energy of the fuel used in the existing plant, in (tCO_2 / TJ), o*btained from reliable local or national data if available, otherwise, taken from the country specific IPCC default emission factors*
$OXID_i$	is the oxidation factor of the fuel , (see page 1.29 in the 1996 Revised IPCC Guidelines for default values)
$\eta_{Plant,i}$	is the overall efficiency of the existing plant that would be used by i^{th} recipient plant in the absence of the project activity, expressed as an average of historical data for 3 years preceding the start of the project activity.

The emission factor shall be estimated for each recipient separately.

If the displaced electricity is supplied by a connected grid system, the CO_2 emission factor of the electricity $EF_{elect,i,y}$ shall be determined following the guidance provided in the "Consolidated baseline methodology for grid-connected electricity generation from renewable sources (ACM0002)".

b) Baseline emissions from thermal energy ($BE_{ther,y}$):

$$BE_{Ther,y} = \sum_{i} HG_{i,y} \cdot EF_{Steam,i,y} \qquad \textbf{(4)}$$

where:

$BE_{Therl,y}$	are baseline emissions from thermal energy (as steam) during the year *y* in tons of CO_2
$HG_{y,i}$	is the net quantity of heat supplied to the recipient plant i by the project activity during the year *y* in TJ, expressed as difference of energy content of the between the steam supplied to the recipient plant and the condensate returned by the recipient plant
$EF_{Steam,i,y}$	is the CO_2 emission factor of the steam supplied to the recipient plant i during the year *y* in tCO_2/t steam, calculated as follows:

$$EF_{Steam,y} = EF_{CO2} \cdot OXID \ / \eta_{Boiler} \quad \textbf{(5)}$$

where:

$EF_{CO2,i}$	is the CO_2 emission factor per unit of energy of the baseline fuel *i,* in tCO_2/TJ, *obtained from reliable local or national data if available, otherwise, taken from the IPCC default emission factors*
$OXID_i$	is the oxidation factor of the baseline fuel *i*, obtained from *page 1.29 of 1996 Revised IPCC Guidelines for default values.*
η_{Boiler}	is efficiency of the boiler that would have been used in the absence of the project activity

Efficiency of the boiler (η_{Boiler}) shall be one of the following:

i) highest of the measured efficiencies of boilers with similar specifications,
ii) highest of the efficiency values provided by two or more manufacturers for boilers with similar specifications,
iii) maximum efficiency of 100%

Scenario 2

Scenario 2 represents the situation where the recipient plant(s) obtains electricity and/or heat generated by a fossil fuel based existing/ new cogeneration plant.

Baseline emissions from cogenerated electricity and heat (BE_y) that is displaced by the project activity:

Baseline emissions from co generated electricity and heat of a cogeneration plant are calculated by multiplying electricity (EG_y) and heat (steam) supplied (HG_y) to the recipient plant(s) with the CO_2 emission factor of the fuel used by the cogeneration plant, as follows:

$$BE_y = \sum_i \frac{(HG_{i,y} + EG_{i,y} * 3.6)}{\eta_{Cogen}} * EF_{CO2,i} \cdot OXID_i \quad \textbf{(6)}$$

where:

$BE_{,y}$	are the baseline emissions from electricity and steam that are displaced by the project activity during the year *y* in tons of CO_2.
$EG_{i,y}$	is the quantity of electricity supplied to the recipient plant i by the project activity during the year *y* in GWh
3.6	conversion factor, expressed as GWh/TJ
$HG_{i,y}$	is the net quantity of heat supplied to the recipient plant i by the project activity during the year *y* in TJ, expressed as difference of energy content between the steam supplied to the recipient plant and the condensate returned by the recipient plant(s)
$EF_{CO2,i}$	is the CO_2 emission factor per unit of energy of the fuel that would have been used in the baseline cogeneration plant supplying energy to recipient i, in (tCO_2 / TJ), obtained from reliable local or national data if available, otherwise, taken from the country specific IPCC default emission factors
OXID	is the oxidation factor of the baseline fuel, (see page 1.29 in the 1996 Revised IPCC Guidelines for default values)
$\eta_{Cogen,i}$	is the efficiency of cogeneration plant using fossil fuel that would have been used in the absence of the project activity by recipient plant i.

Efficiency of the cogeneration plant, *(η_{Cogen})* shall be one of the following:

i) highest of the measured efficiencies of similar plants;
ii) highest of the efficiency values provided by two or more manufacturers for similar plants; or
iii) maximum efficiency of 100%, based on net calorific values.

Project Emissions

Project activity emissions include CO_2 emissions from on-site consumption of fossil fuels by the cogeneration plant(s), in case they are used as supplementary fuels, due to non-availability of waste gas to the project activity or due to any other reason.

Project emissions are calculated by multiplying the quantity of fossil fuels *($FF_{i,y}$)* used by the recipient plant(s) with the CO_2 emission factor of the fuel type *i* *($COEF_{CO2,i}$)*, as follows:

$$PE_y = \sum FF_{i,y} \cdot NCV_i \cdot EF_{CO2,i} \cdot OXID_i \quad \textbf{(7)}$$

where:

PE_y	are the emissions from the project activity during the year *y* in tonnes of CO_2
$FF_{i,y}$	is the quantity of fossil fuel type *i* combusted to supplement waste gas in the project activity during the year *y,* in energy or mass units
NCV_i	is the net calorific value of the fossil fuel type *i* combusted as supplementary fuel, in TJ per unit of energy or mass units, obtained from reliable local or national data, if vailable, otherwise taken from the country specific IPCC default factors
$EF_{CO2,i}$	is the CO_2 emission factor per unit of energy or mass of the fuel type *i* in tons CO_2 obtained from reliable local or national data, if available, otherwise taken from the country specific IPCC default factors
$OXID_i$	is the oxidation factor of the fuel (see page 1.29 in the 1996 Revised IPCC Guidelines for default values).

The above project emissions apply for all scenarios.

Leakage

No leakage is applicable under this methodology.

Emission Reductions

Emission reductions due to the project activity during the year *y* are calculated as follows:

$$ER_y = BE_y - PE_y \quad \textbf{(8)}$$

where:

ER_y	are the total emissions reductions during the year *y* in tons of CO_2
PE_y	are the emissions from the project activity during the year *y* in tons of CO_2
BE_y	are the baseline emissions for the project activity during the year *y* in tons of CO_2, applicable for scenario 2.

Approved monitoring methodology AM0032

"Monitoring methodology for waste gas based cogeneration system"

Source

This baseline methodology is based on the NM0107-rev methodology "Baseline methodology for waste gas-based cogeneration system for power and steam generation" submitted by Alexandria Carbon Black Co.
For more information regarding the proposals and their consideration by the Executive Board please refer to http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html.
This methodology also refers the approved methodology ACM0002, "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* and to the latest version of the "*Tool for the demonstration and assessment of additionality*[5]"

Applicability

This monitoring methodology shall be used in conjunction with the baseline methodology AM0032, ("Baseline methodology for waste gas based cogeneration system"). The same applicability conditions as in the baseline methodology apply.

Monitoring Methodology

All data collected as part of monitoring plan 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 comments in the tables below. The following data shall be monitored.

Project emissions:

1. Quantity of fossil fuels used as supplementary fuel
2. Net calorific value of fossil fuel,
3. CO_2 emission factor of the fossil fuel

While the quantity of fossil fuels fired are measured using calibrated flow meters, other data items are only factors obtained from reliable local or national data. If local data is not available, project participant may use default factors published by IPCC.

Baseline Emissions:

Depending on the baseline scenario, the following data items need monitoring.

1. Quantity of electricity supplied to the recipient plant(s)
2. CO_2 emission factor of electricity that would have been consumed by the recipient plant(s) in the absence of the project activity
3. Quantity of steam supplied to the recipient plant(s)

[5] Please refer to: < http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

4. Pressure and temperature of the steam supplied to the recipient plant(s)
5. Pressure and temperature of the condensate return supplied by the recipient plant(s) to the project plant
6. Efficiencies of steam boiler or cogeneration plant that would have been built in the absence of the project activity

In case the grid electricity is consumed by recipient plant(s) (Scenario 1) and the grid electricity emission factor is applicable, then relevant variables as contained in the "Consolidated monitoring methodology for zero-emission grid connected electricity generation from renewable energy sources" shall be included in the monitoring plan by the project participants.

Project Emissions

The following table illustrates the data to be collected or used in order to estimate emissions from the project activity.

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Proportion of data to be monitored	How will the data be archived?	Comment
1. $FF_{i,y}$	Quantity of fossil fuel *i* used by the project co-generation plant as a supplemental fuel	Measurement records of recipient plant(s)	NM^3 or ton	m	Monthly	100%	Electronic	This data item is measured in volume units or mass units by the project cogeneration plant depending on the type of fossil fuels used.
2. NCV_i	Net calorific value of the fossil fuel *i*	Reliable local or national data	TJ/NM^3 or ton		Yearly	100%	Electronic	IPCC guidelines/Good practice guidance provide for default values where local data is not available.
3. $EF_{CO2,i}$	CO_2 emission factor of the fossil fuel i	Reliable local or national data	Tonnes CO_2 / TJ	e	Yearly	100%	Electronic	IPCC guidelines/Good practice guidance provide for default values where local data is not available.

Baseline Emissions

The following table illustrates the data to be collected or used in order to estimate emissions from the baseline activity.

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Proportion of data to be monitored	How will the data be archived?	Comment
4. EG_y	Electricity supplied to the recipient plant by the project activity	Recipient plant(s) and cogeneration plant measurement records	MWh	m	Monthly	100%	Electronic	Data shall be measured at the recipient plant(s) and at the cogeneration plant for cross check. Sales receipts shall be used for verification. DOEs shall verify that total energy supplied by the generator is equal to total electricity received by recipient plant(s).
5. $EF_{electricity,y}$	CO_2 emission factor of the Grid or specific power plant	Project participants calculation sheets	tCO_2 / MWh	c	Yearly	100%	Electronic	Grid electricity emission factor is calculated as a weighted average of the OM and BM emission factors
6. η_{Plant}	Thermal efficiency of the electricity plant	Manufacturers data or data from similar boiler operators			Once at the beginning of the crediting period	100%	Electronic & Paper	Applicable for Scenario 1 only where a specific identified plant would have provided the electricity in the baseline..

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Proportion of data to be monitored	How will the data be archived?	Comment
7. EF_{CO2}	Emission factor for baseline fuel	Reliable local or national data	tCO_2/TJ	e	Yearly	100%	Electronic & Paper	Fuel corresponds to fuel that the baseline plant of recipient plant i would have used for meeting its energy demand. This refers to specific electricity plants and baseline cogeneration plant. IPCC guidelines/Good practice guidance provide for default values where local data is not available.
8. HG_y	Net quantity heat supplied to the recipient plant(s)	Recipient plant(s) actual measurement records	TJ	c	Continuously	100%	Electronic	Expressed as the difference between the steam supplied and the condensate returned, both in energy units.
9.	Steam quantity supplied to the recipient plant(s)	Recipient plant(s) and cogeneration plant actual measurement records	tons/h	m	Continuously	100%	Electronic	Measured using flow meters installed at the recipient plant(s) and at the cogeneration plant for cross check. Sales receipts shall be used for verification. DOEs shall verify that total energy supplied by the generator is equal to total received by recipient plant(s).
10.	Supplied Steam temperature	Recipient plant(s) actual measurement records	^{o}C	m	Hourly	100%	Electronic	
11.	Supplied Steam pressure	Recipient plant(s) actual measurement records	kg/cm^2a	M	Hourly	100%	Electronic and Paper	

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Proportion of data to be monitored	How will the data be archived?	Comment
12.	Condensate quantity returned by the recipient plant(s)	Recipient plant(s) and cogeneration plant actual measurement records	tons/h	m	Continuously	100%	Electronic	Measured using flow meters installed at recipient plant(s) terminal point
13.	Returned condensate pressure	Recipient plant(s) actual measurement records	kg/cm^2a	m	Hourly	100%	Electronic and Paper	
14.	Condensate return temperature at the recipient plant	Recipient plant(s) actual measurement records	^oC	m	Daily	100%	Electronic	
15. $EF_{steam,y}$	CO_2 emission factor of the steam supplied to the recipient plant(s)	Local or national data	tCO_2/t steam	c	Yearly	100%	Electronic & paper	Calculated as per equation 5 in the baseline methodology.
16. η_{Boiler}	Thermal efficiency of the Boiler that would have been used to supply steam	Manufacturers data or data from similar boiler operators		e	Once at the beginning of the crediting period	100%	Electronic & Paper	Applicable for Scenario 1 only.

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Proportion of data to be monitored	How will the data be archived?	Comment
17. η_{Cogen}	Efficiency of cogeneration plant	Manufacturer's data or information from similar plant operators		e	Once at the beginning of the crediting period	100%	Electronic & Paper	Applicable for Scenario 2 only
17.	Running hours of the project activity plant	Operational log books of the operator	Hours	m	Daily	100%	Electronic & paper	

Leakage

No source of leakage needs to be monitored.

Quality Control (QC) and Quality Assurance (QA) Procedures

All measurements should use calibrated measurement equipment that is maintained for the parameters to be monitored are illustrated in the following table.

Data	Uncertainty level of data (High/Medium/Low)	Are QA/QC procedures planned for these data?	Outline explanation how QA/QC procedures are planned
1	Low	Y	Fuel flow meters will undergo maintenance / calibration subject to appropriate industry standards. Records of measuring devices shall ensure the data consistency. Fuel purchase records / receipts by recipient plants shall be used to verify the measured data.
2	Low	N	Data is obtained from local / national data / IPCC. No QA/QC necessary for this data item.
3	Low	N	Data is obtained from local / national data / IPCC. No QA/QC necessary for this data item

Data	Uncertainty level of data (High/Medium/Low)	Are QA/QC procedures planned for these data?	Outline explanation how QA/QC procedures are planned
4	Low	Y	The energy meters will undergo maintenance / calibration to the industry standards. Sales records and purchase receipts are used to ensure the consistency.
5	Low	N	This data item is either calculated using official local / national data (for grid emission factor) or provided by other sources such as manufacturers. No QA/QC required.
6	Low	N	This data item is a calculated value provided by other sources. No QA/QC required.
7	Low	N	Data is obtained from local / national data / IPCC. No QA/QC necessary for this data item.
8	Low	Y	This data item is a calculated value using other data items. No QA/QC required.
9	Low	Y	Steam flow meters will undergo maintenance / calibration subject to appropriate industry standards. Sales records and purchase receipts of the recipient plant(s) are used to ensure the consistency.
10	Low	Y	Measuring device will undergo maintenance / calibration subject to appropriate industry standards.
11	Low	Y	Measuring device will undergo maintenance / calibration subject to appropriate industry standards.
12	Low	Y	Condensate flow meters will undergo maintenance / calibration subject to appropriate industry standards. Sales records and other documents of the recipient plant(s) are used to ensure the consistency.
13	Low	Y	Measuring device will undergo maintenance / calibration subject to appropriate industry standards.
14	Low	Y	Measuring device will undergo maintenance / calibration subject to appropriate industry standards.
15	Low	N	This data item is a calculated value using other data items. No QA/QC required.
16	Low	N	This data item is a calculated value provided by other sources. No QA/QC required.
17	Low	Y	Operational log books provide plant operational hours. The data will be verified with sales records / purchase receipts / other documents from the recipient plant(s)