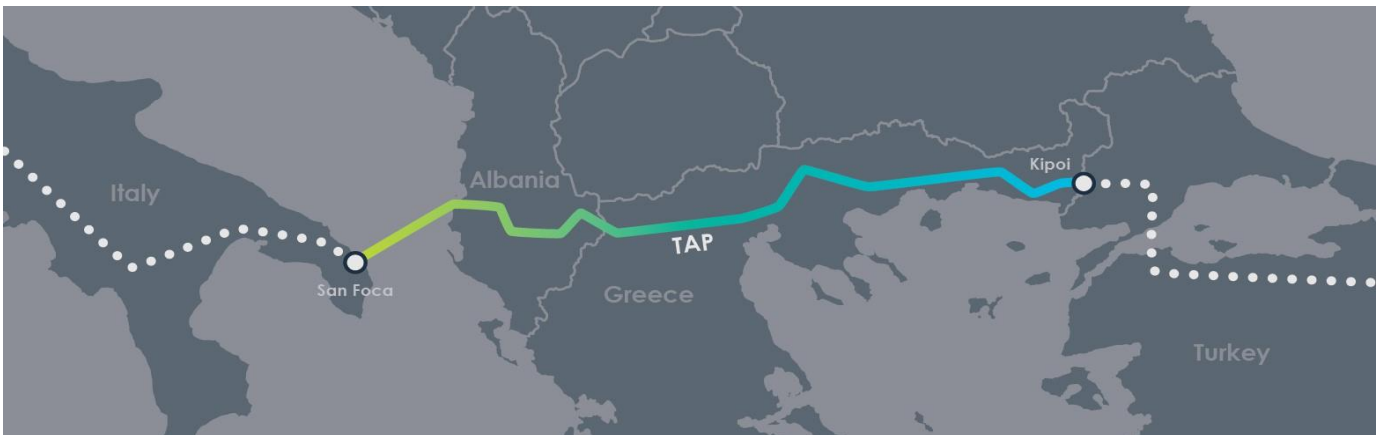




Trans Adriatic
Pipeline



Atmospheric Emissions Management Procedure



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1. Introduction

This Atmospheric Emissions Management Procedure describes the requirements and best practices for management of atmospheric emissions from TAP AG operations to ensure compliance with TAP AG commitments and standards and applicable national and EU legislation.

This procedure is subordinate to and shall be read in conjunction with TAP AG Environmental and Social Management Manual (Ref. 1) which provides an overview of all TAP AG environmental, socio-economic and cultural heritage aspects and how impacts are identified, avoided, mitigated or managed in accordance with TAP AG commitments and TAP Operations Environmental Standards (Ref. 2).

This document contains requirements in addition to any legal requirements applicable to TAP AG (arising from national and/or EU legislation and the ESIA approvals in place), and therefore no such provision has any effect whatsoever on the fulfilment of these legal obligations by TAP AG. This document includes additional requirements formulated by, and incumbent on, TAP AG and, therefore, does not give any right to third parties and are not enforceable by any third party beyond any legal rights they may have in accordance with applicable laws.

1.1 Scope

This procedure is applicable to the following TAP AG owned and operated facilities in Greece, Albania and Italy:

- Pipeline right of way (550 km) from the border between Greece and Turkey in Kipoi up to the border between Greece and Albania, including the compressor station at Kipoi and 23 block valve stations
- Pipeline right of way (215 km) from Qendër, Bilisht in Korçë to 17 km north-west of Fier, approximately 400 m inland from the shoreline, the compressor station near Fier, the metering station near Bilisht and 9 block valve stations
- Pipeline right of way (105 km) pipeline traversing the Adriatic Sea to the Italian coast, the micro-tunnel site near the town of San Foca, the pipeline right of way (8.2 km), Pipeline Receiving Terminal (PRT) and back-up control centre in Brindisi
- TAP AG offices in Switzerland and TAP pipeline host countries.

This procedure applies to TAP AG and Operations and Maintenance (O&M) contractors undertaking work within TAP AG operational facilities listed above, whose activities generate atmospheric emissions.

This document shall take effect from the commencement of commercial operations and shall supersede the previous construction phase Pollution Prevention Contractor Control Plans (Ref 3-7).

This procedure excludes emissions of odour and dust. Dust management is addressed in the Pollution Prevention Procedure (Ref No. 8); odour is not considered to be a concern for the TAP operations given the absence of odour sources.

1.2 Purpose

The purpose of this procedure is to:

- present a clear framework of the tools and processes in place to manage emissions to atmosphere during the operations phase, including greenhouse gas emissions
- establish process for setting measurable reduction targets for greenhouse gases, including fugitive emissions and delivery of these targets

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- to meet TAP AG obligations under the commitments of the approved TAP Environmental and Social Impact Assessments (ESIA) for Greece, Albania and Italy (Ref. 9-11) including subsequent approved amendments.

1.3 Abbreviations and Definitions

Abbreviation	Definition
ACS02	Metering Station in Albania
ACS03	Compressor Station in Albania
AGI	Above Ground Installation
BAT	Best Available Technology
bcm	Billion Cubic Metres
BREFs	EU BAT Reference Documents
BVS	Block Valve Station(s)
CEMS	Continuous Emissions Monitoring System
CCP	Contractor Control Plan
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	CO ₂ equivalent (Emissions)
COD	Commercial Operations Date
DLE	Dry Low Emissions
EBRD	European Bank of Reconstruction and Development
EIB	European Investment Bank
ESIA	Environmental Social Impact Assessment
ESMS	Environmental and Social Management System
EPA	Environmental Protection Agency
E-PRTR	European Pollutant Release and Transfer Register
ETS	Emission Trading Scheme
EU	European Union
GCS00	Compressor Station in Greece (10 BCMY case)
GCS01	Compressor Station in Greece (20 BCMY case)
GHG	Greenhouse Gas
GIE	Gas Infrastructure Europe
GIP	Good Industry Practice
IED	Industrial Emissions Directive
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention and Control
IPR01	Pipeline Receiving Terminal in Italy
LDAR	Leak Detection and Repair
MWth	Mega-watts thermal
NO	Nitrogen monoxide



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Abbreviation	Definition
NO _x	Nitrogen oxides
N ₂ O	Dinitrogen monoxide
O ₂	Oxygen
OEM	Original Equipment Manufacturer
O&M	Operations and Maintenance
P&ID	Piping and Instrumentation Diagram
PPE	Personal Protective Equipment
PRD	Pressure Relief Device
QHSE	Quality, Health, Safety and Environment
SO _x	Sulphur Oxides
TAP	Trans Adriatic Pipeline
TAP AG	Trans Adriatic Pipeline AG
TOC	Total Organic Carbon
UKOOA	United Kingdom Offshore Operators Association Limited
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
VOC	Volatile Organic Compounds

Term	Definition
Competent authority	any person or organization that has the legally delegated or invested authority, capacity, or power to perform a designated function, such as national ministry, a regional authority, a local authority or council, or another public or private body that has been nominated and approved by the national government
Fugitive emissions	Unintended or irregular emissions caused by leaks or loss of tightness in equipment. As per European Standard 15446 ¹ , fugitive emissions are defined as emissions to the atmosphere caused by loss of tightness of an item which is designed to be tight.
Non-fugitive emissions	Emissions from combustion equipment, maintenance/emergency depressurisation and analyser sample vents
TAP Finance Document	Means each of the agreements between TAP AG as borrower and various financing parties and supporting organisations as lenders (including the CTA)

1.4 Roles and Responsibilities

TAP AG organization, with headquarters in Switzerland, includes roles such as the Operations Director, who shall support the roles and responsibilities presented below.

1.4.1 Operations and Maintenance Country Manager

Environmental Management of the hot commissioning activities, the introduction of hydrocarbons, operation and maintenance of TAP pipeline systems in each host country has been delegated to Operations and Maintenance Country Manager(s), who shall be responsible for:

¹ EN 15446: Fugitive and diffuse emissions of common concern to industry sectors - Measurement of fugitive emission of vapours generating from equipment and piping leaks", European Committee for Standardization, January 2008

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- Ensuring compliance with and implementation of TAP AG standards and QHSE Management system, including applicable environmental and urban and land planning legislation, Lenders and ESIA requirements, implementation of practices for prevention of pollution and management of waste, operation of facility flood protection, drainage and runoff systems
- Ensuring implementation of atmospheric emission controls outlined in Section 3 of this procedure.

1.4.2 The Working Group

TAP AG shall establish a carbon management group, henceforth referred to as the Working Group, that shall have the responsibility for the strategic direction and implementation of TAP AG's atmospheric emissions management system and shall consist of members as outlined in Table 1.

Table 1 - Working Group Members

Role	Responsibility
Operations Director	single point of accountability for the overall TAP operations and approval of emission reduction targets
QHSE Manager	supporting implementation of the TAP Operations Environmental Standards
Operations and Maintenance Country Manager(s)	ensuring TAP's ESCH oversight and assurance processes of O&M Contractors are implemented
O&M Contractor(s)	compliance with TAP QHSE Management System

The remit of the Working Group includes:

- Inclusion of GHG reduction and energy efficiency objectives within policies, sustainability reports and that these are adopted at the top level of the TAP organization
- Ensure effective communication of the company's policies to staff
- Monitor the company's performance against predefined targets
- Promoting culture of environmental sustainability within the company.

The Working Group shall provide full support to the Corporate QHSE / Operations Functions in implementation of corrective measures required for compliant execution of this procedure.

1.4.3 Corporate QHSE / Operations Functions

The Corporate QHSE / Operations function shall be responsible for:

- Preparation, implementation and update of this procedure, as required
- Collation of proposals for the next revision and ensuring agreed processes are applied, and that this procedure remains relevant to TAP AG operations and goals and compliant with environmental legislation or to any amendments thereof
- Development and facilitation of workshops to help raise environmental awareness and share TAP AG emission reduction initiatives
- Provision of resources for training, as required, for functions involved in the implementation of this procedure
- Monitoring of compliance with legislative requirements and this procedure
- Implementation of necessary corrective actions.

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1.4.4 Financial Department

The Financial Department shall be responsible for the management of the financial aspects derived from the Emissions Management Under European Union Emission Trading System procedure (Ref. 12).

1.4.5 TAP QHSE Officer(s)

The QHSE Officer(s) shall be responsible for:

- Implementation of this procedure
- Undertaking compliance monitoring and reporting results to the TAP AG management
- Identification and verification of closure of corrective actions
- Recording and reporting atmospheric emission related incidents
- Providing training, guidance and awareness to TAP AG personnel on atmospheric emission control requirements
- Compiling statistics on atmospheric emission control and management
- External reporting to competent authority as required under national legislation
- Carrying out analysis of performance data and making necessary recommendations for improvement
- approving asset specific targets
- ensuring future emission reduction plans align with governmental requirements and expectations
- site based monitoring, supported by the Corporate QHSE function or O&M contractor who maintains the documentation, risk analysis and calculations
- overseeing the collection and recording of operational data in line with monitoring and calculation processes including those under the Emissions Management Under European Union Emission Trading System procedure (Ref. 12)
- Identification and reporting of any defective equipment resulting in fugitive emissions.

1.4.6 O&M Contractor(s)

TAP O&M Contractors shall be responsible for:

- Acting in accordance with the relevant Maintenance contract and this procedure
- Ensuring full compliance with the provisions of this procedure and applicable national legal requirements by its personnel and its subcontractor personnel
- Maintaining TAP operational facilities and associated equipment as per manufacturer recommendations
- Implement preventive maintenance programme for TAP AG operational facilities and associated equipment falling within their scope.

1.4.7 All TAP AG and O&M Contractor Personnel

Personnel shall have responsibility to:

- Follow atmospheric emission control requirements outlined within this procedure
- Promptly report all faulty / defective equipment to the QHSE Function or designated O&M Contractor person (as the case may be)

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- Contact QHSE Officer when unclear on requirements of this procedure.

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2. References

No	Document Title	Document Number
1	Environmental and Social Management Manual	CAL00-TAP-QHSE-Y-TMT-0001
2	Operations Environmental Standards Manual	CAL00-TAP-QHSE-Y-TMT-0002
3	TAP Albania Onshore Pollution Prevention CCP	AAL00-RSK-601-Y-TTM-0002
4	TAP Albania Offshore Pollution Prevention CCP	AAL00-RSK-601-Y-TTM-0024
5	TAP Greece Onshore Pollution Prevention CCP	GAL00-ENT-601-Y-TTM-0002
6	TAP Italy Onshore Pollution Prevention CCP	IAL00-RSK-601-Y-TTM-0002
7	TAP Italy Offshore Pollution Prevention CCP	IAL00-RSK-601-Y-TTM-0015
8	Pollution Prevention Procedure	CAL00-TAP-QHSE-Y-TPA-0001
9	Environmental and Social Impact Assessment (ESIA) for Greece	GAL00-ENT-642-Y-TAE-0001
10	Environmental and Social Impact Assessment (ESIA) for Albania	AAL00-ENT-641-Y-TAE-0001
11	Environmental and Social Impact Assessment (ESIA) for Italy	IAL00-ERM-643-Y-TAE-1011
12	Emissions Management Under European Union Emission Trading System	CAL00-TAP-QHSE-Y-TPA-0008
13	ACS02 - Best Available Technology (BAT) Assessment Report	ACS02-C1448-000-A-TRX-0002
14	ACS03 - Best Available Technology (BAT) Assessment Report	ACS03-C1448-000-A-TRX-0001
15	GCS00 - Best Available Technology (BAT) Assessment Report	GCS00-C1449-000-A-TRX-0001
16	IPR01 - Best Available Technology (BAT) Assessment Report	IPR01-C5521-000-A-TRX-0001
17	GHG Emissions Quantification at Compressor Stations and Pipeline Receiving Terminal	CAL00-PMT-640-Y-TAE-0001
18	ACS02 Fugitive Emissions Calculation Report	ACS02-C1448-000-A-TRX-0004
19	ACS03 Fugitive Emissions Calculation Report	ACS03-C1448-000-A-TRX-0003
20	GCS00 Fugitive Emissions Calculation Report	GCS00-C1449-000-A-TRX-0002
21	IPR01 Fugitive Emissions Calculation Report	IPR01-C5521-000-A-TRX-0002
22	Monitoring of Fugitive Emissions of Natural Gas in The PRT – Methodology	IPR01-C7305-000-S-TRY-0008
23	Environmental Monitoring Project (Italy)	IAL00-ERM-643-Y-TAE-1028
24	Greenhouse Gas Emissions Forecasting and Actuals Reporting (Tool)	CAL00-C36213-000-Y-TRF-0006
25	Method Statement CEMS Systems Reading and Emissions from Stack	CAL00-TAP-QHSE-Y-TAG-0006
26	Reporting and Calculation of NO _x , SO _x and CO Emissions Procedure	CAL00-TAP-QHSE-Y-TPA-0004
27	Method Statement Ambient Air Quality Monitoring	CAL00-TAP-QHSE-Y-TAG-0005
28	Records Retention Guidelines	CAL00-TAP-LEG-X-TPA-0001

3. Atmospheric Emissions Management Procedure

The process of TAP AG atmospheric emissions management is presented in Figure 1 below. Further detail on the process is provided in Section 3.1 – 3.7 of this procedure.

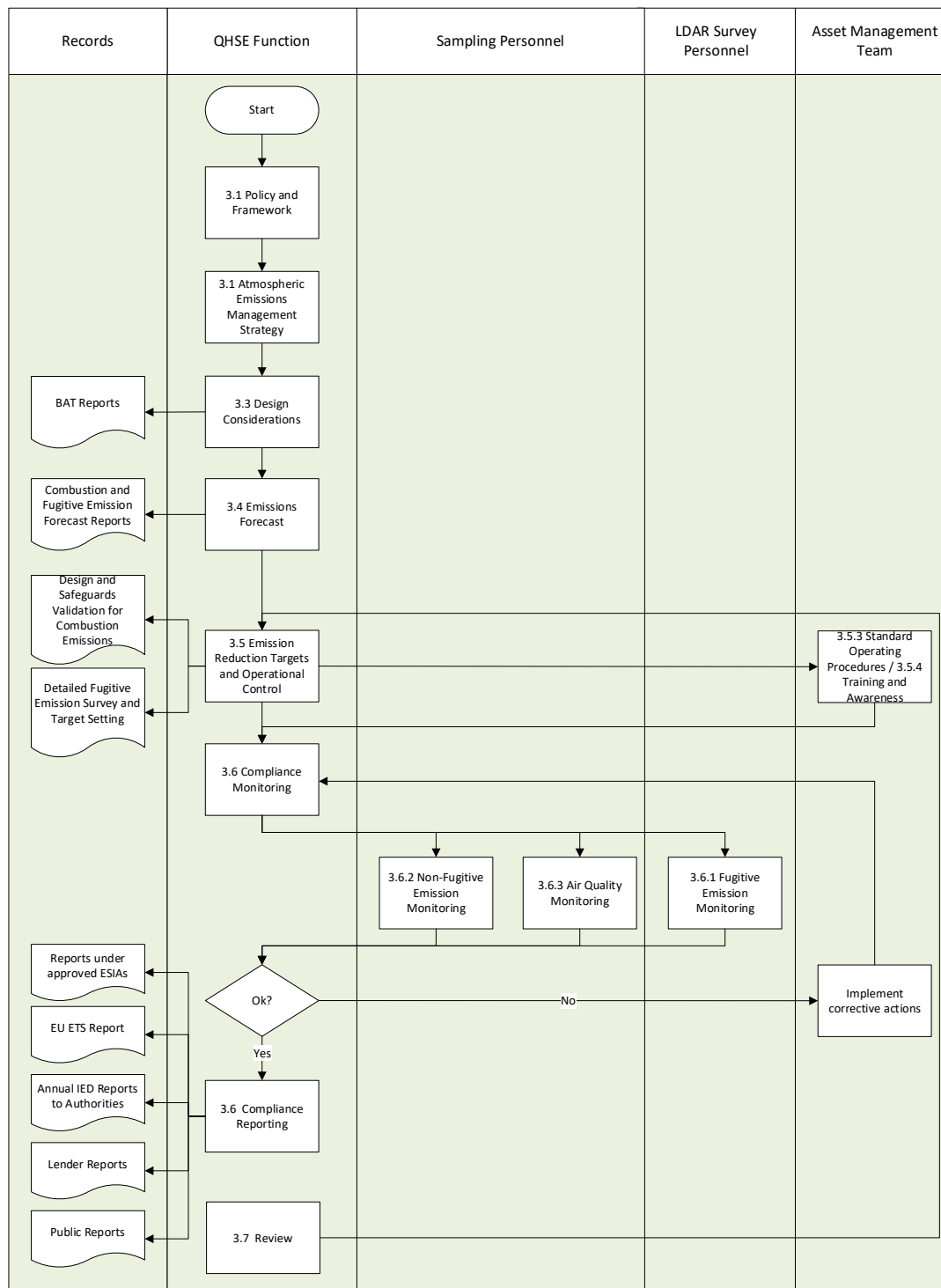


Figure 1 Atmospheric Emissions Management Process

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3.1 Policy and Legal Framework

This section summarises key international requirements and guidance documents, EU and national legislation pertaining to atmospheric emissions that are applicable to TAP operations. Detailed review of applicable international, European and national legislation is provided in TAP Operations Environmental Standards Manual (Ref. 2).

3.1.1 International Requirements and Guidance Documents

UNFCCC

The United Nations Framework Convention on Climate Change (UNFCCC)² is an international environmental treaty which has been in force since 1994. The UNFCCC sets out guiding environmental principles for all member states to help protect the environment and reduce the effects of future climate change by stabilising the concentrations of greenhouse gases in the atmosphere. The UNFCCC is the overarching administrator for the environmental protocols.

The general commitments of parties to the UNFCCC are:

- In accordance with Article 12, all UN parties shall develop, update and publish national inventories of emissions using comparable and approved methodologies
- Implement, publish and regularly update national and, where appropriate, regional climate change mitigation measures
- Promote and cooperate in the development, application and diffusion of technologies, practices and processes that reduce emissions of GHG
- Promote sustainable management
- Prepare plans for adaption to climate change
- Generate social, economic and environmental policies which take climate change into consideration
- Promote and cooperate in research, observation and development of data archives related to climate system
- Promote and exchange relevant environmental scientific information
- Promote education and public awareness of climate changes.

The Paris Agreement

The Paris Agreement³ is a legislation under the UNFCCC bringing member states together to combat global warming. Its mandate is to prevent atmospheric temperature rising above an upper limit of 2 degrees Celsius. To this end, all 186 signatory countries must work towards becoming carbon net-neutral by 2050 (meaning net emission of Carbon Dioxide (CO₂) should be zero). To reach this goal, each participating country was tasked with developing a Nationally Determined Contribution (NDC) plan which outlines a five-year plan of action to cut emissions. New NDCs must be written every 5 years to build upon the emission reduction efforts of the previous period. Regular GHG emissions reporting is a requirement of the Agreement for all participating countries⁴.

² Source: http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf

³ Source: https://unfccc.int/sites/default/files/english_paris_agreement.pdf

⁴ Source: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

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The Kyoto Protocol

The Kyoto protocol⁵ is an international treaty set up in 1997 under the UNFCCC which specifies time periods for developed member states to achieve their GHG emission reduction targets. The first-time period, called the first commitment period covers 2008 – 2012. The second, and current period, known as the Doha Amendment to the Paris Agreement covers the period from 2012 to 2020. Under the Protocol, member states are obligated to report harmful GHG emissions, following reporting rules specified within the Protocol.

IPCC (Intergovernmental Panel on Climate Change)

The Intergovernmental Panel on Climate Change (IPCC) is the international body for assessing the science related to climate change set up in 1988 by the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. Methodology Reports provide practical guidelines for the preparation of greenhouse gas inventories under the UNFCCC.

The 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006 Guidelines)⁶ were produced at the invitation of the UNFCCC to update the Revised 1996 Guidelines and associated good practice guidance which provide internationally agreed methodologies intended for use by countries to estimate greenhouse gas inventories to report to the UNFCCC. In 2019, a Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories was adopted and accepted during the 49th Session of the IPCC in May 2019.

TAP AG applies the IPCC Global Warming Potentials (Climate Change 2007 Synthesis Report)⁷ for calculation of CO₂ (CO₂e) equivalent emissions (see Section 3.4.1).

GHG Protocol

GHG Protocol⁸ produced by the World Resource Institute (WRI) and the World Business Council for Sustainable development (WBCSD), establishes comprehensive global standardized frameworks to measure and manage greenhouse gas (GHG) emissions from private and public sector operations, value chains and mitigation actions. It supplies the world's most widely used greenhouse gas accounting standards.

The GHG Protocol Corporate Accounting and Reporting Standard⁹ provides requirements and guidance for companies and other organizations preparing a corporate-level GHG emissions inventory. To complement the standard and guidance, a number of cross-sector and sector-specific calculation tools are available. These tools provide step-by-step guidance and electronic worksheets to help users calculate GHG emissions from specific sources or industries.

The GHG Protocol Corporate Standard classifies a company's GHG emissions into three 'scopes'. Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

TAP AG sets operational boundary includes mandatory GHG Protocol Scope 1 (direct GHG emissions) and Scope 2 (indirect GHG emissions) from operational facilities (see Section 3.2.1).

⁵ Source: https://unfccc.int/resource/docs/publications/08_unfccc_kp_ref_manual.pdf

⁶ Source: <https://www.ipcc-nggip.iges.or.jp/public/2006gl/>

⁷ Source: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf

⁸ Source: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

⁹ Source: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

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European Standard EN 15446

European Standard EN 15446 provides monitoring standards for fugitive emissions and includes the following:

- Details of monitoring equipment including specification, performance criteria and performance evaluation requirements
- Chemical/calibration gas requirements
- Scope of fugitive emissions surveys and procedures relating to the surveys and subsequent determination of emission rates
- Reporting requirements.

TAP AG will apply ES EN 15466 as the methodology for fugitive emissions monitoring (See Section 3.5.2).

EPA Method 21

The EPA issued Method 21¹⁰ in order to provide an established reference method for determining VOC leaks. The method is applicable for the determination of VOC leaks from process equipment using a portable detecting instrument. Potential sources include, but are not limited to, valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals. The method details specific requirements for the monitoring equipment including the specification, calibration and placement of monitoring probes.

TAP AG will not apply the EPA Method 21 for fugitive emissions monitoring as it pertains to detecting leakage, rather than estimating emission rates.

GIE and MARCOGAZ Report

GIE and MARCOGAZ have published a report “Potential ways the gas industry can contribute to the reduction of methane emissions – Report for the Madrid Forum (5-6 June 2019)” in response to a request from the Directorate General for Energy of the EC, received during the 31st European Gas Regulatory Forum (Madrid Forum) which was held in October 2018.

The report provides an overview of the current status of methane emissions in the EU gas sector and details the actions undertaken by all stages of the gas industry to reduce and better quantify and report emissions. The report addresses the various sources of methane emissions including fugitive emissions. The report discusses the importance of emissions quantification and setting targets to reduce emissions and states that facilities should strive to improve emissions performance. The use of LDAR programmes is promoted in the report as a method to manage emissions.

The philosophy applied to TAP fugitive emissions management in this document (Section 3.5.2) is consistent with the general principles of the report.

3.1.2 European Legislation

EU Emissions Trading Scheme 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 Union (EU ETS Directive) establishes the

¹⁰ EPA Method 21 – Determination of Volatile Organic Compound leaks. Source: https://www.epa.gov/sites/production/files/2017-08/documents/method_21.pdf

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European Union system for greenhouse gas emission allowance trading (EU ETS) in order to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner. Annex I to Directive 2003/87, which lists the categories of activities which fall within the scope of the EU ETS was amended by the Directive 2009/29.

The first phase of the EU ETS ran from 2005 to 2007 and was seen as the pilot phase. The second phase of the EU ETS ran from 2008 to 2012, the same period as the first commitment period under the Kyoto Protocol. The third phase of the EU ETS was shaped by the lessons learnt from the previous two phases with significant efforts taken to improve the harmonisation of the scheme across the EU following a review of the EU ETS, agreed upon in 2008. The third phase runs from 2013 to 2020. This coincides with the Kyoto Protocol second commitment period, as agreed in Doha in December 2012. EU ETS is defined by EU legislation and operates independently of the actions of other countries or the UNFCCC, underlining the commitment of the EU to tackle climate change. The EU ETS does not have an end date and continues beyond phase 3 (from 2021 onwards). The EU ETS legal framework for the fourth trading period as from 2020 has been outlined by the European Commission's Proposal for an amendment to Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments of 15 July 2015¹¹.

The key applicable EU ETS legislation are as follows:

- Directive 2003/87/EC of the European Parliament and Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC
- Directive 2004/101/EC of the European Parliament and Council amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms
- Directive 2009/29/EC of the European Parliament and Council amending Directive 2003/87/EC to improve and extend the greenhouse gas emission allowance trading scheme of the Community
- Commission Regulation 601/2012 (and/or Commission Regulations 2018/2066 and 2019/331 depending on the reference period) on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC.

Installations eligible for inclusion under EU ETS are those with a combustions plant of aggregated thermal input exceeding 20 MWth. The only TAP facility meeting EU ETS criteria is GCS00 in Greece (see Section 3.6.1 and 3.6.4).

EU IPPC (Integrated Pollution Prevention and Control) Directive

The original IPPC directive was adopted as Directive 96/61/EC and was amended four times since it entered in force. The first amendment reinforced public participation in line with the Aarhus Convention. The second amendment clarified the relationship between the permit conditions established in accordance with the IPPC Directive and the EU greenhouse gas emission trading scheme. The last two amendments related to changes regarding Comitology procedures and EPER.

From 2005 to 2007, the effect of the directive was assessed. It was repealed and substituted by 2008/1/EC Directive first, and finally by the Industrial Emissions Directive (2010/75/EU) in 2010.

EU Industrial Emissions Directive (IED)

Directive 2010/75/EU (the Industrial Emissions Directive or IED) is the main EU instrument regulating pollutant emissions from industrial installations. The IED was adopted on 24 November 2010 and is based on recasting 7 previously existing directives (including in particular the IPPC Directive) following an extensive

¹¹ Source: https://ec.europa.eu/clima/news/articles/news_2015071501_en

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review of the policy. The IED entered into force on 6 January 2011 and had to be transposed by Member States by 7 January 2013.

The IED aims to achieve a high level of protection of human health and the environment taken as a whole by reducing harmful industrial emissions across the EU, in particular through better application of Best Available Techniques (BAT). Around 50,000 installations undertaking the industrial activities listed in Annex I of the IED are required to operate in accordance with a permit (granted by the authorities in the Member States). This permit should contain conditions set in accordance with the principles and provisions of the IED.

Combustion equipment within TAP AG operational facilities that fall within the scope of IED are gas turbines at compressor stations GCS00 in Greece and ACS03 in Albania. Although Albania is not currently a member state of the EU, the gas turbines have been designed to meet emission limits of the IED (see Section 3.6.2).

EU Best Available Techniques reference documents (BREFs)

The BREFs are a series of European IPPC Bureau reference documents covering, as far as is practicable, adopted under both the IPPC Directive (2008/1/EC) and the IED. They provide descriptions of a range of industrial processes and for example, their respective operating conditions and emission rates.

TAP AG Best Available Technology assessments (Ref. 13-16) have been carried out at the design phase based on the following BREFs:

- EC IPPC BREF – Large Combustion Plants, July 2006
- EC IPPC BREF – Energy Efficiency, February 2009
- EC IPPC BREF – Mineral Oil and Gas Refinery, February 2003.

EU Medium Combustion Plant Directive

Directive 2015/2193/EU on the limitation of emissions of certain pollutants into the air from medium combustion plants (Medium Combustion Plant Directive or MCPD) regulates pollutant emissions from the combustion of fuels in plants with a rated thermal input equal to or greater than 1 Megawatt thermal (MWth) and less than 50 MWth. It was proposed as part of the Clean Air Policy Package in 2013 and fills the regulatory gap at EU level between large combustion plants (>50 MWth), covered by the Industrial Emissions Directive (IED) and smaller appliances (heaters and boilers <1 MWth) covered by the Eco-design Directive.

Combustion equipment within TAP AG operational facilities falling within the scope of MCPD are gas process boiler at IPR01 in Italy and gas generator at ACS03 in Albania. Although Albania is not currently a member state of the EU, the gas generator has been designed to meet emission limits of the MCPD. All other combustion equipment is exempt from MCPD based on either a) thermal input falling below the specified threshold of ≥ 1 MWth energy input, and/or b) because of the operational time being <500 hrs / year (see Section 3.6.2).

EU Directive on Ambient Air Quality and Cleaner Air for Europe

This Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) specifies ambient air quality limits for a range of parameters for the protection of human health and the environment.

TAP AG applied the thresholds of the Directive along with WHO Air Quality Guidelines for Europe (2000) for setting operational ambient air quality standards (see Section 3.6.3).

3.1.3 National Legislation

TAP AG shall comply with the below key national legislation relating to atmospheric emissions and ambient air quality.



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Greece

- Ministerial Decision 36060/1155/E.103 14 June 2013 (Gov. Gaz. 1450/B) – Implementation of Industrial Emissions Directive 2010/75/EU
- Joint Ministerial Decision 6164 (Government Gazette B / 1107 / 27.03 .2018) on “Limitation of emissions of certain pollutants into the atmosphere from medium-sized combustion plants” implementing MCPD Directive 2015/2193/EU.
- Joint Ministerial Decision No 189533, 9 September 2011 (Gov. Gaz. 2654/B) “Regulation of issues relating to the operation of combustion points for heating buildings and water”
- Joint Ministerial Decision No 181478/965/2017 implementing Directive 2003/87/EC establishing a scheme for GHG emission allowance trading
- Joint Ministerial Decision No 14122/459/E.103 30 March 2011 (Gov. Gaz. 488/B) implementing Directive on Ambient Air Quality and Cleaner Air for Europe Directive 2008/50/EC.

Albania

- Decision of Council of Ministers No. 372/2016 partially approximating Industrial Emissions Directive 2010/75/EU
- Albanian Law No. 10448 14/7/2011 “On environmental permitting”, containing emission limit values for large combustion plants.

Italy

- DLgs 183/2017 the implementing MCPD Directive 2015/2193/EU
- D.lgs 155/2010 “ambient air quality standards” and s.m.i harmonises Italian standards for ambient air quality with Directive on Ambient Air Quality and Cleaner Air for Europe 2008/50/EC
- D.lgs 152/2006 – Environmental Regulations and subsequent amendments.

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3.2 Atmospheric Emissions Management Strategy

TAP AG recognizes that it has a responsibility to manage the environmental impact of its activities and is committed to compliance and demonstration of Good Industry Practice (GIP) as a requirement of lender agreements with international financial institutions. TAP AG emission management strategy is represented in Figure 2.



Figure 2 TAP AG Emission Management Strategy

To support achievement of its goals, TAP AG has developed a series of documents as part of its operations phase QHSE Management System along with technical documentation that provide supplementary details in relations to air quality and emission management. These are represented in Figure 3 and, where necessary, are referenced within Section 2 and discussed in detail in Section 3 of this document.



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Atmospheric Emissions Management Documentation

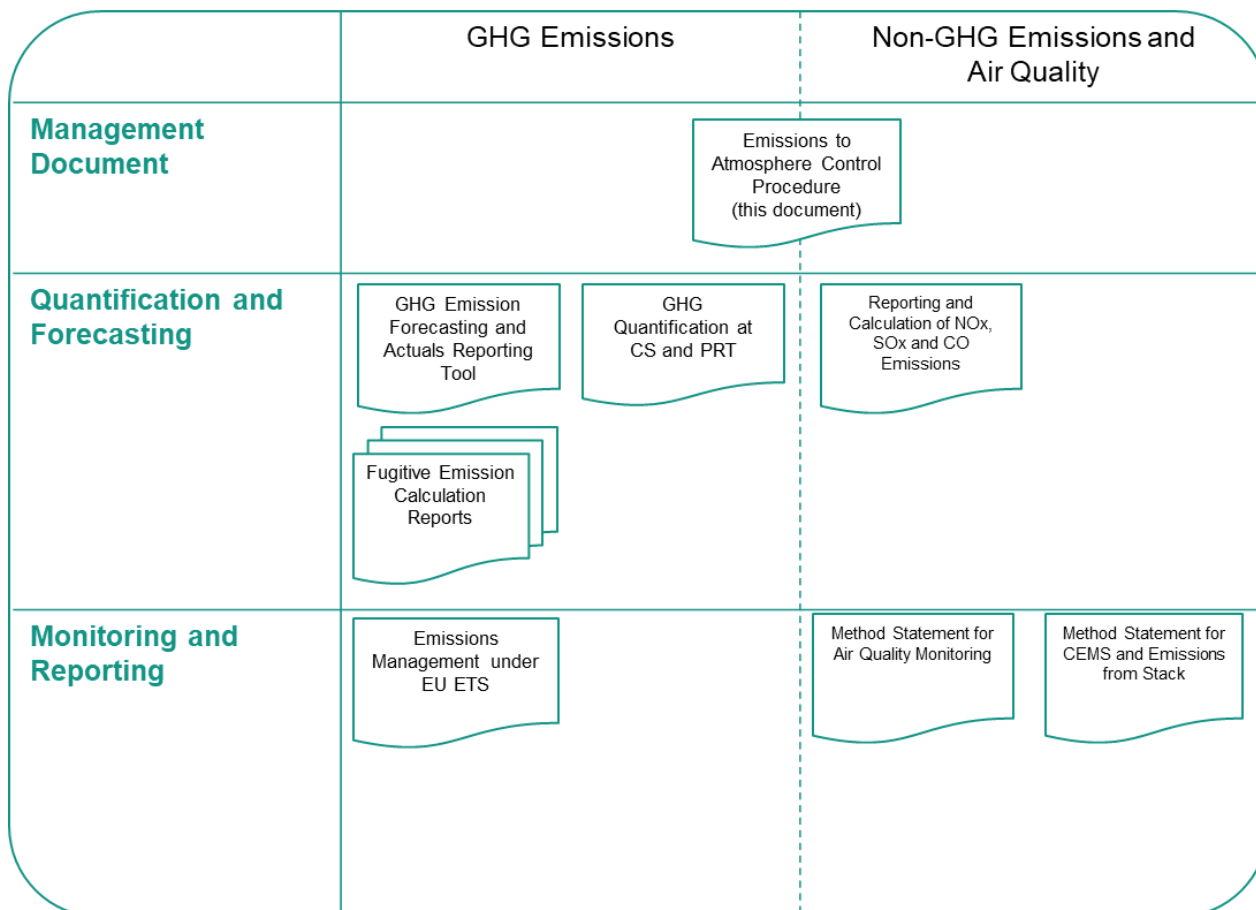


Figure 3 TAP AG Emission Management Documentation

3.2.1 GHG Emissions

Fuels combusted at each facility will consist of natural gas (87 % methane) and diesel. As per the Best Available Technology Assessments (Ref. 13-16) the main GHGs from combustion equipment consist of carbon dioxide (CO₂) and dinitrogen monoxide (N₂O). In addition, each asset holds potential sources of Volatile Organic Compounds (VOC) and methane from fugitive emissions, maintenance/emergency depressurisation and analyser sample vents.

The scope of this procedure includes gas turbines, diesel engines, boilers, fugitive emissions and depressurisation events associated with pipeline activities. Appendix 1 contains the table detailing each of the identified combustion sources located at each site.

Organisational Boundary

The organisational boundary of this procedure is set at the following main TAP AG owned and operated assets:

- GCS00 – Gas compression station located in Kipoi, Greece
- GCS01 – scraper facility in Serres, Greece
- ACS02 – Metering Station in Albania

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- ACS03 – Gas compression station located in Fier, close to Albanian landfall
- IPR01 – Pipeline receiving terminal located in Puglia Italy which also houses a supervisory control centre
- BVs – 32 Block Valves located approximately 30km along the onshore route.

Installations eligible for inclusion under EU ETS are those with a combustion plant of aggregated thermal input exceeding 20 MWth. The only TAP facility meeting EU ETS criteria is GCS00 in Greece.

Operational Boundary

The operational boundary of this procedure includes mandatory GHG Protocol Scope 1 (direct GHG emissions) and Scope 2 (indirect GHG emissions) from operational facilities. Fugitive emissions originating from the operating equipment, not due to combustion of fuels, are also included. Scope 3 other indirect emissions are not mandatory and have been excluded for the present.

Table 2 - GHG Emission sources by IPCC Scope

GHG Protocol Scope	TAP Operations Source	GHG		
		CO2	N2O	CH4
Scope 1	Gas Turbines	√	√	
	Diesel Power Generators	√	√	
	Gas Boilers (HVAC System)	√	√	
	Vehicle fleet	√		
	Analyser Sample Vent		√	
	Fugitive Emissions and depressurisation events			√
Scope 2	Electricity acquired and consumed by TAP AG	√		

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3.3 Design Considerations

To ensure optimum efficiency of each asset, Best Available Technology assessments (Ref. 13-16) have been carried out at the design phase. The conclusions within the reports identified emission saving methods and features which TAP AG has incorporated into the design of the facilities.

Table 3 – Implemented BAT

Pollutant	Implemented BAT
All pollutants	Installation of lean fuel premix combustion hardware and fuel system with the fuel stream Power generators and engines marked as emergency backups only to be used in event of failure of main units.
N ₂ O	Installation of Dry Low Emissions Technology (DLE) on all gas turbines Use of Low NO _x emission type burners on combustion equipment
CO ₂	Use of Energy efficient gas turbines that comply with BREF note for Large Combustion Plants
CH ₄ and VOC	Use of low emission type flanged joints Use of welded connections over flanged connections as much as possible and maintenance procedures to ensure that checks are performed following any changes or adjustments to a connection to avoid misalignment or improper tightening Analyser sample system relocated close to sample point to minimize sample gas usage Use of closed systems for sampling connections Instrument based protective systems installed to eliminate main relief scenarios Primary and secondary dry gas seals for gas turbine compressor seal system Combustion of primary seal gas of compressors in the boiler unit for heat generation Mechanical seals instead of packing for pumps Low emission control valve stem packing has been specified for critical control valves Pressure relief valves e.g. ensure valve set pressure is sufficiently different to the operating pressure so as to avoid the valve “chattering” and releasing emissions. The use of a rupture disk upstream of the relief valve and use of a closed vent system. Open ended lines fitted with blind, cap, plug or second valve.

Validation of design safeguards is discussed further in Section 3.5.

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3.4 Emissions Forecast

3.4.1 GHG Emissions Forecast

Non-fugitive emissions

The full forecasted data is presented in GHG Emissions Quantification at Compressor Stations and Pipeline Receiving Terminal (Ref. 17), summary of which is provided below. The forecasted emissions do not exceed values presented within the Environmental and Social Impact Assessments (Ref. 9-11).

Table 4 presents the forecast emissions for the main combustion and auxiliary diesel equipment and the CO₂ equivalent emission values at each of the host countries. The forecast assumes a throughput flow of 10 billion m³ and includes vent emissions within the CO₂ value.

Table 4 - GHG Emissions (including venting)

Location	Emissions (tonnes / year)			CO ₂ e Emissions (Tonnes)
	CO ₂	N ₂ O	CH ₄	
Albania (ACS03)	171,688	14.4	60.4	177,489
Greece (GCS00)	171,688	14.4	60.4	177,489
Italy (IPR01)	n/a	n/a	n/a	n/a
TOTAL	343,376	28.8	120.8	354,978

IPCC CO₂ equivalent potentials provided in Appendix 2 were used in calculation of CO₂e.

Fugitive Emissions

Calculation reports (Ref. 18-21) have been produced for compressor stations, the metering station and the pipeline receiving terminal to estimate the quantity of fugitive emissions anticipated to arise during operations at each of the facilities. The reports quantify the fugitive emissions of Volatile Organic Compounds (VOC) and Total Organic Compounds (TOC). These suites of compounds are pertinent, given the nature of TAP operational activities (i.e. transportation of gas via pipeline), and can contribute to the formation of ground-level ozone (a secondary air pollutant) and may act as greenhouse gases.

The reports apply several US Environmental Protection Agency (EPA) guidelines including EPA "Average Emission Factor" Approach¹² alongside unit specific data (e.g. number of components, TOC concentration of the process stream, service) to estimate expected fugitive emissions. The emissions factors used are based on historical data for systems with gas, heavy oil, light oil and water services. The EPA "Average Emission Factors" methodology does not allow for incorporation of the effect of mitigation measures that are provided to minimise VOC emissions. As such the results stated in the reports can be regarded as conservative estimates.

¹² EPA-453/R-95-017, "Protocol for Equipment Leak Emission Estimates", US EPA, November 1995

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The reports concluded that the main contributor to the calculated overall fugitive emissions are components in the “Other”¹³ class (mainly instruments and drains). Overall forecasted estimated TOC emissions are found to fall well below the limit for the “LOW”¹⁴ category specified by the Intergovernmental Panel on Climate Change (IPCC)¹⁵. VOC fugitive emissions arising from operation of TAP facilities were estimated to be as follows:

- IPR01: 0.8 kilograms per million Normal cubic metres (kg/ MNm³) of gas processed
- ACS03 / GCS00: 0.9 kg/ MNm³ gas processed
- ACS02: 0.55 kg/ MNm³ gas processed.

The total average estimated VOC release for each of the facilities was compared with the benchmark range specified in the IPPC BREF Best Available Techniques (BAT) document for the Refining of Mineral Oil and Gas¹⁶. For natural gas plants, the benchmark range for fugitive gas release is prescribed as 300 to 350 kg/MNm³ of gas processed. The VOC emissions from all facilities were found to be below this benchmark range (i.e. satisfactory). Table 5 presents the estimated Total Organic Compounds (TOC) and Volatile Organic Carbon (VOC) emission rates broken down by location.

Table 5 - Fugitive Emissions

Location		TOC (t/year)	VOC (t/year)
Albania	ACSO2	13.8	5.48
	ACS03	45.3	8.86
Greece	GCS00	45.6	9.2
Italy	IPR01	29.7	8.4
Total		134.4	31.94

A separate fugitive emissions estimate is currently being developed using a similar approach to that applied for the above-mentioned Fugitive Emissions Calculation Reports (Ref. 18-21). Emissions are calculated for specific component types (Section 3.5.2) that are potential sources of fugitive emissions.

An LDAR Baseline Component Inventory has been populated using the structure presented in Appendix 3. This was achieved by reviewing the facilities piping and instrumentation diagrams (P&IDs) and listing each of the relevant components that are in gas or light liquid service. Once populated a component count was performed for each component type. A United Kingdom Offshore Operators Association Limited (UKOOA) emissions factor was then identified for each equipment type specific to gas or light liquid. The UKOOA factor has been selected to provide a conservative estimate. The emissions factor, the TOC of the stream and the number of components is then used to provide an estimate of fugitive emissions.

The calculation will provide an estimate of the VOC and TOC for each component type, which can then be used to compare the LDAR baseline emission data.

¹³ The “Other” equipment type was derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished roads, relief valves and vents. This “Other” equipment type is applied for any equipment type other than connectors, flanges, open-ended lines, pumps or valves.

¹⁴ Compressor station LOW category is 6000 m³//MW/yr (installed compressor power), meter and regulations stations LOW category is 1000 m³/ station / yr

¹⁵ Intergovernmental Panel on Climate Change, IPCC, Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2000

¹⁶ EC IPPC BREF – Best Available Techniques (BAT) Reference Document for the Refining of Mineral Oil and Gas, February 2015

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3.5 Emission Reduction Targets and Operational Control

TAP AG emissions management objectives and targets shall follow the methodology outlined in Figure 4, i.e. by adopting a top-down and bottom-up approach. At the highest level, TAP AG reporting shall capture the data required to establish objectives for the TAP AG organisation.



Figure 4 Hierarchy of company environmental objectives and targets

At the lowest level, specific operational objectives and targets shall be developed to ensure each of the TAP facilities is aligned to the TAP AG corporate objectives.

Objectives and targets established at all levels shall:

- Be clear and purposely focused on attributes of the organisation so that they can be adapted to reduce environmental impact
- Represent an agreed, quantifiable and time bound goal within TAP AG's ability to achieve
- Include identification of the resources required to achieve goal represented.

3.5.1 Non-Fugitive Emissions

Current TAP AG targets are:

- Alignment of the current energy management systems and incumbent policies and processes with requirements of ISO 50001 – within 12 months from COD
- Establishment of emission reduction and energy saving targets for the upcoming periods – within 12 months of COD: TAP AG shall set CO_{2e} emission reduction targets once an operational baseline has been established after 12 months of operation. As per EU ETS guidelines, the start point for the baseline data shall be taken as the first day of continuous 90-day period where activity level has been identified as reaching 40% of original equipment manufacturer (OEM) design capacity.

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Year 1: Validation of Design / Construction Safeguards

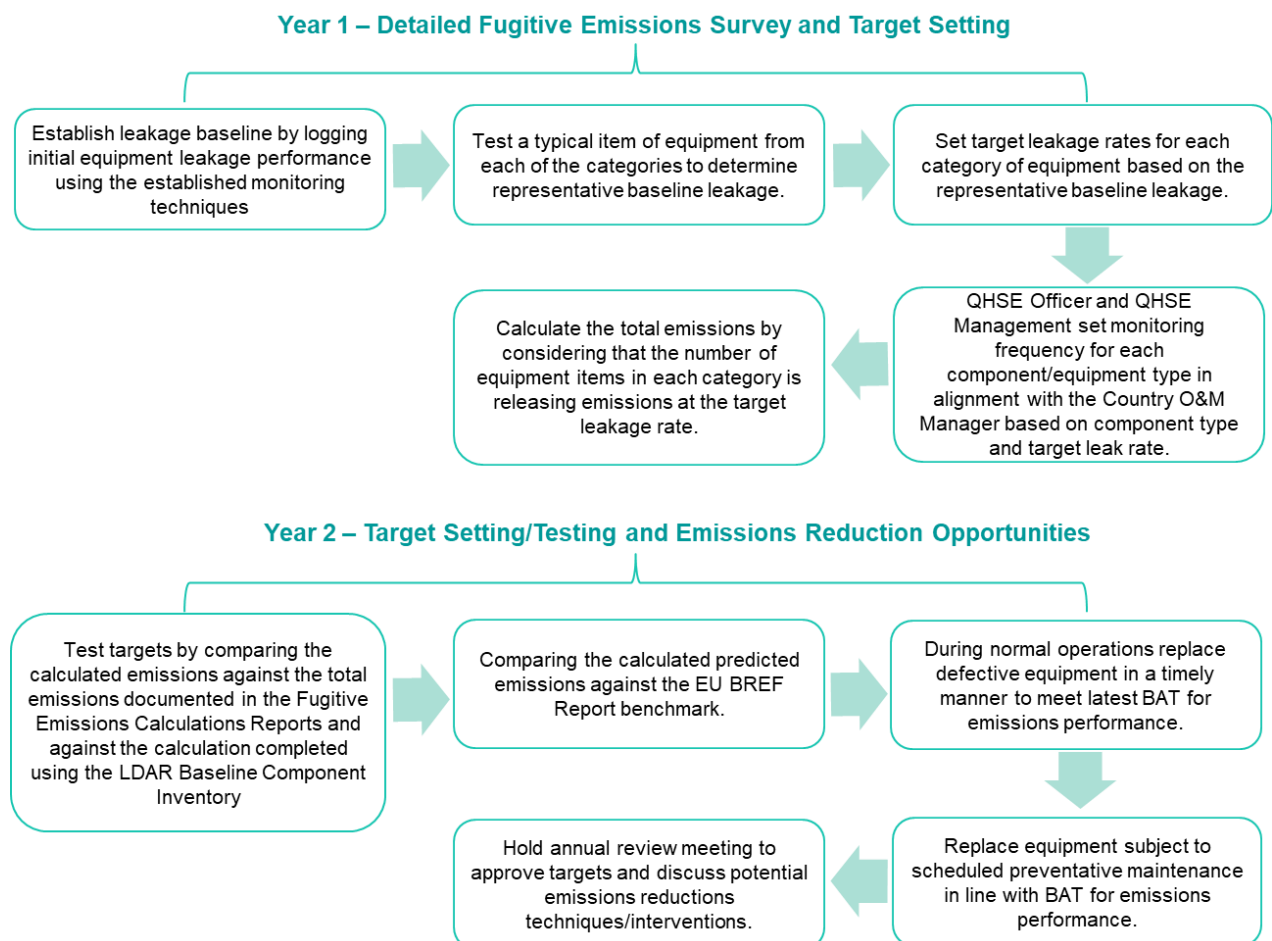
For Year 1 (within 12 months from the start of COD), TAP AG shall perform a validation survey of each facility to ensure proposed BAT abatement technology functions as specified. This shall be completed using field surveys of above ground assets to verify the safeguards are in place and operating correctly.

Year 2: Target Setting and Emissions Reductions Opportunities Implementation

Following the implementation of this procedure and setting of targets for the start of Year 2, the QHSE department shall develop an action plan to review both the progress of goals and suitability of the plan and targets to the current operational and policy situations. Feedback from internal and external audit reports shall be integrated into the QHSE Activity Plan to ensure all aspects of the atmospheric emissions management are under continual improvement.

3.5.2 Fugitive Emissions

Currently fugitive emissions management focuses on the initial 3 years of operation as outlined in Figure 5.



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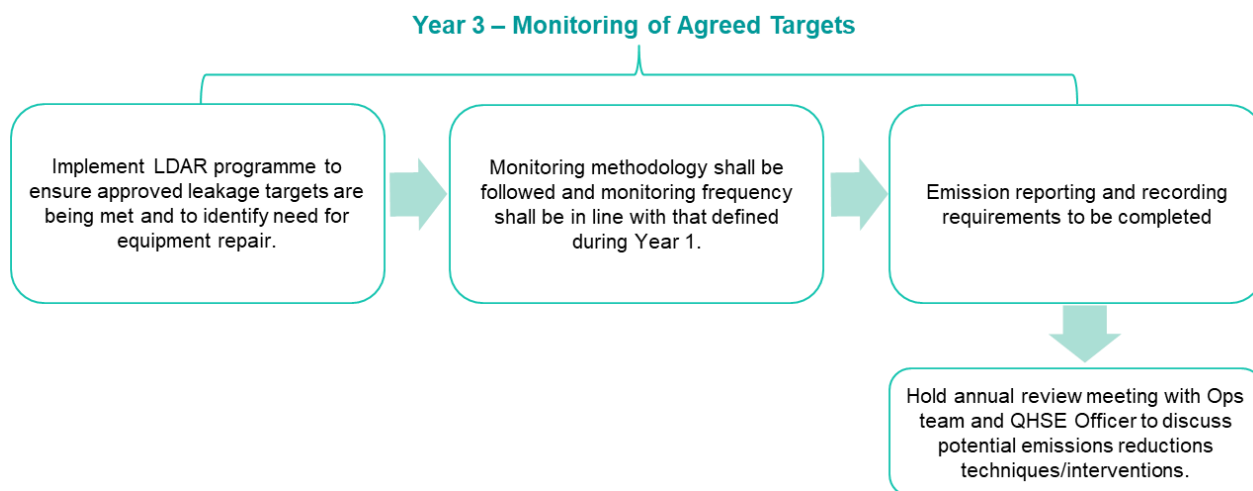


Figure 5: Fugitive Emissions Management for the Initial 3 Years of Operations

Year 1: Detailed Fugitive Emissions Survey and Target Setting

Initial year of operations (Year 1) monitoring and reporting shall comprise of detailed field survey of each facility to establish a leakage baseline by testing and logging initial equipment performance results.

In order to set targets initial equipment leakage performance shall be logged to establish a baseline against which future performance can be measured and compared. The leakage rates shall be measured using the monitoring methodology defined further in this section.

A typical item of equipment for each of the following categories that are part of gas or light liquid services shall be tested to provide a representative baseline leakage rate:

- Pump
- Atmospheric relief valve
- Connection
- Flange
- Valve
- Control valve
- Open ended line
- Sample point
- Meter
- Storage tank
- Compressor
- Vent.

By the end of Year 1 TAP AG shall target leakage rates for each category of equipment based on the representative baseline leakage. Monitoring frequency for each component / equipment type shall be set in Year 1.

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The total emissions shall be calculated, in order to do this the number of equipment items in each category shall be considered to release emissions at the target leakage rate.

Year 2 - Target Testing and Emissions Reductions Opportunities

In Year 2 targets set at the end of Year 1 shall be tested by comparing the calculated emissions with total emissions predicted in the Fugitive Emissions Calculations Reports (Ref. 18-21) and the calculation completed using the LDAR Baseline Component Inventory. The overall estimates of emissions shall also be compared to the benchmark range provided in the EU BREF Report¹⁷.

During normal operation of TAP facilities, processes and equipment shall be operated and maintained in accordance with TAP AG Annual Maintenance Plan. This would typically reduce the likelihood and severity of unplanned releases potentially arising from process conditions occurring beyond the optimal range, and by reducing the risk of component / equipment failure or wear beyond acceptable tolerance.

Where any defective equipment is identified, it shall be repaired or replaced in a timely manner. Any replacement equipment shall meet the latest BAT for emissions performance.

Similarly, any equipment replaced as part of a scheduled preventative maintenance campaign shall meet the latest BAT for emissions performance.

In Year 2 TAP AG shall identify opportunities to further minimise fugitive emissions by holding an annual review meeting with appropriate personnel. The meeting shall provide a forum for potential emission reductions techniques / interventions to be discussed.

Year 3 – Monitoring of Agreed Targets

From the start of Year 3 a monitoring program shall be developed to ensure that the targets are being met and to identify any areas of non-compliance which would indicate that equipment repair may be required. This shall be achieved by the implementation of a LDAR programme designed to identify leaking equipment so appropriate maintenance activities can be implemented.

Monitoring Methodology

Monitoring shall be performed in accordance with the methodology presented in European Standard 15446.

Emissions concentrations shall be measured with a portable instrument, which are converted to a mass emission rate by use of a set of correlations. The monitoring device shall meet the following specifications:

- VOC instrument detector shall respond to the compounds being screened. Detector types that may meet this requirement include, but are not limited to, catalytic oxidation, flame ionisation, infrared absorption, and photo ionisation
- Maximum admissible lower detection limit of the detector provided by the manufacturer shall be 10 ppm
- Scale resolution of the instrument meter shall be $\pm 5\%$ of the threshold concentration
- Instrument shall be equipped with a pump so that a continuous sample is provided to the detector
- The nominal sample flow rate shall be 0.2 l/min to 1.2 l/min
- Instrument shall be intrinsically safe for operation in explosive atmospheres

¹⁷ EC IPPC BREF – Best Available Techniques (BAT) Reference Document for the Refining of Mineral Oil and Gas, February 2015



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- Instrument shall be equipped with a probe or probe extension for sampling with a maximum outside diameter of 6.4 mm, with a single end opening for admission of the sample
- Instruments used for quantification of fugitive emissions shall have a minimum measurement range up to 50000 ppm.

The instruments used shall meet the performance criteria, performance evaluation requirements and calibration requirements defined in European Standard 15446.

European Standard 15446 details the monitoring procedures that shall be followed including preparation and checking of the equipment. The main screening steps are detailed below:

- Place the probe inlet at the surface of the point of equipment where leakage could occur
- Move the probe along the interface periphery while observing the instrument readout
- If an increased meter reading is observed, slowly sample the interface where leakage is indicated until the maximum meter reading is obtained
- Leave the probe inlet at this maximum reading location for approximately twice the instrument's response time, record the results as screening value (ppm)
- Care should be taken to minimise the effect of the wind when the wind speed exceeds 0.5 m/sec, particularly when working in elevation
- Examples of the application of this general technique to specific equipment types are provided in the Standard for valve stems and stuffing box, flanges and other connection (including valve bonnet, valve flanges and body flanges of equipment), pump or compressor seal, pressure relief device (PRD), drains, open-ended lines or valves and access door seals.

The mass emission rate from the equipment shall then be determined using the methodology and correlations provided in European Standard 15446, which are based on US EPA references. The total mass emission over a reporting period is taken as the average between the total emission rate at the beginning of the reporting period and the total emission rate at the end of the reporting period, multiplied by the duration of the reporting period.

In Italy calculation of fugitive emissions shall be carried out in accordance with Monitoring of Fugitive Emissions of Natural Gas in The PRT – Methodology (Ref. 22) developed in line with approved Environmental Monitoring Project Italy (Ref. 23).

Survey Tagging

During LDAR monitoring surveys, it is advisable that components found to be leaking are identified using coloured tags. These tags can assist maintenance teams responsible for conducting repairs with the easy identification of the leaking components. These tags are not considered permanent and would not replace the main LDAR component identification tags.

The survey tags should include information on the specifics of the leak location (e.g. valve – flange in / flange out / stem / bonnet etc.), the date that the leak was found, and the measured leak rate (in ppm).

Repair Programme

The LDAR programme aims to reduce fugitive emissions through the identification of leaking equipment and subsequent repairs. The following considerations shall be made in respect of repairing leaking components within the context of this procedure:



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- First attempts at repair may include, but are not limited to, the following practices where practicable and appropriate:
 - Tightening bonnet bolts
 - Replacing bonnet bolts
 - Tightening packing gland nuts
 - Injecting lubricant into lubricated packing
- Should repair of any component not be technically feasible without a significant process shutdown, the affected component shall be placed on a Delay of Repair list. This shall include a record of the component ID and/or tag number, an explanation of the delay to repairs and a date which the repairs are expected to take effect.
- Including components in the Delay of Repair list should be avoided (all available repair alternatives should have been exhausted)
- A component shall only be considered to have been repaired once monitoring has been undertaken to confirm that any leakage is below the applicable defined target leakage rate. In addition to the immediate post-repair monitoring, valves and connectors in VOC service should additionally be re-monitored within 3 months of the repair.

3.5.3 Standard Operating Procedures

For accurate, clear and traceable monitoring and calculation, TAP AG has invested in developing standard procedures which incorporate internationally accepted methodologies and processes. These procedures cover the areas of:

- Maintenance
- Monitoring
- Reporting
- Pollution prevention
- Calculation
- Corrective actions and
- QHSE Training.

TAP AG shall continue to review and update current policies and develop new ones as required to fulfil reporting requirements.

3.5.4 Training and Awareness

TAP will ensure that all employees, with direct involvement and responsibility for activities relevant to TAP operations are adequately qualified and trained so that they have the knowledge and skills necessary to perform their work.

Different types and levels of training are delivered, covering general training for awareness regarding emissions minimisation and task-specific training for those employees undertaking the monitoring.

Appropriate training will be provided for all personnel that have the responsibility for conducting the monitoring work. This training will include any health and safety risks and information about the personal protective equipment (PPE) required. Specific training related the use of monitoring equipment will also be provided.

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3.6 Compliance Monitoring and Reporting

3.6.1 Monitoring of GHG Emissions

Tables 6 and 7 summarise TAP AG's monitoring and reporting requirements for GHG emissions for each IPCC scope.

Calculation of GHGs of carbon dioxide equivalent emissions (CO₂e) shall be carried out in accordance with Appendix 1 of the Greenhouse Gas (GHG) Emissions Forecasting and Actuals Reporting Tool (Ref 24). The scope of the forecasting tool includes:

- Calculation of diesel emissions sources
- Calculation of natural gas emissions sources
- Calculation of static/facility venting emissions
- Calculation of fugitive emissions from facilities
- Calculation of pipeline venting emissions
- Calculation of fugitive emissions from the pipeline
- Calculation of vehicle fleet emissions.

The GHG Emission Forecasting and Actuals Reporting Tool (Ref. 24) follows standard methodology approach from the fuel gas composition. Emissions from diesel combustion shall be calculated using internationally accepted IPCC emission factors.

Fugitive Emissions Monitoring

Monitoring intervals for fugitive emissions may vary according to applicable regulation and typically depend on the component type and periodic leak rate determined for that component type based on the year 1 baseline measurement. The frequency of monitoring shall be defined in Year 1 by the QHSE Officer and QHSE Management in alignment with the Operations and Maintenance Country Manager.

European Standard 15446 also sets the following emission report requirements which shall be applied to TAP along with any other applicable requirements:

- Scope of the report (facility, type and size of equipment measured, streams, purpose, reporting period)
- Results expressed in mass per year (indicating how this mass is specified: as reference compound equivalent, carbon equivalent, actual composition of emission etc.)
- Characteristics of instrument used
- Response factors that have been used
- Value of the threshold concentration
- Correlation details, including maximum ppm used in correlations
- Number of components measured during the reporting period and in previous reporting period
- Number of components never measured
- Handling of equipment not measured
- Grouping of equipment in case average leak rates are derived from plant data.

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Table 6 – Scope 1 GHG Emissions Compliance Monitoring and Reporting

Asset	Emission Source	Parameters to be monitored	Monitoring Methodology / Tool	Reporting of Results
GCS00	Gas Turbines	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	EU ETS Report Annual report to authorities required by the approved ESIA (Ref. 9)
	Diesel Power Generators	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	EU ETS Report Annual report to authorities required by the approved ESIA (Ref. 9)
	Building Hot Water Gas Boilers	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	EU ETS Report Annual report to authorities required by the approved ESIA (Ref. 9)
	Vehicle Fleet	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	EU ETS Report Annual report to authorities required by the approved ESIA (Ref. 9)
	Fugitive Emissions and depressurisation events including BVS	CH ₄	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	EU ETS Report Annual report to authorities required by the approved ESIA (Ref. 9)
ACS02	Diesel Power Generators	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)
	Vehicle Fleet	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)
	Fugitive Emissions and depressurisation events including BVS	CH ₄	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)
ACS03	Gas Turbines	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)

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Asset	Emission Source	Parameters to be monitored	Monitoring Methodology / Tool	Reporting of Results
	Diesel Power Generators	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)
	Gas Generator	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)
	Building Hot Water Gas Boilers	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)
	Vehicle Fleet	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)
	Fugitive Emissions and depressurisation events including BVS	CH ₄	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Quarterly report to authorities required by the approved ESIA (Ref. 10)
IPR01	Diesel Power Generators	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Report to authorities as required by approved Environmental Monitoring Project (Ref. 23)
	Building Hot Water Gas Boilers	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Report to authorities as required by approved Environmental Monitoring Project (Ref. 23)
	Process Hot Water Boiler	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Report to authorities as required by approved Environmental Monitoring Project (Ref. 23)
	Vehicle Fleet	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Report to authorities as required by approved Environmental Monitoring Project (Ref. 23)
	Fugitive Emissions and depressurisation events including BVS	CH ₄	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	Report to authorities as required by approved Environmental Monitoring Project (Ref. 23)

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Table 7 – Scope 2 GHG Emissions Compliance Monitoring and Reporting

Asset	Emission Source	Parameters to be monitored	Monitoring Methodology / Tool	Reporting of Results
All Facilities	Electricity acquired and consumed by TAP AG	CO ₂ , N ₂ O	GHG Emission Forecasting and Actuals Reporting (Tool) (Ref. 24)	EU ETS Report (for GCS00) Report to authorities on results of environmental monitoring as required under approved ESIA's (Ref. 9 and 4410) and approved Environmental Monitoring Project (Ref. 23)

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3.6.2 Monitoring of Non-GHG Emissions

Tables 8 summarises TAP AG's monitoring and reporting requirements for non-GHG emissions.

Monitoring requirements for combustion emissions are detailed within Method Statement CEMS System Reading and Emissions from Stack (Ref. 25).

CEMS Systems

A continuous emissions monitoring system (CEMS) is provided for the gas turbines (GT) in both ACS03 and GCS00. The CEMS unit withdraws a sample of gases from the GT exhaust and measures the concentration of carbon monoxide (CO), oxides of nitrogen (NO_x) and oxygen (O₂). Each GT unit has a dedicated CEMS analyser cabinet, and the measured gas concentration data from each are sent to a common site server cabinet (one for ACS03 and one for GCS00).

Manual Sampling of Emissions from Stacks

Sampling ports are provided on the ACS03 and GCS00 gas turbine stacks and the ACS03 gas generator stack. The locations for manual sampling shall be sufficiently representative of the emissions within the stack. Permanent platforms are provided at these locations to facilitate access for undertaking periodic manual sampling.

The GTs for both ACS03 and GCS00 have been designed to comply with the Industrial Emissions Directive (IED) (2010/75/EU), which applies to natural gas turbines with a thermal input of >50MWth¹⁸. The required emission limits are show in Tables 2 and 3 of the Method Statement CEMS System Reading and Emissions from Stack (Ref. 25). The applicable emission limits are provided in Table 2 of the Method Statement (Ref. 25).

In line with the BAT considerations (Ref. 13-16), periodic measurements shall be performed at least annually, unless otherwise dictated by a permit. For Italy bi-annual sampling of the process boiler is required.

Calculation of NO_x, SO_x and CO

Calculation of all NO_x, SO_x, and CO emissions from the TAP AG facilities is detailed within the Reporting and Calculation of NO_x, SO_x and CO Emissions Procedure (Ref. 26) which is applicable to all NO_x, SO_x, and CO emissions from the TAP AG facilities in Greece, Albania and Italy. Appendix 1 of the procedure (Ref. 26) aims to provide a user-friendly tool to enable the calculation and presentation of results for NO_x, SO_x, and CO emissions from data input in terms of quantities of fuel or volumes of gas used.

It covers two types of air pollution sources - process and utility:

- Process - the combustion equipment (natural gas or diesel) that are directly needed for TAP's production process or the emergency equipment (fire system and emergency generators)
- Utility - the auxiliary combustion equipment that does not belong directly to the production process or belongs to auxiliary processes. These are the building heating boilers and TAP AG vehicle fleet powered by diesel.

¹⁸ It shall be noted that each individual GT is <50MWth, however there is an aggregation rule, thus the total input for all GTs in each facility is >50MWth.

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Table 8 – Non-GHG Emissions Compliance Monitoring and Reporting

Asset	Emission Source	Limits	Limit Source	Monitoring Methodology / Tool	Reporting of Results
GCS00	Gas Turbines	CO = 100mg/Nm ³ @15% O ₂ NO _x = 50mg/Nm ³ @15% O ₂	Industrial Emissions Directive (IED) (2010/75/EU), which applies to natural gas turbines with a thermal input of >50MWth ¹⁹	Continuous Sampling via CEMS Annual manual stack sampling	CEMS and Emission from Stacks Reports to authorities required under IED Annual report to authorities required by the approved ESIA (Ref. 4)
	Diesel Power Generators	N/A	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input	Exempt from MCPD as thermal input falls below the specified threshold of ≥ 1MWth energy input, and/or because the operational time is <500 hrs per year. Monitoring is therefore not required.	
	Building Hot Water Gas Boilers	N/A	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input.	Exempt from MCPD as thermal input falls below the specified threshold of ≥ 1MWth energy input. Due to the small capacity of the boiler and existence of individual stacks the aggregate clause of the MCPD is not considered applicable. Monitoring is not required. However, emission concentrations comply with MCPD limits.	
ACS02	Diesel Power Generators	N/A	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input with run time >500 hrs per year	Exempt from MCPD as thermal input falls below the specified threshold of ≥ 1MWth energy input, and/or because the operational time is <500 hrs per year. Monitoring is therefore not required.	

¹⁹ It shall be noted that each individual GT is <50MWth, however there is an aggregation rule, thus the total input for all GTs in each facility is >50MWth.

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Asset	Emission Source	Limits	Limit Source	Monitoring Methodology / Tool	Reporting of Results
ACS03	Gas Turbines	CO = 100mg/Nm ³ @15% O ₂ NO _x = 50mg/Nm ³ @15% O ₂	Industrial Emissions Directive (IED) (2010/75/EU), which applies to natural gas turbines with a thermal input of >50MWth ²⁰	Continuous Sampling via CEMS Annual manual stack sampling	CEMS and Emission from Stacks Reports to authorities required under IED Annual report to authorities required by the approved ESIA (Ref. 5)
	Diesel Power Generators	N/A	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input with run time >500 hrs per year	Exempt from MCPD as thermal input falls below the specified threshold of ≥ 1MWth energy input, and/or because the operational time is <500 hrs per year. Monitoring is therefore not required.	
	Gas Generator	NO _x = 95mg/Nm ³ @15% O ₂	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input.	Annual manual stack sampling	Annual report to authorities required by the approved ESIA (Ref. 5)
	Building Hot Water Gas Boilers	N/A	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input.	Exempt from MCPD as thermal input falls below the specified threshold of ≥ 1MWth energy input. Due to the small capacity of the boiler and existence of individual stacks the aggregate clause of the MCPD is not considered applicable. Monitoring is not required. However, emission concentrations comply with MCPD limits.	
IPR01	Diesel Power Generators	N/A	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input.	Exempt from MCPD as thermal input falls below the specified threshold of ≥ 1MWth energy input, and/or because the operational time is <500 hrs per year. Monitoring is therefore not required.	
	Building Hot Water Gas Boilers	N/A	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input.	Exempt from MCPD as thermal input falls below the specified threshold of ≥ 1MWth energy input, and/or because the operational time is <500 hrs per year. Monitoring is therefore not required.	

²⁰ It shall be noted that each individual GT is <50MWth, however there is an aggregation rule, thus the total input for all GTs in each facility is >50MWth.

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Asset	Emission Source	Limits	Limit Source	Monitoring Methodology / Tool	Reporting of Results
	Process Hot Water Boiler	NOx = 100mg/Nm ³ @3% O ₂	MCPD (Directive (EU) 2015/2193) limits apply for equipment with 1 – 50 MWth input.	Bi-annual manual stack sampling. The boiler is rated >1 megawatts thermal (MWth) input but because the operational time is <500 hrs per year, the MCPD limits do not apply. However, since bi-annual reporting is required under Environmental Monitoring Project Italy, monitoring is required and a monitoring port is provided on each of the Process Hot Water boilers and emission concentrations shall comply with MCPD and DLgs 183/2017 (the implementing decree of MCPD Directive)	Report to authorities as required by approved Environmental Monitoring Project (Ref. 19)

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3.6.3 Air Quality Monitoring

The purpose of the ambient air quality monitoring assessment is to ensure that TAP operations are compliant with ambient air quality standards detailed within TAP Operations Environmental Standards (Ref. 2). The monitoring shall be used to determine if any mitigation measures are required to be implemented to minimise any increase in air pollution encountered at key receptor locations.

For the purposes of ambient air quality monitoring in Greece and Albania only parameters NO₂, NO_x, SO₂ and CO shall be monitored in line with commitments stipulated in respective ESIA's (Ref 9-10). In Italy taking into consideration commitments within Italy Environmental Monitoring Project (Ref. 23) all the parameters in Table 3-23 of the TAP Environmental Operations Standards (Ref. 2) are applicable except benzene.

Monitoring shall be carried out using static passive diffusion tubes following the sampling methodology outlined in Section 2 of the Method Statement Air Quality Monitoring (Ref. 27). The method statement details sampling methodologies, sampling locations and provides overview of the baseline air quality monitoring prior to start of operations.

For Greece and Albania air quality monitoring shall be undertaken quarterly during the first two years of operation, potentially reducing in frequency to once every two/three years thereafter if the monitoring results confirm the absence of material changes to air quality that can be attributed to TAP operations. During each monitoring period, long-term (passive diffusion) monitoring shall be undertaken for 1 month. Measurements of CO shall be undertaken during both the deployment and collection of the passive diffusion monitoring devices. Where any significant modifications/additions are made to emission sources (e.g. additional combustion equipment associated with a ramp-up in capacity), then monitoring shall be undertaken for two successive years before the frequency is reviewed. A qualitative evaluation of prevailing meteorological conditions shall be recorded along with any other sources of localised increase in pollution levels.

In Italy air quality monitoring shall be undertaken in accordance with Environmental Monitoring Project Italy (Ref. 23):

- Continuous monitoring, during all the PRT operation phase, at receptor AQ9
- Continuous monitoring for 1 month, to be repeated once every 4 months (once per season) at receptors AQ5 and AQ6 (passive monitoring).

Where any significant modifications/additions are made to emission sources (e.g. additional combustion equipment associated with a ramp-up in capacity), then monitoring shall be undertaken for two successive years before the frequency is reviewed.

Following each survey, the Air Quality Monitoring Record Sheet provided in Appendix 1 of Method Statement Air Quality Monitoring (Ref. 27) shall be scanned and emailed to TAP QHSE Department along with the scanned calibration/certification records (as applicable).

Any exceedance of an air quality threshold shall be initially considered a potential incident and shall be investigated to confirm TAP's contribution during the monitoring period, ambient atmospheric conditions and third-party sources and contributions to the air shed. If its determined that TAP was the primary contributor and cause for the threshold exceedance, a full investigation shall be completed.

3.6.4 Reporting

Atmospheric emissions management compliance indicators shall be reported in accordance with Appendix 1 of the ESMM (Ref. 1).

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Regulatory reporting

In Greece GHG and non-GHG emissions and results of air quality monitoring shall be reported as part of the annual report in accordance with TAP Greece ESIA Approval Decision No 174848.

In Albania GHG and non-GHG emissions and results of air quality monitoring shall be reported as part of the quarterly report in accordance with TAP Albania ESIA Approval Decision No 3.

In Italy GHG and non-GHG emissions and results of air quality monitoring shall be reported at frequencies agreed with the competent authorities in the format as per Technical specifications for preparing and sending documentation in digital format for the SEA and EIA procedures in accordance with Italian Legislative Decree no. 152/2006.

EU ETS Reporting

Reporting of direct carbon dioxide (CO₂) equivalent emissions from the combustion of fossil fuels in TAP AG facilities, which are under the scope of the EU ETS is detailed within Emissions Management Under European Union Emissions Trading System procedure (Ref. 12) which details requirements for:

- Monitoring and Notification
 - Application of GHG Emission Permit for new facilities adhere to the EU ETS
 - Monitoring Plans
 - Termination of GHG Emission Permit for new facilities adhered to the EU ETS
 - Methodology for calculating emissions
 - Outsourced controls
 - Communication of provisional / final emissions
 - Management of irregularities / recommendations for improvement and inaccuracies
 - Delivery of Carbon Credits from holding accounts
- Free Allocation
 - Changes in the assignment.

Installations eligible for inclusion under EU ETS are those with a combustions plant of aggregated thermal input exceeding 20 MWth. The only TAP facility meeting EU ETS criteria is GCS00 in Greece. For Greece, TAP AG shall continue to fulfil reporting requirements to the EU ETS which operates on an annual compliance cycle. The main event dates within EU ETS are presented in Figure 6.

TAP AG is required to submit annual emissions data to the European Environmental Agency for inclusion in the European Pollutant Release and Transfer Register (E-PRTR).

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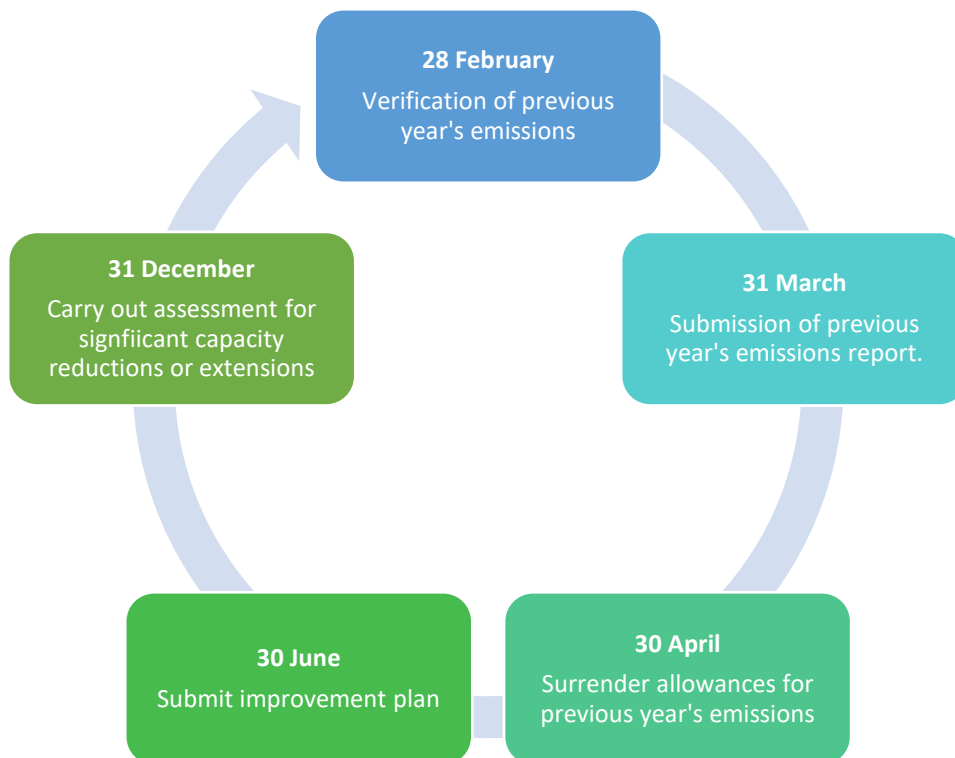


Figure 6: EU ETS Yearly Cycle

EU IED Reporting

Annual reports on emissions from the combustion sources are required by the Industrial Emissions Directive (IED) for large and medium combustion plants.

CEMS Systems Reading shall be completed in line with site specific permit requirements and compliant with IED conditions and to meet annual lenders reporting requirements. As per IFC guidelines²¹ compliance with limits is required for 95% of the time calculated as a portion of operating hours. The CEMS Report provided in Appendix 1 of the Method Statement CEMS Systems Reading and Emissions from Stack (Ref. 25) shall be scanned and emailed to the competent authority.

Reporting of result of manual sampling from stacks shall be consistent with permit requirements. However According to EN 15259:2007, an emission measurement report includes at least the following information:

- General information (e.g. operator's name, the address of the installation, the name and the address of the testing laboratory)
- Specification of the measurement objective(s)
- Description of the installation and materials handled
- Identification of the measurement site and section
- Identification of the measurement methods and apparatus according to individual standards for the measured pollutants and reference quantities (i.e. temperature, pressure, O₂ level and water vapour content)

²¹ Section 2.1 of the International Finance Corporation Environment, Health and Safety Guidelines for Thermal Power Plants

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- Operating conditions of the production process during the measurement
- Identification of deviations from the measurement plan
- Reference to how to access and use the original data for verification purposes
- Measurement results and other relevant data necessary for the interpretation of the results, including the sampling date (hour, day, month and year) and measurement uncertainties
- Calculation procedures, such as the conversion of data to specific standard conditions
- Presentation of the results.

Following each sampling of emissions from stack, the Emission Stacks Sampling Record Sheet provided in Appendix 2 of the Method Statement CEMS System Reading and Emissions from Stack (Ref. 25) shall be scanned and emailed to the competent authority.

Reporting to Lenders

TAP AG emission monitoring results shall be reported to Lenders as part of the annual Self-Monitoring Reports required under TAP Finance Documents, including quantification of Scope 1 and 2 GHG emissions and results of air quality monitoring.

External Reporting via TAP AG website

TAP AG shall also produce an annual public report on GHG Emissions (Scope 1 and 2) and publish it on TAP AG website.

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3.7 Review

3.7.1 Annual Updates

This procedure shall remain as a 'live' document, and its update on an annual basis is envisaged to stay in alignment with operation, business, legislative and economic changes as required to continue to deliver targeted emissions savings. Specifically, the following shall be subject to annual review:

- Progress towards overall carbon reduction targets
- Financial savings achieved due to emission reduction projects
- Costs of the programme and
- Risk Register.

The progress of the atmospheric emissions management shall be reviewed annually by the QHSE department to make sure processes are fit-to-requirement and that emission reduction projects are on track. To facilitate this, performance data shall be collated and reported to the QHSE department by the QHSE Officer for each asset. The collected data shall include:

- Progress data on ongoing projects against projected time scale
- Information on variables which could cause deviation from the forecast emission estimations for the period i.e. breakdown/maintenance statistics, volumes of diesel purchased
- Information on non-conformities.

3.7.2 Annual Improvement Action Plan

The Annual Improvement Plan plays an important contribution to the continual improvement of the atmospheric emissions management and inherit systems. Following the implementation of this procedure and setting of targets, the QHSE department shall develop an Annual Improvements Action Plan to review both the progress towards meeting targets and their suitability to the current operational and economic situations. Feedback from internal and external audit reports shall be integrated into the Annual Improvement Plan to ensure all aspects of the atmospheric emissions management system remain under continual improvement.

3.7.3 Auditing and Verification

This procedure and all related policies and procedures are subjected to annual internal auditing by TAP AG personnel outside of the current Working Group. The internal audits shall mirror external auditor practices and are viewed as a useful tool to assist preparation for external audits. The outcome of the internal auditing shall be communicated across the working group, QHSE department and management as part of TAP AG commitment to continual improvement of this procedure.

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4. Records

Record	Document Code/Number	Generated By	Resp To Store	Storage Method	Location	Storage Period Prior to Disposition
Carbon emissions	As assigned by TAP Corporate procedures	QHSE Officer	QHSE Officer	Paper copy / Electronic Copy	TAP Facility /PIMS	In line with Record Retention Guidelines (Ref. 28)
Estimated Combustion and fugitive Emissions for Asset equipment located at ACS02	ACS02-C1448-000-TRX-002	Competent Body	QHSE Officer	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Estimated Combustion and fugitive Emissions for Asset equipment located at ACS03	ACS03-C1448-000-TRX-001	Competent Body	QHSE Officer	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Estimated Combustion and fugitive Emissions for Asset equipment located at GCS00	GCS00-C1449-000-TRX-001	Competent Body	QHSE Officer	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Estimated Combustion and fugitive Emissions for Asset equipment located at IPR01	IPR01-C5521-000-A-TRX-0001_0_IFD_2018_1121_EN	Competent Body	QHSE Officer	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Descriptive documents required by competent body	As assigned by TAP Corporate procedures	Asset Manager	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Authorisation of emission of greenhouse gases	As assigned by Competent Body	Competent Body	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Verified annual reports	As assigned by Competent Body	Checker	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Consumption Records	As assigned by TAP Corporate procedures	QHSE Officer	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Delivery notes for purchased diesel	As assigned by TAP Corporate procedures	Supplier	Asset Manager	Paper copy / Electronic Copy	Physical Copies Digital Storage	In line with Record Retention Guidelines (Ref. 28)



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Record	Document Code/Number	Generated By	Resp To Store	Storage Method	Location	Storage Period Prior to Disposition
LDAR Component Inventory	As assigned by TAP Corporate procedures	LDAR surveyor	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Records of detailed schematics, equipment design specifications and piping and instrumentation diagrams	As assigned by TAP Corporate procedures	LDAR surveyor	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Records of relevant proactive and reactive maintenance	As assigned by TAP Corporate procedures	LDAR surveyor	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Delay of Repair list	As assigned by TAP Corporate procedures	LDAR surveyor	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Records of the component ID number, the instrument and operator ID numbers, and the date the leak was detected	As assigned by TAP Corporate procedures	LDAR surveyor	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
List of the dates of each repair attempt and an explanation of the attempted repair method	As assigned by TAP Corporate procedures	LDAR surveyor	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Note the dates of successful repairs	As assigned by TAP Corporate procedures	LDAR surveyor	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Include the results of monitoring tests to determine / evidence if the repair was successful	As assigned by TAP Corporate procedures	LDAR surveyor	Asset Manager	Electronic copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
CEMS Reports (with cover notes)	As assigned by TAP Corporate procedures	Sampling personnel	Asset Manager	Paper copy / Electronic Copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Emission Stacks Sampling Record Sheet	As assigned by TAP Corporate procedures	Sampling personnel	Asset Manager	Paper copy / Electronic Copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)
Equipment calibration records	As assigned by TAP Corporate procedures	Sampling personnel	Asset Manager	Paper copy / Electronic Copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)



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Record	Document Code/Number	Generated By	Resp To Store	Storage Method	Location	Storage Period Prior to Disposition
Ambient Air Quality Monitoring Record Sheet	As assigned by TAP Corporate procedures	Sampling personnel	Asset Manager	Paper copy / Electronic Copy	Digital Storage	In line with Record Retention Guidelines (Ref. 28)

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6. List of Appendices

Appendix 1 – Combustion Emission Source Inventory

Appendix 2 – Global Warming Potentials

Appendix 3 – LDAR Component Inventory Template

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6.1 Appendix 1 – Combustion Emission Source Inventory

Location	Source Name	Type	ID TAG	Rating (MW)	Activity
GCS00	Gas Turbines	gas turbine	GCS00-320-V-1001	14.92	Continuous
GCS00	Gas Turbines	gas turbine	GCS00-320-V-2001	14.92	Continuous
GCS00	Gas Turbines	gas turbine	GCS00-320-V-3001	14.92	Continuous
GCS00	Auxiliary diesel generator	engine	GCS00-535-A-1001	1.45	Intermittent
GCS00	Emergency diesel generator	engine	GCS00-535-A-2001	0.065	Intermittent
GCS00	Emergency diesel generator	engine	GCS00-535-A-3001	0.065	Intermittent
GCS00	Diesel Fire water pump	engine	GCS00-710-P-2001	0.094	Intermittent
GCS00	Buildings Hot Water Boilers	boiler	GCS00-552-E-1010	0.9	Continuous
GCS00	Buildings Hot Water Boilers	boiler	GCS00-552-E-1020	0.9	Continuous
GCS00	Buildings Hot Water Boilers	boiler	GCS00-552-E-1030	0.9	Continuous
ACS02	Auxiliary diesel generator	engine	ACS02-535-A-1001	0.45	Intermittent
ACS02	Emergency diesel generator	engine	ACS02-535-A-2001	0.065	Intermittent
ACS02	Emergency diesel generator	engine	ACS02-535-A-3001	0.065	Intermittent
ACS02	Diesel Fire water pump	engine	ACS02-710-P-2001	0.109	Intermittent
ACS03	Gas Turbines	gas turbine	ACS03-320-V-1001	14.92	Continuous
ACS03	Gas Turbines	gas turbine	ACS03-320-V-2001	14.92	Continuous
ACS03	Gas Turbines	gas turbine	ACS03-320-V-3001	14.92	Continuous
ACS03	Gas Generator	engine	ACS03-810-A-0001	1.45	Intermittent
ACS03	Auxiliary diesel generator	engine	ACS03-535-A-1001	1.45	Intermittent
ACS03	Emergency diesel generators	engine	ACS03-535-A-2001	0.065	Intermittent
ACS03	Emergency diesel generators	engine	ACS03-535-A-3001	0.065	Intermittent
ACS03	Diesel Fire water pump	engine	ACS03-710-P-2001	0.094	Intermittent



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Location	Source Name	Type	ID TAG	Rating (MW)	Activity
ACS03	Buildings Hot Water Boilers	boiler	ACS03-552-E-1010	0.9	Continuous
ACS03	Buildings Hot Water Boilers	boiler	ACS03-552-E-1020	0.9	Continuous
ACS03	Buildings Hot Water Boilers	boiler	ACS03-552-E-1030	0.9	Continuous
IPR01	Auxiliary diesel generator	engine	IPR01-535-A-1001	0.85	Intermittent
IPR01	Emergency diesel generators	engine	IPR01-535-A-2001	0.095	Intermittent
IPR01	Emergency diesel generators	engine	IPR01-535-A-3001	0.095	Intermittent
IPR01	Diesel Fire water pump	engine	IPR01-710-P-2001	0.058	Intermittent
IPR01	Process Hot Water Boilers	boiler	IPR01-552-W-1000	3.5	Intermittent
IPR01	Process Hot Water Boilers	boiler	IPR01-552-W-2000	3.5	Intermittent
IPR01	Buildings Hot Water Boilers	boiler	IPR01-552-E-4001	0.15	Intermittent
IPR01	Buildings Hot Water Boilers	boiler	IPR01-552-E-4002	0.15	Intermittent



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6.2 Appendix 2 – Global Warming Potentials

CO₂ equivalent values for greenhouse Gases covered under the Kyoto Protocol sourced from the Intergovernmental Panel on Climate Change Fourth Assessment Report (2007).

Greenhouse Gas	Global Warming Potential
CO ₂	1
N ₂ O	298
CH ₄	25



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6.3 Appendix 1 LDAR Component Inventory Template

Serial No	LDAR Tag No	Component Tag No ID	Component Type	Size	Stream	Service	P&ID Reference	Physical Location
1								
2								
3								
4								
5								
6								
7								
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