



Assessing the impact of lower fuel prices on the UK economy

A report for Howard Cox of FairFuelUK

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Cebr

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Executive Summary

This report investigates the impact of lower fuel prices on the UK economy, assessing the direct effect on growth, jobs and tax receipts.

We estimate that the lower oil and fuel prices seen over the course of 2015 have:

- Provided an **annual boost to Gross Domestic Product (GDP) of between 0.5%-0.6%**: reductions in the cost of production and increases in household spending power have supported higher levels of business investment and household consumption across much of the economy.
- Supported an additional **£11.6 billion in Gross Value Added (GVA)**: roughly equivalent to the annual output of the UK's ninth largest city, Sheffield. Assuming the fuel duty escalator was in place, the impact falls to below £6.9 billion.
- **Created around 121,000 jobs** across the economy: 18% more than under the assumption that the fuel duty escalator remained in place.
- Had a **positive impact on tax receipts**, with **net revenue up between 0.2%-0.3%**: Despite lower VAT receipts on fuel, the exchequer is estimated to collect an additional £1.3 billion in receipts over the course of the year.
- If low oil prices and the associated effects were to persist, the **annual boost to GDP could increase in future years** as the impacts on investment, prices and increases in employment and salaries, etc. continue to filter through to the economy.

The report also assesses the importance of diesel to the UK and analyses the direct impact of increased taxation on this section of the market. Our main findings are:

- **Diesel represents over 60% of all fuel consumed** on UK roads each year. This share is growing as diesel continues to play a greater role in the UK motorparc – annual sales of new diesel cars surpassed those of petrol in 2012.
- Reintroducing a duty escalator on diesel in the coming years would cost diesel users an **additional £7.9 billion in additional fuel costs** over the course of the current parliament.
- An increase in VED on diesel vehicles of £100 a year has the potential to **cost households and businesses between £1.4 and £1.5 billion a year**.

Introduction

Cebr was asked by the FairFuelUK campaign to investigate the impact of lower fuel prices on the UK economy in terms of its benefit to output, tax receipts and jobs. The prices of petrol and diesel have dropped considerably since the middle of 2014, when crude oil prices began to decline. As of the end of October 2015, the price of Brent crude oil remained below \$50 a barrel having stood at over \$110 barrel as recently as June 2014.

Previous analysis by Cebr has quantified the savings achieved by households and businesses across the UK as a result of lower fuel prices over the past year. Based on the average price of fuel in January 2015, it was estimated that the average UK household was in line to save over £220 a year on their fuel bill compared with the prices implied by a cost of crude of \$110 a barrel, equating to a direct boost of around £6 billion to household spending power. Similarly, the cost of operating commercial vehicles has dropped as a result. It was estimated that haulage companies would save over £7,200 a year on the cost of operating the average 44 tonne truck as a result of reduced fuel prices.

This report aims to analyse the wider impact of these savings on the UK economy. As previously highlighted, the additional spending power of both households and businesses should act to boost demand levels in the economy through some combination of higher consumption and increased business activity. However, if these lower crude oil and fuel price reductions endure, this increased economic activity can be expected to encourage business investment in their productive capacity, increased salaries as the gains are shared with employees and new job creation to accompany this new investment. This will, in turn, produce a range of dynamic effects that can act to improve productivity through greater economies of scale, for instance. This will, in turn, boost long run economic growth.

This report is structured as follows:

- **Section 1** discusses the modelling framework and assumptions utilised.
- **Section 2** presents the wider economic impact of lower fuel prices on the UK economy.
- **Section 3** analyses the impact of potential policy changes on diesel users.

Section 4 draws our key conclusions from the analysis.

1 Methodology and Assumptions

This section sets out the modelling framework and assumptions utilised in Cebr's assessment of the economic impact of lower fuel prices and of the fuel duty freeze since 2011.

1.1 The economic modelling framework

To arrive at estimates of the economic impact of lower fuel prices, we undertook a counterfactual analysis, comparing the way the economy would look under different fuel price scenarios. For this purpose, we used the modelling framework provided by the ONS' supply-use tables. These tables are derived from the national accounts and is used to reconcile the three approaches to the measurement of gross domestic product (GDP), that is, the output approach, the income approach and the expenditure approach.

The key benefit of using this framework for the fuel duty assessment is the identification that it allows of the interrelationships between:

- The output of industries and their intermediate consumption, that is, the goods and services supplied by other industries that they need to produce their own output; and
- The output of industries and their consumption of primary inputs, namely labour, capital etc.

Given that the latest available version of the supply-use tables refer to the economy in 2013, we used these under the simplifying assumption that the proportional impacts would not greatly differ had more up-to-date data been available.

1.2 Modelling the impact of recent oil and fuel price reductions

Using this modelling framework, the methodology required a number of steps to arrive at our estimates of the economic impact of the recent drop in crude oil and fuel prices, and the impact of the fuel duty freeze. These steps included:

- Establish the impact on demand for all products (goods and services) in the economy as a result of these crude oil and fuel price drops by:
 - estimating the price reductions available to producers and suppliers as a result of these drops, achieved by calculating the importance of oil and fuel in the supply chain for each product group;
 - making assumptions about the level of pass-through of these price reductions to other producers (who use their products as inputs) and to households, government, investors and exporters (the sources of final demand). We assumed a 20% pass-through to other producers and a 10% pass-through rate to households etc. These assumptions reflect sticky prices in the economy in general and the fact that other producers will be more organised in applying pressure on suppliers to share the reductions in cost. These pass-through rates can, of course, be expected to increase beyond the first year as long as the oil and fuel price reductions endure;
 - making assumptions about the price elasticity of demand for each product group which, combined with the pass-through assumptions, was used to generate percentage changes in the intermediate and final demands for all product groups;

- In assessing the impacts on demands, we build in a substitution effect and an income effect, as economic theory would suggest. The substitution effect results in an increase in the demands for oil and fuel as a result of the change in relative prices – oil and fuel becoming cheaper relative to the prices of other goods and services. The income effect provides the demand changes that occur as a result of business and households being made better off in real terms. These effects were built into the model by:
 - Establishing the change in the value of final consumption of fuel (at existing levels of fuel consumption) at the new lower final price for fuel and using the demand elasticities for oil and fuel to estimate the substitution effects – the increased demand in the quantities of oil and fuel consumed.
 - Assuming an economy-wide savings rate of 7 per cent, we allocated the remaining increase in disposable income as an increase in the final demand for other goods and services on which households are likely to spend their real earnings increases. This represents the income effect.
 - These demand-side impacts are then translated into impacts on production and supply, using these aspects of the supply-use framework. The oil and fuel price reductions are assumed to pass through to the gross operating surplus of industries in the first instance, after taking account of their increased demands for these products based on the substitution effect. This means a boost to industries' gross value added contributions to GDP. The increased demands for other products (due to the income effect) produces a supply and production response, which further boosts intermediate demands for products in industries' supply chains, thereby providing a further boost in production by domestic industry (having taken account of the impacts on imports).

The result is a prediction of the short term impact on GDP, assuming, as is generally the case, sticky prices and wages in the rest of the economy. As already noted, in the medium to long term, if the oil and fuel price reductions endure, the boost in profitability can, to some extent, be expected to be shared with employees (through higher wages and salaries) and/or retained for investment purposes and the creation of new jobs. These can be expected to generate further impacts beyond the first year, meaning that the boost to GDP could be higher than we have estimated in future years.

1.3 Modelling the impact of the fuel duty freeze

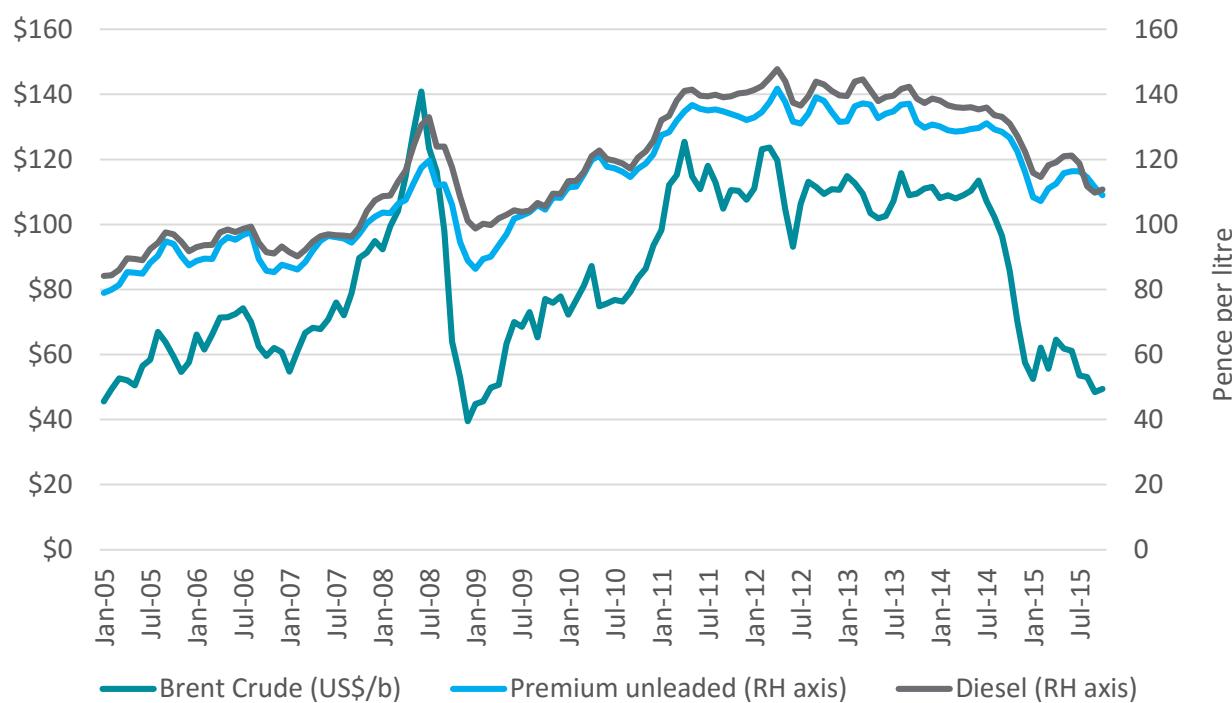
We augmented a new version of the economic model developed for the analysis outlined above in order to consider the impact of the fuel duty freeze that has been in place since 2011. The followed the same methodological processes except that, in this version, fuel prices are assumed to be at the levels that would have prevailed had the fuel duty escalator been still in place.

The difference between the results in the base model and the version of the model with the fuel duty escalator provides our estimates of what would have been lost had the escalator still been in place.

2 Impact of lower fuel prices on the UK economy

Forecourt prices for petrol and diesel are heavily driven by changes in the price of crude oil, from which these products are refined. Over the last 10 years oil prices have traded as low as under \$40 a barrel and as high as over \$140 a barrel. However, prices have tended to be fairly volatile – both of these extremes occurred within seven months of each other in 2008 – and, until the second half of 2014, have sat above \$100 a barrel. As a result, the price of a litre of petrol or diesel stood above £1.20 between 2011 and the end of 2014.

Figure 1 - Average monthly price of fuel in the UK and spot price of a barrel of Brent Crude



This is in contrast with the prices seen in 2015 to date. Average monthly prices of petrol for instance have sat below £1.20 per litre since the beginning of the year. In this section we present the findings resulting from our modelling of lower oil and fuel prices across the UK, assessing the impacts on Gross Domestic Product (GDP), Gross Value Added (GVA), jobs and Government revenue through 2015 and beyond.

2.1 Impact on GDP and GVA

Comparing the alternative fuel price scenarios, we estimate that the recent falls in oil and fuel prices have had a significant short-term impact on UK GDP and GVA. Our estimates suggest that lower oil and fuel prices will have provided a boost to annual GDP of between 0.5% and 0.6%. In other words, GDP would be 0.5%-0.6% lower in 2015 had we not seen these drastic oil and fuel price reductions.

The gross value added (GVA) contributions of industries is predicted to be at least 0.7%-0.8%, equating to around £11.6 billion in monetary terms. The boost to GDP is lower than to GVA as a result of the net loss of indirect taxes, which is dominated by the loss of VAT on fuel sales.

To put this GVA boost into perspective (noting that GVA is a truer measure of economic activity), this is slightly larger than the output produced across the whole of Sheffield in 2013¹. However, assuming the fuel duty escalator had remained in place, the impact of the recent drop in oil and fuel prices would have been eroded. The GVA contribution of industries to GDP would have increased by 0.4%-0.5%, equating to around £6.9 billion. However, the GDP impact is similar, albeit slightly lower (by 0.05% only), because the loss of GVA is compensated by gains in indirect taxes due to increased fuel duty rates and higher VAT takings on fuel.

While the UK is one of the major producers of oil and gas in the European Union – the UK is the largest oil producer in the EU – the UK is a net importer of oil and oil products. As such, although the UK's producers in the North Sea have likely experienced a fall in output, the UK economy as a whole has benefitted from the fall in oil prices. The fall in the price of fuel has a combination of effects. For businesses, it has reduced the cost of production. This either helps to increase profit levels, and potentially boost the level of investment, or is passed onto consumers in the form of reduced prices. For consumers, lower fuel prices translates into increased spending power as households face lower prices for vehicle fuels and other products that have fallen in price as a result of lower fuel prices. These increases in spending power across households should help to boost consumption, further supporting economic activity.

The impact on UK economic output has the potential to grow over time. If low oil prices and the associated effects were to persist, the annual boost to GDP could increase in future years as the impacts on investment, prices and increases in employment and salaries, etc. continue to filter through to the economy. Given the nature of these impacts, we could also expect to see an improvement in productivity and positive contributions to longer term economic growth.

2.2 Impact on jobs

Lower fuel prices are also shown to have a positive impact on employment, supported by increased levels of economic activity. While lower oil prices have put pressure on oil companies to cut workers as part of wider cost-cutting measures, the impact on jobs in other sectors of the economy is more positive.

Using relatively conservative assumptions about the extent to which the reduced cost of doing business will be passed through to existing employees in the form of higher wages and salaries and retained as profit for investment, we estimate that around 121,000 jobs will be created over time as a direct result of the recent fall in oil and fuel prices. Of this, sectors that are both fuel-intensive and that will benefit from the increase in consumer spending such as the transport sector are particularly likely to generate higher levels of employment.

¹Office for National Statistics – Regional GVA (2013)

While the sharp drop in fuel prices resulting from the decline in global oil prices has provided the most considerable boost to the economy, lower levels of fuel duty have also had a role to play in boosting the economy in the manner described above. However, had the fuel duty escalator remained in place, some 19,000 fewer jobs would be created as a result of the recent falls in oil and fuel prices.

2.3 Impact on tax receipts

Given that VAT is charged on the price of motor fuels (including on the fuel duty element), the fall in forecourt prices has undoubtedly put pressure on the VAT receipts collected from sales of petrol and diesel. However, across the economy the fiscal picture is much brighter, with the induced activity resulting from lower fuel prices contributing to higher tax receipts elsewhere in the economy.

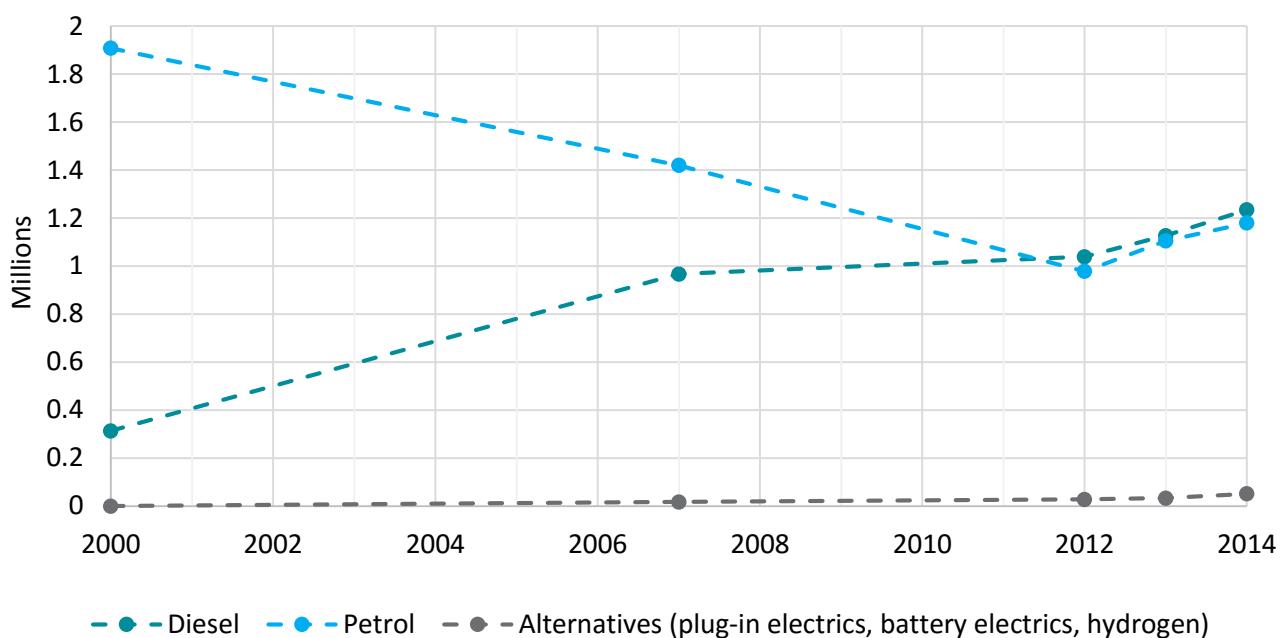
In fact, the loss of tax revenue that results from the fall in oil and fuel prices has been more than offset by the increases in induced taxes, such as income tax, NIC contributions, corporation tax and VAT on other products. The overall effect of lower fuel prices has been to boost Government revenues by between 0.2%-0.3%. Equating our central estimate to Government receipts across the 2014/2015 fiscal year, this implies an overall rise in revenue to the exchequer of £1.3 billion over the course of a year directly as a result of lower fuel prices.

Had the fuel duty escalator still been in place, indirect taxes on fuel would increase significantly and would be just about enough to compensate for the loss of economic activity and the consequent loss in the GVA contributions of industry to GDP. In essence, a continuation of the fuel duty escalator would have traded off the boost to economic activity and jobs for a higher tax take. Given the perceived fragility of the economic recovery, this would in hindsight have been an unwise policy.

3 Diesel users

The UK car market was once dominated by petrol models. However, the drive to reduce CO₂ emissions has led to diesels replacing petrol cars, particularly within the larger car segments. As shown in **Figure 2**, diesel cars made up a greater share of new car sales in the UK than petrol models. Despite the more recent ascension of diesel cars, the fuel type has more traditionally dominated the commercial vehicle market. As such, diesels are an increasingly important part of the UK's motorparc.

Figure 2 – UK new car sales by fuel type



Source: SMMT New Car CO₂ Report 2014

On a like-for-like basis, diesels are between 1% and 28.5% more efficient than petrol vehicles. However, concerns have been raised about the increased levels of other pollutants produced by diesel engines. While CO₂ emissions are lower, particulate matters and nitrous oxide emissions tend to be higher in new diesel models. These have been particularly cited as problems in some urban areas, with particulates associated with respiratory problems and certain cancers.

As such, there have been calls to increase the tax burden of diesel motorists across the country, despite air quality issues presenting a local rather than national issue. In this section of the report, we consider the impact of potential changes to national-level taxation on diesel users, including households and the haulage industry. In line with previous analysis conducted by Cebr, the direct impact of potential changes to the taxation of diesel are considered at a local authority level, utilising data on fuel consumption within each local authority.

3.1 Diesel usage

While only one in every three cars on UK roads is fuelled by diesel, these cars cover 60% more miles on average each year than their petrol counterparts². As a result, diesel represented around 38% of all personal fuel usage in the UK in 2013. Further, despite petrol being the more prominent fuel for personal usage, more than half of the 46 billion litres of fuel consumed on roads across the UK is diesel, reflecting the fuel's importance within the freight industry. As such, additional taxes levied on diesel have the potential to have quite a considerable impact on fuel costs across the economy.

Figure 3 – Diesel use as a share of total fuel use (2013)



Source: DECC, Cebr Analysis

As shown in **Figure 3**, the most prominent use of diesel fuel as a share of total fuel usage was in Scotland in 2013. However, at a household level, Northern Ireland saw the greatest share of personal usage accounted for by diesel, at 45%. However, in volume terms England accounted for the majority, nearly 83%, of the 28 billion litres of diesel consumed on UK roads in 2013.

3.2 Impact of an increase in diesel duty

Utilising data which estimates the volume of vehicle fuel consumed across given geographical areas, we have forecast the impact of the introduction of a duty escalator on diesel on households and businesses in each Local Authority district. Additional fuel costs are estimated for personal and freight usage over the next five years by combining Cebr's forecasts for fuel consumption with the difference between the current rate of fuel duty and a counterfactual level based on uprating fuel duty at the beginning of each financial year between now and the end of the current parliament based on the OBR's projections for RPI

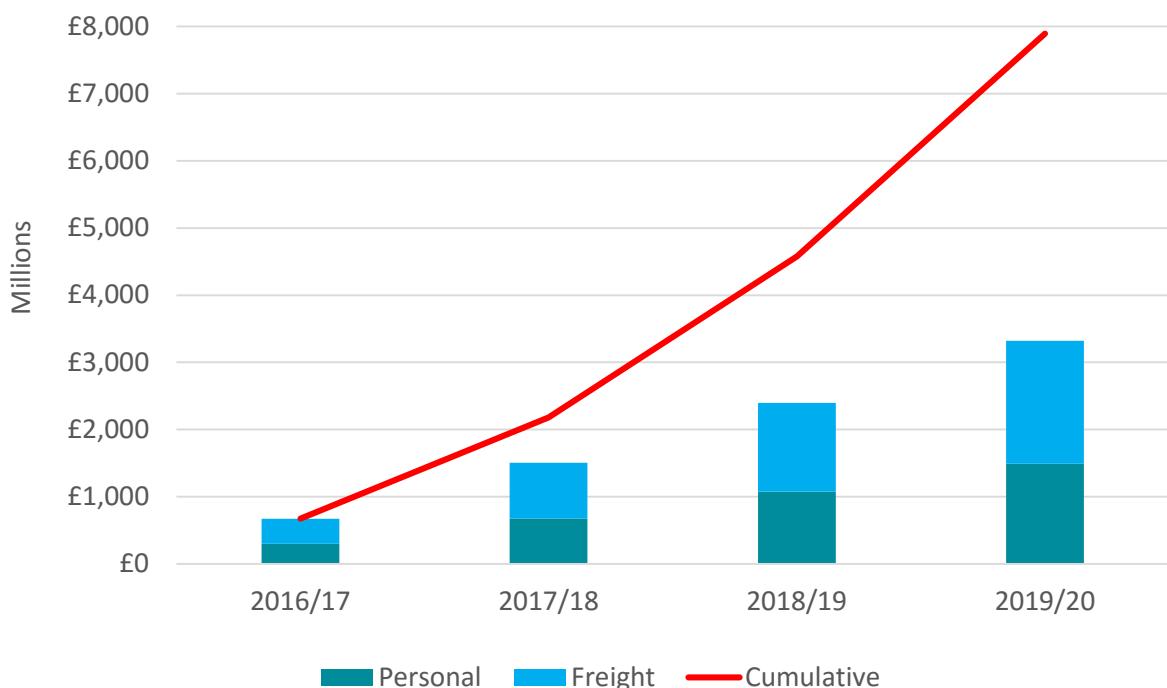
² Society of Motor Manufacturers and Traders

inflation plus £0.01 – the structure of the fuel duty escalator before the current freeze was introduced in 2011.

Under such a policy, duty on diesel fuel would rise from its current level of £0.58 per litre to around £0.69 per litre during the 2019/20 financial year. Over the course of the current parliament, users of diesel vehicles across the UK as a whole would face additional fuel costs of over £7.9 billion compared with diesel duty at its current rate.

While households will also face increased costs from fuel, it is businesses across the country that would be most directly impacted by a decision to raise the level of duty on diesel fuel in the coming years. Of the £7.9 billion of additional fuel costs, around £4.4 billion will be accounted for by freight usage, bringing extra costs for operators of commercial and goods vehicles.

Figure 4 – Additional fuel costs for diesel users as a result of a diesel duty escalator

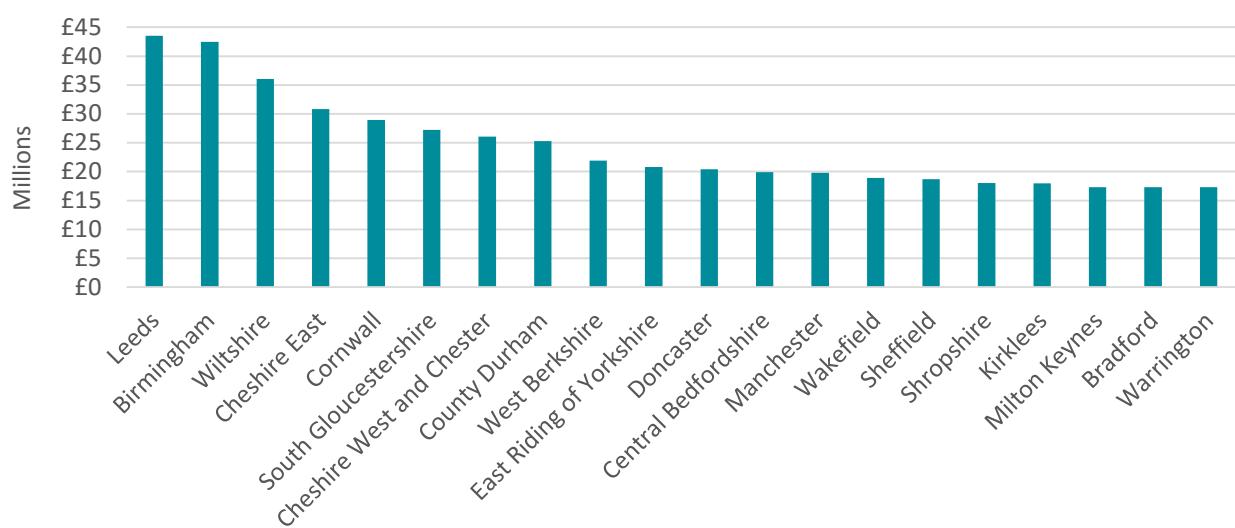


Source: DECC, Cebr Analysis

England

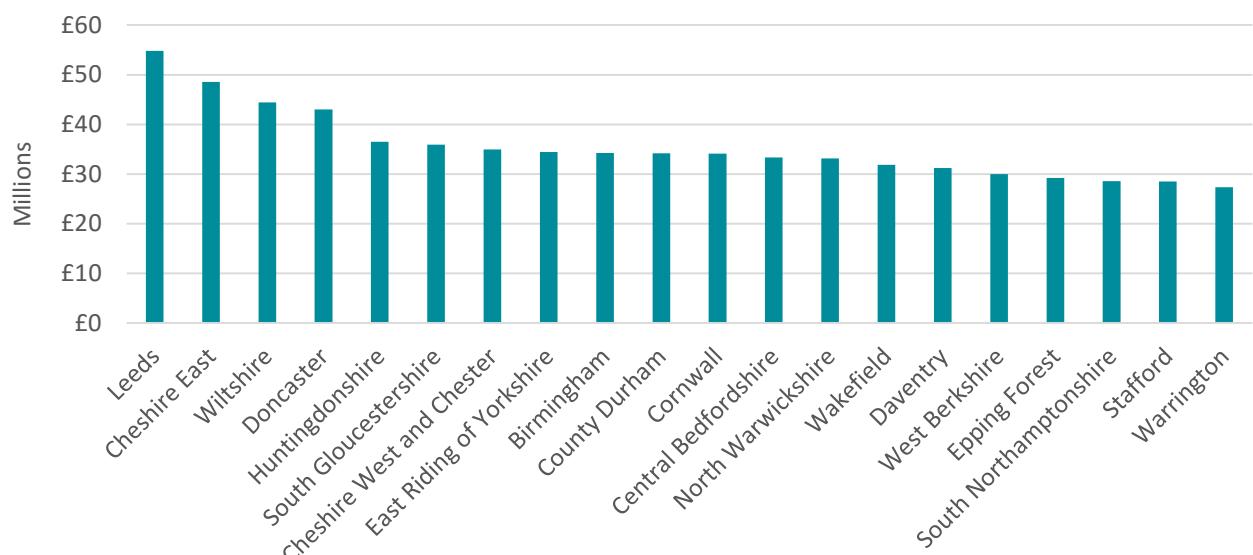
In total, diesel users across England will be hit by an additional £6.5bn of fuel costs over the course of the current parliament if duty on diesel were to rise by RPI inflation plus £0.01 each year. Households would see costs rise by around £2.9bn and operators of HGVs and LCVs would face over £3.6bn of additional costs.

Figure 5 – Top 20 English Local Authorities by additional costs for personal diesel usage



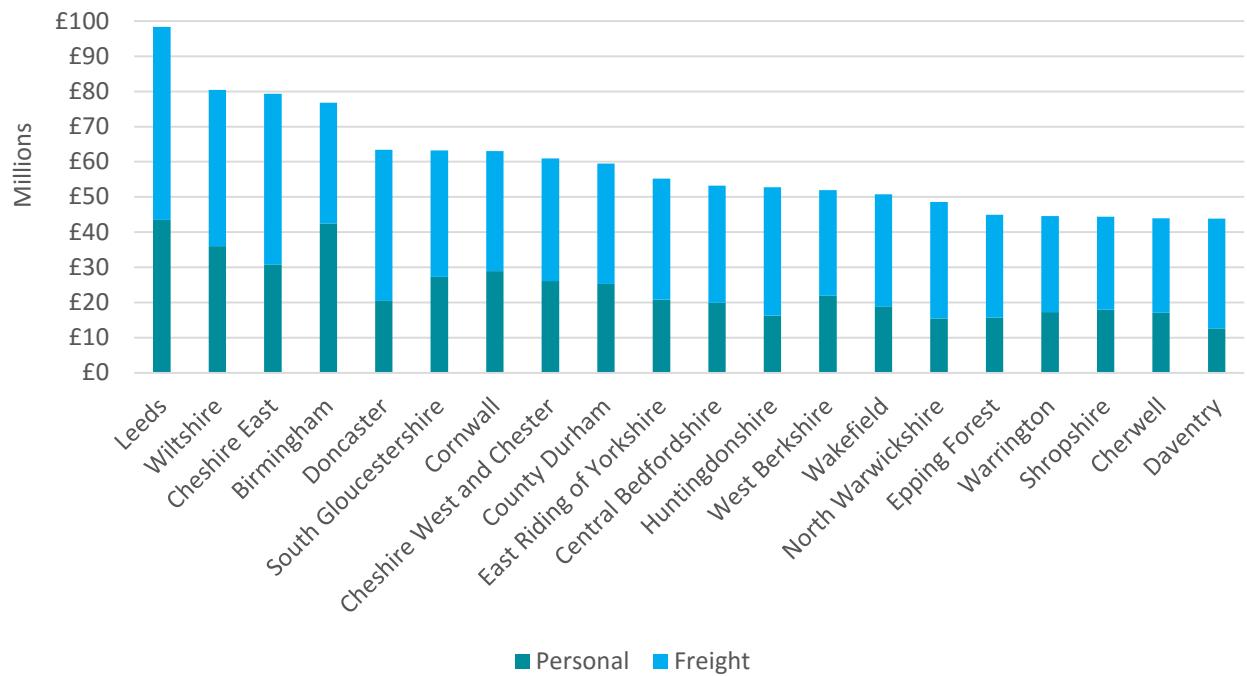
Source: DECC, Cebr Analysis

Figure 6 – Top 20 English Local Authorities by additional costs for diesel freight usage



Source: DECC, Cebr Analysis

Figure 7 – Top 20 English Local Authorities by additional costs for diesel users

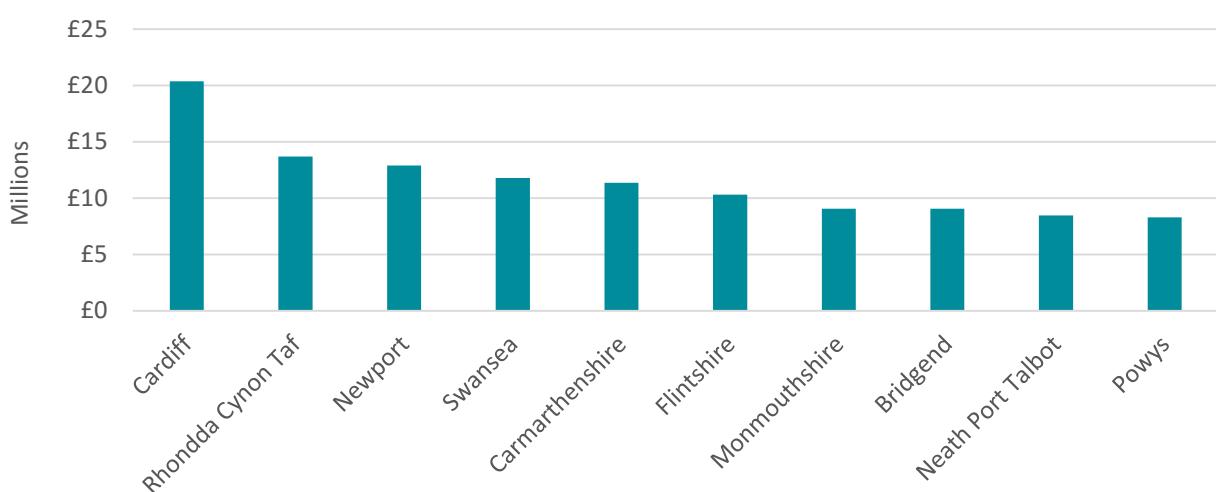


Source: DECC, Cebr Analysis

Wales

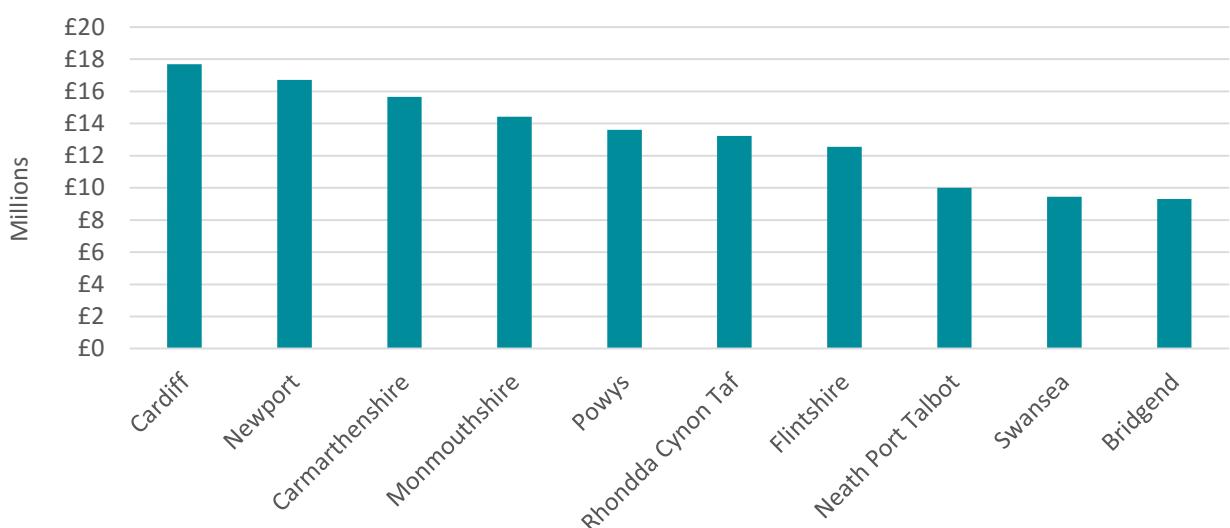
In total, diesel users across Wales will face an additional £380mil of fuel costs over the course of the current parliament if duty on diesel were to rise by RPI inflation plus £0.01 each year. Households would see costs rise by just under £180mil and operators of HGVs and LCVs would face over £200mil of additional costs.

Figure 8 – Top 10 Local Authorities in Wales by additional costs for personal diesel usage



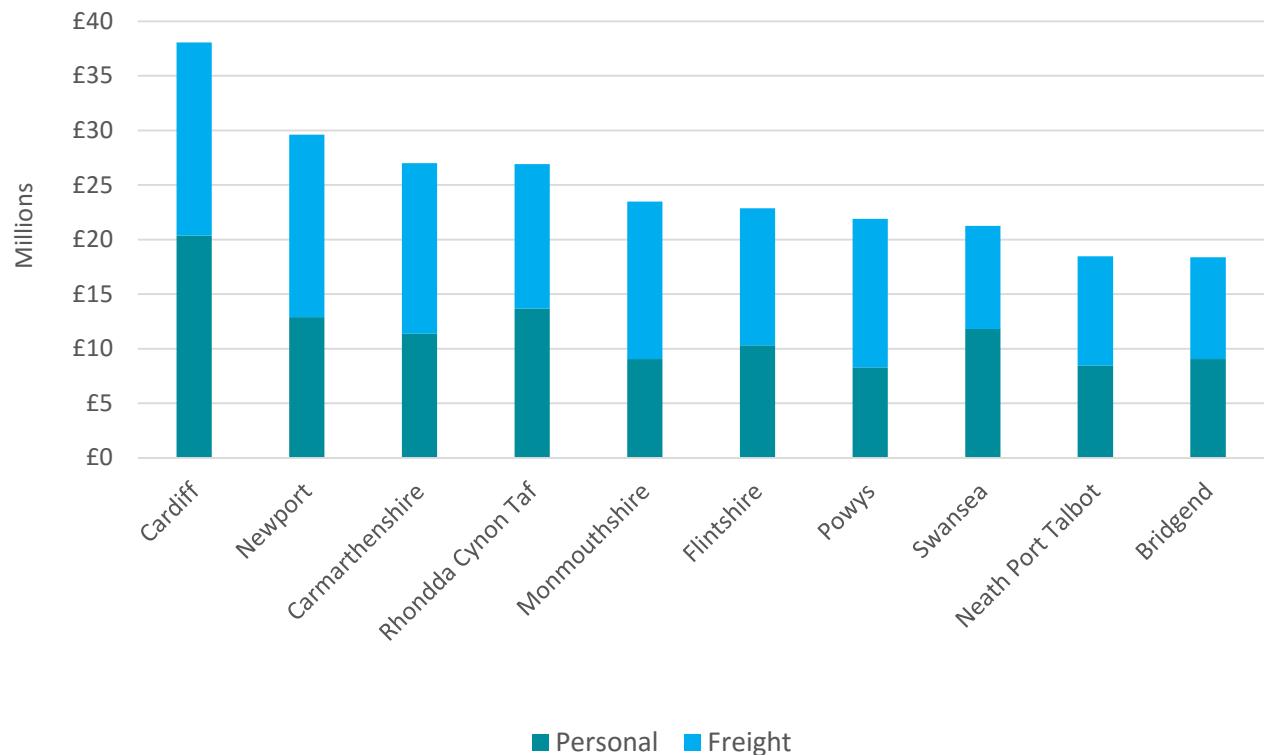
Source: DECC, Cebr Analysis

Figure 9 – Top 10 Local Authorities in Wales by additional costs for diesel freight usage



Source: DECC, Cebr Analysis

Figure 10 – Top 10 Local Authorities in Wales by additional costs for diesel users

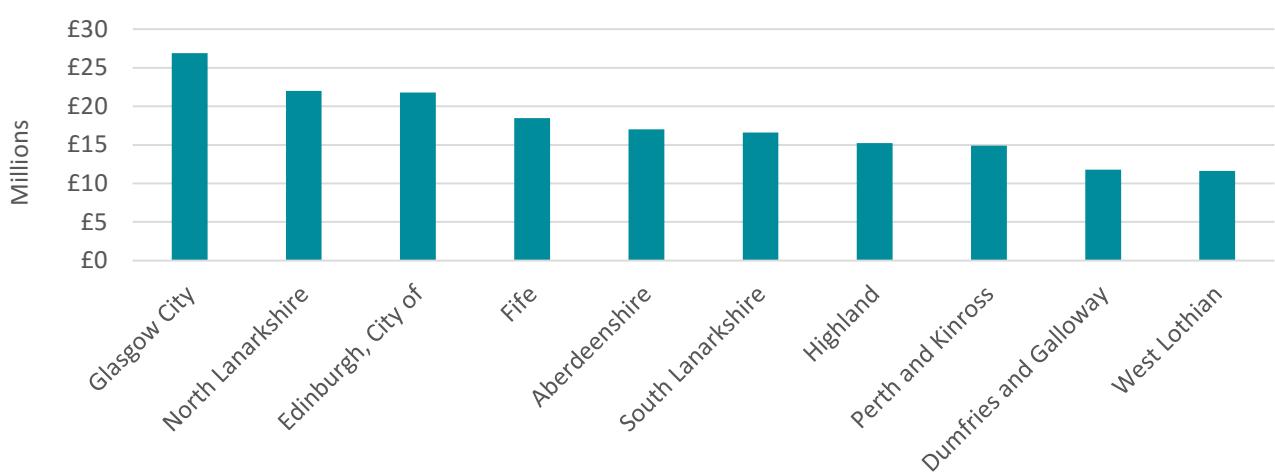


Source: DECC, Cebr Analysis

Scotland

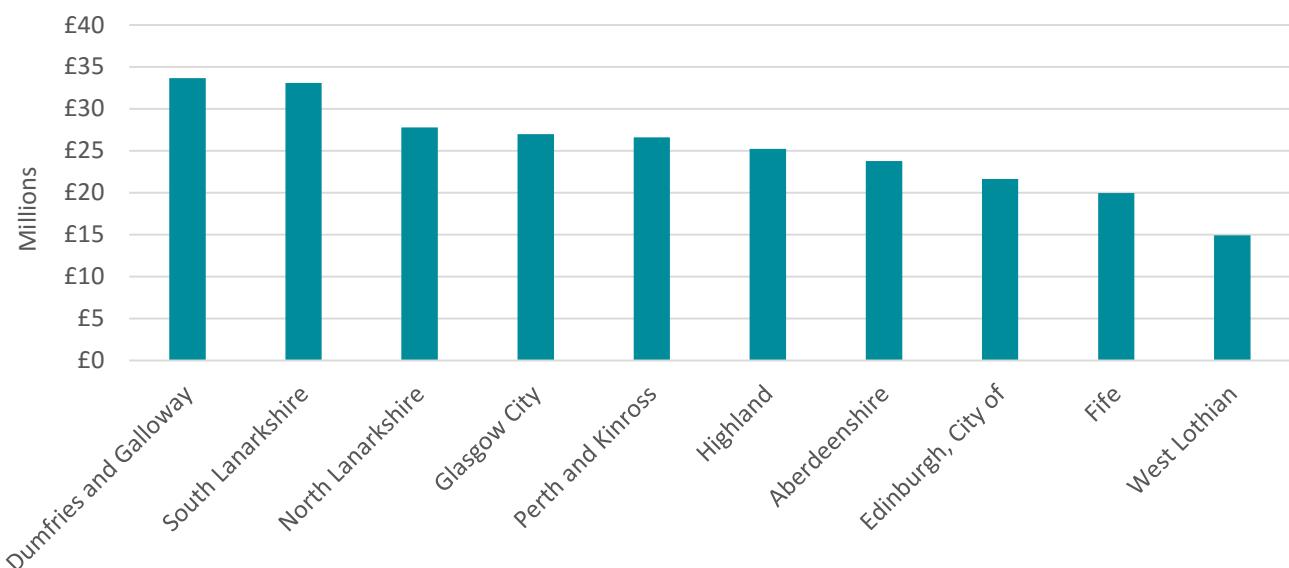
In total, diesel users across Scotland will be hit by an additional £690mil of fuel costs over the course of the current parliament if duty on diesel were to rise by RPI inflation plus £0.01 each year. Households would see costs rise by over £290mil and operators of HGVs and LCVs would face over £390 mil of additional costs.

Figure 11 – Top 10 Scottish Local Authorities by additional costs for personal diesel usage



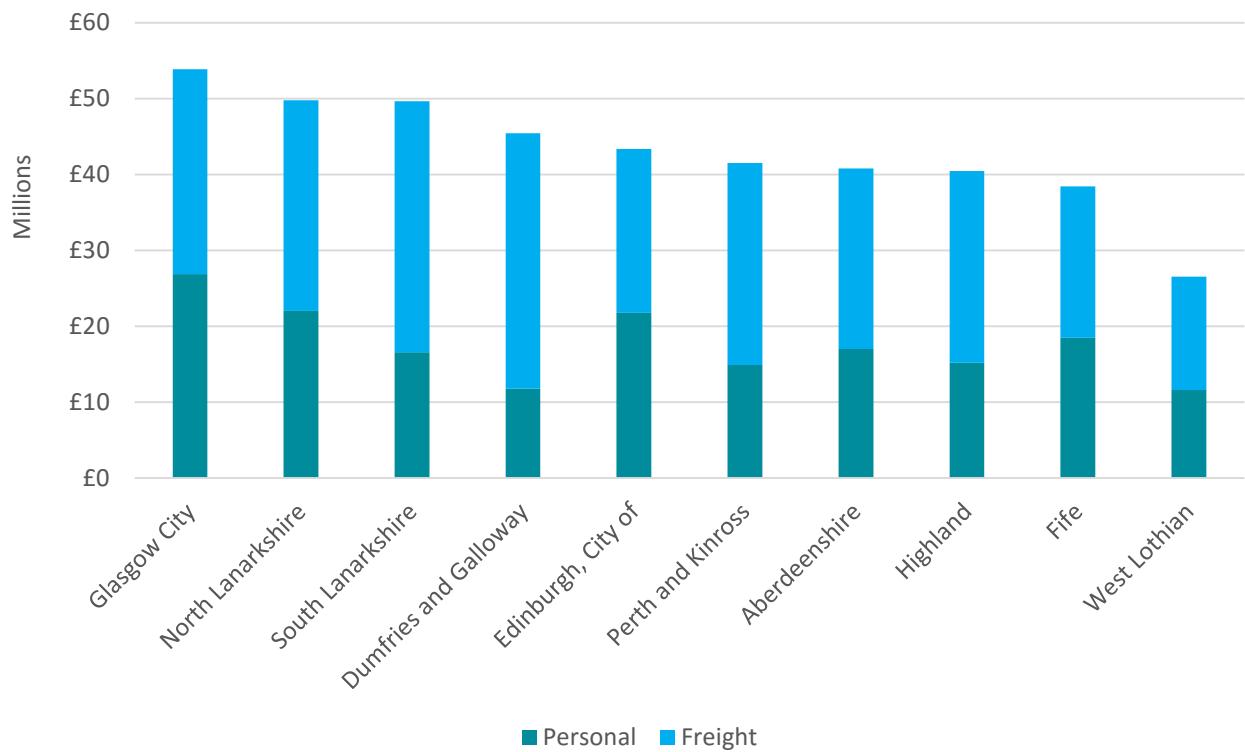
Source: DECC, Cebr Analysis

Figure 12 – Top 10 Scottish Local Authorities by additional costs for diesel freight usage



Source: DECC, Cebr Analysis

Figure 13 – Top 10 Scottish Local Authorities by additional costs for diesel users

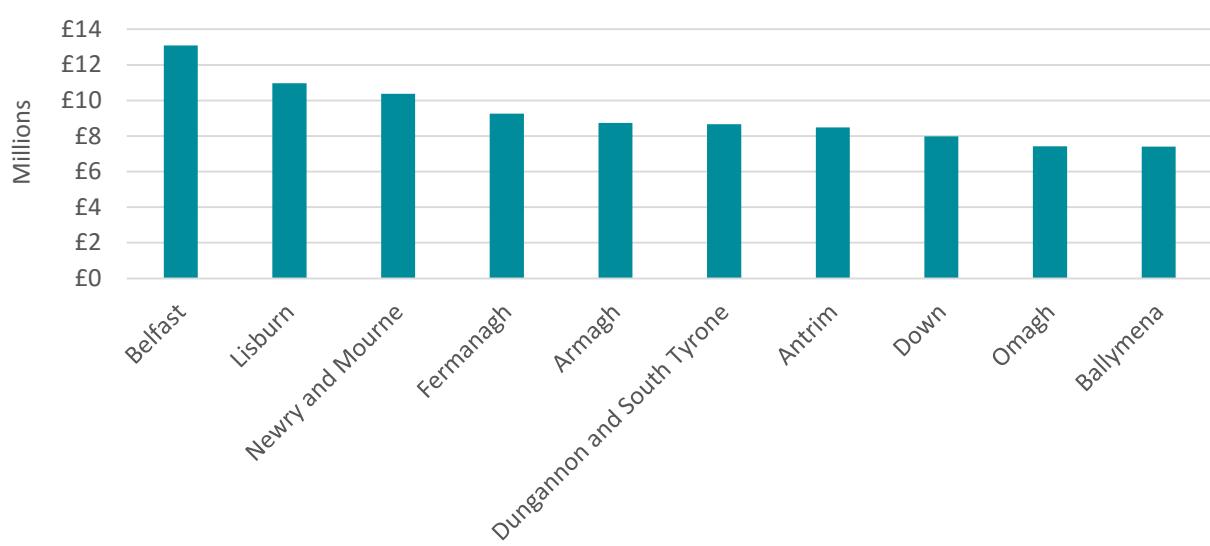


Source: DECC, Cebr Analysis

Northern Ireland

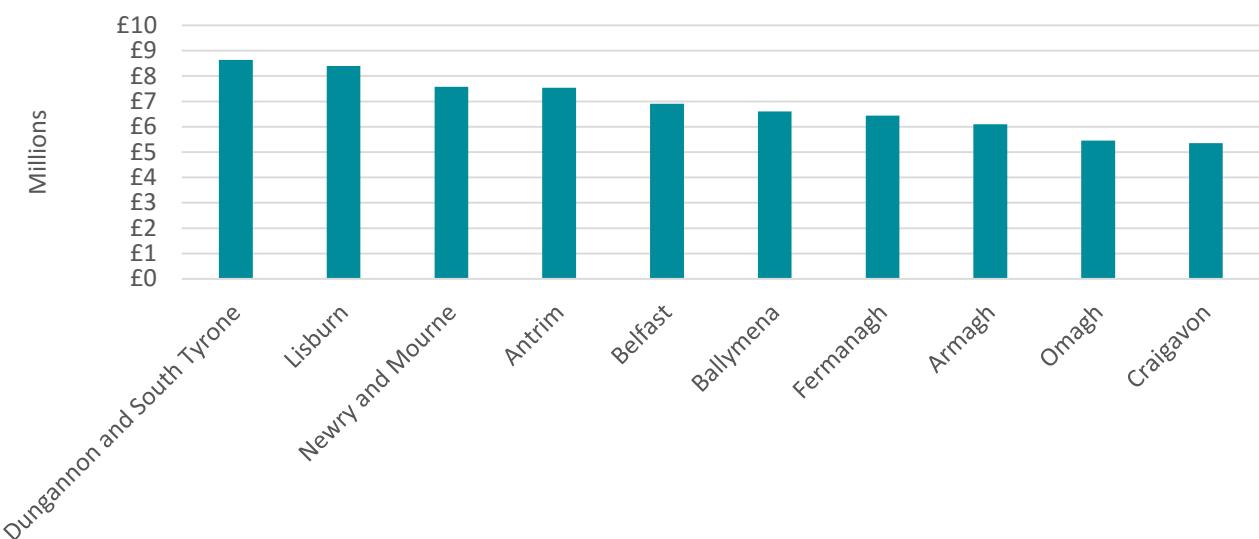
In total, diesel users across Northern Ireland will face an additional £280mil of fuel costs over the course of the current parliament if duty on diesel were to rise by RPI inflation plus £0.01 each year. Households would see costs rise by over £160mil and operators of HGVs and LCVs would face just under £120mil of additional costs.

Figure 14 – Top 10 Local Authorities in Northern Ireland by additional costs for personal diesel usage



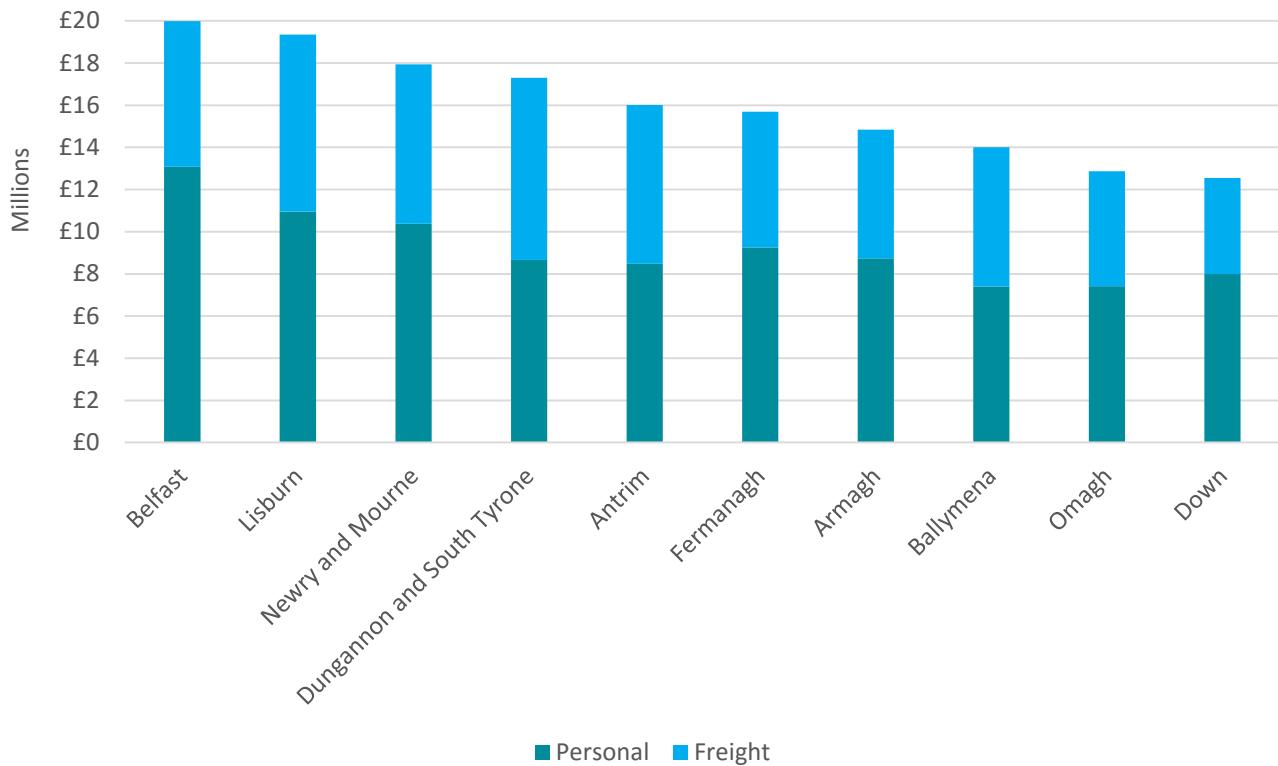
Source: DECC, Cebr Analysis

Figure 15 – Top 10 Local Authorities in Northern Ireland by additional costs for diesel freight usage



Source: DECC, Cebr Analysis

Figure 16 – Top 10 Local Authorities in Northern Ireland by additional costs for diesel users



Source: DECC, Cebr Analysis

3.3 Vehicle Excise Duty

Alongside fuel duty, Vehicle Excise Duty (VED) is one of the key national aspects of motoring taxation applied across the UK. On a revenue basis, VED forms an important share of government revenues from motoring, contributing to around £6 billion of tax revenue in the last financial year.

VED is levied annually based on the ownership of road vehicles. The current structure for cars, though this is due to change for new cars from April 2017, is graduated, with rates based on the CO₂ emissions. While rates differ somewhat in the first year of registration, the annual VED payment for the lowest-emitting cars (Band A - <100 g/km) is currently £0. This increased to over £400 a year for the highest emitting vehicles. This graduation works in line with other policies to help to encourage drivers into lower CO₂ emitting vehicles, something the UK must do in order to continue to meet EU targets on average CO₂ emissions of new cars – currently this stands at an average of 95g/km by 2020.

Currently, there is no distinction between petrol and diesel cars in the VED structure, providing a clear signal targeted towards CO₂ emissions. However, with air quality considerations becoming more apparent in certain areas, suggestions have been made that the VED system should be adapted to account for the higher particulate and nitrous oxide emissions from diesel engines. However, an

additional levy on diesel vehicles could present a considerable increase on the cost of operating a diesel car/van each year.

According to licencing statistics from HMRC, there were over 14 million diesel cars and vans in the UK in 2014, each contributing to the revenue received from VED that year. As a result, an increase in VED on diesel vehicles of £100 a year has the potential to cost households and businesses between £1.4 and £1.5 billion a year. This would present a hefty cost, particularly given that many of these vehicles will be operating outside of areas with air quality for the majority of their usage. Further, it would present a considerable penalty to people who had previously been encouraged by the graduated structure of the current VED system to purchase a more efficient diesel variant in order to make savings on their road tax.

4 Conclusion

The research in this report confirms the positive impact that lower fuel prices have on the UK economy. Our previous analysis has shown the savings that falling fuel prices have bought to consumers and businesses. Here we extend this analysis to show that falling oil and fuel prices have provided a considerable boost to the UK economy over the past year. For example, our estimates suggest that lower fuel prices have provided an annual boost to GDP of between 0.5%-0.6% with the savings made by both households and businesses filtering through into the economy through lower prices for some goods, increased consumption by households and higher levels of business investment.

While the reduction in the price of fuel means that VAT receipts fall, our analysis has shown that, given increased levels of economic activity, the overall effect of lower fuel prices is positive in terms of tax receipts. This is helped by increased levels of income tax resulting from higher levels of employment – the fall in fuel prices is estimated to be responsible for the creation of around 121,000 jobs – and increased tax take resulting from higher levels of consumption and investment.

The impact on the economy is likely to accrue over time. If low oil prices and the associated effects were to continue, the annual boost to GDP could increase in the coming year as the impacts on investment, increases in employment and salaries, prices etc. continue to filter through to the economy. Given that around 70% of the current fuel price constitutes tax in the form of vehicle duty and VAT, tax policy could have an important role to play in delivering lower fuel prices. Given that diesel represents more than 60% of the total vehicle fuel consumed across the UK each year, raising the rates of tax on diesel drivers could have considerable effects on the cost of operating these vehicles. Given the importance of diesel for businesses such as those in the haulage industry, these additional costs are likely to have a negative impact on growth in the economy, offsetting to some extent the boost experienced over the past year as a result of the fall in global oil prices. Further, restrictive taxation on diesel is likely to have some impact on the attractiveness of the UK as a home for manufacturers in the automotive industry. While air quality concerns do warrant attention, broadly targeting diesel engines through the national tax regime represents a fairly heavy-handed approach to what are localised issues.