

Guernsey Annual Greenhouse Gas Bulletin

2016

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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.



States of Guernsey
Data and Analysis

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.

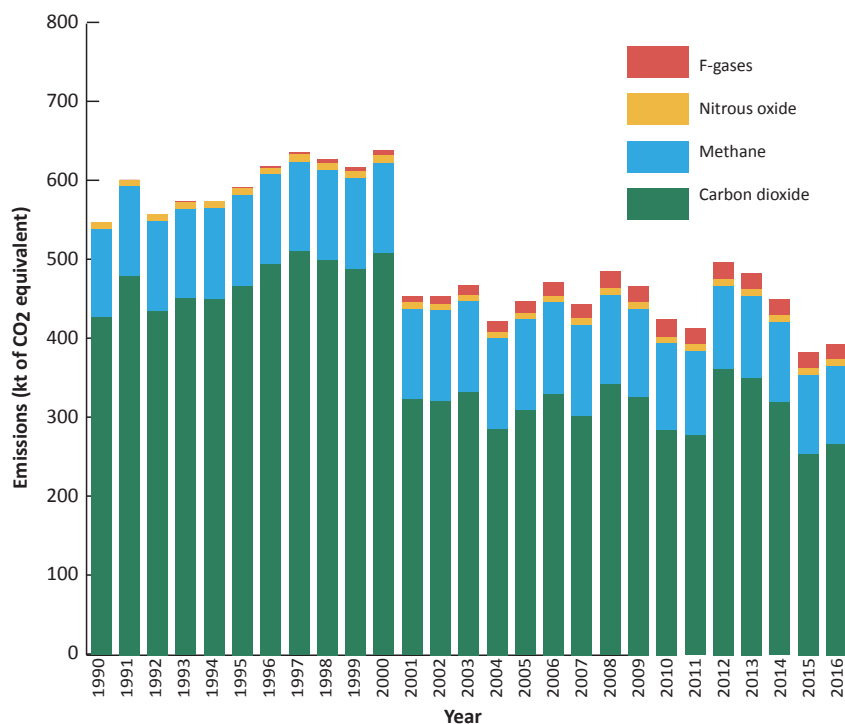
The Kyoto Protocol was extended to the Bailiwick of Guernsey in 2006. The Doha Amendment to the Kyoto Protocol was adopted in 2012 with a commitment period from 2013-2020. Following a formal request, Guernsey is in discussion with the UK about the timing of having the Doha Amendment to the Kyoto Protocol extended to the Bailiwick of Guernsey.

The analysis provided in this bulletin uses 1990 as a base year for comparison.

1.2 Headlines

- Greenhouse gas emissions increased by 2.9% in 2016, when they totalled 398.5kt of carbon dioxide (CO₂) equivalent, compared to 387.3kt in 2015.
- The cumulative percentage change in Guernsey's greenhouse gas emissions between 1990 and 2016 was a decrease of 27.9% (or 153.9kt of CO₂ equivalent).
- Energy from transport contributed the largest proportion (28.6%) of the greenhouse gases emitted in 2016.
- The majority (67.2%) of the emissions were in the form of carbon dioxide.

Figure 1.2.1 Total emissions



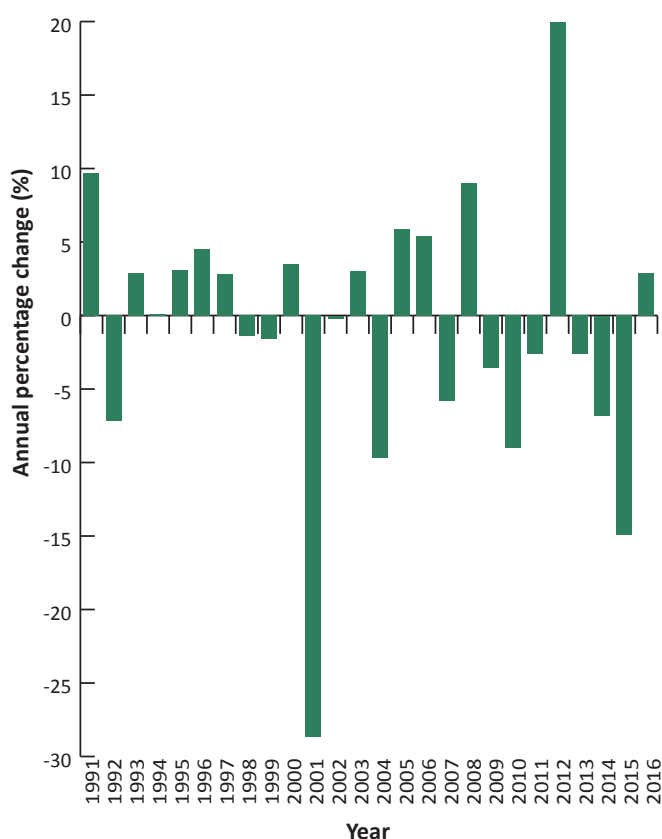
1.3 Key data

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 2016, Guernsey's emissions totalled 398.5kt of CO₂ equivalent, which equates to 6.4 tonnes per capita. The total was 2.9% higher than in 2015 (see [Table 1.3.1](#)) and 27.9% lower than in 1990.

Table 1.3.1 Key data

Date	Total emissions (kt of CO ₂ equivalent)	Annual % change	Cumulative % change
1990	552.4		
1991	606.0	9.7	9.7
1992	562.3	-7.2	1.8
1993	578.4	2.9	4.7
1994	579.0	0.1	4.8
1995	596.7	3.1	8.0
1996	623.6	4.5	12.9
1997	641.3	2.8	16.1
1998	632.4	-1.4	14.5
1999	622.4	-1.6	12.7
2000	644.1	3.5	16.6
2001	459.2	-28.7	-16.9
2002	458.3	-0.2	-17.0
2003	472.2	3.0	-14.5
2004	426.7	-9.7	-22.8
2005	451.9	5.9	-18.2
2006	476.4	5.4	-13.8
2007	448.9	-5.8	-18.7
2008	489.5	9.0	-11.4
2009	471.6	-3.6	-14.6
2010	429.2	-9.0	-22.3
2011	417.9	-2.6	-24.3
2012	501.5	20.0	-9.2
2013	488.2	-2.6	-11.6
2014	455.0	-6.8	-17.6
2015	387.3	-14.9	-29.9
2016	398.5	2.9	-27.9

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 (CO₂) equivalents for ease of comparison.

In 2016, Guernsey's emissions totalled 398.5kt of CO₂ equivalent, which equates to 6.4 tonnes per capita. The total was 2.9% higher than in 2015 (see [Table 1.3.1](#)) and 27.9% lower than in 1990.

[Table 2.1.1](#) shows that the majority (67.2%) of Guernsey's emissions are in the form of carbon dioxide (CO₂). 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	427.7	116.0	8.7	0.0
1991	480.5	116.6	8.8	0.0
1992	436.3	117.2	8.7	0.0
1993	451.6	117.7	8.8	0.3
1994	451.1	118.2	8.9	0.8
1995	467.6	118.6	9.1	1.4
1996	495.5	117.0	8.8	2.3
1997	511.2	117.6	8.9	3.6
1998	500.4	117.9	8.9	5.1
1999	489.2	118.3	9.0	5.9
2000	509.1	118.6	9.0	7.3
2001	324.0	118.0	8.4	8.8
2002	322.0	117.9	8.3	10.1
2003	333.7	118.3	8.3	12.0
2004	286.6	118.4	8.1	13.5
2005	309.8	119.2	8.3	14.5
2006	331.0	119.5	8.3	17.5
2007	303.2	118.6	8.3	18.8
2008	342.8	117.6	8.7	20.3
2009	326.9	115.1	8.6	21.0
2010	285.5	112.9	8.7	22.1
2011	278.1	110.8	8.8	20.2
2012	362.6	108.8	9.0	21.0
2013	351.3	106.9	9.0	21.0
2014	320.1	105.3	9.1	20.5
2015	254.7	103.8	8.9	19.9
2016	267.7	101.8	9.0	19.9

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 2016, at 27.3% and 28.6% respectively. Its contribution to total greenhouse gas emissions was 1.3 percentage points higher in 2016 than in 1990.

Power generation contributed the second largest proportion in 1990 and the third largest proportion in 2016 (at 26.0% and 16.8% respectively).

Waste contributed 24.6% in 2016 compared with 19.4% in 1990, an increase of 5.2 percentage points.

Industrial combustion contributed 10.1% in 2016 compared with 12.2% in 1990, whilst commercial and domestic combustion went from 12.6% in 1990 to 11.0% in 2016.

Agriculture, land use, land use change and forestry contributed 2.4% in 1990 and 3.9% in 2016.

F-Gases, which contributed less than 0.1% in 1990, contributed 5.0% in 2016.

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

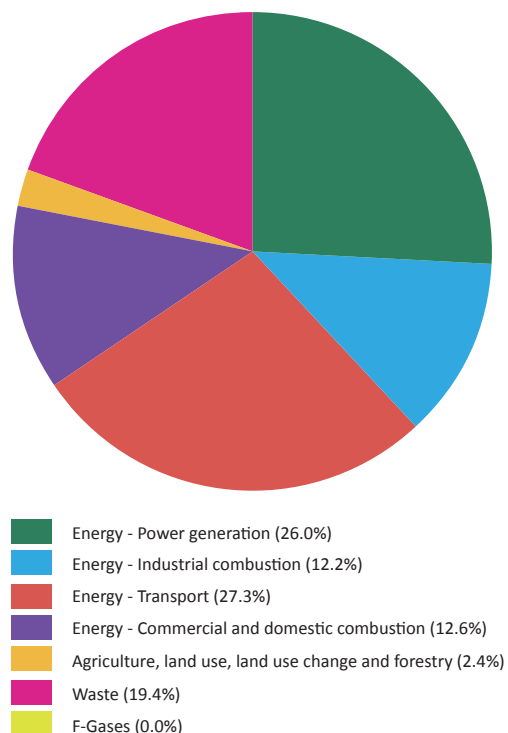
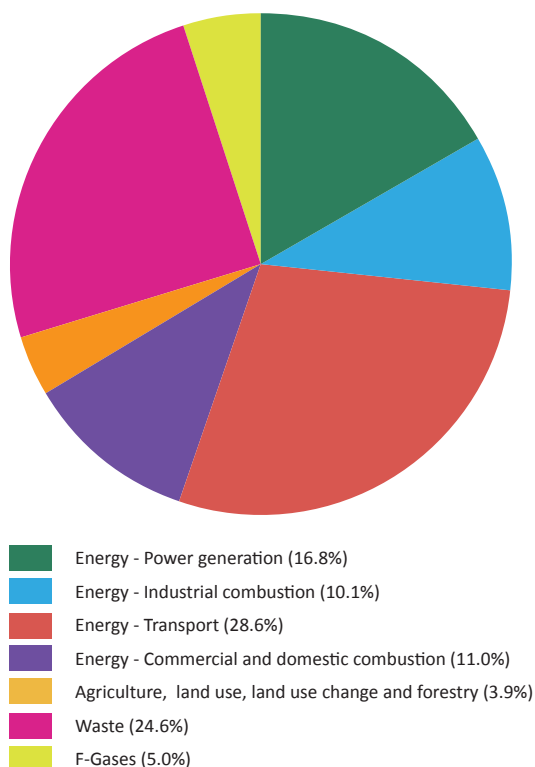


Figure 3.1.2 Percentage contribution of emissions by source 2016



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 2016, emissions from fuels for energy constituted 66.5% 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 (3.9% in 2016). 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.

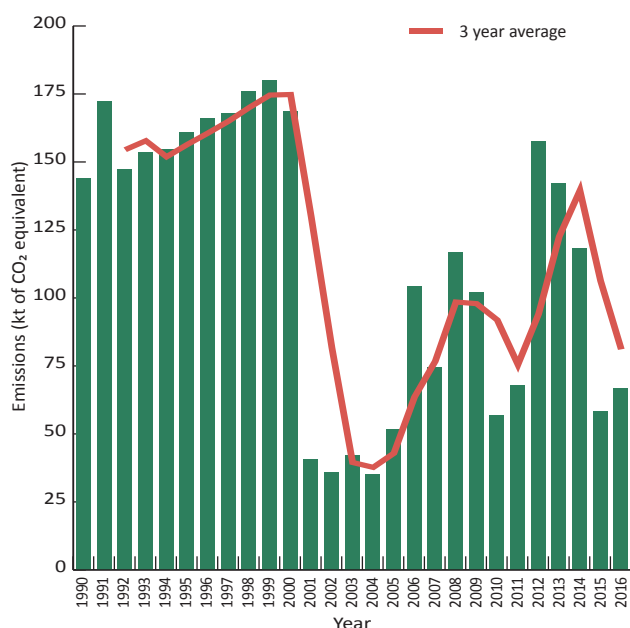
3.1 Emissions inventory - source

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	26.0	12.2	27.3	12.6	2.4	19.4	0.0
1991	28.4	13.3	24.6	13.6	2.2	17.8	0.0
1992	26.2	12.3	26.9	12.9	2.4	19.3	0.0
1993	26.6	12.5	26.7	13.0	2.3	18.8	0.1
1994	26.7	12.5	26.4	13.0	2.3	18.9	0.1
1995	27.0	12.7	26.2	13.2	2.3	18.4	0.2
1996	26.6	13.3	26.1	14.0	1.8	17.7	0.4
1997	26.2	13.4	27.1	13.6	1.8	17.3	0.6
1998	27.8	12.6	26.1	13.2	1.8	17.6	0.8
1999	28.9	11.6	26.3	12.4	1.9	18.0	0.9
2000	26.2	13.2	26.8	13.3	1.8	17.5	1.1
2001	8.9	13.0	34.4	14.7	2.4	24.6	1.9
2002	7.8	14.3	33.1	15.3	2.4	24.8	2.2
2003	8.9	14.2	32.5	15.3	2.4	24.1	2.5
2004	8.3	9.8	36.0	13.3	2.7	26.8	3.2
2005	11.4	10.1	34.1	13.0	2.7	25.4	3.2
2006	21.9	6.8	30.8	10.1	2.7	24.1	3.7
2007	16.7	7.0	33.8	10.0	2.9	25.5	4.2
2008	23.9	8.7	26.5	10.8	2.7	23.3	4.2
2009	21.7	9.0	27.3	11.1	2.8	23.6	4.5
2010	13.3	10.7	29.3	13.0	3.1	25.5	5.2
2011	16.2	9.2	29.4	11.3	3.3	25.7	4.8
2012	31.5	7.7	23.8	9.0	2.8	21.0	4.2
2013	29.2	8.4	24.1	9.9	2.9	21.2	4.3
2014	26.1	8.4	25.8	9.6	3.2	22.4	4.5
2015	15.0	9.4	29.9	10.8	4.0	25.8	5.1
2016	16.8	10.1	28.6	11.0	3.9	24.6	5.0

4.1 Emissions by source - energy

Figure 4.1.1 Energy emissions - power generation



Combustion of fuels for power generation contributed 16.8% of Guernsey's total greenhouse gas emissions in 2016 (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](#)).

Excepting this large change, levels of greenhouse gas emitted from Guernsey as a result of fuel combusted for power generation have generally been trending upwards since 1990 (see [Figure 4.1.1](#)). The red line on the chart shows the historic three year average.

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

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

varies from year to year. 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 of 133.1%. These emissions fell between 2012 and 2014, when the fault was fully repaired. The emissions were back to the pre-fault level in 2015.

In total, the emissions from power generation decreased by 53.6% (or 77.1kt of CO₂ equivalent) between 1990 and 2016.

4.1 Emissions by source - energy

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	82.9	9.7	23.1
1997	86.2	4.0	28.0
1998	79.8	-7.5	18.4
1999	72.3	-9.4	7.3
2000	85.0	17.6	26.2
2001	59.5	-30.0	-11.6
2002	65.6	10.2	-2.6
2003	67.2	2.4	-0.3
2004	41.9	-37.6	-37.8
2005	45.8	9.2	-32.1
2006	32.2	-29.7	-52.3
2007	31.4	-2.3	-53.4
2008	42.6	35.6	-36.8
2009	42.5	-0.3	-37.0
2010	45.8	8.0	-31.9
2011	38.6	-15.8	-42.7
2012	38.8	0.6	-42.4
2013	41.2	6.1	-38.9
2014	38.3	-6.9	-43.1
2015	36.2	-5.5	-46.2
2016	40.2	10.9	-40.4

Energy emissions also include industrial combustion emissions (relating to building processes, use of generators etc), which decreased by 40.4% (or 27.2kt of CO₂ equivalent) between 1990 and 2016 (see [Figure 4.1.2](#) and [Table 4.1.2](#)). The red line on the chart shows the historic three year average.

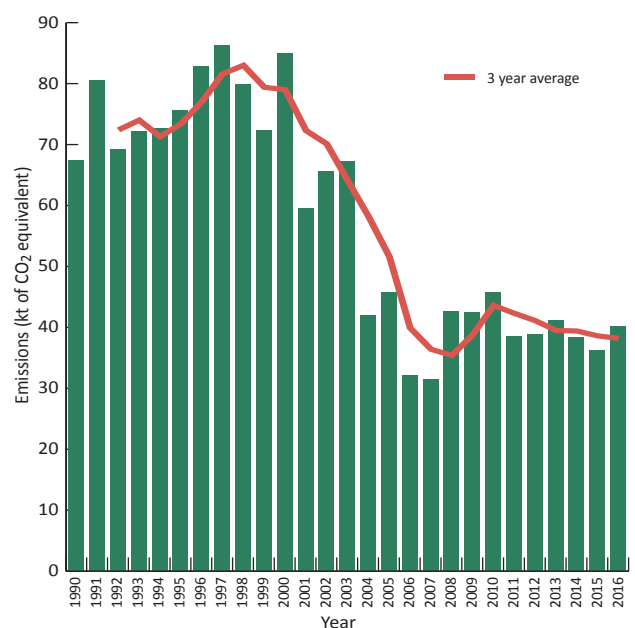
The majority of the emissions are in the form of carbon dioxide, but small amounts of methane and nitrous oxide are also released in the combustion processes.

This source was the fifth largest contributor to emissions in 2016, at 40.2kt of CO₂ equivalent.

In 2016, emissions from industrial combustion contributed 10.1% 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



4.1 Emissions by source - energy

Table 4.1.3 Energy emissions - transport

	Total emissions (kt of CO ₂ equivalent)	Annual % change	Cumulative % change
1990	150.8		
1991	149.3	-1.0	-1.0
1992	151.0	1.1	0.1
1993	154.6	2.4	2.5
1994	152.8	-1.2	1.3
1995	156.1	2.2	3.5
1996	163.0	4.4	8.1
1997	173.6	6.5	15.1
1998	165.2	-4.8	9.5
1999	163.6	-1.0	8.5
2000	172.5	5.4	14.4
2001	157.9	-8.5	4.7
2002	151.5	-4.0	0.5
2003	153.0	1.0	1.5
2004	153.2	0.1	1.6
2005	154.1	0.5	2.1
2006	146.3	-5.0	-3.0
2007	151.5	3.5	0.4
2008	129.6	-14.4	-14.1
2009	128.7	-0.7	-14.7
2010	125.5	-2.5	-16.8
2011	122.8	-2.2	-18.6
2012	119.0	-3.1	-21.1
2013	117.6	-1.2	-22.0
2014	117.3	-0.2	-22.2
2015	115.5	-1.5	-23.4
2016	114.1	-1.3	-24.4

Emissions from transport decreased between 1990 and 2016 by 24.4% (36.7kt of CO₂ equivalent) to 114.1kt of CO₂ equivalent (see **Figure 4.1.3** and **Table 4.1.3**). The red line on the chart shows the historic three year average.

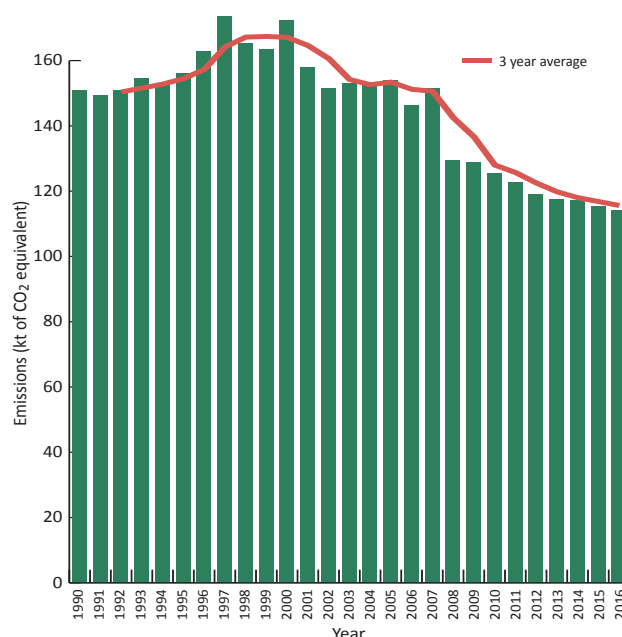
Despite this decrease, emissions from this source constituted the largest proportion of the total in 2016, when it contributed 43.1% of energy emissions and 28.6% of total emissions.

Almost 70% of transport emissions resulted from on-island road transport in 2016, with a further 20% from aviation.

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



4.1 Emissions by source - energy

Table 4.1.4 Energy emissions - commercial and domestic combustion

	Total emissions (kt of CO ₂ equivalent)	Annual % change	Cumulative % change
1990	69.6		
1991	82.4	18.3	18.3
1992	72.7	-11.8	4.4
1993	75.2	3.5	8.0
1994	75.0	-0.3	7.7
1995	78.9	5.2	13.3
1996	87.4	10.8	25.6
1997	87.5	0.0	25.6
1998	83.5	-4.6	19.9
1999	76.9	-7.9	10.4
2000	85.6	11.4	23.0
2001	67.4	-21.2	-3.1
2002	70.1	3.9	0.7
2003	72.2	3.0	3.7
2004	56.5	-21.8	-18.9
2005	58.5	3.6	-16.0
2006	48.1	-17.7	-30.9
2007	44.9	-6.6	-35.5
2008	52.9	17.7	-24.0
2009	52.2	-1.2	-25.0
2010	55.6	6.5	-20.1
2011	47.0	-15.4	-32.4
2012	45.1	-4.1	-35.2
2013	48.1	6.5	-31.0
2014	43.5	-9.5	-37.5
2015	41.9	-3.8	-39.9
2016	43.8	4.6	-37.1

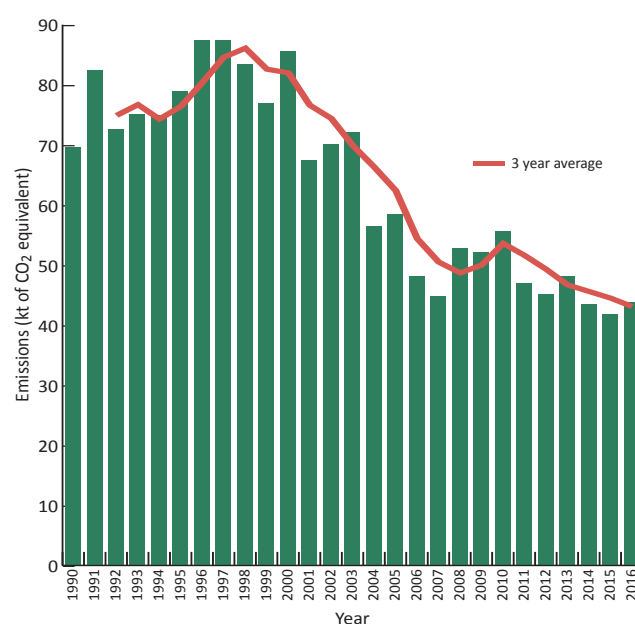
Commercial and domestic combustion of fuels for heating and hot water in homes and offices etc also contribute a substantial amount of the island's emissions (11.0% of the 2016 total).

The emissions from commercial and domestic combustion were 43.8kt of CO₂ equivalent in 2016, which was 37.1% lower than in 1990 (see [Table 4.1.4](#)).

The emissions from this source have ranged from 41kt to over 87kt of CO₂ equivalent over the twenty-seven 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



4.2 Emissions by source - agriculture, land use, land use change and forestry

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	13.4		
1991	13.4	-0.2	-0.2
1992	13.5	0.8	0.6
1993	13.5	0.0	0.6
1994	13.5	0.1	0.7
1995	13.5	-0.1	0.6
1996	11.3	-16.8	-16.3
1997	11.4	0.9	-15.5
1998	11.4	0.3	-15.2
1999	11.5	1.0	-14.3
2000	11.6	1.1	-13.4
2001	11.1	-4.5	-17.3
2002	11.0	-0.7	-17.9
2003	11.4	2.9	-15.6
2004	11.5	1.3	-14.4
2005	12.3	7.3	-8.2
2006	12.7	2.7	-5.7
2007	12.9	1.5	-4.3
2008	13.0	1.1	-3.3
2009	13.2	1.2	-2.1
2010	13.4	2.2	0.0
2011	13.6	1.5	1.5
2012	13.9	1.9	3.4
2013	14.3	3.0	6.5
2014	14.7	2.9	9.6
2015	15.4	4.3	14.4
2016	15.6	1.5	16.0

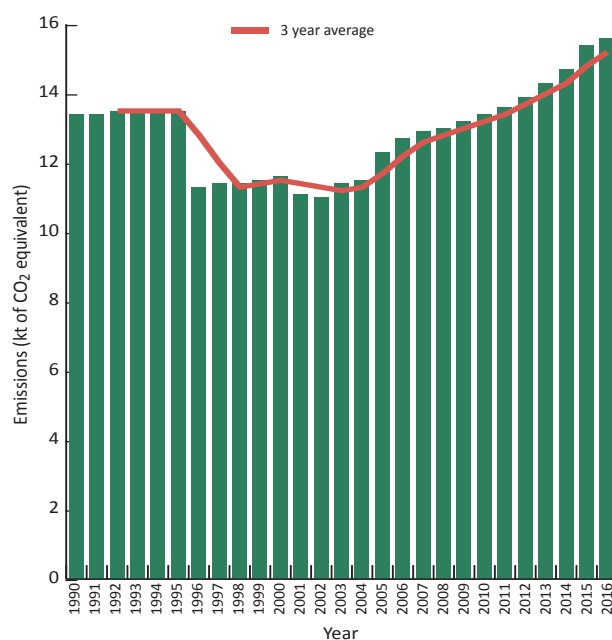
Other emissions include those from agriculture, land use, land use change and forestry (shown in **Figure 4.2.1**), which contributed 3.9% of the total emissions in 2016. The red line on the chart shows the historic three year average.

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 16% (2.2kt of CO₂ equivalent) between 1990 and 2016.

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



4.3 Emissions by source - waste

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	99.9	-1.8	-7.0
2016	97.9	-1.9	-8.8

Waste was the second largest contributor to Guernsey's total emissions in 2016. It contributed 24.6% (97.9kt of CO₂ equivalent) of the total emissions in 2016.

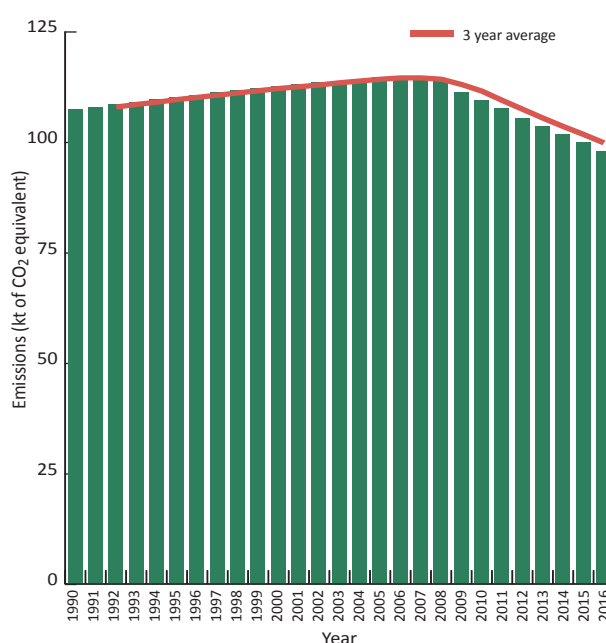
The emissions are mostly (95%) in the form of methane gas, which is released as landfilled matter decomposes. In a weight for weight comparison, methane has a twenty one times higher global warming potential than carbon dioxide i.e. one kilotonne of methane is equivalent to 21 kilotonnes of carbon dioxide.

As a result, relatively small changes in the amount of methane emitted equate to considerably larger changes to emissions in terms of CO₂ 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 2016 was 8.8% (or 9.4kt of CO₂ equivalent).

Figure 4.3.1 Energy emissions - waste



5.1 Emissions - F-gases

Table 5.1.1 F-gas emissions

	Total emissions (kt of CO ₂ equivalent)	Annual % change	Cumulative % change
1990	0.0		
1991	0.0	12.1	12.1
1992	0.0	23.3	38.2
1993	0.3	665.2	957.6
1994	0.8	146.2	2,503.3
1995	1.4	75.9	4,479.8
1996	2.3	59.5	7,204.9
1997	3.6	57.9	11,435.0
1998	5.1	43.5	16,456.6
1999	5.9	14.8	18,899.8
2000	7.3	23.7	23,398.3
2001	8.8	20.9	28,305.6
2002	10.1	15.1	32,586.4
2003	12.0	18.0	38,457.5
2004	13.5	12.8	43,375.6
2005	14.5	7.6	46,688.3
2006	17.5	20.5	56,287.1
2007	18.8	7.7	60,615.5
2008	20.3	7.9	65,411.8
2009	21.0	3.5	67,707.8
2010	22.1	5.0	71,116.3
2011	20.2	-8.6	65,027.0
2012	21.0	4.1	67,673.7
2013	21.0	-0.2	67,561.4
2014	20.5	-2.4	65,965.5
2015	19.9	-2.9	64,021.0
2016	19.9	0.0	64,021.0

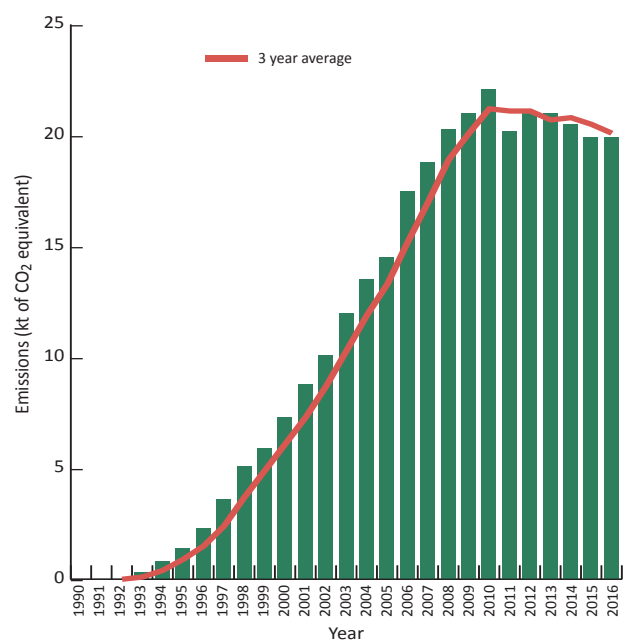
Fluorinated gases (“F-gases”) are not estimated by source in the same way as the other three gases mentioned above, but are included in the total greenhouse gas emissions.

F-gases can be released by refrigeration, air-conditioning and heat pump systems if they leak or are disposed of improperly. They contribute a relatively small, but increasing amount of total emissions (see [Figure 5.1.1](#)). The red line on the chart shows the historic three year average.

In 2016, they contributed 5.0% of the total, compared to less than 0.01% in 1990, an increase of 19.9kt of CO₂ equivalent.

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 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.

E-mail: dataandanalysis@gov.gg

Telephone: (01481) 717292

Write / visit: Data and Analysis
Sir Charles Frossard House
La Charroterie
St Peter Port
Guernsey
GY1 1FH



For more information
go to gov.gg/data