

QinetiQ Group plc Greenhouse Gas Reporting Principles and Methodologies

Reporting period 1 April 2018 to 31 March 2019

1. Introduction

QinetiQ Group plc ("QinetiQ") acknowledges the clear scientific evidence linking the rising concentrations of "greenhouse gases" in our atmosphere to a global warming effect that is resulting in changes to the Earth's climate

As a responsible organisation, QinetiQ seeks to minimise all adverse environmental impacts resulting from its operations. These include the direct and indirect release of greenhouse gas emissions from the use of energy, fuels and refrigerants across the business. QinetiQ employs a dedicated Energy Team to develop and operate an ISO50001 certified Energy Management System across the majority of its UK business (and majority of its Group emissions footprint) to deliver continuous improvement in energy efficiency and greenhouse gas reductions.

QinetiQ is a UK FTSE250 quoted company, and as such is subject to legal obligations with respect to the reporting of greenhouse gas emissions as outlined in **Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013**. The reporting is prepared with reference to the **Environmental Reporting Guidelines: Including streamlined energy and carbon reporting guidance (March 2019)**. From 1st April 2019 QinetiQ's reporting will take into account the requirements of the UK government's new Streamlined Energy & Carbon Reporting (SECR).

This document outlines the criteria and supporting methodologies that have been adopted to prepare QinetiQ's annual greenhouse gas emissions report.

2. Scope & Boundary

a) Emissions & Sources

QinetiQ includes Scope 1 and Scope 2 greenhouse gas emissions, as defined in Section 92 of the Climate Change Act 2008 [carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆)], within its annual greenhouse gas report.

The following sources of emissions are included within the report:

Direct emissions:

- Stationary combustion – combustion fuels in stationary equipment e.g. boilers, heaters and engines
- Mobile combustion – combustion of fuels in transportation devices e.g. automobiles and aircraft
- Process emissions – emissions released as a result of a physical or chemical process e.g. the detonation of explosive material
- Fugitive emissions – intentional or unintentional releases, such as refrigerant leaks from air conditioning, sulphur hexafluoride from specialist equipment etc

In-direct emissions

- Emissions from the generation or purchased electricity that is consumed in owned or controlled equipment.

b) Organisational Boundary

QinetiQ adopts a Financial Control boundary approach in its annual greenhouse gas reporting. This includes all sources of emissions over which QinetiQ has the ability to direct the financial and operating policies of an entity with a view to gaining economic benefit from its activities, and where QinetiQ retains the majority risks and rewards of ownership of the entity's assets.

Under the Financial Control approach, 100% of the calculated impact arising from Group companies and subsidiary entities is included, with emissions from joint ventures incorporated under an equity share approach.

On an annual basis the organisational boundary is reviewed to ensure that any new legal entities are included where necessary. This is completed using the organisational structure from the Company Secretary. From this a review of properties is completed to identify what, if any, new sites fall within the scope of the emissions reporting (e.g. the property assets associated with a company acquisition, the opening of a new facility etc), and also sites which are no longer within the reporting scope (e.g. site closures, divested entities etc). The updated organisational and property records are then reconciled to determine the boundary for the reporting year, after which the emissions source data is requested from the appropriate site contacts.

Emissions from entities acquired during the financial year will be incorporated into the annual greenhouse gas report in the next reporting period in accordance with the scope and boundary criteria set out in this document, unless otherwise indicated in our reporting. Emissions from entities disposed of during the year are included up to the date of disposal within the respective annual reporting year.

c) Property Assets

QinetiQ has a mixed tenure property portfolio. This includes assets that are wholly owned by the QinetiQ Group, assets that QinetiQ operate under a long term license, and assets to which QinetiQ is the lessee to a 3rd party landlord entity.

The annual greenhouse gas emissions report includes all emissions from assets that are wholly owned by the QinetiQ Group or operated under a long term property license agreement. Greenhouse gas emissions associated with leased assets across the QinetiQ Group is reported within the financial control approach in line with the Greenhouse Gas Protocol classification outlined in Table 1 below.

Table 1 Emissions from Leased Assets: Leasing Agreements and Boundaries (Lessee's Perspective), "Categorizing GHG Emissions Associated with Leased Assets Appendix F to the GHG Protocol Corporate Standard"

GHG Reporting Boundary Approach	Type of lease	
	Finance/Capital	Operating
Financial Control / Equity Share	Lessee does not have ownership and financial control, therefore emissions associated with fuel combustion are scope 1 and with use of purchased electricity are scope 2.	Lessee does not have ownership or financial control, therefore emissions associated with fuel combustion are scope 3 and with use of purchased electricity are scope 3.
<i>Operational Control</i>	<i>Lessee does have operational control, therefore emissions associated with fuel combustion are scope 1 and with use of purchased electricity are scope 2</i>	<i>Lessee does have operational control, therefore emissions associated with fuel combustion are scope 1 and with use of purchased electricity are scope 2</i>

Scope 3 emissions are not currently included within our annual greenhouse gas report, but we recognise this as being an opportunity for continuous improvement as we mature our environmental reporting and supporting systems and processes.

3. Reporting Format

a) Period

QinetiQ produces its Annual Report and Accounts for the 12 months to 31 March, and the greenhouse gas emissions reporting also aligns to this period. QinetiQ reports Scope 1 and Scope 2 greenhouse gas emissions for current year and preceding year. These are presented in absolute values, and normalised against revenue to show an intensity ratio.

b) Emission Factors

For the 12 months to 31 March 2019 (FY19), QinetiQ has used the **Greenhouse gas reporting: conversion factors 2018** for our UK emissions (<https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018>), and the **IEA Emissions Factors 2018** (<http://data.iea.org/payment/products/122-emissions-factors-2018-edition.aspx>) for our international business emissions in order to determine the Group's Scope 1 and Scope 2 emissions.

We adopt the conventional approach in calculating our carbon emissions through the collection of primary source data in their appropriate units (e.g. kilowatthours (kWh), litres (L), kilograms (kg), kilometres (km) etc.) and converting into the associated carbon emissions using the relevant emissions factors. For UK emissions we are able to report the full greenhouse gas impact in tonnes of carbon dioxide equivalent (TCO_{2e}), whereas for our international emissions we are only able to report in tonnes of carbon dioxide only (TCO₂).

4. Emissions Data

The greenhouse gas data is collected annually across the QinetiQ Group in two tranches. The first tranche captures Q1-Q3 of the reporting period and is collected in January. The Q4 data is collected at year end (April).

Data collection templates are issued to relevant site and business unit contacts across the company. The completed templates are consolidated by the Energy Team. Information is also obtained from the QinetiQ management systems; including the Energy Bureau, accounts payable, Environmental and Energy Management Systems, QMAS (explosives database), and from our supply chain.

The data is subject to internal reviews followed by independent 3rd party limited assurance prior to inclusion in the Company Annual Report (see section 9).

a) Scope 1 Emissions Sources:

i. Gaseous and Liquid Fuels

QinetiQ procures its UK mains gas supplies centrally on a portfolio contract with an energy supplier. The consumption data and monthly bills for each supply are sent directly into our 3rd party Energy Bureau provider for validation and reporting. This process forms part of our ISO50001 certified Energy Management System, and is subject to both internal and external management system audit. Gas consumption data for the reporting period is obtained from this system and is evidenced by the monthly bills. The majority of our natural gas consumption included in our Group greenhouse gas report is covered by this system.

For subsidiary and international sites mains gas data is collected directly from the sites using relevant reporting templates.

If gaps in the period for natural gas data are identified a pro-rata estimation technique is adopted whereby data from a comparable period e.g. days/weeks either side of the gap (accounting for weekends) is used to estimate consumption for the missing days.

QinetiQ operations use of a variety of liquid fuels such as gas oil, kerosene, jet fuel, diesel, LPG, marine gas oil etc. The liquid fuels data for all QinetiQ Group sites is collected using the relevant reporting templates as issued by the Energy Team during the reporting year.

The liquid fuels source data is primarily volumes purchased taken from supplier statements, invoices and other relevant internally maintained records. In some instances, where fuels are purchased on a bulk basis and actual consumption data is not available, we make the assumption that purchased volume equates to consumption. There are instances where some of the bulk purchased fuels are sold onto other organisations operating from our sites. These volumes are excluded from calculating QinetiQ's emissions reporting.

ii. Fluorinated Gases

Fluorinated gases fall within the Scope 1 reportable emissions, and QinetiQ manages its sources and releases of F-gases from its UK operations (excluding subsidiary entities) through an F-Gas Register that is governed under the ISO14001 certified Environmental Management System and ISO50001 certified Energy Management System. These sites are therefore subject to both internal and 3rd party audits of their F-Gas records. The F-Gas register is controlled by the Group Property function. Systems containing F-gases are subject to a range of routine maintenance inspections. All refrigerant losses, including those identified during system inspections, are recorded in the F Gas Register. The majority of systems are inspected annually, however no assumed leakage rate is applied to systems that are not subject to an annual inspection within the reporting year and instead the quantity of lost gas will be captured and reported within the reporting year in which the inspection occurs. This decision follows analysis to extrapolate the average loss rate observed across the F-Gas register to the specific systems not subject to at least an annual inspection and concluding it amounted to a negligible quantity of emissions. Given the small impact, and that all losses from these systems will eventually be reported within the year the inspection occurs, the method adopted is therefore to not assume an average yearly leakage rate.

The F-Gas emissions from International and UK subsidiary entities are estimated using the "Screening Method" as defined in Appendix C of the **Environmental Reporting Guidelines: Including Mandatory Greenhouse Gas Emissions Reporting Guidance (DEFRA, 2013)**. The source information (gas type and total charge) is collected from the sites using the relevant reporting templates provided by the Energy Team.

iii. Sulphur Hexafluoride

Sulphur Hexafluoride (SF₆) is an extremely potent greenhouse gas and QinetiQ is currently exploring options to phase out its use. However there is specialist equipment in operation within QinetiQ that results in the release of SF₆ emissions.

SF₆ emissions in the year are estimated using the number of trials that have occurred which required the use of the specialist equipment, with each trial estimated to release 15.75kg of SF₆.

iv. Transport

Scope 1 transport emissions across the QinetiQ Group extend to the following:

- Vehicles owned or leased by the QinetiQ Group (including subsidiary entities)
- Vehicles hired for longer than 14 days by the QinetiQ Group (including subsidiary entities)

Exclusions to the Scope 1 transport emissions include:

- Short term hires (less than 14 days)
- Employee-owned vehicles

Both of which fall within Scope 3 emissions sources which are currently not reported.

Transport data is obtained from the QinetiQ Vehicle Insurance Database which contains records of all vehicles within Scope 1 as defined above. This database contains either the distance travelled by each vehicle (typically

road going vehicles) or the hours of use (typically Non-Road going Mobile Machinery (NRMM)). This database is maintained by the QinetiQ Transport team and is subject to internal spot checks.

- Scope 1 emissions are calculated based on the type of vehicle record (distance or hours of use) and using the relevant emissions factor from the UK Government GHG Conversion Factors for Company Reporting.

v. Detonation of explosive material

QinetiQ operations involve the detonation of explosive material which results in the release of a small proportion of greenhouse gas emissions. Given the nature of the material, it is subject to regulation and underpinned by robust governance and internal controls to accurately monitor the quantity of explosive material passing through the organisation.

QinetiQ uses an internally developed database (QinetiQ Munitions Accounting System – QMAS) to catalogue and track the movement of explosive material from receipt through to disposal. The QMAS system complies with the requirements of the Health & Safety Executive with respect to the handling of explosive material, and is a key system operating within the QinetiQ ISO45001 certified Health & Safety management system, and ISO9001 certified Quality Management system. The QMAS system itself is certified to the TickIT+ standard for databases.

Data on the total quantity and type of explosive material disposed of throughout the reporting period is extracted from QMAS. This data is categorised into the 7 Groups as presented in Table 2:

The emissions factor from a representative explosive type for each Group is applied for all explosives within the Group. The representative explosive for each Group is identified by the QinetiQ Explosives Team and presented below in Table 2. The emissions factor for each representative explosive type is calculated in line with the **CEA2 Combustion Model** developed by NASA.

Table 2 Explosives Groups and Representatives

Explosives Group	Representative Explosive
C-NO2	TNT
N-NO2	RDX
O-NO2	PETN
Compound Explosives	C4
Polymer Bonded Explosives	PBX
Propellants	0.50 calibre cartridge
Pyrotechnics	Estimated 10% of propellant

The CEA2 combustion model was selected as the most appropriate model for the GHG reporting process by the QinetiQ Explosives Team who are subject matter experts in modelling and explosives. The output of the combustion model is collected in the form of total Kgs of CO₂, CH₄ and N₂O and multiplied by the relevant emission factor.

b) Scope 2 Emissions

i. Electricity

QinetiQ procures its UK electricity supplies centrally on a portfolio contract with an energy supplier. The consumption data and monthly bills for each supply are sent directly into our 3rd party Energy Bureau provider for validation and reporting. This process forms part of our ISO50001 certified Energy Management System, and is subject to both internal and external management system audit. Electricity consumption data for the reporting period is obtained from this system. The majority of our electricity consumption included in our Group greenhouse gas report is covered by this system. Where data is not available via the system (primarily

our subsidiary and international operations), it is collected using relevant templates provided by our Energy Team to local on-site teams.

The electricity consumption data is then converted using the UK government provided factors (for UK operations) and IEA emissions factors (for international operations).

If gaps in the period for electricity data are identified a pro-rata estimation technique is adopted whereby data from a comparable period e.g. days/weeks either side of the gap (accounting for weekends) is used to estimate consumption for the missing days.

5. Assurance

QinetiQ ensure that appropriate procedures are in place to report performance data, in all material respects, as set out in this document. These procedures ensure that:

- the reported information reflects QinetiQ's performance;
- the data is meaningful and is consistent with the stated definitions and scope;
- any specific exclusions are stated clearly and explained;
- any assumptions made, including accounting and calculation methods are clearly described; and
- the level of transparency is sufficient to enable users to have confidence in the integrity of QinetiQ's reporting.

In addition to our own internal processes and governance, QinetiQ commissions an independent 3rd-party assurance of its annual greenhouse gas emissions report prior to publication in the annual accounts.

For the financial year ended 31st March 2019, PricewaterhouseCoopers LLP ('PwC') were appointed to undertake limited assurance of QinetiQ Group plc's Scope 1 and Scope 2 greenhouse gas emissions data and intensity ratio (normalised against revenue) in accordance with the International Standard on Assurance Engagements ISAE 3000 (Revised) Assurance Engagements other than Audits or Reviews of Historical Financial Information, and the International Standard on Assurance Engagements 3410 'Assurance engagements on greenhouse gas statements' <https://www.qinetiq.com/about-us/corporate-responsibility>.