

REPORT

# Cost of the Fossil Fuel Crisis – Scotland

## Executive Summary

This analysis examines the financial implications of the recent oil and gas price shocks on Scotland, detailing the distribution of increased gas, electricity and road transport fuel expenses across various regions and economic sectors. The analysis reveals that:

- **The surge in global oil and gas markets resulted in an £11 billion spike** in direct expenditure for Scottish consumers between 2021 and 2024.
- **Scottish families and individuals absorbed £5.8 billion** of these excess costs, which equates to an average of **£2,263 per household**.
- **The most acute financial pressures** at the domestic level were felt in the Shetland and Orkney Islands, as a proportion of household disposable income. Inhabitants of Dundee City, one of the areas with the lowest levels of household disposable income in the UK, were also very hard hit.
- **The industrial sector saw energy bills climb by £1.8 billion**, while commercial, agricultural, and public sector organisations together faced an extra **£2.6 billion**.
- **A further £830 million in increased road fuel costs** was distributed across the nation's non-domestic sectors.
- **Major urban and industrial hubs**, including Glasgow, Edinburgh, and Aberdeen, experienced the most significant non-domestic cost increases.

These findings underscore Scotland's continued vulnerability to international energy market fluctuations and the resulting long-term economic strain on both the nation's households and its business landscape.

## Introduction

The energy crisis of 2021–24 exposed Scotland's deep vulnerability to global oil and gas markets, driving the sharpest energy price surge in decades. This report builds a picture of excess costs borne by domestic, industrial, commercial and public sector actors across the Scottish economy resulting from the spikes in UK oil and gas prices experienced between 2021 and 2024.

We aim to capture as full a picture as possible, including spending on higher gas and electricity bills across all sectors of the economy due to a sharp increase in the cost of wholesale gas in the wake of Russia's invasion of Ukraine, and higher road fuel costs due to the spike in oil prices.

Our analysis first quantifies excess costs above pre-crisis baseline levels for the wider UK, before apportioning those costs across Scottish regions and sectors. The analysis calculates excess gas, electricity and road fuel costs to Scottish Local Authorities and ITL3 regions, drawing on datasets from the National Records of Scotland (NRS), Department of Energy Security and Net Zero (DESNZ), the Office for National Statistics (ONS) and others. We present Scottish national results, followed by a breakdown of non-domestic costs by ITL3 region and household impacts across all 32 Local Authorities.

Our findings show a significant burden placed on Scottish consumers during the crisis, highlighting the risks for all energy consumers of reliance on volatile fossil fuel markets. Renewed calls to increase oil and gas production in the North Sea to increase price stability through self-sufficiency ignore the fact that wherever they are produced, oil and gas are globally traded commodities and prices subject to exogenous market conditions. Historically the vast majority of North Sea oil production has been exported, while the proportion of gas consumed in the UK that has come from North Sea has declined significantly.

## Methodology

Our approach seeks to quantify the direct costs faced by energy consumers during the crisis period, over and above that which would be expected had the price spikes not occurred. For each sector or cost area we therefore establish a baseline using historical cost data from DESNZ available at the UK level, compare this to actual costs during the crisis, and then use additional data from the ONS, NRS and others to apportion these costs to national and subnational levels. Fiscal spending by the UK government on various measures implemented to shield consumers from the worst impacts of the price shocks are excluded as the cost of public sector debt and spending cannot be

reasonably disaggregated, but these costs will inevitably be ultimately borne by all constituent parts of the United Kingdom.<sup>1</sup>

DESNZ's Digest of UK Energy Statistics (DUKES) table 1.3 reports annual gas and electricity spending across all economic sectors for the UK as a whole. After adjusting for inflation, we compare expenditure in each reported sector over the four years 2021 to 2024 against a baseline of 2016 to 2019 (omitting 2020 on the grounds of disruption from the pandemic).

For road fuels, baseline and per-litre excess costs were established using DESNZ data on monthly average fuel prices<sup>2</sup> and total purchase volumes.<sup>3</sup> For each fuel, a 'structural break test' was used to define the duration of the price spike (October 2021 to February 2023 for petrol, and November 2021 to June 2023 for diesel)<sup>4</sup> and prices during these spikes were compared to pre-crisis averages, generating monthly excess cost values on a per litre basis.

### *Domestic gas and electricity*

Disaggregation of UK domestic energy cost data is performed using DESNZ's regional and local authority electricity and gas consumption statistics, which provide average domestic consumption and meter counts for all GB local authorities between 2005 and 2024.<sup>5 6</sup> These are used to generate a timeseries of consumption as a share of the GB total, for each fuel, at the Local Authority (LA) level.

The core DESNZ Digest of UK Energy Statistics (DUKES) dataset used to calculate excess costs is adjusted to remove Northern Ireland's consumption and align with the local consumption dataset. Finally, the calculated consumption shares are applied to the adjusted DUKES data to calculate LA-level expenditure on each fuel across the crisis period and preceding years, which are used to determine excess cost incurred above the pre-crisis baseline in line with the previous work<sup>7</sup>. Excess standing charge costs are

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<sup>1</sup> <https://eciu.net/analysis/reports/2025/budget-cost-of-energy-crisis-exceeds-nhs-englands-annual-health-spending>

<sup>2</sup> QEP 4.1 (DESNZ, 2025)

<sup>3</sup> Data from Energy Trends 3 (DUKES, 2025) is reported in tonnes and was converted to litres using BP conversion factors.

<sup>4</sup> The price spikes were defined to have started when the monthly average inflation adjusted price reached a level 5% above the pre-crisis (2016-2019) average for two consecutive months, and to have finished when the price fell below this level for the same duration.

<sup>5</sup> <https://www.gov.uk/government/statistics/regional-and-local-authority-electricity-consumption-statistics>

<sup>6</sup> <https://www.gov.uk/government/statistics/regional-and-local-authority-gas-consumption-statistics>

<sup>7</sup> Apportionment of excess costs is performed based on consumption volumes rather than overall cost and therefore does not explicitly account for regional variation in unit costs and standing charges, or the relative prevalence of different payment methods which impact consumer prices. These are known to differ across the UK

<https://www.ofgem.gov.uk/information-consumers/energy-advice-households/get-energy-price-cap-standing-charges-and-unit-rates-region>. The impact of this omission is minimised by reporting only the excess costs over and above a pre-

apportioned according to numbers of households from NRS<sup>8</sup>. All cost figures are adjusted for inflation.

### *Non-domestic gas and electricity*

Equivalent LA-level consumption data for non-domestic sectors is unavailable, so an alternative approach is taken to cost disaggregation, using ONS figures for regional Gross Value Added by Standard Industrial Classification (SIC) group.<sup>9</sup> This dataset includes annual inflation-adjusted output, reported at International Territorial Level 3 (ITL3) units. These are less granular than Local Authorities, with 18 covering Scotland, versus 32 LAs.

The DESNZ source data reports non-domestic energy expenditure against two non-domestic headings: 'Industrial' and 'Other', the latter encompassing the commercial and agricultural sectors, and the public sector. For each heading, we calculate the regional shares of total UK GVA in relevant industries, and use this to apportion total UK energy expenditure and determine excess costs in each geography<sup>10</sup>. Shares for the 'Industrial' heading are calculated using GVA figures for the SIC *Production Sector*, while 'Other' shares take the combined outputs of the *Services Sector, Agriculture, Forestry and Fishing* and *Construction* sectors, weighted according to their respective energy intensities.<sup>11</sup>

### *Road fuels*

Calculation of local road fuel costs during the crisis period relies on DESNZ's Sub-national road transport consumption data<sup>12</sup>, which publishes annual petrol and diesel consumption figures (in ktoe) at LA level. These undergo minor processing to group by domestic and non-domestic use<sup>13</sup> and by fuel and convert to litres. These LA fuel

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crisis baseline calculated for each region, thus assuming only that the characteristics of each region vis. energy cost ranking and payment type mix remains stable over the crisis period.

<sup>8</sup> <https://www.nrscotland.gov.uk/publications/households-and-dwellings-in-scotland-2024/>

<sup>9</sup>

<https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalandrealregionalgrossvalueaddedbalancedbyindustry>

<sup>10</sup> Apportioning excess energy costs using GVA shares relies on the assumption that the energy intensity of production in the relevant industry(ies) is equal across different subnational regions. While there may be some degree of regional variation where particularly energy intensive subsectors are clustered, the use of high-level SIC categories covering a broad range of subsectors mitigates the risk of such clusters skewing the results.

<sup>11</sup> Energy intensities used to weight GVA figures are annual UK sectoral averages from the ONS:

<https://www.ons.gov.uk/economy/environmentalaccounts/datasets/ukenvironmentalaccountsenergyreallocatedenergyconsumptionandenergyintensityunitedkingdom>

<sup>12</sup> <https://www.gov.uk/government/collections/road-transport-consumption-at-regional-and-local-level>

<sup>13</sup> Energy Consumption UK table C8 (DESNZ, 2025). This user split is not recorded at the pump and therefore reliable data is not available, but recorded data on fuel use by vehicle type was used as a proxy to calculate an appropriate allocation. All LGV, HGV and bus fuel use (primarily diesel) is considered non-domestic. Petrol cars and motorcycles are assumed to be 95% domestic use due to limited commercial use as fleet vehicles and taxis, while 75% of diesel car use was considered domestic, reflecting a higher prevalence of diesel car use in commercial fleets. Diesel cars have historically been

consumption volumes are then multiplied by the monthly fuel price excess values, to generate a total value for excess costs incurred by motorists during the spike period.

#### *A note on tax*

Throughout this analysis, reported figures include tax costs only where they are not recoverable by the consumer. Thus, VAT is included in figures relating to domestic consumption at the relevant rate but excluded for non-domestic consumers as it is assumed that it will be reclaimed by commercial users and therefore does not represent a net cost. Fuel duty, as a non-recoverable expense, is included for all consumers.

## Results

### *National*

Between 2021 and 2024, higher oil and gas prices forced Scottish consumers to spend an extra £11bn on gas, electricity and road fuels compared to pre-crisis levels. Just over half of this fell directly onto households, the bulk of this through higher energy bills. The Industrial sector faced cost increases of almost £2bn in energy bills, while the 'Other' category, encompassing commercial, agricultural and public sectors, was hit by an extra £2.6bn. These last two categories also shared £830 million in extra road fuel costs.

Consumer/cost group	Total excess cost
Domestic consumers	£5.77 bn
of which energy unit costs	£4.10 bn
of which standing charges	£0.82 bn
of which road fuels	£0.86 bn
Industrial energy bills	£1.82 bn
Other energy bills	£2.60 bn
Non-domestic road fuels	£0.83 bn
<b>Scotland Total</b>	<b>£11.04 bn</b>

### *Non-domestic costs by ITL3 region*

The table below outlines excess non-domestic energy and road fuel costs, apportioned by Scottish ITL3 regions.

Urban centres in Glasgow and Edinburgh, the Highlands and Islands and the industrial hub of Aberdeen saw the highest overall increases in the non-domestic cost categories. In both Glasgow and Edinburgh, GVA across all relevant sectors is significant and has

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overrepresented in company fleets, but the proportion has been falling in recent years – see Benefit in kind statistics commentary June 2025 (HMRC, 2025).

grown as a share of UK total over the period, resulting in increased exposure to higher energy costs in our modelling. The Highlands and Islands' GVA shares are large but have remained relatively steady over the crisis period, meaning that excess costs reflect simply higher bills rather than significant shifts in energy demand. Conversely in Aberdeenshire, GVA shares have fallen significantly over the period with the result that exposure to excess energy costs, despite ranking in the top four, is lower than it might otherwise have been.

<b>Region</b>	<b>Industrial excess energy costs</b>	<b>'Other' sector excess energy costs</b>	<b>Non-domestic excess road fuel costs</b>	<b>Total non-domestic excess costs</b>
<i>Units</i>	<i>2024 £M</i>	<i>2024 £M</i>	<i>2024 £M</i>	<i>2024 £M</i>
Aberdeen City and Aberdeenshire	102	213	76	390
Angus and Dundee City	89	97	34	220
City of Edinburgh	177	517	47	741
Clackmannanshire and Fife	157	139	50	347
Dumfries and Galloway	68	65	60	193
East Dunbartonshire and West Dunbartonshire	82	42	17	142
East Lothian and Midlothian	41	70	27	138
Falkirk	29	54	27	110
Glasgow City	304	443	59	806
Highlands and Islands	205	265	92	563
Inverclyde, East Renfrewshire, and Renfrewshire	97	93	41	231
North Ayrshire and East Ayrshire	118	59	31	208
North Lanarkshire	81	148	63	292
Perth and Kinross, and Stirling	96	99	69	264
Scottish Borders	25	52	22	100
South Ayrshire	33	32	17	82
South Lanarkshire	39	107	65	211
West Lothian	83	109	32	224
<b>Scotland Total</b>	<b>1,829</b>	<b>2,605</b>	<b>829</b>	<b>5,263</b>

Scottish industry has faced a long period of uncertainty, dating back to before the fossil fuel crisis. For example, the decline in output and closure of the Grangemouth refinery (which ceased operations 2025) and the Mossmorran chemicals plant (due to stop

operating in 2026) are the culmination of decades of structural fragility. While volatile gas prices have undoubtedly squeezed margins – Grangemouth owner Petroineos (a joint venture between PetroChina and INEOS), claimed losses of nearly £400,000 a day<sup>14</sup> in 2024 - the roots of this decline precede the fossil fuel crisis, with Petroineos having significant financial losses since 2011<sup>15</sup>. Both sites have struggled with ageing infrastructure; the closure of a hydrocarbon “cracker” at Grangemouth in 2023 after it failed to restart following planned maintenance was dubbed a turning point that made further investment challenging<sup>16</sup>.

Beyond technical issues, the industry has faced a broader de-industrialisation and a shifting geopolitical landscape. Brexit introduced regulatory uncertainty and higher costs for the chemicals industry, with the Government citing a £2bn cost for the industry<sup>17</sup> and businesses pointing to increased “red tape” and supply chain barriers when exporting to the EU<sup>18</sup>.

Furthermore, a long-term decline in North Sea supply as production fell by 75% between 1999 and 2024<sup>19</sup> meant reduced local feedstock for the plants. At Grangemouth the Forties pipeline saw oil flows drop by 40% over the last six years<sup>20</sup>, so in recent times feedstock has been largely imported at a higher cost from the US. Mossmorran also increased imports of feedstock as North Sea supply dropped.

Combined with the high energy costs during the crisis, particularly oil and gas which play such a crucial role in the refinery and chemicals industries, challenges at these Scottish industrial sites have reached breaking point.

### *Domestic costs by local authority*

Across all Local Authorities of Scotland, households have had to bear significantly higher gas, electricity and road fuel costs during the fossil fuel crisis. On average across the country, consumers paid £2,263 per household in additional direct costs for energy.

The four areas experiencing the lowest excess costs in absolute terms (highlighted **green**) all lie in the South West, clustered around Glasgow. This is primarily due to a lower energy bill component, though some also benefit from below average exposure to road

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<sup>14</sup> <https://www.scotsman.com/news/politics/ineos-petroineos-grangemouth-400-jobs-oil-refinery-snp-labour-policies-4865335>

<sup>15</sup> <https://www.gov.scot/news/joint-plan-to-secure-industrial-future-of-grangemouth/>

<sup>16</sup> <https://www.theferret.scot/why-grangemouth-shut-and-what-happens-next/>

<sup>17</sup> [https://consult.defra.gov.uk/reach-policy/consultation-on-extending-the-uk-reach-submission/supporting\\_documents/Impact%20Assessment%20IA.pdf](https://consult.defra.gov.uk/reach-policy/consultation-on-extending-the-uk-reach-submission/supporting_documents/Impact%20Assessment%20IA.pdf)

<sup>18</sup> <https://www.ft.com/content/f41e3350-c870-41a7-b350-80d3a483ef8d>

<sup>19</sup> <https://publications.parliament.uk/pa/cm5901/cmselect/cmsscota/1603/report.html>

<sup>20</sup> <https://news.stv.tv/east-central/grangemouth-closure-represents-the-most-significant-industrial-loss-for-scotland-in-a-decade>

fuel excesses. All four highlighted LAs have consumed a declining share of UK total energy consumption over the crisis period, resulting in a lower apportioned cost to these regions. It should be noted that while this could be the result of efficiency measures, it is also possible that these trends illustrate demand suppression, with higher prices forcing domestic consumers in the wider Glasgow region to ration their energy use more than households elsewhere; all of these areas fall in the bottom third of UK Local Authorities by Gross Disposable Household Income per capita<sup>21</sup>.

The highest costs both in absolute terms and as a share of average household incomes were seen in Orkney and Shetland, driven primarily by higher energy bills, and in spite of lower exposure to standing charge increases due to lack of connection to the gas grid.<sup>22</sup> Inhabitants of Dundee City, one of the areas with the lowest levels of household disposable income in the UK, were also very hard hit. Meanwhile residents in more affluent areas, despite in some cases seeing some of the largest absolute cost increases, were least affected in relative terms – East Renfrewshire for example had the 5<sup>th</sup> highest absolute cost increase, but as the wealthiest region in Scotland was only 3<sup>rd</sup> lowest when this cost is expressed in terms of average household disposable income.

Local Authority	Total excess household costs	Number of households, 2024	Excess cost per household	Excess cost as % of disposable household income
<i>Units</i>	<i>2024 £M</i>	<i>2023</i>	<i>2024 £</i>	<i>%</i>
Aberdeen City	245.7	112,387	£2,186	1.17%
Aberdeenshire	284.4	117,419	£2,422	1.03%
Angus	122.3	54,998	£2,225	1.17%
Argyll and Bute	106.5	42,831	£2,486	1.32%
City of Edinburgh	540.9	244,791	£2,210	0.90%
Clackmannanshire	52.7	24,438	£2,157	1.17%
Dumfries and Galloway	150.6	70,972	£2,121	1.12%
Dundee City	155.0	71,098	£2,180	1.37%
East Ayrshire	124.3	56,162	£2,213	1.24%
East Dunbartonshire	112.6	46,743	£2,409	0.91%
East Lothian	135.3	50,562	£2,675	1.13%
East Renfrewshire	106.6	40,541	£2,630	0.96%

<sup>21</sup>

<https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdincome/bulletins/regionalgrossdisposablehouseholdincomeeqdhi/1997to2023>

<sup>22</sup> It should be noted that it is beyond the scope of this analysis to consider alternative home heating fuels. Home heating oil also saw a significant price increase during the period which may reduce or eliminate the lower excess gas costs seen in Orkney, Shetland and other rural areas.

<https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/kj5u/mm23>

Falkirk	164.8	73,237	£2,251	1.19%
Fife	392.2	171,913	£2,281	1.21%
Glasgow City	561.8	298,251	£1,884	1.13%
Highland	294.8	113,906	£2,588	1.29%
Inverclyde	72.2	37,615	£1,918	1.08%
Midlothian	108.0	42,739	£2,526	1.14%
Moray	101.5	44,291	£2,291	1.21%
Na h-Eileanan Siar	31.5	12,888	£2,448	1.31%
North Ayrshire	132.7	65,107	£2,039	1.21%
North Lanarkshire	350.4	153,004	£2,290	1.27%
Orkney Islands	30.7	10,887	£2,821	1.53%
Perth and Kinross	192.8	71,441	£2,699	1.26%
Renfrewshire	189.8	87,749	£2,163	1.25%
Scottish Borders	121.2	56,085	£2,162	1.08%
Shetland Islands	34.0	10,763	£3,157	1.44%
South Ayrshire	114.8	53,129	£2,160	1.11%
South Lanarkshire	347.2	150,643	£2,305	1.17%
Stirling	108.9	41,103	£2,649	1.18%
West Dunbartonshire	82.7	43,050	£1,922	1.23%
West Lothian	208.1	81,645	£2,549	1.26%
<b>Scotland Total</b>	<b>5,777</b>	<b>2,552,388</b>	£2,263	<b>1.15%</b>

## Wider economic impacts

This analysis seeks to capture the *direct* cost impacts on Scottish consumers of increased fossil fuel prices, via energy bills and road fuels but it should be noted that this is far from the end of the story in terms of wider economic implications.

Rising energy costs have been the primary driver of high inflation in the years since the crisis began, with businesses forced to either absorb increased cost base at the expense of profitability, or pass on higher costs to consumers via higher prices of food and other consumer products. Lower profitability and economic uncertainty impact investment across the economy, with broad impacts for GDP growth and productivity playing out long after the initial price shocks have subsided.

Meanwhile, high energy bills have left households struggling to keep up, with UK-wide levels of energy debt and arrears reaching historic highs of £4.5bn in Q3 2025.<sup>23</sup> For many, this means that despite falls in the energy price cap over the last year, high monthly repayments on accrued debt mean that the actual cost of living may take much longer to fall.<sup>24</sup>

## Conclusion

Scotland has faced years of energy price volatility that has impacted energy consumers across the board. Households, industry and businesses have all been impacted, with the cross-economy effects of higher energy prices having wider implications.

In total, the fossil fuel crisis cost Scotland £11 billion in direct expenditure for Scottish consumers between 2021 and 2024; households absorbed £5.8 billion of these excess costs, which equates to an average of the equivalent of £2,263 per household. Households in areas with lower disposable household incomes were more affected, for example those in Orkney and Shetland and Dundee City.

The Scottish industrial sector saw energy bills increase by £1.8 billion, while commercial, agricultural, and public sector organisations together faced an extra £2.6 billion. And a further £830 million in surplus road fuel costs was distributed across the nation's non-domestic sectors.

While there has been some progress made on reducing demand for gas through building more renewables during the crisis, progress on shifting away from gas boilers for heating and reducing dependence on oil and gas in the industrial sector remains slow. In an increasingly uncertain world, this raises questions about whether Scotland is prepared for another crisis.

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<sup>23</sup> <https://www.ofgem.gov.uk/data/debt-and-arrears-indicators>

<sup>24</sup> <https://www.nea.org.uk/news/april-2024-price-cap-debt/>