

## 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 energy supply and use in 2022. Figures are also presented for the last five calendar years. Longer term trends going back to the 1990s are shown for primary energy supply, road fuel consumption, and 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. Jersey's "Carbon Neutral Roadmap" was published in 2022<sup>1</sup> and sets out the Island's journey to carbon neutrality in line with commitments under the Paris Agreement.

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 Aether<sup>2</sup> and submitted to the international inventories as part of the UK's national inventory.

## Summary for 2022

### Supply

- Almost all of Jersey's energy supply was imported; about 2% was produced on-Island as electricity generated by the Energy Recovery Facility and Jersey Electricity solar panels
- Petroleum products accounted for about three-fifths (60%) of Jersey's energy supply; electricity (imported and on-Island generated) accounted for the remainder (40%)
- Jersey's total primary energy supply (TPES) was 6% less than in 2021

### Use

- Total final energy consumption (FEC) was 5% less than in 2021
- Energy consumption per head of resident population was 1.3 toe<sup>3</sup> and was below that of the UK (1.9 toe)
- Of total energy used, just over a third (38%) was by households, a similar amount (35%) for transportation (predominantly road) and around a quarter (27%) by industry and government

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<sup>1</sup> [www.gov.je/Government/Pages/StatesReports.aspx?ReportID=5530](http://www.gov.je/Government/Pages/StatesReports.aspx?ReportID=5530)

<sup>2</sup> [www.gov.je/Environment/GenerateEnergy/GreenHouseEmissions/Pages/GreenhouseGasEmissions.aspx](http://www.gov.je/Environment/GenerateEnergy/GreenHouseEmissions/Pages/GreenhouseGasEmissions.aspx)

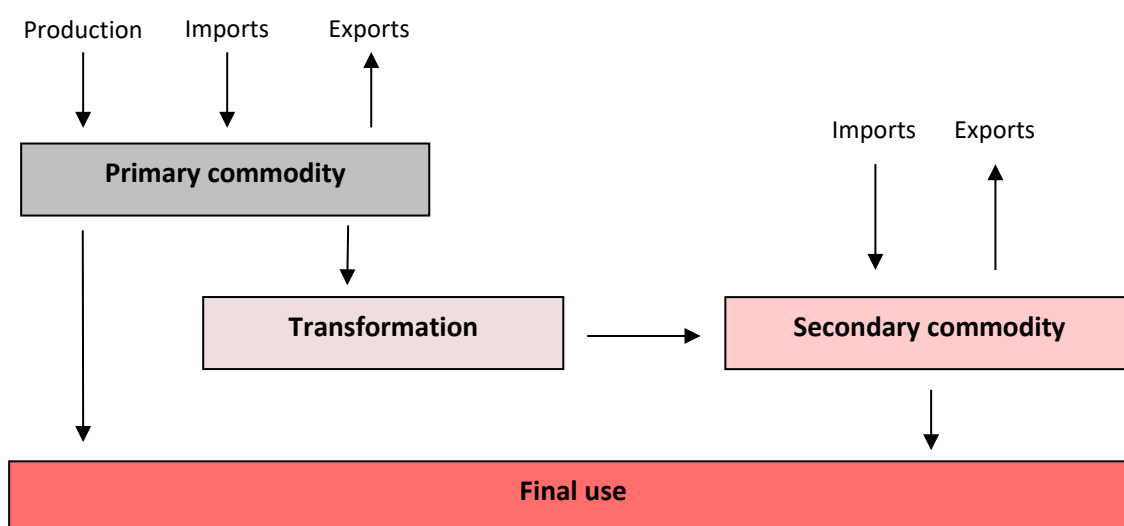
<sup>3</sup> A toe (tonne of oil equivalent) is a unit of energy which represents the quantity of energy released through burning one tonne of crude oil: 1 toe = 11,630 kWh or 10 million kilocalories. For further definitions see the [Glossary](#)

## 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 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 of terms](#)).

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. There is also a small contribution (around 2%) to TPES from electricity generated within Jersey by the Energy Recovery Facility (formerly known as Energy from Waste) and Jersey Electricity solar panels.

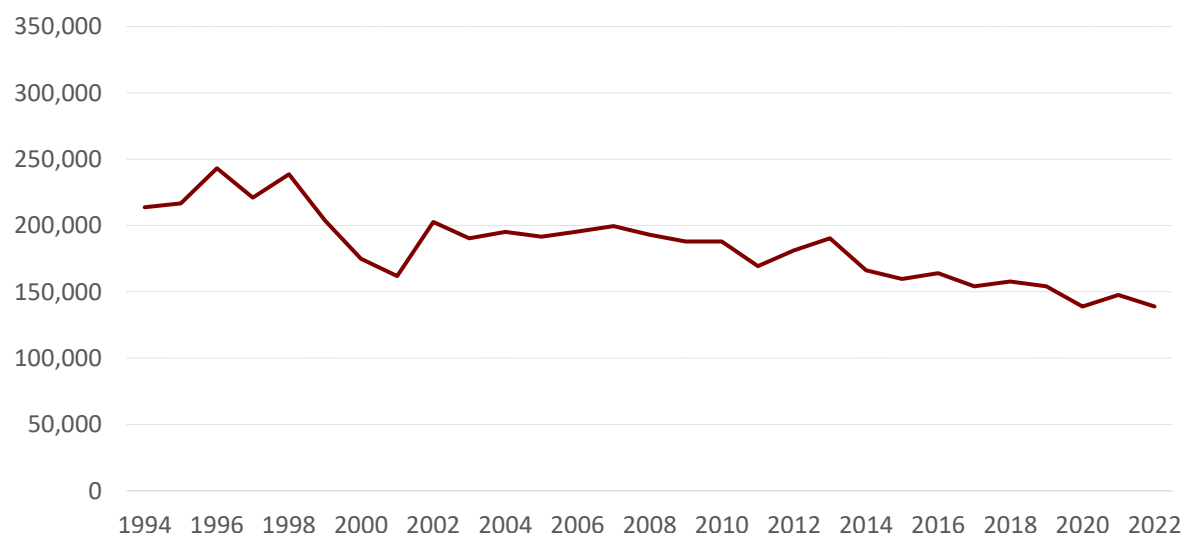
Table 1 shows TPES<sup>4</sup> for each year from 2018 to 2022. Petroleum products accounted for three-fifths (60%) of Jersey's TPES in 2022, electricity (imported and on-Island generated) accounted for the remainder (40%).

**Table 1 - Jersey's total primary energy supply (TPES) 2018 to 2022; toe**

	2018	2019	2020	2021	2022
Total primary energy supply	157,712	154,092	138,926	147,572	139,055

TPES in 2022 was 6% less than in the previous year (2021). The longer-term behaviour of Jersey's TPES is shown in Figure 2.

**Figure 2 - Jersey's total primary energy supply (TPES), 1994 to 2022; toe**



<sup>4</sup> 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 to 2019. 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. TPES has subsequently remained below 150,000 toe from 2020 to 2022
- 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

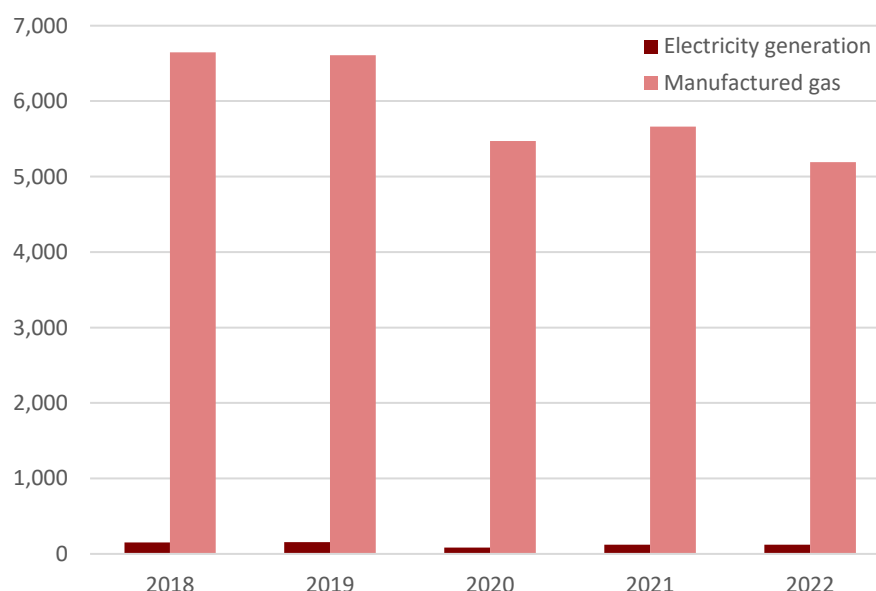
## Transformation

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 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 generation of electricity from petroleum products, although the amounts produced from this were very small

The supply of energy produced by on-Island transformations each year from 2018 to 2022 is shown in Figure 3.

Figure 3 - Energy supply produced by transformation processes, 2018 to 2022, toe



The quantity of manufactured gas produced in 2022 was 5,191 toe, a small decrease when compared to 2021. Over the last 5 years, quantities of manufactured gas produced were, on average, around 6,500 toe in 2018, reducing to around 5,000 toe by 2022.

In 2022, Jersey Electricity (JE) used 416 toe of petroleum products to generate 120 toe of electricity.

## 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 2018 to 2022 and FEC per head of resident population (FEC per capita).

**Table 2 - Jersey's final energy consumption (FEC) and per capita 2018 to 2022; toe**

	2018	2019	2020	2021	2022
FEC	152,840	149,190	134,753	143,041	135,976
FEC per capita <sup>5</sup>	1.5 <sup>r</sup>	1.4	1.3	1.4	1.3

*FEC per capita for 2018 has been revised, see note 5 below*

From 2018 to 2022, FEC saw a general decrease from just above 150,000 toe to around 135,000 toe, acknowledging the effect of warmer or colder winters (see [Appendix Table A1](#)). Demand for certain fuels saw a temporary reduction in 2020, in part as a consequence of the global pandemic. FEC per capita in Jersey from 2018 and 2022, has seen an overall decrease from 1.5 to 1.3 toe. Energy consumption per head of population in Jersey in 2022 was below that of the UK (1.9 toe<sup>6</sup>).

Jersey's FEC, broken down by fuel type for each year from 2018 to 2022, is shown in Table 3.

**Table 3 - FEC by fuel type, 2018 to 2022; toe**

	2018	2019	2020	2021	2022
Petroleum products	92,181	88,871	76,864	83,368	79,487
Gas	6,191	5,977	4,961	4,965	4,283
Electricity	54,468	54,342	52,928	54,708	52,206
<b>Total FEC</b>	<b>152,840</b>	<b>149,190</b>	<b>134,753</b>	<b>143,041</b>	<b>135,976</b>

In 2022, petroleum products (such as road fuels and heating oil) accounted for three-fifths (58%) of Jersey's FEC (see [Figure 4](#)). Electricity accounted for over a third (38%) and manufactured gas the remainder (3%).<sup>7</sup>

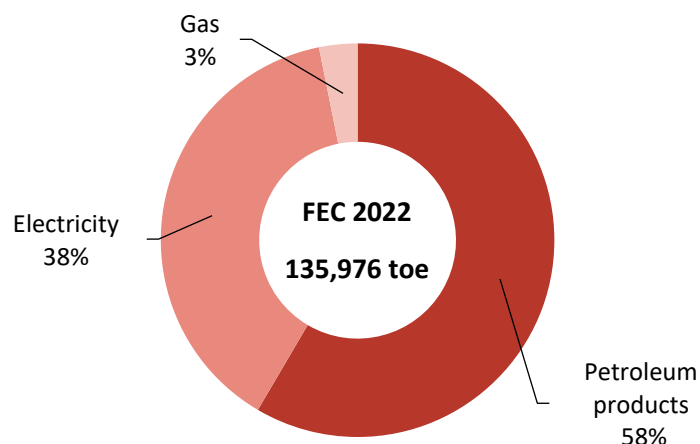
<sup>5</sup> FEC per capita for Jersey using mid-year population estimates, derived from end-of-year population estimates, from 'Population and migration statistics, 2011 to 2021' (Statistics Jersey, June 2023). Data in the aforementioned report replaces previous estimates, hence 2018's FEC per capita figure has been revised from the 1.4 toe that was originally published

<sup>6</sup> FEC per capita for the UK has been derived from:

- FEC: 'Digest of UK Energy Statistics (DUKES) 2023', (UK Government Department for Energy Security & Net Zero, July 2023)
- Population: the 2021 mid-year estimate (Office for National Statistics, December 2022) was used for the UK 2022 population figure, as this was the most current figure available at the time this report was published

<sup>7</sup> Throughout this report, numbers have been rounded independently to the nearest integer, hence contributions shown may not sum to their total

Figure 4 - Jersey's total final energy consumption (FEC) by fuel type, 2022; toe



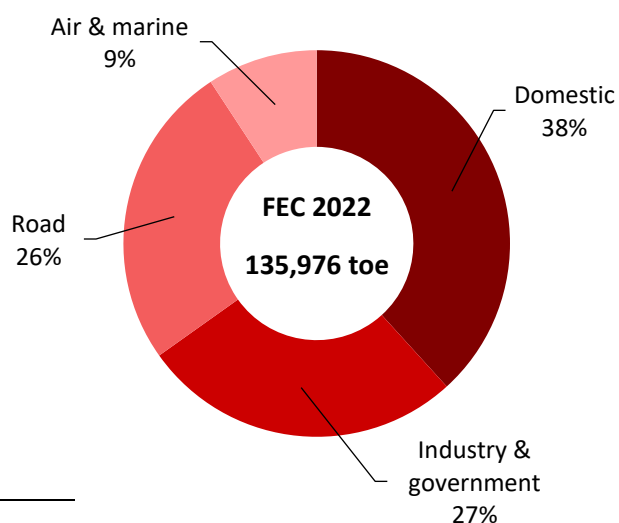
FEC may also be considered in terms of final end use sectors such as households, industry, government and transportation, as shown in Table 4.

Table 4 - FEC by final end use sector, 2018 to 2022; toe

	2018	2019	2020	2021	2022
Industry and government	42,655	42,783	37,100	38,566	36,588
Air and marine <sup>8</sup>	11,740	10,832	5,154	7,687	12,568
Road	40,534	39,083	34,308	36,441	34,802
Domestic	57,911	56,492	58,190	60,346	52,017
<b>Total FEC<sup>7</sup></b>	<b>152,840</b>	<b>149,190</b>	<b>134,753</b>	<b>143,041</b>	<b>135,976</b>

In 2022, just over a third (38%) of Jersey's energy was consumed by households (the domestic sector), around a third (35%) was used for transport (road, air and marine<sup>8</sup>) and the remainder (27%) was consumed by industry and government, see Figure 5.

Figure 5 - FEC by final end use sector, 2022; toe



<sup>8</sup> '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.

## 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 use<sup>9</sup>, presented in one common unit of measurement (toe).

Table 5 shows the energy balance for Jersey for 2022.

**Table 5 - Energy Balance for Jersey, 2022; toe**

	Petroleum products	Gas	Electricity	Total
Production	0	0	3,404	3,404
Net Imports <sup>10</sup>	83,456	0	52,124	135,580
Stock change	71	0	0	71
<b>Primary supply</b>	<b>83,527</b>	<b>0</b>	<b>55,528</b>	<b>139,055</b>
Statistical difference <sup>11</sup>	-1,452	0	180	-1,272
<b>Primary demand</b>	<b>84,978</b>	<b>0</b>	<b>55,348</b>	<b>140,326</b>
<b>Transformations</b>				
Electricity Generation	-416	0	120	-296
Gas supply	-5,075	5,191	0	116
<b>Energy industry own use and losses</b>	<b>0</b>	<b>908</b>	<b>3,262</b>	<b>4,170</b>
<b>Final consumption</b>	<b>79,487</b>	<b>4,283</b>	<b>52,206</b>	<b>135,976</b>
Industry and government	11,107	2,648	22,833	36,588
Air and marine	12,568	0	0	12,568
Road <sup>12</sup>	34,802	0	0	34,802
Domestic	21,010	1,635	29,372	52,017

<sup>9</sup> 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>

<sup>10</sup> Net Imports is the sum of imports minus exports

<sup>11</sup> Statistical difference is defined as Primary supply minus Primary demand (see [Glossary](#))

<sup>12</sup> Electricity consumed in charging electric vehicles is included under Domestic, and Industry & government consumption; it is not included under road consumption

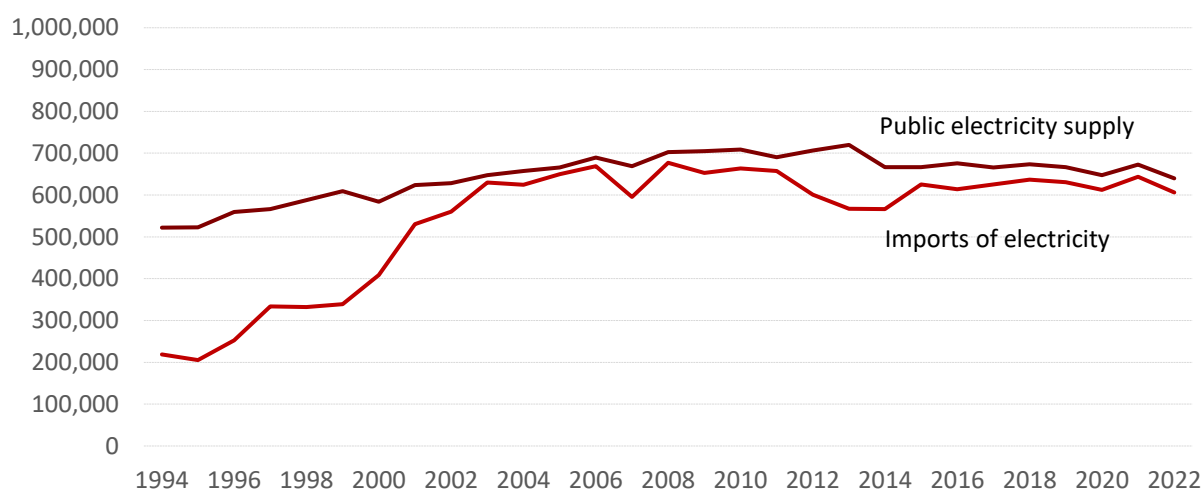
## Individual fuel types

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 1994, the overall public electricity supply<sup>13</sup> and the proportion of electricity imported into Jersey has generally increased, see Figure 6.

Figure 6 - Public electricity supply and imports of electricity, 1994 to 2022; MWh



Throughout the 1990s imported electricity accounted for between 40% and 60% of Jersey's public electricity supply. In 2022, this proportion was 95%.

### Petroleum products

The category 'petroleum products' covers a range of fuels derived from crude oil. Such products accounted for over half (58%) of Jersey's overall final energy consumption (FEC) in 2022, see Figure 4.

All the petroleum products supplied and used in Jersey are imported; around 75,000 tonnes of petroleum products were imported in 2022, a similar amount to 2021 (78,000 tonnes)<sup>14</sup>.

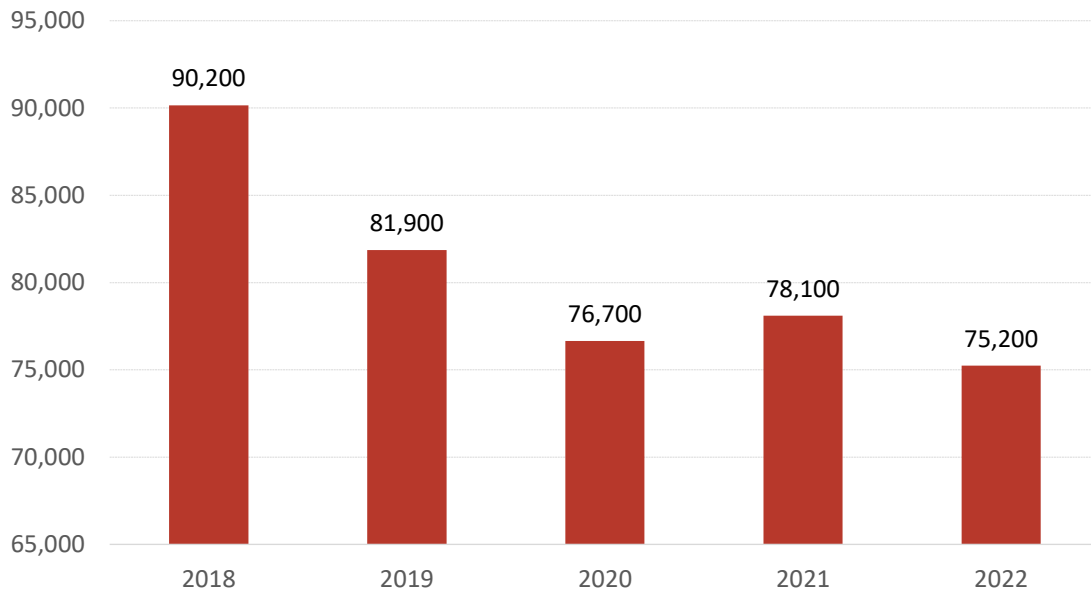
The imported quantities of petroleum products in each year from 2018 to 2022 are shown in Figure 7 (see [Glossary](#) for description of products included).

<sup>13</sup> 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 the Energy Recovery Facility).

<sup>14</sup> Quantities of commodities that pass through Jersey on their way to a final destination in another jurisdiction are excluded from import totals.

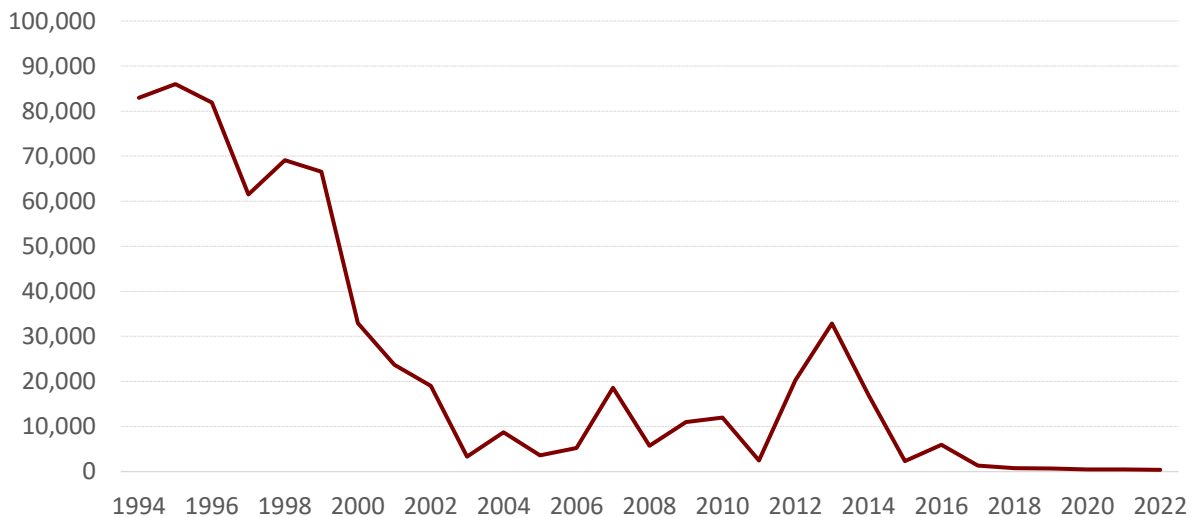


Figure 7 - Imports of petroleum products, 2018 to 2022; tonnes



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 to generate electricity in Jersey. This was a result of the increased importation of electricity through submarine cables, see Figure 8.

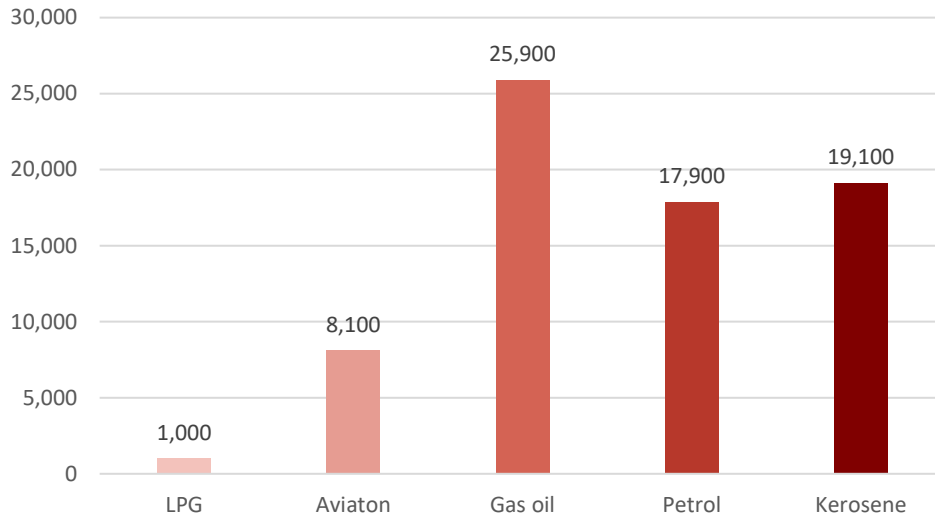
Figure 8 - Oil used for electricity generation, 1994 to 2022; tonnes



In the early 1990s around 80,000 tonnes of oil were used each year to generate electricity on-Island. In 2022 this figure had reduced to 385 tonnes.

Petroleum products that are not used in transformations constitute the final consumption. Of the final consumption of petroleum products in 2022, gas oils (including road diesel, marine diesel and other gas oil) accounted for 36%, and kerosene for 27%. Sales of petrol accounted for around a quarter (25%), with aviation fuels and LPG making up the remainder (11% and 1% respectively), see Figure 9.

Figure 9 - Final consumption of petroleum products in 2022; tonnes



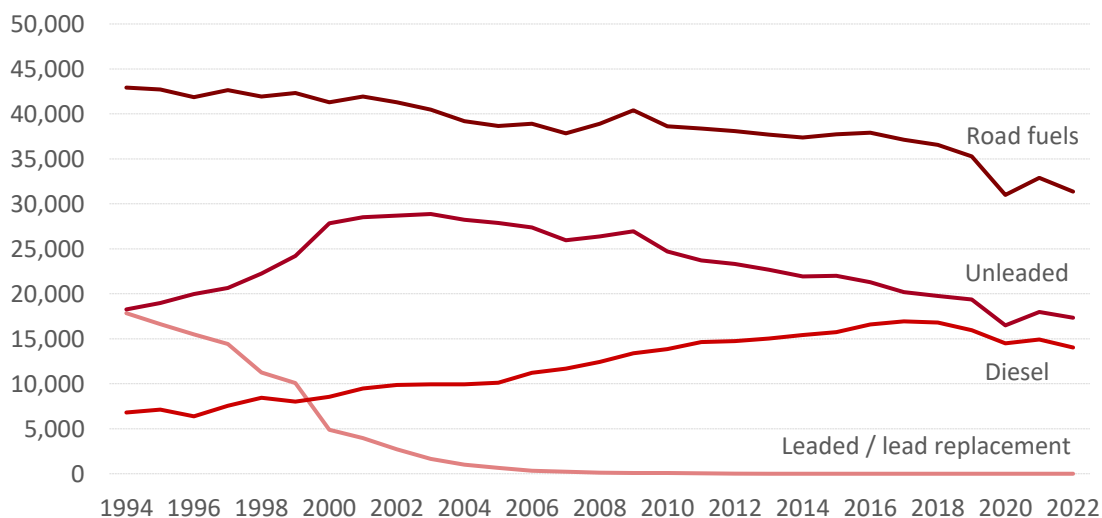
Petrol and motor diesel consumption has generally declined from around 35,000 tonnes in 2018 to around 30,000 tonnes in 2022 (see Table 6).

Table 6 - Road fuel consumption, 2018 to 2022; tonnes

	2018	2019	2020	2021	2022
Unleaded petrol	19,750	19,356	16,493	17,972	17,343
Motor diesel	16,814	15,938	14,505	14,928	14,031
<b>Total road fuels</b>	<b>36,563</b>	<b>35,294</b>	<b>30,997</b>	<b>32,900</b>	<b>31,374</b>

Overall, there has been a general decline in the long-term consumption of road fuel, since the mid 1990's (figure 10).

Figure 10 - Road fuel consumption, 1994 to 2022; tonnes



## Energy use in homes

Table 7 shows final energy consumption by households in Jersey over the period from 2018 to 2022, broken down by fuel type. Variations in average monthly winter temperatures are a factor in annual fluctuations (see Appendix Table A1).

Table 7 - Household final energy consumption, 2018 to 2022; *toe*

	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
Petroleum products	26,323	24,661	25,023	25,747	21,010
Manufactured gas	2,785	2,660	2,516	2,335	1,635
Electricity	28,803	29,171	30,652	32,264	29,372
<b>Total household consumption</b>	<b>57,911</b>	<b>56,492</b>	<b>58,190</b>	<b>60,346</b>	<b>52,017</b>

In 2022 electricity consumption accounted for about half of total domestic consumption (56%); petroleum products accounted for 40%; and gas accounted for the remainder (3%).

*Statistics Jersey*

*9 August 2023*

## Appendix

Table A1 - Average (mean) daily air temperature in Jersey, 2012-2022; degrees Celsius, °C

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>Jan</b>	8.2	6.3	8.3	7.7	7.8	5.9	8.5	7.0	8.2	6.3	7.3
<b>Feb</b>	5.7	5.3	8.3	6.3	7.6	8.0	4.9	8.6	9.0	6.9	8.4
<b>Mar</b>	10.3	6.1	9.5	8.8	7.8	10.4	7.5	10.0	9.0	9.0	10.2
<b>Apr</b>	9.7	9.2	11.8	12.4	9.8	11.1	11.9	11.5	13.5	9.4	11.3
<b>May</b>	13.3	12.0	13.8	13.4	13.9	14.7	14.6	13.1	14.9	12.3	14.8
<b>Jun</b>	16.1	14.7	17.1	16.6	16.0	18.0	16.9	16.5	16.7	16.6	17.4
<b>Jul</b>	18.1	19.2	19.1	18.4	17.8	18.5	20.2	19.7	17.7	18.5	20.6
<b>Aug</b>	18.6	18.7	17.4	18.0	18.9	17.7	18.5	18.6	19.7	17.6	20.9
<b>Sep</b>	15.7	16.6	18.5	15.4	18.1	15.4	16.8	16.7	17.4	18.2	17.4
<b>Oct</b>	13.3	14.9	15.7	13.5	13.1	14.4	13.7	13.8	13.0	14.4	15.7
<b>Nov</b>	9.4	9.6	11.7	12.6	9.8	10.3	10.1	9.4	11.4	10.0	11.9
<b>Dec</b>	8.3	8.5	8.8	11.6	8.2	8.2	9.2	8.6	8.2	8.5	6.8
<b>Year</b>	<b>12.2</b>	<b>11.8</b>	<b>13.3</b>	<b>12.9</b>	<b>12.4</b>	<b>12.7</b>	<b>12.7</b>	<b>12.8</b>	<b>13.2</b>	<b>12.3</b>	<b>13.6</b>

## 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

**Available supply** – the sum of supply and transformation.

**Calorific value** - the calorific values assigned to each fuel are from the tables “Estimated average calorific values of fuels (DUKES A1-A3)” published by the UK Department for Energy Security and Net Zero:

<https://www.gov.uk/government/statistics/dukes-calorific-values>

The prior year’s calorific values are used due to their availability at time of analysis.

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

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

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

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

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

**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.

**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.