**CLEAN DEVELOPMENT MECHANISM**
**PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)**
**Version 03 - in effect as of: 22 December 2006**

**CONTENTS**



**Annexes**

**Revision history of this document**

| Version Number | Date | Description and reason of revision |
|---|---|---|
| 01 | 21 January 2003 | Initial adoption |
| 02 | 8 July 2005 | • The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document.<br>• As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>. |
| 03 | 22 December 2006 | • The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM. |

## SECTION A. General description of small-scale project activity

### A.1 Title of the small-scale project activity:

Title of the project activity: DEWA Chiller Station L
Current version: 3
Date of completing version 3 of this document: 14/11/2012

### A.2. Description of the small-scale project activity:

The purpose of the project activity is to improve the efficiency of the three gas turbines (GTs) L 71 – L 73 installed at Station L Phase 1 of Dubai Electricity and Water Authority (DEWA) (DEWA being the project proponent) by implementing an inlet air chilling system called Thermal Energy Storage and Turbine Inlet Air Cooling (TESTIAC). It is estimated that this measure will result in an increase of average historic (2008-2010) efficiencies of the gas turbines by approximately 2%.

The project activity will cool the inlet air of 3 gas turbines, each a model GE PG9351 (FA+e) installed at Station L Phase 1, down to approximately 25 degrees Celsius. The TESTIAC system will cool in continuous mode for 8 hours per day, 7 days per week; the thermal energy storage system will re-charge during the 16 hours/day when it is not cooling. The TESTIAC system will be operated during 7 months of the year, between April – October, when ambient temperatures in Dubai are at their highest.

The effect of cooling the ambient air is to increase the efficiency of the gas turbine by increasing the density of inlet air, thereby increasing the air mass flow rate into the (constant volumetric flow) gas turbine.

The project activity reduces greenhouse gas emissions because less fossil fuel input is required to generate the same output of electricity during operation of the TESTIAC system. The expected emission reductions will be approximately 26,800 $tCO_2e$ per year

In the view of the project participants, the project activity contributes to sustainable development by:

- Generating electrical energy with less fossil fuel consumption, thereby reducing greenhouse gas emissions.

- Transferring new technology to the host country, as this will be the first project activity installing a Thermal Energy Storage and Turbine Inlet Air Cooling system in a power plant located in the host country.

### A.3. Project participants:

| Name of Party involved ((host) indicates a host Party): | Private and/or public entity(ies) project participants(*) (as applicable) | Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|---|---|---|
| Government of United Arab Emirates (host) | Dubai Carbon Centre of Excellence | No |

| | | |
|---|---|---|
| | Dubai Electricity and Water Authority (DEWA) | |

**A.4. Technical description of the small-scale project activity:**

**A.4.1. Location of the small-scale project activity:**

**A.4.1.1. Host Party(ies):**

United Arab Emirates

**A.4.1.2. Region/State/Province etc.:**

Emirate of Dubai

**A.4.1.3. City/Town/Community etc:**

Jebel Ali area in Jumeirah, south west of Dubai

**A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :**

Longitude 55.11129545
Latitude 25.05208411


**A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:**

According to the *appendix B of the simplified modalities and procedures (M & P) for small-scale CDM project activities*[1], the proposed project falls under the following type and category.

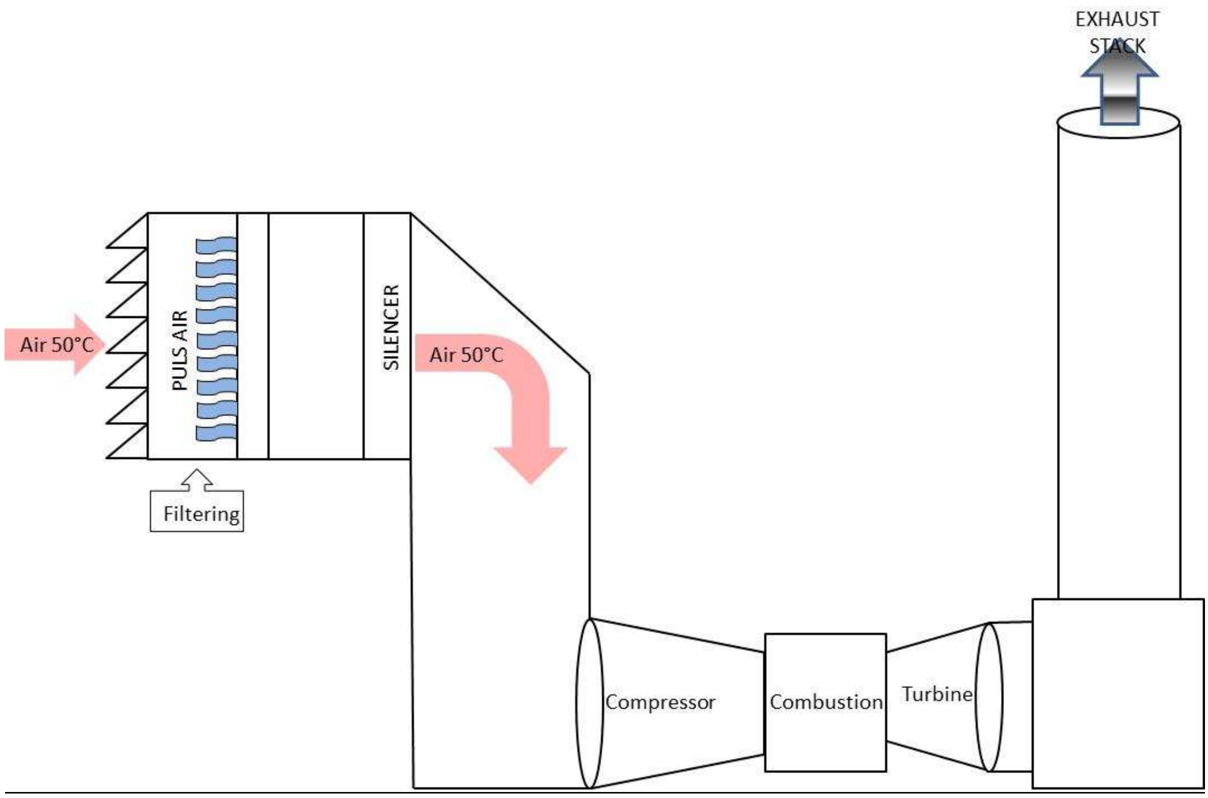
| | |
|---|---|
| Project type: | Type II project activities: energy efficiency improvement projects |
| Category | II.B - Supply side energy efficiency improvements – generation |
| Reference | AMS II.B, Version 09 |

By implementing the state-of-the-art TESTIAC system for the first time in the host country, environmentally safe and sound technology and know-how are being applied in this CDM project activity in the host country.

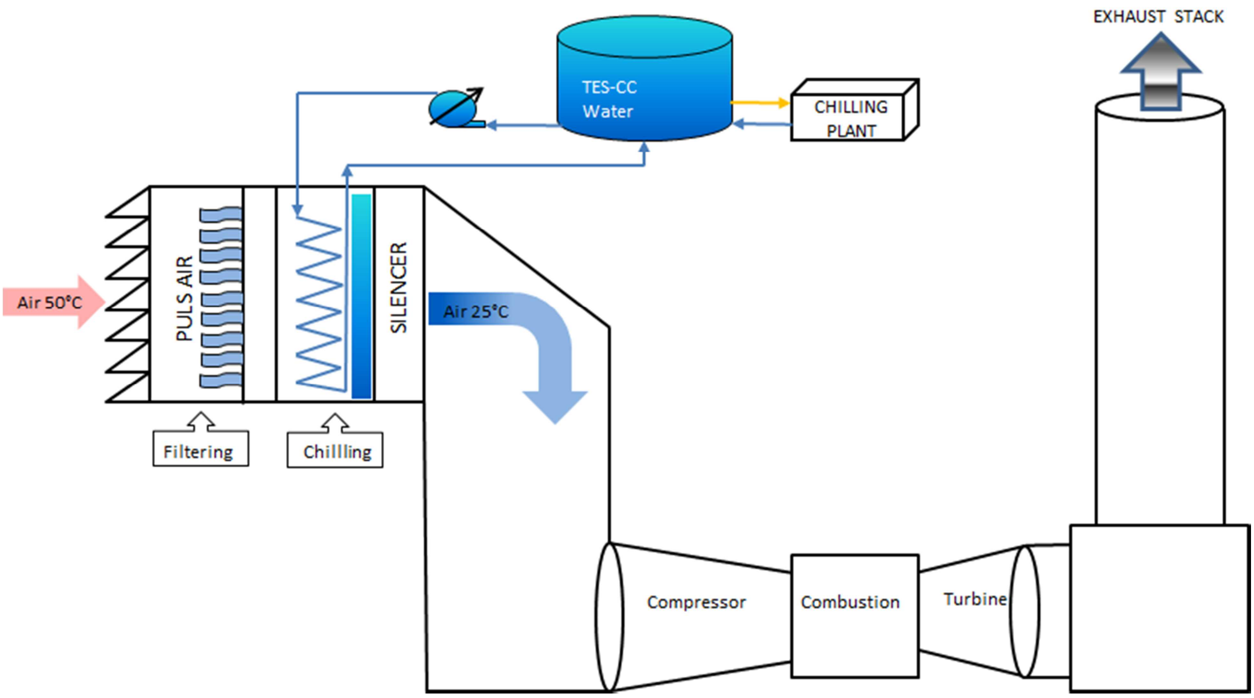
The project proponent has even been contacted by renowned gas turbine manufacturers, expressing their interest in learning about the experiences from the project proponent with the new technology.

The following sketches illustrate first (1) the current GT system at Station L without and second (2) with chilling:

[1] http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf




Without the chilling system, the ambient air passes through the filter section to the gas turbine and then to the exhaust stack. In this case, the temperature of the ambient air is equal to the temperature of the inlet air.




With chilling, the ambient air will be cooled after the filter section by cooling coils. The purpose of the air cooling coils is to produce indirect cooling of the air going to the turbine compressor, by means of cold water. These coils will use cooling water coming from the Thermal Storage Tank. The water is cooled in an ammonia-based refrigeration plant.

It is estimated that this measure will result in an increase of average historic (2008-2010) efficiencies of the gas turbines by approximately 2%.

**Summarized description of the equipment and facilities of the project's system:**

**System guarantee:**

| | |
|---|---|
| Ambient air temperature: | 50.0º C |
| Relative humidity: | 25.0% |
| Cooled air temperature: | 25.0º C |
| Number of cooling hours per day: | 8 hours |
| Number of cooling days per week: | 7 days |

**Thermal Storage:**

| | |
|---|---|
| Type of storage: | Water / Stratified |
| Temperature difference: | 14.0º C / 36.5º C |
| Method of stratification: | Natural/Concentric Diff. |
| Tank usable volume: | 24,871 $m^3$ |

**Refrigeration plant:**

| | |
|---|---|
| Total refrigeration capacity: | 42,000 kW |
| Water inlet temperature: | 36.5º C |
| Water outlet temperature: | 14.0º C |

| | |
|---|---|
| 2 x Compressors screw type (HP): | +19.7º C / +51º C |
| Refrigeration capacity per compressor: | 11,950 kW |
| 2 x Compressor screw type (LP): | +10.5º C / +51º C |
| Refrigeration capacity per compressor: | 9,126 kW |

**Pumping groups:**

**Chilled water consumption pumping group (5+1):**

**Low speed condition (normal operation):**

| | |
|---|---|
| Total flow rate: | 3,257 $m^3$/h |
| Number of running pumps: | 5 |
| Pumps speed: | 1,220 rpm |
| Flow rate per pump: | **651 $m^3$/h** |

**Normal speed condition (emergency operation):**

| | |
|---|---|
| Total flow rate: | 5,428 $m^3$/h |
| Number of running pumps: | 5 |
| Pumps speed: | 1,790 rpm |
| Flow rate per pump: | **1,086 $m^3$/h** |

**Chilled water production pumping group (2+1):**

| | |
|---|---|
| Total flow rate: | 1,775 $m^3$/h |
| Number of running pumps: | 2 |
| Pump speed: | 1,490 rpm |
| Flow rate per pump: | **888 $m^3$/h** |

### A.4.3 Estimated amount of emission reductions over the chosen crediting period:

The chosen crediting period for the project activity is 10 years. Annual estimates of emission reductions by the project activity during the above crediting period are furnished below:

| **Years** | **Estimate of annual emission reductions in tonnes of $CO_2$e** |
|---|---|
| 1 | 26,800 |
| 2 | 26,800 |
| 3 | 26,800 |
| 4 | 26,800 |
| 5 | 26,800 |
| 6 | 26,800 |
| 7 | 26,800 |
| 8 | 26,800 |
| 9 | 26,800 |
| 10 | 26,800 |
| **Total estimated reductions (tonne of $CO_2$e)** | **268,000** |
| **Total number of crediting years** | **10** |
| **Annual average of the estimated reductions over the crediting period.** | **26,800** |

| **($tCO_2e$)** | |
|---|---|

**A.4.4. Public funding of the small-scale project activity:**

There is no public funding from Annex I Parties for the proposed project activity.

**A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:**

In reference to Appendix C to the simplified modalities and procedures for the SSC CDM project activities[2] the project proponent confirms that they have not registered any small scale CDM activity or applied to register another small scale CDM project activity within 1km of the project boundary, in the same project category and technology/measure in the previous two years. The project activity is not a debundled component of another larger project activity.

## SECTION B. Application of a baseline and monitoring methodology

**B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:**

Version 09 of AMS-II.B Supply side energy efficiency improvements – generation

Furthermore the following methodological tool has been applied:

"Tool to determine the remaining lifetime of equipment" (Version 01)"[3]

**B.2 Justification of the choice of the project category:**

| Applicability conditions in Version 09 of AMS.II.B | Characteristics of the project activity | Applicability criterion met? |
|---|---|---|

[2] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid17.pdf

[3] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

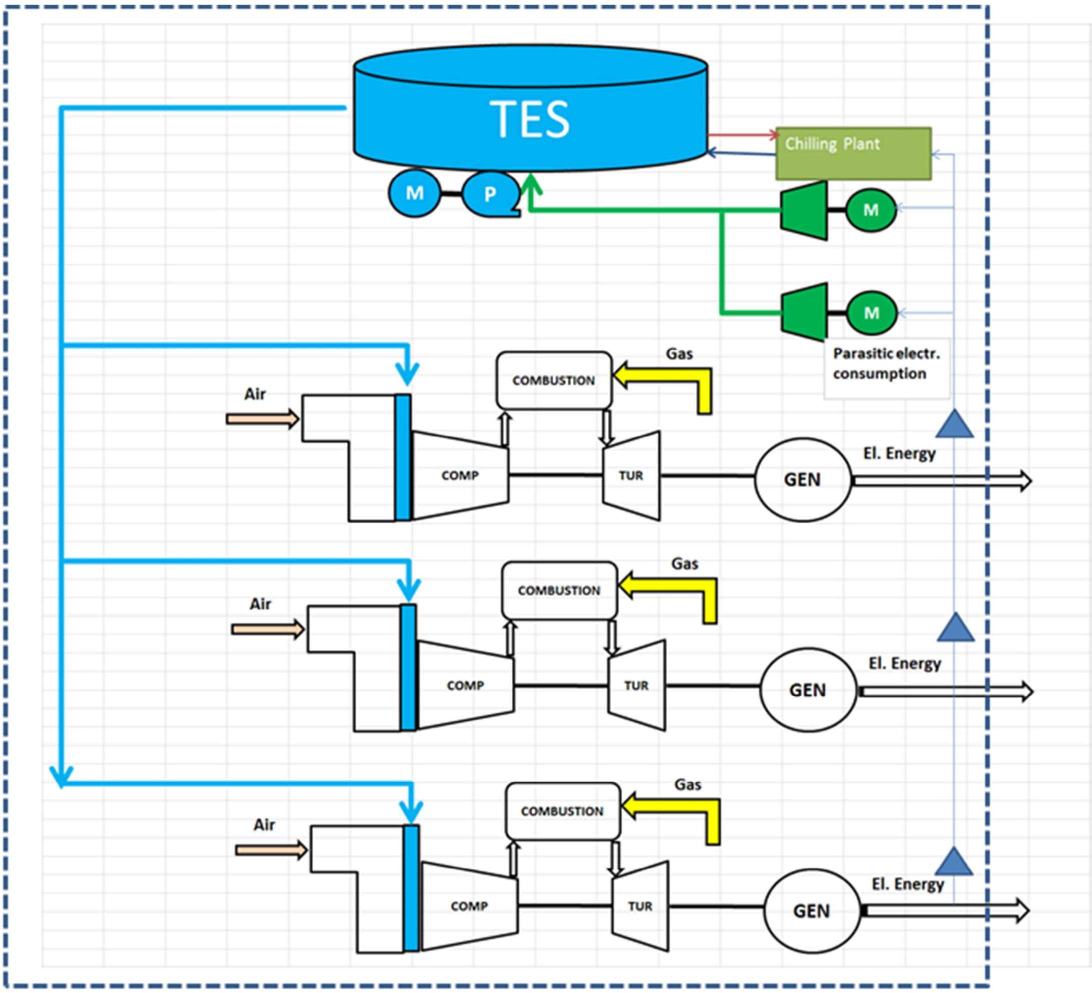
| | | |
|---|---|---|
| *This category comprises technologies or measures to improve efficiency of fossil fuel generating units that supply an electricity or thermal system by reducing energy or fuel consumption by up to the equivalent of 60 GWhe per year. Examples include efficiency improvements at power stations and district heating plants and co-generation. The technologies or measures may be applied to existing stations or be part of a new facility. A total saving of 60 GWhe is equivalent to maximal saving of 180 $GW_{hth}$ in the fuel input to the generation unit.* | The proposed project activity involves the implementation of a Thermal Energy Storage and Turbine Inlet Air Cooling system to improve the efficiency of three gas turbines (GTs) installed at Station L Phase 1 of Dubai Electricity and Water Authority (DEWA).<br>The proposed project activity will result in reductions of fuel consumption of approximately 136 $GWh_{th}$ This estimation is based on an average historic **plant load factor** of the three turbines of approximately 54% and a **design capacity of 255.6** MW. The typical range of plant load factors of comparable gas turbines observed in the host country is between approximately 53-57%. However the threshold of 180 $GWh_{th}$ would only be met if the the project gas turbines would operate with a plant load factor of approximately 65%<br>(see 6.1 and 6.3 and attached spread sheet for Emission Reduction calculations for further details) | Yes |

## B.3. Description of the project boundary:

According to Version 09 of AMS.II.B[4], the project boundary *is the physical, geographical site of the fuel fired power station unit affected by the efficiency measures*.

Therefore the project boundary is the Station L Phase 1 plant including 3 gas turbines L71-L73 manufactured by GE Power Systems, model PG9351 (FA+e) with serial numbers GEK 110689 (298398 to 298400), located at Jebel Ali, Dubai, United Arab Emirates.

[4] http://cdm.unfccc.int/methodologies/SSCmethodologies/approved




Project Boundary

**B.4. Description of baseline and its development:**

According to Version 09 of AMS.II.B, the baseline *is the technical losses of energy within the project boundary. In the case of retrofit measures the energy baseline is calculated as the monitored performance of the existing generating unit*.

Since the proposed project activity is a retrofit measure, the baseline emissions are to be calculated as the monitored performance of the 3 existing gas turbines L71-L73 in Station L: model PG9351 (FA+e), serial numbers GEK 110689 (298398 to 298400).

In order to calculate (project and) baseline emissions, the following parameters are required:

- Total quantity of electricity generated in each of the three GTs L71-L73 in year y (MWh)
- Quantity of natural gas (NG) combusted in each of the three GTs L71-L73 in year y ($Nm^3$)
- Net calorific value of NG in year y ($GJ/Nm^3$)

- Quantity of distillate fuel oil (DFO) combusted for auxiliary purposes in each of the three GTs in year y (imperial gallon = IG)
- Net calorific value of DFO in year y (GJ/IG)
- Electricity consumption of the TESTIAC system in year y (MWh).

- Total electricity generation in each of the three GTs L71-L73 in any of the three historic years 2008-2010 h (MWh)
- Quantity of NG combusted in each of the three GTs L71-L73 in any of the three historic years 2008-2010 h ($Nm^3$)
- Net calorific value of NG in any of the three historic years 2008-2010 h ($GJ/Nm^3$)
- Quantity of DFO combusted in each of the three GTs L71-L73 in any of the three historic years 2008-2010 h (IG)
- Net calorific value of DFO in any of the three historic years 2008-2010 h (GJ/IG)

- $CO_2$ emission factor of natural gas (tCO2/GJ)

For the explanation and justification of key assumptions and rationale, as well as for illustration of data used to determine the baseline emissions (variables, parameters, data sources etc.), please see Sections B 6.1-6.3.

**B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:**

Since the starting date of the project activity was before the date of validation, evidence is provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity.

| | |
|---|---|
| 29/04/2010 | Letter of Acceptance of order for project activity equipment (start date of the proposed project activity) |
| 27/05/2010 | Receipt of prior consideration form at UNFCCC |
| 29/08/2010 | Civil Works Starting Date |
| 03/10/2010 | Receipt of prior consideration form at DNA of the host country |

As such notifications were made within six months of the project activity start date, it can be concluded that CDM benefits were considered necessary in the decision to undertake the project as a CDM project activity.

Further implementation of the project activity:

| | |
|---|---|
| 12/11/2011 | Upload of PDD for Validation |
| 29/11/2011 | Take over of TESTIAC system from manufacturer by the project proponent |

According to *Guidelines on the Demonstration of Additionality of Small Scale Project Activities*[5], project participants have the following options to demonstrate additionality:

*(a) Investment barrier*

[5] http://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf

*(b) Technological barrier*
*(c) Barrier due to prevailing practice*
*(d) Other barriers*

According to *EB 35, Annex 34: Non-binding best practice examples to demonstrate additionality for SSC project activities*[6], best practice examples for demonstration of additionality of small scale activities inter alia are:

*(d)* ***Barrier due to prevailing practice****: …; Best practice examples include but are not limited to, the demonstration that the project is among the first of its kind in terms of technology, geography, sector, type of investment and investor, market etc.*

The TESTIAC system as applied in the proposed project activity is among the first of its kind in terms of technology/measure not only in the host country but worldwide (as confirmed by statements from various renowned turbine manufacturers). The use of the TESTIAC system is therefore below the 10% usage threshold in the host country as set out in EB 50 Annex 13 *Guidelines for Objective Demonstration and Assessment of Barriers*[7]. These facts demonstrate that the technology faces a barrier due to prevailing practice in the host country and can therefore be classified as additional.

## B.6. Emission reductions:

### B.6.1. Explanation of methodological choices:

>>

$$ER_y = BE_y - PE_y - LE_y \qquad 1$$

where

| | |
|---|---|
| $ER_y$ | Emission reductions in year *y* [$tCO_2$] |
| $BE_y$ | Baseline emissions in year *y* [$tCO_2$] |
| $PE_y$ | Project emissions in year *y* [$tCO_2$] |
| $LE_y$ | Leakage emissions in year *y* [$tCO_2$] |

**Baseline Emissions, $BE_y$**

Baseline emissions are calculated by (i) first summing up the electricity generated in year y by each of the three gas turbines (GTs) L71-L73 $\boldsymbol{EG_{PJ,m,y}}$ while subtracting **the parasitic load of the** TESTIAC system[8] used for chilling each turbine $\frac{\boldsymbol{EC_{PJ,TESTIAC,y}}}{\boldsymbol{m=3}}$ The result is then (ii) second multiplied by the baseline emission factor $\boldsymbol{(EF_{BL,m,CO2})}$.

[6] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid15_v01.pdf
[7] http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid38.pdf

[8] Since the parameter $EG_{PJ,m,y}$ refers to total (or "gross") electricity generated by the turbines it also still includes the amount or electricity which is supplied to the TESTIAC system. That means that project and baseline emissions as monitored in the proposed project activity would both "automatically" include emissions associated to the TESTIAC system. Therefore instead of adding TESTIAC related emissions again to project emissions (which would basically mean that they are counted twice), they have to be subtracted from baseline emissions (in the baseline there would be no TESTIAC system and hence no related emissions)

$$BE_y = \sum_m (EG_{PJ,m,y} - \frac{EC_{PJ,TESTIAC,y}}{m=3}) \times EF_{BL,m,CO2} \qquad 2$$

Where:

| | |
|---|---|
| $EG_{PJ,m,y}$ | Quantity of electricity generated in each of the three GTs m L71-L73 in year y (MWh) |
| $EF_{BL,m,CO2}$ | Baseline Emission Factor for each of the three GTs m L71-L73 ($tCO_2$/MWh) |
| $EC_{PJ,TESTIAC,y}$ | Quantity of electricity consumed by the TESTIAC system in year y MWh |
| m | Gas turbines GTs L71-L73 |

$$EF_{BL,m,CO2} = \frac{\sum_i \sum_h \frac{FC_{m,i,h} \times NCV_{i,h}}{EG_{m,h}} \times EF_{NG,CO2,y}}{h=3} \qquad 3$$

Where:

| | |
|---|---|
| $FC_{m,i,h}$ | Quantity of fuels i (NG and DFO) combusted in each of the three GTs m L71-L73 in any of the three historic years 2008-2010 h ($Nm^3$ and IG) |
| $NCV_{i,h}$ | Net calorific value of fuels i (NG and DFO) in any of the three historic years 2008-2010 h (GJ/$Nm^3$ and GJ/IG) |
| $EF_{NG,CO2,y}$ | $CO_2$ emission factor of natural gas ($tCO_2$/GJ) |
| $EG_{m,h}$ | Electricity generation in each of the three GTs m L71-L73 in any of the three historic years 2008-2010 (MWh) |
| h | Three most recent historic years before implementation of the TESTIAC system 2008-2010 |

Explanation of parameters and key assumptions:

$EG_{PJ,m,y}$:

- For ex post baseline emissions determination, this parameter is monitored.
- For ex ante determination, the average of the three most recent historic years 2008-2010 before implementation of the TESTIAC system is applied

$EC_{PJ,TESTIAC,y}$

- For ex post baseline emissions determination, this parameter is monitored.
- For ex ante determination this parameter is based on the assumptions that the proposed project activity will operate during 214 days (7 months) of the year for 24 hours (of which 8 hours are cooling and 16 hours are for recharging) with a parasitic load of 5.3MW. The estimate based on manufacturer´s specifications results in 27,221 MWh per year.

$EF_{,NG,CO2,y}$:

- The IPCC default value for natural gas at the lower limit of the uncertainty at a 95% confidence interval, as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the *2006 IPCC Guidelines on National GHG Inventories*, has been selected: 0.0543 $tCO_2$/GJ

$EF_{BL,m,CO2}$:

- This parameter is based on the average of (the reciprocal value of) efficiencies (which is expressing the *technical losses of energy in the baseline* as requested by methodology AMSII.B-

Ver.9) of the three gas turbines L71-L73 of the three most recent historic years 2008-2010 before implementation of the TESTIAC system (explained by the expression $\frac{\sum_i \sum_h \frac{FC_{m,i,h} \times NCV_{i,h}}{EG_{m,h}}}{h=3}$) multiplied with the $CO_2$ emission factor of natural gas $EF_{NG,CO2,y}$ which is the lower emission factor of the two fuels, natural gas and distillate fuel oil, used in the gas turbines and is therefore conservative.[9]

$FC_{m,i,h}$

- Historic measurements by the project proponent as described in more detail under 6.2

$NCV_{i,h}$

- Information provided by the fuel supplier as described in more detail under 6.2

$EG_{m,h}$

- Historic measurements by the project proponent as described in more detail under 6.2

**Project Emissions, $PE_y$**

Project emissions are calculated by summing up the electricity generated in each of the three gas turbines (GTs) L71-L73 $EG_{PJ,m,y}$ multiplied by a **project emission factor ($EF_{PJ,m,CO2}$)** as follows:

$$PE_y = \sum_m EG_{PJ,m,y} \times EF_{PJ,m,CO2} \quad (4)$$

$$EF_{PJ,m,CO2} = \left(\sum_i \frac{FC_{m,i,y} \times NCV_{i,y}}{EG_{PJ,m,y}}\right) \times EF_{NG,CO2,y} \quad (5)$$

| | |
|---|---|
| $PE_y$ | Project Emissions in year y ($tCO_2$) |
| $EG_{PJ,m,y}$ | Quantity of electricity generated in each the three GTs m L71-L73 in year y (MWh) |
| $EF_{PJ,m,CO2}$ | Project Emission Factor for each of the three GTs m L71-L73 ($tCO_2$/MWh) |
| $FC_{m,i,y}$ | Quantity of fuels i (natural gas and distillate fuel oil [DFO]) combusted in each of the three GTs L71-L73 in year y ($Nm^3$ and imperial gallon = IG) |
| $NCV_{i,y}$ | Net calorific value of fuels i (natural gas and distillate fuel oil [DFO]) in year y ($GJ/Nm^3$ and GJ/IG)) |
| $EF_{NG,CO2,y}$ | $CO_2$ emission factor of natural gas ($tCO_2$/GJ) |
| m | Gas turbines GTs L71-L73 |

Explanation of <u>parameters and key assumptions:</u>

$EG_{PJ,m,y}$:

- For <u>ex post</u> project emissions determination, this parameter is monitored.
- For <u>ex ante</u> determination, the average of the three most recent historic years 2008-2010 before implementation of the TESTIAC system is applied

$EF_{PJ,m,CO2}$:

- For <u>ex post</u> project emissions this parameter is monitored based on the monitored efficiency (which is expressing the *technical losses of energy in the project scenario*) of the three gas

[9] This is also in line with response from the Executive Board to request for clarification AM_CLA_0173

turbines L71-L73 (explained by the expression) $(\sum_i \frac{FC_{m,i,y} \times NCV_{i,y}}{EG_{PJ,m,y}})$ multiplied by the $CO_2$ emission coefficient of natural gas $EF_{NG,CO2,y}$. The same emission coefficient is used for baseline emission determination and project emission determination because emission reductions of the project activity are then limited to the extent of the incremental efficiency increase through the project activity and no emission reductions can be claimed due to differences in fossil fuel emissions and change of fuel consumption patterns.[10] AMS-II.B does not specify any approaches for cases where more than one fossil fuel may be used. Therefore this approach from latest version of ACM0013 has been selected. Even though ACM0013 only relates to new facilities while AMS-II.B refers to new and existing facilities both methodologies apply to technologies or measures which improve the efficiency of fossil fuel generating units.

- For ex ante project emissions this parameter is based on the manufacturer´s estimation of an increase of average historic (2008-2010) efficiencies of gas turbines of 2%. (E.g. having calculated an annual average historic efficiency of 33.5% for GT L71, this would mean an estimated increase to an efficiency level of 34.2%). The expected efficiency increase is used to calculate the expected ex-ante fuel consumption of NG and DFO.

$EF_{NG,CO2,y}$:

- The IPCC default value for natural gas at the lower limit of the uncertainty at a 95% confidence interval, as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the *2006 IPCC Guidelines on National GHG Inventories*, has been selected: 0.0543 $tCO_2$/GJ.

$FC_{m,i,y}$

- For ex post project emissions this parameter is monitored by the project proponent as described in more detail under B.7.1
- For ex ante project emissions this parameter is calculated based on the expected efficiency increase as determined by the manufacturer.

$NCV_{i,y}$

- For ex post project emissions this parameter is monitored by the project proponent as described in more detail under B.7.1
- For ex ante project emissions this parameter is based on average of historic values (see section B.6.2)

**Leakage emissions, $LE_y$**

Since the energy efficiency technology is not equipment transferred from another activity, no leakage emissions are to be considered

| **B.6.2. Data and parameters that are available at validation:** |
|---|

[10] This is was actually the response from the Executive Board to request for clarification AM_CLA_0173. Based on that response the latest version 5 of ACM0013 now defines one emission factor $EF_{FF,CO2}$ which is *the $CO_2$ emission factor of the fossil fuel type* ***used in the project and the baseline*** *($tCO_2$/GJ)* and which is determined as follows: *IPCC default values of the fuel type used in the project plant at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.* ***In the case that several fuel types may be used in the project plan****t according to the technology provider's designs,* ***use the fuel type with the lowest IPCC default value*** *at the lower limit of the uncertainty.* The same approach has been taken in the proposed project activity.

*(Copy this table for each data and parameter)*

| **Data / Parameter:** | ***$EG_{m,h}$*** |
|---|---|
| Data unit: | MWh |
| Description: | Electricity generation in each of the three GTs L71-L73 in any of the three historic years h 2008-2010 |
| Source of data to be used: | Records of the project proponent |
| Value applied | For m = GT L71<br>h = 2008: 1,144,412<br>h = 2009: 1,228,708<br>h = 2010: 1,172,679<br><br>For m = GT L72<br>h = 2008: 1,407,091<br>h = 2009: 1,186,193<br>h = 2010: 1,247,474<br><br>For m = GT L73<br>h = 2008: 1,179,853<br>h = 2009: 1,256,233<br>h = 2010: 1,123,850 |
| Justification of the choice of data or description of measurement methods and procedures actually applied | Measurements by electricity meter(s) of the project proponent. The data was recorded daily. |
| Any comment: | -- |

| **Data / Parameter:** | ***$FC_{m,NG,h}$*** |
|---|---|
| Data unit: | $Nm^3$ |
| Description: | Quantity of fuel i = natural gas combusted in each of the three GTs L71-L73 in any of the three historic years 2008-2010 h |
| Source of data to be used: | Records of the project proponent |

| | |
|---|---|
| Value applied | For m = GT L71<br>h = 2008: 360,977,142<br>h = 2009: 381,155,447<br>h = 2010: 375,712,369<br><br>For m = GT L72<br>h = 2008: 456,092,770<br>h = 2009: 390,438,691<br>h = 2010: 411,700,586<br><br>For m = GT L73<br>h = 2008: 384,346,421<br>h = 2009: 413,380,953<br>h = 2010: 375,597,289 |
| Justification of the choice of data or description of measurement methods and procedures actually applied | On-site measurements by flow meters of the project proponent. The data was recorded daily. |
| Any comment: | -- |

| **Data / Parameter:** | $FC_{m,DFO,h}$ |
|---|---|
| Data unit: | IG |
| Description: | Quantity of fuel i = distillate fuel oil (DFO) combusted in each of the three GTs L71-L73 in any of the three historic years 2008-2010 h |
| Source of data to be used: | Records of the project proponent |

| | |
|---|---|
| Value applied | For m = GT L71<br>h = 2008: 63,246<br>h = 2009: 39,405<br>h = 2010: 78,942<br><br>For m = GT L72<br>h = 2008: 313,169<br>h = 2009: 52,349<br>h = 2010: 18,287<br><br>For m = GT L73<br>h = 2008: 426,196<br>h = 2009: 171,400<br>h = 2010: 2,253 |
| Justification of the choice of data or description of measurement methods and procedures actually applied | On-site measurements by flow meters of the project proponent. The data was recorded daily. |
| Any comment: | -- |

| | |
|---|---|
| **Data / Parameter:** | $NCV_{NG,h}$ |
| Data unit: | $GJ/Nm^3$ |
| Description: | Net calorific value of fuel i = natural gas in any of the three historic years 2008-2010 h |
| Source of data to be used: | Provided by the fuel supplier |
| Value applied | h = 2008 0.034<br>h = 2009 0.034<br>h = 2010 0.033 |
| Justification of the choice of data or description of measurement methods and procedures actually applied | Information provided by the fuel supplier |
| Any comment: | -- |

| | |
|---|---|
| **Data / Parameter:** | $NCV_{DFO,h}$ |
| Data unit: | GJ/IG |
| Description: | Net calorific value of fuel i = distillate fuel oil (DFO) in any of the three historic years 2008-2010 h |
| Source of data to be | Provided by the fuel supplier |

| | |
|---|---|
| used: | |
| Value applied | h = 2008 0.164<br>h = 2009 0.163<br>h = 2010 0.163 |
| Justification of the choice of data or description of measurement methods and procedures actually applied | Information provided by the fuel supplier |
| Any comment: | -- |

**B.6.3 Ex-ante calculation of emission reductions:**

**Baseline emissions:**
Applying formula 2 using values as outlined under B.6.1 gives the following ex ante baseline emissions:

$$BE_y =$$

$$for\ m = L71\ (1{,}181{,}933 MWh - 9{,}074 MWh) \times \frac{0.583 tCO2}{MWh} +$$

$$for\ m = L72\ (1{,}280{,}253 MWh - 9{,}074 MWh) \times \frac{0.606 tCO2}{MWh} +$$

$$for\ m = L73\ (1{,}186{,}645 \mathrm{MWh} - 9{,}074 \mathrm{MWh}) \times \frac{0.611 \mathrm{tCO2}}{\mathrm{MWh}}$$

*$BE_y$ = 2,172,702 $tCO_2$*

**Project emissions:**
Applying formula 4 using assumptions and values as outlined under B.6.1 gives the following ex ante project emissions:

$$PEy =$$

$$for\ m = L71\left(1{,}181{,}933 MWh \times \left(\frac{1}{0.342}\right) \times \frac{0.0543 tCO2}{GJ} \times \frac{3.6 GJ}{MWh}\right) +$$

$$for\ m = L72\left(1{,}280{,}253 MWh \times \left(\frac{1}{0.329}\right) \times \frac{0.0543 tCO2}{GJ} \times \frac{3.6 GJ}{MWh}\right) +$$

$$for\ m = L73(1{,}186{,}645 MWh \times \left(\frac{1}{0.327}\right) \times \frac{0.0543 tCO2}{GJ} \times \frac{3.6 GJ}{MWh})$$

*$PE_y$ = 2,145,902 $tCO_2$*

**Leakage emissions:**

*LEy = 0 tCO$_2$*

**Emission reductions:**

Applying formula 1 using values as outlined under B.6.1 gives the following ex ante emission reductions:

$ER_y$ = 2,172,702 – 2,145,902 = 26,800 tCO$_2$

The detailed baseline calculations according to the methodology *AMS-II.B Supply side energy efficiency improvements – generation Version 09* and section 6.1 of this PDD are provided in a separate excel sheet *PDD_DEWAChillerStL-ERCalculationV2-EXANTE*

### B.6.4 Summary of the ex-ante estimation of emission reductions:

| Year | Estimation of baseline emissions | Estimation of project emissions | Estimation of leakage | Estimation of overall emission reductions |
|---|---|---|---|---|
| | $BE_y$ | $PE_y$ | $LE_y$ | $ER_y$ |
| | [tCO$_{2eq}$] | [tCO$_{2eq}$] | [tCO$_{2eq}$] | [tCO$_{2eq}$] |
| 1 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 2 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 3 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 4 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 5 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 6 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 7 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 8 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 9 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| 10 | 2,172,702 | 2,145,902 | 0 | 26,800 |
| **Total** (t CO$_{2eq}$) | **21,727,020** | **21,459,020** | **0** | **268,000** |

### B.7 Application of a monitoring methodology and description of the monitoring plan:

### B.7.1 Data and parameters monitored:

| | $EG_{PJ,m,y}$ |
|---|---|
| Data unit: | MWh |
| Description: | Quantity of electricity generated in each of the three GTs L71-L73 in year y |
| Source of data to be used: | Measurements by electricity meter(s) of the project proponent |
| Value of data | Ex ante the average of the three most recent historic years 2008-2010 before implementation of the TESTIAC system is applied (see above under 6.2) |

| | |
|---|---|
| | For m = GT L71<br>Average 1,181,933<br><br>For m = GT L72<br>Average 1,280,253<br><br>For m = GT L73<br>Average 1,186,645 |
| Description of measurement methods and procedures to be applied: | The monitoring will be continuous, with hourly recording. The data will be archived electronically and as paper print-outs for 2 years following the end of the crediting period. |
| QA/QC procedures to be applied: | The metering equipment will be calibrated according to the instructions (schedules, procedures) for quality assurance from the technology provider and in line with General Guidelines to SSC methodologies specifying calibration at least once in three years. The accuracy level is at minimum 0.5s. For QA/QC an external CDM consultant will double check the records for plausibility. |
| Any comment: | - |

| **Data / Parameter:** | $FC_{NG,m,y}$ |
|---|---|
| Data unit: | $Nm^3$ |
| Description: | Quantity of fuel type natural gas combusted by GT *m* (L71-L73) in year *y*. |
| Source of data to be used: | On-site measurements by gas flow meters of the project proponent |
| Value of data | Ex ante estimated based on assumption of increase of efficiency by the manufacturer;<br><br>For m = GT L71<br>368,955,376<br><br>For m = GT L72<br>415,418,156<br><br>For m = GT L73<br>387,603,369 |
| Description of measurement methods and procedures to be applied: | The monitoring will be continuous, with hourly recording. The data will be archived electronically and as paper print-outs for 2 years following the end of the last crediting period |
| QA/QC procedures to be applied: | The metering equipment will be calibrated according to the instructions (schedules, procedures) for quality assurance from the technology provider and in line with General Guidelines to SSC methodologies specifying calibration at least once in three years. The accuracy level is +/-1%.<br>The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock |

| | |
|---|---|
| | changes.<br>Where the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records. |
| Any comment: | -- |

| **Data / Parameter:** | $FC_{DFO,m,y}$ |
|---|---|
| Data unit: | IG |
| Description: | Quantity of fuel type distillate fuel oil combusted by GT *m* (L71-L73) in year *y*. |
| Source of data to be used: | On-site measurements by flow meters of the project proponent |
| Value of data | Ex ante estimated based on assumption of increase of efficiency by the manufacturer;<br><br>For m = GT L71<br>59,936<br><br>For m = GT L72<br>126,717<br><br>For m = GT L73<br>197,989 |
| Description of measurement methods and procedures to be applied: | The monitoring will be continuous, with hourly recording. The data will be archived electronically and as paper print-outs for 2 years following the end of the last crediting period |
| QA/QC procedures to be applied: | The metering equipment will be calibrated according to the instructions (schedules, procedures) for quality assurance from the technology provider and in line with General Guidelines to SSC methodologies specifying calibration at least once in three years. The accuracy level is +/-1%.<br>The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes.<br>Where the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records |
| Any comment: | The DOE should verify that DFO as start-up or auxiliary fuel is only used during: the start-up periods of the power plant, or short periods of interruption in the supply of natural gas due to technical or operational problems.<br><br>This is to ensure that it is not a common practice, during the normal operation of the power plant, to fire or cofire DFO as a multi-fuel power plant.<br>In the case DFO input comprises more than 1% of the total fuel input annually on an energy basis no emission reductions can be claimed for that period.[11] |

[11] This approach is more conservative than prescribed in similar large scale methodologies ACM0013 or AM0029.

| | |
|---|---|
| **Data / Parameter:** | ***$NCV_{NG,y}$*** |
| Data unit: | $GJ/m^3$ |
| Description: | Net calorific of fuel type natural gas in year *y* |
| Source of data to be used: | One of the following data sources will be used, depending on their availability:<br>**Data source** — **Conditions for using the data source**<br>(a) Values provided by the fuel supplier in invoices — This is the preferred source<br>(b) Measurements by the project participant — If (a) is not available<br>(c) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter1 of Vol. 2 (Energy) of the *2006 IPCC Guidelines on National GHG Inventories* — If (a) is not available |
| Value of data | Ex ante 0.034 (assumed to be the [rounded] average of historic values, see section 6.2 which was provided by fuel supplier) |
| Description of measurement methods and procedures to be applied: | For a) and b) measurements will be undertaken in line with national or international fuel standards.<br>Monitoring frequency:<br>For a) and b): The NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated<br>For c): Any future revision of the IPCC Guidelines should be taken into account |
| QA/QC procedures to be applied: | Values will be verified if they are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range, additional information from the testing laboratory shall be collected to justify the outcome or additional measurements shall be conducted. The testing laboratory will have ISO17025 accreditation or will be able to justify that it can comply with similar quality standards. |
| Any comment: | The data shall be archived for 2 years following the end of the crediting period. |

| | |
|---|---|
| **Data / Parameter:** | ***$NCV_{DFO,y}$*** |
| Data unit: | GJ/IG |
| Description: | Net calorific of fuel type distillate fuel oil in year *y* |
| Source of data to be used: | One of the following data sources will be used, depending on their availability:<br>**Data source** — **Conditions for using the data source**<br>a) Values provided by the fuel supplier in invoices — This is the preferred source<br>b) Measurements by the project participant — If (a) is not available<br>c) Regional or national default values — If (a) is not available<br>d) IPCC default values at the upper limit of the uncertainty at a — If (a) is not available |

| | |
|---|---|
| | 95% confidence interval as provided in table 1.2 of Chapter1 of Vol. 2 (Energy) of the *2006 IPCC Guidelines on National GHG Inventories* |
| Value of data | Ex ante 0.163 (assumed to be the [rounded] average of historic values, see section 6.2 which was provided by fuel supplier) |
| Description of measurement methods and procedures to be applied: | For a) and b) measurements will be undertaken in line with national or international fuel standards.<br>Monitoring frequency:<br>For a) and b): The NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated<br>For c): Review appropriateness of the values annually<br>For d): Any future revision of the IPCC Guidelines should be taken into account |
| QA/QC procedures to be applied: | Values will be verified if they are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range, additional information from the testing laboratory shall be collected to justify the outcome or additional measurements shall be conducted. The testing laboratory will have ISO17025 accreditation or will be able to justify that it can comply with similar quality standards. |
| Any comment: | The data shall be archived for 2 years following the end of the crediting period. |

| | $EC_{PJ,TESTIAC,y}$ |
|---|---|
| Data unit: | MWh |
| Description: | Quantity of electricity consumed by the TESTIAC system in year y |
| Source of data to be used: | Electricity consumption meters at the TESTIAC system |
| Value of data | Ex ante: 27,221 MWh |
| Description of measurement methods and procedures to be applied: | The monitoring will be continuous, with hourly recording. The data will be archived electronically and as paper print-outs for 2 years following the end of the last crediting period |
| QA/QC procedures to be applied: | The metering equipment will be calibrated according to the instructions (schedules, procedures) for quality assurance from the technology provider and in line with General Guidelines to SSC methodologies specifying calibration at least once in three years. The accuracy level is +/-1%. For QA/QC an external CDM consultant will double check the records for plausibility. |
| Any comment: | |

| **Data / Parameter:** | $EF_{NG,CO2,y}$ |
|---|---|
| Data unit: | $tCO_2/GJ$ |
| Description: | Emission factor of fuel type natural gas |

| | |
|---|---|
| Source of data to be used: | IPCC default value of the fuel type used in the project plant at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the *2006 IPCC Guidelines on National GHG Inventories*.[12] |
| Value of data | 0.0543 |
| Description of measurement methods and procedures to be applied | -- |
| QA/QC procedures to be applied | -- |
| Any comment: | Any future revision of the IPCC Guidelines should be taken into account |

**B.7.2 Description of the monitoring plan:**

>>

**Management structure and responsibility**

Overall responsibility for daily operating and reporting lies with the project proponent. A staff member will be specified within the company, and provided with training, to carry out the monitoring work (data recording and archiving, quality assurance and quality control of the data, equipment calibration, scheduled and unscheduled maintenance, and adoption of corrective actions if needed).

Management structure

The manager of the proposed project activity will assume overall responsibility for the monitoring process, including the follow-up of daily operations, definition of personnel involved with the monitoring work, review of the monitored results/data, and quality assurance of measurements and the process of training new staff.

Responsibility of the personnel directly involved

The personnel involved with monitoring will be given appropriate training. They will be responsible for carrying out the following tasks:

- Supervise and verify metering and recording: the staff will coordinate internally with other departments to ensure and verify adequate metering and recording of data, including hourly recording of TESTIAC system operation, hourly fuel consumption and electricity generation;
- Collection of additional data, sales/invoices: the staff will collect sales receipts and relevant data for monitoring of the proposed project activity;
- Calibration: the staff will coordinate with the responsible organizations to ensure that calibration of the metering instruments is carried out in accordance with instructions (schedules, procedures) for quality assurance from the technology provider;
- Data archives: the staff will be responsible for storing all monitoring data and making it available to the DOE for the verification of emission reductions.

Support and third party participation

[12] http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html

The staff will receive support from CDM experts (internal and/or external) in their responsibilities through the following actions:

- Provide the staff with a calculation template in electronic form for calculation of annual emission reductions;
- Provide specific CDM monitoring instructions to the personnel involved in the project activity's operation;
- Follow-up of the monitoring plan and continuous on-demand advice to the staff;
- Compilation of the monitored data and preparation of the monitoring report;
- Coordination with DOEs for the preparation of periodic verifications.

**Monitoring equipment and installation:**
All equipment will be in compliance with national standards.
The gas and distillate fuel oil consumption of the gas turbines will be monitored by flow meters. The generated electricity will be monitored by electricity meters. Readings will be taken every hour and recorded in a log book.

**Data monitoring management and recording**
All monitoring data and records will be archived in electronic form and as paper print-outs. Electronic documents will be backed up on compact disc or hard disc. The project proponent will also keep copies of additional relevant documents and prepare a periodic monitoring report, which includes the monitoring parameter data and data summary, the calibration records and the emission reductions calculation. The recorded data will be kept for at least two years after the end of the crediting period or issuance of CERs, whichever occurs later.

**Quality control and Quality assurance**
The metering equipment will be properly calibrated in accordance with the instructions (schedules, procedures) for quality assurance from the technology provider and in line with General Guidelines to SSC methodologies specifying calibration at least once in three years

**Emergency procedures**
In case of emergencies (conditions under which the project proponent has not been able to monitor due to an unexpected accident), the project entity will not claim emission reductions due to the project activity for the duration of the emergency. The project entity will follow the below procedure for declaring the emergency period to be over:

1. The project proponent will ensure that all requirements for monitoring of emission reductions have been re-established.
2. The monitoring staff and the manager of the project activity will both sign a statement declaring the emergency situation to have ended and normal operations to have resumed

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

Date of Completion 14/11/2012

**<u>Person/entity determining the baseline and monitoring methodology :</u>**
**Clemens Plöchl, Wolfgang Wetzer;**
Energy Changes Projektentwicklung GmbH

| | | |
|---|---|---|
| Zip code + city postal address: | Obere Donaustraße 12/28, 1020 Vienna | |
| Country: | Austria | |
| Telephone number: | Wolfgang Wetzer<br>+43 (0) 19684529 | Clemens Ploechl<br>+43 699 10403690 |
| Fax number: | +43 (0) 19684529 | |
| Email: | clemens.ploechl@energy-changes.com<br>wolfgang.wetzer@energy-changes.com | |

Energy Changes Projektentwicklung GmbH is not a project participant.

## SECTION C. Duration of the project activity / crediting period

### C.1 Duration of the project activity:

#### C.1.1. Starting date of the project activity:

The CDM Glossary of Terms, Version 05[13] defines the start date as follows:

*…..In light of the above definition, the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which contracts have been signed for equipment or construction/operation services required for the project activity. Minor pre-project expenses, e.g. the contracting of services /payment of fees for feasibility studies or preliminary surveys, should not be considered in the determination of the start date as they do not necessarily indicate the commencement of implementation of the project.*

29/04/2010 Letter of Acceptance of order for project activity equipment.

#### C.1.2. Expected operational lifetime of the project activity:

The operational lifetime of the TESTIAC system according to the manufacturer's design specifications is 30y-0m

Date of take over of the gas turbines GTs of Station L where the TESTIAC is being implemented:

| | |
|---|---|
| GT L 71 | 04/06/2006 |
| GT L 72 | 28/08/2006 |
| GT L 73 | 11/08/2007 |

The operational lifetime of the gas turbines according to the manufacturer´s design specifications is 30 years and 0 months (30y-0m). Therefore the remaining operational lifetime is above 10 years (proposed crediting period).

[13] http://cdm.unfccc.int/Reference/glossary.html

**C.2 Choice of the crediting period and related information:**

**C.2.1. Renewable crediting period**

**C.2.1.1. Starting date of the first crediting period:**

N.A

**C.2.1.2. Length of the first crediting period:**

N.A

**C.2.2. Fixed crediting period:**

**C.2.2.1. Starting date:**

01/01/2013 or the date of registration of the project activity whichever is later

**C.2.2.2. Length:**

10y-0m

This is determined according to EB 50 Annex 15 *Tool to determine the remaining lifetime of equipment* Version 1[14]

The following option to determine the remaining lifetime of the equipment is chosen:

*Use manufacturer´s information on the technical lifetime of equipment and compare to the date of first commissioning;*

Date of take over of the gas turbines GTs of Station L where the TESTIAC is being implemented:

| | |
|---|---|
| GT L 71 | 04/06/2006 |
| GT L 72 | 28/08/2006 |
| GT L 73 | 11/08/2007 |

The technical lifetime of the gas turbines according to the manufacturer´s design specifications is 30 years and 0 months (30y-0m). Therefore the remaining lifetime is above 10 years (proposed crediting period).

Date of take over of the TESTIAC system:

| | |
|---|---|
| TESTIAC | 29/11/2011 |

The technical lifetime of the TESTIAC system (project activity) according to the manufacturer's design specifications is 30y-0m. Therefore the remaining lifetime is above 10 years (proposed crediting period).

[14] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

## SECTION D. Environmental impacts

**D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:**

Documentation of environmental impacts is not required by the host Party for the proposed project activity, however a short summary is provided below:

The proposed project activity will create more favorable ambient conditions for the gas turbines while operating in summer. This operation mode will not create any adverse conditions for increase of current emissions levels.

Releases to the Atmosphere:
Emissions of $CO_2$ and $NO_x$ are expected to be reduced. Noise emissions generated by chilling compressors and various other plant equipment, are limited to acceptable levels (less than 55dBA) by the contract specification and confirmed by design documents.

The project activity is using ammonia as the refrigeration medium. All vents of the ammonia system are conducted to specifically designed “ammonia dilution tank” where eventual gases are dispersed in water without any emissions to the ambient air.

Releases to the Sea:
The project activity is using treated distillate water in a closed cycle process without draining to the external sea. All project chemical drains are collected in the common drainage pit that has no release to the sea.

Noise Emissions:
Noise emissions generated by chilling compressors and various other plant equipment are limited to acceptable levels by contract specifications and confirmed by design documents

**D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:**

Not Applicable

## SECTION E. Stakeholders’ comments

**E.1. Brief description how comments by local stakeholders have been invited and compiled:**

On May 17th 2011, a stakeholder event was organized in Amwaj Rotana Hotel, Jumeirah Beach Residence, Dubai, UAE.

The local stakeholders had been invited to the event through a public announcement in the newspaper *Gulf News* on May 3rd 2011.

The project proponent presented the proposed project activity and an introduction to the Clean Development Mechanism to local stakeholders.

Stakeholders had the opportunity to make oral comments during the event and additionally by sending an e-mail to the Dubai Carbon Centre of Excellence at cdm@dcce.com until 30th May 2011.

## E.2. Summary of the comments received:

During the stakeholder event, some general questions of a technical nature were discussed.

After the presentation, different questions regarding the project were asked. Mr. Sami Bustami, DUBAL, asked how many hours DEWA needs to cool the water and how much it costs to cover 8 hours daily. Another question was raised regarding the anticipated reduction of inlet air temperature. Mr. Simic replied that the reductions are expected to be between 20 to 25 degrees.

Prof. Bassam Abdel Karim, of the British University in Dubai, asked how DEWA goes about identifying its peak period – whether it is based on the load or the temperature. He observed that it is noticeable that the load is also very high even outside the identified peak hours. This question was answered by an engineer from DEWA who stated that they use both load and temperature.

No concerns with regard to the project activity were raised during the event or through email.

## E.3. Report on how due account was taken of any comments received:

No concerns were raised, and technical questions were answered during the stakeholder event.

## Annex 1

## CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

| | |
|---|---|
| Organization: | Dubai Carbon Centre of Excellence |
| Street/P.O.Box: | P.O. BOX 333992 |
| Building: | - |
| City: | Dubai |
| State/Region: | Dubai |
| Postcode/ZIP: | P.O. BOX 333992 |
| Country: | United Arab Emirates (UAE) |
| Telephone: | + 971 4 451 3388 |
| FAX: | + 971 4 451 3399 |
| E-Mail: | info@dcce.ae |
| URL: | www.dcce.ae |
| Represented by: | Ivano Iannelli |
| Title: | Chief Executive Officer |
| Salutation: | Mr |
| Last name: | Iannelli |
| Middle name: | - |

| | |
|---|---|
| First name: | Ivano |
| Department: | - |
| Mobile: | +971 50 558 7503 |
| Direct FAX: | +971 4 451 3399 |
| Direct tel: | +971 4 451 3388 x201 |
| Personal e-mail: | ivanoi@dcce.ae |

| | |
|---|---|
| Organization: | Dubai Electricity and Water Authority (DEWA) |
| Street/P.O.Box: | P. O. Box 564 |
| Building: | |
| City: | Dubai |
| State/Region: | |
| Postfix/ZIP: | |
| Country: | United Arab Emirates |
| Telephone: | +971 4 324 4444 |
| FAX: | +971 4 324 8111 |
| E-Mail: | |
| URL: | www.dewa.gov.ae |
| Represented by: | |
| Title: | Deputy Senior Manager – Commissioning (G) |
| Salutation: | |
| Last Name: | Simic |
| Middle Name: | |
| First Name: | Nebojsa |
| Department: | Commissioning |
| Mobile: | +971 50 455 2328 |
| Direct FAX: | +971 4304 1471 |
| Direct tel: | +971 4802 4752 |
| Personal E-Mail: | Nebojsa.simic@dewa.gov.ae |

**Annex 2**

**INFORMATION REGARDING PUBLIC FUNDING**

N.A.

**<u>Annex 3</u>**

**BASELINE INFORMATION**

The detailed baseline calculations according to the methodology *AMS-II.B Supply side energy efficiency improvements – generation Version 09* and section 6.1 of this PDD are provided in a separate excel sheet *PDD_DEWAChillerStL-ERCalculationV2-EXANTE*

**<u>Annex 4</u>**

**MONITORING INFORMATION**

The monitoring details for the project activity have been specified in Section B.7 of this PDD.

**- - - - -**