Monitoring Report Sheet (Input Sheet) [For Verification]

Table 1: Parameters monitored *ex post*

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
Monitoring period	Monitoring point No.	Parameters	Description of data	Monitored Values	Units	Monitoring option	Source of data	Measurement methods and procedures	Monitoring frequency	Other comments
2014/12/20 - 2014/12/31	(1)	$EC_{PJ,i,p}$	Power consumption of project chiller *i* during the period *p*	60.952	MWh/p	Option C	Monitored data	Data is measured by measuring equipments in the factory. - Specification of measuring equipments: 1) Electrical power meter is applied for measurement of electrical power consumption of project chiller. 2) Meter is certified in compliance with national/international standards on electrical power meter. - Measuring and recording: 1) Measured data is automatically sent to a server where data is recorded and stored. Measured data is manually recorded by responsible staff for calculation of emission reduction. 2) Recorded data is checked its integrity once a month by responsible staff. The accuracy level of electric meter is ±0.5%. The data monitored and required for verification and issuance will be kept and archived electronically for two years after the final issuance of credits. - Calibration: Calibration was conducted by the Manufacturer at the time of Manufacturer's inspection. Next calibration is required after 10 years.	Continuously	The data of energy consumption of the project chiller to calculate the emission reduction amount applies the manual recorded data of meter.
2014/12/20 - 2014/12/31	(2)	$EI_{grid,p}$	Electricity imported from the grid to the project site during the period *p*	1,677.365	MWh/p	Option B or Option C	Invoice from the power company for Option B or monitored data for Option C	[for Option B] Data is collected and recorded from invoices from the power company.	Every month	
2014/12/20 - 2014/12/31	(3)	$h_{gen,p}$	Operating time of captive electricity generator during the period *p*	0	hours/p	Option C	Monitored data	Data is measured by meter equipped to a generator.	Continuously	

Table 2: Project-specific parameters fixed *ex ante*

(a)	(b)	(c)	(d)	(e)	(f)
Parameters	**Description of data**	**Estimated Values**	**Units**	**Source of data**	**Other comments**
EF_{elec}	[For grid electricity] CO_2 emission factor for consumed electricity	0.843	tCO_2/MWh	The most recent value available at the time of validation is applied and fixed for the monitoring period thereafter. The data is sourced from “Emission Factors of Electricity Interconnection Systems”, National Committee on Clean Development Mechanism Indonesian DNA for CDM unless otherwise instructed by the Joint Committee.	
EF_{elec}	[For captive electricity] CO_2 emission factor for consumed electricity	0.8	tCO_2/MWh	CDM approved small scale methodology: AMS-I.A	In the project, there is no generator for captive electricity.
$T_{cooling-out,i}$	Output cooling water temperature of project chiller i set under the project specific condition	36.9	degree Celsius	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$T_{chilled-out,i}$	Output chilled water temperature of project chiller i set under the project specific condition	11	degree Celsius	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$COP_{RE,i}$	COP of reference chiller i under the standardizing temperature conditions	5.59	-	Selected from the default values set in the methodology	
$COP_{PJ,i}$	COP of project chiller i under the project specific conditions	7.14	-	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$COP_{PJ,tc,i}$	COP of project chiller i calculated under the standardizing temperature conditions	6.25	-	Calculated with the following equation; $COP_{PJ,tc,i} = COP_{PJ,i} \times [(T_{cooling-out,i} - T_{chilled-out,i} + TD_{chilled} + TD_{cooling}) \div (37 - 7 + TD_{chilled} + TD_{cooling})]$	
RC_{gen}	Rated capacity of generator	0.0	kW	Specification of generator for captive electricity	

Table3: *Ex-post* estimation of CO_2 emission reductions

Monitoring Period	CO_2 emission reductions	Units
2014/12/20-2014/12/31	6	tCO_2/p

[Monitoring option]

Option A	Based on public data which is measured by entities other than the project participants (Data used:
Option B	Based on the amount of transaction which is measured directly using measuring equipments (Data
Option C	Based on the actual measurement using measuring equipments (Data used: measured values)

Monitoring Report Sheet (Calculation Process Sheet) [For Verification]

1. Calculations for emission reductions	Fuel type	Value	Units	Parameter
Emission reductions during the period p	N/A	6.07	tCO_2/p	ER_p
2. Selected default values, etc.				
COP of reference chiller i under the standardizing temperature conditions	N/A	5.59	-	$COP_{RE,i}$
3. Calculations for reference emissions				
Reference emissions during the period p	N/A	57.45	tCO_2/p	RE_p
Reference emissions	N/A			
CO_2 emission factor for consumed electricity [grid]	Electricity	0.84	tCO_2/MWh	EF_{elec}
CO_2 emission factor for consumed electricity [captive]	Electricity	0.8	tCO_2/MWh	EF_{elec}
Proportion of grid electricity over total electricity consumed at the project site	N/A	1.00	-	-
Proportion of captive electricity over total electricity consumed at the project site	N/A	0.00	-	-
Power consumption of project chiller i	Electricity	60.95	MWh/p	$EC_{PJ,i,p}$
COP of reference chiller i under the standardizing temperature conditions	N/A	5.59	-	$COP_{RE,i}$
COP of project chiller i calculated under the standardizing temperature conditions	N/A	6.25	-	$COP_{PJ,tc,i}$
4. Calculations of the project emissions				
Project emissions during the period p	N/A	51.38	tCO_2/p	PE_p
Project emissions	N/A			
CO_2 emission factor for consumed electricity [grid]	Electricity	0.84	tCO_2/MWh	EF_{elec}
CO_2 emission factor for consumed electricity [captive]	Electricity	0.8	tCO_2/MWh	EF_{elec}
Proportion of grid electricity over total electricity consumed at the project site	N/A	1.00	-	-
Proportion of captive electricity over total electricity consumed at the project site	N/A	0.00	-	-
Power consumption of project chiller i	Electricity	60.95	MWh/p	$EC_{PJ,i,p}$

[List of Default Values]

$COP_{RE,i}$ (x<300USRt)	4.92	-
$COP_{RE,i}$ (300≤x<450USRt)	5.33	-
$COP_{RE,i}$ (450≤x<500USRt)	5.59	-
$COP_{RE,i}$ (500≤x<700USRt)	5.85	-
$COP_{RE,i}$ (700≤x<1250USRt)	5.94	-

$TD_{cooling}$	1.50	degree Celsius
$TD_{chilled}$	1.50	degree Celsius

Monitoring Report Sheet (Input Sheet) [For Verification]

Table 1: Parameters monitored *ex post*

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
Monitoring period	Monitoring point No.	Parameters	Description of data	Monitored Values	Units	Monitoring option	Source of data	Measurement methods and procedures	Monitoring frequency	Other comments
2015/1/1-2015/12/31	(1)	$EC_{PJ,i,p}$	Power consumption of project chiller *i* during the period *p*	1,673.745	MWh/p	Option C	Monitored data	Data is measured by measuring equipments in the factory. - Specification of measuring equipments: 1) Electrical power meter is applied for measurement of electrical power consumption of project chiller. 2) Meter is certified in compliance with national/international standards on electrical power meter. - Measuring and recording: 1) Measured data is automatically sent to a server where data is recorded and stored. Measured data is manually recorded by responsible staff for calculation of emission reduction. 2) Recorded data is checked its integrity once a month by responsible staff. The accuracy level of electric meter is ±0.5%. The data monitored and required for verification and issuance will be kept and archived electronically for two years after the final issuance of credits. - Calibration: Calibration was conducted by the Manufacturer at the time of Manufacturer's inspection. Next calibration is required after 10 years.	Continuously	The data of energy consumption of the project chiller to calculate the emission reduction amount applies the manual recorded data of meter.
2015/1/1-2015/12/31	(2)	$EI_{grid,p}$	Electricity imported from the grid to the project site during the period *p*	48,936.544	MWh/p	Option B or Option C	Invoice from the power company for Option B or monitored data for Option C	[for Option B] Data is collected and recorded from invoices from the power company.	Every month	
2015/1/1-2015/12/31	(3)	$h_{gen,p}$	Operating time of captive electricity generator during the period *p*	0	hours/p	Option C	Monitored data	Data is measured by meter equipped to a generator.	Continuously	

Table 2: Project-specific parameters fixed *ex ante*

(a)	(b)	(c)	(d)	(e)	(f)
Parameters	**Description of data**	**Estimated Values**	**Units**	**Source of data**	**Other comments**
EF_{elec}	[For grid electricity] CO_2 emission factor for consumed electricity	0.843	tCO_2/MWh	The most recent value available at the time of validation is applied and fixed for the monitoring period thereafter. The data is sourced from “Emission Factors of Electricity Interconnection Systems”, National Committee on Clean Development Mechanism Indonesian DNA for CDM unless otherwise instructed by the Joint Committee.	
EF_{elec}	[For captive electricity] CO_2 emission factor for consumed electricity	0.8	tCO_2/MWh	CDM approved small scale methodology: AMS-I.A	In the project, there is no generator for captive electricity.
$T_{cooling-out,i}$	Output cooling water temperature of project chiller i set under the project specific condition	36.9	degree Celsius	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$T_{chilled-out,i}$	Output chilled water temperature of project chiller i set under the project specific condition	11	degree Celsius	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$COP_{RE,i}$	COP of reference chiller i under the standardizing temperature conditions	5.59	-	Selected from the default values set in the methodology	
$COP_{PJ,i}$	COP of project chiller i under the project specific conditions	7.14	-	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$COP_{PJ,tc,i}$	COP of project chiller i calculated under the standardizing temperature conditions	6.25	-	Calculated with the following equation; $COP_{PJ,tc,i} = COP_{PJ,i} \times [(T_{cooling-out,i} - T_{chilled-out,i} + TD_{chilled} + TD_{cooling}) \div (37 - 7 + TD_{chilled} + TD_{cooling})]$	
RC_{gen}	Rated capacity of generator	0.0	kW	Specification of generator for captive electricity	

Table3: *Ex-post* estimation of CO_2 emission reductions

Monitoring Period	CO_2 emission reductions	Units
2015/1/1-2015/12/31	166	tCO_2/p

[Monitoring option]

Option A	Based on public data which is measured by entities other than the project participants (Data used:
Option B	Based on the amount of transaction which is measured directly using measuring equipments (Data
Option C	Based on the actual measurement using measuring equipments (Data used: measured values)

Monitoring Report Sheet (Calculation Process Sheet) [For Verification]

1. Calculations for emission reductions	Fuel type	Value	Units	Parameter
Emission reductions during the period p	N/A	166.59	tCO_2/p	ER_p
2. Selected default values, etc.				
COP of reference chiller i under the standardizing temperature conditions	N/A	5.59	-	$COP_{RE,i}$
3. Calculations for reference emissions				
Reference emissions during the period p	N/A	1577.56	tCO_2/p	RE_p
Reference emissions	N/A			
CO_2 emission factor for consumed electricity [grid]	Electricity	0.84	tCO_2/MWh	EF_{elec}
CO_2 emission factor for consumed electricity [captive]	Electricity	0.8	tCO_2/MWh	EF_{elec}
Proportion of grid electricity over total electricity consumed at the project site	N/A	1.00	-	-
Proportion of captive electricity over total electricity consumed at the project site	N/A	0.00	-	-
Power consumption of project chiller i	Electricity	1673.75	MWh/p	$EC_{PJ,i,p}$
COP of reference chiller i under the standardizing temperature conditions	N/A	5.59	-	$COP_{RE,i}$
COP of project chiller i calculated under the standardizing temperature conditions	N/A	6.25	-	$COP_{PJ,tc,i}$
4. Calculations of the project emissions				
Project emissions during the period p	N/A	1410.97	tCO_2/p	PE_p
Project emissions	N/A			
CO_2 emission factor for consumed electricity [grid]	Electricity	0.84	tCO_2/MWh	EF_{elec}
CO_2 emission factor for consumed electricity [captive]	Electricity	0.8	tCO_2/MWh	EF_{elec}
Proportion of grid electricity over total electricity consumed at the project site	N/A	1.00	-	-
Proportion of captive electricity over total electricity consumed at the project site	N/A	0.00	-	-
Power consumption of project chiller i	Electricity	1,673.75	MWh/p	$EC_{PJ,i,p}$

[List of Default Values]

$COP_{RE,i}$ (x<300USRt)	4.92	-
$COP_{RE,i}$ (300≤x<450USRt)	5.33	-
$COP_{RE,i}$ (450≤x<500USRt)	5.59	-
$COP_{RE,i}$ (500≤x<700USRt)	5.85	-
$COP_{RE,i}$ (700≤x<1250USRt)	5.94	-

$TD_{cooling}$	1.50	degree Celsius
$TD_{chilled}$	1.50	degree Celsius

Monitoring Report Sheet (Input Sheet) [For Verification]

Table 1: Parameters monitored *ex post*

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
Monitoring period	Monitoring point No.	Parameters	Description of data	Monitored Values	Units	Monitoring option	Source of data	Measurement methods and procedures	Monitoring frequency	Other comments
2016/1/1-2016/5/31	(1)	$EC_{PJ,i,p}$	Power consumption of project chiller *i* during the period *p*	851.434	MWh/p	Option C	Monitored data	Data is measured by measuring equipments in the factory. - Specification of measuring equipments: 1) Electrical power meter is applied for measurement of electrical power consumption of project chiller. 2) Meter is certified in compliance with national/international standards on electrical power meter. - Measuring and recording: 1) Measured data is automatically sent to a server where data is recorded and stored. Measured data is manually recorded by responsible staff for calculation of emission reduction. 2) Recorded data is checked its integrity once a month by responsible staff. The accuracy level of electric meter is ±0.5%. The data monitored and required for verification and issuance will be kept and archived electronically for two years after the final issuance of credits. - Calibration: Calibration was conducted by the Manufacturer at the time of Manufacturer's inspection. Next calibration is required after 10 years.	Continuously	The data of energy consumption of the project chiller to calculate the emission reduction amount applies the manual recorded data of meter.
2016/1/1-2016/5/31	(2)	$EI_{grid,p}$	Electricity imported from the grid to the project site during the period *p*	21,200.624	MWh/p	Option B or Option C	Invoice from the power company for Option B or monitored data for Option C	[for Option B] Data is collected and recorded from invoices from the power company.	Every month	
2016/1/1-2016/5/31	(3)	$h_{gen,p}$	Operating time of captive electricity generator during the period *p*	0	hours/p	Option C	Monitored data	Data is measured by meter equipped to a generator.	Continuously	

Table 2: Project-specific parameters fixed *ex ante*

(a)	(b)	(c)	(d)	(e)	(f)
Parameters	**Description of data**	**Estimated Values**	**Units**	**Source of data**	**Other comments**
EF_{elec}	[For grid electricity] CO_2 emission factor for consumed electricity	0.843	tCO_2/MWh	The most recent value available at the time of validation is applied and fixed for the monitoring period thereafter. The data is sourced from “Emission Factors of Electricity Interconnection Systems”, National Committee on Clean Development Mechanism Indonesian DNA for CDM unless otherwise instructed by the Joint Committee.	
EF_{elec}	[For captive electricity] CO_2 emission factor for consumed electricity	0.8	tCO_2/MWh	CDM approved small scale methodology: AMS-I.A	In the project, there is no generator for captive electricity.
$T_{cooling-out,i}$	Output cooling water temperature of project chiller i set under the project specific condition	36.9	degree Celsius	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$T_{chilled-out,i}$	Output chilled water temperature of project chiller i set under the project specific condition	11	degree Celsius	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$COP_{RE,i}$	COP of reference chiller i under the standardizing temperature conditions	5.59	-	Selected from the default values set in the methodology	
$COP_{PJ,i}$	COP of project chiller i under the project specific conditions	7.14	-	Specifications of project chiller i prepared for the quotation or factory acceptance test data by manufacturer	
$COP_{PJ,tc,i}$	COP of project chiller i calculated under the standardizing temperature conditions	6.25	-	Calculated with the following equation; $COP_{PJ,tc,i} = COP_{PJ,i} \times [(T_{cooling-out,i} - T_{chilled-out,i} + TD_{chilled} + TD_{cooling}) \div (37 - 7 + TD_{chilled} + TD_{cooling})]$	
RC_{gen}	Rated capacity of generator	0.0	kW	Specification of generator for captive electricity	

Table3: *Ex-post* estimation of CO_2 emission reductions

Monitoring Period	CO_2 emission reductions	Units
2016/1/1-2016/5/31	84	tCO_2/p

[Monitoring option]

Option A	Based on public data which is measured by entities other than the project participants (Data used:
Option B	Based on the amount of transaction which is measured directly using measuring equipments (Data
Option C	Based on the actual measurement using measuring equipments (Data used: measured values)

Monitoring Report Sheet (Calculation Process Sheet) [For Verification]

1. Calculations for emission reductions	Fuel type	Value	Units	Parameter
Emission reductions during the period p	N/A	84.74	tCO_2/p	ER_p
2. Selected default values, etc.				
COP of reference chiller i under the standardizing temperature conditions	N/A	5.59	-	$COP_{RE,i}$
3. Calculations for reference emissions				
Reference emissions during the period p	N/A	802.50	tCO_2/p	RE_p
Reference emissions	N/A			
CO_2 emission factor for consumed electricity [grid]	Electricity	0.84	tCO_2/MWh	EF_{elec}
CO_2 emission factor for consumed electricity [captive]	Electricity	0.8	tCO_2/MWh	EF_{elec}
Proportion of grid electricity over total electricity consumed at the project site	N/A	1.00	-	-
Proportion of captive electricity over total electricity consumed at the project site	N/A	0.00	-	-
Power consumption of project chiller i	Electricity	851.43	MWh/p	$EC_{PJ,i,p}$
COP of reference chiller i under the standardizing temperature conditions	N/A	5.59	-	$COP_{RE,i}$
COP of project chiller i calculated under the standardizing temperature conditions	N/A	6.25	-	$COP_{PJ,tc,i}$
4. Calculations of the project emissions				
Project emissions during the period p	N/A	717.76	tCO_2/p	PE_p
Project emissions	N/A			
CO_2 emission factor for consumed electricity [grid]	Electricity	0.84	tCO_2/MWh	EF_{elec}
CO_2 emission factor for consumed electricity [captive]	Electricity	0.8	tCO_2/MWh	EF_{elec}
Proportion of grid electricity over total electricity consumed at the project site	N/A	1.00	-	-
Proportion of captive electricity over total electricity consumed at the project site	N/A	0.00	-	-
Power consumption of project chiller i	Electricity	851.43	MWh/p	$EC_{PJ,i,p}$

[List of Default Values]

$COP_{RE,i}$ (x<300USRt)	4.92	-
$COP_{RE,i}$ (300≤x<450USRt)	5.33	-
$COP_{RE,i}$ (450≤x<500USRt)	5.59	-
$COP_{RE,i}$ (500≤x<700USRt)	5.85	-
$COP_{RE,i}$ (700≤x<1250USRt)	5.94	-

$TD_{cooling}$	1.50	degree Celsius
$TD_{chilled}$	1.50	degree Celsius