



Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

GREENHOUSE GAS EMISSIONS PERMIT

Permit Register Number: IE-GHG160-10425-2

Operator: Electricity Supply Board
27 Lower Fitzwilliam Street
Dublin 2

Installation Name: ESB Poolbeg Generating Station (CCGT)

Site Name: ESB Poolbeg Generating Station

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 N^o IE-GHG160-10425.

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
P0577-03

Status Log

Current Permit

Permit number	Date application received	Date Permit issued	Comment
IE-GHG160-10425-2	04 December 2013	16 April 2014	Inclusion of acetylene gas and equipment. Minor corrections and additions to the management procedures.

Previous Permits

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG160-10425-1	GHG Permit Application	22 August 2013	06 September 2013	

End of Introductory Note

Glossary of Terms

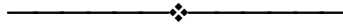
For the purposes of this permit the terms listed in the left hand column shall have the meaning given in the right hand column below:

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)	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
27 Lower Fitzwilliam Street
Dublin 2

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)
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at the following installation(s):

ESB Poolbeg Generating Station (CCGT) **Installation number: 118**

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.: 118

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	CT14	470	MW
S3	CT15	470	MW
S5	Auxiliary Boiler	6	MW
S6	Diesel Generator	0.6	MW
S7	Diesel Fire Pump	0.37	MW
S8	Diesel Fire Pump	0.77	MW
S9	Gas Pre-heater 1	0.8	MW

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S10	Gas Pre-heater 2	0.8	MW
S11	Workshop Gases - Acetylene	0	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 16 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-GHG160-10425

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	ESB Poolbeg Generating Station (CCGT)
Site name	ESB Poolbeg Generating Station
Address	Pigeon House Road Ringsend Dublin 4 Ireland

Grid reference of site main entrance	320455E,233578N
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Licence held pursuant to the Environmental Protection Agency Act 1992, as amended.	Yes
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IPC/IE Licence Register Number	Licence holder	Competent body
P0577-03	ESB Poolbeg Generating Station	Environmental Protection Agency

Has the regulated activity commenced at the Installation? Yes

Date of Regulated Activity commencement	01 January 2005
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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

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

Title	[REDACTED]
Forename	[REDACTED]
Surname	[REDACTED]
Position	Environmental and Sustainability Manager

Registered office address

Address Line 1	27 Lower Fitzwilliam Street
Address Line 2	N/A
City/Town	Dublin 2
County	N/A
Postcode	N/A

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 | Yes |

end of a reporting period allowances can be balanced against reported emissions.

4. Service Contact

e. Service Contact

Name

[REDACTED]

Address / Email Address

[REDACTED]

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.

Poolbeg Generating Station is located on Pigeon House Road, Ringsend, situated on the mouth of Dublin Harbour on land that was reclaimed from the sea during the 1960s. The area in which it is located has a long tradition in the generation of electricity. The site is adjacent to the Old Pigeon House generating station dating to early in the last century.

Poolbeg CCGT site includes the combined cycle generating unit plant made up of two combustion turbines of 155 MWe each, and a steam turbine of 170 MWe, a thermal in-put capacity of 470 MW each.

Typically the combined cycle plant operates at high loads during the day and reduced load during the night and only shuts down for overhauls.

The combustion turbines can burn natural gas or gas oil as their fuel. Natural gas is the primary fuel, gas oil is stored on site as a secondary fuel generally only being used for test purposes or when there is an interruption to the supply of Natural Gas.

The main sources of emissions of carbon dioxide from the facility are;

- Combustion of natural gas in the combustion turbines
- Combustion of gas oil in the combustion turbines

The natural gas fuel supply for Poolbeg CCGT is taken from the BGE network. The gas is fed to the station via a BGE compound consisting of a shut off valve, filters and gas / energy metering equipment.

There are two gas oil storage tanks in the station with each tank having a capacity of 7,000 tonnes. The tanks are located in a concrete bund.

Other minor sources of CO2 emissions on site include;

Diesel fire pumps which use gas oil supplied from independent supply tanks.

Auxiliary boiler which can be fired on natural gas or gas oil supplied from the main gas oil tanks.

Natural Gas Preheaters in the AGI.

Acetylene used in workshop activities.

Propane used as a start up fuel on the gas turbines if natural gas is not available.

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)	949.34	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
ESB Poolbeg Site Boundary.pdf	Site Boundary and buildings
Poolbeg Emission Sources.pdf	Emission Source Locations
Poolbeg Source Streams.pdf	Sources Stream Locations
Gas Metering Equipment Location.pdf	BGE Gas Metering Equipment Location

i. Estimated Annual Emissions

Detail of the estimated annual emission of CO₂ 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 CO₂ excluding CO₂ from biomass.

Estimated Annual Emissions (tonnes CO_{2(e)}) 1049445

Justification for the use of a conservative estimate of CO₂ emissions.

The figure above is based on Natural Gas verified emissions from 2009, 2010 and 2012 as in 2011 mid life refurbishments of the gas turbines in Poolbeg took place with both turbines not running for a number of months.

-Gas oil emissions from 2012 only are included as they are more typical of future gas oil use used as a result of grid code testing.

-Gas oil oil use in fire pumps and propane based on 2009,2010 and 2012 also.

-Acetylene emissions estimated but very small consumption expected.

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	CT14
S3	CT15
S5	Auxiliary Boiler
S6	Diesel Generator
S7	Diesel Fire Pump
S8	Diesel Fire Pump
S9	Gas Pre-heater 1
S10	Gas Pre-heater 2
S11	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	CT14
S3	CT15
S5	Auxiliary Boiler
S6	Diesel Generator
S7	Diesel Fire Pump
S8	Diesel Fire Pump
S9	Gas Pre-heater 1
S10	Gas Pre-heater 2
S11	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
A1-5	CT14 HRSG Stack
A1-7	CT14 Bypass Stack
A1-6	CT15 HRSG Stack
A1-8	CT15 Bypass Stack

Emission Point Reference	Emission Point Description
A1-4	Auxiliary Boiler Stack
A2-2	Diesel Generator Exhaust
A2-3	Diesel Fire Pump Exhaust
A2-4	Diesel Fire Pump Exhaust
A3-3	Gas pre-heater 1 Stack
A3-4	Gas pre-heater 2 Stack
A4-1	Workshop Gases - Acetylene

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	Liquefied Petroleum Gases
F5	Combustion: Other gaseous & liquid fuels	Acetylene - Workshop Gas

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,S10,S3,S5,S9	A1-5,A1-7,A1-6,A1-8,A1-4,A3-3,A3-4	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	S7,S8	A2-3,A2-4	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
			incineration of hazardous or municipal waste)
F4	S1,S3	A1-5,A1-7,A1-6,A1-8	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	S1,S3,S5,S6	A1-5,A1-7,A1-6,A1-8,A1-4,A2-2	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	S11	A4-1	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 CO₂ but exclude CO₂ 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 ₂ O	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 CO₂ emissions:

Natural Gas CO₂ Emissions are calculated as follows;

Natural Gas consumption and CO₂ emissions calculations will be based on data issued to the station by Bord Gais (BGE) on a monthly basis. This data comprises gas consumption and average gas composition on an hourly basis over the full year. The consumption will be in thousands of cubic meters(KCM) at standard conditions (15oC and 1.01325 Bar). For reporting purposes the consumption will be in KCM at 0oC and 101,325 Pa.

The monthly BGE report to the station includes the hourly average gas analysis and NCV on an hourly basis. This analysis and NCV are generated from a BGE Gas Chromatograph which is self calibrating daily. The carbon content of the gas will be calculated from this analysis.

A calculation spreadsheet for CO₂ emissions from Natural Gas has been designed by ESB and monthly data received from BGE. The calculation is as follows;

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

Therefore 1 litre of pure methane weighs $16 \div 22.414$ grams.

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

Per litre of gas mixture, methane weighs $(99 \div 100) \times (16 \div 22.414)$ grams at standard conditions

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

Therefore wt of carbon in grams per litre of gas mixture is $(12 \div 16) \times (99 \div 100) \times 16 \div 22.414$ 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. This figure is then multiplied by the gas flow rate in Sm³ per hour to produce a figure for CO₂ emitted per hour, expressed in tonnes. The volume of natural gas is adjusted to standard conditions (0oC, 101.325 kPa).

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

The average gas analysis for each month will themselves be averaged to get the annual average analysis. This data will then be used to calculate the annual NCV to ISO 6976. The emission factor will be calculated using the CO₂ and NCV data.

Gasoil F2:

Gasoil consumption is based on gas oil deliveries and on the difference in stock at the start and end of the year. Tank dips are carried out by an Independent surveyor before and after deliveries by ship or road or stock transfers between other ESB locations. Gasoil use is de-minimis, gasoil is stored on site as a secondary fuel and used for test purposes only unless in times of natural gas supply emergencies. CO₂ emissions are calculated by the product of activity data*EF*NCV*OF. Emission factor and NCV data will be taken from National inventory figures published on the EPA website. Oxidation Factor used is 1.0 as per guidelines for gas oil.

Gasoil F3:

Gasoil consumption for the diesel fire pumps is based on deliveries to the storage tank for the diesel fire pumps. Volume is converted from litres to tonnes using a factor of 0.8657 g/l. Gasoil use is de-minimis, CO₂ emissions are calculated by the product of activity data*EF*NCV*OF. Emission factor and NCV data will be taken from National inventory figures published on the EPA website. Oxidation Factor used is 1.0 as per guidelines for gas oil.

Propane F4:

Propane consumption will be based on delivery dockets.

In the CCGT propane is only used for initial light off when the units are started on Gas oil. Therefore these sources contribute to much less than 1% to overall carbon dioxide emissions and are considered to be a de-minimis source.

CO₂ emissions are calculated by the product of activity data*EF*NCV*OF. Emission factor and NCV data will be taken from National inventory figures published on the EPA website. Oxidation Factor used is 1.0 as per guidelines for propane.

Acetylene F5

Acetylene consumption will be based on purchasing records.

Acetylene is used in the workshop for cutting and welding work.

This source contributes to much less than 1% to overall carbon dioxide emissions and are considered to be a de-minimis source.

CO2 emissions are calculated by the product of activity data*EF*NCV*OF. Emission factor and NCV data will be taken from National inventory figures published on the EPA website. Oxidation Factor used is 1.0 as per guidelines for propane.

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,S5,S9,S10	MD1	Turbine meter	200 - 4000	Sm ³ /hr	1.41	ESB Poolbeg Bord Gais AGI
F1	S1,S3,S5,S9,S10	MD2	Turbine meter	200 - 4000	Sm ³ /hr	1.41	ESB Poolbeg Bord Gais AGI
F2	S1,S3,S5,S6	MD3	Annual Stock Check (Tank Dips)	0 - 14.6 (Height of tank)	meters	0.08	ESB Poolbeg Gasoil tank farm
F3	S7,S8	MD4	Delivery dockets/supplier invoices	unknown	litres	N/A	Supplier Depot
F4	S1,S3	MD5	Delivery dockets/supplier invoices	propane cylinders	kgs	N/A	ESB Poolbeg
F2	S1,S3,S5,S6	MD6	Deliveries(Tank Dip)	0 - 14.6 (Height of tank)	Meters	0.06	ESB Poolbeg Gasoil Tank Farm
F5	S11	MD7	Purchasing Records/Invoices	Acetylene Cylinders	Kgs	n/a	ESB Poolbeg Workshop

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	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
F1	MD2	Continual	Trade partner	Yes	Yes	Yes
F2	MD3	Batch	Trade partner	Yes	No	Yes
F3	MD4	Batch	Trade partner	Yes	Yes	Yes
F4	MD5	Batch	Trade partner	Yes	Yes	Yes
F2	MD6	Batch	Trade partner	Yes	No	Yes
F5	MD7	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,S5,S9,S10	MD1, MD2	<1.5%	Standard	4	3	3	N/A	1	N/A	N/A	1048740	99.93	Major	Yes	n/a	n/a
F2	S1,S3,S5,S6	MD3	<1.5%	Standard	4	2a	2a	N/A	1	N/A	N/A	700	0.07	De-minimis	No	De-minimis approach. National Inventory Factors for EF and NCV used.	n/a
F3	S7,S8	MD4	N/A	Standard	No tier	2a	2a	N/A	1	N/A	N/A	3	0	De-minimi	No	De-minimi	n/a

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)
														s		s approach. National Inventory Factors used for EF and NCV.	
F4	S1,S3	MD5	N/A	Standard	No tier	2a	2a	N/A	1	N/A	N/A	1	0	De-minimis	No	De-minimis approach. National Inventory Factors for EF and NCV used.	n/a

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)
F5	S11	MD7	N/A	Standard	No tier	1	1	N/A	1	N/A	N/A	1	0	De-minimis	No	De-minimis approach. National Inventory Factors for EF and NCV used.	n/a

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

1049445

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
Dip Tape Certificates.pdf	Dip Tape calibration certificates
Poolbeg Uncertainty Version3 .xls	Uncertainty Calculations
BGE email confriming uncertainty of meters temperature pressure compensation.pdf	BGE email confirming uncertainty of meters & temperature pressure compensation
Human Error Uncertainty email from SSL.pdf	Human error figure used in uncertainty calculations

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,S5,S9,S10	4	3	3	N/A	1	N/A	N/A
F2	S1,S3,S5,S6	4	2a	2a	N/A	1	N/A	N/A
F3	S7,S8	No tier	2a	2a	N/A	1	N/A	N/A
F4	S1,S3	No tier	2a	2a	N/A	1	N/A	N/A
F5	S11	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)
F2	S1,S3,S5,S6	De-minimis approach. National Inventory Factors for EF and NCV used.	n/a
F3	S7,S8	De-minimis approach. National Inventory Factors used for EF and NCV.	n/a
F4	S1,S3	De-minimis approach. National Inventory Factors for EF and NCV used.	n/a
F5	S11	De- minimis approach. National Inventory Factors for EF and NCV used.	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,F3,F4,F5	S1,S3,S5,S6,S11	NCV and EF	Country Specific Net Calorific Values and CO2 Emission Factors for use in the Annual Installation Emissions Report	n/a
F1,F2,F3,F4,F5	S1,S10,S11,S3,S5,S6,S7,S8,S9	OxF	MRR Annex II Section 2.3	1.0

Sampling and Analysis

Do you undertake sampling and analysis of any of the parameters used in the calculation of your CO₂ 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,S5,S9,S10	NCV	EN ISO 6976:2005	Continuous	EfechTech	Yes	n/a
F2	S1,S3,S5,S6	Density	IP365	Annual	ITS Testing Services(UK) Ltd (Ellesmere Port Laboratory)	Yes	n/a

Source Stream Refs.	Emission Source Refs.	Parameter	Method of Analysis	Frequency	Laboratory Name	Laboratory ISO17025 Accredited	Evidence Reference
F1	S1,S3,S5,S9,S10	EF	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	Poolbeg CCGT Monitoring and Reporting Protocol for CO2 emissions EU ETS PHASE III 2013 -2020
Reference for procedure	EMS11.2-13
Diagram reference	n/a
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 8 of the referenced procedure details Natural Gas analysis, gas is sampled and analysed by a Gas Chromatograph whose composition data is used to calculate CO2 emissions. Section 7.2 references gasoil sampling for density analysis - a sample is taken once per year and sent to an external lab for density analysis which is used in the stock level calculations.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	Poolbeg Microsoft Sharepoint
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	Natural Gas - ISO 6976 and ISO 6974 Gasoil - IP365

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
UKAS Accreditation Certificate.pdf	Ellesmere Port Laboratory Accreditation Cert - Gasoil Density Samples
ITS Testing (Ellesmere Port)Schedule of Accreditation.pdf	ITS Testing Schedule of Accreditation - Gasoil Density
Cert of Reg - IS EN ISO 9001 2008 - GWR - to 19Nov2014.pdf	BGE ISO 9001 Certification
Effectech0590Calibration Multiple.pdf	Effectech Scope of accreditation for Natural Gas
Gas streams 4 & 5 turbine meter cal Dec2012.pdf	Natural Gas metering systems calibration December 2012
Poolbeg CCGT Streams4 5 6 Mar 2012.pdf	Natural Gas metering streams calibrations March 2012
Poolbeg CCGT Streams4 and 5 Sep 2012.pdf	Natural Gas metering calibrations September 2012
Certificate 12_007_13 Poolbeg 2 114709.pdf	GC Calibration Cert 2012
Calibration Report 12_007_13 Poolbeg 2 sn 114709.pdf	GC Calibration report 2012
Poolbeg 2 AGI Audit Report 2012.pdf	BGE AGI Report 2012

Attachment	Description
EMS 11 2-13 Procedure for Monitoring and Reporting Protocol for CO2 Emiss CCGT Station Ver3.doc	CO2 procedure which includes sampling and analysis details.

Title of procedure	Poolbeg CCGT Monitoring and Reporting Protocol for CO2 emissions EU ETS PHASE III 2013 -2020
Reference for procedure	EMS11.2.13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 7 of the referenced procedure details Natural Gas and gasoil sampling protocols. Natural Gas is sampled and analysed continuously by a Gas Chromatograph. Gasoil is sampled once per year for density measurement used in stock level measurements.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	Poolbeg Microsoft Sharepoint
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	Natural Gas - ISO 10715 Natural Gas - Sampling Guidelines Gasoil - Sampled as per ASTM D4057-95 and IP Petroleum Manual Part IV. Values corrected as per ASTM-IP correction tables 54B and 56.

aa. Sampling Plan Appropriateness

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

Title of procedure	Poolbeg CCGT Monitoring and Reporting Protocol for CO2 emissions EU ETS PHASE III 2013 -2020
Reference for procedure	EMS11.2.13
Diagram reference	n/a
Brief description of procedure. The description should cover the essential parameters and operations performed	See Section 7.1.2 of referenced procedure for sampling plan appropriateness of Natural Gas. Gasoil is sampled as per Section 7.2 of procedure once per year by an Independent Third Party.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	Poolbeg Microsoft Sharepoint
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	ISO 17015 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	Poolbeg CCGT Monitoring and Reporting Protocol for CO2 emissions EU ETS PHASE III 2013 -2020
Reference for procedure	EMS 11.2-13
Diagram reference	N/A
Brief description of procedure.	Section 7 in this procedure describes how Gasoil (F2) consumption is measured. Independant third party tank dips are carried out at the start of each year and used as opening/closing stocks.
	Gasoil(F3) is estimated based on invoices for deliveries during the year.
	Propane and acetylene use (F4 and F5) is estimated based on invoices for deliveries during the year.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	Poolbeg Microsoft Sharepoint
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	Gasoil - IP Petroluem Manual Parts 1, XVI and IV, ASTM D4057-95 and IP Petroluem Manual Part VI. ASTM-IP Petroleum measurement correction tables 54B and 56.

cc. Tracking Instruments

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

Title of procedure	Poolbeg CCGT Monitoring and Reporting Protocol for CO2 emissions EU ETS PHASE III 2013 -2020
Reference for procedure	EMS 11.2-13
Diagram reference	n/a
Brief description of procedure.	See Section 11 of referenced procedure. Gas chromatograph and flow meters are operated and maintained by BGE, ESB monitor and track the calibrations and checks carried out on the instrumentation.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	Poolbeg Microsoft Sharepoint
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	N/A

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	Ensure compliance with GHG permit, carry out CO2 emission calculations. Ensuring all relevant CO2 emissions documentation is received and filed appropriately.
Environmental and Sustainability Team (ESB Head Office)	Carry out internal reviews of systems to ensure compliance with GHG permit and verification of CO2 emissions. Advise on all aspects of CO2 monitoring.
Technical Officer	Dipping gas oil tanks as necessary, observe Independent Surveyor during gas oil stock checks. Ordering propane, acetylene and gas oil for diesel fire pumps.
Station Manager	Sign off on verified annual report.

Attachment	Description
ESB Poolbeg Structure.pdf	ESB Poolbeg Station Structure

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process to manage 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. Section 3 and 4 outlines responsibilities and training mechanisms.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process. Section 11 outlines how the appropriateness of the monitoring methodology is reviewed through a system of internal and external reviews.

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.

As Poolbeg is a Category C installation, improvements will be made if applicable.

Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS11.2-13
Diagram reference	See referenced procedure EMS11.2-13 Appendix I - Attached in sampling plan attachments.
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process, to manage data flow activities in accordance with Article 57 of the MRR. See Appendix I for CO2 information flow activities.

Post or department responsible for the procedure and for any data generated	Chemical and Environmental Manager
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	As per procedure.
List of primary data sources	National Inventory Tables
	EU Commission Regs 601/2012
	BGE monthly gas reports - flow data, consumption and gas

<p>Description of the relevant processing steps for each specific data flow activity.</p>	<p>composition.</p> <p>Gasoil Stock Checks(F2)</p> <p>Gasoil purchasing records(F3)</p> <p>Propane and acetylene purchasing records (F4 and F5)</p> <p>Natural Gas CO2 Emissions are calculated as follows;</p>
<p>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</p>	<p>There is a Bord Gais Eireann AGI on site in Poolbeg. 2 streams in the AGI are used for supply of Natural Gas to Poolbeg CCGT. Gas metering equipment is calibrated as per gas code contract which is at least once per year.</p> <p>There is one Gas chromatograph for monitoring of natural gas composition which is calibrated externally once per year and the GC is self calibrating daily. Gas calibration bottles are supplied by BGE.</p>
	<p>Natural Gas consumption and CO2 emissions calculations will be based on data issued to the station by Bord Gais(BGE) on a monthly basis.</p>
	<p>This data comprises gas consumption and average gas composition on an hourly basis over the full year. The consumption will be in thousands of cubic meters(KCM) at standard conditions (15oC and 1.01325 Bar). For reporting purposes the consumption will be in KCM at 0oC and 101,325 Pa.</p>
	<p>The monthly BGE report to the station includes the hourly average gas analysis and NCV on an hourly basis. This analysis and NCV are generated from a BGE Gas Chromatograph which is self calibrating daily. The carbon content of the gas will be calculated from this analysis.</p>
	<p>A calculation spreadsheet for CO2 emissions from Natural Gas has been designed by ESB and monthly data received from BGE. The calculation is as follows;</p>
	<p>One Gram-Mole of methane (16 grams) occupies 22.414 litres at standard conditions (0°C, 1.01325b)</p> <p>Therefore 1 litre of pure methane weighs $16 \div 22.414$ grams.</p>
	<p>Methane fraction in the gas mixture is (say) 99%.</p>
	<p>Per litre of gas mixture, methane weighs $(99 \div 100) \times (16 \div 22.414)$ grams at standard conditions</p>

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

Therefore wt of carbon in grams per litre of gas mixture is;
 $(12 \div 16) \times (99 \div 100) \times 16 \div 22.414$ 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. This figure is then multiplied by the gas flow rate in Sm³ per hour to produce a figure for CO₂ emitted per hour, expressed in tonnes. The volume of natural gas is adjusted to standard conditions (0oC, 101.325 kPa).

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

The average gas analysis for each month will themselves be averaged to get the annual average analysis. This data will then be used to calculate the annual NCV to ISO 6976. The emission factor will be calculated using the CO₂ and NCV data.

Gasoil F2:

Gasoil consumption is based on gas oil deliveries and on the difference in stock at the start and end of the year. Tank dips are carried out by an Independent surveyor before and after deliveries by ship or road or stock transfers between other ESB locations. Gasoil use is currently de minimis, gasoil is stored on site as a secondary fuel and used for test purposes only unless in times of natural gas supply emergencies.

CO₂ emissions are calculated by the product of activity data*EF*NCV*OF. Emission factor and NCV data will be taken from National inventory figures published on the EPA website. Oxidation Factor used is 1.0 as per guidelines for gas oil.

Gasoil F3:

Gasoil consumption for the diesel fire pumps is based on deliveries to the storage tank for the diesel fire pumps. Volume is converted from litres to tonnes using a factor of

0.8657 g/l. Gasoil use is de-minimis.

CO2 emissions are calculated by the product of activity data*EF*NCV*OF. Emission factor and NCV data will be taken from National inventory figures published on the EPA website. Oxidation Factor used is 1.0 as per guidelines for gasoil.

Propane F4:

Propane consumption will be based on delivery dockets. In the CCGT propane is only used for initial light off when the units are started on Gas oil. Therefore these sources contribute to much less than 1% to overall carbon dioxide emissions and are considered to be a de-minimis source. CO2 emissions are calculated by the product of activity data*EF*NCV*OF. Emission factor and NCV data will be taken from National inventory figures published on the EPA website. Oxidation Factor used is 1.0 as per guidelines for propane.

Acetylene F5

Acetylene consumption will be based on delivery dockets. Acetylene is used in the workshop for welding and cutting and these sources contribute to much less than 1% to overall carbon dioxide emissions and are considered to be a de-minimis source. CO2 emissions are calculated by the product of activity data*EF*NCV*OF. Emission factor and NCV data will be taken from National inventory figures published on the EPA website. Oxidation Factor used is 1.0 as per guidelines for acetylene.

Submit relevant documents to record data flow activities

Attachment	Description
N/A	N/A

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS 11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	See Section 17 of referenced procedure for details of risk management. The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process, to assess inherent risks and control risks in accordance with Article 58 of the MRR.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM system
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS 11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process, to ensure quality assurance of measuring equipment in accordance with Article 58 and 59 of the MRR. See Section 10 for Quality Assurance of metering and measuring equipment.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS 11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process. See Section 10.4 for Quality Assurance of the IT system. Backup, recovery and security of electronic files are managed outside of the station by IT security at ESB Head Office. The information documentation management folders are read and write access for select staff only and all documents are password protected, to ensure quality assurance of information technology used for data flow activities in accordance with Article 58 and 60 of the MRR.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	See Section 12 of referenced procedure for review and validation of data. The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process, to ensure regular internal reviews and validation of data in accordance with Articles 58 and 62 of the MRR.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint

List of EN or other standards applied N/A

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of the referenced procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process, to handle corrections and corrective actions in accordance with Articles 58 and 63 of the MRR. See Section 14 for preventative and corrective actions.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

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	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process, to control outsourced processes in accordance with Articles 59 and 64 of the MRR. See Section 16 for control of outsourced activities.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

nn. Record Keeping and Documentation

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

Title of procedure	Poolbeg CCGT Monitoring and Reporting protocol for CO2 emissions EU ETS Phase III 2013 -2020
Reference for procedure	EMS11.2-13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	See Section 13 of referenced procedure for records and documentation. All documentation will be kept for 10 years. The purpose of the procedure is to show how CO2 emissions are determined in ESB Poolbeg. This procedure covers all aspects involved in the CO2 emissions calculation process.
Post or department responsible for the procedure and for any data generated	Environmental Coordinator
Location where records are kept	ESB Poolbeg IDM System
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

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
Risk Register for CO2 Process Rev01.doc	Risk Assessment

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: ISO 14001

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
BGE	Bord Gais Eireann

Abbreviation	Definition
GC	Gas Chromatograph
IDM	Information document management
CCGT	Combined Cycle Gas Turbine
AGI	Above Ground Interface

14. Additional Information

Any other information:

Attachment	Description
Poolbeg Diesel Deluge Engine Specification Clarke DR8H-UFAA40 2350 RPM.pdf	Details of capacity of Diesel Fire pump S7 replacement 2013.
Thermometer calibration cert..pdf	Thermometer calibration cert. - used when dipping gasoil tanks during stock checks.

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 false

confidential/sensitive:

END of Appendix I.