Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

GREENHOUSE GAS EMISSIONS PERMIT

Permit Register Number: IE-GHG091-10393-2

Operator: Tynagh Energy Limited
The Crescent Building
Northwood Park
Santry
Dublin
D09 X8W3

Installation Name: Tynagh 400MW CCPP

Site Name: Tynagh 400MW CCPP

Location: Derryfrench
Tynagh
Loughrea
Galway

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-GHG091-10393.

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

Email: help.ets@epa.ie

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

Updating of the permit:

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

Surrender of the permit:

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

Transfer of the permit or part of the permit:

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

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

IPC/IE Licence Register Number
P0700-02 and technical amendments A and B

Status Log

Current Permit

Permit number	Date application received	Date Permit issued	Comment
IE-GHG091-10393-2	22 June 2020	06 January 2021	1. Total Capacity updated to 811.03 MW 2. New measurement devices added for F2 Gas/Diesel Oil and F3 LPG.

Previous Permits

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG091-10393-1	GHG Permit Application	11 December 2013	08 January 2014	

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)	Tynagh Energy 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:

Tynagh Energy Limited
The Crescent Building
Northwood Park
Santry
Dublin
D09 X8W3

Company Registration Number: 378735

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):

Tynagh 400MW CCPP **Installation number:** 71

located at

Derryfrench
Tynagh
Loughrea
Galway
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.: 71

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
(WWTP) Wastewater Treatment Plant

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	789.11	MW
S2	Diesel Generator	4.47	MW
S3	Auxiliary Boiler	15.59	MW
S4	Diesel Fire Pump Engine	0.5	MW
S5	AGI Gas Boiler	0.27	MW
S6	AGI Gas Boiler	0.27	MW
S7	AGI Gas Boiler	0.27	MW

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S8	AGI Gas Boiler	0.27	MW
S9	AGI Gas Boiler	0.27	MW
S10	Auxillary Boiler Pilot Flame	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 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.

Signed by the Authorised Person on this the 06 January 2021:

_____

Dr Suzanne Monaghan
Inspector/ Authorised Person

Appendix 1 to Greenhouse Gas Emissions Permit Number IE-GHG091-10393

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	Tynagh 400MW CCPP
Site name	Tynagh 400MW CCPP
Address	Derryfrench Tynagh Loughrea Galway Ireland
Grid reference of site main entrance	174300E, 212800N
Licence held pursuant to the Environmental Protection Agency Act 1992, as amended.	Yes

IPC/IE Licence Register Number	Licence holder	Competent body
P0700-02 and technical amendments A and B	Tynagh Energy Limited	Environmental Protection Agency

Has the regulated activity commenced at the Installation?	Yes
Date of Regulated Activity commencement	29 March 2006

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	Tynagh Energy Limited
Company Registration Number	378735

Operator Legal status

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

(c) Company / Corporate Body

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

Registered office address

Address Line 1	The Crescent Building
Address Line 2	Northwood Park
City/Town	Santry
County	Dublin
Postcode	D09 X8W3

Principal office address

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

Holding company

Does the company belong to a holding company?	No

(d) Operator Authority

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

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

4. Service Contact

e. Service Contact

Address	The Crescent Building Northwood Park Santry Dublin 9 Ireland

5. Installation Activities

f. Installation Description

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

The installation is a Combined Cycle Gas Turbine (CCGT) plant. The principal purpose of the installation is to generate electricity. The site is located in Derryfrench, Loughrea, Co Galway. A site map illustrating the location of the station is provided with this application.

The plant comprises of a gas turbine and a steam turbine, with a rated output of 384 MWe and thermal input of 789 MW on diesel. In addition there is an auxiliary boiler 15.59 MW and an emergency generator of 4.47 MW.

The fuels used by the plant are natural gas and gas oil. The combustion of these fuels is the only process operated by Tynagh Energy Ltd. on the site that gives rise to the production of carbon dioxide by the installation.

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)	811.03	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
Tynagh Power Station Site Location Map.pdf	Site drawing showing the location of Tynagh physically and surrounding area.
Tynagh Site Diagram Emission sources and metering devices.docx	Overview of location of Emission Sources & Metering Devices

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 $CO_{2(e)}$) 529247

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	Diesel Generator
S3	Auxiliary Boiler
S4	Diesel Fire Pump Engine
S5	AGI Gas Boiler
S6	AGI Gas Boiler
S7	AGI Gas Boiler
S8	AGI Gas Boiler
S9	AGI Gas Boiler
S10	Auxillary Boiler Pilot Flame
WWTP	Wastewater Treatment Plant

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	Diesel Generator
S3	Auxiliary Boiler
S4	Diesel Fire Pump Engine
S5	AGI Gas Boiler
S6	AGI Gas Boiler
S7	AGI Gas Boiler
S8	AGI Gas Boiler
S9	AGI Gas Boiler
S10	Auxillary Boiler Pilot Flame

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
A2.1	Gas Turbine - Boiler Stack

Emission Point Reference	Emission Point Description
A2	Emergency Generator Exhaust
A3	Auxillary Boiler Stack
A3.3	Diesel Fire Pump Exhaust
A1.2	AGI - Gas Heater Boiler Exhaust
A1.3	AGI - Gas Heater Boiler Exhaust
A1.4	AGI - Gas Heater Boiler Exhaust
A1.5	AGI - Gas Heater Boiler Exhaust
A1.6	AGI - Gas Heater Boiler Exhaust
WWTP-WP	Wastewater Treatment Plant Tanks

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 Natural Gas	Combustion: Other gaseous & liquid fuels	Natural Gas
F2 Gas/Diesel Oil	Combustion: Commercial standard fuels	Gas/Diesel Oil
F3 LPG	Combustion: Commercial standard fuels	Liquefied Petroleum Gases

n. Emissions Summary

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

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
F1 Natural Gas	S1,S3,S5,S6,S7,S8,S9	A2.1,A3,A1.2,A1.3,A1.4,A1.5,A1.6	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
F2 Gas/Diesel Oil	S1,S2,S3,S4	A2,A2.1,A3,A3.3	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)

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
F3 LPG	S10	A3	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? Yes

Detail of these activities:

Source Stream Refs	Emission Source Ref	Emission Point Ref
F1 Natural Gas	WWTP	WWTP-WP

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:

CO2 emissions will be determined by the following equation:

Activity data x emission factor x oxidation factor.

Natural gas:

The activity data will be derived from fuel consumption x Net CV. Fuel consumption will be taken from a fiscal gas meter and a measurement of Net CV will be taken hourly from an on-line gas chromatograph (GC) which is accredited to ISO 17025. The emission factor shall be determined from the gas composition. Emission factors are calculated on an hourly basis from a measurement of gas composition. The oxidation factor will be 1 as per Tier 1 requirements.

Calculation of Normalised Annual Gas Volume

Annual Gas volume is normalised for standard temperature and pressure at the end of the year as follows:

The annual actual gas volume to the standardised gas volume (Nm3) is calculated as follows:

Vs (Nm3) = (Va*273.15)/288.15)

Where Vs is the standardised gas volume and Va is the actual gas volume determined from the gas volume record (GNI)

GNI data is based on 101,325 Pa, therefore no pressure correction required.

Calculation of Annual Net Calorific Value :

The Annual the net calorific value of the fuel (TJ/Nm3) is calculated as follows:

TJ/Nm3 = Annual TJ (as calculated above)/Annual standardised gas volume (as calculated above)

Calculation of Annual Emission Factor:

The Annual Emission Factor is calculated at the end of the year as follows:

Annual Calculated CO2 Emissions (tonnes) / Annual TJ

Calculation of Annual CO2 in Energy (TJ):

Annual Energy use (TJ) is calculated as follows:

Total Energy Use (TJ) = Monthly Energy use January to December

Gas oil:

CO2 emissions from the combustion of gas oil (diesel) (sources S1, S2 and S3 and S4):

This fuel source is considered "de minimis" as it contributes (and is expected to continue to do so) less than 2% of the total CO2 emissions.

For sources S1, S2, S3 and S4 the diesel fuel consumption is determined using a mass balance approach and running hours with oil delivery records.

Opening and closing stock takes of diesel will be taken each year and the radar type level gauge used to determine oil level in the main oil diesel tank.

Delivery records and invoices will be used to confirm quantities of oil deliveries from tanker deliveries to each of the diesel storage tanks.

Using mass balance approach the overall quantity of oil used in the year will be determined include temperature compensation in the calculation for differences in level and volume readings at different temperatures of the main oil tank.

The Net CV is to be taken from the Irish Emissions Factors for the current year (EPA). The activity data will then be calculated from [fuel consumption]* [NCV]. The oxidation factor will be 1 as per Tier 1 requirements.

Propane/LPG:

For source S10, the propane consumption will be determined using a mass balance approach (Delivery Records/Invoices). The Net CV is to be taken form the Irish Emissions Factors for the current year (EPA). The activity data will then be calculated from [fuel consumption]* [NCV] The emission factor is to be taken from the Irish specific emission factor for the current year (EPA). The oxidation factor will be 1 as per Tier 1 requirements.

s. Measurement Devices

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

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

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
F1 Natural Gas	S1,S3,S5,S6,S7,S8,S9	H1:A1:BGE:INT_VOL_A	Ultrasonic meter	80-2,500	Nm3/hr	0.466	GNI AGI
F1 Natural Gas	S1,S3,S5,S6,S7,S8,S9	H1:A1:BGE:INT_VOL_B	Ultrasonic meter	80-2,500	Nm3/hr	0.466	GNI AGI
F2 Gas/Diesel Oil	S1,S2	EGA11CL001	Float type transmitter/Level gauge	0-18.5m	metres	5.0	Main oil tank (top)
F2 Gas/Diesel Oil,F3 LPG	S1,S10,S2,S3,S4	Deliviery Records/Invoices	Invoices	N/A	N/A	N/A	Admin and Diesel Fuel Log (CCR)
F2 Gas/Diesel Oil	S1,S2,S3,S4	Stock take	Stock take	N/A	N/A	N/A	Diesel Fuel Log Control Room
F2 Gas/Diesel Oil	S1,S2,S3,S4	Running hours	Running hours	0-100000	hours	10	Control Room, Plant Historian (PI)
F2 Gas/Diesel Oil	S3	Aux boiler Level	Level gauge	0-100%	litres	10	Aux boiler Diesel tank
F2 Gas/Diesel Oil	S4	Diesel fire pump level	Level gauge	0-100%	litres	10	Diesel fire pump diesel tank
F2 Gas/Diesel Oil	S2	Diesel Generator level	Level gauge	0-120	cm	10	Diesel generator outside diesel tank

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Under Control Of	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
F1 Natural Gas	H1:A1:BGE:INT_VOL_A	Continual	Trade partner	Yes	No	Yes
F1 Natural Gas	H1:A1:BGE:INT_VOL_B	Continual	Trade partner	Yes	No	Yes
F2 Gas/Diesel Oil	EGA11CL001	Continual	Operator	N/A	No	N/A
F2 Gas/Diesel Oil,F3 LPG	Deliviery Records/Invoices	Batch	Operator	N/A	Yes	N/A
F2 Gas/Diesel Oil	Stock take	Batch	Operator	N/A	N/A	N/A
F2 Gas/Diesel Oil	Running hours	Batch	Operator	N/A	N/A	N/A
F2 Gas/Diesel Oil	Aux boiler Level	Batch	Operator	N/A	N/A	N/A
F2 Gas/Diesel Oil	Diesel fire pump level	Batch	Operator	N/A	N/A	N/A
F2 Gas/Diesel Oil	Diesel Generator level	Batch	Operator	N/A	N/A	N/A

t. Applied Tiers

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

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

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

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

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

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

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

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

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

Source Stream Refs.	**Emission Source Refs.**	**Measurement Device Refs.**	**Overall Metering Uncertainty (less than +/- %)**	**Applied Monitoring Approach**	**Activity Data Tier Applied**	**Net Calorific Value Tier Applied**	**Emission Factor Tier Applied**	**Carbon Content Tier Applied**	**Oxidation Factor Tier Applied**	**Conversion Factor Tier Applied**	**Biomass Fraction Tier Applied**	**Estimated Emissions $tCO_{2(e)}$**	**% of Total Estimated Emissions**	**Source Category**	**Highest Tiers Applied**	**Justification for not applying the highest tiers**	**Improvement Plan Reference (where applicable)**
F1 Natural Gas	S1,S3,S5,S6,S7,S8,S9	H1:A1:BGE:INT_VOL_A,H1:A1:BGE:INT_VOL_B	<1.5%	Standard	4	3	3	n/a	1	N/A	n/a	528558	99.87	Major	Yes	n/a	n/a
F2 Gas/Diesel Oil	S1,S2,S3,S4	EGA11CL001, Running hours	<7.5%	Standard	1	2a	2a	n/a	1	N/A	n/a	689	0.13	De-minimis	Yes	n/a	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)**
F3 LPG	S10	Delivery Records/Invoices	<10.0%	Standard	No tier	2a	2a	n/a	1	N/A	n/a	0	0	De-minimis	No	Propane use is almost negligible as it is only used ocassionaly as a starter flame for the auxillary boiler (<5kg / year)	N/A - De-minimis source stream

Total Estimated Emissions for Calculation (tonnes $CO_{2(e)}$) 529247

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**
Tynagh Energy - Meter Uncertainty Calc 30.11.2012.xls	Meter Uncertainty Calculation
Fuel Metering System Uncertainty Report - IE0310945-22-RP-0002_A_09.PDF	Fuel Metering System Uncertainty Report
Pressure calibration stream A and B 20_07_2012.pdf.pdf	Pressure Calibration Cert
Temp calibration Stream A and B 20_07_2012.pdf.pdf	Temperature calibration Cert
Gas Chromatograph Calibration Report Tynagh 2012.pdf	Gas Chromatograph Calibration Report
Tynagh Str1 Cert no 8064_2009 03_09_2009.pdf.pdf	Flow Meter Calibration Cert
Tynagh Str2 Cert no 7233_2008 19_11_2008.pdf.pdf	Flow Meter Calibration Cert

v. Applied tiers

Applied tiers for each source stream

Source Stream Ref.	Emission Source Refs.	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied
F1 Natural Gas	S1,S3,S5,S6,S7,S8 ,S9	4	3	3	n/a	1	N/A	n/a
F2 Gas/Diesel Oil	S1,S2,S3,S4	1	2a	2a	n/a	1	N/A	n/a
F3 LPG	S10	No tier	2a	2a	n/a	1	N/A	n/a

w. Justification for Applied tiers

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

Source Stream Ref.	**Emission Source Refs.**	**Justification for the applied tier**	**Improvement Plan Reference (where applicable)**
F3 LPG	S10	Propane use is almost negligible as it is only used ocassionaly as a starter flame for the auxilliary boiler (<5kg / year)	N/A - De-minimis source stream

10. Calculation Factors

x. Default Values

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

Source Stream Refs.	Emission Source Refs.	Parameter	Reference Source	Default Value applied (where appropriate)
F2 Gas/Diesel Oil	S1,S2,S3,S4	NCV	Ireland's National Greenhouse Gas Inventory (EPA)	n/a
F3 LPG	S10	NCV	Ireland's National Greenhouse Gas Inventory (EPA)	n/a
F3 LPG	S10	EF	Ireland's National Greenhouse Gas Inventory (EPA)	n/a
F3 LPG	S10	OxF	Tier 1 as per MMR Article 37	n/a
F2 Gas/Diesel Oil	S1,S2,S3,S4	EF	Ireland's National Greenhouse Gas Inventory (EPA)	n/a
F2 Gas/Diesel Oil	S1,S2,S3,S4	OxF	Tier 1 as per MMR Article 37	n/a
F1 Natural Gas	S1,S3,S5,S6,S7,S8,S9	OxF	Tier 1 as per MMR Article 37	n/a

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,S5,S6,S7,S8,S9	NCV	EN ISO 6976:2005	Continuous	EffecTech	Yes	n/a
F1	S1,S3,S5,S6,S7,S8,S9	Carbon Content	Gas Chromatograph	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	Sampling and Analysis of Natural Gas
Reference for procedure	17GHG13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure that all fuels consumed on site are sampled & analysed for carbon content 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. An annual performance assessment of the Gas Chromatograph will be undertaken by an accredited laboratory to ISO 10723:2012.
Post or department responsible for the procedure and for any data generated	EHS Specialist
Location where records are kept	Plant Admin Building
Name of IT system used	Info-Router
List of EN or other standards applied	ENISO 6976 and ISO 10723 (Natural Gas Performance evaluation of on-line Analytical Systems).

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**
17GHG13 Sampling and Analysis of Natural Gas Issue 02 (2).doc	Procedure - Sampling and Analysis of Natural Gas

Title of procedure	Sampling and Analysis of Natural Gas
Reference for procedure	17GHG13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure that all fuels consumed on site are sampled & analysed for carbon content 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	EHS Specialist
Location where records are kept	Plant Admin Building
Name of IT system used	Info-Router

List of EN or other standards applied	ISO 10715 Natural Gas -Sampling Guidelines

aa. Sampling Plan Appropriateness

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

Title of procedure	Sampling and Analysis of Natural Gas
Reference for procedure	17GHG13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The Sampling Plan Appropriateness procedure is a subsection of the Sampling and Analysis procedure. This section outlines the checks that are in place to ensure the on-going appropriateness of the plan.
Post or department responsible for the procedure and for any data generated	EHS Specialist
Location where records are kept	Plant Admin Building
Name of IT system used	Info-Router
List of EN or other standards applied	N/A

Are stock estimates carried out as part of the emission calculations?	No

bb. Tracking Instruments

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

Title of procedure	N/A
Reference for procedure	N/A
Diagram reference	N/A
Brief description of procedure.	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
List of EN or other standards applied	N/A

11. Management

cc. 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**
Site Plant Manager (GE Energy)	- Ensuring that sufficient resources, including Staff are made available to ensure compliance with the current Monitoring & Reporting Plan for Phase 3 and as detailed within the site current Greenhouse Gas Permit and EPA approval conditions. - Overall responsibility for quality assurance of reports - Overall responsibility for quality of metering and measuring equipment - Overall responsibility for GHG record keeping and documentation - Ensuing there is sufficient review and validation of data - Ensuring control measures identified in GHG risk assessment are in place and operational or corrective actions in progress.
Operations Manager	- Reporting of Monthly MWH Generated Data - Reporting of Monthly Plant Availability Data - Ensuring Monthly Emission Data is completed on time - Record keeping and documentation - Incident notification of any GHG instrument or operational system failures - Implementing corrective actions. - Checking GNI gas flow readings against Plant historian records
Site Maintenance Manager	- Maintaining calibration records on all instruments

Job Title / Post	**Responsibilities**
	within the M&R Plan and GHG Permit. - To agree with GNI and TEL the schedule of calibrations and get agreement from GNI that that they are going to conduct the required calibrations. - Initiating corrective actions on instrument failure that come under the remit of GHG Permit instrumentation or have a direct effect on the ability to calculate Monthly Emissions Data. - Notifying the EHS Manager of any such failures in a timely manner. This includes failures of IT equipment. - Maintaining calibration records on all instruments within the M&R Plan and GHG Permit Organising the completion of calibrations due, in line with timelines of GHG Permit and verifier recommendations. - Initiating corrective actions on instrument failure that come under the remit of GHG Permit instrumentation or have a direct effect on the ability to calculate Monthly Emissions Data. Notifying the EHS Manager of any such failures in a timely manner. This includes failures of IT equipment. - Working with GNI to ensure completion of instrument calibrations required to be carried out by GNI. - Ensuring quality assurance of metering and measurement equipment used in GHG monitoring. - Ensuring record keeping and on-site documentation for all GHG listed instruments and calibrations. - Ensuring automated systems of emissions calculations are operational and resources are available for fixing problems.
Site Commercial Manager	- Provide copies of documented diesel fuel invoices for all diesel fuel purchases made each month where appropriate. - Quickly responding to processing invoices / quotes for work required at site to meet GHG Permit requirements - To agree with TEL any additional costs for required calibrations in order to meet GHG Permit and Verifier requirements - Carry out quarterly quality assurance audit of CO2 monitoring system and data flow activity via compliance

Job Title / Post	**Responsibilities**
	calendar. - Notifying the site management team of any such failures or findings from quality audits in a timely manner - Implement where appropriate corrective actions
Site EHS Manager	- Ensuring that data is collected on a monthly basis and emissions are reported to the EPA in a timely fashion - Calculation of Monthly CO2 Emissions. - Calculation of Monthly Gas Volumes. - Perform initial Quality Control checks on Calculated Emission Data. - Ensuring ongoing monitoring of data flow activity. - Ensuring ongoing monitoring plan appropriateness. - Liaise with TEL and EPA over Emission Reports and GHG Permit inspections and requirements. - Review and validation of GHG data in line with permit and M&R plan and verification requirements. - Record keeping and documentation of GHG related reports and data. - Assisting TEL with any changes required to the GHG Permit or M&R Plans.
Engineering Manager - Tynagh Energy Ltd	- The point of contact for the legal 'operator' and working directly for the company as detailed in the license application. - Individual duly authorised to submit application and details on behalf of the company. - Overall responsibility to manage site operations through having day-to-day control of plant operation including the manner and rate of operation. - Overall responsibility to ensure that permit conditions are effectively complied with. - Overall responsibility to control, monitor and report specified emissions. - Responsible for trading in allowances, if applicable,at

Job Title / Post	Responsibilities
	the end of a reporting period. - Responsibility to act as the service contact between the operator and the EPA.

Attachment	Description
Tynagh GHG Phase 3 Site Organisational drawing (2019).docx	Tynagh Power plant organisational chart for Greenhouse gas permit management

dd. 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	Greenhouse gas permit compliance responsibilities.
Reference for procedure	17GHG01
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 Tynagh Power Station is at all times in compliance with GHG Emissions Permit and has clearly defined 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 and site GHG permit.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Inforouter
List of EN or other standards applied	ISO 9001, ISO 14001

ee. 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	CO2 Monitoring Plan Appropriateness
Reference for procedure	17GHG09
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	This procedure details the periodic evaluation of the monitoring plan's appropriateness, including any potential measures for the improvement of the monitoring methodology by; - checking the list of emissions sources and source streams, ensuring completeness of the emissions and source streams and that all relevant changes in the nature and functioning of the installation will be included in the

	monitoring plan; - assessing compliance with the uncertainty thresholds for activity data and other parameters (where applicable) for the applied tiers for each source stream and emission source; and - carrying out assessments of potential measures for improvement of the monitoring methodology applied.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Info-router, Gensuite compliance calendar & ATS
List of EN or other standards applied	ISO 9001, ISO 14001

ff. Data Flow Activities

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

Title of procedure	Managing CO2 system data flow activities
Reference for procedure	17GHG05
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The EU Emission Trading Scheme for Greenhouse Gases requires that, as a Schedule 1 activity, the Station holds a Permit to enable it to emit greenhouse gases. The Power Station holds a Permit issued by the EPA. Calculation and reporting of emissions is a condition placed on the Permit holder. This procedure outlines the main process steps in the data flow activity along with a diagram showing how the data management procedures link together. It also outlines the quality and data system risk control steps that are part of the generation of quality assured CO2 data so as to manage data flow activities in accordance with Article 57 of the MRR.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Info-router
List of EN or other standards applied	ISO 14001, ISO 9001
List of primary data sources	Gas volume flow data Gas chromatograph readings

	PI data gas data CO2 Emission calculator Diesel tank level readings Pump Running hours Diesel Fuel log Instrument calibration records PI data Co2 monthly emissions report Verified CO2 Emissions report Staff training records Operations incident log Maintenance incident log Quarterly CO2 system audit Site CO2 procedures Management of change records
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	Gas: -Gas enters AGI and is analysed by GNI flow meters and chromatograph and data is recorded. -Tynagh PI system interfaces with the AGI and records gas flow and chromatograph values onto a PI system server. -A CO2 emissions calculator extracts hourly gas volume & chromatograph data from PI at the end of each month and calculates on an hourly basis the quantity of CO2. -CO2 emissions will be determined by the following equation: Activity data x emission factor x oxidation factor. The activity data will be derived from fuel consumption x Net CV. Fuel consumption will be taken from a fiscal quantity gas meter and a measurement of net CV will be taken hourly from an on-line gas Chromatograph (GC).

-The emission factor shall be determined from the gas composition. This is taken from an on-line gas chromatograph which is accredited to ISO 17025. Emission factors are calculated on an hourly basis from a measurement of gas composition.

-The oxidation factor used will be taken from the Irish Specific Emission factors for the year in question (EPA).

-The hourly CO2 values are then summed for the reporting year.

-This is recorded on a monthly emission calculator and kept on info-router.

Diesel:

-Diesel is sent from the main on site diesel storage tank and the run hours on Diesel in the various plant equipment (Gas turbine, diesel fire pump, diesel generator, aux boiler) is recorded on Tynagh PI system.

-Level readings on the tank are also taken daily from operational routes.

-The diesel use for the month is calculated based on summation of the volumes used at the different diesel consumers.

-CO2 emissions from the combustion of gas oil (diesel) (sources S1,S2 and S3 and S4):

This fuel source is considered "de minimis" as it contributes (and is expected to continue to do so) less than 2% to the total CO2 emissions. For sources S1, S2,S3 and S4 the diesel fuel consumption is determined using a mass balance approach and running hours. The Net CV is to be taken from the Irish Emissions Factors for the current year (EPA).The activity data will then be calculated from [fuel consumption]* [NCV] The emission factor is to be taken from the Irish specific emission factor for the current year (EPA).The oxidation factor will be taken from the Irish Specific emission factor for the current year (EPA).

-Using these national inventory emission factors the tonnage of diesel is converted to tonnes CO2 and recorded monthly on info-router.

Propane:

-As propane use is relatively very small any deliveries to the

area of combustion (Aux boiler) is assumed to be used up for that year.

-The quantity of propane is converted to CO2 using Emission factors from the national inventory for that year.

-Addition of CO2 due to propane use is usually adjusted at the end of the year by adding to the annual emissions report as part of verification.

Risk control on data flow activity:

A number of quality assurance and risk control steps are integrated along each of these process steps including:

-All GNI instruments are calibrated by GNI and copies are kept at Tynagh CCGT in line with permit plan and uncertainty requirements and frequency.

-Records are kept with the maintenance manager and on Maximo.

-Some outsourced calibrations are carried out from time to time and this is controlled in line with requirements by the site maintenance manager.

-The IT system which involves reliability of PI data, CO2 emissions calculators, gas volume data etc is maintained by the site maintenance manager.

-Any incidents with GNI instruments, site level readings or site IT systems are noted and logged as incidents by the operations and maintenance team in Maximo.

-Monthly quality control checks are carried out by the EHS Manager by comparing CO2 calculated emissions to MWHrs in the site emissions calculator kept on info-router.

-A quarterly audit assesses the overall risk operational control of the CO2 data system and is carried out by the commercial manager.

-Any actions from this are tracked via a site corrective action system, ATS.

-Site quality procedures and revisions are integrated into the site quality assurance system (ISO 9001, NSAI)

-Monitoring plan appropriateness is triggered at the quarterly audit and more immediate measures such as communications between operations and maintenance

team. Similarly any planned changes are triggered via communications.

-Staff training includes training specific to the roles identified in the responsibilities section and includes back-up for the tasks involved in the monthly CO2 System data generation as appropriate.

Submit relevant documents to record data flow activities

Attachment	**Description**
Tynagh Power plant Data flow activities for the CO2 monitoring system.pdf	Process flow overview of how CO2 emissions are monitored including checks and calibrations.

gg. 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	CO2 Emissions – Risk Management & Control
Reference for procedure	17GHG07
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	This procedure outlines a written assessment of the risks of errors in the annual report, and of the risks of failure to comply with the monitoring methodology. This procedure is a written method of controls aimed at reducing the risks, including an overall assessment via an internal audit of the control system and data so as 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	EHS
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Info-router
List of EN or other standards applied	ISO 9001, ISO 14001

hh. 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	Greenhouse Gas Permit: Quality Assurance of Measuring and metering Equipment including IT systems.
Reference for procedure	17GHG08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	This procedure outlines how the site operator maintains the quality assurance of measuring and monitoring equipment and instrumentation in line with the site GHG permit and MMR requirements. This covers equipment operated and maintained on the site and outsourced calibration in the GNI AGI so as to ensure quality assurance of measuring equipment in accordance with Article 58 and 59 of the MRR.
Post or department responsible for the procedure and for any data generated	Maintenance
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Maximo, Info-router
List of EN or other standards applied	ISO 9001, ISO 14001, ISO55000

ii. 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	Greenhouse Gas Permit: Quality Assurance of Measuring and metering Equipment including IT systems.
Reference for procedure	17GHG08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	This procedure outlines how the site operator maintains quality assurance of measuring and monitoring equipment and instrumentation in line with the site GHG permit and MMR requirements. This covers equipment operated and maintained on the site and outsourced calibrations so as 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	Maintenance
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Maximo, Info-router
List of EN or other standards applied	ISO 9001, ISO 14001

jj. 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	Quality Control Checks, review and validation on CO2 data.
Reference for procedure	17GHG06
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The inherent risks and controls identified in the risk assessment (17GHG07) require a periodic review and validation of CO2 data resulting from the data flow activities used to generate calculated CO2. This Procedure describes how some 'sense checks' are to be used to test the accuracy of the calculated CO2 emissions calculations spreadsheet. This will be generally carried out monthly as part of monthly CO2 reporting but can be carried out at any time on calculated CO2 emissions. Additional checks will be carried out as part of a quarterly audit of the overall plant CO2 Monitoring and Reporting Process System and more detailed checks in preparation for annual verification visits so as 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	EHS
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Info-router, Gensuite
List of EN or other standards applied	ISO 9001, ISO 14001

kk. 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	Quality Control Checks, review and validation on CO2 data.
Reference for procedure	17GHG06
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The inherent risks and controls identified in the risk assessment (17GHG07) require a periodic review and validation of CO2 data resulting from the data flow activities used to generate calculated CO2. This Procedure describes how some 'sense checks' are to be used to test the accuracy of the calculated CO2

	emissions calculations spreadsheet. This will be generally carried out monthly as part of monthly co2 reporting but can be carried out at any time on calculated CO2 emissions. Additional checks will be carried out as part of a quarterly audit of the overall plant CO2 Monitoring and Reporting Process System. More detailed checks will be carried out in preparation for annual verification visits and investigating findings from monthly and quarterly checks. Findings will be tracked appropriately and corrective actions tracked to closure so as to handle corrections and corrective actions in accordance with Articles 58 and 63 of the MRR.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Info-router, Gensuite
List of EN or other standards applied	ISO 9001, ISO 14001

II. 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	Control Of outsourced Activities
Reference for procedure	17GHG10
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	It is possible that a number of activities in measuring CO2 Emissions could become outsourced. Some Typical examples include but are not limited to -Calibration of fuel meters -Calculation of monthly gas volumes -Repairs to GHG instruments listed on the site GHG monitoring plan -Improvement of CO2 calculator emission tools. -Change to IT monitoring systems This procedure outlines how the operator should remain in control of out-sourced activity and ensure all activities remain compliant with the site GHG permit, monitoring plans and EU MMR regulations at all times, so as to control

	outsourced processes in accordance with Articles 59 and 64 of the MRR.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Info-router
List of EN or other standards applied	ISO 14001, ISO 9001

mm. Record Keeping and Documentation

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

Title of procedure	Document & Data Control
Reference for procedure	QWI-4-01
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The control of documentation and data at Tynagh Power station is essential to allow the O&M Team to meet its legal and contractual obligations for environmental, safety and quality. This QWI details how documentation and data shall be controlled and an appendix lists record retention details including all GHG record keeping for at least 10 years.
Post or department responsible for the procedure and for any data generated	Quality
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Info-router
List of EN or other standards applied	ISO 9001 ISO 14001

nn. Risk Assessment

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

Attachment	**Description**
17GHG07 CO2 Emissions - Risk Managment and Control Issue 06.doc	Risk Management and control of CO2 Emissions calculations and monitoring

oo. 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, NSAI certified

12. Changes in Operation

pp. 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	Managing Changes in Operation
Reference for procedure	17GHG11
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	From time to time changes may occur which impact the production of CO2 e.g. change in operation routine, increase in diesel usage, change of IT systems, addition of boiler emission point, change to higher tier level etc. This procedure outlines how regular reviews are to be 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 existing M&R plan or permit and ensure that appropriate actions are taken.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	Tynagh CCGT Plant
Name of IT system used	Info-router, gensuite

13. Abbreviations

qq. Abbreviations Acronyms or definitions

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

Abbreviation	**Definition**
Admin	Administration office at Tynagh Power Station
AGI	Above ground installation
ATS	GE IT application 'action tracking system'
GNI	Gas Networks Ireland
CCPP, CCGT	Combined cycle power plant, combine cycle gas turbine
CV	Calorific Value
EHS	Environmental Health and safety
EPA	Environmental Protection Agency
GC	Gas Chromatograph
GE	General Electric
GHG	Greenhouse gas
IPC/IPPC	Integrated pollution control/ Integrated pollution prevention control
M&R	Monitoring and Reporting
MMR	The Monitoring and Reporting Regulation (Commission Regulation (EU) No. 601/2012 of 21 June 2012)
MW	Megawatts
MWH	Megawatt hours
NCV	Net Calorific Value
NSAI	National Standards Authority Ireland
TEL	Tynagh Energy Limited

Abbreviation	Definition
Info-router	Quality controlled document management system.
Activity Code	Code number assigned to the categories of activity in Schedule 1 to the Regulations.
Emissions	The release of greenhouse gases into the atmosphere from sources in an installation.
Misstatement	An omission, misrepresentation or error in the report required to be submitted under Condition 3.5 of this permit.
Non-conformity	Any act or omission by the Operator, either intentional or unintentional, that is contrary to the requirements of the Monitoring and Reporting Plan.
The Operator	Tynagh Energy Limited
IEL	Industrial Emissions Licence

14. Additional Information

Any other information:

Attachment	Description
Unreasonable cost Justificiation for Diesel calc.xlsx	Unreasonable cost justification for diesel
Conservative estimate of Carbon (Diesel usage).xlsx	Conservative estimate of carbon emissions from diesel use
19_0057_03 Calibration Report Tynagh AGI 2019 (110201).pdf	AGI Tynagh Chromatograph Calibration report 2019
Tynagh Str 1 43877291 06-09-2019.pdf	Tynagh AGI Gas flow meter stream 1 cal check 2019
Tynagh Str 2 43877349 06-09-2019.pdf	Tynagh AGI Gas flow meter stream 2 cal check 2019
17GHG05 Calculation of Monthly CO2 Emissions Issue 04.doc	Procedure Calculation of Monthly and Annual CO2 Emissions from Gas
17GHG04 Calculations of Monthly CO2 Emissions from Diesel.doc	Procedure: Calculation of Monthly and annual Co2 emissions from diesel

15. Confidentiality

rr. 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.