



Ricardo
Energy & Environment

Summary Report: Gibraltar City Inventory 2017

A Summary of the City-Level Greenhouse Gas Emissions Inventory for
Gibraltar

Report for HM Government of Gibraltar

Customer:

Sera Fromow, Department of the Environment,
HM Government of Gibraltar

Customer reference:

ED61636

Confidentiality, copyright & reproduction:

This report is the Copyright of the Government of Gibraltar. It has been prepared by Ricardo Energy & Environment, a trading name of Ricardo-AEA Ltd, under contract to the Government of Gibraltar dated 17/03/2016. The contents of this report may not be reproduced in whole or in part, nor passed to any organisation or person without the specific prior written permission of the Government of Gibraltar. Ricardo Energy & Environment accepts no liability whatsoever to any third party for any loss or damage arising from any interpretation or use of the information contained in this report, or reliance on any views expressed therein.

Contact:

Ellie Kilroy
Ricardo Energy & Environment
Gemini Building, Harwell, Didcot, OX11 0QR,
United Kingdom

t: +44 (0) 1235 75 3706

e: Eleanor.kilroy@ricardo.com

Ricardo-AEA Ltd is certificated to ISO9001 and ISO14001

Author:

Ellie Kilroy and Luke Jones

Date:

17 May 2019

Ricardo Energy & Environment reference:

Ref: ED61636- Issue Number 2

Summary of Gibraltar's 2017 City-Scale Greenhouse Gas Inventory

This summary is intended to provide an easily accessible synopsis of the main technical report accompanying Gibraltar's 2017 City-Scale Greenhouse Gas (GHG) Inventory. It provides the background to Gibraltar's city-scale greenhouse gas inventory programme, the results of the 2017 inventory, and changes between previous inventories. For more information on the background behind Gibraltar's inventories, the data and methodologies used, revisions to previous inventories and recommended future improvements, see the full report, available at: [\(insert link to full report\)](#).

Background

The management of greenhouse gas (GHG) emissions on a local scale is becoming of increasing importance in the global commitment to limiting the impacts of climate change as cities expand and grow. At the 21st Conference of the Parties (the COP) in Paris in 2015, almost 200 countries collectively committed to limiting global temperatures to 'well below' 2 degrees and avoiding the worsening effects of climate change. At the same time, more than 360 cities from all continents and regions worldwide announced that the collective impact of their commitments will deliver over half of the world's potential urban emissions reductions by 2020. Since then, the focus has transferred from making promises to taking action. Effective and committed governance at the national level will be key to achieving the Paris Agreement; however, it is at the sub-national level where real gains in climate change mitigation will be made.

In October 2015, Gibraltar became a signatory of the Compact of Mayors (CoM), a global coalition of mayors and city officials pledging to reduce local GHGs, enhance resilience to climate change and track their progress transparently. As of January 2017, the CoM merged with the EU's Covenant of Mayors to create the Global Covenant of Mayors for Climate and Energy (GCoM). GCoM brings together the world's two primary initiatives of cities and local governments with the aim to advance and accelerate community-level transition to a low emission and climate resilient economy, and to demonstrate the global impact of local action. Gibraltar is now one of over 9,200 cities and local governments who have committed to GCoM.

Under GCoM, Gibraltar have committed to regularly reporting a GHG Inventory, assessing climate risks and vulnerabilities, defining ambitious climate mitigation, resilience and energy targets, and creating a full climate action plan outlining how targets will be delivered, as depicted in **Figure 1**.

Figure 1: GCoM commitment requirements



Source: https://data.bloomberglp.com/mayors/sites/14/2015/07/Compact-of-Mayors-Full-Guide_July2015.pdf

Greenhouse gas emission inventories

The first step in managing GHG emissions effectively at the community scale, and making informed decisions to contribute to global mitigation efforts, is to have a good understanding of these emissions; the major sources, activities and relative contributions of different activities. The Global Protocol for Community-Scale Greenhouse Gas Emission Inventories¹ (GPC) was launched in December 2014 for just this, and is a robust, transparent and globally-accepted framework to consistently identify, calculate and report on sub-national GHGs. It is methodologically consistent with national territory-based approaches to emissions accounting, but also provides the flexibility to account for emissions in ways that more

What is a GHG inventory?

A GHG inventory is an accounting of GHGs emitted to or removed from the atmosphere over a period of time.

Policy makers use inventories to establish a baseline for tracking emission trends, developing mitigation strategies and policies, and assessing progress.

¹ <http://www.wri.org/publication/global-protocol-community-scale-greenhouse-gas-emission-inventories>

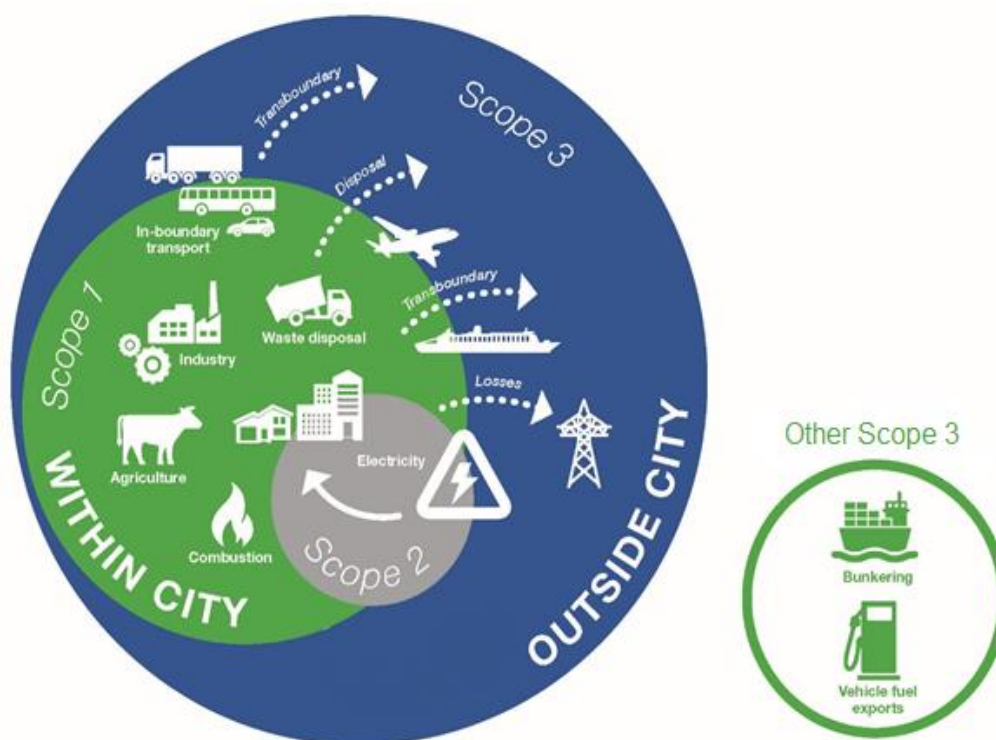
accurately reflect local circumstances. The CoM required that GHG emissions inventories follow the GPC guidelines. Under GCoM, inventories must be reported following the GCoM Common Reporting Format, which is largely based upon the GPC.

For Gibraltar, emissions are calculated for seven GHGs, reported as carbon dioxide equivalent² (CO_{2e}) and are categorised by 'scope', to distinguish where emissions physically occur:

- Scope 1 emissions are directly emitted within the city boundary (**direct emissions**)
- Scope 2 emissions are indirect from in-boundary consumption of electricity (**Indirect emissions**)
- Scope 3 emissions are indirect and out of boundary emissions (**Other direct emissions**)

The sources, and scopes, that are included within Gibraltar's GHG inventories are shown in **Figure 2**.

Figure 2: GHG Inventory sources and scopes



Gibraltar has four iterations of the city-scale GHG inventory: 2013, 2015, 2016 and 2017. The inventory will continue to be annually updated and reported to CDP³ to fulfil the requirements of the GCoM.

Gibraltar's 2017 inventory

Gibraltar's 2017 GHG emissions are presented, by sector, in **Table 1** and **Figure 3**. Certain sources, such as international shipping (non-bunkering), are excluded from the results presented in this report due to its very large impact on overall totals, and the lack of potential local influence; this sub-set of emissions is considered as **Gibraltar's 'manageable' emissions**. In addition to 'manageable' emissions, there are alternative reporting levels which include/exclude certain sources; these are covered in the full report accompanying Gibraltar's 2017 city inventory.

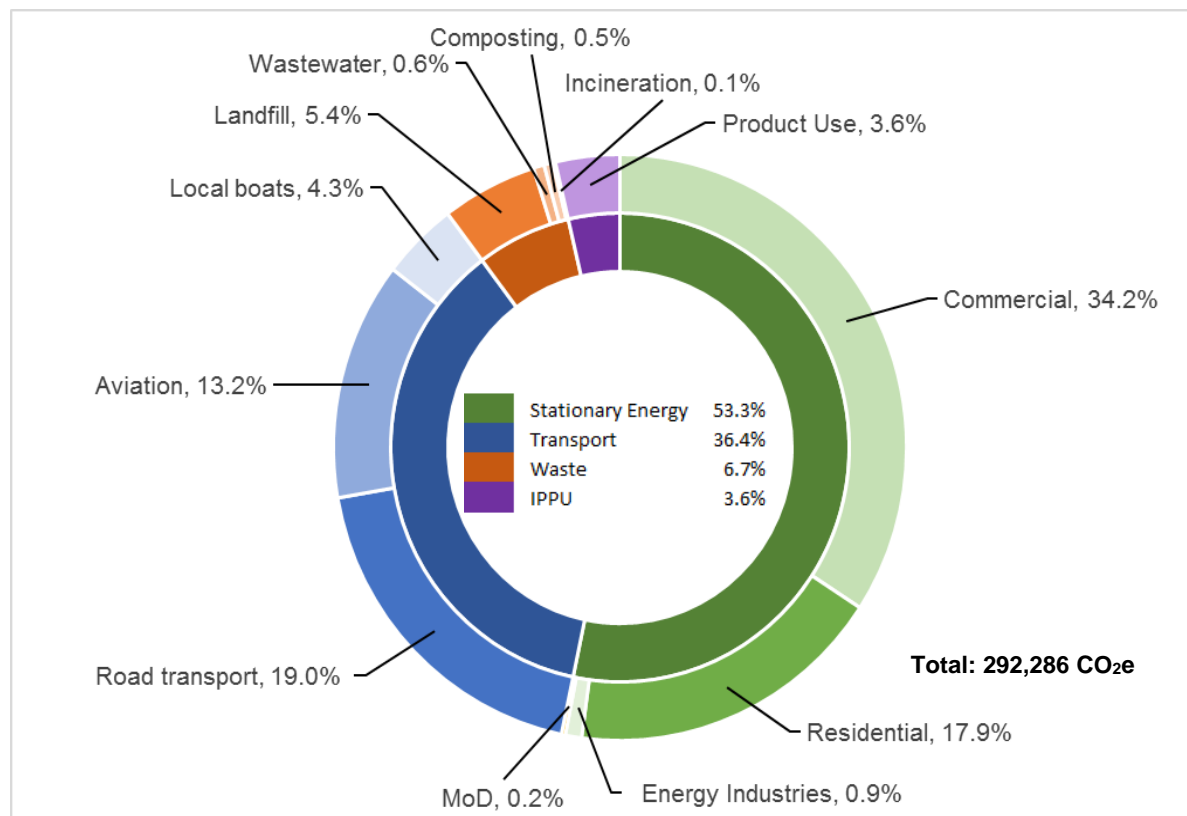
² CO_{2e} values are used to take account of different GHGs having a greater or lesser warming impact than another. A Global Warming Potential (GWP) value is used to convert quantities of different GHGs to a shared unit (CO_{2e}) that can then be directly compared.

³ <https://www.cdp.net/en>

Table 1: Gibraltar's 2017 emissions (tonnes CO₂e) by sector

Sector	'Manageable' emissions	
	Tonnes CO ₂ e	% contribution
Stationary Energy	155,740	53.3%
Transportation	106,496	36.4%
Waste	19,460	6.7%
Industrial Processes and Product Use (IPPU)	10,591	3.6%
TOTAL	292,286	100%

Figure 3: Gibraltar's 2017 'manageable' emissions



Emissions from electricity consumption are the largest source of emissions in Gibraltar, due to the reliance on electricity for nearly all energy needs, the generation technology currently used and the territory's independence from other electricity supply networks. Because gas oil is used to generate electricity, the emissions per kilowatt hour (kWh) are considerably higher than, for example, the UK and other European countries, which use a more diverse mix of fuels and technologies. Emissions from electricity consumption will likely decline as Gibraltar's new LNG power station begins operation, supported by an increasing shift towards renewable sources of power.

Sources that are deemed to be 'outside of scopes' (i.e. they are reported for information in the full report, but are not deemed to be within the influence or responsibility of Gibraltar – such as bunker fuel) would dominate emissions overall if included in emission totals.

Changes between previous inventories and 2017 inventory

The 2017 inventory has been compared against the revised 2016 (2016r) and 2015 (2015r) inventories. There are some differences between the original 2015 inventory⁴, 2016 inventory⁵ and the revised versions used as the comparison in this section; this is due to improvements in methodologies and activity data availability during the compilation of the 2017 inventory, which have been applied

⁴ https://www.gibraltar.gov.gi/new/sites/default/files/HMGoG_Documents/20170601-Gibraltar_City_Inventory_Report_Published.pdf

⁵ https://www.gibraltar.gov.gi/new/sites/default/files/HMGoG_Documents/2016-GibraltarCityInventory_Report_Final.pdf

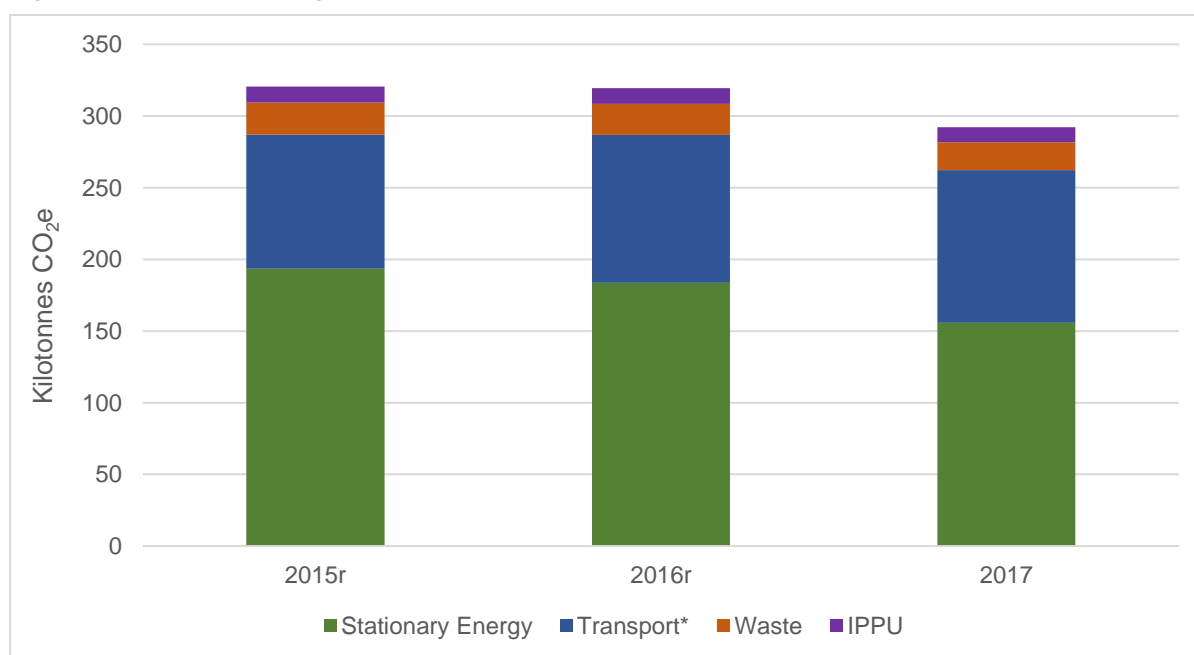
retrospectively to previous year's inventories for consistency and accuracy, following international best practice. Important recalculations are explained in Appendix 2 of the full report accompanying the 2017 inventory.

Emissions from the 2015r, 2016r and 2017 inventories are presented, by sector, in **Table 2** and **Figure 4**.

Table 2: Comparison between the 2015r, 2016r and 2017 inventories

Reporting sector	Emissions (tCO ₂ e)		
	2015r	2016r	2017
Stationary Energy	193,439	183,707	155,740
<i>Transportation (all ⁶)</i>	283,488	376,318	369,279
Transportation (excluding scope 3 shipping)	93,589	103,035	106,496
Waste	22,249	21,561	19,460
IPPU	11,061	10,874	10,591
<i>Other Scope 3 ⁶</i>	3,077,423	3,206,983	3,324,642
Total Manageable emissions	320,338	319,177	292,286

Figure 4: Gibraltar's 'manageable' emissions for 2015r, 2016r and 2017



* Transport emissions excluding scope 3 shipping

Gibraltar's total manageable emissions have decreased by 9% since 2015r and 8% since 2016r; this is a result of the following:

- ↓ Emissions from electricity generation have decreased by 19% since 2015r and 15% since 2016r; this is due to less fuel being used to generate a unit of electricity, implying improvements in efficiency at Gibraltar's electricity power stations. Electricity consumption by residents and activity in Gibraltar remained fairly consistent between 2015 and 2017.
- ↓ Emissions from Waste are around 13% and 10% lower in 2017 than 2015r and 2016r (respectively) due to a reduction in total waste arisings sent to landfill (and composting).
- ↓ Emissions from IPPU have decreased by 4% between 2015r and 2017; this follows trends in UK data that is used as a proxy for Gibraltar's emissions from product use (e.g. air conditioning and refrigeration).

-
- ↑ Emissions from road transport in Gibraltar have increased by 5% due to more fuel being consumed by vehicles in Gibraltar.
 - ↑ Emissions from scope 3 waterborne navigation⁶ are 44% higher in the 2016r inventory than the 2015r inventory, largely due to longer liquid bulk container departing journey lengths in 2016; the reason for this is currently unknown. Trends in other vessel categories were more stable between the two years. These emissions have declined slightly since 2016r.
 - ↑ Emissions from aviation are around 36% higher in 2017 than 2015r, likely due to an increased number of flights to London Gatwick, London Heathrow and Manchester between 2015r and 2016r. Between 2016r and 2017, aviation emissions have increased by 4%, largely due to an increased number of flights to London Gatwick and Manchester.

Future inventories

The continuous improvement programme, covering all of Gibraltar's emissions inventories, has identified further data and methodological improvements which will be pursued in collaboration with HM Government of Gibraltar. This will ensure the emission inventories represent the best possible estimate each year, and provide the most accurate information for both international reporting and local policy.

⁶ not included in Gibraltar's 'manageable' emissions

The Gemini Building
Fermi Avenue
Harwell
Didcot
Oxfordshire
OX11 0QR
United Kingdom

t: +44 (0)1235 753000
e: enquiry@ricardo.com

ee.ricardo.com