

Environmental Basis of Reporting

Principles and Methodologies



Introduction

The Environmental Basis of Reporting outlines the scope of each of the environmental key performance indicators (KPIs) assured in the Corporate Responsibility Report and sets out the reporting approach and criteria required to support the environmental section of the Serco Group plc Board's commitment to non-financial reporting (NFR).

The reporting approach aims to:

- Report Serco's activities honestly and give a fair impression of business conduct
- Provide key stakeholders with appropriate information, as guided by leading frameworks and standards
- Inform relevant investor evaluations and indices.



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2 Approach to Reporting

2.1 Commitment to reporting

Serco Group plc, as a UK public company, is required to disclose important information in its Annual Report and Accounts, and from 2013 this includes reporting Greenhouse Gas (GHG) performance.

Compliance with these regulations also provides assurance that the plc Board is properly addressing its social, environmental and economic responsibilities towards key stakeholders; including employees, investors, suppliers, customers, consumers, communities, government and society.

As an international company operating in many countries, the Group also voluntarily discloses more detailed performance information. It does this primarily on its website www.serco.com and in its Annual Report and Accounts (also available from the website). The Group also chooses to participate in a number of external indices to benchmark its performance against other companies, and to answer queries from the investment community, customers and other stakeholders.

The Group has a formal approach to non-financial reporting (NFR) which identifies material issues and performance indicators to enable better management and communication of the non-financial aspects of the business.

This information is used by Executive Management to set improvement objectives and targets, which are also endorsed by the plc Board. This is enabled by performance management which exists at division, business unit and site level.

2.2 General greenhouse gas reporting principles

Serco quantifies and reports greenhouse gas emissions in accordance with ISO 14064-1 2012 and the Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard (Revised Edition 2004), and therefore will follow the following principles:

Relevance	Serco will identify all GHG sources, sinks, data and methodologies appropriate for the needs of our stakeholders.
Completeness	Every effort is be made to include all material GHG emissions.
Consistency	To enable meaningful comparisons of GHG-related information, Serco will use emission factors produced using the same methodology where possible, and if not, explain why.
Accuracy	All uncertainties and biases are reduced as much as possible and explained.
Transparency	Serco will disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence.

2.3 Assurance

Assurance and data verification is scoped and sought for the publically reported greenhouse gas disclosures. This is in line with good-practice and to help build trust with stakeholders. The assurance and verification exercise involves the use of an independent third party to select a sample of Serco sites to visit and personnel to interview and to provide reasonable assurance over its environmental public reporting.

This is to verify reporting is accurate, reliable and enable a third party to provide an opinion as to whether the reporting provides a fair and balanced view of the Group's GHG emissions.

The approach includes assurance of the qualitative information detailed in the Annual Report and Account.

Details of our assurance activities including assurance statements can be accessed on the Serco website www.serco.com.

Our 2013 assured data can be found in the Annual Report and Accounts 2013 and the Corporate Responsibility section of the website.

2013 assured indicators include:

- Relative & absolute energy consumption
- Relative and absolute CO₂e emissions from energy consumed
- An Intensity figure - tonnes CO₂e/full time equivalents (FTE)



3 Environmental Reporting Requirements

Serco is committed to responsible stewardship of the environment, wherever we operate and specifically where our activities have the potential to adversely affect the environment. We aim to identify and reduce our environmental impacts, by minimising the use of non-renewable energy and other resources and by reflecting our principles of sustainable development in all our activities.

Significantly, across the majority of our business we are working on our customers' premises and are therefore not in direct control of the environment within which we operate. That is why collaborative working with our customers on environmental issues is important. Serco recognises its responsibility to ensure that any adverse impact on the environment is reduced or, where possible, eliminated by applying the most appropriate management systems at contract level - whether designed by our customers or by ourselves.

Where Serco is not in control of the working environment, it supports our customers in applying their own environmental management systems and objectives.

3.1 Reporting timetable

Frequency of reporting is dependent on the level of the business at which the operation sits and may be determined by the metric itself, based on the timeframes on which a judgement can be made. Reporting of KPIs at a group level is undertaken quarterly and monthly at divisional level. KPIs are calculated over a twelve month rolling period to prevent the perception of short term variations affecting the view of performance.

Reporting type	Frequency	Deadline
Internal Reporting		
Divisional operational performance reporting	Monthly	15 th of each month
Quarterly report to the Group Risk Management and Safety Committee (GRMSC)	Quarterly	15 th after each quarter
Group Annual CR Report and KPI performance reporting	Annual	31 st December
Voluntary External Reporting		
Carbon Disclosure Project	Annual	31 st May
Reporting Obligations		
Carbon Reduction Commitment Energy Efficiency Scheme (CRC) Reporting year	Annual	1 st April to 31 st March
CRC submission deadline	Annual	31 st July
Mandatory Carbon Reporting	Annual	31 st December

4 Reporting Obligations

4.1 Climate Change Act 2008

The UK has passed legislation which introduces the world's first long term legally binding framework to tackle the dangers of climate change. The Climate Change Bill was introduced into Parliament on 14 November 2007 and became law on 26th November 2008.

The UK Government is committed to addressing both the causes and consequences of climate change. The Act creates a new approach to managing and responding to climate change in the UK through setting ambitious targets, assuming powers to help achieve them, strengthening the institutional framework, enhancing the UK's ability to adapt to the impact of climate change and establishing clear and regular accountability to the UK Parliament and devolved legislatures.

There are two key aims underpinning the Act:

1. Improve carbon management and help the transition towards a low carbon economy in the UK
2. Demonstrate strong UK leadership internationally, signaling that we are committed to taking our share of responsibility for reducing global emissions in the context of developing negotiations on a post-2012 global agreement at Copenhagen in 2009.

The key provisions were:

1. Legally binding targets: greenhouse gas emission reductions through action in the UK and abroad of at least 80% by 2050, and reductions in CO₂e emissions of at least 26% by 2020, against a 1990 baseline.
2. A carbon budgeting system which caps emissions over five year periods, with three budgets set at a time, to set out our trajectory to 2050.

Against this backdrop Serco is required to comply with the following legislation:

- Mandatory Carbon Reporting (MCR) in the Annual Directors Report
- Carbon Reduction Commitment Energy Efficiency Scheme (CRC)

The MCR regulations requires reporting of all scope 1 and 2 CO₂e emissions for the company including mobile, fleet, fugitive and process emission for all global operations while the CRC just requires CO₂ emission reporting for all relevant electricity and gas supplies for operations owned or controlled in the UK.

4.2 Mandatory Carbon Reporting

Under the Companies Act 2006 (Strategic and Directors' Reports) Regulations 2013 all quoted companies are required to report their annual global carbon equivalence emissions in their directors' report. Therefore Serco will report annual, global greenhouse gas emissions under their operational control in the Directors Reports of the Annual Report and Accounts from 2013 onwards.

4.2.1 Data

Serco is required to disclose the annual quantity of global emissions from the combustion of fuel, or the operation of any facility (scope 1 emissions) and the emissions from purchased electricity, heat, steam or cooling (scope 2). This must be reported in tonnes of carbon dioxide equivalent (CO₂e), with an appropriate intensity metric. Serco will report an emissions intensity figure in tonnes CO₂e per FTE.

The report must:

- disclose the reporting period used for the carbon disclosure
- include annual data for Scope 1 and Scope 2
- provide global coverage
- use carbon dioxide equivalent (CO₂e) factors, such as those published by DEFRA, which takes into account each of the six 'Kyoto' greenhouse gases, stated in section 92 of the Climate Change Act 2008:
- report emissions as the intensity metric, Serco will use tonnes CO₂e per FTE
- from 2014, disclose both the current year and the previous year's emissions
- state the methodologies used to calculate the reported information.

4.2.2 Methodology

Serco quantifies and reports to ISO 14064-1. Serco has opted to use operational control as the consolidation approach due to the nature of its business, where employees are often on customer sites where no control is possible. As this will be inconsistent with the financial statement, classification of reporting boundaries will be described in detail.

4.2.3 Materiality

Due to the diverse nature of Serco's businesses across its global operation there are cases where Serco will consider greenhouse gas emitting operations to be immaterial or de-minimis. This document describes in detail the rules used to ascertain materiality for each territory and the Directors Report will state what is omitted and why.

4.2.4 Comparatives

Serco has increased the scope of the global reporting of GHG emissions in readiness for the requirement to report in the annual Directors Report. Consequently, Serco will re-benchmark its emissions using the reported emissions in the 2013 report as the new baseline. In subsequent years, the Directors Report will provide comparisons to previous years.

4.3 Carbon Reduction Commitment Energy Efficiency Scheme

The CRC Energy Efficiency Scheme (formerly known as the Carbon Reduction Commitment) is a mandatory carbon emissions reporting and pricing scheme to cover all organisations in the UK using more than 6,000 MWh per year of electricity.

Participants in the CRC are required to measure and report their electricity and gas related carbon emissions annually following a specific set of measurement rules. The CRC scheme applies to emissions not already covered by Climate Change Agreements (CCAs) and the EU Emissions Trading System (EU ETS).

The scheme requires participants to buy allowances for every tonne of CO₂ they emit (relating to electricity and gas), as reported under the scheme.

In 2013, Serco reported emissions under Phase 1 of the scheme, where only one sale of allowances took place to cover emissions in the previous year. The price of the allowances was set at £12 per tonne of CO₂ for 2012/13 reporting year.

From Phase 2 (From April 2014), there will be two sales of allowances for each compliance year. The first sale at the start of a compliance year will be based on predicted emissions at a lower price of £15.60 per tonne. The second will be a "buy to comply" sale after the end of the compliance year at the higher price of £16.40. Serco will report its emissions and purchase allowances for the period 2013/14 after April 2014.

4.3.1 Data

Serco is required to disclose the annual quantity of UK emissions from the combustion of natural gas supplied through any meter that measures more than 73,200 kWh in any compliance year (scope 1 emissions) and the emissions from purchased electricity (scope 2) for meter types 03 through 08 and 00. This must be reported in tonnes of carbon dioxide (CO₂) using conversion factors of 0.541 Kg CO₂ per kWh of electricity and 0.1836 Kg of CO₂ per kWh of natural gas. An Evidence Pack must be produced which contains:

- Introduction
- Summary of key emissions data
- Organisational structure
 - » Structural records – i.e. the scope of the CRC organisation,(key fuel types and the source list)
- Data records – i.e. annual consumption of energy (invoices /supplier statements, conversion factors to CO₂) needed for verification purposes.
- Responsibilities
- Sources and sites
- Footprint Report
- Annual report
- Changes and special events
 - » Special events/change records i.e. unusual events (actions after a meter failure, change of energy supplier, or a 'designated changes' in company structure).

The records for the Footprint Year must be retained for the duration of the organisation's participation within the scheme. The Footprint Year provides the emissions data on which each Participant's proportion of the revenue recycling is based.

Annual records must be kept for the duration of the relevant phase and for a further five years (12 years) after the end of the phase to which they relate. If selected for an audit, the data collected for previous five years must also be made available for assessment.

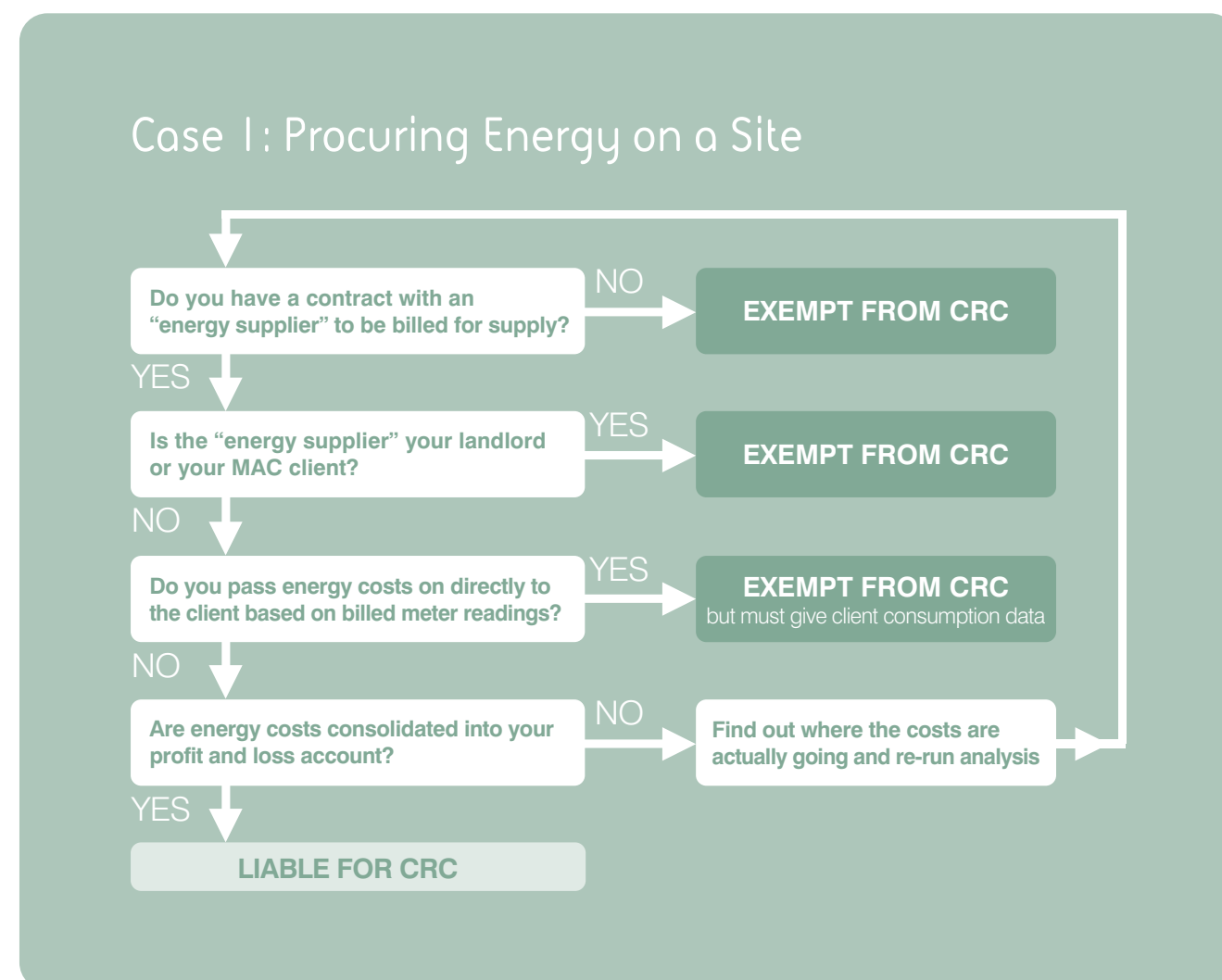
5 Methodology

4.3.2 Methodology

Serco currently follows the guidance available in the document CRC Energy Efficiency Scheme guidance for participants in Phase 1 (2010-2011 to 2013-2014) published by the Environment Agency but will adopt any further changes made to the regulations and guidance. It also uses the GHG conversion factors as requested by the Environment Agency.

4.3.3 Materiality

The following figure outlines the process used to determine whether a location is in scope for the CRC scheme.



4.3.4 Comparatives

Serco has been a participant in the CRC scheme since the start of phase 1, as such three years of Annual Reports are now in the public domain.

5.1 Reporting framework

Serco use the reporting framework ISO 14064-1:2012 for all GHG reporting. Any variations are stated and explained. This specifies principles and requirements at the organisation level for quantification and reporting of greenhouse gas (GHG) emissions and removals. It includes requirements for the design, development, management, reporting and verification of an organisation's GHG inventory. This section will detail how Serco has applied the principles of ISO 14064-1 in producing its reports for the year.

5.2 Relevance

Serco report on the following GHG sources, GHG sinks data and methodologies appropriate to the needs of our business and stakeholders.

This is done by examining each facility or operation, and establishing if Serco has control of any emission sources, and if so, whether they are material to its reporting.

5.3 Completeness

Serco has attempted to include all relevant GHG emissions from primary sources. The following sections describe:

- Greenhouse gas emissions sources
- Greenhouse gas emission calculations
- Emission data capture processes and accuracy hierarchies
- Emissions excluded from scope
- Assumptions

A complete list of conversion factors used is detailed in Annex A.

5.4 Consistency

The processes used by each Division for capturing data about facilities or operational assets and identifying changes are documented. The process for establishing whether the facilities are within Serco's reporting boundary are consistent across all Divisions, but due to the varying nature of operations in different territories, all decisions are documented and authorised by senior management. In each reporting period after the 2013 baseline, any material changes to the organisation will be documented and explained. Any significant changes in reported emissions as a result of these changes will also be reported.

5.5 Accuracy

In the following sections, the methods of capturing both facility and emissions data are documented for each division and source. The methods of verifying the data capture is also described.

5.5.1 Estimation

Where any estimation is made (see section 6.6), the process used is documented and the potential consequential error described.

All scope 1 and 2 GHG emissions are then externally verified to ISO 14064-3.

5.5.2 Assurance

Serco had UK CO₂e emissions externally verified to ISO14064-3 to a reasonable level by Carbon Credentials Ltd prior to its CRC Annual Report submission in 2011 and 2012. For 2013 Serco sought assurance for its global CO₂e emissions.

5.6 Transparency

Serco will disclose sufficient and appropriate GHG related information to allow intended users to make decisions with reasonable confidence.

To ensure this is the case, this document will record:

- Internal processes and procedures, how they are used and why
- All material assumptions and estimations
- Methodologies and conversion factors



6 Consolidation

6.1 Overview

This section describes the operating structure of Serco to give context to the Basis of Reporting.

6.1.1 Where Serco operate

Serco operates in 1,625 locations across 33 Countries (as at 31st December 2013).

Division	Country	Facilities
AMEAA	Australia	57
	Bahrain	2
	Hong Kong	2
	India	1
	New Zealand	2
	Qatar	1
	Republic of Iraq	2
	UAE	20
Americas	Bahrain	1
	Canada	61
	Cuba	1
	Djibouti, Africa	1
	Dominican Republic	1
	Germany	25
	Guam	2
	Italy	5
	Japan	6
	Mexico	2
	Qatar	1
	Republic of Iraq	1
	Saipan	1
	South Korea	9

	UK	1
	USA	539
	Virgin Islands	1
Serco Global Services	Australia	8
	Guatemala	1
	India	40
	Ireland	1
	Mauritius	1
	Philippines	1
	Singapore	1
	UAE	1
	UK	151
	USA	2
UK & Europe	Belgium	12
	Europe	1
	France	5
	Germany	14
	Gibraltar	1
	Holland	6
	Ireland	12
	Italy	7
	Jersey	1
	UK	614

6.1.2 The 2013 operating structure

Division	Business Units
AMEAA	Justice, Community & Health Immigration Middle East Great Southern Rail Defence & Local Government Systems
Americas	Defense & Intel Business Group: Federal Civilian Services Business Group Strategic Programs
UK & Europe	Defence Health Home Affairs Local, Direct & Transport Strategic Partnerships
Global Services	UK, Europe & Africa Offshore Americas AMEAA

6.1.3 The sectors we work in

Serco operates across a number of market sectors, the key areas are:

- Business Process Outsourcing and Back-office Services
- Defence Support Services
- Military and Civilian Aviation
- Marine Services
- Clinical Health
- Custodial & Custodial Support services
- Waste, refuse and grounds maintenance Services
- Leisure
- Facilities and Estates Management
- Rail
- Local Government

6.2 Consolidation approach

6.2.1 Facility level definition

As a service company Serco employees are very often on customer sites, therefore we classify our facilities individually. Significantly, across over two thirds of our business we are working on our customers' premises and frequently do not have operational control of the facilities that are sources of GHG emissions within which we operate. Therefore, Serco has chosen to use operational control for its consolidation approach.

In general, if Serco manages the operations that will control CO₂e emissions, then Serco will report them as part of its GHG inventory.

There are exceptions, for example the Carbon Reduction Commitment requires a subset of its UK portfolio to be reported over a different time period to that required for Serco Group annual reporting.

Environmental performance data is collected from our global operations on an operational control basis.

For Mandatory Carbon Reporting this is defined as where Serco has control as either the purchase and use of energy, or the authority to define health, safety and environmental policies over the facility.

6.2.2 Entity level definition

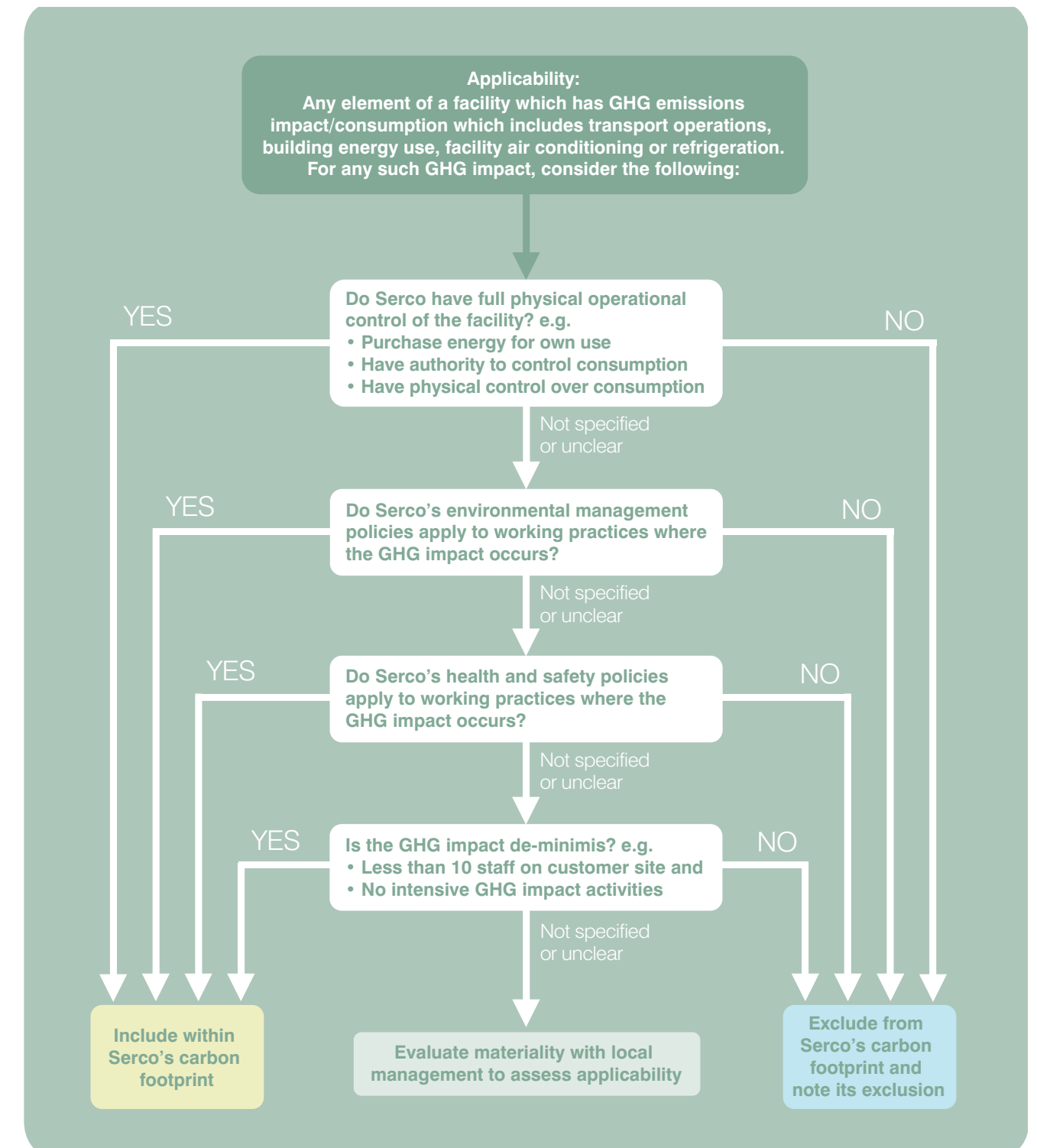
We aim to account for 100% of the data from the following entities:-

- wholly owned operations and subsidiaries
- any entities where Serco has full authority over operating policies [e.g. majority board-level voting rights]
- facilities that belong to our customers where we have been given authority over operational control



6.2.3 Operation or facility level definition

Serco has developed a process (shown below) for determining if a facility or entity is within its boundary of Mandatory Carbon Reporting. This has been used to evaluate all 1,625 locations and transport operations.



6.2.4 Operation or facility level classification

All facilities are assessed according to the classifications shown below:

Classification	Facility or Asset Type	Data Availability	Example	Boundary Scope Status	Reporting Requirements
0	Owned or managed premises where Serco has operational control over emissions	Data is directly available, e.g. meter readings, invoices, fuel purchased, supplier data	Prisons Leisure centres	In Scope	Emissions are reported for scope 1 and 2 and capture processes are documented
1	Leased premises with Serco held supply contract where Serco has operational control over emissions	Data is available for Serco controlled operation on leased premises	Leased office accommodation - all consumption data available	In Scope	Emissions are reported for scope 1 and 2 and capture processes are documented
2	In serviced lease or rental accommodation Sub-tenancy within a larger building or working on a customer's premises where Serco has operational control over emissions	Data is partially available, e.g. some consumption under control but part in service charge	Leased office accommodation - some consumption data available	In Scope	Emissions are reported for scope 1 and 2. Consumption is estimated where not available (see section 6.6). Where estimation is not possible, the reason is documented along with a reasonable indication of scale of omission. Capture processes are documented
3	In serviced lease or rental accommodation Sub-tenancy within a larger building or working on a customer's premises where Serco has operational control over emissions	Data is not available, e.g. all consumption in service charge	Companies House (Cardiff)	In Scope	Consumption is estimated for scope 1 and 2. Estimation process is documented. Where estimation is not possible, the reason is documented along with a reasonable indication of scale of omission. Capture processes are documented
4	- Staff placed on Government, military or transient facilities performing directed tasks - Work conducted amongst public - Serco are not in control of operating policies and therefore excluded from MCR reporting	Data not available. Consumption and emissions are under the control of the customer. These are either paid directly by the customer or Serco pay on behalf of the customer Serco staff working within customers policies	UK RAF bases JSCSC Braintree hospital	Not in Scope	Description of situation with reason for decision documented for external audit
5	De-Minimis <10 staff with no unusual emission activity	De-Minimis <10 staff with no unusual emission activity	Americas Driver Examination Centres	In scope but excluded as immaterial	Brief description of situation with reason for decision documented

6	Joint Ventures where Serco do not have authority to set environmental policies governing energy use in greenhouse gas emitting facilities	Not relevant	Northern and Mersey Rail	Not in scope	Brief description of situation with reason for decision documented
7	Joint Ventures where Serco has authority to set environmental policies governing energy use in greenhouse gas emitting facilities	Data is directly available or partly available, e.g. meter readings, invoices, fuel purchased, supplier data	ATS Bahrain	In Scope	Emissions are reported for scope 1 and 2. Consumption is estimated where not available (see section 6.6) Where estimation is not possible, the reason is documented along with a reasonable indication of scale of omission. Capture processes are documented
8	Staff in customer facilities. Serco staff have authority to set environmental policies governing energy using greenhouse gas emitting facilities	Data not available for all or part of a contract	AMEAA immigration centres	In Scope	Data for the contract is estimated. Estimation process documented. Where estimation is not possible, the reason is documented along with a reasonable indication of scale of omission
9	Facility last used before start of reporting period (1/10/2012)	Data not required	PECS - Chelmsford	Not in scope	No report required, location inactive before 1st MCR report
10	Additional contract on a facility that is already reporting all emissions for the facility and Serco staff have no authority to set environmental policies governing energy use in the facilities	Data not required, but headcount included in facility total	Healthcare contract in custodial centre	Not in scope	Evidence that facility is outside of reporting boundary documented
11	Owned or leased assets where Serco is the lessee, e.g. vehicles or vessels	Data is directly available, e.g. fuel card data, tankered deliveries	Serco UK car fleet, Northlink ferries	In Scope	Data to be captured for scope 1
12	Serco operated assets owned by customer. Data is not directly available, e.g. supplied by customer	Vehicles or vessels that Serco operate where fuel supplied by customer	Vehicles or vessels that Serco operate where fuel supplied by customer	In Scope	Consumption is estimated for scope 1. Where estimation is not possible, the reason is reported along with reasonable indication of scale of omission

6.3 Facility Data Capture Processes

13	Serco operate on assets owned by customer and under the operational control of the customer	Serco staff work under customer policies	AFBINI contract – Research Vessel Corystes	Not in scope	Evidence that facility is outside of reporting boundary documented
14	Owned or managed premises	Data availability transferred to or from customer during reporting period	HMP Don-caster, where customer took control of utility purchase on 7/4/13	In Scope	Data to be captured for scope 1 and 2 for period where Serco had control. Data is estimated for remaining period and estimation process is documented
15	Facilities where ownership or environmental management transferred to or from customer during reporting period	Data available, partly available or not available	Laburnum House transfer to SunGard Feb 2013	In Scope	For period of Serco ownership: - Data to be captured or scope 1 and 2 Consumption is estimated where not available (see section 6.6) - Where estimation is not possible, the reason is documented along with a reasonable indication of scale of omission - Capture processes are documented
16	No Staff on client facility. Serco are paying energy invoices as a service to the customer but have no operational control over emissions	No data available or required	JSCSC residential premises	Not in scope	Brief description of situation with reason for decision to be documented

6.3.1 Method of capturing location and asset data

Facilities data management processes

Process definition

The primary method for UK AND EUROPE and AMEAA is based around the bid or rebid process where potential new or changing portfolio of facilities are added to the contract master database. In addition, a number of secondary mechanisms are in place and where additional locations are identified, they are added to the contract master database. These include:

- SAP Invoice data capture process (see UK utility capture process for more detail)
- Acquisitions & Divestments process
- Notification of new suppliers by procurement
- Provision of operational support by Safety, Risk and Compliance team & Energy & Environment Team
- Serco's in-house Facilities Management Services Team updates
- Property Manager updates

For the UK, identified locations are added to the contract master database, maintained by the Management Information & Reporting team, and requests for additional information are sent to contract management, the Safety, Risk and Compliance team (SRC) and the Energy and Environment Team. Once information is verified it's added to the contract master database.

Due to the high number of contracts and locations where emission sources have been identified (>3,000) within the division, the information held within the contract master database will change regularly, as such regular maintenance is required and all stakeholders have a responsibility to ensure updates are provided to the MI & Reporting team.

The mechanisms used to identify new contracts are also used to identify changes in location information and in such cases details will be provided to the divisional Management Information & Reporting teams to update the contract master database.

Where information is missing reminders will be sent regularly to the owners of each set of data. Changes reports summarising updated information in the period and gaps in the information will be collated by the Management Information and Reporting team and circulated monthly to all stakeholders.

For Americas, the process for deciding which locations are in scope and which are not begins with a listing of all sites that is extracted from Serco Americas' accountable financial system, the Cost Point database. The listing of sites is then reviewed to exclude those sites which are exempt per approved classifications. For example, many Serco Americas worksites are exempted from reporting because they occur on military installations or vessels where Serco does not have financial or operational control over emissions sources.

For AMEAA, a full review was undertaken in readiness for the first Annual Directors Report, with all contracts confirming and providing data about each facility.

For Serco Global Services (outside UK) the Health, Safety, Environment and Security (HSE&S) team review all known facilities, cross-checking against finance systems, to ensure all facilities are identified and correctly classified. Updates to the Site list held by the HSE & Security team are supplied monthly by the site HSE & S Single Point of Contacts (SPOC).

Data held by location includes:

- Site name and full address
- Division
- Business Unit
- Sub-Business Unit
- All MPANs/MPRNS for the facility
- All post-codes (or equivalents) suppliers use for delivery to a facility; it is not unusual for a tankered oil supplier to use a different postcode to an electricity supplier for a large facility such as a prison
- Activities that cause emissions
- Location status (lease, freehold)
- Data of last invoice for each emission if relevant
- Determination of whether facility is in scope for CRC and MCR with reasons if necessary
 - » Operational control for MCR with explanation and authority
 - » Classification of inclusion for CRC with explanation and authority
- Significant events

Provision is being made in Serco's internal HSE database (Assure) to hold and maintain all global facility data. This will be maintained monthly by Divisions, and reviewed quarterly by the Group Environmental Reporting Team. This will lead to clearer and more transparent reporting.

Verification

Contract Data – provision of details relating to the organisation and operation of the contract is the responsibility of the Contract Manager; this includes a nominated point of contact for provision of further information relating to environmental management within the contract.

Environmental data – this includes some information captured from existing sources as well as specific information required under SMS_GSOP_HSE1_26_Carbon Management Serco Internal Jul 13. The responsibility for capture and verification of this information sits with the Energy & Environment team in the UK, the HSE&S team in SGS, the Assurance Team in AMEAA and the Engineering and EHS team in Americas. Information will generally be obtained through discussion with the identified points of contact for each contract and is signed-off as a true, accurate and complete set of data by the relevant director of each operating unit within the division on an annual basis.

Once facility data is signed off by the division it is reviewed by the Head of Group Environmental Reporting.

6.4 Emission Source Data Capture Processes

6.4.1 Emission sources

Emission source data management processes

Process definition

- Data mining scanned images of electricity, natural gas, tanker delivered fuel invoices for UK and AMEAA

This is the primary method of capturing consumption information.

A list of all vendors maintained by the Group Environmental Reporting team and validated with Procurement (Proxima) quarterly to ensure completeness and accuracy. Each Division using SAP supplies the Head of Group Environmental Reporting with updates regarding supply vendors. Invoices for all known utility suppliers that are paid via the Serco financial system SAP are extracted and inspected by a team in India to capture:

- MPAN/MPRN or postcode for tanker delivered fuels
- KWh/litre/Kg/Metric tonnes
- Units
- Cost
- Levies, e.g. Climate Change Levy in the UK
- Invoice period or delivery date

Location data is checked and for new facilities identified by this method:

- » Business name
- » Full address

This process frequently identifies new locations that have purchased utilities but have not yet been captured by the process documented in the Facility Data Capture Process documented above. There are approximately 3,000 emission sources in the UK and AMEAA where Serco pay invoices through SAP. Of these, 412 are within Serco's reporting boundary, the remainder being where Serco pay as a service on behalf of a customer for the reporting year 2013.

This process accounts for the collection of 62.3% of Serco's global emission s data.

- **Data supplied by suppliers (UK)**
Serco's two largest UK suppliers (npower and Dong) provide access to kWh data electronically. This approach covers approximately 10% of emission sources in the UK and 70% of Serco's consumption.
- **Automated Meter Reading**
AMR's have been installed across the UK Leisure portfolio. AMR data is recorded and analysed for error using in-house proprietary data management software (PowerHouse). This covers all electricity sources and approximately 80% of gas supplies, but a programme is in place to take this to 100%. AMR readers have also been installed in all other major Serco gas consuming locations.
- **Manual meter reading**
UK Leisure sites have a paper record to complete gas and electricity readings that are taken at a set time each day. These are then transposed to a centrally held utility spreadsheet to capture consumption, cost and location information. The centrally held spreadsheet is then manually validated in relation to:

- **Significant cost variance (vs. previous and benchmark periods)**
- **Significant consumption variance (vs. previous and benchmark periods)**
This data is compared to data received from AMRs. Any variances are investigated on the same day. Should meter readings on any day exceed a pre-determined boundary, emails are sent to the location manager who must investigate.
- **Estimation**
For office accommodation, where consumption data is not available, it is calculated by using the number of Full Time Employees (FTE) for the facility compared to known consumption figures of similar facilities, or occupancy figures where appropriate.
- UK – FTE figures as this is required almost exclusively for back-office functions
- Americas use the UK Basis of Estimation but may use local data in the future
- In Australia, People in Detention (PID) figures are added to the FTE figures to provide a more robust estimation methodology. For SGS, where consumption data for Electricity, Fuel Oil and/or Transport/Vehicle Fuel is not available for any quarter, the average consumption for Electricity, Fuel Oil and Transport/Vehicle Fuel for the subsequent or surrounding quarters is taken as the consumption for that quarter for which the data is unavailable.

Verification

- **Data mining scanned images of invoices**
The capture spreadsheets contain various error checks such as kWh against cost range checking, comparing calculated climate change levy costs to kWh consumption and MPAN and MPRN checks against location data.

Once captured 20% of the data is re-processed and compared to the original by Group Environmental Reporting, and when the external verification to ISO 14064-3 happens, a sampling plan is produced requiring the invoices covering 10% of consumption to be checked.

Data supplied by the suppliers electronically is used to verify the consumption data captured from invoices.

Utility invoices collated onto the centrally held utilities spreadsheet are sorted by site /meter number / invoice period and inspected to ensure no duplicates or gaps. On the odd occasion these are found, they are investigated and resolved. These are typically due to:

- No invoice for gas supplies in the summer
- Invoice paid twice due to dispute or price change, e.g. CCL accompanied by....
- Late credit
- **Data supplied by suppliers**
Data supplied electronically by suppliers is assumed to be correct, although on rare occasions comparison to invoice data has thrown up anomalies resolved through investigation. This data is used to check the data mined from invoices. The reason it is not used as primary data is that:
- It only covers a small percentage of emission sources identified from invoices in the UK, although it is a high consumption percentage
- It does not include all information that Serco require, such as Climate Change Levy.

- **Automated Meter Reading**
AMR data is recorded and analysed for error using in-house proprietary data management software (Power-House) for Leisure. This system automatically alerts local management by email if consumption is out of range.
- **Manual meter readings (leisure)**
Serco Leisure account for approximately 30% of UK and Europe electricity and gas consumption. 100% of electricity and 80% of natural gas is automatically metered, but all is manually read on a daily basis. The recorded sheets are entered onto control spreadsheets which are used by finance to verify against invoices.
- **Manual meter readings (Serco Global Services)**
Electricity, Fuel Oil and Transport/Vehicle Fuel consumption are monitored and recorded on a monthly basis by facility HSE SPoCs in the format provided by the HSE and Security team. The HSE and Security team prepare a facility and region report of consumption data which is shared with the Senior Manager - HSE & Security and Head - HSE & Security on a quarterly basis. Head - HSE & Security reviews the consumption report and provides the final sign off.

Forecourt purchased vehicle fuel

- **Fuel Card purchased fuel**
The vast majority of forecourt fuels purchased for UK AND EUROPE vehicles use a centrally controlled commercial fuel card. As this is directly invoiced back with individual purchase item information this data is considered as close to 100% accurate as is possible. A small minority purchase fuel without a fuel card. The following processes describes how this data is processed:
- Arval provide monthly data to the Serco Fleet Management System. Out of this a monthly report is provided listing fuel card number, date purchased, gross and net cost, litres purchased, type of fuel, contract and division, and vehicle type and driver where known
- For non-commercial vehicles, company car drivers are required each month to enter details of each business trip made during the month including start and end point, reason and date into an SAP portal. The driver also has to enter the start and end odometer reading for the vehicle for the month. This data is then authorised by the driver's line manager. The data is then extracted via a report for matching against the litres purchased data. If no business mileage is entered for a company car it is assumed all litres purchased were for private use and are excluded

The litres purchased data for each vehicle has a business /private mileage ratio applied so that the number of litres used for business in the month can be determined.

- For the commercial vehicles in the fleet, it is assumed that all fuel consumption is for business use
- Non fuel card purchased information
- Until last year, some company car drivers used an ECO car scheme. Since May 2012, these drivers no longer used a fuel card
- Business mileage for reimbursement is entered into SAP
- Serco Fleet department produce a report showing business mileage and the types of vehicle for all ECO drivers
- Until May 2012 Serco operated an Employee Car Ownership (ECO) scheme but this was then discontinued

At the time of removing fuel cards from ECO drivers there were approximately 400 ECO drivers in the UK

Serco fleet of around 5,000 vehicles. Working on the premise that each vehicle lease lasts around four years, the ECO fleet will be reduced to around 230 for the 2012-13 report and 130 by the 2013-14 report. This makes the ECO fleet approximately 4.5% of the total fleet for 2012-13. Business mileage is recorded each month by ECO car drivers. DEFRA emission factors are applied to the mileage to estimate emissions.

Estimated vehicle emissions (SGS)

- For a number of Serco Global Services locations in India, the only information available is seating capacity, number of vehicles and kilometres driven. The GHG emissions are calculated using the passenger capacity and the number of kilometres driven each quarter. This is described in more detail in the following estimation section
- Miscellaneous fuel purchases**
A small amount of fuel is purchased by the driver for other reasons including filling of hire cars, waiting for the issue of a fuel card, or emergencies. Several examinations of expenses resulting from these cases have shown the amount to be de minimis and are not reported.

Verification

All data is prepared by Divisions and signed off by the relevant senior manager. It is then given to the Head of Group Environmental Reporting who inspects each submission. All data is included in the external verification to ISO 14064-3 and random requests for data are requested and checked. Once all data is collated, it is visually inspected for any obvious anomalies before sign off by the Head of Group Environmental Reporting.

Fugitive Emissions

- Subcontractor data**
Install / commission, top up / recharge / escape and decommission emissions recorded by approved subcontractor for each used refrigerant type and reported site by site.
- Site by site estimation**
Estimation based on each used refrigerant type at each individual location. Significant variances recorded and incorporated into dataset.
- Estate wide estimation**
Estimation based on operational knowledge of estate and likely refrigerant requirements – top up and recharge only. Assumption made on refrigerant type.

Verification

As the data currently available is reliant on estate wide estimation, new processes are required for future years. Therefore, verification is confined to confirmation of facility data and confirmation as Reasonable by the external ISO 14064 verifiers. All data is prepared by Divisions and signed off by the relevant senior manager. It is then given to the Head of Group Environmental Reporting who inspects each submission. All data is included in the external verification to ISO 14064-3 and random requests for data are requested and checked. Once all data is collated, it is visually inspected for any obvious anomalies before sign off by the Head of Group Environmental Reporting.

6.5 Accuracy Hierarchies

The accuracy hierarchy for scope 1 and 2 building energy is shown on the right. While AMR data is assumed to be the most accurate, it is not available for the majority of Serco's electricity and gas meters. Some suppliers offer consumption data without costs, so invoice data is used to supplement.

Local meter reads are used in a small minority of cases with local management sign off and auditing. In most cases they are taken to verify AMR to support real time EMS management systems.

Utility invoice data is used to capture the majority of consumption for UK, Americas and AMEAA.

Where data is not available for a short period, such as when a single invoice is not received, the value is calculated using the estimation techniques described in the Estimation section later.

Where consumption data is not available, a Basis of Estimation is used to estimate consumption using FTE rates or in the case of detention centres, FTE plus People in Detention (PID) rates.

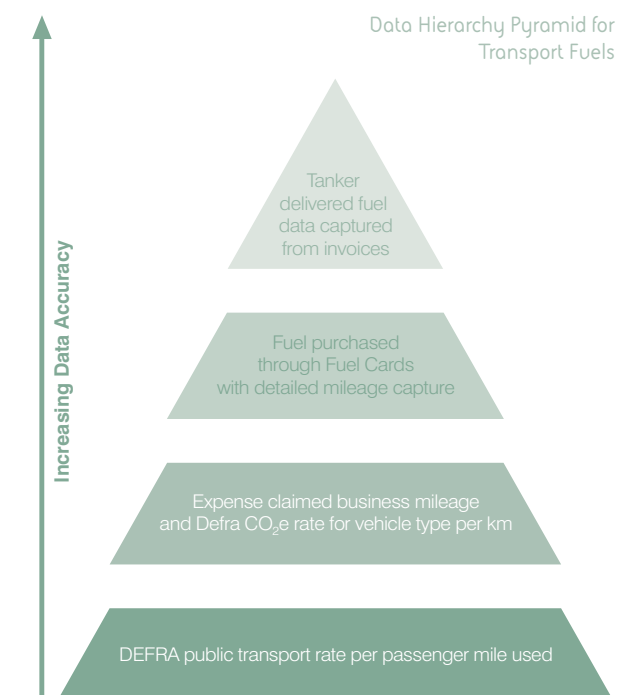
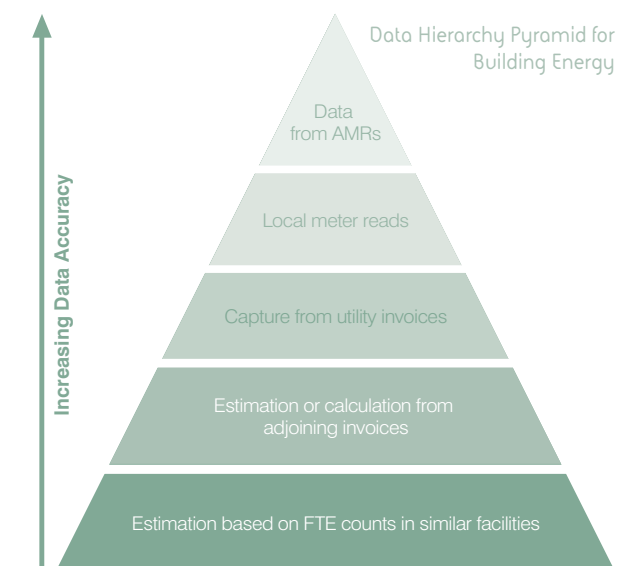
The majority of Serco delivered fuel is by tanker, for marine, road transport and heating. Marine fuel oil is delivered by the metric tonne to two decimal points and the remainder by litre. All tanker delivered fuel data is captured from invoices.

Over 95% of forecourt purchased fuel in the UK is by fuel cards, and is reported to Serco monthly. At the same time, when our people use their vehicles for private mileage they record the total mileage and business mileage monthly, allowing a ratio of business mileage to private mileage to be calculated before applying DEFRA conversion factors.

Those employees without fuel cards record their business mileage each month in SAP.

DEFRA guidelines for emissions by vehicle types per km are used to calculate CO₂e.

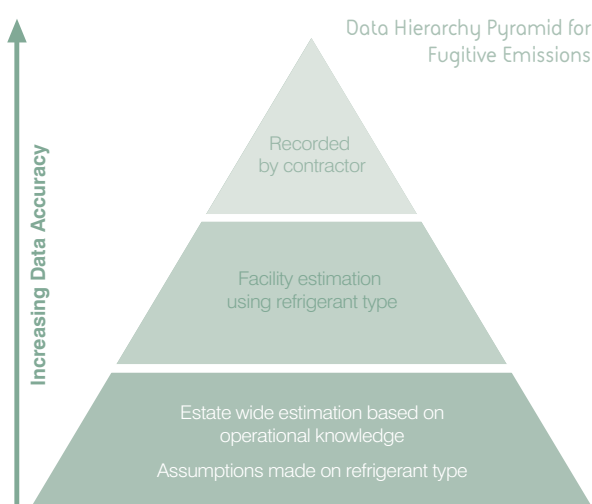
Parts of Serco Global Services use buses and minibuses to transport staff. Mileage and size is recorded and emissions calculated using DEFRA public transport conversion factors.



Install / commission, top up / recharge / escape and decommission emissions are recorded by approved subcontractors for each used refrigerant type and reported site by site.

Site by site estimation based on each used refrigerant type at each individual location. Significant variances recorded and incorporated into dataset.

Estate wide estimation based on operational knowledge of estate and likely refrigerant requirements – top up and recharge only. Assumption made on refrigerant type.



6.6 Methods of Estimation

Emission Source	Method
Electricity and natural gas	1. Estimation based on FTE There are a number of UK, AMEAA, Americas and Global Services facilities where Serco staff work in premises where we have control over the consumption but no sight, or partial sight of the consumption because they are working in facilities where the energy consumed is part of a service charge. In such cases, the following process is used: <ul style="list-style-type: none">Electricity and natural gas consumption is captured and verified for several major UK facilitiesThe average FTE figure for the reporting year is used to calculate an energy consumption figure for electricity and natural gas per FTE in an office environment.This figure is used for all office accommodation where the true consumption figure is unavailable.
	2. Gaps in supply data Where data is captured from invoices, there can occasionally be a gap for a time period which must be calculated. If it is from a supplier that supplies data electronically, then this gap should already have been resolved, but where this does not help then the following approaches are used in the following order: <ul style="list-style-type: none">For electricity, the meter readings from either side are used to accurately calculate the consumption. This approach is documented in the SAP data capture spreadsheetFor natural gas, meter readings from either side are used to derive the number of units consumed and then the formula in the preceding invoice can be used to accurately calculate the kWh consumption. This process is documented in the SAP data capture spreadsheetWhere the above methods are not possible, either at the start or end of a reporting period or where a meter has been changed (often when the supplier changes), then the consumption must be estimated.<ul style="list-style-type: none">» For electricity where consumption is typically flat an average over several months is used, and documented in the SAP data capture spreadsheet.» For Gas, seasonality is taken into account. Occasionally suppliers provide no invoice in summer months where there is no supply, and this is checked and noted. Otherwise an average taken over a year, or using the previous year's trend is used depending on which seems most appropriate. This process is documented in the SAP data capture spreadsheet.

	3. Major gaps in supply information This situation has occurred where records were not kept prior to the introduction of the MCR regulations. It occurred at six, low usage locations for the first quarter of the reporting year Q4 2012 – Q3 2013 accounting for 0.29% of global consumption.																																								
Forecourt fuels	1. Carbon Smart conversion factors Serco use the latest conversion figures each as year recommended by DEFRA. Carbon Smart has provided the emission factors for the year 2012-13. These factors are show in Annex A. At the time of removing fuel cards from ECO drivers (May 2012) there were approximately 400 ECO drivers in the UK Serco fleet of around 5,000 vehicles. The ECO scheme was removed at the same time, and working on the premise that each vehicle lease lasts around four years, then the ECO fleet will be reduced to around 230 for the 2012-13 report and 130 by the 2013-14 report. This makes the ECO fleet approximately 4.5% of the total fleet for 2012-13, If it is assumed that the estimates using the EFs result in 10% error then the overall effect of the ECO calculation result in a total of 0.5% error in the overall UK fleet emissions which are around 3% of total global emissions and so are considered inconsequential.																																								
Vehicle transport for Serco Global Services	2. Carbon Smart conversion factors Global Services have six locations operating vehicles to transport staff to and from work, these being 5, 7, 27, and 49 seat vehicles. The emissions have been calculated using Carbon Smart figures as follows: <table><tr><th>Vehicle Capacity</th><th>Assumed Load Intensity</th><th>Type</th><th>Unit</th><th>Kg CO₂e</th><th>Kg CO₂</th><th>Kg CH₄</th><th>Kg N₂O</th></tr><tr><td>5</td><td>80%</td><td>Local bus (not London)</td><td>passenger .km</td><td>0.123218</td><td>0.122158</td><td>0.0001</td><td>0.00096</td></tr><tr><td>7</td><td>80%</td><td>Local bus (not London)</td><td>passenger .km</td><td>0.123218</td><td>0.122158</td><td>0.0001</td><td>0.00096</td></tr><tr><td>27</td><td>80%</td><td>Average Local Bus</td><td>passenger .km</td><td>0.111621</td><td>0.110691</td><td>0.00009</td><td>0.00084</td></tr><tr><td>49</td><td>80%</td><td>Coach</td><td>passenger .km</td><td>0.02932</td><td>0.0287</td><td>0.00005</td><td>0.00057</td></tr></table> This emission source accounted for an figure of 0.39% of Serco's emissions for 2012-13.	Vehicle Capacity	Assumed Load Intensity	Type	Unit	Kg CO ₂ e	Kg CO ₂	Kg CH ₄	Kg N ₂ O	5	80%	Local bus (not London)	passenger .km	0.123218	0.122158	0.0001	0.00096	7	80%	Local bus (not London)	passenger .km	0.123218	0.122158	0.0001	0.00096	27	80%	Average Local Bus	passenger .km	0.111621	0.110691	0.00009	0.00084	49	80%	Coach	passenger .km	0.02932	0.0287	0.00005	0.00057
Vehicle Capacity	Assumed Load Intensity	Type	Unit	Kg CO ₂ e	Kg CO ₂	Kg CH ₄	Kg N ₂ O																																		
5	80%	Local bus (not London)	passenger .km	0.123218	0.122158	0.0001	0.00096																																		
7	80%	Local bus (not London)	passenger .km	0.123218	0.122158	0.0001	0.00096																																		
27	80%	Average Local Bus	passenger .km	0.111621	0.110691	0.00009	0.00084																																		
49	80%	Coach	passenger .km	0.02932	0.0287	0.00005	0.00057																																		
Fugitive emissions	Notes, calculations & assumptions Total number of sites on MCR Master List = 888, of which 492 are classified as not in scope for F-Gas calculations. The basis of the calculation is therefore made on 396. Assumption based on review of MCR master list concluded that c25% of all sites listed may have a have AC / cooling requirement of some nature. Assessment comprises 'top up' quantity only and not newly commissioned or full recharge F-gas activities based on estimation made by Head of Technical Services. It has been assumed that of sites estimated to have F-gas reporting requirements, this is split equally across the portfolio between R407C and R410A. Conversion factor and CO2e calculation derived from 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. Total annualised emissions (based on 100 GWP) estimated as 644t CO ₂ e. This figure equates to 0.18% of the global emissions for 2012-13.																																								

Fugitive emissions (cont)	Total number of applicable sites within UK AND EUROPE	396
	Estimated number of sites with AC requirement (%)	25%
	Estimated number of sites with AC requirement	99
	Estimated operational 'top up' quantity of F-Gas required annually	4kG
	Estimated total operational 'top up' of F Gas required annually	396kG
	Estimated split between R407C and R410A within UK AND EUROPE	50/50
	CO2e EMISSIONS CALCULATION	
	R407C	23:25:52 blend HFC-32,-125,-134a
	Chemical Formula	0.198t
	Amount emitted per year (tonnes)	1526
	Conversion factor (GWP)	1725
	R410A Annual tonnes CO ₂ e	342t
	TOTAL ESTIMATED ANNUAL OPERATIONAL F-GAS EMISSIONS (t)	644t CO ₂ e

6.7 Materiality

6.7.1 Weighted average emissions

Serco has 368 facilities reported in the 2012-13 report, with an emission % shown below.

Number of Facilities	% of CO ₂ e emissions
19	50% of overall emission
159	95% of overall emission
209	Remaining 5% of overall emission
319 facilities or operations in total	

Of these facilities 89 accounted for <2% of overall emissions

For the same period the breakdown by emission source is as follows:

Emission Source Type	Tonnes CO ₂ e	%
Scanned Images, Energy and Oil	257,231	65%
Forecourt Fuels	10,708	3%
Local Invoices	890	0.2%
Leisure AMR and meter read processes	41,899	11%
Meter Reads (Mostly to verify AMR)	62,787	16%
Provided Oil Figures	8,999	2.2%
Estimates	12,455	3.2%

It is known that Serco has around a further fifty locations, each having less than ten staff in office type or manual environments where there is no significant emission source and data is not available. A review of these facilities has shown that emissions would be below 0.2% of our total global emissions. Serco has decided to set its materiality threshold at 5% for UK and Europe and Serco Global services, and 10% for Americas and AMEAA.

6.8 Exclusions

There are a number of potential emission sources that Serco have decided are immaterial and so are not included its 2013 MCR report because capturing the information would outweigh the value of reporting the GHG impact and are considered to be well below the materiality threshold of 5%. These include:

- Fugitive emissions from AMEAA and Serco Global Services
- A small amount of fuel is purchased by the driver for other reasons including filling of hire cars, waiting for the issue of a fuel card, or emergencies. Several examinations of expenses resulting from these cases have shown the amount to be de minimis and are not reported. These include:
 - » Business mileage in hire cars claimed as personal expenses
 - » Business mileage in private cars claimed as personal expenses, discouraged by Serco
 - » Instances where fuel costs are claimed, as opposed to mileage

6.9 Conversion Factors and Calculations

6.9.1 Conversion factors

Emission factors relevant to each year will be applied, using the latest DEFRA conversion factors. These will always be updated during Q4 of each calendar year in readiness for end of year reporting, MCR and CDP. This approach is consistent with good reporting practice and is the methodology applied in the Corporate Responsibility Report and the Annual Directors Report. All reporting uses carbon dioxide equivalents' including the global warming potential of all six 'kyoto' greenhouse gases, stated in section 92 of the Climate Change Act 2008, these being Carbon Dioxide, Methane (CH₄), Nitrous Oxide (N₂O), Hydroflourocarbons (HFCs), Perflourocarbons (PFCs) and Sulphur hexaflouride (SF₆).

A detailed list of the emissions factors used for 2013 is listed in Annex A.

6.10 Calculations

6.10.1 Source of emission factors

All emission and conversion factors for the period 2012013 were taken from DCFCarbonFactors_7_12_2013_11477 version 1 which expires on 31/05/2014. The relevant sections are shown in Annex A.

Emission Sources (actual)	Unit	Facilities	Conversion Calculations
Grid electricity	kWh	UK & Europe valid sites	kWh to kg CO ₂ e = x 0.44548 CO ₂ e to t/CO ₂ e = / 1000
Grid electricity	M Joules	Australia	MJ to kWh = x 0.27778 kWh to kg CO ₂ e = x 0.44548 CO ₂ e to t/CO ₂ e = / 1000
Natural Gas	kWh	UK & Europe valid sites	kWh to kg CO ₂ e = x 0.18404 CO ₂ e to t/CO ₂ e = / 1000
Natural Gas	M Joules	Australia	MJ to kWh = x 0.27778 kWh to kg CO ₂ e = x 0.18404 CO ₂ e to t/CO ₂ e = x 1000
Natural Gas	Cubic Feet	Americas	100 Cubic feet to BTU = x 100,000 (average) BTU to kWh = / 3412
Fuel Oil	Tonnes		M Tonnes to kg CO ₂ e = x 3232.7 CO ₂ e to t/CO ₂ e = / 1000
Marine Fuel MF 380	Tonnes		MF 380 is 97% Fuel oil and 3% mineral diesel oil 1 tonne MF 380 = (3232.7 x 0.97) + (3188.5 x 0.03) CO ₂ e to t/CO ₂ e = / 1000

Marine Fuel MF 40	Tonnes		MF 40 is 67% Fuel oil and 33% mineral diesel oil 1 tonne MF 40 = (3232.7 x 0.67) + (3188.5 x 0.33) CO ₂ e to t/CO ₂ e = x 1000
Road Diesel	Litres		Litres to kg CO ₂ e = 2.6008 CO ₂ e to t/CO ₂ e = / 1000
Marine Diesel	Litres		Litres to kg CO ₂ e = 2.6705 CO ₂ e to t/CO ₂ e = / 1000
Bottled LPG	Litres		Litres to kg CO ₂ e = 1.4929 CO ₂ e to t/CO ₂ e = / 1000
Compressed Natural Gas	Kg		Kg to kg CO ₂ e = 2.707 CO ₂ e to t/CO ₂ e = / 1000
Kerosene	Litres		Litres to kg CO ₂ e = 2.538 CO ₂ e to t/CO ₂ e = / 1000
Fugitive GHG emissions - R407C 23:25:52 blend HFC-32,-125,-134a	Kg		Kg to kg CO ₂ e = 1,526 CO ₂ e to t/CO ₂ e = / 1000
Fugitive GHG emissions - R410A 50:50 blend HFC-32, -125	Kg		Kg to kg CO ₂ e = 1,526 CO ₂ e to t/CO ₂ e = / 1000

6.1.1 Intensity Metrics

6.11.1 Approach

Serco has chosen to use the intensity metric tonnes CO₂e/FTE. The sources for this information are:

System	Territories	Number of FTEs
MyHR, which calculates based on contracted hours to standard weeks	UK, Middle East	c 25,000
Head office calculated figures based on contracted hours to standard weeks	AMEAA excluding Middle East, and Global Services (excluding UK)	c71,000
		c96,000

The intensity metric is then calculated using the formula tonnes CO₂e/FTE.



Annex A – Conversion Factors

As advised by DEFRA, all emission and conversion factors for the period 2012/2013 were taken from DCFCarbonFactors_7_12_2013_11477 version 1 which expires on 31/05/2014.

Activity	Fuel	Unit	Energy - Gross CV				Energy - Net CV				Volume				Tonnes			
			kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O	kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O	kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O	kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O
Gaseous Fuels	CNG	Tonnes													2707.213766	2701.623996	3.971679	1.618091
		Litres									0.473762	0.472784	0.000695	0.000283				
		Cubic m																
		kWh	0.18404	0.18366	0.18366	0.00011	0.20421	0.20379	0.0003	0.00012								

Gaseous Fuels					Gaseous Fuels					Activity
LPG					LNG					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.21452					0.18404				kg CO ₂ e	Energy - Gross CV
0.21419					0.18366				kg CO ₂	Energy - Net CV
0.0001					0.00027				kg CH ₄	Volume
0.00023					0.00011				kg N ₂ O	Tonnes
0.22991					0.20421				kg CO ₂ e	
0.22956					0.20421				kg CO ₂	
0.0001					0.0003				kg CH ₄	
0.00025					0.00012				kg N ₂ O	
		1.4929					1.224984		kg CO ₂ e	
		1.4906					1.222454		kg CO ₂	
		0.0007					0.001797		kg CH ₄	
		0.0016					0.000732		kg N ₂ O	
								2707.213766	kg CO ₂ e	
								2701.623996	kg CO ₂	
								3.971679	kg CH ₄	
								1.618091	kg N ₂ O	

Gaseous Fuels					Gaseous Fuels					Activity
Other Petroleum Gas					Natural Gas					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.18391					0.18404				kg CO ₂ e	Energy - Gross CV
0.18365					0.18366				kg CO ₂	Energy - Net CV
0.00015					0.00027				kg CH ₄	Volume
0.00011					0.00011				kg N ₂ O	Tonnes
0.2001					0.20421				kg CO ₂ e	
0.19981					0.20379				kg CO ₂	
0.00017					0.0003				kg CH ₄	
0.00017					0.00012				kg N ₂ O	
						2.0194			kg CO ₂ e	
						2.0152			kg CO ₂	
						0.003			kg CH ₄	
						0.0012			kg N ₂ O	
		2590.1							kg CO ₂ e	
		2586.4							kg CO ₂	
		2.1							kg CH ₄	
		1.6							kg N ₂ O	

Liquid Fuels					Liquid Fuels					Activity
Aviation Turbine Fuel					Aviation Spirit					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.24798					0.24234				kg CO ₂ e	Energy - Gross CV
0.24543					0.23754				kg CO ₂	Energy - Net CV
0.00242					0.00245				kg CH ₄	Volume
0.00242					0.00235				kg N ₂ O	Tonnes
0.26096					0.25471				kg CO ₂ e	
0.25829					0.24966				kg CO ₂	
0.00013					0.00258				kg CH ₄	
0.00254					0.00247				kg N ₂ O	
		2.5418					2.2615		kg CO ₂ e	
		2.5157					2.2166		kg CO ₂	
		0.0013					0.0229		kg CH ₄	
		0.0248					0.022		kg N ₂ O	
			3182.3					3191.0	kg CO ₂ e	
			3149.7					3127.7	kg CO ₂	
			1.6					32.3	kg CH ₄	
			31.0					31.0	kg N ₂ O	

Liquid Fuels					Liquid Fuels					Activity
Diesel (average biofuel blend)					Burning Oil					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.24512					0.24555				kg CO ₂ e	Energy - Gross CV
0.24322					0.24437				kg CO ₂	Energy - Net CV
0.00007					0.00051				kg CH ₄	Volume
0.00183					0.00067				kg N ₂ O	Tonnes
0.26112					0.25836				kg CO ₂ e	
0.25909					0.25712				kg CO ₂	
0.00008					0.00054				kg CH ₄	
0.00195					0.0007				kg N ₂ O	
		2.6008					2.538		kg CO ₂ e	
		2.5805					2.5258		kg CO ₂	
		0.0008					0.0053		kg CH ₄	
		0.0195					0.0069		kg N ₂ O	
			3100.1					3164.9	kg CO ₂ e	
			3076.0					3149.7	kg CO ₂	
			0.9					6.6	kg CH ₄	
			23.2					8.6	kg N ₂ O	

Liquid Fuels					Liquid Fuels					Activity
Fuel Oil					Diesel (100% mineral diesel)					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.26876					0.25117				kg CO ₂ e	Energy - Gross CV
0.26774					0.24927				kg CO ₂	Energy - Net CV
0.00026					0.00007				kg CH ₄	Volume
0.00076					0.00183				kg N ₂ O	Tonnes
0.28594					0.26757				kg CO ₂ e	
0.28485					0.26554				kg CO ₂	
0.00028					0.00008				kg CH ₄	
0.00081					0.00195				kg N ₂ O	
							2.6705		kg CO ₂ e	
							2.6502		kg CO ₂	
							0.0008		kg CH ₄	
							0.0195		kg N ₂ O	
			3232.7					3188.5	kg CO ₂ e	
			3220.3					3164.3	kg CO ₂	
			3.2					0.9	kg CH ₄	
			9.2					23.3	kg N ₂ O	

Liquid Fuels					Liquid Fuels					Activity
Lubricants					Gas Oil					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.26451					0.27176				kg CO ₂ e	Energy - Gross CV
0.26451					0.25295				kg CO ₂	Energy - Net CV
0.00016					0.00024				kg CH ₄	Volume
0.0007					0.01857				kg N ₂ O	Tonnes
0.28141					0.28895				kg CO ₂ e	
0.28049					0.26895				kg CO ₂	
0.00017					0.00025				kg CH ₄	
0.00075					0.01975				kg N ₂ O	
							2.9343		kg CO ₂ e	
							2.7312		kg CO ₂	
							0.0026		kg CH ₄	
							0.2005		kg N ₂ O	
			3181.5					3427.2	kg CO ₂ e	
			3171.1					3190.0	kg CO ₂	
			1.9					3.0	kg CH ₄	
			8.5					234.2	kg N ₂ O	

Liquid Fuels					Liquid Fuels					Activity
Petrol (average biofuel blend)					Naphtha					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.23394					0.23714				kg CO ₂ e	Energy - Gross CV
0.23305					0.23633				kg CO ₂	Energy - Net CV
0.00033					0.0002				kg CH ₄	Volume
0.00056					0.00061				kg N ₂ O	Tonnes
0.24651					0.24971				kg CO ₂ e	
0.24556					0.24885				kg CO ₂	
0.00035					0.00022				kg CH ₄	
0.0006					0.00064				kg N ₂ O	
		2.3104							kg CO ₂ e	
		2.3018							kg CO ₂	
		0.0032							kg CH ₄	
		0.0054							kg N ₂ O	
			3146.8					3142.0	kg CO ₂ e	
			3135.0					3131.3	kg CO ₂	
			4.4					2.7	kg CH ₄	
			7.4					8.0	kg N ₂ O	

Liquid Fuels					Liquid Fuels					Activity
Processed fuel oils - residual oil					Petrol (100% mineral petrol)					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.26876					0.24051				kg CO ₂ e	Energy - Gross CV
0.26774					0.23962				kg CO ₂	Energy - Net CV
0.00026					0.00033				kg CH ₄	Volume
0.00076					0.00056				kg N ₂ O	Tonnes
0.28594					0.25343				kg CO ₂ e	
0.28485					0.25248				kg CO ₂	
0.00028					0.00035				kg CH ₄	
0.00081					0.0006				kg N ₂ O	
							2.3104		kg CO ₂ e	
							2.3018		kg CO ₂	
							0.0032		kg CH ₄	
							0.0054		kg N ₂ O	
			3232.7					3146.8	kg CO ₂ e	
			3220.3					3135.0	kg CO ₂	
			3.2					4.4	kg CH ₄	
			9.2					7.4	kg N ₂ O	

Liquid Fuels					Liquid Fuels					Activity
Refinery Miscellaneous					Processed fuel oils - distillate oil					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.24591					0.27176				kg CO ₂ e	Energy - Gross CV
0.24501					25295				kg CO ₂	Energy - Net CV
0.00023					0.00024				kg CH ₄	Volume
0.00067					0.01857				kg N ₂ O	Tonnes
0.25914					0.28895				kg CO ₂ e	
0.25819					0.26895				kg CO ₂	
0.00024					0.00025				kg CH ₄	
0.00071					0.01975				kg N ₂ O	
									kg CO ₂ e	
									kg CO ₂	
									kg CH ₄	
									kg N ₂ O	
								3427.2	kg CO ₂ e	
								3190.0	kg CO ₂	
								3.0	kg CH ₄	
								234.2	kg N ₂ O	

Solid Fuels					Liquid Fuels					Activity
Coal (industrial)					Waste Oils					Fuel
kWh	Cubic m	Litres	Tonnes		kWh	Cubic m	Litres	Tonnes	Unit	
0.31304					0.2645				kg CO ₂ e	Energy - Gross CV
0.30712					0.26365				kg CO ₂	Energy - Net CV
0.00021					0.00023				kg CH ₄	Volume
0.00571					0.00067				kg N ₂ O	Tonnes
0.32893					0.2814				kg CO ₂ e	
0.32271					0.28049				kg CO ₂	
0.00022					0.00024				kg CH ₄	
0.006					0.00071				kg N ₂ O	
									kg CO ₂ e	
									kg CO ₂	
									kg CH ₄	
									kg N ₂ O	
			2339.1					3181.87516	kg CO ₂ e	
			2294.8					3171.1	kg CO ₂	
			1.6					2.7	kg CH ₄	
			42.7					8.1	kg N ₂ O	

Activity	Type	Unit	kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O
Bus	Local bus (not London)	passenger.km	0.123218	0.122158	0.0001	0.00096
	Local London bus	passenger.km	0.083144	0.082534	0.082534	0.00055
	Average local bus	passenger.km	0.111621	0.110691	0.00009	0.00084
	Coach	passenger.km	0.02932	0.0287	0.00005	0.00057

Activity	Country	Unit	Year	kg CO ₂
Electricity Generated	Electricity: Australia	kWh	2013	0.84092
	Electricity: Austria	kWh	2013	0.18788
	Electricity: Belgium	kWh	2013	0.21956
	Electricity: Brazil	kWh	2013	0.08677
	Electricity: Bulgaria	kWh	2013	0.53546
	Electricity: Canada	kWh	2013	0.18641
	Electricity: Chinese Taipei	kWh	2013	0.6238
	Electricity: Croatia	kWh	2013	0.23637
	Electricity: Cyprus	kWh	2013	0.69708
	Electricity: Czech Republic	kWh	2013	0.58902
	Electricity: Denmark	kWh	2013	0.35967
	Electricity: Egypt	kWh	2013	0.44987
	Electricity: Estonia	kWh	2013	1.01414
	Electricity: Finland	kWh	2013	0.22948
	Electricity: France	kWh	2013	0.07909
	Electricity: Germany	kWh	2013	0.46089
	Electricity: Gibraltar	kWh	2013	0.7616
	Electricity: Greece	kWh	2013	0.71826
	Electricity: Hong Kong, China	kWh	2013	0.72343
	Electricity: Hungary	kWh	2013	0.31708

Activity	Country	Unit	Year	kg CO ₂
Electricity Generated	Electricity: Iceland	kWh	2013	0.00018
	Electricity: India	kWh	2013	0.91239
	Electricity: Indonesia	kWh	2013	0.70908
	Electricity: Ireland	kWh	2013	0.45804
	Electricity: Israel	kWh	2013	0.68896
	Electricity: Italy	kWh	2013	0.40631
	Electricity: Japan	kWh	2013	0.41641
	Electricity: Latvia	kWh	2013	0.11971
	Electricity: Lithuania	kWh	2013	0.33741
	Electricity: Luxembourg	kWh	2013	0.40984
	Electricity: Malaysia	kWh	2013	0.72738
	Electricity: Malta	kWh	2013	0.87232
	Electricity: Mexico	kWh	2013	0.45483
	Electricity: Netherlands	kWh	2013	0.41485
	Electricity: New Zealand	kWh	2013	0.1502
	Electricity: Norway	kWh	2013	0.01669
	Electricity: Pakistan	kWh	2013	0.42466
	Electricity: People's Rep. of China	kWh	2013	0.76647
	Electricity: Phillippines	kWh	2013	0.481
	Electricity: Poland	kWh	2013	0.78135
	Electricity: Portugal	kWh	2013	0.25531
	Electricity: Romania	kWh	2013	0.41344
	Electricity: Russian Federation	kWh	2013	0.3836
	Electricity: Saudi Arabia	kWh	2013	0.73678
	Electricity: Singapore	kWh	2013	0.49945
	Electricity: Slovak Republic	kWh	2013	0.19704
	Electricity: Slovenia	kWh	2013	0.32491

Activity	Country	Unit	Year	kg CO ₂
Electricity Generated	Electricity: South Africa	kWh	2013	0.92654
	Electricity: South Korea	kWh	2013	0.53307
	Electricity: Spain	kWh	2013	0.23798
	Electricity: Sweeden	kWh	2013	0.02957
	Electricity: Switzerland	kWh	2013	0.02731
	Electricity: Thailand	kWh	2013	0.51289
	Electricity: Turkey	kWh	2013	0.4596
	Electricity: Ukraine	kWh	2013	0.39165
	Electricity: United States	kWh	2013	0.52225
	Electricity: Africa (average)	kWh	2013	0.63741
	Electricity: EU (average)	kWh	2013	0.34723
	Electricity: Latin America (average)	kWh	2013	0.19654
	Electricity: Middle East (average)	kWh	2013	0.67422
	Electricity: Middle East (average)	kWh	2013	0.67422
	Electricity: Non-OECD Europe and Eurasia (average)	kWh	2013	0.40732
	Electricity: Non-OECD Europe and Eurasia (average)	kWh	2013	0.40732
	Electricity: Non-OECD Europe and Eurasia (average)	kWh	2013	0.40732

Annex B – Glossary

CCA	Climate Change Agreement
CH ₄	Methane
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide equivalence
CRC	Carbon Reduction Commitment Energy Efficiency Scheme
ECO	Employee Car Ownership Scheme
EMS	Environmental Management System
EU ETS	EU Emissions Trading System
FTE	Full Time Employee
GRMSC	Group Risk Management and Safety Committee
GSOP	Group Standard Operating Procedure
GWP	Global Warming Potential
HSE	Health, Safety and Environment
HFCs	Hydroflourocarbons
KPI	Key Performance Indicators
kWh	Kilowatt hours
MCR	Mandatory Carbon Reporting
MWh	Megawatt hours
N ₂ O	Nitrous Oxide
NFR	Non Financial Reporting
PFCs	Perflourocarbons
PID	Person in Detention
SF ₆	Sulphur hexaflouride
SRC	Safety, Risk and Compliance
SPOC	Single Point of Contact



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