

Article

Behavioural impacts of rising automotive fuel prices on consumer fuel demand, UK: July 2021 to August 2022

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1 . Main points

- Automotive fuel prices peaked at 48% above the previous year in July 2022, with consumers reducing their fuel demanded per transaction by 16% over the same period.
- Total automotive fuel sales growth was at 41% in the week ending 27 February 2022, compared with the same week in the previous year; this has fallen to minus 19 % in the week ending 31 July, with the proportion of adults who are facing cost of living increases and have cut back on non-essential vehicle travel during this period, increasing by 14 percentage points.
- Consumers bought 6% more fuel per transaction in the week ending 27 February (the week of the Russian invasion of Ukraine) compared with the same week in the previous year; this was up 7 percentage points from the week prior, possibly indicating consumers anticipating future fuel price increases or shortages amidst wider factors impacting oil prices.
- Consumers bought 7% more fuel per transaction than the previous year in response to the September 2021 UK fuel distribution driver shortage, up 13 percentage points from the week prior, as a form of short-term stockpiling.

2 . Overview of the fuel demand indicator

Over the past two years as part of the Office for National Statistics' (ONS') response to the coronavirus (COVID-19) pandemic, we have been working with a number of private and public sector organisations to help us improve our current statistics and produce real-time experimental statistics. For more information, please see our [Statement on data sources](#).

The ONS have developed a range of real-time indicators to provide more timely and higher-frequency insights into how the economy is evolving over time. More recently, we seek to understand the change in consumer demand given the growing cost of living (CoL) pressures and consistently high fuel prices.

The Department for Business, Energy and Industrial Strategy's (BEIS) fuel price data are a timely measure of how fuel prices are changing on a weekly basis. However, changes in fuel prices alone do not allow us to gather insights on changing consumer behaviour. The Opinions and Lifestyle (OPN) survey provides estimates of behaviour at a population level. Card spending data in combination with BEIS total average road fuel sales data, provide a quantitative and behavioural dimension. Therefore, the ONS are introducing for the first time an experimental real-time fuel demand indicator. This will provide insights into consumers' response to high fuel prices and CoL squeeze. This experimental indicator may be an occasional feature in our [Economic activity and social change in the UK, real-time indicators bulletin](#).

3 . UK automotive fuel consumption and changing behaviours

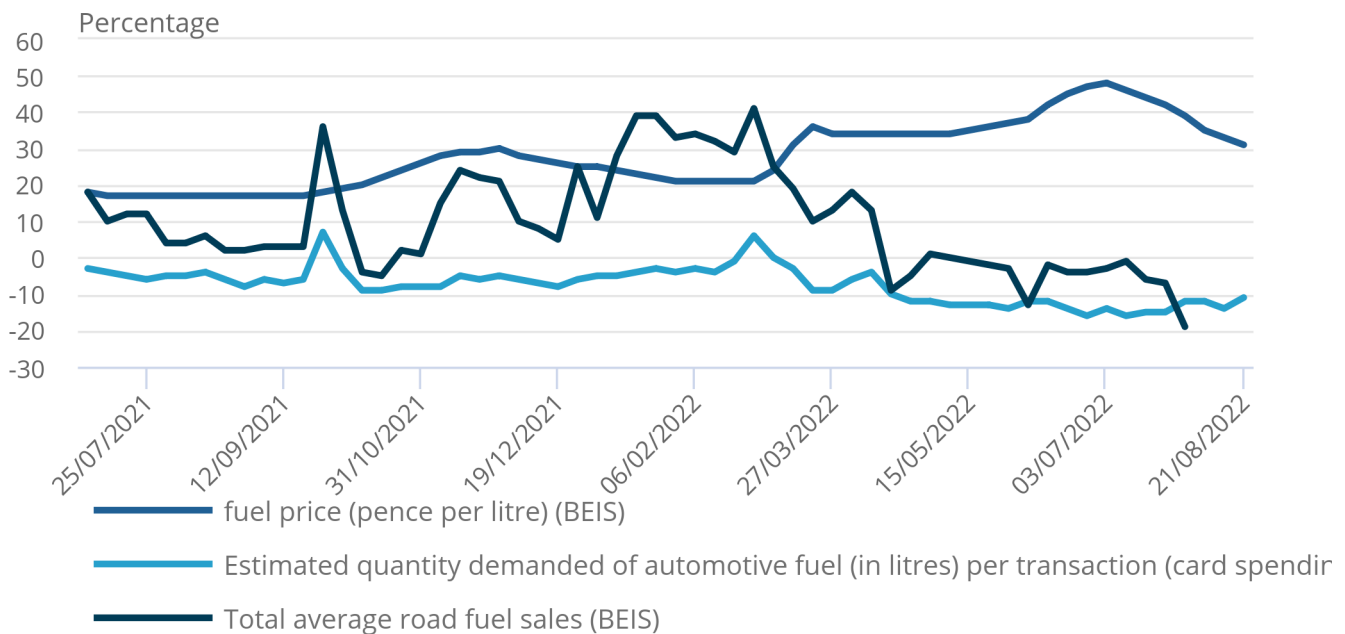
Automotive fuel indicators and experimental demand index

Figure 1: Estimated quantity demanded of automotive fuel per transaction year-on-year growth is at minus 11%, remaining below the long-term average

Year-on-year growth in average fuel prices and estimated quantity demanded per fuel transactions, UK, 4 July 2021 to 21 August 2022

Figure 1: Estimated quantity demanded of automotive fuel per transaction year-on-year growth is at minus 11%, remaining below the long-term average

Year-on-year growth in average fuel prices and estimated quantity demanded per fuel transactions, UK, 4 July 2021 to 21 August 2022



Source: Office for National Statistics – Aggregated anonymised Visa transaction data, ONS calculation, Department for Business, Energy and Industrial Strategy – Road fuel price statistics, Department for Business, Energy and Industrial Strategy – Experimental statistics on average road fuel sales and stock levels

Notes:

1. The year-on-year metric for average road fuel sales may be subject to coronavirus (COVID-19) impacts, which may distort automotive consumer trends.
2. The total average road fuel sales series (BEIS) is a combination of total diesel and petrol sales, and is the average road fuel sales per filling station sampled.
3. Total average road fuel sales (BEIS) are published monthly, latest data periods may not cover data periods of other sources.

Figure 1 shows the total average road fuel sales from the Department for Business, Energy and Industrial Strategy (BEIS). This provides context into the number of total road fuel sales alongside the price of automotive fuel over time (BEIS). It also adds context to the derived estimated quantity demanded of automotive fuel per card transaction (extrapolated from multiple sources including aggregated and anonymised Visa transaction data, and the Office for National Statistics' (ONS') calculations). This indicates not only total fuel demand through the BEIS series, but more granular behavioural insights through card spend data if consumers are filling up their vehicles less or more each time at the pump.

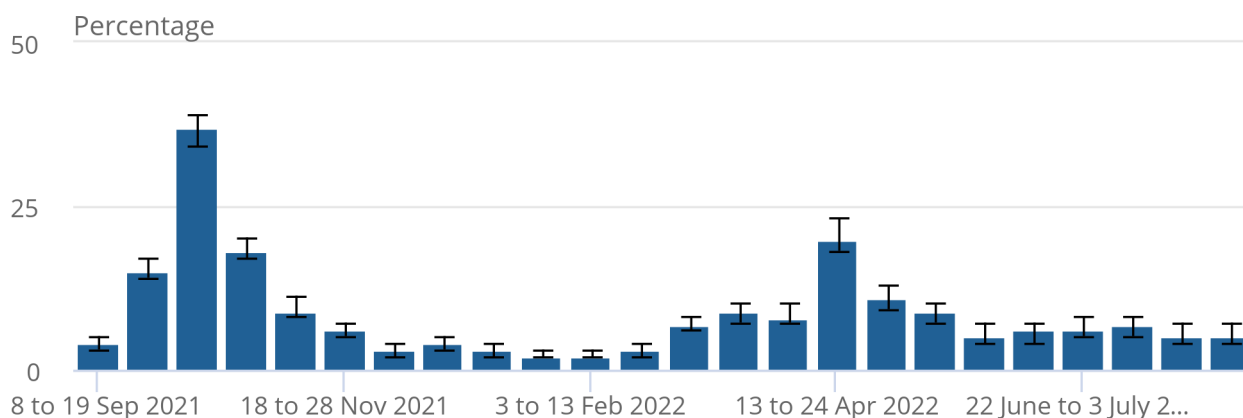
Consumer behaviours during September 2021 fuel shortage

Figure 2: The percentage of people who experienced fuel shortages in the previous two weeks peaked during the September 2021 fuel shortage at 37%, and at the start of the Russian invasion of Ukraine in March 2022 at 20%

Percentage of adults experiencing shortages of fuel in the past two weeks, Great Britain, 8 to 19 September 2021 to 3 to 14 August 2022

Figure 2: The percentage of people who experienced fuel shortages in the previous two weeks peaked during the September 2021 fuel shortage at 37%, and at the start of the Russian invasion of Ukraine in March 2022 at 20%

Percentage of adults experiencing shortages of fuel in the past two weeks, Great Britain, 8 to 19 September 2021 to 3 to 14 August 2022



Source: Office for National Statistics – Public opinion and social trends, Great Britain

Notes:

1. Question: “In the past two weeks, which of these things, if any, have you not been able to buy as they were not available?”.
2. Base: all adults.
3. Respondents were able to choose more than one option, “fuel” was one option.
4. Breakdowns by age and sex, including confidence intervals for the estimates, are contained in the [Public opinion and social trends, Great Britain: personal experiences of shortages of goods dataset](#).

During the September 2021 period, the UK experienced a spike in consumer demand following media reports of a shortage of fuel delivery drivers. Total UK year-on-year growth in average road fuel sales (BEIS) peaked at an aggregate level to 36% above the previous year in the week-ending; 26 September 2021, up 23 percentage points from the previous week. These levels were equivalent to around 80% of typical pre-coronavirus (COVID-19) levels for this period. Automotive fuel prices remained stable during this period. During the period 6 to 17 October 2021, 37% of people in Great Britain experienced fuel shortages at some point in the previous two weeks, as detailed in our [Public opinions and social trends, Great Britain: personal experiences of shortages of goods dataset](#).

The experimental fuel indicator (UK) captures more granular consumer behavioural changes during this period. The year-on-year growth in quantity of fuel demanded per transaction increased to 7% compared with the previous year in the week ending 26 September 2021, up 13 percentage points from the previous week. This indicates that consumers across the UK not only bought more fuel at an aggregate level but changed their behaviours at the pump. This was through buying more fuel per transaction in response to the shortage – a form of precautionary stockpiling.

Once both fuel supply and short-term stockpiling stabilised, levels of fuel demanded per transaction fell back to regularly expected levels.

Consumer behaviours during initial Russian invasion of Ukraine

At the beginning of the Russian invasion of Ukraine in March 2022, year-on-year growth in total average road fuel sales (BEIS) peaked at 41% above the previous year during the week ending 27 February 2022, up 12 percentage points from the previous week. Fuel prices saw sustained increases peaking at 36% above the previous year in the following weeks. Fuel prices may also be impacted by post-pandemic global recovery and fewer international travel restrictions. Data from the Opinions and Lifestyle Survey (OPN) showed people experiencing fuel stock shortages in Great Britain rose from 8% in the previous two weeks from 30 March to 10 April, to 20% in the period from 13 to 24 April 2022.

At a more granular level, the indicator shows that in response to the Russian invasion of Ukraine, UK consumers initially demanded 6% more fuel per transaction compared with the previous year in the week ending 27 March 2022, up 7 percentage points from the previous week. This increase occurred before the initial fuel price increase. It indicates a potential anticipatory behavioural response, as consumers likely expected automotive fuel prices to rise in the future so demanded more fuel at the pump prior to this.

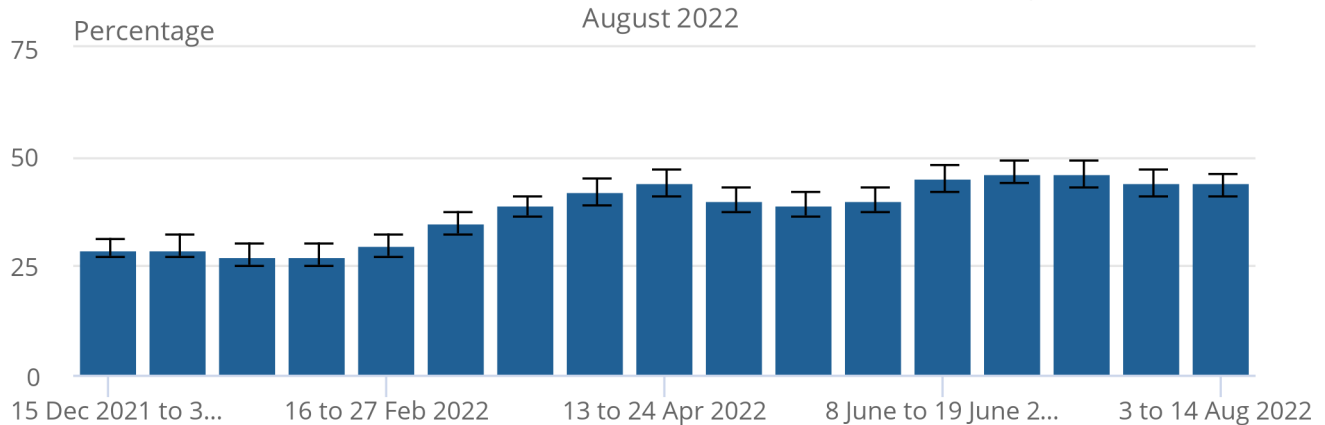
Consumer behaviours during sustained high fuel prices and wider cost of living pressures

Figure 3: The percentage of people reporting cost of living increases who have cut down on non-essential travel in their vehicle is at 44%, up 15 percentage points from 15 December 2021 to 3 January 2022

Percentage of adults reporting their cost of living increased, and are also cutting down on non-essential travel in their vehicle, Great Britain, 15 December 2021 to 3 January 2022, to 3 to 14 August 2022

Figure 3: The percentage of people reporting cost of living increases who have cut down on non-essential travel in their vehicle is at 44%, up 15 percentage points from 15 December 2021 to 3 January 2022

Percentage of adults reporting their cost of living increased, and are also cutting down on non-essential travel in their vehicle, Great Britain, 15 December 2021 to 3 January 2022, to 3 to 14 August 2022



Source: Office for National Statistics – Public opinion and social trends, Great Britain

Notes:

1. Question: “Which of the following are you doing because your cost of living has increased?”.
2. Base: adults who said their cost of living had increased over the last month.
3. Respondents were able to choose more than one option, “Cutting back on non-essential journeys in my vehicle” was one option.
4. Breakdowns by age and sex, including confidence intervals for the estimates, are contained in the [Public opinion and social trends, Great Britain: household dataset](#).
5. Data from 15 December 2021 to end of March 2022 is available in each edition of our [Coronavirus and the social impacts on Great Britain: Household finances dataset](#). From April onwards, the data is available in each edition of our [Public opinions and social trends, Great Britain: household finances dataset](#).

Year-on-year growth in total average road fuel sales decreased sharply from 41% at the start of the Russian invasion of Ukraine to minus 19% in the week ending 31 July 2022. This was in response to fuel prices continually remaining above their 2021 level. OPN data suggest that prior to the Russian invasion of Ukraine (16 February to 27 February), 30% of adults in Great Britain whose cost of living had increased reported cutting down on non-essential vehicle travel. This increased to 44% in the period 3 to 14 August 2022 in the face of sustained high fuel prices and wider cost of living pressures.

The UK fuel indicator shows behavioural changes during this period, with consumers filling up less at the pump per transaction, with a fall in year-on-year growth from 7% at the start of the Russian invasion to minus 11% in the week ending 21 August 2022.

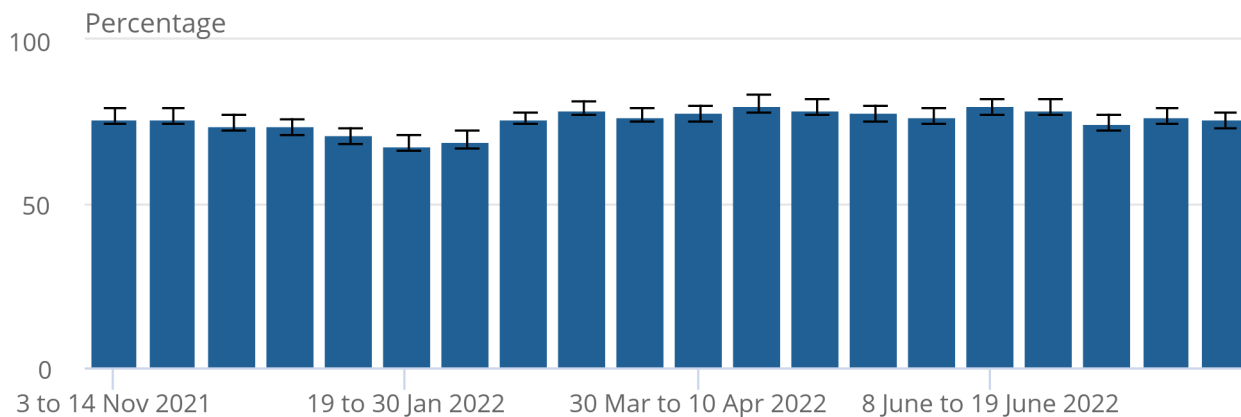
These decreases suggest that consumers have reduced their spending at the pump per transaction and are also visiting petrol stations less often since May 2022.

Figure 4: The percentage of people who reported cost of living increases and who have listed fuel price increases as one reason is at 76% for 3 to 14 August 2022, up 8 percentage points from 19 to 30 January 2022

Percentage of adults reporting their cost of living increased, and listed fuel price increases as one reason, Great Britain, 3 to 14 November 2021 to 3 to 14 August 2022

Figure 4: The percentage of people who reported cost of living increases and who have listed fuel price increases as one reason is at 76% for 3 to 14 August 2022, up 8 percentage points from 19 to 30 January 2022

Percentage of adults reporting their cost of living increased, and listed fuel price increases as one reason, Great Britain, 3 to 14 November 2021 to 3 to 14 August 2022



Source: Office for National Statistics – Public opinion and social trends, Great Britain

Notes:

1. The question asked was: “Over the last month, for what reasons has your cost of living increased?”.
2. Base: adults who said their cost of living had increased over the last month.
3. Respondents were able to choose more than one option, “the price of my fuel has increased” was one option.
4. Breakdowns by age and sex, including confidence intervals for the estimates, are contained in the [Public opinion and social trends, Great Britain: household finances dataset](#).

The OPN shows that 89% of adults in Great Britain reported cost of living increases during the period 3 to 14 August 2022, with 76% of those reporting increases listing fuel prices as one driver of this. This may also reflect the impact of rising cost of living pressures on fuel expenditure capping, where a fixed amount now purchase less fuel than a year ago in relative terms.

Current aggregate average road fuel sales and fuel demanded per transaction growth are now below long-term levels since October 2021. This indicates consumers are choosing to actively reduce fuel demand in response to continually high fuel prices, and potentially wider current economic budget constraints from ongoing cost of living pressures.

4 . Behavioural impacts of rising automotive fuel prices on consumer fuel demand, UK data

[Automotive fuel indicators, July 2021 to August 2022](#)

Dataset | Released 2 September 2022

The Department for Business, Energy and Industrial Strategy's (BEIS's) statistics on total fuel price in pence per liter, BEIS total average road fuel sales, and the Office for National Statistics' (ONS) experimental indicator of fuel demand compiled from multiple sources including aggregated and anonymised Visa transaction data.

[Opinions and Lifestyle Survey, September 2021 to August 2022](#) Dataset | Released 19 August 2022

The ONS' Opinions and Lifestyle Survey (OPN) survey data relating to fuel and cost of living questions, presented in a time series format with confidence intervals of estimates included.

5 . Glossary

Credit card

A card linked to a secured or unsecured open-ended credit account, including revolving or non-revolving consumer, business, or commercial credit or charge accounts.

Debit card

A card linked to a demand deposit account, checking account, current account, negotiable order of withdrawal account, or savings account held at a financial institution.

Debit and credit card transactions

These cards facilitate transfer of money for goods and services rendered without the usage of cash. These transactions occur both in-person through contactless and chip and pin, and online through mail order or ecommerce. All card data that the Office for National Statistics (ONS) receive are anonymised and aggregated to protect against disclosure of individuals consumer data.

Financial payment system

Debit and credit cards are provided by card issuers that enables consumers to make payment transactions. Once a consumer attempts a transaction, this transaction is routed through a merchant acquirer, card scheme, and the card issuer as part of the payment validation process.

Inflation

Inflation is the rate that the prices of goods and services bought by households rises or falls (consumer price measure). It is estimated by using price indices. For an overview of the indices and their uses, please see our [Consumer price indices, a brief guide: 2017 article](#).

Nominal and real value

Nominal values are those with the impact of inflation present, whilst real values are the nominal values that have been adjusted to account for inflation.

6 . Data sources and quality

More information on underlying methodology can be found in our accompanying [Behavioural impact of rising automotive fuel prices on UK consumers QMI](#). The experimental indicator of fuel demand is compiled from multiple sources including aggregated and anonymised Visa transaction data.

Visa card data

Visa is a financial services corporation and a card scheme within the financial payment ecosystem. Card schemes are organisations that are a part of the financial payment ecosystem that process debit and credit card payment transactions.

The Department for Business, Energy and Industrial Strategy data

This experimental indicator uses daily fuel price data from the Department for Business, Energy and Industrial Strategy (BEIS) to remove price impacts. Further information can be found in the [BEIS road fuel price statistics QMI \(PDF, 669 KB\)](#).

For contextual information on the number of transactions, the total average road fuel sales series from experimental statistics on average road fuel sales and stock levels (BEIS) is also presented. Further information can be found in [GOV.UK's Average road fuel sales and stock levels dataset](#).

Opinions and Lifestyle Survey data

The Office for National Statistics (ONS) collect and publish fortnightly social insights on daily life and events, including cost of living, in our [Public opinions and social trends, Great Britain bulletin](#). This is produced from the Opinions and Lifestyle Survey (OPN). Further detail can be found in our [OPN QMI](#).

From the period 30 March to 10 April 2022, changes were made to the OPN to enable us to provide ongoing indicators on a wide range of public opinion and societal issues.

Changes were made to the OPN survey design, for example, sample size, the questionnaire, and financial incentives to participate. These changes may result in small changes to the responding sample. We therefore advise caution with comparing estimates from this period onwards with those published prior to this period.

7 . Related links

[Behavioural impact of rising automotive fuel prices on UK consumers QMI](#)

QMI | Released 2 September 2022

Quality and methodology information for estimated quantity demanded (of fuel) per transaction, detailing the strengths and limitations of the data, methods used, and data uses and users.

[Energy Trends: UK oil and oil products](#)

Web page | Released 26 August 2022

Data on oil and oil products, including upstream production and UK refinery activity, trade, stocks, and demand.

[Energy trends](#)

Web page | Released 30 June 2022

Quarterly publication which presents data on the supply and demand of all the major fuels in the UK.

8 . Cite this article

Office for National Statistics (ONS), released 2 September 2022, ONS website, article, [Behavioural impacts of rising automotive fuel prices on consumer fuel demand, UK: July 2021 to August 2022](#)