Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

GREENHOUSE GAS EMISSIONS PERMIT

Permit Register Number: IE-GHG016-10346-2

Operator: Synergen Power Limited
Power Plant
Pigeon House Road
Ringsend
Dublin 4

Installation Name: Dublin Bay Power Plant

Site Name: Dublin Bay Power Plant

Location: Pigeon House Road
Ringsend
Dublin 4
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-GHG016-10346.

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

Email: help.ets@epa.ie

By Post: Climate Change Unit, Environmental Protection Agency
Regional Inspectorate, McCumiskey House,
Richview, Clonskeagh Road, Dublin 14

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
P0486-02

Status Log

Current Permit

Permit number	Date application received	Date Permit issued	Comment
IE-GHG016-10346-2	18 November 2013	11 April 2014	Inclusion of acetylene and propane as de minimis source streams and revision of related procedures.

Previous Permits

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG016-10346-1	GHG Permit Application	19 July 2013	20 August 2013	

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)	Synergen Power Limited
"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:

Synergen Power Limited
Power Plant
Pigeon House Road
Ringsend
Dublin 4

Company Registration Number: 289737

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):

Dublin Bay Power Plant **Installation number:** 14

located at

Pigeon House Road
Ringsend
Dublin 4
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.: 14

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	Gas Turbine	730	MW
S2	Stand-by Diesel Generator	1.49	MW
S3	Dew-Point Heater	0.6	MW
S4	Diesel Fire Pump 1	0.54	MW
S5	Diesel Fire Pump 2	0.54	MW
S6	Workshop Gases (Acetylene)	0.01	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 or agreed with the Agency in writing as minor emissions 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 11 April 2014:

PRESENT when the seal of the Agency was affixed hereto:

_____

Mr. Marc Kierans
Inspector/ Authorised Person

Appendix 1 to Greenhouse Gas Emissions Permit Number IE-GHG016-10346

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	Dublin Bay Power Plant
Site name	Dublin Bay Power Plant
Address	Pigeon House Road Ringsend Dublin 4 Ireland
Grid reference of site main entrance	E319668 N233793
Licence held pursuant to the Environmental Protection Agency Act 1992, as amended.	Yes

IPC/IE Licence Register Number	Licence holder	Competent body
P0486-02	Synergen Power Limited	Environmental Protection Agency

Has the regulated activity commenced at the Installation?	Yes
Date of Regulated Activity commencement	01 January 2005

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	Synergen Power Limited
Company Registration Number	289737

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

Details of the individual authorised to submit this application on behalf of the company / corporate body.

Title	Mr
Forename	David
Surname	Brazil
Position	Scientific Officer

Registered office address

Address Line 1	Power Plant
Address Line 2	Pigeon House Road
City/Town	Ringsend
County	N/A
Postcode	Dublin 4

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?	Yes
Holding company name	ESB Energy International Limited

Holding company address

Address Line 1	Stephen Court
Address Line 2	St Stephens Green
City/Town	Dublin 2
County	N/A
Postcode	N/A
Company registration number	289737
Is the holding company principal address different to the	No

holding company address?

(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

Name	Mr David Brazil
Address / Email Address	Pigeon House Road Ringsend Dublin 4 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.

Dublin Bay Power Plant is situated on the south side of the Liffey Estuary on Pigeon House Road. The site, including outlying yards and buildings, covers an area of approximately 43,000m2. The installation, which covers 5,000 m2, is, located centrally on the site and comprises one combined cycle gas turbine (CCGT) generating unit with a capacity of 415MW.

The sole activity carried out in the installation is the combustion of fossil fuel for the generation of electrical power.

Fuel is burned in the gas turbine (GT) which drives an electrical generator. Waste heat in the exhaust is used to generate steam in a Heat Recovery Steam Generator (HRSG) which is used to drive steam turbines. The steam turbines are also used to drive the generator, thereby increasing the overall efficiency. Cooling water is pumped from the river Liffey through a condenser in order to condense the spent steam so that it can be returned to the HRSG for re-use.

The plant is fired on natural gas for approximately 99% of the running time and on Gas Oil for the remainder.

There are five source streams:

- F1, fuel gas for the GT,

- F2, gas oil for the GT,

- F3, gas oil for 'domestic' purposes, such as stand-by diesel generator, fire-fighting diesel pumps and occasional, temporary equipment, including space heaters and diesel generators.

- F4, propane for the ignition of the GT

- F5 Acetylene for workshop activities

A calculation approach is used for F1 as follows:

1. The individual Gas Fractions of the Natural Gas supplied to the plant are measured by Gas Chromatograph

2. The weight of each fraction of gas is calculated

3. The weight of Carbon due to each fraction is then calculated

4. The weight of Carbon in all the fractions is summed to get a total.

5. The total weight of Carbon Dioxide from all the fractions of all the gas supplied is then calculated.

A calculation approach is used for F2 as follows:

1. The Carbon content of individual gas oil deliveries supplied to the plant for use in the Gas Turbine is analysed by a contract laboratory, accredited to ISO17025, and is reported as % Carbon.

2. The yearly consumption of gas oil is calculated from the opening and closing stock levels, taking into account fuel deliveries.

3. The Carbon content and the volume of the deliveries are used to calculate the quantity of Carbon Dioxide emitted as a result of burning gas oil on site as follows:

CO2 Emissions = Quantity of gas oil consumed (tonnes) x (% Carbon content/100) x 3.664

A calculation approach is used for GO2 as follows:

1. Due to the comparatively small volumes of gas oil used in the Stand-by Diesel Generator and Fire Pumps, default factors published by the CA are used. Volume, measured by calibrated flow meters, is taken from delivery dockets.

2. The published default factors and the volume of the deliveries are used to calculate the quantity of Carbon Dioxide emitted as a result of burning 'domestic' fuel on site as follows:

CO2 Emissions = Quantity of gas oil consumed (tonnes) x emissions factors.

There are no parts of the installation which are not operated by the applicant, or parts which are not deemed to fall under the scope of the EU ETS.

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)	733.18	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
GHG Emission Monitoring Map.pdf	Map of Monitoring Points

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 $CO_{2(e)}$) 1084746

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	Gas Turbine
S2	Stand-by Diesel Generator
S3	Dew-Point Heater
S4	Diesel Fire Pump 1
S5	Diesel Fire Pump 2
S6	Workshop Gases (Acetylene)

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

Emission Source Reference	Emission Source Description
S1	Gas Turbine
S2	Stand-by Diesel Generator
S3	Dew-Point Heater
S4	Diesel Fire Pump 1
S5	Diesel Fire Pump 2
S6	Workshop Gases (Acetylene)

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	Stack (Gas Turbine)
EP2	Exhaust (Stand-by Diesel Generator)
EP3	Exhaust (Dew-Point Heater)
EP4	Exhaust (Diesel Fire Pump 1)
EP5	Exhaust (Diesel Fire Pump 2)
EP6	Workshop (Various)

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
F1	Combustion: Other gaseous & liquid fuels	Natural Gas
F2	Combustion: Commercial standard fuels	Gas/Diesel Oil
F3	Combustion: Commercial standard fuels	Gas/Diesel Oil
F4	Combustion: Commercial standard fuels	Propane
F5	Combustion: Other gaseous & liquid fuels	Acetylene

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	S1,S3	EP1,EP3	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
			or municipal waste)
F2	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)
F3	S2,S4,S5	EP2,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)
F4	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)
F5	S6	EP6	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:

The CO2 Emissions for Natural Gas (F1) is calculated as follows:

1. The individual Gas Fractions of the Natural Gas supplied to the plant are measured by BGE Gas Chromatograph and are reported on an hourly basis as a percentage of each m3 consumed.

2. The weight in grammes of each fraction, say A, in each cubic metre of gas is calculated according to the formula:

(%A/100) x (1000/23.645) x MW of A = A(w).

where 23.645 is the volume in litres occupied by one mole of the fraction at 15 dec C and MW is Molecular Weight. The percentage of A is divided by 100 to get a decimal proportion. 1000 / 23.645 is the no. of moles in 1 m3. This amounts to a factor of 10 in the calculation spreadsheet. A mole is the weight in grammes, equal to the molecular weight (MW) of a substance.

3. The weight of Carbon due to each fraction in each cubic metre of gas is then calculated as follows:

A(w) x (MW of Carbon x number of Carbon atoms in the molecule)/MW of Fraction =A(c).

4. The weight of Carbon in all the fractions in each cubic metre of gas is then summed to get a total, Tot(c).

5. The total weight due to Carbon Dioxide in each cubic metre of gas is then calculated as follows:

Tot(c) x (MW of Carbon Dioxide/MW of Carbon) = Tot(CO2)

6. The total CO2 emitted for each hour is then calculated as follows:

Tot(CO2) x total flow for that hour = TOThr(CO2).

7. The hourly total is summed on a monthly and annual basis to provide reportable values for CO2 emissions and Trading of Allowances.

8. The NCV is determined by EN ISO 6976:2005 and the outputs from the chromatograph. The gas composition factor is determined by EN ISO6974

The CO2 Emissions for gas oil is calculated as follows:

1. The Carbon content of individual gas oil deliveries supplied to the plant for use in the Gas Turbine (F2) is analysed by a contract laboratory (see EP006(7W)), accredited to ISO17025, and is reported to UOMS as %Carbon.

2. Due to the comparatively small volumes of Fuel Oil used in the Stand-by Diesel Generator and Fire Pumps (F3), default factors are used. Volume is taken from delivery dockets and cross-checked against invoices and expectations.

3. The yearly consumption of gas oil is calculated according to:

Fuel C = Fuel P + (Fuel S – Fuel E) – Fuel O, where;

Fuel C: Fuel combusted during the reporting period

Fuel P: Fuel purchased during the reporting period

Fuel S: Fuel stock at the beginning of the reporting period

Fuel E: Fuel stock at the end of the reporting period

Fuel O: Fuel used for other purposes (transportation or re-sold)

4. The Carbon content and the volume of the deliveries are used to calculate the quantity of Carbon Dioxide emitted as a result of burning gas oils on site as follows:

CO2 Emissions = Quantity of gas oil consumed (tonnes) x (% Carbon content/100) x 3.664

where the quantity of gas oil consumed is taken from the vendors delivery dockets and where 3.664 is a factor used to convert the quantity of Carbon to Carbon Dioxide according to Article 36 of Commission Regulation (EU) No 601/2012.

The CO2 Emissions for Propane (F4) and Acetylene (F5) is calculated as follows:

1. Due to the comparatively small volumes of these fuels used in the Gas Turbine and Workshop, default factors are used. Volume is taken from delivery dockets and cross-checked against invoices and expectations.

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	S1,S3	MD1	Turbine meter	500 - 170,000	Nm3 hr-1	1.4	Bord Gais Compound on Site
F1	S1,S3	MD2	Turbine meter	500 - 170,000	Nm3 hr-1	1.4	Bord Gais Compound on Site
F2	S1	MD3	Tank dip	12 metres	mm	0.01	In Contractor's Possession
F3	S2,S4,S5	MD4	Rotary meter	100	m3hr-1	1	Trade Partner's Premises
F4	S1	Purchase Records - Propane	Purchase records	kg	n/a	n/a	n/a
F5	S6	Purchase Records - Acetylene	Purchase records	kg	n/a	n/a	n/a

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	MD1	Continual	Trade partner	Yes	No	Yes
F1	MD2	Continual	Trade partner	Yes	No	Yes
F2	MD3	Batch	Trade partner	Yes	No	Yes
F3	MD4	Batch	Trade partner	Yes	Yes	Yes
F4	Purchase Records -	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
	Propane					
F5	Purchase Records - Acetylene	Batch	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	S1,S3	MD1, MD2	<1.5%	Standard	4	3	3	N/A	1	N/A	N/A	1082661	99.81	Major	Yes	n/a	n/a
F2	S1	MD3	<1.5%	Standard	4	3	3	N/A	1	N/A	N/A	2084	0.19	Minor	Yes	n/a	n/a
F3	S2,S4,S5	MD4	<1.5%	Standard	No tier	2a	2a	N/A	1	N/A	N/A	1	0	De-minimis	Yes	n/a	n/a
F4	S1	Purchase Records - Propane	<1.5%	Standard	No tier	2a	2a	N/A	1	N/A	N/A	0.15	0	De-minimis	Yes	n/a	n/a
F5	S6	Purchase Records - Acetylene	<1.5%	Standard	No tier	1	1	N/A	1	N/A	N/A	0.17	0	De-minimis	Yes	n/a	n/a

Total Estimated Emissions for Calculation (tonnes $CO_{2(e)}$)	1084746.32

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**
Road Tanker Meter Uncertainty.docx	Extract from an email from the OEM regarding the uncertainty of the meter used on the road tanker used for deliveries of de minimis fuels.
Gas Meter Uncertainty.docx	This is a copy of the text of an email fron BGE relating to the uncertainty of the gas meters. The original email format could not be uploaded.
Synergen Ringsend Metering Summary 17-Jan-2013.pdf	Including accuracy data
Fuel Tank Dip Standard IP HM 32 (accuracy).pdf	Section 3.2.2.1 refers to accuracy
Flogas Accuracy.pdf	Accuracy of propane measurement equipment. 2000divs =/- 3.
Uncertainty Calculation.xlsx	Note that the uncertainty of the tank dip method is so small (0.00005%) that the square approaches zero.

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	S1,S3	4	3	3	N/A	1	N/A	N/A
F2	S1	4	3	3	N/A	1	N/A	N/A
F3	S2,S4,S5	No tier	2a	2a	N/A	1	N/A	N/A
F4	S1	No tier	2a	2a	N/A	1	N/A	N/A
F5	S6	No tier	1	1	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)
F3	S2,S4,S5	NCV	Irish National GHG Inventory	Subject to change
F3	S2,S4,S5	EF	Irish National GHG Inventory	Subject to change
F3	S2,S4,S5	OxF	MRR Annex II Section 2.3	1
F4	S1	NCV	Irish National GHG Inventory	Subject to change
F4	S1	EF	Irish National GHG Inventory	Subject to change
F4	S1	OxF	MRR Annex II Section 2.3	1
F5	S6	NCV	Irish National GHG Inventory	n/a
F5	S6	OxF	MRR Annex II Section 2.3	1
F5	S6	EF	Irish National GHG Inventory	n/a
F1	S1,S3	OxF	MRR Annex II Section 2.3	1
F2	S1	OxF	MRR Annex II Section 2.3	1

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
F1	S1,S3	NCV	EN ISO 6976:2005	Continuous	EffecTech	Yes	n/a
F2	S1	NCV	ASTM D240	After delivery and mixing	SGS Nerderland BV	Yes	n/a
F2	S1	Carbon Content	ASTM D5291	After delivery and mixing	SGS Nederland BV	Yes	n/a
F2	S1	Density	ASTM D 4052	After delivery and mixing	SGS Nederland BV	Yes	n/a
F1	S1,S3	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	EP006(7W) Sampling and Analysis of Fuels
Reference for procedure	EP006(7W)
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 fuels F1 and F2 consumed on site are sampled & analysed for carbon content and NCV to allow for the calculation of CO2 emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling & analysis will be used for the verification, auditing and calculation of CO2 (GHG) emissions.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Folder EMS7(W) Records
Name of IT system used	Dublin Bay Power Plant IT System
List of EN or other standards applied	EN ISO 6976:2005. ASTM D240. ASTM D5291. ASTM D 4052. ISO 3170: 2004. ISO17025. ISO 10723:2011. ISO 12405:2002.

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**
EP006(7W) Sampling and Analysis of Fuels.pdf	Descrption of the method for sampling and analysis of fuels

Title of procedure	EP006(7W) Sampling and Analysis of Fuels
Reference for procedure	EP006(7W)
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 fuels F1 and F2 consumed on site are sampled & analysed for carbon content and NCV to allow for the calculation of CO2 emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling & analysis will be used for the verification, auditing and calculation of CO2 (GHG) emissions.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Folder EMS7(W) Records
Name of IT system used	Dublin Bay Power Plant IT System
List of EN or other standards applied	EN ISO 6976:2005. ASTM D240. ASTM D5291. ASTM D

	4052. ISO 3170: 2004. ISO17025. ISO 10723:2011. ISO 12405:2002.

aa. Sampling Plan Appropriateness

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

Title of procedure	EP006(7W) Sampling and Analysis of Fuels
Reference for procedure	EP006(7W)
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 fuels F1 and F2 consumed on site are sampled & analysed for carbon content and NCV to allow for the calculation of CO2 emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling & analysis will be used for the verification, auditing and calculation of CO2 (GHG) emissions. The appropriateness of the sampling plan is described within the procedure.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Folder EMS7(W) Records
Name of IT system used	Dublin Bay Power Plant IT System
List of EN or other standards applied	EN ISO 6976:2005. ASTM D240. ASTM D5291. ASTM D 4052. ISO 3170: 2004. ISO17025. ISO 10723:2011. ISO 12405:2002.

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	EP005(7W) Gas oil Stock-Take and Measurement of Gas Consumption
Reference for procedure	EP005(7W)
Diagram reference	N/A
Brief description of procedure.	The purpose of this document is to describe how fuel stock level is measured and how the resulting data is used to calculate emissions.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Folder EMS7(W) Records
Name of IT system used	Dublin Bay Power Plant IT System
List of EN or other standards applied	HM29 Procedures for Petroleum Product Cargo Measurements by Cargo Inspectors

cc. Tracking Instruments

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

Title of procedure	Sampling and Analysis of Fuels
Reference for procedure	EP006(7W)
Diagram reference	N/A
Brief description of procedure.	The purpose of this document is to ensure that reliable and accurate information regarding the sampling and analysis of fuels which contribute to Greenhouse Gas (GHG) emissions is available to all stakeholders in Dublin Bay Power Plant (DBPP). This procedure applies to the sampling and analysis of gas oil and verification of Natural Gas data supplied by Bord Gais. All compliance-related obligations are as described in sections 4.3 to 4.9 of procedure EP004(7W) Monitoring and Reporting of Greenhouse Gases.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	HM29 Procedures for Petroleum Product Cargo Measurements by Cargo Inspectors • IP475 Petroleum liquids - Manual sampling (ISO 3170: 2004) • ASTM D240. • ASTM D5291. • EN ISO 6974 • EN ISO 6976 • EN ISO 10715 • EN ISO 17025 • EN ISO 17023

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**
Scientific Officer	Sourcing, recording, reporting and maintaining fuel consumption data, including measurements, analyses, calculations and certifications.
Station Manager	ESBI-appointed manager. This person represents the interests of ESBI, the station owner.
Plant Manager	Manager of UO+MS, the company with responsibility for day-to-day operations.

Attachment	**Description**
UOMS Organisation Chart.doc	Organisation Chart

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	Monitoring and Reporting of Greenhouse Gases
Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 4.4 of the procedure defines how roles and responsibilities are identified, assigned and managed. They include descriptions of the key competencies of those responsible, their training records (including attendance at EPA training seminars) and the review process.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

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	Monitoring and Reporting of Greenhouse Gases
Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 4.10 defines the review process for the appropriateness of the monitoring plan.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

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	Fuel Oil Stock-Take, Measurement of Gas Consumption and Data Flow.
Reference for procedure	EP005(7W)
Diagram reference	Appendix 1 contains data flow diagrams for Natural Gas F1, Gas Oil F2, Gas Oil (F3), Propane (F4) and Acetylene (F5)
Brief description of procedure. The description should cover the essential parameters and operations performed	The procedure describes how the relevant data associated with stock movements is used in the calculation of emissions, including gas flow rates, quantities of gas oil combusted, calculation of the carbon content of the combusted fuels and the tonnage of carbon dioxide emitted to the atmosphere. See also procedure EP004(7W).
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004
List of primary data sources	National Inventory Tables EU Commission Regs 601/2012 Bord Gais Eireann Gas Reports Independent Laboratory accredited to ISO 17025 Trade Partner's invoices. Independent Tank Dip Reports
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	The CO2 Emissions for Natural Gas (F1) is calculated as follows: 1. The individual Gas Fractions of the Natural Gas supplied to the plant are measured by BGE Gas Chromatograph and are reported on an hourly basis as a percentage of each m3 consumed. 2. The weight in grammes of each fraction, say A, in each cubic metre of gas is calculated according to the formula: (%A/100) x (1000/23.645) x MW of A = A(w). - where 23.645 is the volume in litres occupied by one mole of the fraction at 15 dec C and MW is Molecular Weight. The percentage of A is divided by 100 to get a decimal proportion. 1000 / 23.645 is the no. of moles in 1 m3. This amounts to a factor of 10 in the calculation spreadsheet. A mole is the weight, in grammes, equal to the molecular weight (MW) of a substance. 3. The weight of Carbon due to each fraction in each cubic

metre of gas is then calculated as follows:

A(w) x (MW of Carbon x number of Carbon atoms in the molecule)/MW of Fraction =A(c).

4. The weight of Carbon in all the fractions in each cubic metre of gas is then summed to get a total, Tot(c).

5. The total weight due to Carbon Dioxide in each cubic metre of gas is then calculated as follows:

Tot(c) x (MW of Carbon Dioxide/MW of Carbon) = Tot(CO2)

6. The total CO2 emitted for each hour is then calculated as follows:

Tot(CO2) x total flow for that hour = TOThr(CO2).

7. The hourly total is summed on a monthly and annual basis to provide reportable values for CO2 emissions and Trading of Allowances.

8. The NCV is determined by EN ISO 6976:2005 and the outputs from the chromatograph. The gas composition factor is determined by EN ISO6974

The CO2 Emissions for gas oil is calculated as follows:

1. The Carbon content of individual gas oil deliveries supplied to the plant for use in the Gas Turbine (F2) is analysed by a contract laboratory (see EP006(7W)), accredited to ISO17025, and is reported to UOMS as %Carbon.

2. Due to the comparatively small volumes of gas oil used in the Stand-by Diesel Generator and Fire Pumps (F3), default factors are used. Volume is taken from delivery dockets and cross-checked against invoices and expectations.

3. The yearly consumption of gas oil is calculated according to:

- Fuel C = Fuel P + (Fuel S – Fuel E) – Fuel O,

where

- Fuel C: Fuel combusted during the reporting period

- Fuel P: Fuel purchased during the reporting period

- Fuel S: Fuel stock at the beginning of the reporting period

- Fuel E: Fuel stock at the end of the reporting period

- Fuel O: Fuel used for other purposes (transportation or re-sold)

4. The Carbon content and the volume of the deliveries are used to calculate the quantity of Carbon Dioxide emitted as a result of burning Fuel Oils on site as follows:

CO2 Emissions = Quantity of gas oil consumed (tonnes) x (% Carbon content/100) x 3.664

where the quantity of Gas Oil consumed is taken from the vendors delivery dockets and where 3.664 is a factor used to convert the quantity of Carbon to Carbon Dioxide according to Article 36 of Commission Regulation (EU) No 601/2012.

The CO2 Emissions for Propane (F4) and Acetylene (F5) is calculated as follows:

1. Due to the comparatively small volumes of these fuels used in the Gas Turbine and Workshop, default factors are used. Volume is taken from delivery dockets and cross-checked against invoices and expectations.

Submit relevant documents to record data flow activities

Attachment	**Description**
EP005(7W) Fuel Oil Stock-Take and Measurement of Gas Consumption.pdf	Data Flow of Information

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	Monitoring and Reporting of Greenhouse Gases
Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should	Section 4.3 refers to an assessment of inherent risks and

cover the essential parameters and operations performed	control risks in written procedures related to control activities that are to mitigate the risks identified and shall at least include: (a) 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.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

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	Monitoring and Reporting of Greenhouse Gases
Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 4.5. QA is assured by the provision by trade partners of independently audited records of instrument calibrations and training records of relevant personnel. Natural gas metering is the responsibility of BGE. QA/QC of BGE equipment is ensured by: • calibration and auditing of gas chromatograph(s) in accordance with ISO17025 • certification of gas metering equipment by BGE

	personnel • data review Metering of gas oil is the responsibility of the vendor. QA/QC of the vendors equipment is ensured by regular calibrations of the metering equipment and the issuing of certified results by the vendor to DBPP
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

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	Monitoring and Reporting of Greenhouse Gases
Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	IT Security and Back-up procedures are referred to in EP004(7W). The procedures describe back-ups, off-site storage, disaster recovery and control of access to information by key personnel.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

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	Monitoring and Reporting of Greenhouse Gases
Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Data is reviewed monthly and validated by reference to audits, calibration and training records.
Post or department responsible for the procedure and for any data generated	Scientific Officer

Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

ll. 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	Monitoring and Reporting of Greenhouse Gases
Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Missing, corrupt or unusual data values identified during data review will in the first instance be reported to the supplier for clarification and correction. Details of the cause and correction applied by the supplier will be obtained in a timely manner.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

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	Monitoring and Reporting of Greenhouse Gases
Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Data is checked for completeness, conformance to expectations, auditing, calibration of instruments and that it arrives in a timely manner.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

nn. Record Keeping and Documentation

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

Title of procedure	Monitoring and Reporting of Greenhouse Gases

Reference for procedure	EP004(7W)
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	All documents and the procedures describing the means of access to them are retained electronically, with regular back-ups, and are available at all times by key personnel. The procedure address the requirement of Article 66 and Annex IX of MRR for a 10 years retention time.
Post or department responsible for the procedure and for any data generated	Scientific Officer
Location where records are kept	Dublin Bay Power Plant document management system
Name of IT system used	Sharepoint
List of EN or other standards applied	ISO14001:2004

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
EP004(7W) Monitoring and Reporting of Greenhouse Gases.pdf	This includes an assessment of risk

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:	ISO14001:2004

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	n/a
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**
Sharepoint	This refers to the Microsoft Sharepoint software used for document control

14. Additional Information

Any other information:

Attachment	Description
Calibration Certificate AGI 116575.pdf	Calibration certificate for Natural Gas meters
Capital Cal Cert.pdf	Certificate of verification of delivery meter on road tanker used for de minimis fuel oil
Synergen All Streams Dec 2012.pdf	Pressure and Temperature Calibration of Gas meters 2012

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.