CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM-SSC-PoA-DD) Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.

(ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).

This template shall not be altered. It shall be completed without modifying/adding headings or logo, format or font.

SECTION A. General description of small-scale programme of activities (PoA)

A.1 Title of the small-scale programme of activities (PoA):

Building Energy Saving Programmatic CDM Project for ABC Telecommunication Co.

A.2. Description of the small-scale programme of activities (PoA):

ABC Telecommunication Co. is a telecommunication company in the Philippines, which operates a nationwide telecommunication network, covering a wide range of the population. ABC Telecommunication Co. is committed to make a difference in the lives of the Filipino people through their services and through their contribution to the country's sustainable development goals by reducing their greenhouse gas (GHG) emissions. The company believes that sustainable development goals can be achieved through energy efficiency and conservation.

The proposed PoA aims to reduce greenhouse gas (GHG) emissions through the reduction of electricity consumption in the different buildings owned and operated by ABC Telecommunication Co. This can be done by introducing energy efficiency improvement measures in the company's air conditioning system and lighting system.

Starting from a few main buildings of ABC Telecommunication Co., this project intends to expand proposed energy efficiency improvement measures to all the buildings belonging to the company in the end. Depending on the actual energy consumption patterns in each building, each building will apply a combination of selected energy efficiency improvement measures among the proposed measures under the PoA. The target of the PoA is to reduce the energy consumption of ABC Telecommunication Co. by around 15% to 20%.

The reduction of electricity consumption through the implementation of energy efficiency improvement measures to all its buildings is a voluntary coordinated action by ABC Telecommunication Co. as part of the company's energy policy on reducing energy consumption and the company's environmental policy on reducing GHG emissions.

The PoA will definitely have positive contribution to the sustainable development goals and objectives of the Philippine Government outlined in Philippine Agenda 21 by reducing electricity consumption and thus, conserve valuable energy resources. It shall contribute to the social, economic, technological and environmental well being of the country.

Social Well Being:

Energy efficiency improvements at ABC Telecommunication Co. will result to increased level of access (i.e., availability, affordability, and variety) of energy services in the country. Through the amount of energy saved by the company, more people will gain access to energy services such as the provision of electricity to unenergized areas. The lack of access to energy services is closely linked to a range of social concerns, including poverty, lack of opportunities, urbanization, and poor health. Hence, through this PoA, energy savings can help alleviate some of these social concerns.

At the company level, people employed will have no worries of being retrenched because of increased expenditures by the company. The equivalent amount of money saved due to energy efficiency

improvements can be channelled to other expenditures like benefits for the employees. In this manner, the company will be able to exercise its corporate social responsibility to its employees while, at the same time, the employees will enjoy a sense of job security.

Economic Well Being:

Energy efficiency improvements can contribute to the economic well-being of the country. Through energy savings, demand for electricity will be reduced. Because of this, the country will not be constrained to construct additional power plants which entail investments and additional resources for fuel. As most of the fossil fuel is imported, dollar exchange will also be conserved. Without fuel importation and construction investments, electricity rates will not go up. Hence, the economy of the country will improve.

At the company level, energy efficiency improvements can help reduce and defer financial investments on new capacity process and utility equipment. ABC Telecommunication Company can sustain its main core business on telecommunication. Energy efficiency can give some stability to the company in terms of staying up in business.

Environmental Well Being:

The implementation of the PoA will sustain the environmental well being of the country. The energy efficiency improvements under the PoA mainly involve the reduction of electricity consumption which will lead to a reduction in the demand to generate electric power. This, in turn, will directly reduce the greenhouse gases emitted by power plants. In addition, other social benefits in terms of improved health conditions due to reduced air pollution and transportation activities will be envisaged.

In reducing the demand for electric power, there will also be a corresponding decrease in the use of valuable energy resources.

Technological well being:

The implementation of the PoA will encourage other commercial buildings as well as office, industrial and residential buildings to adopt energy efficient and environmentally sound technologies such as efficient chillers, efficient electric motors, and efficient lighting systems. With the demonstration of the new technologies and proven energy savings, many buildings will come to realize the social, economic and environmental benefits of energy efficiency improvements.

A.3. Coordinating/managing entity and participants of SSC-PoA:

Philippines: ABC Telecommunication Company

Japan: Kajima Corporation

A.4. Technical description of the small-scale programme of activities:

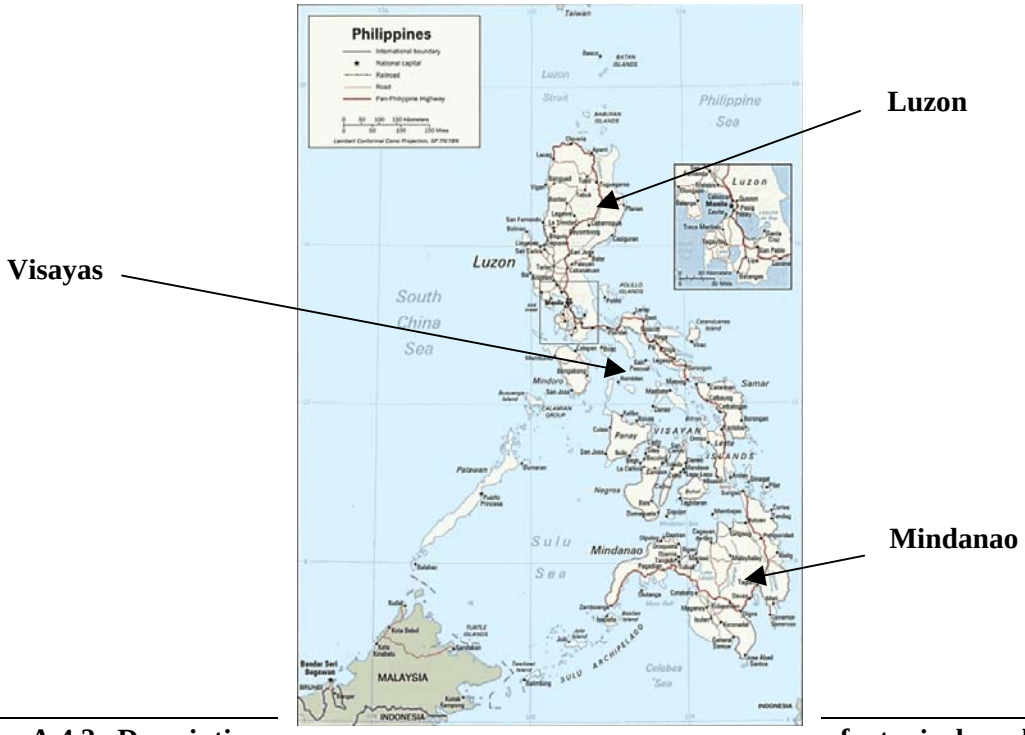
A.4.1. Location of the programme of activities:

A.4.1.1. Host Party(ies):

Philippines

A.4.1.2. Physical/ Geographical boundary:

The project will be implemented in the buildings owned and operated by ABC Telecommunication Co. located nationwide.



A.4.2. Description of a typical small-scale CDM programme activity (CPA):

A.4.2.1. Technologies or measures to be employed by the SSC-CPA:

The proposed PoA intends to implement energy efficiency and fuel switching measure at a group of commercial buildings. It also intends to replace the existing equipment. Hence, this PoA falls under Type II category – Energy Efficiency Improvement Projects specifically under II.E – Energy Efficiency and Fuel Switching Measures for Buildings (version 10).

The PoA consists of four (4) general types of energy efficiency improvement measures in the buildings owned and operated by ABC Telecommunication Co. They are as follows:

Type A - Improvement of cooling sources and cooling towers
Type B – Improvement of air-conditioners
Type C - Improvement of chilled water/air carrier systems

Type D – Improvement of lighting systems

Under these 3 types of energy efficiency improvement measures, there are nine (9) specific energy efficiency improvement measures and they are listed below:

Type A: Improvement of cooling sources and cooling towers

Measure 1: Replacement of chillers with high-efficient type
For the buildings that use a centralized chiller as cooling source, this measure can be applied. By replacing the existing chiller (air-cooled chiller and/or water-cooled chiller) with high-efficient equipment, electricity required to cool the same amount of water/air to the same degree would be reduced. For the buildings that currently use distributed air conditioning system, renovation to apply centralized cooling system which consists of installation of a chiller, air handling unit (AHU) system and new chilled water pipe can also be applied.

Mearure2: Replacement of cooling tower (CT) with high efficient type
Replacement of CT with high efficient type, operation number control of CT units, and operation number control of fan units may be applied to CTs.

Type B: Improvement of air-conditioners

Measure 3: Replacement of PAC with high-efficient type
For the buildings that use distributed package type cooling units (referred to as air-cooled PAC and/or water-cooled PAC), this measure can be applied. High efficiency can be attained by application of high efficient compressors and fans in PAC units.

Type C: Improvement of chilled water/air carrier systems

Measure 4: Replacement of chilled/cooled water pump with high-efficient type
By replacing existing chilled-water pump with high-efficient type, electricity required to pump the same amount of water will be reduced.

Measure 5: Installation of inverter control of pump and VWV
Installation of inverter control of fan and VWV (Variable Water Volume) will optimize the operation of the pump, thus electricity requirement for unloaded operation of pump will be reduced.

Measure 6: Replacement of fan with high-efficient type
By replacing existing fan with high-efficient type, electricity required to pump the same amount of water will be reduced.

Measure 7: Installation of inverter control of fan and VAV to the duct
Installation of inverter control of fan and VAV (Variable Air Volume) will optimize the operation of the fan and air volume, thus electricity requirement for unloaded operation of fan will be reduced.

Type D: Improvement of lighting systems

Measure 8: Replacement of Ballast

Electricity required for lighting system will be reduced by replacing existing ballasts with energy efficient ballasts with inverter control.

Measure 9: Replacement of lighting equipments
Electricity required for lighting system will be reduced by replacing existing lighting equipments with energy efficient equipments such as lamps, etc.

Depending on the current condition of each target building, appropriate energy efficiency measure or set of measures will be selected from those listed above, and applied to the building. The current condition of the target building will be assessed by doing an energy audit.

A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:

The following eligibility criteria will be adopted in determining whether a SSC-CPA can be included in the PoA:

1. The SSC-CPA must be able to demonstrate its additionality in accordance with that described in Section E.5

2. All SSC-CPAs must apply the baseline and monitoring methodology described under Project Type II (Energy Efficiency Improvement Projects), specifically II.E (Energy efficiency and fuel switching measures for buildings).

3. All SSC-CPAs must adopt an appropriate energy efficiency measure or set of measures which are included in the list of energy efficiency improvements in Section A.4.2.1.

4. The aggregate energy savings by a SSC-CPA must not exceed the equivalent of 60 GWh per year.

5. The SSC-CPA must neither been registered as an individual CDM project activity nor included in another registered *PoA*.

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

To date, no laws and regulation requires business entities to implement energy saving activities for the existing buildings. Therefore, business entities have no legal obligation to implement energy efficient improvement activity. Thus, these activities are developed voluntarily by the ABC telecommunication Co. which is the private entity participating the project.

If the proposed PoA is not implemented, the current practice would be continued, and no reduction of GHG emission would be achieved. Because the energy efficiency improvement activities face the investment barriers, due to the low budget for facility maintenance in the company, the measures such as replacement of existing equipment with higher energy-efficiency equipment would not be implemented in the absence of the PoA.

A.4.4. Operational, management and monitoring plan for the programme of activities (PoA):

A.4.4.1. Operational and management plan:

ABC Telecommunication Co. shall assign a project staff to keep a database of all possible CDM project activities under the PoA. The project staff will have on record all the equipment specifications pertaining to the air-conditioning system and the lighting system. Each building will be treated as one CDM project activity. The project staff will devise a numbering system as well as a registration procedure internal to the company which will ensure that no double accounting takes place. The inclusion of a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA must strictly be avoided.

As mentioned under Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM Project Activities, the following results into debundling of large CDM project:

> *"A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:*
>
> - ☐ *With the same project participants;*
> - ☐ *In the same project category and technology/measure; and*
> - ☐ *Registered within the previous 2 years; and*
> - ☐ *Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point."*

There is no registered small-scale CDM project activity and no application to register a small-scale CDM project activity that meets all four conditions above. At least there is no CDM project activity that meets the third and fourth condition (registered within the previous 2 years, and having project boundary within 1km of the project boundary of the proposed CDM). Therefore, the proposed CPA is not a debundled component of a larger project activity.

A.4.4.2. Monitoring plan:

ABC Telecommunication Co. shall designate an energy team who will conduct the monitoring of energy use and the emission reductions. All equipment and gadgets to be replaced will be labeled and recorded taking note of its nameplate data and specifications (e.g. kW rating, voltage, amperes, etc.). Power meters shall be installed in strategic locations to monitor the electricity consumption of the replaced equipment and gadgets. The installation of power meters will either be one of the following options: a) one meter each for replaced equipment, b) one meter for each group of equipment, or c) one meter for each closed circuit of lighting system that can be clearly separated from other equipment.

Daily reading of meters will be done by the energy team and readings will be placed on logbooks dedicated for the replaced equipment. The energy team will further log the power data on spreadsheets, analysed for emissions reduction and reported to the Energy Overall Team Leader. The Overall Team Leader will, in turn, review the data for any discrepancies observed from past readings. The energy team

will maintain all records on a daily, monthly, quarterly and yearly basis. The energy team shall also monitor and check non-metered systems to ensure that they are still operating.

Details of the Monitoring Plan are described in Annex 4.

A.4.5. Public funding of the programme of activities (PoA):

No public funding is involved in the PoA.

SECTION B. Duration of the programme of activities (PoA)

B.1. Starting date of the programme of activities (PoA):

The PoA is planned to be started in July 2008.

B.2. Length of the programme of activities (PoA):

The length of the PoA will run for 7 year period, which is renewable crediting period.

SECTION C. Environmental Analysis

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C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

1. Environmental Analysis is done at PoA level ☐
2. Environmental Analysis is done at SSC-CPA level ☐

Environmental analysis will be undertaken at CPA level. The administrative order related to EIA in the Philippines stipulates the project to prepare and submit necessary documents per area. Complying with this provision, the project will take necessary actions at CPA level.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

The adoption of the energy efficiency improvement measures under the proposed PoA poses no major negative environmental impacts. Environmental Impact Assessment (EIA) is required for the construction of new commercial buildings as provided for in the Department of Environment and Natural Resources (DENR) Administrative Order No. 30 Series of 2003 (DAO 03-30) entitled "Implementing Rules and Regulations of Presidential Decree No. 1586, Establishing the Philippine Environmental Impact Statement System". Retrofitting of energy efficient technologies in commercial buildings like upgrading of chillers or installation of inverters is not covered under DAO 03-30. As indicated in the Administrative Order, the appropriate document is not an Environmental Impact Statement (EIS) but an EIA Report incorporating the project's environmental performance and its current Environmental Management Plan. This report is an Environmental Performance Report and Management Plan (EPRMP)

for single project applications. For small project modifications, an updating of the project description or the Environmental Management Plan with the use of the proponent's historical performance and monitoring records may suffice.

The possible negative environmental impact that can be caused by the implementation of the PoA is the generation of wastes, which are the used inefficient equipment. The PoA, however, shall comply with Republic Act 9003 or the Ecological Solid Waste Management Act of 2000. The inefficient equipment shall be disposed of in assigned Materials Recovery Facility located in various towns and cities.

Major positive environmental impact from the PoA will be the energy savings at target buildings. Because of the energy efficiency improvement measures at buildings, the PoA will be able to reduce the consumption of energy resources and contribute to the stable supply of electricity.

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA),:

No environmental impact assessment is required for a typical CPA included in the PoA. The PoA involves only retrofitting of energy efficient technologies. It does not involve the construction of a new building.

SECTION D. Stakeholders' comments

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D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

1. Local stakeholder consultation is done at PoA level ☐
2. Local stakeholder consultation is done at SSC-CPA level ☒

Local stakeholder consultation was done at the SSC-CPA level. The proposed PoA covers the buildings of ABC Telecommunication Co. located nationwide. It is quite difficult to convene all the stakeholders from Luzon, Visayas and Mindanao.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

Comments from the local stakeholders of energy efficiency improvement measures at ABC Telecommunication Co. were obtained from the employees, the Top Management, the Energy Efficiency and Conservation Division of the Department of Energy and the Energy Efficiency Practititoners Association of the Philippines, Inc. The stakeholders were interviewed about the proposed CPA.

D.3. Summary of the comments received:

All the stakeholders interviewed have given positive feedbacks on the objective of the proposed CPA. They have given their approval and satisfaction on the adoption of energy efficient technologies by ABC Telecommunication Co. particularly on the benefits that can be derived by the country on the reduction of GHG emissions.

D.4. Report on how due account was taken of any comments received:

The comments received from the stakeholders were compiled into a report taking note of all the inquiries and clarifications made about the different energy efficiency improvement measures. All concerns of the stakeholders were addressed.

SECTION E. Application of a baseline and monitoring methodology

E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:

Project Type – Type II (Energy Efficiency Improvement Projects)

Project Category - II.E (Energy efficiency and fuel switching measures for buildings)

Reference: II.E./Version 10; Sectoral Scope: 03; EB 35

E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:

As shown in the table below, the project activity meets all the applicability criteria provided in the AMS-II.E, and hence the project activity is applicable to the selected approved small scale CDM methodologies.

Applicability Criteria	Project Activity
This category "comprises any energy efficiency and fuel switching measure implemented at a single building, such as a commercial, institutional or residential building, or group of similar buildings, such as school, district or university.	This project activity is intended to reduce GHG emissions through the reduction of electricity consumption by introducing energy-efficiency improvement measures at a commercial building.
This category covers project activities aimed primarily at energy efficiency; a project activity that involves primarily fuel switching falls into category III.B.	This project activity aims at only energy-efficiency and does not involve fuel switching.
Examples include technical energy efficiency measures (such as efficient appliances, better insulation and optimal arrangement of equipment) and fuel switching measures (such as switching from oil to gas).	Specific energy-efficiency measures implemented in this project activity are energy efficiency measures as shown in A.4.2.
The technologies may replace existing equipment or be installed in new facilities.	All the measures employed in this project activity are replacement of existing equipment with higher energy-efficiency equipment.

Applicability Criteria	Project Activity
The aggregate energy savings of a single project may not exceed the equivalent of 60 GWh per year."	The aggregate energy savings of a CPA are not expected to exceed the equivalent of 20.76 GWhe per year as indicated in Section A.4.3.
This category is applicable to project activities where it is possible to directly measure and record the energy use within the project boundary (e.g. electricity and/or fossil fuel consumption)	The electricity used within the project boundary is measured directly by setting monitoring devices such as meters to the target equipment, and recorded.
This category is applicable to project activities where the impact of the measures implemented (improvements in energy efficiency) by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity (signal to noise ratio).	The electricity of the target equipment will be measured directly and individually, by setting up monitoring devices to all equipment, and those target equipment will not be used for other purpose. Therefore, no changes in energy use will happen due to other variables not influenced by the project activity.

E.3. Description of the sources and gases included in the SSC-CPA boundary

The SSC-CPA boundary constitutes the buildings of ABC Telecommunication Co. where the energy efficiency measures will be installed. Therefore, the project boundary of the model CPA will be the target building housing the Main Headquarters of ABC Telecommunication Co. located at Makati City. This building uses only electricity as their main source of energy.

GHG emission sources taken into account in the project activity are as shown in the table below.

		Inside project boundary	Outside project boundary
Baseline scenario	Calculated (to be monitored)	- CO_2 emissions from electricity consumption of existing facilities	
	Not calculated (not to be monitored)	- CH_4 and N_2O emissions from electricity consumption of existing facilities	
Project scenario	Calculated (to be monitored)	- CO_2 emissions from electricity consumption of supporting facilities after applying energy-efficiency improvement measures	GHG emissions related to transferred existing equipments to another activity or transferred energy-efficiency facilities from another activity - HFC emissions from disposal of existing facilities

	Not calculated (not to be monitored)	- CH_4 and N_2O emissions from electricity consumption of facilities after applying energy-efficiency improvement measures	

E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

To identify the baseline scenario and demonstrate additionality, the following steps have been applied:

STEP 1: Identification of alternative scenarios including consistency with mandatory applicable laws and regulations
STEP 2: Investment analysis, or STEP 3: Barrier analysis (technology, prevailing practice, other barriers)
STEP 4: Common practice analysis

STEP 1: List up the alternative baseline scenario

There are three plausible alternatives considered by the project proponents:
Alternative 1: No energy efficiency measures will be implemented (Continuation of current situation)
Alternative 2: Alternative energy efficiency improvement measures will be implemented
Alternative 3: The planned energy efficiency improvement measures will be implemented without CDM

In alternative 1, ABC Telecommunication Co. will continue its operation with the existing air-conditioning equipment and lighting systems. This alternative is in compliance with all mandatory applicable laws and regulations.

In alternative 2, there exists energy efficiency improvement measures in the air-conditioning and lighting systems and ABC Telecommunication may adopt one of the measures.

In alternative 3, ABC Telecommunication Co. would willingly implement the energy efficiency measures planned in this proposed project activity as business as usual practice.

Energy efficiency initiatives are emphasized by the Philippine Government particularly in the industrial, transport and commercial sectors to ensure efficient utilization of energy resources. The Philippine Government has officially launched the National Energy Efficiency and Conservation Program (NEECP) last August 28, 2004, and has been carried out a set of programmes. Although energy efficiency activity in commercial sector is very much encouraged, it is not required for building owners to reduce their energy consumption to a prescribed standard. Hence, the alternative 2 and 3 are also in compliance with all mandatory applicable laws and regulation.

STEP 2: Investment Analysis

ABC Telecommunication Co., adopts “payback time” as an indicator to evaluate the economic attractiveness of energy-efficiency improvement measures. Therefore, payback time is an appropriate

indicator for financial analysis of the project activity. As a criterion to judge whether or not an energy efficiency improvement measures can be introduced as a normal business practice, the ABC Telecommunication Co. has set a threshold value of payback time for these kind of project, which is 2 years.

The payback time is calculated as initial cost divided by annual reduction in energy cost. Initial cost includes facility cost and installation cost of the facilities. These costs are quoted by facility manufactures.

In an energy audit conducted at the headquarters of ABC Telecommunication Co., the following payback period was calculated for the different energy efficiency improvement measures:

Measures	Payback Time (year)
Measure 2 (replacement of cooling tower with high efficient type)	3.5
Measure 3-a (replacement of PAC with high efficiency type) + **Measure 7** (installation of inverter control fan and VAV)	6.9
Measure 3-b (replacement of PAC with high efficiency type)	7.9
	6.2
Measure 4 (replacement of chilled/cooled water pump with high-efficient type) + **Measure 5** (Installation of inverter control of pump and VWV)	6.7
Measure 8 (replacement of ballast: Installation of inverter)	3.5

In all the measures, the payback time is longer than 2 years, and thus it can be concluded that the proposed project is not economically attractive, and not financially viable for the company unless they can have additional financial source such as CER revenue.

In this respect, the alternative 2 and 3 can be screened out.

Step 3: Common Practice Analysis

At the buildings belonging to the ABC Telecommunications Co. in the Philippines, it is common to continue to use a building facilities and equipments until the end of the lifetime of those. All the measures intend to replace the existing equipments with new equipments before the end of the lifetime. Therefore, those measures face barriers due to prevailing practices.

Based on the above-mentioned analysis results, Alternatives 2 & 3 was screened out, while Alternative 1 was identified as the most plausible baseline scenario.

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA): >>

E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:

In accordance with paragraph 28 of the simplified modalities and procedures for small-scale CDM project activities, a simplified baseline and monitoring methodology listed in Appendix B may be used if project participants can demonstrate that the project activity would otherwise not be implemented due to at least one of the following barries: (a) investment barrier, (b) technological barrier, (c) barrier due to prevailing practice, and (d) other barriers.

(a) Investment barrier analysis

As stated in the E.5., ABC Telecommunication adopts "payback time" as a criterion to evaluate the economic attractiveness of energy-efficiency improvement measures. All the payback times of the energy efficiency improvement measures planned to be introduced as CPA are longer than the "threshold value", and thus they do not comply with the project viability requirements of ABC telecommunication Co.

In addition, the proposed energy-efficiency improvement measures in the typical CPA do not result in expansion of their business operation. Therefore, the investment priority for these measures is relatively low, and the proposed measures are unlikely implemented as introduced in the project activity, without CDM.

(b) Technological barrier analysis

All the necessary equipments for each proposed measure are available in the Philippines. There are no difficulties in installing those equipments at the target buildings. However, building owners in the Philippines have limited opportunities to obtain information on new energy-efficiency improvement technologies.

Lack of awareness on energy efficient technologies has hampered the introduction of new technologies in commercial buildings. There is a general reluctance in the implementation of new technologies in the telecommunication industry as they would rather focus on installing new telecommunication equipment to expand their market rather than to install energy efficient technologies. This is also the same case with ABC Telecommunication Co. They perceive installing energy efficient technologies as high technical risk with only a minor competitive advantage. Being a customer-driven company, they would also put more attention in improving customer service.
Therefore, in the absence of the CDM, they might not be aware of opportunities and significance of energy savings.

(c) Barrier due to prevailing practice

At the buildings belonging to the ABC Telecommunications Co. in the Philippines, it is common to continue to use a building facilities and equipments until the end of the lifetime of those. All the measures intend to replace the existing equipments with new equipments before the end of the lifetime. Therefore, those measures face barriers due to prevailing practices.

(d) Other barrier

To date, no laws or regulations at the national or local level have required adoption of an energy-efficiency improvement measures at the target facilities, and there are no incentives being given for the implementation of those measures. Thus, it can be said that all the energy efficiency improvement activities are implemented on a voluntary basis, without any obligations.

Given these high barriers, in the absence of CDM incentives, it is expected that the building owners continue to use the current and existing facilities, and not implement the proposed energy efficiency improvement measures planned to be introduced as CDM projects. The project activity should therefore be considered additional.

E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:

The key criteria for assessing additionality of a CPA when proposed to be included in the registered PoA will be the payback period of the project. As explained in the previous section, ABC Telecommunication Co. has a threshold of 2 years for its payback period. Any project with a payback period higher than 2 years is being scrapped and not approved for implementation.

E.6. Estimation of Emission reductions of a CPA:

E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:

As explained in section E.2, the baseline and monitoring methodologies applied to the project activity are as follows;

Approved baseline and monitoring methodology applied to the project
Version 10 of AMS-II.E. "Energy-efficiency and fuel switching measures for buildings"

Methodologies or tools which the approved methodology above draws upon
Version 12 of AMS-I.D. "Grid connected renewable electricity generation", and
"Tool to calculate the emission factor for an electricity system"

The proposed energy efficiency improvement measures under the PoA involve retrofitting by replacing the existing equipment such as the cooling sources and cooling towers, the chilled water/air carrier systems and the lighting system with the high efficiency type. All of the existing equipment to be replaced uses electricity. Hence, the baseline energy usage will be the additional amount of electricity that would have been continued to be consumed by the existing equipment or group of equipment before the energy efficiency improvement measures were adopted. The baseline emissions will be the amount of electricity consumed prior to the project multiplied by a CO_2 emission coefficient based on the displaced electricity from the grid or in accordance with provisions under AMS: I.D – "Grid Connected Renewable Electricity Generation", and "Tool to calculate the emission factor for an electricity system".

In the "Tool to calculate the emission factor for an electricity system", the following two options are provided to calculate the carbon emission factor for electricity from a grid;

"For all other systems, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient calculated in a transparent and conservative manner as:
(a) the average of the "approximate operating margin (OM)" and "build margin (BM)"; or
(b) the weighted average emissions (in kg CO2e/k Wh) of the current generation mix"

The second option "the weighted average emissions of the current generation mix" is chosen in the project activity because the data necessary to calculate the combined margin is not available in the Luzon Grid, from which the target building of the typical CPA purchases electricity.
The weighted average emissions for Luzon Grid can be calculated as 0.548 $kgCO_2/kWh$

E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:

GHG emission reductions are calculated as follows;

$$ER_y = BE_y – PE_y - L_y$$

where

ER_y	Annual GHG emission reductions in year *y* (tCO_2/year)
BE_y	Annual baseline GHG emissions in year *y* (tCO_2/year)
PE_y	Annual project GHG emissions in year *y* (tCO_2/year)
L_y	Annual leakage GHG emissions in year y (tCO_2/year)

$$BE_y = \sum_j E^B_{j,y} = \sum_j (Q^B_{j,y} * EF^B_{j,y})$$

where

$E^B_{j,y}$	Annual GHG emissions from target facility *j* in year *y* in baseline scenario (tCO_2/year)
$Q^B_{j,y}$	Annual electricity consumption of facility *j* in year *y* in baseline scenario (MWh/year)
$EF^B_{j,y}$	Carbon emission factor of electricity consumed by facility *j* in year *y* in baseline scenario (tCO_2/MWh)

In case the lifetime of existing target facilities ends during the crediting period, emission reductions derived from the corresponding energy-efficiency improvement measures is not claimed after the end of the lifetime, assuming that baseline emissions are equal to project emissions at the facilities ($E^B_{i,j,y} = E^P_{i,j,y}$)

$$PE_y = \sum_j E^P_{j,y} = \sum_j (Q^P_{j,y} * EF^P_{j,y})$$

where

$E^P_{j,y}$	Annual GHG emissions from target facility *j* in year in project scenario (tCO_2/year)
$Q^P_{j,y}$	Annual electricity consumption of facility *j* in year *y* in project scenario (MWh/year)

[1] Department of Energy, 2007. Power Statistics.

$EF^{P}_{j,y}$ Carbon emission factor of electricity consumed by facility *j* in year *y* in project scenario (tCO_2/MWh)

Measures applied to the typical CPA (at the headquarters of ABC Telecommunication Co.) are:

Measure 2: Replacement of cooling tower with high-efficient type
Measure 3-a: Replacement of PAC with high-efficient type (12hour operation)
Measure 3-b: Replacement of PAC with high-efficient type (24hour operation)
Measure 4: Replacement of cool water pump with high-efficient type
Measure 5: Installation of inverter control of pump and VWV
Measure 7: Installation of inverter control of fan and VAV to the duct
Measure 8: Replacement of ballast

Practically, at the headquarters of ABC Telecommunication Co., Measure 2-A will be implemented in combination with Measure 7. The electricity consumption reduced through those measures will be monitored in a lump. The same is applied to the combination of Measure 4 and Measure 5.

Formula to calculate $Q^{B}_{j,y}$ (for a typical CPA)

Measure 2: Replacement of cooling tower with high-efficient type

$$Q^{B}_{j,y} = \sum^{8760} Q^{P}_{CT,h} / (1\text{-}ESR_{CT})$$

where

$Q^{P}_{CT,h}$ Hourly electricity consumption of target new CT with inverter control in hour *h* in project scenario (MWh/hours)

ESR_{CT} Energy saving rate of the energy-efficiency measure (CT with inverter control) introduced to the target building(%)

<Ex-ante estimation>

$$Q^{B}_{j,y} = n * W^{B}_{CT} * h \ / 1000$$

where

n Number of target facilities

W^{B}_{CT} Rated electricity consumption of target existing CT in baseline scenario (kW)

h Annual operation hour of target new facility in project scenario (hour/year)

Measure 3-a: Replacement of PAC with high-efficient type (12-hour operation) **+ Measure 7**:Installation of inverter control of fan and VAV to the duct

$$Q^{B}_{j,y} = \sum^{8760} Q^{P}_{PACa,h} / (1\text{-}ESR_{PACa})$$

where

$Q^{P}_{PACa,h}$	Hourly electricity consumption of target new PAC with inverter control of evaporator fan and VAV in hour *h* in project scenario (MWh/hours)
ESR_{PACa}	Energy saving rate of the energy-efficiency measure (PAC with inverter control of evaporator fan and VAV) introduced at building *i* (%)

<Ex-ante estimation>

$$Q^{B}_{j,y} = n * (W^{B}_{compressor} + W^{B}_{evap.fan})* h / 1000$$

n	Number of target facilities
$W^{B}_{compressor}$	Rated electricity consumption of target existing compressor of water-cooled PAC in baseline scenario (kW)
$W^{B}_{evap.fan}$	Rated electricity consumption of target existing evaporator fan of water-cooled PAC in baseline scenario (kW)
h	Annual operation hour of target new facility in project scenario (hour/year)

Measure 3-b: Replacement of PAC with high-efficient type (24-hour operation)

$$Q^{B}_{j,y} = \sum^{8760} Q^{P}_{PACb,h} / (1-ESR_{PACb})$$

where

$Q^{P}_{PACb,h}$	Hourly electricity consumption of target new PAC in hour *h* in project scenario (MWh/hours)
ESR_{PACb}	Energy saving rate of the energy-efficiency measure (high-efficient PAC) introduced at building *i* (%)

<Ex-ante estimation>

$$Q^{B}_{j,y} = n * (W^{B}_{compressor} + W^{B}_{evap.fan} + W^{B}_{cond.fan})* h * LF / 1000$$

where

n	Number of target facilities
$W^{B}_{compressor}$	Rated electricity consumption of target existing compressor of PAC in baseline scenario (kW)
$W^{B}_{evap.fan}$	Rated electricity consumption of target existing evaporator fan of PAC in baseline scenario (kW)
$W^{B}_{cond.fan}$	Rated electricity consumption of target existing condenser fan of PAC in baseline scenario (kW)
h	Annual operation hour of target new facility in baseline scenario
LF	Load factor of target facility

Measure 4: Replacement of chilled/cooled water pump with high-efficient type + **Measure 5:** Installation of inverter control of pump and VWV

$Q^{B}_{j,y} = \sum^{8760} Q^{P}_{pump,h} / (1\text{-}ESR_{pump})$

where

$Q^{P}_{pump,h}$	Hourly electricity consumption of target new pump with inverter control in hour *h* in project scenario (MWh/hours)
ESR_{pump}	Energy saving rate of the energy-efficiency measure (installation of inverter control of pump) introduced to the target new pump building *i* (%)

<Ex-ante estimation>

$Q^{B}_{j,y} = n * W^{B}_{pump} * h / 1000$

where

n	Number of target facilities
W^{B}_{pump}	Rated electricity consumption of target existing pump with inverter control in baseline scenario (kW)
h	Annual operation hour of target new facility in baseline scenario (hour/year)

Measure 8: Replacement of ballast

$Q^{B}_{j,y} = n * W^{B}_{light} * h / 1000$

where

n	Number of target facilities
W^{B}_{light}	Rated electricity consumption of target existing light in baseline scenario (kW)
h	Annual operation hour of target new facility in baseline scenario (hour/year)

<Ex-ante estimation>

$Q^{B}_{j,y} = n * W^{B}_{light} * h / 1000$

Formula to calculate $Q^{P}_{j,y}$ (for a typical CPA)

Measure 2: Replacement of cooling tower with high-efficient type

$Q^{P}_{j,y} = \sum^{8760} Q^{P}_{CT,h}$

where

$Q^{P}_{CT,h}$	Hourly electricity consumption of target new CT with inverter control of CT unit and fan unit in hour *h* in project scenario (MWh/hours)

<Ex-ante estimation>

$Q^{P}_{j,y} = n * W^{P}_{CT} * h *(1\text{-}ESR_{inverter\ CT}) / 1000$

where

n	Number of target facilities
W^{P}_{CT}	Rated electricity consumption of target new CT in project scenario (kW)
h	Annual operation hour of target new facility in project scenario (hour/year)
$ESR_{inverter\ CT}$	Energy saving rate of the energy-efficiency measure (installation of inverter control of CT unit and fan unit) introduced to the target new CT at building *i* (%)

Measure 3-a: Replacement of PAC with high-efficient type (12-hour operation) **+ Measure 7**:Installation of inverter control of fan and VAV to the duct

$Q^{P}_{j,y} = \sum^{8760} Q^{P}_{PACa,h}$

where

$Q^{P}_{PACa,h}$	Hourly electricity consumption of target new PAC with inverter control of evaporator fan and VAV in hour *h* in project scenario (MWh/hours)

<Ex-ante estimation>

$Q^{P}_{j,y} = [\ n * W^{P}_{compressor} * h + n * W^{P}_{evap.fan} * h * (1\text{-}ESR_{fan\ inverter})\ ] / 1000$

where

n	Number of target facilities
$W^{P}_{compressor}$	Rated electricity consumption of target new compressor of PAC in project scenario (kW)
h	Annual operation hour of target new facility in project scenario (hour/year)
$W^{P}_{evap.fan}$	Rated electricity consumption of target new evaporator fan of PAC in project scenario (kW)
$ESR_{fan\ inverter}$	Energy saving rate of the energy-efficiency measure (inverter control of evaporator fan) introduced to the new PAC (%)

Measure 3-b: Replacement of PAC with high-efficient type (24-hour operation)

$Q^{P}_{j,y} = \sum^{8760} Q^{P}_{PACb,h}$

where

$Q^{P}_{PACb,\ h}$	Hourly electricity consumption of target new PAC with inverter control of evaporator fan and VAV in hour *h* in project scenario (MWh/hours)

<Ex-ante estimation>

$Q^{P}_{j,y} = n * (\ W^{P}_{compressor} + W^{P}_{evap.fan} + W^{P}_{cond\ fan}\ ) * h * LF / 1000$

where

n	Number of facilities
$W^{P}_{compressor}$	Rated electricity consumption of target new compressor in project scenario (kW)
$W^{P}_{evap.fan}$	Rated electricity consumption of target new evaporator fan in project scenario (kW)
$W^{P}_{cond.fan}$	Rated electricity consumption of target new condenser fan in project scenario (kW)
h	Annual operation hour of target new facility in project scenario (hour/year)
LF	Load factor of the target facility

Measure 4: Replacement of chilled/cooled water pump with high-efficient type + **Measure 5:** Installation of inverter control of pump and VWV

$$Q^{P}_{j,y} = \sum^{8760} Q^{P}_{pump,h}$$

where

$Q^{P}_{pump,h}$	Hourly electricity consumption of target new pump with inverter control in hour h in project scenario (MWh/hours)

<Ex-ante estimation>

$$Q^{P}_{j,y} = n * W_{pump} * h * (1\text{-}ESR_{inverter\ pump}) / 1000$$

where

n	Number of target facilities
W_{pump}	Rated electricity consumption of target new pump with inverter control in project scenario (kW)
h	Annual operation hour of target new facility in project scenario (hour/year)
$ESR_{i,inverter\ pump}$	Energy saving rate of the energy-efficiency measure (installation of inverter control of pump) introduced to the target new pump (%)

Measure 8: Replacement of ballast

$$Q^{P}_{j,y} = \sum^{8760} Q^{P}_{light,h}$$

where

$Q^{P}_{light,h}$	Hourly electricity consumption of target new inverter ballast to the existing lighting system at building i in hour h in project scenario (MWh/hours)

<Ex-ante estimation>

$$Q^{P}_{j,y} = Q^{B}_{light,y} * (1\text{-}ESR_{light})$$

where

$Q^{B}_{light,\,y}$	Annual electricity consumption of target existing lighting system in year *y* in baseline scenario (MWh/years)
ESR_{light}	Energy saving rate of the energy-efficiency measure (Replacement of ballast with inverter type) introduced to existing lighting system (%)

Formula to calculate $EF^{B}_{j,y}$

The Philippine electricity grid is divided into three (3) main grids, namely, the Luzon Grid, the Visayas Grid and the Mindanao Grid. Each grid has a different energy mix and therefore has different emission coefficients. The target building of the typical CPA is located at the Makati City, Luzon region. All the electricity consumed at target building is purchased from the Luzon Grid, hence, emission factor for the Luzon Grid is adopted in the typical CPA.

In category I.D, it has been indicated that the emission coefficient (measured in kg CO_2e/kWh) must be calculated in a transparent and conservative manner. Two options have been provided:

- A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM)
- The weighted average emissions (in kg CO_2e/kWh) of the current generation mix.

The second option "the weighted average emissions of the current generation mix" is chosen in the project activity because the data necessary to calculate the combined margin is not available in the area from which the buildings of ABC Telecommunication purchases electricity.

Emission Coefficient for the Luzon Grid, and other grids in the Philippine calculated based on the data available are as summarized in the Table below[2]

Grid	Emission Coefficient $kgCO_{2e}/kWh$
Luzon	0.548
Visayas	0.219
Mindanao	0.163

Leakage (L_y)

Leakage can be calculated from the following formula;

$$L_y = L_{diversion,y} + L_{HFC,y} * GWP_{HFC}$$

where

L_y	Annual leakage emissions in year y (tCO_2/y)

[2] Department of Energy, 2007. Power Statistics.

$L_{diversion,y}$	GHG emissions related to existing equipment transferred to another activity or energy-efficiency equipment transferred from another activity in year y. (tCO_2/y)
$L_{HFC,y}$	HFC emissions contained in target existing chillers to be disposed through the project activity in year y. (tHFC/y)
GWP_{HFC}	Global warming potential of HFC ($tCO_2/tHFC$)

The project activity does not include transfer of equipment from another activity nor the transfer of existing equipment to another activity. Therefore, $L_{diversion,y}$ is estimated to be zero. This fact will be confirmed by monitoring disposal certificates which are prepared as part of normal accounting procedures at the target buildings.

As HFC is contained in existing chillers at some building, there is some possibility that implementation of Measure 1-A may cause the release of this gas into the atmosphere. However, this project activity will include thorough recovery of HFC at the time of disposal of these equipments. Recovery certificates issued by companies conducting the recovery will be monitored.

Based on the above consideration, leakage is estimated to be zero.

Summary of Emission Reduction

	$Q^B_{j,y}$ (MWh/year)	$Q^P_{j,y}$ (MWh/year)	BE_y tCO_2/year	PE_y tCO_2/year	ER_y (=BE-PE) tCO_2/year
Measure 2	347.20	138.88	190	76	114
Measure 3-a + Measure7	5,704.00	4,290.40	3,126	2,351	775
Measure 3-b	2,310.00	1,848.00	1,266	1,013	253
Measure 4 + Measure 5	341.00	208.32	187	114	73
Measure 8	1,178.00	1,001.30	646	549	97
Total	**9,880.20**	**7,486.90**	**5,415**	**4,103**	**1,312**

E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:

Data / Parameter:	BE_y
Data unit:	tCO_2/y
Description:	Annual Baseline GHG Emission
Source of data used:	Calculation
Value applied:	-
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as follows: $BE_y = \sum_j E^B_{j,y}$
Any comment:	

Data / Parameter:	$E^{B}_{j,y}$
Data unit:	tCO_2/y
Description:	Annual GHG emissions from target facility j in baseline scenario
Source of data used:	Calculation
Value applied:	-
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as follows: $E^{B}_{j,y} = Q^{B}_{j,y} * EF^{B}_{j,y}$
Any comment:	

Data / Parameter:	$Q^{B}_{j,y}$
Data unit:	MWh/y
Description:	Annual electricity consumption of facility j in baseline scenario
Source of data used:	Calculation
Value applied:	-
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as the sum of electricity consumption of target facilities in baseline scenario
Any comment:	

Data / Parameter:	EF
Data unit:	tCO_2/MWh
Description:	The weighted average emissions of the current generation mix in the Luzon grid in baseline scenario
Source of data used:	Calculation
Value applied:	0.548
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as follows: $EF^{B}=(\sum F_{i,w,y} * COEF_{i,w})/ \sum_t GEN_{t,y}$
Any comment:	

Measure 2

Data / Parameter:	W^{B}_{CT}
Data unit:	kW
Description:	Rated electricity consumption of the existing target CT in baseline scenario
Source of data used:	Calculation
Value applied:	CT1: 20.0

	CT2: 36.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the past data measured by WH monitor
Any comment:	

Data / Parameter:	W^{P}_{CT}
Data unit:	kW
Description:	Rated electricity consumption of the new target CT in project scenario
Source of data used:	Calculation
Value applied:	CT 1: 12.0 CT 2: 16.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Estimated from the data provided by the manufacture's specification
Any comment:	

Data / Parameter:	$ESR_{inverter,CT}$
Data unit:	
Description:	Energy saving rate of the higher-efficient CT
Source of data used:	Manufacturer's specifications
Value applied:	0.2
Justification of the choice of data or description of measurement methods and procedures actually applied :	Estimated from the data provided in the manufacture's specification
Any comment:	

Measure 3-a + Measure 7

Data / Parameter:	$W^{B}_{compressor}$
Data unit:	kW
Description:	Rated electricity consumption of the existing target evaporator fan of PAC in baseline scenario
Source of data used:	Calculation
Value applied:	Compressor 1: 26.0 Compressor 2: 40.0
Justification of the choice of data or	Calculated based on the past data measured by WH monitor

description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	$W^{B}_{evap.fan}$
Data unit:	kW
Description:	Rated electricity consumption of the existing target evaporator fan of PAC in baseline scenario
Source of data used:	Calculation
Value applied:	Evaporator fan 1: 8.0 Evaporator fan 2: 18.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the past data measured by WH monitor
Any comment:	

Data / Parameter:	$W^{P}_{compressor}$
Data unit:	kW
Description:	Rated electricity consumption of the target compressor introduced to the PAC-a in project scenario
Source of data used:	Calculation
Value applied:	Compressor 1: 22.0 Compressor 2: 32.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Estimated from the data provided in the manufacture's specification
Any comment:	

Data / Parameter:	$W^{P}_{evap.fan}$
Data unit:	kW
Description:	Rated electricity consumption of the new target evaporator fan of PAC in project scenario
Source of data used:	Calculation
Value applied:	Evaporator fan 1: 7.0 Evaporator fan 2: 12.0
Justification of the choice of data or description of measurement methods and procedures actually	Estimated from the data provided in the manufacture's specification

applied :	
Any comment:	

Data / Parameter:	$ESR_{inverter.fan}$
Data unit:	
Description:	Energy saving rate of the energy-efficiency measure (installation of inverter of fan and VAV) introduced to the target new PAC
Source of data used:	Manufacturer's specifications
Value applied:	0.2
Justification of the choice of data or description of measurement methods and procedures actually applied :	Estimated from the data provided by the manufacturer of inverter of fan and VAV
Any comment:	

Measure 3-b

Data / Parameter:	$W^{B}_{compressor}$
Data unit:	kW
Description:	Rated electricity consumption of the existing target compressor of PAC in baseline scenario
Source of data used:	Calculation
Value applied:	400.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the past data measured by WH monitor
Any comment:	

Data / Parameter:	$W^{B}_{evap.fan}$
Data unit:	kW
Description:	Rated electricity consumption of the existing target evaporator fan of PAC in baseline scenario
Source of data used:	Calculation
Value applied:	100.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the past data measured by WH monitor
Any comment:	

Data / Parameter:	$W^{B}_{cond.fan}$
Data unit:	kW

Description:	Rated electricity consumption of the existing target condenser fan of PAC in baseline scenario
Source of data used:	Calculation
Value applied:	25.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the past data measured by WH monitor
Any comment:	

Data / Parameter:	LF
Data unit:	
Description:	Load factor of target facility
Source of data used:	Calculation
Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	Estimated from the past data measured by monitoring device
Any comment:	

Data / Parameter:	$W^{P}_{compressor}$
Data unit:	kW
Description:	Rated electricity consumption of the new target compressor of PAC in project scenario
Source of data used:	Calculation
Value applied:	310.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Estimated from the data provided by the manufacture's specification
Any comment:	

Data / Parameter:	$W^{P}_{evap.fan}$
Data unit:	kW
Description:	Rated electricity consumption of the new target evaporator fan of PAC in project scenario
Source of data used:	Calculation
Value applied:	90.0
Justification of the choice of data or	Calculated based on the data measured by WH monitor

description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	$W^{P}_{cond.fan}$
Data unit:	kW
Description:	Rated electricity consumption of the new target condenser fan of PAC in project scenario
Source of data used:	Calculation
Value applied:	20.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the data measured by WH monitor
Any comment:	

Measure 4 and 5

Data / Parameter:	W^{B}_{pump}
Data unit:	kW
Description:	Rated electricity consumption of the existing target pump in baseline scenario
Source of data used:	Calculation
Value applied:	Pump 1: 30.0 Pump 2: 25.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the data measured by WH monitor
Any comment:	

Data / Parameter:	W^{P}_{pump}
Data unit:	kW
Description:	Rated electricity consumption of the new target pump in project scenario
Source of data used:	Calculation
Value applied:	Pump 1: 20.0 Pump 2: 22.0
Justification of the choice of data or description of measurement methods and procedures actually	Calculated based on the data measured by WH monitor

applied :	
Any comment:	

Data / Parameter:	ESR_{pump}
Data unit:	
Description:	Energy saving rate of the energy-efficiency measure (installation of inverter control of pump)
Source of data used:	Manufacturer's specifications
Value applied:	0.2
Justification of the choice of data or description of measurement methods and procedures actually applied :	Estimated from the data provided by the manufacturer of cool water pump
Any comment:	

Measure 8

Data / Parameter:	W^{B}_{light}
Data unit:	kW
Description:	Rated electricity consumption of the light in baseline scenario
Source of data used:	Calculation
Value applied:	Light 1: 0.08 Light 2: 0.04
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the data measured by WH monitor
Any comment:	

Data / Parameter:	ESR_{light}
Data unit:	-
Description:	Energy saving rate of the energy-efficiency measure (higher-efficient lighting system) in project scenario
Source of data used:	Manufacturer's specifications
Value applied:	0.15
Justification of the choice of data or description of measurement methods and procedures actually applied :	Estimated from the data provided by the manufacturer of the lighting system
Any comment:	

E.7. Application of the monitoring methodology and description of the monitoring plan:

D.7.1. Data and parameters to be monitored by each SSC-CPA:

Data / Parameter:	PE_y
Data unit:	tCO_2/y
Description:	Annual Project GHG Emission
Source of data to be used:	Calculation
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Calculated as follows: $PE_y = \sum_j E^P_{j,y}$
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

Data / Parameter:	$E^P_{j,y}$
Data unit:	tCO_2/y
Description:	Annual GHG emissions from target facility j in project scenario
Source of data to be used:	Calculation
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Calculated as follows: $E^P_{j,y} = Q^P_{j,y} * EF^P_{j,y}$
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

Data / Parameter:	$Q^P_{j,y}$
Data unit:	MWh/y
Description:	Annual electricity consumption of facility j in project scenario
Source of data to be used:	Calculation

Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Calculated as the sum of electricity consumption of target facilities in project scenario
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

Data / Parameter:	EF^{P}
Data unit:	tCO_2/MWh
Description:	The weighted average emissions of the current generation mix in the Luzon grid in project scenario
Source of data to be used:	Calculation
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.548
Description of measurement methods and procedures to be applied:	Calculated as follows: $EF^{B}=(\sum F_{i,w,y} * COEF_{i,w})/ \sum_t GEN_{t,y}$
QA/QC procedures to be applied:	Energy saving expert(s) is appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

Data / Parameter:	GEN
Data unit:	MWh/year
Description:	Annual electricity generated by power plant connected to the Grid
Source of data to be used:	Statistics
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Luzon Grid – 37,879,081,365
Description of measurement methods and procedures to be applied:	To be updated annually using appropriate official documents.
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.

Any comment:	Electricity consumed at the target buildings is purchased from the Luzon, Visayas and Mindanao Grid.

Measure 2

Data / Parameter:	$Q^{P}_{CT,h}$
Data unit:	MWh/hour
Description:	Hourly electricity consumption of target CT in project scenario
Source of data to be used:	Monitoring device
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Measure by WH monitor
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

Measure 3-a + Measure 7

Data / Parameter:	$Q^{P}_{PACa,h}$
Data unit:	MWh/hour
Description:	Hourly electricity consumption of target PAC (12-hour operation) in project scenario
Source of data to be used:	Monitoring device
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Measure by WH monitor
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

Measure 3-b

Data / Parameter:	$Q^{P}_{PACb,h}$
Data unit:	MWh/hour
Description:	Hourly electricity consumption of target PAC(24-hour operation) in project scenario
Source of data to be used:	Monitoring device
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Measure by WH monitor
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

Measure 4 + Measure 5

Data / Parameter:	$Q^{P}_{pump,h}$
Data unit:	MWh/hour
Description:	Hourly electricity consumption of target chilled water pump with inverter control in project scenario
Source of data to be used:	Monitoring device
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Measure by WH monitor
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

Measure 8

Data / Parameter:	$Q^{P}_{light,h}$
Data unit:	MWh/hour
Description:	Hourly electricity consumption of target lighting system with inverter ballast in project scenario
Source of data to be used:	Monitoring device
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Measure by WH monitor
QA/QC procedures to be applied:	Energy saving expert(s) are appointed from the project participants. The person(s) are engaged in data collection and calculation.
Any comment:	

E.7.2. Description of the monitoring plan for a SSC-CPA:

Monitoring at ABC Telecommunication Co. shall consist of:

(a) Documenting the specifications of the equipment replaced;
(b) Calculating the energy savings due to the measures installed.

Monitoring shall be done by an Energy Team consisting of the Team Manager for the air-conditioning system and the Team Manager for the lighting system. Both Team Managers shall prepare a monitoring worksheet for all equipment to be monitored. Monitoring shall be done by reading directly from electric meters the actual electricity consumption hourly, weekly and monthly. They shall also be responsible for the calculation of the electricity consumption and the GHG emissions. They shall be reporting to the Energy Overall Team Leader and to the Facilities and Engineering Department Head.

E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

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Annex 1

CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAMME of ACTIVITIES

Organization:	ABC Telecommunication Co.
Street/P.O.Box:	
Building:	Headquarter Building
City:	Makati City
State/Region:	
Postfix/ZIP:	
Country:	Philippines
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No fund from public sources is used in any aspect of the proposed project.

Annex 3

BASELINE INFORMATION

The Philippine electricity grid is divided into three (3) main grids, namely, the Luzon Grid, the Visayas Grid and the Mindanao Grid. Each grid has a different energy mix and therefore has different emission coefficients as follows[3]. Below tables will show how the emission coefficients were calculated.

Calculation of Emission Coefficients for Luzon Grid

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Item	2002-2004 Electricity Generation	Heat Rate	Fuel Consumption Impact	Carbon Emission Factor	Unadjusted Annual Carbon Emission Impact	Combustion Efficiency	Actual Carbon Emission Impact	Annual Carbon Dioxide Emission Impact
Abbreviation	GEN		FCI	CEF	CEI		Adjusted CEI	tCO_2/yr
Data Source	PDOE Powerstats	PEOE	(AxBx1055) / 10^12	IPCC	CxE		Ex F	Fx (44/12)
Unit	kWh/yr	BTU/ kWh	TJ/yr	tC/TJ	tC/yr		tC/yr	
Oil-based								
Comb Cycle	641,881,033	6,550	4,435.56	20.2	89,598.28	0.99	88,702.30	325,241.76
Diesel	2,344,537,894	8,900	22,014.04	20.2	444,683.58	0.99	440,236.74	1,614,201.39
Gas Turbine	10,420,047	14,400	158,30	20.2	3,197.69	0.99	3,165.71	11,607.60
Oil Thermal	894,336,867	8,600	8,114.32	21.1	171,212.12	0.99	169,500.00	621,499.99
Coal	15,237,932,917	8,900	143,076.57	26.8	3,834,452.11	0.98	3,757,763.06	13,778,464.57
Natural Gas	11,431,575,403	6,550	78,995.04	15.3	1,208,624.17	0.995	1,202,581.05	4,409,463.85
Hydro	3,681,713,073							
Geothermal	3,636,684,131							
Wind								
Total	37,879,081,365							20,760,479.16

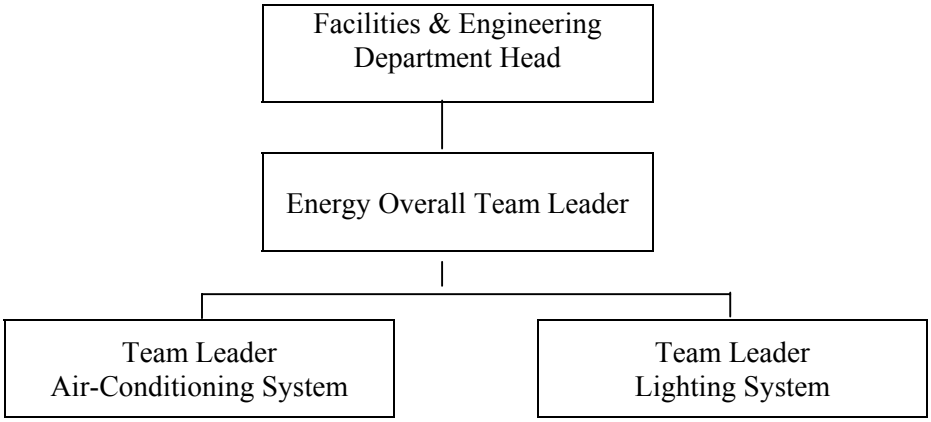
Emission Factor	(H) / (A / 1000)	0.548	tCO_2/MWh

[3] Department of Energy, 2007. Power Statistics.

Annex 4

MONITORING INFORMATION

Organizational Structure of the Monitoring Team:



Responsibilities:

Team Leaders:

- Daily reading of meters
- Logging of data in logbooks and spreadsheets
- Analysis of emission reductions
- Maintain all records on a daily, monthly, quarterly and yearly basis
- Monitor and check non-metered systems to ensure that they are still operating.
- Prepare report to the Energy Team Leader

Energy Team Leader

- Review data entry in logbooks
- Review data in spreadsheets for any discrepancies
- Consolidate reports of the Team Leaders
- Prepare report for the Facilities and Engineering Department Head

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