

# Guernsey Annual Greenhouse Gas Bulletin

2015

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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.

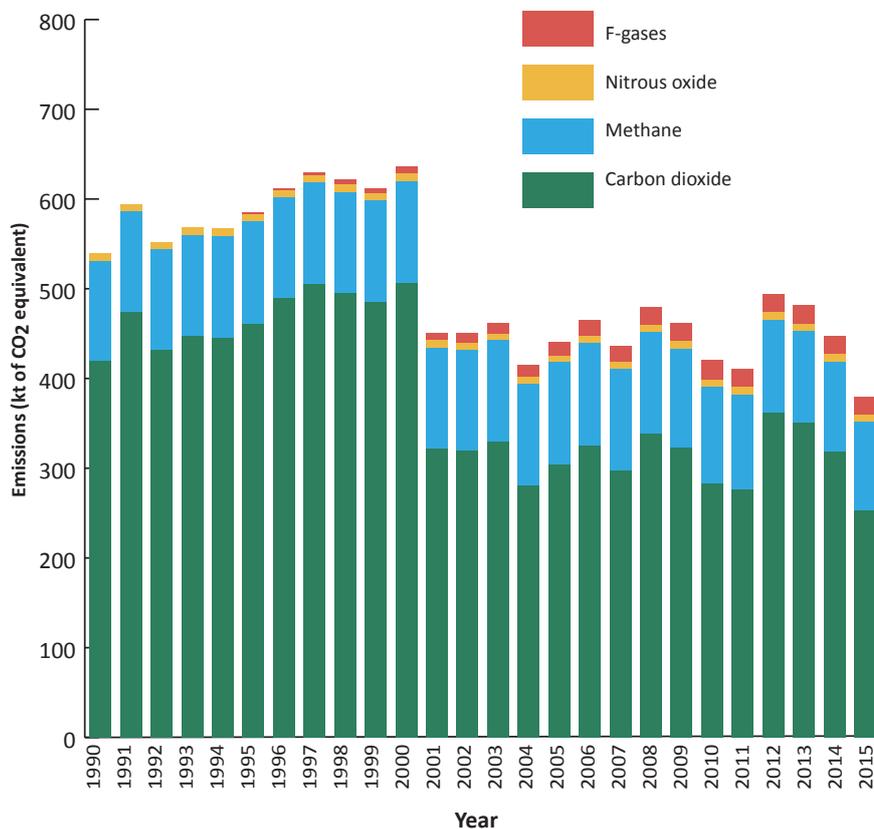
Guernsey has signed up to the Kyoto Protocol, which entered its second commitment period in 2013.

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

# 1.2 Headlines

- Greenhouse gas emissions decreased by 15.0% in 2015, when they totalled 383.2kt of carbon dioxide (CO<sub>2</sub>) equivalent, compared to 451.0kt in 2014.
- The cumulative percentage change in Guernsey’s greenhouse gas emissions between 1990 and 2015 was a decrease of 29.4% (or 159.7kt of CO<sub>2</sub> equivalent).
- Waste contributed the largest proportion (28.8%) of the greenhouse gases emitted in 2015.
- The majority (65.9%) of the emissions were in the form of carbon dioxide.

**Figure 1.2.1 Total emissions**



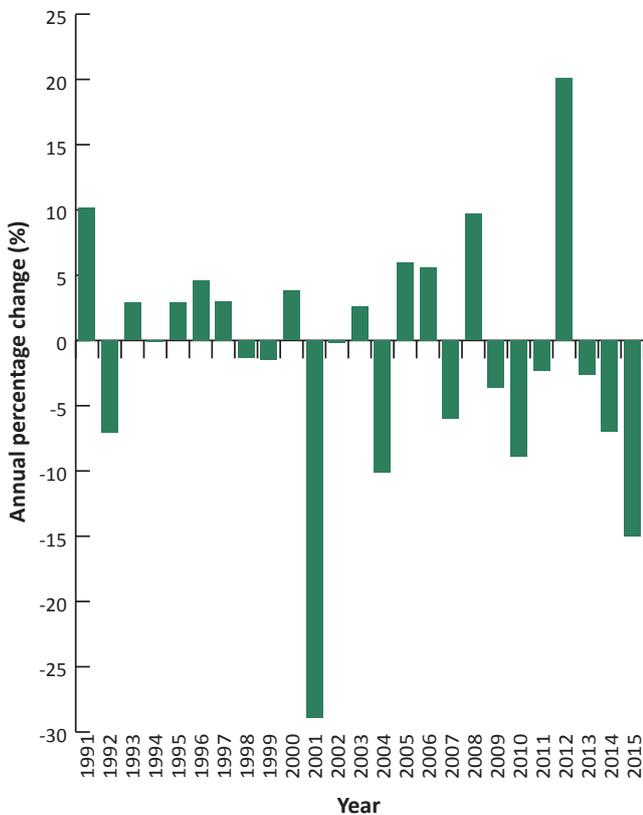
## 1.3 Key data

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](http://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 2015, Guernsey's emissions totalled 383.2kt of CO<sub>2</sub> equivalent, which equates to 6.1 tonnes per capita. The total was 15.0% lower than in 2014 (see [Table 1.3.1](#)) and 29.4% lower than in 1990.

**Table 1.3.1 Key data**

Date	Total emissions (kt of CO <sub>2</sub> equivalent)	Annual % change	Cumulative % change
1990	543.0		
1991	598.1	10.2	10.2
1992	555.6	-7.1	2.3
1993	571.9	2.9	5.3
1994	571.6	-0.1	5.3
1995	588.4	2.9	8.4
1996	615.4	4.6	13.3
1997	633.7	3.0	16.7
1998	625.2	-1.3	15.1
1999	615.9	-1.5	13.4
2000	639.5	3.8	17.8
2001	454.7	-28.9	-16.3
2002	453.8	-0.2	-16.4
2003	465.6	2.6	-14.2
2004	418.7	-10.1	-22.9
2005	443.7	6.0	-18.3
2006	468.4	5.6	-13.7
2007	440.5	-6.0	-18.9
2008	483.3	9.7	-11.0
2009	465.7	-3.6	-14.2
2010	424.1	-8.9	-21.9
2011	414.1	-2.3	-23.7
2012	497.6	20.1	-8.4
2013	484.8	-2.6	-10.7
2014	451.0	-7.0	-16.9
2015	383.2	-15.0	-29.4

## 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<sub>2</sub>) equivalents for ease of comparison.

In 2015, Guernsey's emissions totalled 383.2kt of CO<sub>2</sub> equivalent, which equates to 6.1 tonnes per capita. The total was 15.0% lower than in 2014 (see [Table 1.2.1](#)) and 29.4% lower than in 1990.

[Table 2.1.1](#) shows that the majority (65.9%) of Guernsey's emissions are in the form of carbon dioxide (CO<sub>2</sub>). 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 <sub>2</sub> equivalent)	Nitrous Oxide (kt of CO <sub>2</sub> equivalent)	F-Gases (kt of CO <sub>2</sub> equivalent)
1990	420.1	114.7	8.1	0.0
1991	474.4	115.4	8.2	0.0
1992	431.4	116.0	8.1	0.0
1993	446.9	116.5	8.2	0.3
1994	445.5	116.9	8.3	0.8
1995	461.1	117.3	8.5	1.4
1996	489.3	115.7	8.1	2.3
1997	505.5	116.3	8.3	3.6
1998	495.2	116.6	8.2	5.1
1999	484.6	117.1	8.3	5.9
2000	506.5	117.3	8.4	7.3
2001	321.4	116.7	7.8	8.8
2002	319.4	116.6	7.6	10.1
2003	329.1	117.0	7.6	12.0
2004	280.6	117.2	7.5	13.5
2005	303.5	118.0	7.6	14.5
2006	325.2	118.3	7.7	17.3
2007	296.9	117.3	7.6	18.6
2008	338.8	116.4	8.0	20.1
2009	323.1	113.8	8.0	20.8
2010	282.5	111.7	8.0	21.9
2011	276.1	109.6	8.1	20.3
2012	361.5	107.5	8.4	20.1
2013	350.6	105.7	8.4	20.1
2014	318.2	104.1	8.5	20.3
2015	252.7	102.5	8.3	19.7

### 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.

Power generation contributed the largest proportion of emissions in 1990 at 26.5% . Its contribution to total greenhouse gas emissions was 11.3 percentage points lower in 2015 than in 1990, when it was the third largest contributor at 15.2%.

Waste contributed the largest proportion in 2015 and the third largest proportion in 1990 (at 28.8% and 21.7% respectively). Its contribution to greenhouse gas emissions was 7.1 percentage points higher in 2015 than in 1990.

Transport contributed 26.4% in 2015 compared with 24.1% in 1990, an increase of 2.3 percentage points.

Industrial combustion contributed 9.5% in 2015 compared with 12.4% in 1990, whilst commercial and domestic combustion went from 12.8% in 1990 to 10.9% in 2015.

Agriculture, land use, land use change and forestry contributed 2.5% in 1990 and 4.0% in 2015, an increase of 1.5 percentage points.

F-Gases, which contributed less than 0.1% in 1990, contributed 5.2% in 2015.

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

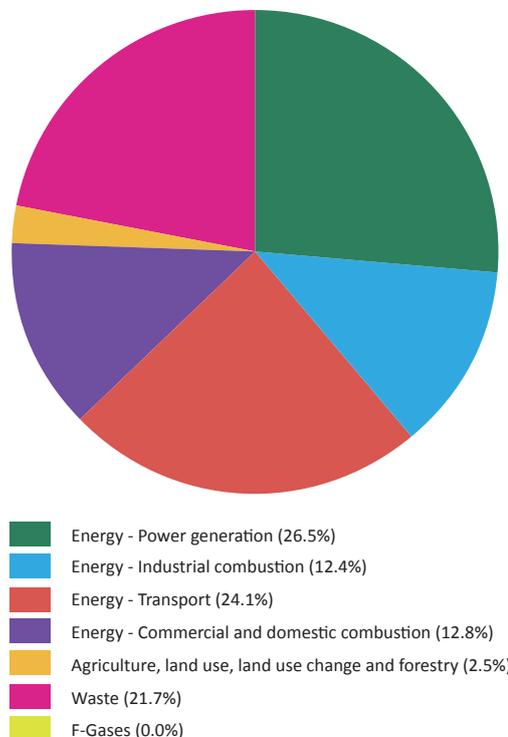
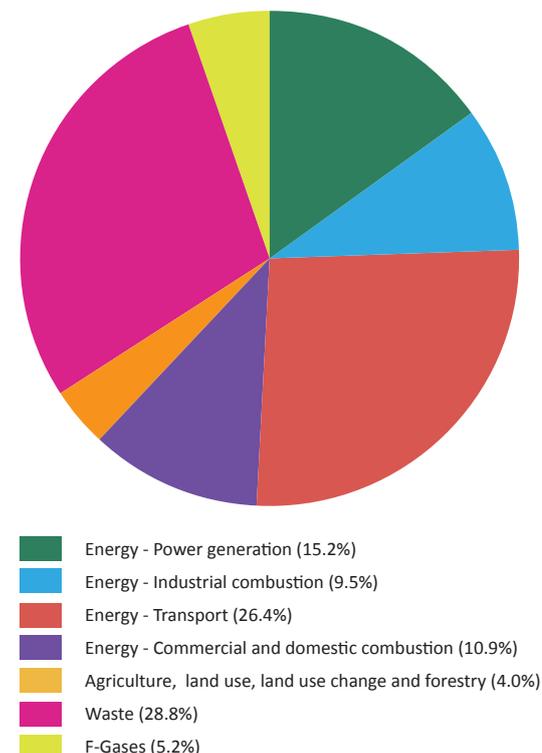


Figure 3.1.2 Percentage contribution of emissions by source 2015



## 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 2015, emissions from fuels for energy constituted 62.1% 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 (4.0% in 2015). 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.

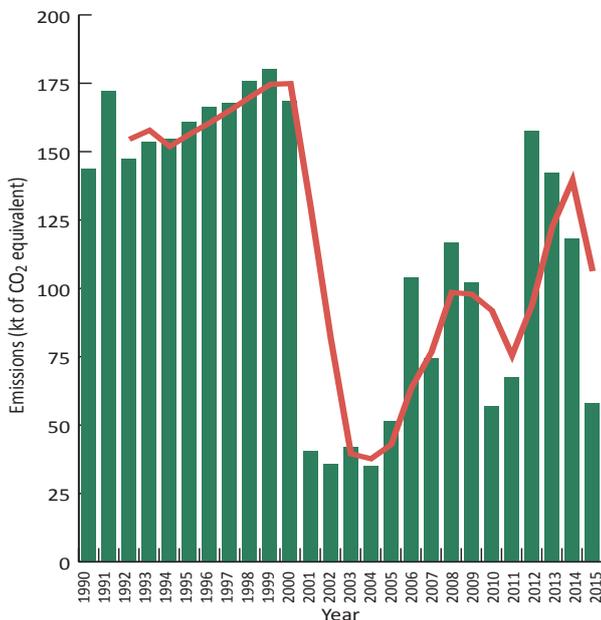
## 3.1 Emissions inventory - source

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	26.5	12.4	24.1	12.8	2.5	21.7	0.0
1991	28.8	13.5	21.9	13.8	2.2	19.8	0.0
1992	26.5	12.5	24.1	13.1	2.4	21.4	0.0
1993	26.9	12.6	24.1	13.2	2.4	20.9	0.1
1994	27.1	12.7	23.6	13.1	2.4	21.0	0.1
1995	27.4	12.8	23.4	13.4	2.3	20.5	0.2
1996	27.0	13.5	23.5	14.2	1.8	19.7	0.4
1997	26.5	13.6	24.6	13.8	1.8	19.2	0.6
1998	28.1	12.8	23.6	13.4	1.8	19.5	0.8
1999	29.2	11.7	23.8	12.5	1.8	19.9	1.0
2000	26.4	13.3	24.7	13.4	1.8	19.2	1.1
2001	9.0	13.1	31.5	14.9	2.4	27.2	1.9
2002	7.9	14.5	30.2	15.5	2.4	27.3	2.2
2003	9.0	14.5	29.3	15.5	2.4	26.7	2.6
2004	8.4	10.0	32.3	13.5	2.7	29.8	3.2
2005	11.6	10.3	30.6	13.2	2.8	28.2	3.3
2006	22.3	6.9	27.4	10.3	2.7	26.8	3.7
2007	17.0	7.1	30.2	10.2	2.9	28.3	4.2
2008	24.2	8.8	23.5	11.0	2.7	25.7	4.2
2009	22.0	9.1	24.2	11.2	2.8	26.2	4.5
2010	13.4	10.8	26.0	13.1	3.1	28.3	5.2
2011	16.4	9.3	26.3	11.4	3.3	28.5	4.9
2012	31.7	7.8	21.3	9.1	2.8	23.3	4.0
2013	29.4	8.5	21.6	9.9	2.9	23.5	4.2
2014	26.3	8.5	22.9	9.7	3.2	24.9	4.5
2015	15.2	9.5	26.4	10.9	4.0	28.8	5.2

## 4.1 Emissions by source - energy

**Figure 4.1.1 Energy emissions - power generation**



Combustion of fuels for power generation contributed 15.2% of Guernsey's total greenhouse gas emissions in 2015 (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 <sub>2</sub> 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

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 59.5% (or 85.6kt of CO<sub>2</sub> equivalent) between 1990 and 2015.

## 4.1 Emissions by source - energy

**Table 4.1.2 Energy emissions - industrial combustion**

	Total emissions (kt of CO <sub>2</sub> 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

Energy emissions also include industrial combustion emissions (relating to building processes, use of generators etc), which decreased by 46.2% (or 21kt of CO<sub>2</sub> equivalent) between 1990 and 2015 (see [Figure 4.1.2](#) and [Table 4.1.2](#)). The red line on the chart shows the historic three year average.

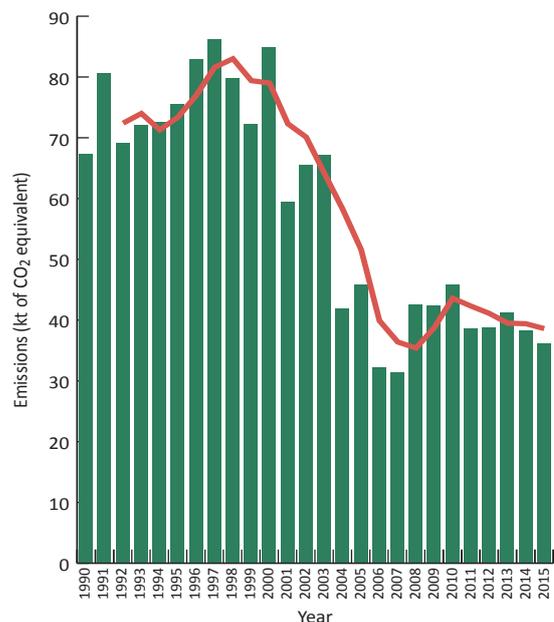
The majority of the emissions are in the form of carbon dioxide, but small amounts of methane and nitrous oxide are also released in the combustion processes.

This source was the fifth largest contributor to emissions in 2015, at 36.2kt of CO<sub>2</sub> equivalent. In 2014 the CO<sub>2</sub> equivalent figure for industrial combustion was 38.3kt.

In 2015, emissions from industrial combustion contributed 9.5% 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 <sub>2</sub> equivalent)	Annual % change	Cumulative % change
1990	131.0		
1991	131.1	0.1	0.1
1992	133.9	2.1	2.2
1993	137.7	2.9	5.1
1994	135.0	-2.0	3.1
1995	137.5	1.8	4.9
1996	144.6	5.2	10.4
1997	155.7	7.7	18.9
1998	147.8	-5.1	12.8
1999	146.8	-0.7	12.1
2000	157.5	7.3	20.2
2001	142.9	-9.2	9.1
2002	136.7	-4.4	4.3
2003	136.1	-0.4	3.9
2004	134.9	-0.9	3.0
2005	135.5	0.4	3.4
2006	128.2	-5.4	-2.2
2007	132.9	3.7	1.5
2008	113.2	-14.8	-13.5
2009	112.6	-0.6	-14.1
2010	110.2	-2.1	-15.9
2011	108.5	-1.5	-17.1
2012	105.6	-2.7	-19.4
2013	104.6	-0.9	-20.1
2014	103.1	-1.4	-21.3
2015	101.2	-1.9	-22.7

Emissions from transport decreased between 1990 and 2015 by 22.7% (29.8kt of CO<sub>2</sub> equivalent) to 101.2kt of CO<sub>2</sub> equivalent (see **Figure 4.1.3** and **Table 4.1.3**). The red line on the chart shows the historic three year average.

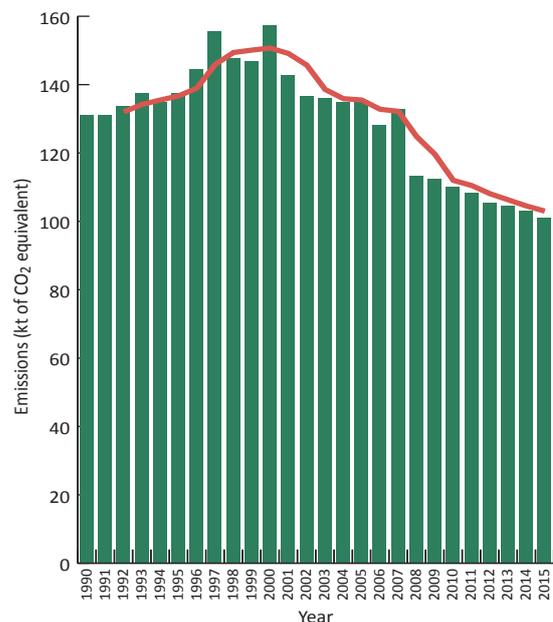
Despite this decrease, emissions from this source constituted the second largest proportion of the total in 2015, when it contributed 42.6% of energy emissions and 26.4% of total emissions.

Similar to previous years, approximately 75% of transport emissions resulted from on-island road transport in 2015.

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 <sub>2</sub> 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	48.2	-17.7	-30.8
2007	44.9	-6.7	-35.5
2008	52.9	17.8	-24.0
2009	52.3	-1.2	-24.9
2010	55.7	6.5	-20.1
2011	47.1	-15.4	-32.4
2012	45.1	-4.1	-35.2
2013	48.1	6.5	-30.9
2014	43.5	-9.5	-37.5
2015	41.9	-3.8	-39.9

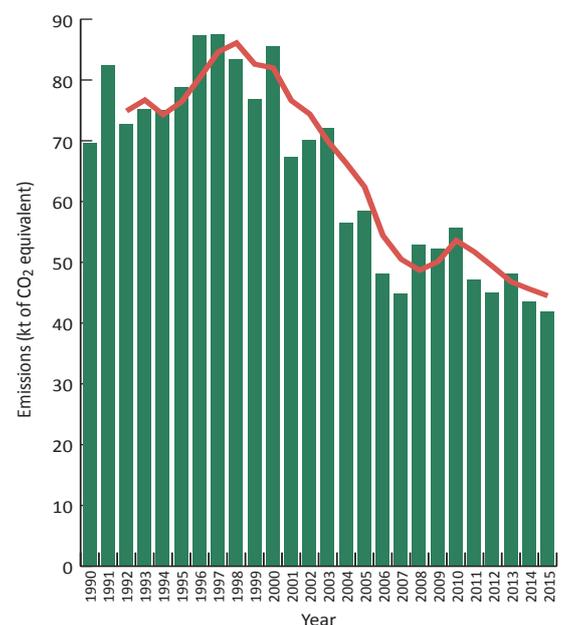
Commercial and domestic combustion of fuels for heating and hot water in homes and offices etc also contribute a substantial amount of the island's emissions (10.9% of the 2015 total).

The emissions from commercial and domestic combustion were 41.9kt of CO<sub>2</sub> equivalent in 2015, which was 39.9% lower than in 1990 and 3.8% lower than in 2014 (see [Table 4.1.4](#)).

The emissions from this source have ranged from 41kt to over 87kt of CO<sub>2</sub> equivalent over the twenty-six 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 <sub>2</sub> 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	11.1	-17.7	-17.2
1997	11.2	0.9	-16.4
1998	11.3	0.3	-16.2
1999	11.4	1.0	-15.3
2000	11.5	1.1	-14.4
2001	11.0	-4.5	-18.3
2002	10.9	-1.0	-19.1
2003	11.2	2.8	-16.8
2004	11.4	1.6	-15.5
2005	12.2	7.4	-9.2
2006	12.5	2.7	-6.7
2007	12.7	1.4	-5.4
2008	12.8	1.0	-4.5
2009	13.0	1.1	-3.4
2010	13.3	2.1	-1.3
2011	13.4	1.5	0.1
2012	13.7	1.9	2.1
2013	14.1	3.0	5.1
2014	14.5	2.9	8.2
2015	15.1	4.3	12.8

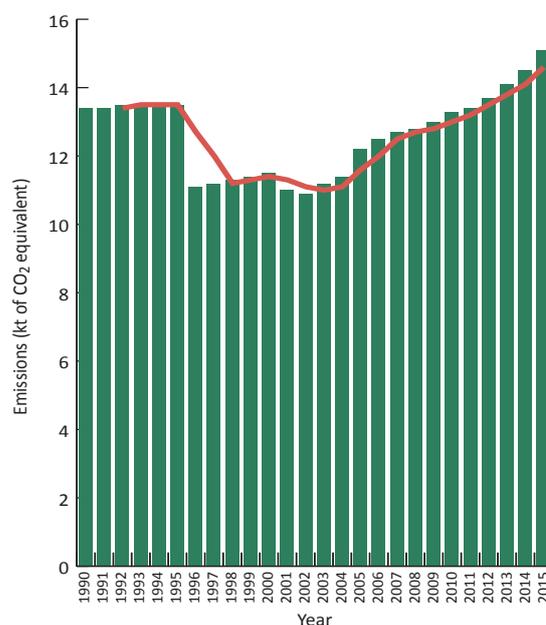
Other emissions include those from agriculture, land use, land use change and forestry (shown in **Figure 4.2.1**), which contributed 4.0% of the total emissions in 2015. The red line on the chart shows the historic three year average.

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 12.8% between 1990 and 2015.

**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 <sub>2</sub> equivalent)	Annual % change	Cumulative % change
1990	117.7		
1991	118.3	0.5	0.5
1992	118.9	0.5	1.0
1993	119.4	0.5	1.4
1994	120.0	0.5	1.9
1995	120.5	0.4	2.3
1996	120.9	0.4	2.7
1997	121.5	0.4	3.2
1998	122.0	0.4	3.6
1999	122.5	0.4	4.1
2000	122.9	0.3	4.4
2001	123.3	0.4	4.8
2002	123.8	0.3	5.1
2003	124.2	0.3	5.5
2004	124.5	0.3	5.8
2005	124.9	0.3	6.1
2006	125.2	0.3	6.4
2007	124.5	-0.6	5.7
2008	124.1	-0.3	5.4
2009	121.7	-1.9	3.4
2010	119.8	-1.6	1.7
2011	117.9	-1.6	0.1
2012	115.8	-1.7	-1.6
2013	113.8	-1.7	-3.3
2014	112.1	-1.5	-4.7
2015	110.3	-1.7	-6.3

Waste was the largest contributor to Guernsey's total emissions in 2015. It contributed 28.8% (110.3kt of CO<sub>2</sub> equivalent) of the total emissions in 2015.

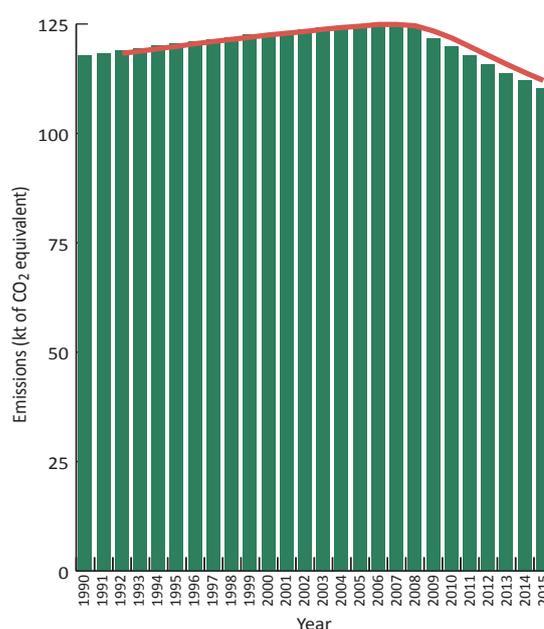
The emissions are mostly (85%) in the form of methane gas, which is released as landfilled matter decomposes. In a weight for weight comparison, methane has a twenty one times higher global warming potential than carbon dioxide i.e. one kilotonne of methane is equivalent to 21 kilotonnes of carbon dioxide.

As a result, relatively small changes in the amount of methane emitted equate to considerably larger changes to emissions in terms of CO<sub>2</sub> 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 2015 was 6.3% (or 7.4kt of CO<sub>2</sub> equivalent). The red line on the chart shows the historic three year average.

**Figure 4.3.1 Energy emissions - waste**



## 5.1 Emissions - F-gases

**Table 5.1.1 F-gas emissions**

	Total emissions (kt of CO <sub>2</sub> 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	18,899.9
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	17.3	19.3	55,699.8
2007	18.6	7.6	59,958.2
2008	20.1	7.9	64,718.2
2009	20.8	3.5	66,985.2
2010	21.9	5.0	70,335.2
2011	20.3	-7.1	65,326.9
2012	20.1	-0.9	64,756.4
2013	20.1	-0.1	64,686.0
2014	20.3	1.2	65,464.5
2015	19.7	-3.0	63,489.2

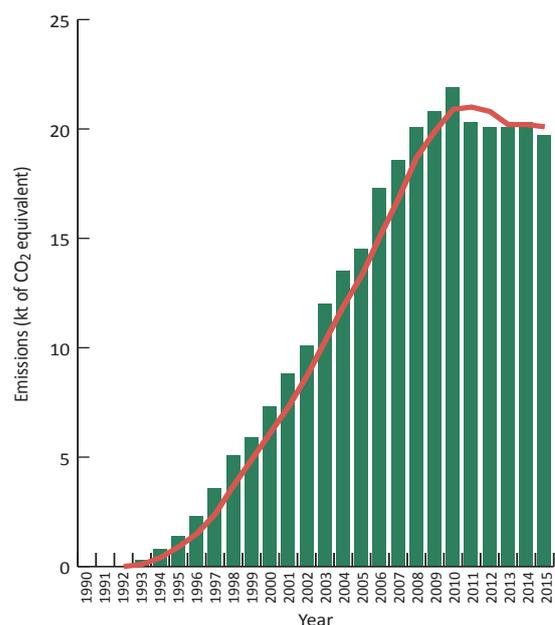
Fluorinated gases (“F-gases”) are not estimated by source in the same way as the other three gases mentioned above, but are included in the total greenhouse gas emissions.

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 2015, they contributed 5.2% of the total, compared to less than 0.01% in 1990, an increase of 19.7kt of CO<sub>2</sub> 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-AEA, in collaboration with Aether, CEH, AMEC and SKM Enviros. The NAEI is funded by the Department of Energy and Climate Change (DECC), Department for Environment, Food and Rural Affairs (Defra), the Scottish Government, the Welsh Government and the Department of Environment, Northern Ireland.

## 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](http://www.gov.gg/data). Please contact us for further information.

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