Guernsey Annual Greenhouse Gas Bulletin

2018

Issue date March 2020

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States of Guernsey

1.1 Introduction

The Greenhouse Gas Bulletin provides annual updates of Guernsey's greenhouse gas emissions inventory. The data is provided by Aether Limited who compile the figures as part of the UK National Atmospheric Emissions Inventory.

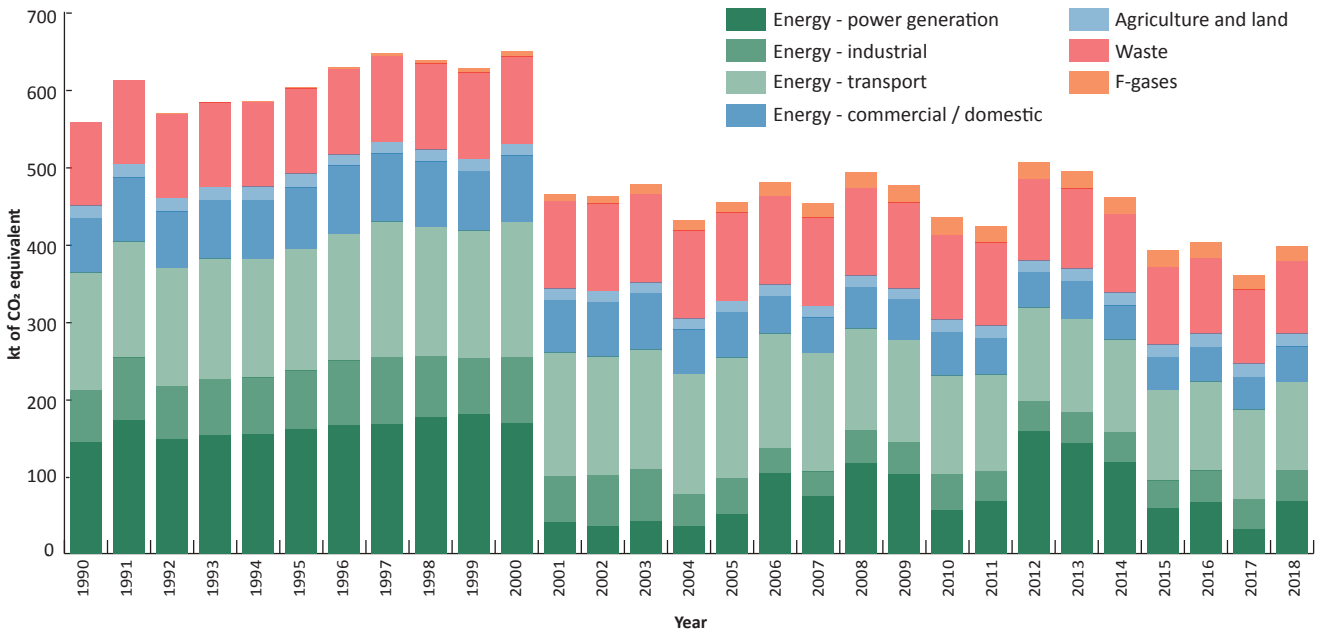
The Kyoto Protocol was extended to the Bailiwick of Guernsey in 2006. The Doha Amendment to the Kyoto Protocol was adopted in 2012 with a commitment period from 2013-2020. Following a formal request, Guernsey remains in discussion with the UK about the timing of having the Doha Amendment to the Kyoto Protocol extended to the Bailiwick of Guernsey. The Doha Amendment to the Kyoto Protocol only enters into force when a certain number of ratifications have occurred. As at mid-February 2020, the required number of ratifications had not been received.

The analysis provided in this bulletin uses 1990 as a base year for comparison. The inventory is the for island of Guernsey only.

1.2 Headlines

- Greenhouse gas emissions from Guernsey increased by 10.3% in 2018, when they totalled 397.1kt of carbon dioxide (CO_2) equivalent, compared to 360.1kt in 2017.
- The cumulative percentage change in Guernsey's greenhouse gas emissions between 1990 and 2018 was a decrease of 28.7% (or 160.1kt of CO_2 equivalent).
- Transport contributed the largest proportion (28.6%) of the greenhouse gases emitted in 2018. Waste contributed a further 23.7%. On island power generation contributed 16.9% (a greatly reduced proportion compared with pre-2001 when the cable link was established).
- The majority (67.3%) of the emissions were in the form of carbon dioxide.
- Compared with 1990 only agriculture and f-gas emissions have increased in volume, agriculture by 0.5 kt of CO_2 equivalent and f-gases by 18.5kt of CO_2 equivalent.

Figure 1.2.1 Total emissions by source



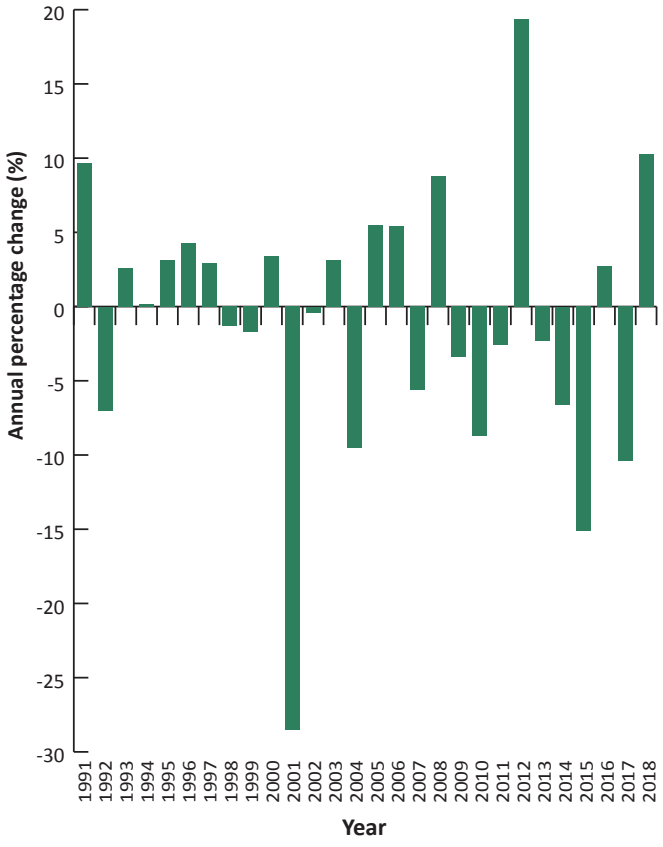
1.3 Key data

Greenhouse gas emissions need to be calculated in a consistent manner across all jurisdictions to ensure comparability and avoid double counting or omissions.

The content and structure of the inventory is based on the categories defined by the United Nations Economic Commission for Europe (UNECE). See **www.unece.org** for more information.

The methodology used to calculate the data is refined each year and the whole data set is revised to ensure comparability between one year and the next. As such, the figures published here should not be compared with those previously published.

Figure 1.3.1 Annual percentage change in total emissions



In 2018, Guernsey's emissions totalled 397.1kt of CO_2 equivalent, which equates to 6.3 tonnes per capita. The total was 10.3% higher than in 2017 (see **Table 1.3.1**) and 28.7% lower than in 1990.

Table 1.3.1 Key data

Date	Total emissions (kt of CO_2 equivalent)	Annual % change	Cumulative % change
1990	557.2		
1991	611.1	9.7	9.7
1992	568.1	-7.0	2.0
1993	583.1	2.6	4.6
1994	584.5	0.2	4.9
1995	602.8	3.1	8.2
1996	628.6	4.3	12.8
1997	646.7	2.9	16.1
1998	638.2	-1.3	14.5
1999	627.6	-1.7	12.6
2000	649.0	3.4	16.5
2001	464.2	-28.5	-16.7
2002	462.2	-0.4	-17.1
2003	476.3	3.1	-14.5
2004	431.0	-9.5	-22.7
2005	454.7	5.5	-18.4
2006	479.4	5.4	-14.0
2007	452.7	-5.6	-18.8
2008	492.5	8.8	-11.6
2009	476.0	-3.4	-14.6
2010	434.4	-8.7	-22.0
2011	423.1	-2.6	-24.1
2012	505.4	19.4	-9.3
2013	493.8	-2.3	-11.4
2014	461.0	-6.6	-17.3
2015	391.4	-15.1	-29.8
2016	402.0	2.7	-27.8
2017	360.1	-10.4	-35.4
2018	397.1	10.3	-28.7

2.1 Emissions inventory - type

Emissions of the greenhouse gases; carbon dioxide, methane, nitrous oxide and fluorinated gases (hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) are all estimated for the inventory. They are all presented in the form of carbon dioxide (CO_2) equivalents for ease of comparison.

In 2018, Guernsey's emissions totalled 397.1kt of CO_2 equivalent, which equates to 6.3 tonnes per capita. The total was 10.3% higher than in 2017 (see **Table 1.3.1**) and 28.7% lower than in 1990.

Table 2.1.1 shows that the majority (267.2 kt) of Guernsey's emissions are in the form of carbon dioxide (CO_2). The main source of these emissions is combustion of fossil fuels for power generation, transport and heating i.e. energy.

The variability in recent years as shown in **Figure 1.2.1** is largely due to changes in the amount of power being generated on island.

Table 2.1.1 Emissions by type

Date	Carbon Dioxide (kt)	Methane (kt of CO_2 equivalent)	Nitrous Oxide (kt of CO_2 equivalent)	F-Gases (kt of CO_2 equivalent)
1990	428.6	116.8	11.8	0.0
1991	481.2	118.0	11.9	0.0
1992	437.2	119.2	11.7	0.0
1993	452.5	118.6	11.6	0.3
1994	452.0	119.7	12.0	0.8
1995	468.5	120.6	12.3	1.4
1996	496.6	117.9	11.8	2.2
1997	512.3	118.8	12.0	3.6
1998	501.6	119.5	12.0	5.1
1999	490.4	119.3	12.1	5.8
2000	509.9	119.9	11.9	7.2
2001	324.7	119.5	11.3	8.7
2002	322.6	118.7	11.0	10.0
2003	334.1	119.5	11.0	11.7
2004	286.9	120.0	10.8	13.1
2005	310.1	119.9	10.8	14.0
2006	331.2	120.4	10.8	17.1
2007	303.3	120.2	10.8	18.4
2008	342.9	118.8	11.0	19.8
2009	327.3	115.5	10.9	22.2
2010	285.7	114.5	11.2	23.0
2011	278.2	112.4	11.3	21.3
2012	362.9	109.4	11.4	21.7
2013	351.4	108.7	11.7	22.1
2014	319.9	107.5	11.8	21.8
2015	253.8	105.0	11.3	21.2
2016	266.9	103.6	11.5	20.0
2017	228.4	101.6	11.6	18.5
2018	267.2	99.6	11.8	18.5

3.1 Emissions inventory - source

Figure 3.1.1 and **Figure 3.1.2** show the proportions of emissions contributed by different sources. This data is also provided in **Table 3.1.1** overleaf.

Transport contributed the largest proportion of emissions in both 1990 and 2018, at 27.2% and 28.6% respectively.

Power generation contributed the second largest proportion in 1990 and the third largest proportion in 2018 (at 25.8% and 16.9% respectively).

Waste contributed 23.7% in 2018 compared with 19.3% in 1990, an increase of 4.4 percentage points.

Industrial combustion contributed 10.3% in 2018 compared with 12.1% in 1990, whilst commercial and domestic combustion went from 12.6% in 1990 to 11.5% in 2018.

Agriculture, land use, land use change and forestry contributed 3.0% in 1990 and 4.3% in 2018.

F-Gases, which contributed less than 0.1% in 1990, contributed 4.7% in 2018.

The changes in terms of emissions by mass, rather than proportions, are given on **pages 8** to **14**.

Figure 3.1.1 Percentage contribution of emissions by source 1990

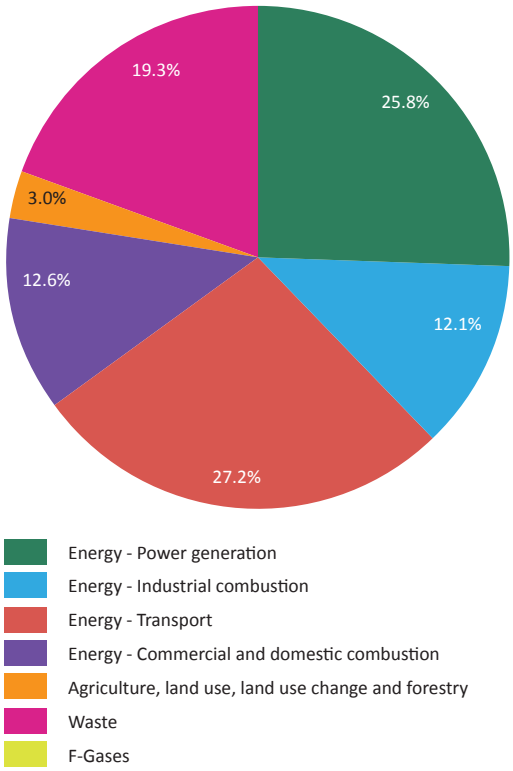
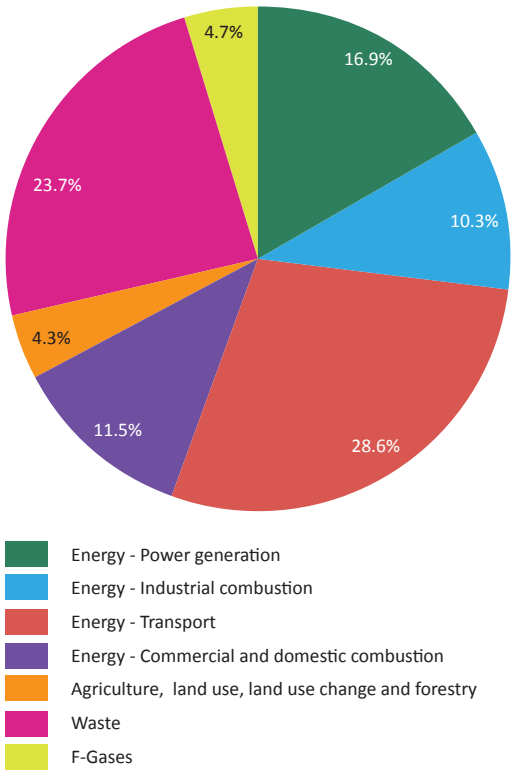


Figure 3.1.2 Percentage contribution of emissions by source 2018



3.1 Emissions inventory - source

The emissions inventory is “source based”, which means it reflects only emissions released from Guernsey. As such, emissions resulting from the generation of electricity in Europe, which is imported for consumption in Guernsey, are not included. Electricity has been imported via a cable link to France since 2001, resulting in a significant decrease in the amount of power generated on-island.

Combustion of fuels for energy (including electricity generation, heating, industrial processes and transport) has contributed the largest proportion of emissions since 1990. The majority of the emissions are in the form of carbon dioxide, but methane and nitrous oxide are also released in the combustion processes. In 2018, emissions from fuels for energy constituted 67.3% of the total emissions.

Landfilled waste is the next largest contributor to Guernsey’s total emissions and the proportion it has contributed has changed little since 1990. The emissions are mostly in the form of methane gas, which is released by decomposing material.

Agriculture, land use, land use change and forestry combined contribute a small proportion of total emissions (4.3% in 2018). The majority of the emissions are methane released by the digestive processes of cattle. Nitrous oxide is also released as a result of the combustion of fuels for energy and as a result of waste disposal and agricultural processes, but at comparatively low levels.

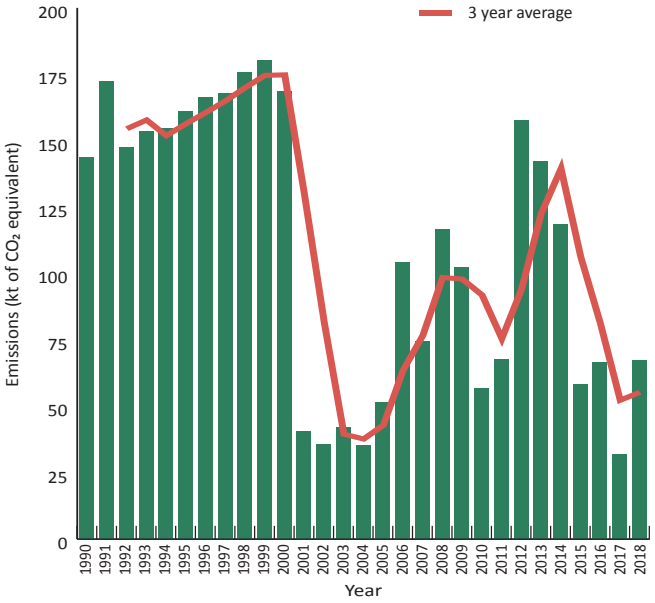
The fluorinated gases (“F-gases”) are not estimated by source in the same way as the other three gases mentioned above. They are associated with chemicals used in refrigeration, air-conditioning and heat pump systems and can be released as greenhouse gases if the systems leak or are disposed of improperly.

More detail and analysis of Guernsey emissions by source is provided over the next pages.

Table 3.1.1 Percentage contribution of emissions by source

	Energy - Power generation (%)	Energy - Industrial combustion (%)	Energy - Transport (%)	Energy - Commercial and domestic combustion (%)	Agriculture, land use, land use change and forestry (%)	Waste (%)	F-gases (%)
1990	25.8	12.1	27.2	12.6	3.0	19.3	0.0
1991	28.2	13.2	24.5	13.6	2.8	17.7	0.0
1992	25.9	12.2	26.8	12.9	3.1	19.1	0.0
1993	26.3	12.4	26.7	13.0	2.9	18.7	0.1
1994	26.5	12.4	26.3	12.9	3.0	18.7	0.1
1995	26.7	12.5	26.1	13.2	3.0	18.3	0.2
1996	26.4	13.2	26.1	14.0	2.3	17.6	0.4
1997	26.0	13.3	27.0	13.6	2.3	17.2	0.5
1998	27.5	12.5	26.1	13.2	2.4	17.5	0.8
1999	28.7	11.5	26.3	12.3	2.4	17.9	0.9
2000	26.0	13.1	26.9	13.3	2.3	17.3	1.1
2001	8.8	12.8	34.4	14.6	3.1	24.3	1.9
2002	7.7	14.2	33.2	15.3	2.9	24.5	2.2
2003	8.8	14.1	32.5	15.3	3.0	23.9	2.5
2004	8.2	9.7	36.0	13.2	3.4	26.5	3.0
2005	11.3	10.1	34.3	13.0	3.1	25.2	3.1
2006	21.7	6.7	30.9	10.2	3.0	24.0	3.6
2007	16.5	6.9	33.9	10.1	3.4	25.2	4.1
2008	23.7	8.7	26.7	10.9	3.0	23.1	4.0
2009	21.5	8.9	27.5	11.1	2.9	23.4	4.7
2010	13.1	10.6	29.4	12.9	3.6	25.2	5.3
2011	16.0	9.1	29.5	11.3	3.7	25.4	5.0
2012	31.2	7.7	24.0	9.0	2.9	20.9	4.3
2013	28.8	8.3	24.3	9.9	3.3	20.9	4.5
2014	25.7	8.3	25.9	9.6	3.7	22.1	4.7
2015	14.9	9.3	29.9	10.8	4.2	25.5	5.4
2016	16.6	10.0	28.8	11.0	4.3	24.4	5.0
2017	8.9	10.7	32.1	11.7	4.8	26.7	5.1
2018	16.9	10.3	28.6	11.5	4.3	23.7	4.7

Figure 4.1.1 Energy emissions - power generation



Combustion of fuels for power generation contributed 16.9% of Guernsey's total greenhouse gas emissions in 2018 (see **Table 3.1.1**). The majority of the emissions are in the form of carbon dioxide, but small amounts of methane and nitrous oxide are also released in the combustion processes.

Electricity has been imported via a cable link to France since 2001, reflected by a 75.9% decrease in power generation emissions between 2000 and 2001 (see **Table 4.1.1**).

Prior to 2000, when all of Guernsey's electricity was generated on island, power generation was the single largest component contributor to Guernsey's total emissions. Some electricity is still generated on island and it is this amount which impacts most noticeably on the total level of emissions.

The amount of electricity generated on island varies from year to year. For example, in 2012 a fault in the cable link to France resulted in the need to generate electricity on island, resulting in an increase in power generation emissions between 2011 and 2012. In the latter part of 2018 there was another cable fault, again leading to increased power generation emissions.

Table 4.1.1 Energy emissions - power generation

	Total emissions (kt of CO_2 equivalent)	Annual % change	Cumulative % change
1990	143.8		
1991	172.3	19.8	19.8
1992	147.4	-14.5	2.5
1993	153.6	4.2	6.8
1994	154.7	0.7	7.5
1995	161.0	4.1	12.0
1996	166.2	3.2	15.5
1997	168.0	1.1	16.8
1998	175.8	4.6	22.2
1999	180.1	2.5	25.3
2000	168.7	-6.4	17.3
2001	40.7	-75.9	-71.7
2002	35.8	-12.0	-75.1
2003	42.0	17.3	-70.8
2004	35.2	-16.2	-75.5
2005	51.5	46.4	-64.2
2006	104.1	102.1	-27.6
2007	74.6	-28.3	-48.1
2008	116.8	56.4	-18.8
2009	102.2	-12.5	-29.0
2010	56.8	-44.4	-60.5
2011	67.7	19.1	-52.9
2012	157.7	133.1	9.7
2013	142.3	-9.8	-1.1
2014	118.4	-16.7	-17.6
2015	58.2	-50.8	-59.5
2016	66.7	14.6	-53.6
2017	31.9	-52.2	-77.8
2018	67.2	110.9	-53.2

In total, the emissions from power generation decreased by 53.2% (or 76.6kt of CO_2 equivalent) between 1990 and 2018.

Table 4.1.2 Energy emissions - industrial combustion

	Total emissions (kt of CO_2 equivalent)	Annual % change	Cumulative % change
1990	67.4		
1991	80.6	19.7	19.7
1992	69.2	-14.2	2.7
1993	72.1	4.2	7.1
1994	72.6	0.7	7.8
1995	75.6	4.1	12.2
1996	83.0	9.7	23.1
1997	86.3	4.0	28.0
1998	79.8	-7.5	18.4
1999	72.3	-9.4	7.3
2000	85.1	17.6	26.2
2001	59.6	-30.0	-11.6
2002	65.6	10.2	-2.6
2003	67.2	2.4	-0.3
2004	41.9	-37.6	-37.7
2005	45.8	9.2	-32.0
2006	32.2	-29.7	-52.2
2007	31.5	-2.3	-53.3
2008	42.6	35.6	-36.7
2009	42.5	-0.3	-36.9
2010	45.9	8.0	-31.9
2011	38.6	-15.8	-42.7
2012	38.9	0.6	-42.3
2013	41.2	6.1	-38.8
2014	38.4	-6.8	-43.0
2015	36.3	-5.5	-46.2
2016	40.2	10.8	-40.3
2017	38.4	-4.4	-42.9
2018	40.8	6.2	-39.4

Energy emissions also include industrial combustion emissions (relating to building processes, use of generators etc), which decreased by 39.4% (or 26.6kt of CO_2 equivalent) between 1990 and 2018 (see **Figure 4.1.2** and **Table 4.1.2**). The red line on the chart shows the historic three year average.

The majority of the emissions are in the form of carbon dioxide, but small amounts of methane and nitrous oxide are also released in the combustion processes.

This source was the fifth largest contributor to emissions in 2018, at 40.8kt of CO_2 equivalent.

In 2018, emissions from industrial combustion contributed 10.3% to the total.

The methodology behind the calculations is constantly being refined and, as such, the figures published here should not be compared with those previously published.

Figure 4.1.2 Energy emissions - industrial combustion

Table 4.1.3 Energy emissions - transport

	Total emissions (kt of CO_2 equivalent)	Annual % change	Cumulative % change
1990	151.8		
1991	150.0	-1.2	-1.2
1992	152.0	1.3	0.1
1993	155.6	2.4	2.5
1994	153.7	-1.2	1.3
1995	157.1	2.2	3.5
1996	164.1	4.4	8.1
1997	174.8	6.5	15.1
1998	166.4	-4.8	9.6
1999	164.8	-0.9	8.6
2000	174.3	5.7	14.8
2001	159.7	-8.4	5.2
2002	153.3	-4.0	1.0
2003	154.7	0.9	1.9
2004	155.0	0.1	2.1
2005	155.8	0.5	2.6
2006	148.1	-5.0	-2.5
2007	153.3	3.5	1.0
2008	131.4	-14.3	-13.4
2009	131.0	-0.3	-13.7
2010	127.7	-2.5	-15.9
2011	124.9	-2.2	-17.7
2012	121.4	-2.8	-20.0
2013	119.9	-1.2	-21.0
2014	119.4	-0.4	-21.3
2015	117.0	-2.0	-22.9
2016	115.7	-1.1	-23.8
2017	115.7	0.0	-23.8
2018	113.5	-1.9	-25.2

Emissions from transport decreased between 1990 and 2018 by 25.2% (38.3kt of CO_2 equivalent) to 113.5kt of CO_2 equivalent (see **Figure 4.1.3** and **Table 4.1.3**). The red line on the chart shows the historic three year average.

Despite this decrease, emissions from this source constituted the largest proportion of the total in 2018, when it contributed 42.5% of energy emissions and 28.6% of total emissions.

65% of transport emissions resulted from on-island road transport in 2018, with a further 22% from aviation and 11% from navigation.

Levels of greenhouse gases emitted as a result of transport have generally been trending downwards since a peak in 2000 (see **Figure 4.1.3**).

The majority of greenhouse gas emissions resulting from transport are carbon dioxide. Other non-greenhouse gas air pollutants, such as nitrogen dioxide, sulphur dioxide are also present in vehicle exhaust emissions.

Figure 4.1.3 Energy emissions - transport

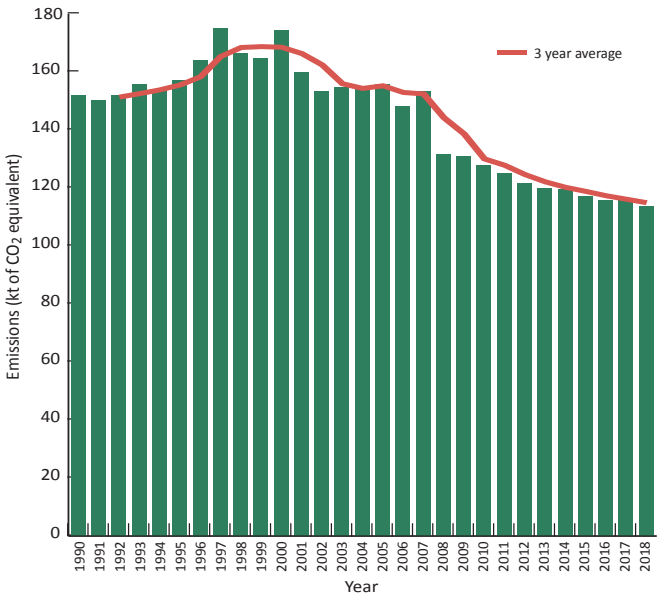


Table 4.1.4 Energy emissions - commercial and domestic combustion

	Total emissions (kt of CO_2 equivalent)	Annual % change	Cumulative % change
1990	70.2		
1991	82.9	18.1	18.1
1992	73.2	-11.7	4.3
1993	75.7	3.5	8.0
1994	75.5	-0.3	7.6
1995	79.4	5.2	13.2
1996	88.0	10.8	25.4
1997	88.0	0.0	25.4
1998	84.0	-4.5	19.7
1999	77.4	-7.9	10.3
2000	86.2	11.3	22.8
2001	68.0	-21.1	-3.1
2002	70.6	3.9	0.7
2003	72.8	3.0	3.7
2004	57.0	-21.6	-18.7
2005	59.0	3.5	-15.9
2006	48.7	-17.5	-30.6
2007	45.5	-6.6	-35.2
2008	53.5	17.5	-23.8
2009	52.8	-1.2	-24.7
2010	56.2	6.4	-19.9
2011	47.6	-15.3	-32.1
2012	45.7	-4.1	-34.9
2013	48.6	6.4	-30.7
2014	44.1	-9.4	-37.2
2015	42.4	-3.7	-39.5
2016	44.4	4.6	-36.7
2017	42.3	-4.8	-39.8
2018	45.6	7.9	-35.0

Commercial and domestic combustion of fuels for heating and hot water in homes and offices etc also contribute a substantial amount of the island's emissions (11.5% of the 2018 total).

The emissions from commercial and domestic combustion were 45.6kt of CO_2 equivalent in 2018, which was 35.0% lower than in 1990 (see **Table 4.1.4**).

The emissions from this source have ranged from 42kt to 88kt of CO_2 equivalent over the twenty-eight years covered by the inventory.

The red line on the chart shows the historic three year average.

Figure 4.1.4 Energy emissions - commercial and domestic combustion

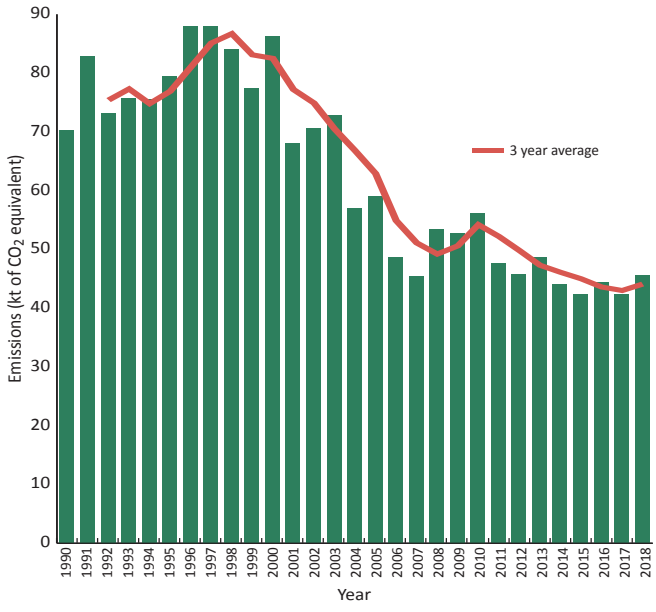


Table 4.2.1 Energy emissions - agriculture, land use, land use change and forestry

	Total emissions (kt of CO_2 equivalent)	Annual % change	Cumulative % change
1990	16.7		
1991	17.3	3.6	3.6
1992	17.8	2.9	6.6
1993	16.6	-6.8	-0.6
1994	17.6	5.6	5.0
1995	18.2	3.4	8.6
1996	14.6	-19.5	-12.6
1997	15.0	2.9	-10.0
1998	15.5	3.3	-7.1
1999	15.0	-3.4	-10.2
2000	15.0	0.1	-10.1
2001	14.6	-3.1	-12.9
2002	13.5	-7.5	-19.4
2003	14.1	4.6	-15.6
2004	14.6	3.1	-13.0
2005	14.1	-3.4	-15.9
2006	14.4	2.6	-13.8
2007	15.3	6.3	-8.3
2008	14.7	-3.9	-11.9
2009	14.0	-5.0	-16.4
2010	15.5	10.9	-7.2
2011	15.5	0.0	-7.2
2012	14.6	-5.8	-12.6
2013	16.2	11.1	-2.9
2014	17.1	5.5	2.5
2015	16.3	-4.6	-2.2
2016	17.1	4.8	2.5
2017	17.2	0.4	2.8
2018	17.3	0.4	3.3

Other emissions include those from agriculture, land use, land use change and forestry (shown in **Figure 4.2.1**), which contributed 4.3% of the total emissions in 2018. The red line on the chart shows the historic three year average.

The majority of these emissions are methane released by the digestive processes of cattle. The decrease between 1995 and 1996 resulted from a change in the way cattle data were sourced.

There was a decrease in the number of cattle in the island in 2001, when the milk quota was reduced, resulting in a reduction in emissions from cattle. Livestock-related emissions have since remained at a steady level. However, there has been a generally increasing trend in total emissions from this source since 2002, due to increasing emissions resulting from land use change.

The total level of emissions from these sources has increased by 3.3% (0.6kt of CO_2 equivalent) between 1990 and 2018.

Figure 4.2.1 Energy emissions - agriculture, land use, land use change and forestry

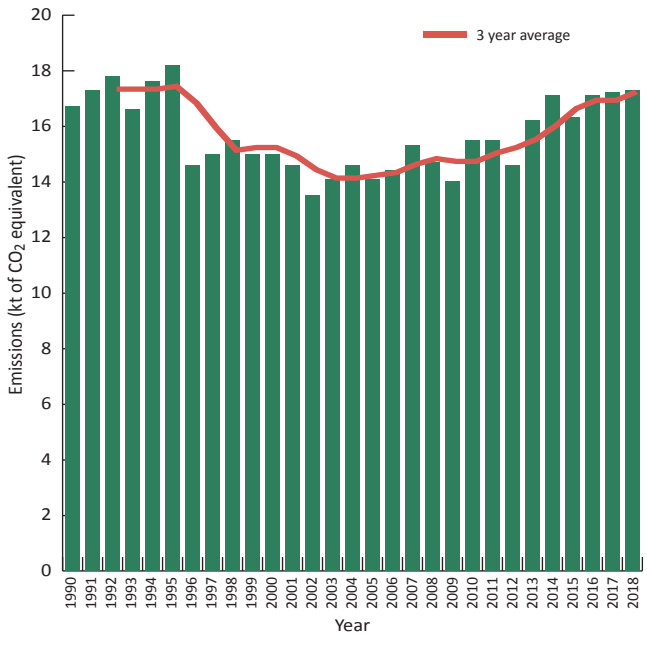


Table 4.3.1 Energy emissions - waste

	Total emissions (kt of CO_2 equivalent)	Annual % change	Cumulative % change
1990	107.3		
1991	107.9	0.5	0.5
1992	108.5	0.5	1.1
1993	109.0	0.5	1.6
1994	109.6	0.5	2.1
1995	110.1	0.5	2.6
1996	110.6	0.4	3.0
1997	111.1	0.5	3.5
1998	111.6	0.5	4.0
1999	112.1	0.5	4.5
2000	112.5	0.4	4.8
2001	113.0	0.4	5.2
2002	113.4	0.4	5.6
2003	113.8	0.4	6.0
2004	114.2	0.3	6.4
2005	114.5	0.3	6.7
2006	114.9	0.3	7.0
2007	114.1	-0.7	6.3
2008	113.7	-0.4	5.9
2009	111.3	-2.1	3.7
2010	109.4	-1.8	1.9
2011	107.5	-1.7	0.1
2012	105.4	-1.9	-1.8
2013	103.4	-1.9	-3.6
2014	101.7	-1.6	-5.2
2015	99.8	-1.9	-7.0
2016	97.9	-1.9	-8.8
2017	96.1	-1.8	-10.5
2018	94.1	-2.1	-12.3

Waste was the second largest contributor to Guernsey's total emissions in 2018. It contributed 23.7% (94.1kt of CO_2 equivalent) of the total emissions in 2018.

The emissions are mostly (94%) in the form of methane gas, which is released as landfilled matter decomposes. In a weight for weight comparison, methane has a twenty one times higher global warming potential than carbon dioxide i.e. one kilotonne of methane is equivalent to 21 kilotonnes of carbon dioxide.

As a result, relatively small changes in the amount of methane emitted equate to considerably larger changes to emissions in terms of CO_2 equivalents.

There have been decreases in the emissions from this source since 2006 (see **Figure 4.3.1** and **Table 4.3.1**). This mirrors the trend in waste going to landfill during these years.

The cumulative decrease between 1990 and 2018 was 12.3% (or 13.2kt of CO_2 equivalent).

Figure 4.3.1 Energy emissions - waste

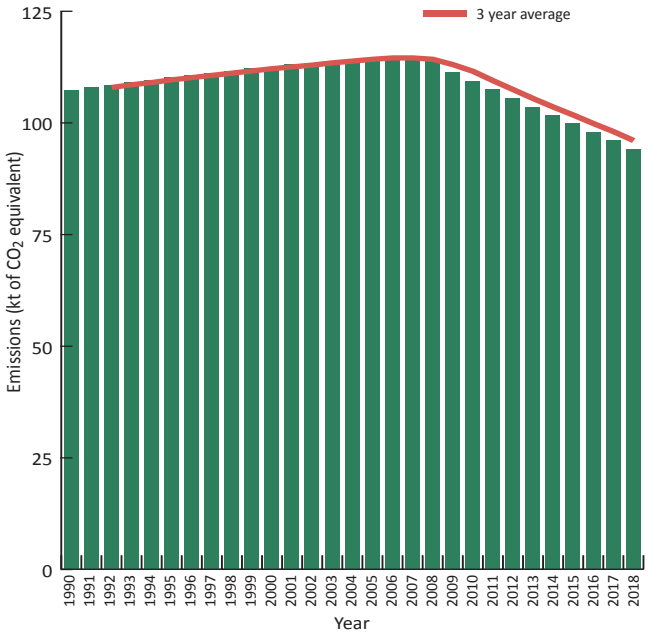


Table 5.1.1 F-gas emissions

	Total emissions (kt of CO_2 equivalent)	Annual % change
1990	0.0	
1991	0.0	0.0
1992	0.0	205.0
1993	0.3	2305.5
1994	0.8	163.1
1995	1.4	79.2
1996	2.2	60.9
1997	3.6	58.1
1998	5.1	43.4
1999	5.8	14.5
2000	7.2	23.9
2001	8.7	20.7
2002	10.0	14.4
2003	11.7	17.7
2004	13.1	11.9
2005	14.0	6.6
2006	17.1	21.8
2007	18.4	7.8
2008	19.8	7.8
2009	22.2	12.0
2010	23.0	3.6
2011	21.3	-7.2
2012	21.7	1.8
2013	22.1	1.5
2014	21.8	-1.2
2015	21.2	-2.6
2016	20.0	-5.8
2017	18.5	-7.5
2018	18.5	0.0

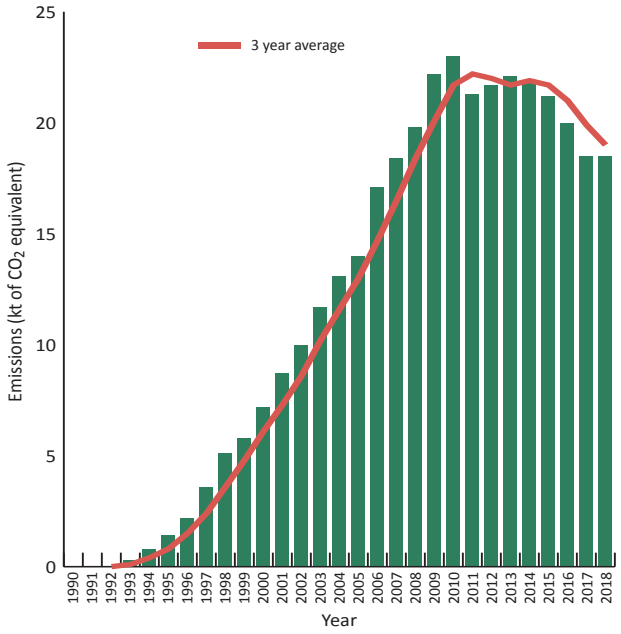
Fluorinated gases ("F-gases") are not estimated by source in the same way as the other three gases mentioned above, but are included in the total greenhouse gas emissions.

F-gases can be released by refrigeration, air-conditioning and heat pump systems if they leak or are disposed of improperly.

In 2018, they contributed 4.7% of the total, compared to less than 0.001% in 1990, an increase of 18.5kt of CO_2 equivalent. The red line on the chart shows the historic three year average.

F-gases have very high global warming potentials compared to carbon dioxide. As such, amounts in the region of one gram in weight could have the same effect as one tonne of carbon dioxide being released into the atmosphere. The result of this is a highly volatile trend in terms of percentage changes.

Figure 5.1.1 F-gas emissions



6.1 Further information

This bulletin has been produced by the States of Guernsey Data and Analysis team. The Guernsey emissions inventory is compiled by Aether, who lead the compilation of the inventories for UK crown dependencies and applicable overseas territories as part of the UK National Atmospheric Emissions Inventory (NAEI), which is developed and maintained by Ricardo Energy & Environment, in collaboration with Aether, CEH, Forest Research, Hartley McMaster and Gluckman Consulting. The NAEI is funded by the Department for Business, Energy & Industrial Strategy (BEIS), Department for Environment, Food and Rural Affairs (Defra), the Scottish Government, the Welsh Government and the Northern Ireland Department of Agriculture, Environment and Rural Affairs.

6.2 Contact details

You may also be interested in other States of Guernsey Data and Analysis publications, which are all available online at **www.gov.gg/data**. Please contact us for further information.

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