Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

GREENHOUSE GAS EMISSIONS PERMIT

Permit Register Number: IE-GHG162-10427-3

Operator: Electricity Supply Board
Two Gateway
East Wall Road
Dublin 3
D03 A995

Installation Name: Aghada CCGT

Site Name: Aghada Generating Station

Location: Whitegate
Midleton
Cork
Ireland

Introductory Note

This introductory note does not form a part of the Greenhouse Gas Emissions Permit.

This Greenhouse Gas Emissions Permit authorises the holder to undertake named activities resulting in emissions of Carbon Dioxide from the listed emission sources. It also contains requirements that must be met in respect of such emissions, including monitoring and reporting requirements. This Greenhouse Gas Emissions Permit places an obligation on the Operator to surrender allowances to the Agency equal to the annual reportable emissions of carbon dioxide equivalent from the installation in each calendar year, no later than four months after the end of each such year.

Contact with Agency:

If you contact the Agency about this Greenhouse Gas Emissions Permit please quote the following reference: Greenhouse Gas Emissions Permit Nº IE-GHG162-10427.

All correspondence in relation to this permit should be addressed to:

Email: help.ets@epa.ie

By Post: Climate Change Unit, Environmental Protection Agency
P.O. Box 3000, Johnstown Castle Estate,
Co. Wexford

Updating of the permit:

This Greenhouse Gas Emissions Permit may be updated by the Agency, subject to compliance with Condition 2. The current Greenhouse Gas Emissions Permit will normally be available on the Agency's website at www.epa.ie and ETSWAP.

Surrender of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially surrendered, a written application must be made to the on-line ETS portal, and written permission received from, the Agency through ETSWAP.

Transfer of the permit or part of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially transferred to another Operator a joint written application to transfer this Greenhouse Gas Emissions Permit must be made (by both the existing and proposed Operators) to, and written permission received from, the Agency through the on-line ETS portal ETSWAP.

Licence held pursuant to the Environmental Protection Agency Act 1992, as amended. (as of the date of this permit)**:**

IPC/IE Licence Register Number
P0561-05

Status Log

Current Permit

Permit number	Date application received	Date Permit issued	Comment
IE-GHG162-10427-3	08 August 2018	30 January 2020	Change to description for F1 from turbine to ultrasonic meters in measurement devices section. Laboratory name change for gas oil analysis to SGS Ellesmere Port. Change of registered address. Removal of the source stream Acetylene and associated emission source S6. Update to Category C Installation.

Previous Permits

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG162-10427-1	GHG Permit Application	24 May 2013	11 June 2013	
IE-GHG162-10427-2	GHG Variation	09 January 2014	30 July 2014	Inclusion of the fuel stream Acetylene. Update of procedure descriptions.

End of Introductory Note

Glossary of Terms

For the purposes of this permit the terms listed in the left hand column shall have the meaning given in the right hand column below:

The Agency	Environmental Protection Agency.
Agreement	Agreement in writing.
Allowance	Permission to emit to the atmosphere one tonne of carbon dioxide equivalent during a specified period issued for the purposes of Directive 2003/87/EC by the Agency or by a designated national competent authority of a Member State of the European Union.
Annual Reportable Emissions	Reportable Emissions of carbon dioxide made in any calendar year commencing from 1 January 2005 or the year of commencement of the activity, whichever is the later.
A & V Regulation	Commission Regulation (EU) No 600/2012 of 21 June 2012 on the verification of greenhouse gas emission reports and tonne-kilometre reports and the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Category A Installation	As defined in Article 19.2 (a) of the M&R Regulation.
Category B Installation	As defined in Article 19.2 (b) of the M&R Regulation.
Category C Installation	As defined in Article 19.2 (c) of the M&R Regulation.
The Directive	Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
Emissions	The release of greenhouse gases into the atmosphere from sources in an installation.
EPA	Environmental Protection Agency.
Fall-Back Methodology	As defined in Article 22 of the M&R Regulation.
GHG	Greenhouse gas.
GHG Permit	Greenhouse gas emissions permit.
Greenhouse Gas	Any of the gases in Schedule 2 of the Regulations.
IPC/IE	Integrated Pollution Control/Industrial Emissions.
Installation	Any stationary technical unit where one or more activities listed in Schedule 1 to the Regulations are carried out. Also any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution. References to an installation include references to part of an installation.

Installation with low emissions	As defined in Article 47 of the M&R Regulation.
Major Source Streams	As defined in Article 19.3 (c) of the M&R Regulation.
M&R Regulation	Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Mis-statement	An omission, misrepresentation or error in the Operators reported data, not considering the uncertainty permissible pursuant to Article 12(1)(a) of Regulation (EU) no 601/2012.
N/A	Not applicable.
Monitoring Plan	The Plan submitted and approved in accordance with Condition 3.1 of this permit and attached at Appendix 1.
Non-conformity	Any act or omission by the Operator, either intentional or unintentional, that is contrary to the greenhouse gas emissions permit and the requirements of the Monitoring Plan.
The National Administrator	The person so designated in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC.
The Operator (for the purposes of this permit)	Electricity Supply Board
"operator"	Any person who operates or controls an installation or to whom decisive economic power over the functioning of the installation has been delegated.
Person	Any natural or legal person.
Reportable emissions	The total releases to the atmosphere of carbon dioxide (expressed in tonnes of carbon dioxide equivalent) from the emission sources specified in Table 2 and arising from the Schedule 1 activities which are specified in Table 1.
The Regulations	European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 (S.I. No 490 of 2012) and any amendments or revisions thereto.
The Verifier	A legal person or another legal entity carrying out verification activities pursuant to Regulation (EU) No 600/2012 and accredited by a national accreditation body pursuant to Regulation (EC) No 765/2008 and Regulation (EU) No 600/2012 or a natural person otherwise authorised, without prejudice to Article 5(2) of Regulation (EC) No 765/2008, at the time a verification report is issued.
The Registry	The Registry as provided for under Article 19 of Directive 2003/87/EC.

Schedule 1	Schedule 1 to the Regulations.

Reasons for the Decision

The Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of this permit, the Operator is capable of monitoring and reporting emissions in accordance with the requirements of the Regulations.

Activities Permitted

Pursuant to the Regulations the Agency issues this Greenhouse Gas Emissions Permit, subject to any subsequent revisions, corrections or modifications it deems appropriate, to:

The Operator:

Electricity Supply Board
Two Gateway
East Wall Road
Dublin 3
D03 A995

Company Registration Number: NA ESB Act 1927

to carry out the following

Categories of activity:

Annex 1 Activity
Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)

at the following installation(s):

Aghada CCGT **Installation number:** 122

located at

Whitegate
Midleton
Cork
Ireland

subject to the five conditions contained herein, with the reasons therefor and associated tables attached thereto.

Conditions

Condition 1. The Permitted Installation

1.1 This permit is being granted in substitution for the previous GHG permit granted to the Operator as listed in the Status Log of this GHG permit.

1.2 The Operator is authorised to undertake the activities and/or the directly associated activities specified in Table 1 below resulting in the emission of carbon dioxide:

Table 1 - Activities which are listed in Schedule 1 of the Regulations and other directly associated activities carried out on the site:

Installation No.: 122

Activity Description
Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)

Directly Associated Activity Description
N/A

1.3 Carbon dioxide from Schedule 1 activities shall be emitted to atmosphere only from the emission sources as listed in Table 2 below:

Table 2 Emission Sources and Capacities:

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S1	CCGT	742.3	MW
S2	Emergency Generator	2	MW
S3	Fire pump	1.2	MW
S4	Gas preheater	0.69	MW
S5	Gas preheater	0.69	MW

1.4 The activity shall be controlled, operated and maintained so that emissions of carbon dioxide shall take place only as set out in this GHG Emissions Permit. The permit does not control emissions of gases other than carbon dioxide. All agreed plans, programmes and methodologies required to be carried out under the terms of this permit, become part of this permit.

1.5 This GHG Permit is for the purposes of GHG emissions permitting under the European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 and any amendments to the same only and nothing in this permit shall be construed as negating the Operator's statutory obligations or

requirements under any other enactments or regulations unless specifically amended by the Regulations.

1.6 Any reference in this permit to 'installation' shall mean the installation as described in the Greenhouse Gas Emissions Permit application and any amendments approved by the Agency.

Reason: To describe the installation and clarify the scope of this permit.

Condition 2. Notification

2.1 No alteration to, or reconstruction in respect of, the activity or any part thereof which would, or is likely to, result in a change in:

2.1.1 the nature or functioning of the installation;

2.1.2 the capacity of the installation as detailed in this permit;

2.1.3 the fuels used at the installation;

2.1.4 the range of activities to be carried out at the installation

that may require updating of the GHG permit shall be carried out or commenced without prior notice to and without the prior written agreement of the Agency.

2.2 The Operator shall notify the Agency in writing of the cessation of all or part of any activity listed in Table 1 of this permit no later than one month from the date of cessation or by 31 December of the year of cessation, whichever is sooner.

2.3 The Operator shall apply for an update of this GHG Permit where there is a change to the Operator name and/or registered address of the Operator, within seven days of the change.

2.4 For installations or parts of installations which have not come into operation when the application for this permit was made the Operator shall notify the Agency of the date of commencement of the activity within seven days of commencement.

2.5 The Operator shall notify the Agency in writing within three days of becoming aware of any factors which may prevent compliance with the conditions of this permit.

2.6 The Operator shall submit to the Agency by 21 January of each year a declaration of operability. The declaration submitted shall be in the format required by the Agency.

2.7 All notifications required under Condition 2 above shall be made to the address given in the Explanatory Note included with this permit.

Reason: To provide for the notification of updated information on the activity.

Condition 3. Monitoring and Reporting

3.1 The Operator shall monitor and record greenhouse gas emissions on site in accordance with the M&R Regulation and the approved Monitoring Plan attached at Appendix 1 to this GHG permit and in compliance with any other guidance approved by the Agency for the purposes of implementing the Directive and/or the Regulations.

3.2 The Operator shall modify the monitoring plan in any of the following situations:

3.2.1 new emissions occur due to new activities carried out or due to the use of new fuels or materials not yet contained in the monitoring plan;

3.2.2 the change of availability of data, due to the use of new measurement instrument types, sampling methods or analysis methods, or for other reasons, leads to higher accuracy in the determination of emissions;

3.2.3 data resulting from the previously applied monitoring methodology has been found incorrect;

3.2.4 changing the monitoring plan improves the accuracy of the reported data, unless this is technically not feasible or incurs unreasonable costs;

3.2.5 the monitoring plan is not in conformity with the requirements of the M&R Regulation and the Agency requests a change;

3.2.6 it is necessary to respond to the suggestions for improvement of the monitoring plan contained in the verification report.

The Operator shall notify any proposals for modification of the monitoring plan to the Agency without undue delay. Any significant modifications of the monitoring plan, as defined in Article 15 of the M&R Regulation, shall be subject to approval by the Agency. Where approved these changes shall be implemented within a timeframe agreed by the Agency.

3.3 Temporary changes to the monitoring methodology:

3.3.1 Where it is for technical reasons temporarily not feasible to apply the tier in the monitoring plan for the activity data or each calculation factor of a fuel or material stream as approved by the Agency, the Operator shall apply the highest achievable tier until the conditions for application of the tier approved in the monitoring plan have been restored. The Operator shall take all necessary measures to allow the prompt restoration of the tier in the approved monitoring plan. The Operator shall notify the temporary change to the monitoring methodology without undue delay to the Agency specifying:

(i) The reasons for the deviation from the tier;

(ii) in detail, the interim monitoring methodology applied by the Operator to determine the emissions until the conditions for the application of the tier in the monitoring plan have been restored;

(iii) the measures the Operator is taking to restore the conditions for the application of the tier in the approved monitoring plan;

(iv) the anticipated point in time when application of the approved tier will be resumed.

3.3.2 A record of all non-compliances with the approved monitoring plan shall be maintained on-site and shall be available on-site for inspection by authorised persons of the Agency and/or by the Verifier at all reasonable times.

3.4 The Operator shall appoint a Verifier to ensure that, before their submission, the reports required by Condition 3.5 below are verified in accordance with the criteria set out in Schedule 5 of the Regulations, the A&V Regulation and any more detailed requirements of the Agency.

3.5 The written report of the verified annual reportable emissions and the verification report in respect of each calendar year shall be submitted to the Agency by the Operator no later than 31 March of the following year. The reports shall be in the format required by the Agency and meet the criteria set out in the M&R and A&V Regulations.

3.6 The Operator shall enter the verified annual reportable emissions figure for the preceding year into the Registry no later than 31 March of the following year. This figure shall be electronically approved by the Verifier in the registry no later than 31 March of each year.

3.7 Where an Operator is applying the Fall-Back methodology, the Operator shall assess and quantify each year the uncertainties of all parameters used for the determination of the annual emissions in accordance with the ISO Guide to the Expression of Uncertainty in Measurement or another equivalent internationally accepted standard and include the verified results in the written report of the verified annual reportable emissions to be submitted to the Agency by 31 March each year.

3.8 An Operator shall submit to the Agency for approval a report containing the information detailed in (i) or (ii) below, where appropriate, by the following deadlines:

(a) for a category A installation, by 30 June every four years;

(b) for a category B installation, by 30 June every two years;

(c) for a category C installation, by 30 June every year.

(i) Where the Operator does not apply at least the tiers required pursuant to the first subparagraph of Article 26(1) and to Article 41(1) of the M&R Regulation, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply the required tiers. Where evidence is found that measures needed for reaching those tiers have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan and submit proposals for implementing appropriate measures and its timing.

(ii) Where the Operator applies a fall-back monitoring methodology, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply at least tier 1 for one or more major or minor source streams. Where evidence is found that measures needed for reaching at least tier 1 for those source streams have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan, submit proposals and a timeframe for implementing appropriate measures.

3.9 Where the verification report states outstanding non conformities, misstatements or recommendations for improvements the Operator shall submit a report to the Agency for approval by 30 June of the year in which the verification report is issued. This requirement does not apply to the Operator of an installation with low emissions where the verification report contains recommendations for improvements only. The report shall describe how and when the Operator has rectified or plans to rectify the non-conformities identified and to implement recommended improvements. Where recommended improvements would not lead to an improvement of the monitoring methodology this must be justified by the Operator. Where the recommended improvements would incur unreasonable costs the Operator shall provide evidence of the unreasonable nature of the costs. The Operator shall implement the improvements specified by the Agency in response to the report submitted in accordance with this Condition in accordance with a timeframe set by the Agency.

3.10 The Operator shall make available to the Verifier and to the Agency any information and data relating to emissions of carbon dioxide which are required in order to verify the reports referred to in Condition 3.5 above or as required by the Agency to facilitate it in establishing benchmarks and/or best practice guidance.

3.11 Provision shall also be made for the transfer of environmental information, in relation to this permit, to the Agency's computer system, as may be requested by the Agency.

3.12 The Operator shall retain all information as specified in the M&R Regulation for a period of at least 10 years after the submission of the relevant annual report.

3.13 A record of independent confirmation of capacities listed in this permit shall be available on-site for inspection by authorised persons of the Agency at all reasonable times.

3.14 The Operator shall keep records of all modifications of the monitoring plan. The records shall include the information specified in Article 16.3 of the M&R Regulation.

3.15 The Operator shall ensure that members of the public can view a copy of this permit and any reports submitted to the Agency in accordance with this permit at all reasonable times. This requirement shall be integrated with the requirements of any public information programme approved by the Agency in relation to any other permit or licence held by the Operator for the site.

Reason: *To provide for monitoring and reporting in accordance with the Regulations.*

Condition 4. Allowances

4.1 Surrender of Allowances

4.1.1 The Operator shall, by 30 April in each year, surrender to the Agency, or other appropriate body specified by the Agency, allowances equal to the annual reportable emissions in the preceding calendar year.

4.1.2 The number of allowances to be surrendered shall be the annual reportable emissions for the preceding calendar year plus such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due. This includes allowances to cover the amount of any annual reportable emissions in respect of which allowances were not surrendered in accordance with Condition 4.1.1 in the previous year, and the amount of any reportable emissions which were discovered during the previous year to have been unreported in reports submitted under Condition 3 in that or in earlier years.

4.1.3 In relation to activities or parts of activities which have ceased to take place and have been notified to the Agency in accordance with Condition 2.2 above, the Operator shall surrender to the Agency allowances equal to the annual reportable emissions from such activities in the preceding calendar year or part thereof, together with such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due as described in Condition 4.1.2 above.

4.1.4 The Operator may, from 2008 onwards, subject to the provisions of the Regulations and the relevant National Allocation Plan for that compliance year, surrender emission reduction units (ERUs) and certified emission reduction units (CERs) in place of allowances.

4.2 The holding, transfer, surrender and cancellation of allowances shall be in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC, any amendment or revision to the same and any guidance issued by the Agency or the National Administrator.

4.3 The Operator shall provide the National Administrator with all the necessary information for the opening of an Operator holding account for the installation described in Condition 1 of this permit within twenty working days of the issue of this permit, unless such an account is already open.

Reason: *To provide for the surrendering, holding, transfer and cancellation of allowances in respect of reported emissions.*

Condition 5. Penalties

5.1 Any Operator who fails to comply with Condition 4.1 above shall be subject to the provisions of the Regulations, including, but not limited to the payment of penalties.

Reason: To provide for the payment of excess emissions penalties as required under the Regulations.

Sealed by the seal of the Agency on this the 30 January 2020:

PRESENT when the seal of the Agency was affixed hereto:

_____

Ms. Annette Prendergast
Inspector/ Authorised Person

Appendix 1 to Greenhouse Gas Emissions Permit Number IE-GHG162-10427

Monitoring Plan

1. Guidelines & Conditions

1. Directive 2003/87/EC as amended by Directive 2009/29/EC (hereinafter "the (revised) EU ETS Directive") requires operators of installations which are included in the European Greenhouse Gas Emission Trading Scheme (the EU ETS) to hold a valid GHG emission permit issued by the relevant Competent Authority and to monitor and report their emissions and have the reports verified by an independent and accredited verifier.

The Directive can be downloaded from:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:PDF

2. The Monitoring and Reporting Regulation (Commission Regulation (EU) No 601/2012) (hereinafter the "MRR") defines further requirements for monitoring and reporting.

The MRR can be downloaded from:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:181:0030:0104:EN:PDF

Article 12 of the MRR sets out specific requirements for the content and submission of the monitoring plan and its updates. Article 12 outlines the importance of the Monitoring plan as follows:

The monitoring plan shall consist of a detailed complete and transparent documentation of the monitoring methodology of a specific installation [or aircraft operator] and shall contain at least the elements laid down in Annex I.

Furthermore Article 74(1) states:

Member States may require the operator and aircraft operator to use electronic templates or specific file formats for submission of monitoring plans and changes to the monitoring plan as well as for submission of annual emissions reports tonne-kilometre data reports verification reports and improvement reports. Those templates or file format specifications established by the Member States shall at least contain the information contained in electronic templates or file format specifications published by the Commission

3. All Commission guidance documents on the Monitoring and Reporting Regulation will be published at the link below as they become available:

http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

(a) Information sources:

EU Websites:

EU-Legislation: http://eur-lex.europa.eu/en/index.htm
EU ETS general: http://ec.europa.eu/clima/policies/ets/index_en.htm

Monitoring and Reporting in the EU ETS: http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

Environmental Protection Agency Website:

http://www.epa.ie

Environmental Protection Agency Contact:

GHGpermit@epa.ie

2. Application Details

The Installation Name, Site Name and the address of the site of the installation are detailed below. The Site Name and address can be updated from the Organisation Details Page on the ETSWAP website. The Installation Name can only be updated by your Competent Authority.

Installation name	Aghada CCGT
Site name	Aghada Generating Station
Address	Whitegate Midleton Cork Ireland
Grid reference of site main entrance	E183800, N64560
Licence held pursuant to the Environmental Protection Agency Act 1992, as amended.	Yes

IPC/IE Licence Register Number	Licence holder	Competent body
P0561-05	ESB Aghada Generating Station	EPA

Has the regulated activity commenced at the Installation?	Yes
Date of Regulated Activity commencement	31 March 2010

This information is only required to identify the first relevant reporting year of an installation. If the installation was in operation from the beginning of 2008 and held a Greenhouse Gas Emissions Permit from this point, 1 January 2008 will be used where the actual date of commencement is not readily known.

3. About the Operator

The information about the "Operator" is listed below. The "Operator" is defined as the person who it is proposed will have control over the relevant Regulated Activities in the installation in respect of which this application is being made.

(b) Operator Details

The name of the operator and where applicable the company registration number are detailed below. These details can only be updated by the Environmental Protection Agency.

Operator name	Electricity Supply Board
Company Registration Number	NA ESB Act 1927

Operator Legal status

The legal status of the operator is:	Company / Corporate Body

(c) Company / Corporate Body

Is the trading / business name different to the operator name?	No

Registered office address

Address Line 1	Two Gateway
Address Line 2	East Wall Road
City/Town	Dublin 3
County	N/A
Postcode	D03 A995

Principal office address

Is the principal office address different to the registered office address?	No

Holding company

Does the company belong to a holding company?	No

(d) Operator Authority

Does the operator named above have the authority and ability to:

a.	manage site operations through having day-to-day control of plant operation including the manner and rate of operation	Yes
b.	ensure that permit conditions are effectively complied with	Yes
c.	control monitor and report specified emissions	Yes
d.	be responsible for trading in Allowances so that at the end of a reporting period allowances can be balanced against reported emissions.	Yes

4. Service Contact

e. Service Contact

Address	ESB Whitegate Midleton County Cork Ireland

5. Installation Activities

f. Installation Description

Below is a description of the installation and its activities, a brief outline description of the site and the installation and the location of the installation on the site. The description also includes a non-technical summary of the activities carried out at the installation briefly describing each activity performed and the technical units used within each activity.

The Combined Cycle Power Plant is constructed on the existing Aghada station grounds on the reclaimed land immediately to the west of the existing plant and amongst other items consists of the main turbine hall, stack, control/administration building, water treatment building, workshop, AGI, cooling water pump-house and long-sea outfall. The plant is designed and constructed to be a “stand alone” station independently operable from the existing units. The combined cycle power plant consists of one (1) KA26-1 advanced single shaft unit. The plant has dual fuel capability, primarily operating on fuel gas but with fuel oil as a back up. The plant is designed for a nominal output of 430.6MW with an efficiency of 58.3% at rated conditions.

The KA26-1 Combined Cycle Power Plant has the following main characteristics. Operational Flexibility: the unit is capable of running at base load and part loads as well as in two shift operation mode. Highest efficiency at full load and part loads, sequential combustion in the gas turbine, optimised water/steam cycle and HRSG and three (3) rows of compressor variable inlet guide vanes result in highest efficiency throughout all load regimes. Environmental impact: low emission levels throughout a large load range Highest reliability and availability:all components of proven design, simplicity in design and operation, thus minimising Operation and Maintenance (O&M) requirements and increasing reliability and availability Low operation costs:resulting from the above mentioned points leads to low project specific operational costs. Over the last two years the unit has gone from a base load plant to a two shifting unit. The unit operates predominately on natural gas and is tested on gasoil every 90 days.

g. Annex 1 Activities

The table below lists the technical details for each Annex 1 activity carried out at the installation.

Note that 'capacity' in this context means:

- Rated thermal input (for combustion installations) which is defined as the rate at which fuel can be burned at the maximum continuous rating of the installation multiplied by the calorific value of the fuel and expressed as megawatts thermal.
- Production capacity for those specified Annex I activities for which production capacity determines ETS eligibility.

Annex 1 Activity	Total Capacity	Capacity units	Specified Emissions
Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)	746.88	MW	Carbon Dioxide

h. Site Diagram

The table below lists attachments (if available) that provide a simple diagram showing emissions sources source streams sampling points and metering/measurement equipment.

Attachment	Description
P378250-D617-0001-A1 Updated May 2013.pdf	Site Map GHG162 Updated May 2013

i. Estimated Annual Emissions

Detail of the estimated annual emission of CO_2 equivalent. This information enables categorisation of the installation in accordance with Article 19 of the MRR and is based on the average verified annual emissions of the previous trading period data OR if this data is not available or is inappropriate a conservative estimate of annual average emissions including transferred CO_2 excluding CO_2 from biomass.

Estimated Annual Emissions (tonnes $CO_{2(e)}$) 500001

Installation Category: C

6. Emissions Details

j. About your emissions

Annex I of the Monitoring and Reporting Regulations (MRR) requires that monitoring plans include a description of "the installation" and activities to be carried out and monitored including a list of emission sources and source streams. The information provided in this template relates to the Annex I activity(ies) comprised in the installation in question and should relate to a single installation. It includes any activities carried out by the operator and does not include related activities carried out by other operators.

k. Emission Sources

The table below lists all the emission sources at the installation, which may include directly associated activities/excluded activities.

Emission Source Reference	Emission Source Description
S1	CCGT
S2	Emergency Generator
S3	Fire pump
S4	Gas preheater
S5	Gas preheater

The table below lists the emission sources which are linked to the Regulated Activities at the installation.

Emission Source Reference	Emission Source Description
S1	CCGT
S2	Emergency Generator
S3	Fire pump
S4	Gas preheater
S5	Gas preheater

l. Emission Points

The table below lists all the emission points at the installation, which may include directly associated activities/excluded activities.

Emission Point Reference	Emission Point Description
EP1	CCGT Stack
EP2	Emergency Generator
EP3	Fire pump
EP4	Gas preheater 1
EP5	Gas Preheater 2

m. Source Streams (fuels and/or materials)

The table below lists the source streams which are used in Schedule 1 Activities at the installation.

Source Stream Reference	Source Stream Type	Source Stream Description
F3 (Propane)	Combustion: Commercial standard	Propane

Source Stream Reference	Source Stream Type	Source Stream Description
	fuels	
F1 (Natural Gas)	Combustion: Other gaseous & liquid fuels	Natural Gas
F2 (Gas Oil)	Combustion: Commercial standard fuels	Gas/Diesel Oil

n. Emissions Summary

The table below provides a summary of the emission source and source stream details in the installation.

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
F1 (Natural Gas)	S1,S4,S5	EP1,EP4,EP5	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
F2 (Gas Oil)	S1,S2,S3	EP1,EP2,EP3	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
F3 (Propane)	S1	EP1	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)

o. Excluded Activities

Certain activities that result in greenhouse gas emissions may be excluded under the EU ETS Directive for example truly mobile sources such as vehicle emissions.

Do you have any excluded activities which need to be identified in your monitoring plan?	No

7. Low Emissions Eligibility

p. Low Emissions Eligibility

The operator may submit a simplified monitoring plan for an installation where no nitrous oxide activities are carried out and it can be demonstrated that:

(a) the average verified annual emissions of the installation during the previous trading period was less than 25 000 tonnes $CO_{2(e)}$ per year or;

(b) where this data is not available or inappropriate a conservative estimate shows that emissions for the next 5 years will be less than 25 000 tonnes $CO_{2(e)}$ per year.

Note: the above data shall include transferred CO_2 but exclude CO_2 stemming from biomass.

Does the installation satisfy the criteria for installations with low emissions (as defined by Article 47 of the MRR)?	No

8. Monitoring Approaches

q. Monitoring Approaches

Emissions may be determined using either a calculation based methodology ("calculation") or measurement based methodology ("measurement") except where the use of a specific methodology is mandatory according to the provisions of the MRR. [MRR Article 21].

Note: the operator may subject to competent authority approval combine measurement and calculation for different sources. The operator is required to ensure and demonstrate that neither gaps nor double counting of reportable emissions occurs.

Please specify whether or not you propose to apply the following monitoring approaches. Select all monitoring approaches that are applicable to you. The consecutive sections will become mandatory based on the selected approaches.

Calculation	Yes
Measurement	No
Fall-back approach	No
Monitoring of N_2O	No
Monitoring of PFC	No
Monitoring of transferred / inherent CO_2	No

9. Calculation

r. Approach Description

The calculation approach including formulae used to determine annual CO_2 emissions:

As per M&R plan:

Aghada Unit 2 site is supplied with natural gas by means of 2 streams which are metered by BGE using either its service or standby metering installations, and a gas chromatograph. All of the gas supplied is combusted in Aghada Unit 2 plant.

At the end of each month BGE supplies a data file setting out for each day and hour of the month the gas flow hourly integrator readings corrected to 288.15 K and 101.325 kPa, and hourly averages of gross calorific value, specific gravity, and individual gas fractions in the gas mixture (namely CO2, Nitrogen, and the paraffin gases from methane through to hexane). The gas volumes are corrected to 288.15 K and 101.325 kPa. From this data the total nett energy supplied TJ [= Fuel Flow Nm3 * Average Net Calorific Value TJ/Nm3] and the emission factors tCO2/TJ are calculated for the month (defined as from 06:00 hrs on 1st of the month to 06:00 on 1st of the following month). In calculating the Emission Factor for the conversion of tonnes of Carbon into CO2 a conversion factor of 3.664 tonnes CO2/tonne Carbon is used.

CO2 tonnes = fuel flow [Nm3] * Net Calorific Value [TJ/Nm3] * Emission Factor [tCO2/TJ] * Oxidation Factor

The NCV of the gas will be calculated from the gas analysis to the following standard ISO6976. The standard for EF is ISO6974.

Aghada site is supplied with gas oil (as a secondary fuel) from an Oil Tank . Six (6) times per annum the stored gas oil is sampled and tested by an accredited laboratory for carbon content, calorific values, and gravity. Gas Oil is delivered by tanker and the total consumption is based on delivery dockets and stock difference between start and end of year. From the above data sources, the total net energy supplied [TJ/t], and the emission factor tCO2/TJ are determined.

CO2 tonnes = Fuel Flow [t] * Net Calorific Value [TJ/t] * Emission Factor [tCO2/TJ * Oxidation Factor

Oxidation Factor is 1.0 for both fuels. Propane consumption will be absolutely deminimis.

Propane will be procured by the bottle. Invoices will be retained. Emission for this will be determined by cylinders purchased= comsumption. NCV and EF for propane will be determined from the Current Report of Country Specific Net Calorific Values and CO2 Emission Factors for use in the Annual Installation Emissions Report.

Uncertainity for gas have assumed the max values allowable for both the meter and the pressure & temperature in accordance with the international standard (see uncertainity attachment). This is a conservative approach however in practice the uncertainities are much lower than this.

s. Measurement Devices

Below is a description of the specification and location of the measurement systems used for each source stream where emissions are determined by calculation

Also a description of all measurement devices including sub-meters and meters used to deduct non-Annex I activities to be used for each source and source stream.

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
F1 (Natural Gas)	S1,S4,S5	MD1	Ultrasonic meter	4000 - 75000	SM3/hr	1.41	CCGT AGI Independent to operator
F2 (Gas Oil)	S1,S2,S3	MD 3	Ultrasonic meter	450-1800	litres/minute	0.009	Supplier Depot-Independent to operator
F3 (Propane)	S1	MD 4	Invoices	na	kg	N/A	Supplier Depot-Independent to operator
F2 (Gas Oil)	S1,S2,S3	MD 5	Tank Dips	0-5,500,000	litres	0.086	ESB Tank Farm CCGT
F1 (Natural Gas)	S1,S4,S5	MD 6	Turbine meter	4000-75000	m3/hr	1.41	CCGT AGI-Independent to operator

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Under Control Of	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
F1 (Natural Gas)	MD1	Continual	Trade partner	Yes	Yes	Yes
F2 (Gas Oil)	MD 3	Batch	Trade partner	Yes	Yes	Yes
F3 (Propane)	MD 4	Batch	Trade partner	Yes	Yes	Yes

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Under Control Of	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
F2 (Gas Oil)	MD 5	Batch	Trade partner	Yes	N/A	Yes
F1 (Natural Gas)	MD 6	Continual	Trade partner	Yes	Yes	Yes

t. Applied Tiers

The table below identifies the tiers applied against the relevant input data for each source stream and confirms whether a standard (MRR Article 24) or mass balance (MRR Article 25) approach is applied.

(i) The highest tiers as defined in Annex II of the MRR should be used by Category B and C installations to determine the activity data and each calculation factor (except the oxidation factor and conversion factor) for each major source stream. Category A installations should apply as a minimum the tiers listed in Annex V.

(ii) Operators may apply a tier one level lower than those referred to in sub paragraph (i) above for Category C installations and up to two levels lower for Category A and B installations with a minimum of tier 1 if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier. The justification for not applying the higher tier should be recorded when completing the tier table.

(iii) The competent authority may allow an operator to apply even lower tiers than those referred to in the sub paragraph (ii) with a minimum of tier 1 for a transition period of up to three years if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier and provides an improvement plan detailing how and by when at least the tier referred to in sub paragraph (ii) will be achieved. The improvement plan should be referenced in subsequent table and provided to the competent authority at the time of submission of this plan.

(iv) For minor source streams operators shall apply the highest tier which is technically feasible and will not lead to unreasonable costs with a minimum of tier 1 for activity data and each calculation factor. For de-minimis source streams operators may use conservative estimations rather than tiers unless a defined tier can be achieved without additional effort (MRR Article 26(2)).

(v) Installations with low emissions as identified in section 6(d) may apply as a minimum tier 1 for determining activity data and calculation factors for all source streams unless higher accuracy is achievable without additional effort.

* Note 1: For commercial standard fuels the minimum tiers listed in Annex V of the MRR may be applied for all activities in all installations.

* Note 2: If you are intending to apply a fall-back approach please complete the table below and select "n/a" for the tiers to be applied for each source stream where a fall-back approach is used. Section 10 "Fall-back" must also be completed for these source streams.

* Note 3: For biomass or mixed fuels the emission factor is the preliminary emission factor as defined in Definition 35 Article 3 of the MRR.

Source Stream Refs.	**Emission Source Refs.**	**Measurement Device Refs.**	**Overall Metering Uncertainty (less than +/- %)**	**Applied Monitoring Approach**	**Activity Data Tier Applied**	**Net Calorific Value Tier Applied**	**Emission Factor Tier Applied**	**Carbon Content Tier Applied**	**Oxidation Factor Tier Applied**	**Conversion Factor Tier Applied**	**Biomass Fraction Tier Applied**	**Estimated Emissions $tCO_{2(e)}$**	**% of Total Estimated Emissions**	**Source Category**	**Highest Tiers Applied**	**Justification for not applying the highest tiers**	**Improvement Plan Reference (where applicable)**
F1 (Natural Gas)	S1,S4,S5	MD1, MD 6	<1.5%	Standard	4	3	3	N/A	1	N/A	N/A	500000	99.65	Major	Yes	n/a	n/a
F2 (Gas Oil)	S1,S2,S3	MD 3,MD 5	<1.5%	Standard	4	3	3	N/A	1	N/A	N/A	1771	0.35	Minor	Yes	n/a	n/a
F3 (Propane)	S1	MD 4	N/A	Standard	No tier	2a	2a	N/A	1	N/A	N/A	0.13	0	De-minimis	Yes	n/a	n/a

Total Estimated Emissions for Calculation (tonnes $CO_{2(e)}$) 501771.13

u. Uncertainty Calculations

The table below lists evidence attached to the application that demonstrates compliance with the applied tiers in accordance with Article 12 of the MRR.

Attachment	**Description**
Aghada Uncertainity 2012.xls	Uncertainity Analysis Justification for applied tiers
Aghada CCCT Str 1. 06-09-11.pdf	Support CCGT Stream 1
Aghada CCGT Str 2. 06-09-11.pdf	Support for CCGT Stream 2
UDAY SSL Marine Stock Accuracy.doc	UDAY SSL Marine Stock Accuracy
BGE email confriming uncertainity of meters & temperature pressure compensation.doc	BGE email confriming uncertainity of meters & temperature
Cert of Reg - IS EN ISO 9001 2008 - GWR - to 19Nov2014.pdf	BGE accreditation to ISO 9001
Stock Accuracy 5th May 2013 (Amended).pdf	Stock Accuracy Gasoil Richter tapes
SSL email to confirm Human Uncertainty May 2013.doc	SSL email to confirm Human Uncertainty May 2013
Copy of Aghada CCGT uncertainty 2013.xls	Copy of Aghada CCGT uncertainty 2013
phillips 66 gasoil meter records march 2013.pdf	GO calibration certs 2013
phillips 66 gasoil meter records sept 2012.pdf	GO CAlibration certs SEpt. 2012
Gasoil meters March 2012 .pdf	GO Calibration Certs March 2012
AghadaCCGT Metering summary 11-Jan-2013.pdf	Gas Meter uncertainty
AghadaCCGT Str 2 Cert no. 6522_2008 02-04-2008.pdf	NG meter original calibration cert
AghadaCCGT Str 1 Cert no. 6523_2008 02-04-2008.pdf	NG Meter original calibration cert

v. Applied tiers

Applied tiers for each source stream

Source Stream Ref.	Emission Source Refs.	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied
F1 (Natural Gas)	S1,S4,S5	4	3	3	N/A	1	N/A	N/A
F2 (Gas Oil)	S1,S2,S3	4	3	3	N/A	1	N/A	N/A
F3 (Propane)	S1	No tier	2a	2a	N/A	1	N/A	N/A

w. Justification for Applied tiers

Justifications for the applied tiers for each major source stream where highest tiers are not currently achieved.

Source Stream Ref.	**Emission Source Refs.**	**Justification for the applied tier**	**Improvement Plan Reference (where applicable)**
N/A	N/A	N/A	N/A

10. Calculation Factors

x. Default Values

The table below lists, for each parameter, where default values are to be used for calculation factors.

Source Stream Refs.	Emission Source Refs.	Parameter	Reference Source	Default Value applied (where appropriate)
F2 (Gas Oil)	S1,S2,S3	OxF	Irelands National GHG Inventory	NA
F3 (Propane)	S1	NCV	Irelands National GHG Inventory	NA
F3 (Propane)	S1	EF	Irelands National GHG Inventory	NA
F3 (Propane)	S1	OxF	Irelands National GHG Inventory	NA
F1 (Natural Gas)	S1,S4,S5	OxF	National GHG Inventory	NA

Sampling and Analysis

Do you undertake sampling and analysis of any of the parameters used in the calculation of your CO_2 emissions? Yes

y. Analysis

The table below lists, for each source stream, where calculation factors are to be determined by analysis.

Source Stream Refs.	Emission Source Refs.	Parameter	Method of Analysis	Frequency	Laboratory Name	Laboratory ISO17025 Accredited	Evidence Reference
F2	S1,S2,S3	Carbon Content	ASTM D5291	6 samples per year	SGS Ellesmere Port	Yes	n/a
F2	S1,S2,S3	NCV	ASTM D 240	6 samples per year	SGS Ellesmere Port	Yes	n/a
F1	S1,S4,S5	NCV	EN ISO 6976:2005	Continuous	EffecTech	Yes	n/a

Source Stream Refs.	Emission Source Refs.	Parameter	Method of Analysis	Frequency	Laboratory Name	Laboratory ISO17025 Accredited	Evidence Reference
F1	S1,S4,S5	EF	EN ISO6974	Continuous	EffecTech	Yes	n/a

Detail about the written procedures for the above analysis.

Where a number of procedures are used details of an overarching procedure which covers the quality assurance of analyses methods and links together individual analytical methods is listed.

Title of procedure	Procedure for the Sampling & Analysis of Fuels
Reference for procedure	EMS 9.1-11
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure that all fuels consumed on site are sampled & analysed for carbon content to allow calculation of CO2 emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling and analysis will be used for verification, auditing and calculation of CO2 (GHG) emissions. For Natural Gas, NCV are performed to EN ISO 6976:2005.Annual performance assessment is conducted for the on-line gas chromatograph in accordance with EN ISO 10723:2012. EF is performed to EN ISO6974. For Gas Oil, the carbon content is determined in accordance with ASTM D5291 and NCV determined in accordance with ASTM D240.
Post or department responsible for the procedure and for any data generated	Station Chemist/ Environmental Co Ordinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	API 2545 standard, . EF to EN ISO6974 & NCV to EN ISO 6976:2005. Annual performance assessment is conducted for the on line gas chromatograph with EN ISO 10723:2012

z. Sampling Plan

Details about the procedure covering the sampling plan for the analysis table above.

The procedure below covers the elements of a sampling plan as required by Article 33 of the MRR. Where a number of procedures are used, details of an overarching procedure which covers the sampling methods and links together individual sampling methods are listed.

Attachment	**Description**
Certificaat L468 UK 03-2009.pdf	Gasoil Laboratory Certificate
EffecTech 0590Calibration Multiple_030.pdf	EffecTech Scope of accrediation for natural gas
EMS 9.1-11 Procedure for Sampling and Analysis of Fuels Ver11.0.doc	EMS 9.1-11 Procedure for Sampling and Analysis of Fuels Ver11.0.doc
EP UKAS accreditation.pdf	Ellesmere Port UKAS accrediation
UKAS Cert.pdf	Ellesmere Port UKAS certificate

Title of procedure	Procedure for the Sampling & Analysis of Fuels
Reference for procedure	EMS 9.1-11

Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure that all fuels consumed on site are sampled & analysed for carbon content to allow calculation of CO2 emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling and analysis will be used for verification, auditing and calculation of CO2 (GHG) emissions. Annual performance assessment is conducted for the on-line gas chromatograph in accordance with EN ISO 10723:2012.
Post or department responsible for the procedure and for any data generated	Station Chemist/ Environmental Co Ordinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ASTM D4057-95 (2002) Standard Practice for manual sampling of petroleum and Petroleum products, EN ISO 10715 Natural gas sampling guidelines.

aa. Sampling Plan Appropriateness

The procedure to be used to revise the appropriateness of the sampling plan.

Title of procedure	Procedure for the Sampling & Analysis of Fuels
Reference for procedure	EMS 9.1-11
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure that all fuels consumed on site are sampled for carbon content to allow calculation of CO2 emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling will be used for verification, auditing and calculation of CO2 (GHG) emissions. In relation to the sampling plan appropriateness- should any change occur to the above sampling and analysis plan the plan will be revised and the EPA informed and their approval sought. In relation to the sampling of natural gas, the sampling plan will be reviewed 6 monthly when an internal audit is conducted by Environmental services Head office. The flow chart links roles and responsibilities and sampling plan appropriateness is part of this as per procedure EMS 11.2-08. The previous months data will be reviewed. The data from BGE will be reviewed and checked for accuracy and in comparison to calculated data. Should any change occur to the above sampling and analysis plan the plan will be revised and the EPA informed and their approval sought. In addition & in relation to sampling plan appropriateness, the following apply: Natural Gas standard for EF is EN ISO6974. Annual performance assessment is conducted for the on-line gas chromatograph in accordance with EN ISO 10723:2012. EN ISO 10715 Natural gas sampling guidelines also applies. A review of any issues which may prompt change in the

	current procedures including GC calibrations, audits/inspections and recommend actions that may arise will be followed through and closed out accordingly.
Post or department responsible for the procedure and for any data generated	Station Chemist/ Environmental Co Ordinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ASTM D4057-95 (2002) Standard Practice for manual sampling of petroleum and Petroleum products, EN ISO 6976:2005, EN ISO 10723:2012, EN ISO 10715 Natural gas sampling guidelines

Are stock estimates carried out as part of the emission calculations?	Yes

bb. Year-end reconciliations

The procedure to be used to estimate stocks at the beginning/end of a reporting period where applicable. This should include any source streams monitored using batch metering e.g. where invoices are used.

Title of procedure	Procedure for measurement of fuel consumption for Green House Gas permit reporting
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure.	Procedure for measurement of fuel consumption for Green House Gas permit reporting- covers gasoil . In relation to gasoil - a stock check is taken at the start and end of the year. Any deliveries or imports are included in the AIER and give the station its annual consumption figure. Tanks dips are by a independent third party who are accredited independant personel. If gasoil is delivered during the year then the tanks are also dipped before & after by the indepenant verifer. Dips & Back calculations are performed to give gasoil usage on the 31st December each year.
Post or department responsible for the procedure and for any data generated	Environmental Management System
Location where records are kept	Station Chemist/ Environmental Co Ordinator
Name of IT system used	Aghada Microsoft Sharepoint & Hard Copies
List of EN or other standards applied	API 2545 standard USA Standard Method of Gaging Petroleum and Petroleum Products

cc. Tracking Instruments

The procedure used to keep track of instruments installed in the installation used for determining activity data.

Title of procedure	Procedure for sampling & Analysis
Reference for procedure	EMS9.1-11
Diagram reference	N/A
Brief description of procedure.	Eventhough the GC & metering for natural gas and gasoil is

	outside of the control of ESB Aghada, ESB Aghada will ensure that BGE uses in date and calibrated instruments & gases, that P66 perform gasoil meter calibrations on their usual 6 monthly basis. ESB Aghada has a PM in place, policy number 0370000001 YE 001 to prompt BGE to change gases, requests monitoring checks from BGE meters, calibrations & spot checks conducted by themselves or by a third part on their behalf. ESB Aghada will also ensure that independent stock checks are completed by a third party and oil ops perform monthly dips. ESB Aghada has a metering record schedule for both natural gas and gaoil oil in place. This ensures compliance with appropriate tiers on behalf of ESB Aghada.
Post or department responsible for the procedure and for any data generated	Environmental Management System
Location where records are kept	Station Chemist/ Environmental Co Ordinator
Name of IT system used	Aghada Microsoft Sharepoint & Hard Copies
List of EN or other standards applied	BGE ISO 9001, EN ISO17027 & EN ISO10723

11. Management

dd. Monitoring and Reporting Responsibilities

Responsibilities for monitoring and reporting emissions from the installation are listed below:

Relevant job titles/posts and provide a succinct summary of their role relevant to monitoring and reporting are listed below.

Job Title / Post	**Responsibilities**
Environmental Coordinator	Internal check of calculations & reports, compiliation of emission report, Permit & M&R compliance. Tank dips, Gas metering & Gas oil deliveries
ESB Environmental Sevices Head Office	Audit station procedure, calculations etc. on a 6 monthly basis.
Technical Service Engineer	Fuel consumption & analysis recording, checks imputs to fuel management system and OIS, calculations for CO2 and input to annual report
Station Manager	Sign off on verified report

Attachment	**Description**
Aghada Organisational chart 2012.doc	Aghada Organisational Chart 2012

ee. Assignment of Responsibilities

Details of the procedure used for managing the assignment of responsibilities for monitoring and reporting within the installation and for managing the competencies of responsible personnel in accordance with Article 58(3)(c) of the MRR:

This procedure identifies how the monitoring and reporting responsibilities for the roles identified above are assigned and how training and reviews are undertaken.

Title of procedure	Procedure describing the protocol used in the determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to illustrate how CO2 Emissions are calculated for Aghada CCGT according to the Monitoring and Reporting Plan as agreed with the EPA. The procedure details the roles & responsibilities of personnel in the station. A flowchart also illustrates roles & responsibilities. Monitoring and reporting responsibilities are assigned to people competent in the area and familiar with the GHG reporting. There are training plans for individuals involved as per article 61 & segregation of duties is in complance with Article 58 3(c) of the M&R regulations.
Post or department responsible for the procedure and for any data generated	Station Chemist/ Environmental Co Ordinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006

ff. Monitoring Plan Appropriateness

Details of the procedure used for regular evaluation of the monitoring plan's appropriateness covering in particular any potential measures for the improvement of the monitoring methodology:

Title of procedure	Procedure describing the protocol used in the determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The monitoring plan appropriateness is reviewed by on-site personnel prior to any changes in emission sources, source streams and metering and fuel analysis. All reviews cover checking emission sources and source streams for completeness and that any changes have been taken into account, assessing compliance with uncertainty thresholds

	for activity data and assessing potential measures for improvement of monitoring methodology. This is to ensure compliance with Article 69.1 of the Monitoring and Reporting Regulation.
Post or department responsible for the procedure and for any data generated	Environmental Management System
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006

gg. Data Flow Activities

Details of the procedures used to manage data flow activities in accordance with Article 57 of the MRR:

Title of procedure	Procedure describing the protocol used in the determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Procedure details information flow and the links internally and externally. It highlights interactions of third party involvement and station staff involvement in the process to ensure correct reporting. The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. The procedure covers the flow of activities for gasoil, propane & natural gas. The procedure covers article 57.
Post or department responsible for the procedure and for any data generated	Environmental Management System
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006
List of primary data sources	National Inventory Tables BGE gas reports & invoices Gaoil oil invoices, analysis & year end stock checks Propane invoices
Description of the relevant processing steps for each specific data flow activity. Identify each step in the data flow and include the formulas and data used to determine emissions from the primary data. Include details of any relevant electronic data processing and storage systems and other inputs (including manual inputs) and confirm how outputs of data flow activities are recorded	As per our procedure: CALCULATION METHODOLOGY CO2 emissions (NG) = Activity Data x Emissions factor x NCV x Oxidation Factor. Emissions factor will be calculated from the Carbon content of the NG multiplied by 3.664 (for conversion to CO2) and divided by the NCV.

CO2 emissions (GO) = Activity Data x Emissions factor x NCV x Oxidation Factor.

Emissions factor will be calculated from the Carbon content multiplied by 3.664 and divided by NCV.

The fuels consumed in Aghada CCGT will be Natural Gas, Gas Oil and very small quantities of Propane.

Gas Oil Consumption

Gasoil calculations are based on Opening stock+deliveries - closing stock. Activity data is in litres.

Propane Consumption

Propane consumption will be based on deliveries- cylinder weights

EMISSION FACTOR

Emission Factor will be calculated from the carbon content, NCV and a conversion factor from carbon to carbon dioxide of 3.664.

Natural Gas

The monthly Bord Gais report to the station will include the average gas analysis and GCV on an hourly basis. This analysis and GCV are generated from a Bord Gais Gas Chromatograph (GC) which is self-calibrating daily. The carbon content of the gas will be calculated from this analysis. Aghada will have two Gas Chromatographs, one that supplies composition data for Aghada U1, CG11, CG12 and CG14; and the other will supply data for Aghada CCGT. In the event of failure of one of the GCs we will use composition data from the other GC for the period of failure. In relation to natural gas on-line analytical systems, validation tests shall be conducted at regular intervals in accordance with ISO 10723 "Natural gas Performance for on-line analytical Systems". Validation tests shall be conducted by an EN ISO 17025 accredited Lab. Results of such tests should be maintained on-site. Online analytical systems shall be calibrated with certified reference materials supplied by an EN ISO 17025 accredited lab. NCV will be calculated from the gas analysis to Standard ISO6976. The Natural Gas spreadsheet calculates the weight of carbon in grams for each component gas in the gas mixture.

The calculation is as follows:

One Gram-Mole of methane (16 grams) occupies 22.414 litres at standard conditions (0ºC, 1.01325b)

Therefore 1 litre of pure methane weighs 16 ÷ 22.414grams.

Methane fraction in the gas mixture is (say) 99%.

Per litre of gas mixture, methane weighs (99 ÷ 100) x (16 ÷ 22.414) grams at standard conditions

Carbon weight in methane expressed as a fraction is 12 ÷ 16 (Mol Wt of Carbon divided by Mol Wt of Methane)

Therefore wt of carbon in grams per litre of gas mixture is

(12 ÷ 16) x (99 ÷ 100) x 16 ÷ 22.414 grams.

This calculation is done for each component gas and the component carbon weights summed.

This total weight in grams per litre is converted to CO2 in grams per KCM.

A factor of 3.664 is used.

The volume of natural gas is adjusted to standard conditions (0C, 101.325 kPa).

The total weight of CO2 in grams per KCM is multiplied by the volume to give total CO2 for the period.

For periods of time where natural gas analysis data is missing, the average analysis will be calculated for the valid data for that month. These values will be used only for period where data is missing. The average gas analysis for the year will be determined annually. This data will then be used to calculate the annual NCV to ISO 6976. The emission factor will be calculated using CO2 and NCV data.

Gas Oil Emission factor and NCV

- For reporting purposes samples of gas oil will be taken from the service tank every 20,000 tonnes and at least 6 times per year by an independent agency.

- The Carbon content and NCV of the opening stock and closing stock will be taken as the Carbon content and

NCV of the first and last samples taken each year.

- All laboratories used for fuel analysis figures used in the calculations for the reported CO2 emissions will be accredited according to EN ISO 17025.

Propane Emission Factor and NCV

Figures from the national inventory will be taken for the NCV and Emission Factor.

OXIDATION FACTOR

An oxidation factor of 1.0 will be used for the calculations for Natural Gas, Gas Oil and Propane.

CALCULATION SPREADSHEETS

CO2 emission calculation spreadsheets will be updated regularly and an estimate for monthly CO2 emissions is included in the quarterly report to HO. These spreadsheets will also be checked each month by the Environmental Coordinator & also reviewed by HO on a spot check basis. Further cross-checks are carried out at six monthly intervals by HO & the Verifier. All systems in ESB are backed up regularly in case of computers failure. Access to the data will be controlled, with access only to those directly involved in the process. Spreadsheet will be checked every six months by Environment Services Head Office.

Submit relevant documents to record data flow activities

Attachment	**Description**
EMS 11.2-08 PROCEDURE DESCRIBING THE PROTOCOL USED IN THE DETERMINATION OF CO2 EMISSIONS FOR AGHADA CCGT 11.2-08 Ver 8.doc	PROCEDURE DESCRIBING THE PROTOCOL USED IN THE DETERMINATION OF CO2 EMISSIONS FOR AGHADA CCGT

hh. Assessing and Controlling Risks

Details of the procedures used to assess inherent risks and control risks in accordance with Article 58 of the MRR:

Title of procedure Procedure describing the protocol used in the

	determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined & described in a single protocol. The protocol demonstrates the risk register for the station and includes methodology, calculations, legal, IT controls, QA, Validation of data, metering equipment & corrective actions. It also identifies controls and systems in place to ensure the station is complaint with Article 58.
Post or department responsible for the procedure and for any data generated	Station Chemist/Environmental Corodinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006

ii. Quality Assurance of Metering / Measuring Equipment

Details of the procedures used to ensure quality assurance of measuring equipment in accordance with Article 58 and 59 of the MRR.

Title of procedure	Procedure for Sampling & Analysis of fuels.
Reference for procedure	EMS 9.1-11
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined & described in a single protocol. Reference is made to gas meter records kept, GC calibrations records obtained & verified and gasoil meter records kept to ensure qulaity assurance, complaince and corrective actions where necessary. ESB Aghada will make sure that all relevant measuring equipment is calibrated, adjusted and checked at regular intervals including prior to use, and checked against measurement standards traceable to international measurement standards, where available, in accordance with the requirements of this Regulation and proportionate to the risks identified. Where components of the measuring systems cannot be calibrated, the ESB Aghada shall identify those in the monitoring plan and propose alternative control activities.When the equipment is found not to comply with required performance, ESB Aghada shall promptly take necessary corrective action.
Post or department responsible for the procedure and for any data generated	Station Chemist/Environmental Co-ordinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006 BGE ISO 9001

	ISO10723
	ISO17025

jj. Quality Assurance of Information Technology used for Data Flow Activities

Details of the procedures used to ensure quality assurance of information technology used for data flow activities in accordance with Article 58 and 60 of the MRR:

Title of procedure	Procedure describing the protocol used in the determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined & described in a single protocol. The procedure refers to records. All documents are kept for 10 years. The station holds electronic and hardcopies. Access to spreadsheets are password controlled. The information documentation management folders are read & write for personnel directly involved in GHG activities & read only for general staff. Back up, recovery and security of electronic files are managed outside of the station by IT security at ESB Head Office. Back up of ectronic copies is every 24hrs. ESB Aghada shall ensure that the information technology system is designed, documentated, tested, implemented, controlled and maintained in a way to process reliable, accurate and timely data in accordance with point (a) of Article 58 (2). The control of the information technology system includes access control, control of back up, recovery, continunity planning and security.
Post or department responsible for the procedure and for any data generated	Station Chemist/Environmental Corodinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006

kk. Review and Validation of Data

Details of the procedures used to ensure regular internal reviews and validation of data in accordance with Articles 58 and 62 of the MRR.

Title of procedure	Procedure describing the protocol used in the determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should	The purpose of this procedure is to show how CO2

cover the essential parameters and operations performed	emissions are determined & described in a single protocol. ESB Aghada will document, implement and maintain an effective control system to ensure that the annual emission report resulting from dataflow activities does not contain misstatements and is conformity with the monitoring plan and the MRR. ESB Aghada will assess inherent risks and control risks;ESB Aghada has written procedures related to control activities that mitigate the risks identified. The written procedure relates to quality assurance of the measurement equipment. (b) quality assurance of the information technology system used for data flow activities, including process control computer technology;(c) segregation of duties in the data flow activities and control activities as well as management of necessary competencies;(d) internal reviews and validation of data;(e) corrections and corrective action;(f) control of out-sourced processes;(g) keeping records and documentation including the management of document versions. ESB Aghada will monitor the effectiveness of the control system, including by carrying out internal reviews and taking into account the findings of the verifier during the verification of annual emission reports. ESB Aghada shall review and validate data resulting from the data flow activities. The review and validation process includes a check on whether data is complete, comparisons with data over previous years, comparison of fuel consumption reported with purchase records and factor obtained from fuel analysis with country specific and/or international reference factors , if applicable, and criteria for rejecting data.
Post or department responsible for the procedure and for any data generated	Station Chemist/Environmental Corodinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006

II. Corrections and Corrective Actions

Details of the procedures used to handle corrections and corrective actions in accordance with Articles 58 and 63 of the MRR:

Title of procedure	Procedure describing the protocol used in the determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined & described in a single protocol. Corrective actions are detailed in section 11 of the

	procedure. The procedure details all close out mechanism from internal & external reports during validation for the reporting years. The whole process of gathering data for the EUTS will be reviewed and checked on and ongoing basis. If there is a problem with data or figures they are promptly addressed by means of a investigation. Data is reviewed and data corrected. If needs be procedures are amended. If the past preventative maintenance policy's have been created to ensure that errors do not occur again. Any corrective actions or changes will be notified to the EPA in a timely manner if required. These notifications will be the responsibility of the Environmental Coordinator. ESB Aghada is certified to ISO 14001 is audited frequently by a third party
Post or department responsible for the procedure and for any data generated	Station Chemist/Environmental Corodinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006

mm. Control of Outsourced Activities

Details of the procedures used to control outsourced processes in accordance with Articles 59 and 64 of the MRR.

Title of procedure	Procedure describing the protocol used in the determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined & described in a single protocol. ESB Aghada has a number of outsourced activities- BGE calibrate & keep maintenance records of the chromatograph & keep records of gas flow meters . Bge also issue reports to ESB Aghada in relation to the AGI at ESB Aghada. The sampling, analysis and tank dips in relation to gas oil and their meter records are all reviewed, maintained and calibrated by a several third parties. BGE, SSL,Efftech & SGS are all accreditied to do what they provide. BGE provide NG data, SSL do the tank dips- end of year stock checks, Efftech do the gas chromatograph calibrations. Information is complete and provided by competent authorities. ESB Aghada shall ensure that all relevant measuring equipment is calibrated, adjusted and checked at regular intervals including prior to use, and checked against measurement standards traceable to international measurement standards, where available, in accordance with the requirements of this Regulation and proportionate

	to the risks identified. In addition , ESB aghada will a) check the quality of the outsourced data flow activities and control activities in accordance with this Regulation; (b) define appropriate requirements for the outputs of the outsourced processes as well as the methods used in those processes; (c) check the quality of the outputs and methods referred to in point (b) of this Article; (d) ensure that outsourced activities are carried out such that those are responsive to the inherent risks and control risks identified in the risk assessment referred to in Article 58.
Post or department responsible for the procedure and for any data generated	Station Chemist/Environmental Corodinator
Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006

nn. Record Keeping and Documentation

Details of the procedures used to manage record keeping and documentation:

Title of procedure	Procedure describing the protocol used in the determination of CO2 emissions for Aghada CCGT
Reference for procedure	EMS 11.2-08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined & described in a single protocol. ESB will meet the requirements of Article 66 and Annex IX. All records relating to the consumption of fuel shall be maintained on site by the Technical Services Engineer. All relevant information relating to quantity and calculation shall be entered into the stations Perform by the Technical Services Engineer. All records shall be maintained on site for a period of ten years. All relevant information relating to quantity and calculation shall be entered into the stations Perform by the Technical Services Engineer. All records shall be maintained on site for a period of ten years. Information is available on request. ES HO keep old records and bill of lading as required.
Post or department responsible for the procedure and for any data generated	Station Chemist/Environmental CoOrdinator

Location where records are kept	Aghada Microsoft Sharepoint & Hard Copies
Name of IT system used	N/A
List of EN or other standards applied	ISO14001:2006

oo. Risk Assessment

The results of a risk assessment that demonstrates that the control activities and procedures are commensurate with the risks identified:

Attachment	Description
12 CCGT Risk Register 2013.doc	CCGT Risk Register 2013

pp. Environmental Management System

Does your organisation have a documented Environmental Management System?	Yes
Is the Environmental Management System certified by an accredited organisation?	Yes
The standard to which the Environmental Management System is certified:	ISO14001:2006

12. Changes in Operation

qq. Changes in Operation

Article 24(1) of Commission Decision 2011/278/EC requires that Member States must ensure that all relevant information about any planned or effective changes to the capacity activity level and operation of an installation is submitted by the operator to the competent authority by 31 December each year. Article 12(3) of the MRR further provides that Member States may require information to be included in the monitoring plan of an installation for the purposes of meeting these requirements.

Details of the procedure used to ensure regular reviews are carried out to identify any planned or effective changes to the capacity activity level and operation of the installation that have an impact on the installation's allocation:

The procedure specified below cover the following:

- planning and carrying out regular checks to determine whether any planned or effective changes to the capacity activity level and operation of an installation are relevant under Commission Decision 2011/278/EC; and
- Procedures to ensure such information is submitted to the competent authority by 31 December of each year.

Title of procedure	N/A
Reference for procedure	EPA guidance
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	N/A
Post or department responsible for the procedure and for any data generated	N/A
Location where records are kept	N/A
Name of IT system used	N/A

13. Abbreviations

rr. Abbreviations Acronyms or definitions

Abbreviations acronyms or definitions that have been used in this monitoring plan:

Abbreviation	Definition
N/A	N/A

14. Additional Information

Any other information:

Attachment	Description
Certificate 09_282_13 Aghada CCGT AGI 60800344.pdf	BGE CAlibration certificate for CCGT AGI Chromatograph 2010
Aghada CCGT AGI 60800344 Calibration Report 2010.pdf	Aghada CCGT AGI Calibration Report 2010
Calibration Certificate 09_282_47 Aghada CCGT 2011.pdf	Calibration Certificate 09_282_47 Aghada CCGT 2011
Calibration Report 09_282_47 Aghada CCGT 2011.pdf	Calibration Report 09_282_47 Aghada CCGT 2011
Certificate 09_282_29 Aghada CCGT Encal sn	Certificate 09_282_29 Aghada CCGT Encal sn

Attachment	Description
60800344.pdf	60800344.pdf
Aghada CCGT 2 AGI calibration Report 2011.pdf	Aghada CCGT 2 AGI calibration Report 2011

15. Confidentiality

ss. Confidentiality Statement

It is the Environmental Protection Agency's policy to make information received by it in the course of its work open to inspection by any person on request. This is in accordance with the provisions of the European Communities (Access to Information on the Environment) Regulations 2007 to 2011.

In the event that you considered that some of the information being submitted of a confidential nature, then the nature of this information and the reasons why it should be considered confidential, with reference to the European Communities (Access to Information on the Environment) Regulations 2007 to 2011 and any amendments must be explicitly requested using the facility below. The Board of the Environmental Protection Agency will consider the requests and if the information can be deemed as confidential and necessary.

Notwithstanding any request for confidentiality, the Environmental Protection Agency explicitly reserves the right to release data to the Commission, including emissions and allocations to the public, on the basis that the data will be used for the purposes foreseen in Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

Please tick this box if you consider that any part of your form should be treated as commercially confidential/sensitive: false

END of Appendix I.