

Statistics Jersey: www.gov.je/statistics

Overview

This report examines supply and use of energy in Jersey through the importation, distribution and consumption of fuels such as petroleum products and electricity.

The focus of the report is on energy supply and use in 2018. Figures are also presented for calendar years 2014 to 2017. Longer term trends, going back to 1991, are shown for road fuel consumption and for electricity importation and generation.

The energy data presented in this report provides the basis for calculating carbon emissions for Jersey. Through the UK, Jersey is a signatory to the Kyoto Protocol; the document “Pathway 2050: An Energy Plan for Jersey”¹ outlines how the Island intends to reduce its carbon emissions in line with the commitments of the UK and other European nations.

Jersey’s energy data is submitted annually to the compilers of the UK’s national greenhouse gas inventory, Aether, who independently verify and validate the data using internationally agreed methodologies. The resultant emissions calculated for Jersey are published by Aether² and submitted to the international inventories as part of the UK’s national inventory.

Summary for 2018

Supply

- almost all of Jersey’s energy supply was imported; about 2% was produced on-Island as electricity generated by the Energy from Waste Facility
- petroleum products accounted for almost two-thirds (63%) of Jersey’s energy supply; electricity (imported and on-Island generated) accounted for the remainder (37%)
- Jersey’s total primary energy supply (TPES) was 2% higher than in 2017

Use

- total final energy consumption (FEC) was 2% higher than in 2017
- energy consumption per head of resident population was 1.4 toe³ and was below that of the UK (2.1 toe)
- of total energy used, more than a third (38%) was by households, a similar proportion (34%) for transportation (predominantly road) and over a quarter (28%) by industry and government

¹ www.gov.je/government/pages/statesreports.aspx?reportid=1039

² www.gov.je/Environment/GenerateEnergy/GreenHouseEmissions/Pages/GreenhouseGasEmissions.aspx

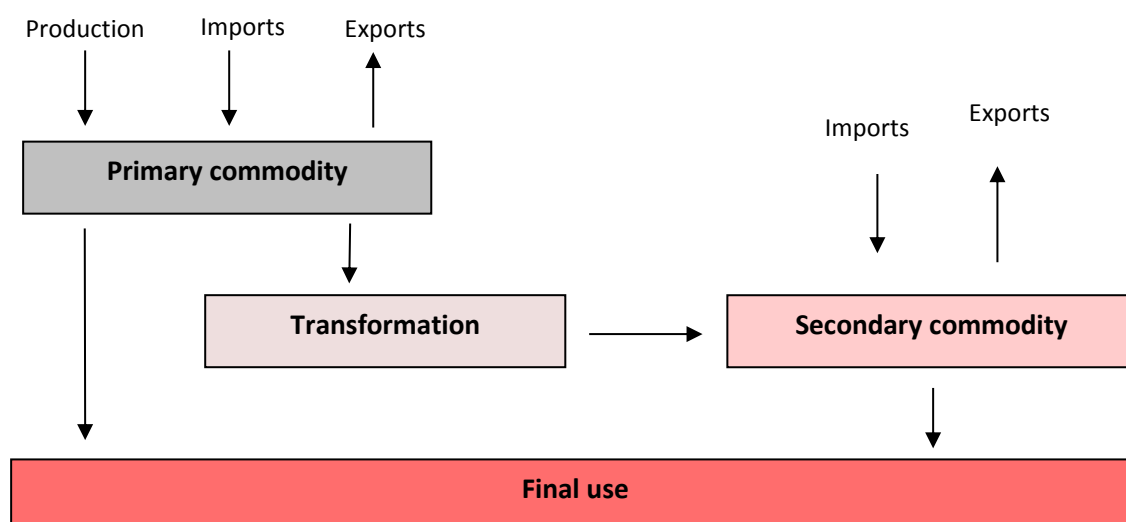
³ A toe (tonne of oil equivalent) is a unit of energy which represents the quantity of energy released through burning one tonne of crude oil; 1 toe =11,630 kWh or 10 million kilocalories.

Introduction

Energy is supplied to Jersey predominantly through imports; there is also a small amount of on-Island production. The primary supply of energy is either distributed to consumers in its original form or is transformed into different sources of energy; for example, petroleum products can be burned to generate electricity. Some energy is also used in such transformation processes and some is lost during transmission and distribution to consumers. The final uses of energy include consumption by households, industry, government and for transportation.

The supply and use of each individual type of fuel ('commodity') may be considered by means of a commodity balance. Figure 1 outlines a commodity balance, showing how a primary commodity may be either used directly by consumers or transformed into a secondary commodity before then being used.

Figure 1 - Commodity Balance outline



Energy balance

The overall flow of energy in Jersey may be examined by combining all of the individual commodity balances into an "energy balance" which shows the energy flows from production to final use, including movements between fuel categories.

Units

Since different fuel types provide different amounts of energy, volume or mass measures (such as litres or tonnes), do not enable fuels to be compared directly from the perspective of energy supply and use. In order to compare and aggregate different fuels within a single framework (the energy balance) fuel quantities are converted into a standardised unit based on calorific value (see Glossary).

The standardised unit of energy used in an energy balance is the toe (tonne of oil equivalent). A toe represents the quantity of energy released through burning one tonne of crude oil; 1 toe = 11,630 kWh or 10 million kilocalories.

Total Primary Energy Supply, TPES

Total primary energy supply (TPES) is defined as the total energy which a jurisdiction imports and produces from its own natural resources, accounting for any changes in stock, and subtracting any exports.

TPES for Jersey predominantly consists of imported petroleum products and imported electricity. Imported electricity is treated as a primary energy supply because it is originally generated outside of the Island. There is also a small contribution to TPES from electricity generated within Jersey by the Energy from Waste Facility (EFW), which was 2% of TPES in 2018.

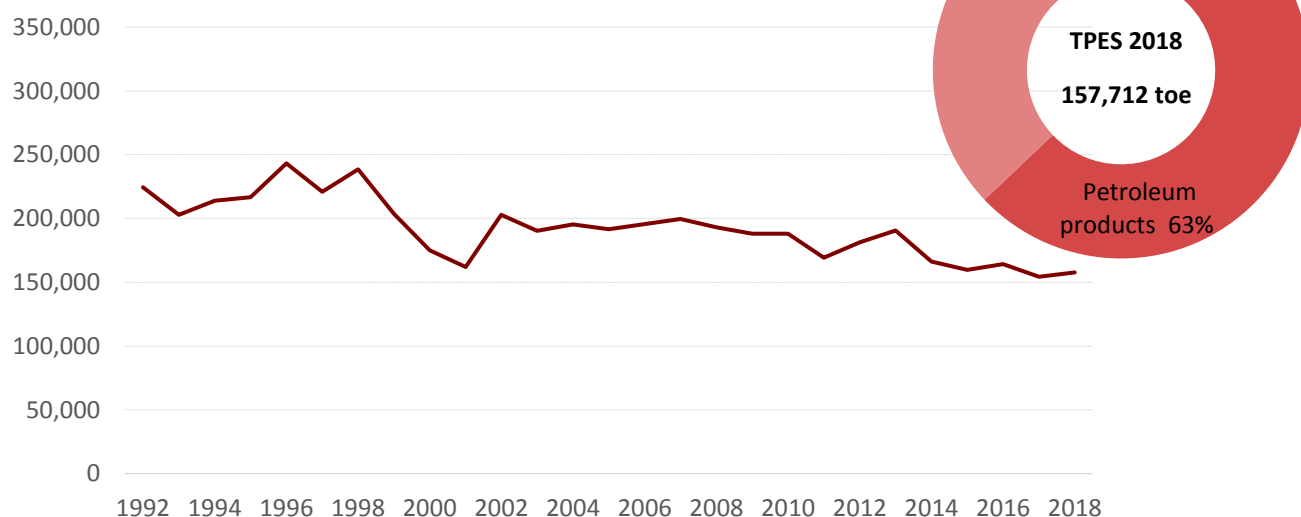
Table 1 shows TPES for each year from 2014 to 2018. Petroleum products accounted for almost two-thirds (63%) of Jersey's TPES in 2018, electricity (imported and on-Island generated) accounted for the remainder (37%), see Figure 2⁴.

Table 1 - Jersey's total primary energy supply (TPES) 2014 to 2018; toe

	2014	2015	2016	2017	2018
TPES	166,287	159,699	164,165	154,293	157,712

TPES in 2018 was 2% higher than in the previous year (2017). The longer term behaviour of Jersey's TPES is shown in Figure 2.

Figure 2 - Jersey's total primary energy supply (TPES), 1992 to 2018; toe



⁴ Throughout this report:

- coal and other solid fuels are not included due to the lack of available data. In 2007, the last year for which such data was compiled, the contribution from coal and other solid fuels to TPES was less than 1%
- electricity generated from private generators (wind, solar etc.) is not included

Figure 2 shows that there are two principal features in the longer term behaviour of Jersey's TPES:

- a reduction in level, from between 200,000 and 250,000 toe during most of the 1990s to between 150,000 and 200,000 toe since the turn of the millennium. A key factor in this reduction in the level of TPES has been the increase in imported electricity and the complementary decrease in imported petroleum products for on-Island electricity generation
- a generally downward trend in TPES since around 2007 due to a range of factors, including a reduction in the use of kerosene for domestic heating and of motor fuels for transportation

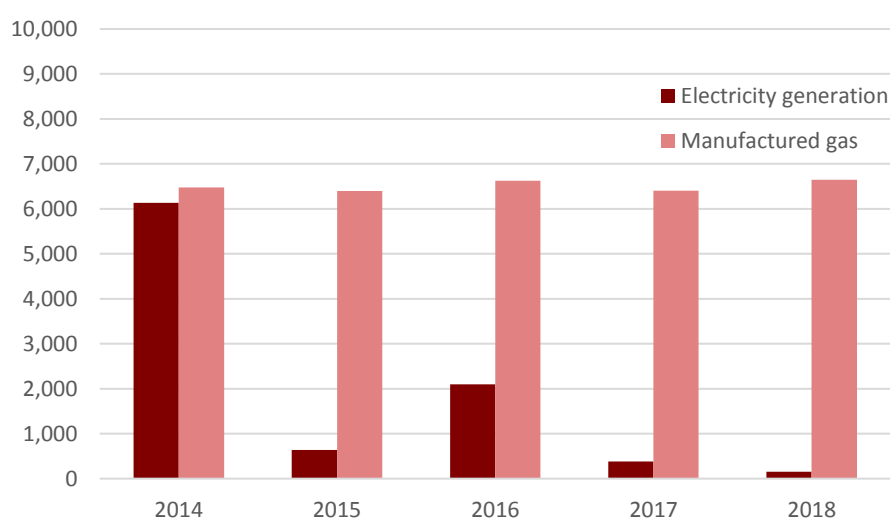
Transformation

Transformation is the process of converting fuel from one form into another which is better suited for specific uses. There is little transformation carried out in Jersey since most fuel is imported in the form that the consumer requires. Transformation processes that do occur in Jersey are:

- the generation of electricity from petroleum products
- the conversion of Liquefied Petroleum Gas (LPG) into a gaseous form (referred to as "manufactured gas") which can then be piped through the Island's gas network

The supply of energy produced by on-Island transformations each year from 2014 to 2018 is shown in Figure 3.

Figure 3 - Energy supply produced by transformation processes, 2014 to 2018; toe



A greater amount of electricity was generated on-Island in 2014, and also in the preceding year 2013, through the burning of petroleum products. This reflects the reduction of imported electricity during these years. More recently, in 2018, Jersey Electricity (JE) used 770 toe of petroleum products to generate 153 toe of electricity.

The quantity of manufactured gas produced in 2018 was at a similar quantity to that in each of the last 5 years (6,648 toe produced in 2018, compared with 6,475 toe in 2014). During the previous decade (2001 to 2010), the quantity of manufactured gas produced each year in Jersey was around 10,000 to 11,000 toe.

Final Energy Consumption

Final energy consumption (FEC) refers to the use of energy by final consumers, either as a primary commodity or as a secondary commodity after any transformations have occurred. The use of energy by the energy industry itself and losses due to transmission and distribution of energy are excluded from FEC.

Table 2 shows Jersey's FEC for each year from 2014 to 2018 and FEC per head of resident population (FEC per capita).

Table 2 - Jersey's final energy consumption (FEC) and per capita 2014 to 2018; toe

	2014	2015	2016	2017	2018
FEC	148,824	152,491	154,969	150,274	152,840
FEC per capita ⁵	1.48	1.50	1.50	1.43	1.44

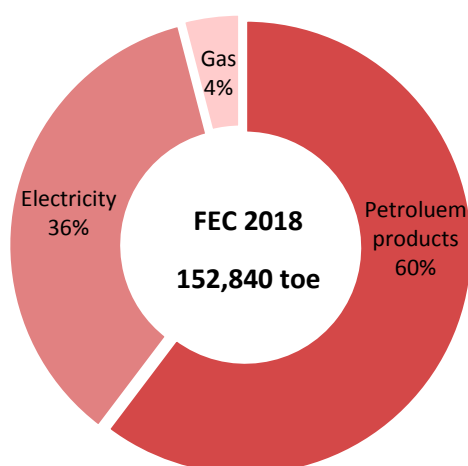
Figures have been revised for previous years, now using mid-year population estimates

In 2018 final energy consumption in Jersey was 2% higher than in 2017. However, over the 5 years from 2014 to 2018, FEC has been relatively flat at around 150,000 toe, acknowledging the effect of warmer or colder winters (see Appendix Table A1).

FEC per capita in Jersey has decreased slightly between 2014 and 2018, from approximately 1.5 to 1.4 toe respectively. Energy consumption per head of population in Jersey in 2018 was below that of the UK (2.1 toe⁶).

In 2018, petroleum products (such as road fuels and heating oil) accounted for three-fifths (60%) of Jersey's FEC (see Figure 4). Electricity accounted for over a third (36%) and manufactured gas the remainder (4%).

Figure 4 - Jersey's total final energy consumption (FEC) by fuel type, 2018; toe



⁵ FEC per capita for Jersey using mid-year population estimates

⁶ FEC per capita for the UK has been derived from:

- FEC: "Energy Consumption in the UK", Department for Business, Energy & Industrial Strategy, July 2019
- Population: 2018 mid-year estimate, Office for National Statistics, June 2019.

Jersey's FEC broken down by fuel type for each year from 2014 to 2018 is shown in Table 3⁷.

Table 3 - FEC by fuel type, 2014 to 2018; toe

	2014	2015	2016	2017	2018
Petroleum products	90,005	92,799	94,585	91,720	92,181
Gas	5,985	6,217	5,636	5,252	6,191
Electricity	52,835	53,475	54,748	53,303	54,468
Total FEC	148,824	152,491	154,969	150,274	152,840

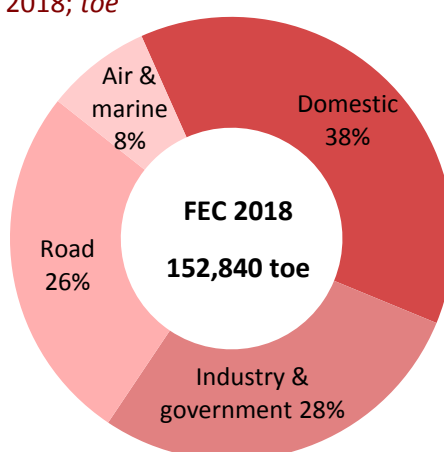
FEC may also be considered in terms of final end use sectors such as households, industry, government and transportation, as shown in Table 4⁷.

Table 4 - FEC by final end use sector, 2014 to 2018; toe

	2014	2015	2016	2017	2018
Industry and government	42,963	42,786	43,843	41,872	43,074
Air and marine ⁸	11,323	11,779	11,735	9,839	11,740
Road	41,396	41,787	41,931	41,194	40,115
Domestic	53,143	56,140	57,460	57,370	57,911
Total FEC	148,824	152,491	154,969	150,274	152,840

In 2018, more than a third (38%) of Jersey's energy was consumed by households (the domestic sector), a similar proportion (34%) was used for transport (road, air and marine⁸) and over a quarter (28%) was consumed by industry and government, see Figure 5.

Figure 5: FEC by final end use sector, 2018; toe



⁷ Throughout this report, numbers have been rounded independently to the nearest integer. Hence, columns may not sum to totals.

⁸ 'Air & marine' covers fuel that is supplied in Jersey, i.e. supplied to commercial airlines and also for private air or marine use whilst in Jersey. The category 'marine' includes both marine diesel and petrol. 'Air' accounts for almost three-quarters of the final energy consumption of the 'Air & marine' sector shown in Table 4 and Figure 5.

Energy Balance

An energy balance shows the flows of all forms of energy within a jurisdiction, from supply to final consumption. This includes transformations, losses and the energy industry's own use⁹, presented in one common unit of measurement (toe).

Table 5 shows the energy balance for Jersey for 2018.

Table 5⁷ - Energy Balance for Jersey, 2018; toe

	Petroleum products	Gas	Electricity	Total
Production	0	0	3,692	3,692
Imports	100,096	0	54,753	154,849
Stock change	-828	0	0	-828
Primary supply	99,268	0	58,445	157,712
Statistical difference ¹⁰	-204	357	37	189
Primary demand	99,472	-357	58,408	157,523
Transformations				
Electricity Generation	-770	0	153	-616
Gas supply	-6,521	6,648	0	127
Energy industry own use and losses	0	100	4,094	4,193
Final consumption	92,181	6,191	54,468	152,840
Industry and government	14,003	3,406	25,665	43,074
Air and marine	11,740	0	0	11,740
Road ¹¹	40,115	0	0	40,115
Domestic	26,323	2,785	28,803	57,911

⁹ See Glossary for definition of terms. For methodology used to construct the energy balance see "Energy Balance: methodology note", UK Department Business, Energy and Industrial Strategy, 2010 at:

<https://www.gov.uk/government/publications/energy-balance-methodology-note>.

¹⁰ Statistical difference is defined as Primary supply minus Primary demand (see Glossary).

¹¹ Electricity consumed in charging electric vehicles is included under Domestic and Industry & government consumption; it is not included under road consumption.

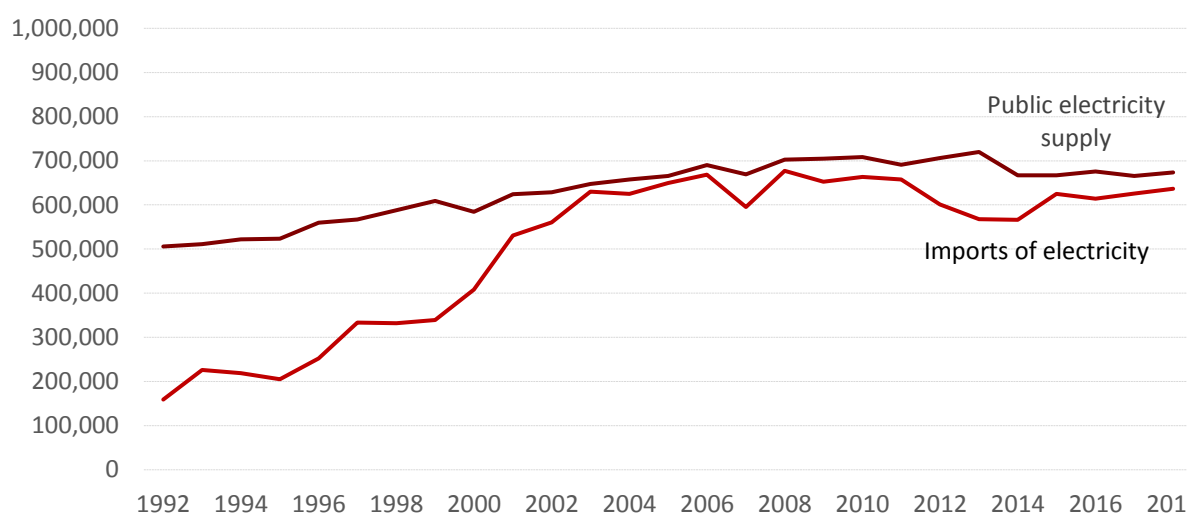
Individual fuel types

This section looks at individual fuels in more detail and in units which are specific to each type of fuel, e.g. electricity in MWh and petroleum products in tonnes.

Electricity

Since 1992, the overall public electricity supply¹² and the proportion of electricity imported into Jersey have increased, see Figure 6.

Figure 6 - Public electricity supply and imports of electricity, 1992 to 2018; MWh



Throughout the 1990s imported electricity accounted for between 40% and 60% of Jersey's public electricity supply. In 2018, this proportion was 95%.

Petroleum products

The category 'petroleum products' covers a range of fuels derived from crude oil. Such products accounted for three-fifths (60%) of Jersey's overall final energy consumption (FEC) in 2018, see Figure 4.

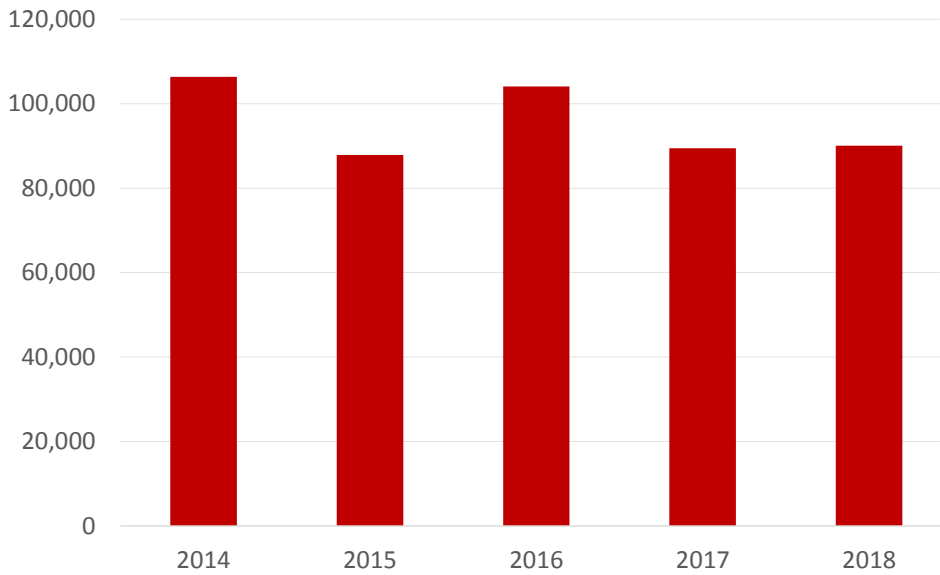
All of the petroleum products supplied and used in Jersey are imported; some 90,000 tonnes of petroleum products were imported in 2018¹³, a similar level to that in 2017.

The imported quantities of various petroleum products in each year from 2014 to 2018 are shown in Figure 7 (see Glossary for description of products included in each category).

¹² Public electricity supply (PES) is electricity provided to consumers through the JE network. PES is the sum of imported electricity (pre-transmission losses) and electricity produced in Jersey (both by JE and EFW).

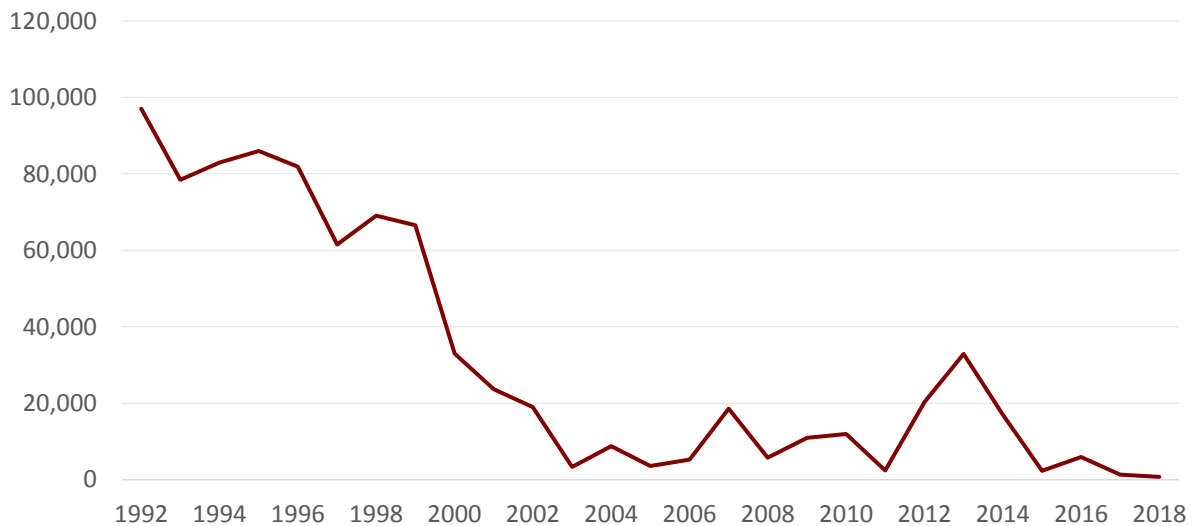
¹³ Quantities of commodities that pass through Jersey on their way to a final destination in another jurisdiction are excluded from import totals.

Figure 7 - Imports of petroleum products, 2014 to 2018; tonnes



Some of these imports were used to generate Electricity and produce Manufactured Gas. Since the 1990s, there has been a considerable reduction in the use of petroleum products (specifically of fuel oil and gas oil) to generate electricity in Jersey. This was a result of the increased importation of electricity through submarine cables, see Figure 8.

Figure 8 - Oil used for electricity generation, 1992 to 2018; tonnes

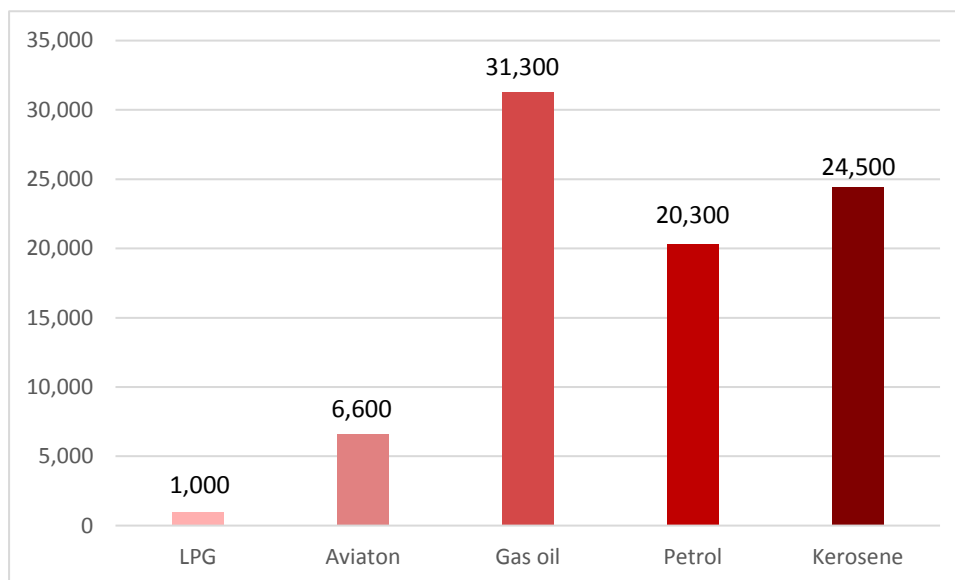


Includes fuel oil and gas oil used by JE

In the early 1990s around 80,000 tonnes of oil were used each year to generate electricity on-Island. In 2018 this figure had reduced to 740 tonnes.

Petroleum products that are not used in transformation constitute the final consumption. Of 2018's final consumption of petroleum products, gas oils (including road diesel, marine diesel and other gas oil) accounted for around a third (37%), and kerosene for (29%). Sales of petrol accounted for almost a quarter (24%), with aviation fuels and LPG making up the remainder (8% and 1% respectively), see Figure 9.

Figure 9 - Final consumption of petroleum products in 2018; tonnes



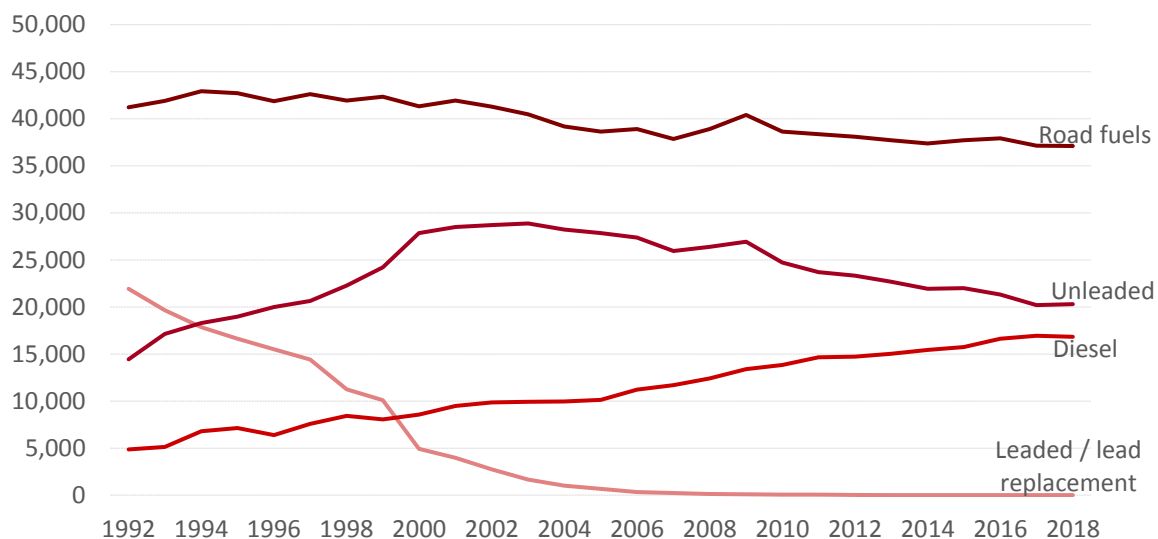
A generally downward trend in the consumption of petrol since 2014 is apparent in Table 6, which also shows a complementary increase in the consumption of diesel as a road fuel up to 2017.

Table 6 - Road fuel consumption, 2014 to 2018; tonnes

	2014	2015	2016	2017	2018
Unleaded petrol	21,946	21,997	21,303	20,205	20,290
Motor diesel	15,425	15,731	16,612	16,938	16,814
Total road fuels	37,371	37,728	37,915	37,143	37,103

The short term changes in consumption of petrol and motor diesel reflect the general downward trend in the overall consumption of road fuel since the mid-1990's (Figure 10).

Figure 10 - Road fuel consumption, 1992 to 2018; tonnes



Energy use in homes

Table 7 shows final energy consumption by households in Jersey over the period from 2014 to 2018, broken down by fuel type. Variations in average monthly winter temperatures are a factor in annual fluctuations (see Appendix Table A1).

Table 7⁷ - Household final energy consumption, 2014 to 2018; toe

	2014	2015	2016	2017	2018
Petroleum products	24,337	26,050	27,089	27,129	26,323
Manufactured gas	3,009	2,984	2,829	2,669	2,785
Electricity	25,796	27,107	27,542	27,572	28,803
Total household consumption	53,143	56,140	57,460	57,370	57,911

In 2018 electricity consumption accounted for half of total domestic consumption (50%); petroleum products accounted for 45%; and gas accounted for the remainder.

Statistics Jersey

28 November 2019

Appendix

Table A1 - Average (mean) daily air temperature in Jersey, 2008-2018; degrees Celsius, °C

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Jan	8.1	4.5	4.4	6.6	8.2	6.3	8.3	7.7	7.8	5.9	8.5
Feb	7.8	6.1	6.0	8.5	5.7	5.3	8.3	6.3	7.6	8.0	4.9
Mar	8.3	8.8	7.8	9.0	10.3	6.1	9.5	8.8	7.8	10.4	7.5
Apr	10.3	11.2	11.3	13.8	9.7	9.2	11.8	12.4	9.8	11.1	11.9
May	15.8	13.5	13.0	14.0	13.3	12.0	13.8	13.4	13.9	14.7	14.6
Jun	16.1	16.8	16.7	15.6	16.1	14.7	17.1	16.6	16.0	18.0	16.9
Jul	18.1	18.1	18.7	17.0	18.1	19.2	19.1	18.4	17.8	18.5	20.2
Aug	17.7	18.3	17.5	17.5	18.6	18.7	17.4	18.0	18.9	17.7	18.5
Sep	15.3	16.8	16.1	17.5	15.7	16.6	18.5	15.4	18.1	15.4	16.8
Oct	12.3	14.2	13.6	14.6	13.3	14.9	15.7	13.5	13.1	14.4	13.7
Nov	9.9	11.4	9.0	12.4	9.4	9.6	11.7	12.6	9.8	10.3	10.1
Dec	6.2	6.9	4.2	9.0	8.3	8.5	8.8	11.6	8.2	8.2	9.2
Year	12.2	12.2	11.5	13.0	12.2	11.8	13.3	12.9	12.4	12.7	12.7

Glossary of terms

Petroleum products

Aviation spirit - a light hydrocarbon oil product used to power piston-engine aircraft.

Aviation turbine fuel – used in aircraft jet and gas-turbine engines, consisting of either kerosene or a mixture of naphtha and kerosene; also known as ‘jet fuel’.

Fuel oil - used in furnaces and boilers of power stations and in industry.

Gas oil - used in industry, diesel engines and as marine diesel, burned in central heating systems.

Kerosene - known as burning oil or heating oil, used for lighting and heating.

Ultra low sulphur Petrol (ULSP) - motor spirit with a sulphur content of less than 0.005 per cent.

Ultra low sulphur Diesel (ULSD) – motor diesel which has a sulphur content of less than 0.005 per cent.

Lead Replacement Petrol (LRP) - contains an additive different to lead for lubrication.

Gas

LPG – liquefied petroleum gas; a mixture of gaseous hydrocarbons that is changed into liquid form under pressure. LPG may be converted (transformed) into a gaseous form (manufactured gas) and is also used in portable cooking stoves and heaters and to power some vehicles.

Manufactured gas - used as a fuel in homes for cooking and heating; made by converting (transforming) LPG into a gaseous form which can be piped through a gas network.

Energy balance

Calorific value - the calorific values assigned to each fuel are from the tables “Estimated average calorific values of fuels 2015 (DUKES A1-A3)” published by the UK Department for Business, Energy & Industrial Strategy: <https://www.gov.uk/government/statistics/dukes-calorific-values>.

Supply - the sum of production, imports and other sources, accounting for exports and stock changes; commodities that pass through Jersey on their way to a final destination in another jurisdiction are excluded.

Transformation - activities that transform the original primary (and sometimes secondary) commodity into a form which is more suited for specific uses, e.g. burning petroleum products in order to generate electricity; converting LPG into a gaseous state which can then be pumped through a gas network.

Available supply – the sum of supply and transformation.

Public electricity supply - the sum of electricity produced in Jersey, imports (pre-transmission losses) and exports.

Demand - the sum of transformations, energy industry use and losses, and final consumption, including non-energy use.

Final consumption - energy consumption by final users; does not include energy used in transformation processes, energy industry own use or losses.

Energy industry use - consumption to support transformation processes e.g. for lighting, operating compressors and cooling systems, but not for transformation itself.

Losses - the intrinsic losses that occur during the transmission and distribution of electricity and gas.

Statistical difference - the excess of supply over demand. A statistical difference arises when figures are gathered from a variety of independent sources and reflect differences in timing, definition of coverage, commodity definition and also in metering and accounting. A non-zero statistical difference is generally expected.