Deloitte.

Study of the UK petroleum retail market.

A Final Report for DECC

14 December 2012

This report has been prepared on the basis of the limitations set out in the engagement letter and the matters noted in the Important Notice From Deloitte on page 1.

Contents

Important Notice from Deloitte

This final report (the "Final Report") has been prepared by Deloitte LLP ("Deloitte") for the Department of Energy and Climate Change ("DECC") in accordance with the contract with them dated 12 June 2012 ("the Contract") and on the basis of the scope and limitations set out below.

The Final Report has been prepared solely for the purposes of undertaking a study of the UK petroleum retail market, as set out in the Contract. It should not be used for any other purpose or in any other context, and Deloitte accepts no responsibility for its use in either regard including its use by DECC for decision making or reporting to third parties.

The Final Report is provided exclusively for DECC's use under the terms of the Contract. No party other than DECC is entitled to rely on the Final Report for any purpose whatsoever and Deloitte accepts no responsibility or liability or duty of care to any party other than DECC in respect of the Final Report or any of its contents.

As set out in the Contract, the scope of our work has been limited by the time, information and explanations made available to us. The information contained in the Final Report has been obtained from DECC and third party sources that are clearly referenced in the appropriate sections of the Final Report. Deloitte has neither sought to corroborate this information nor to review its overall reasonableness. Further, any results from the analysis contained in the Final Report are reliant on the information available at the time of writing the Final Report and should not be relied upon in subsequent periods.

Accordingly, no representation or warranty, express or implied, is given and no responsibility or liability is or will be accepted by or on behalf of Deloitte or by any of its partners, employees or agents or any other person as to the accuracy, completeness or correctness of the information contained in this document or any oral information made available and any such liability is expressly disclaimed.

This Report and its contents do not constitute financial or other professional advice, and specific advice should be sought about your specific circumstances. In particular, the Report does not constitute a recommendation or endorsement by Deloitte to invest or participate in, exit, or otherwise use any of the markets or companies referred to in it. To the fullest extent possible, both Deloitte and DECC disclaim any liability arising out of the use (or non-use) of the Report and its contents, including any action or decision taken as a result of such use (or non-use).

Summary

Background

The Department of Energy and Climate Change ('DECC') has commissioned Deloitte to conduct a study of the UK petroleum retail market in order to develop a better understanding of the implications of recent trends in the number of petrol filling stations ('PFS') on the overall security of supply and the resilience of the downstream oil sector. For the purposes of this study, the UK petroleum retail market is defined as the retail sales of road transport fuel (petrol[1] and diesel) to consumers and businesses via the UK's PFS network.

This report provides an overview of the UK petroleum retail market, including its size, key demand drivers, types of retailers and PFS proximity, and how these have evolved over time. It also sets out the key business drivers in this market and the ensuing business models and strategies of different market participants.

Key changes in the UK petroleum retail market

The petroleum retail market has undergone a number of significant changes over the last few decades. The key changes are summarised below.

- The number of PFS has declined from more than 37,500 in 1970 to less than 9,000 in 2011, which represents closures of more than 75% of PFS. Between 2001 and 2011, the number of PFS has declined from 12,258 in 2001 to 8,677 in 2011 (a 29% decrease). However, it should be noted that the rate of PFS closures has reduced to some extent in the last five years (a 6% decrease during this period).

- PFS closures primarily comprise independent dealer-owned and company-owned PFS, while hypermarket-owned PFS[2] have continued to grow. The growth in hypermarket-owned PFS is broadly in line with the growth of hypermarkets in the grocery retailing business. Hypermarket-owned PFS typically sell higher volumes and have more fuelling positions relative to dealer-owned and company-owned sites. This has resulted in hypermarkets having a higher market share by fuel volume compared to their market share by number of PFS. In 2011, hypermarkets had a market share of 39% in total fuel volumes sold while their share of the number of PFS was only 15%.

- Independent dealers continue to face pressure on their business models. This is primarily due to competition from hypermarkets and to a certain extent from company-owned sites as they try to compete on price.

---

1 Throughout this report, 'petrol' is used to refer to motor spirit or motor gasoline.

2 PFS comprise three main types: (i) Independent dealer-owned PFS - An independent dealer who owns and operates a PFS while sourcing fuels and using the brand name of the fuel supplier, such as Shell; (ii) Company-owned PFS, for example where BP owns and operates a PFS under its own brand; and (iii) Hypermarket-owned PFS – for example Tesco, which sells fuel under its own brand.

- Non-fuel sales, in particular convenience store sales, are becoming increasingly important in making a PFS business model viable. At the same time, non-fuel sales also present growth opportunities for larger players. This has led to growth of some larger independent dealers with multiple PFS (such as Rontec) which are able to exploit economies of scale and develop a compelling convenience store offering at their PFS sites.

- On the supply side, over the last few decades, there has been some rationalisation of distribution terminals and the secondary distribution network (comprising road tankers), with major oil companies outsourcing their road distribution operations. This has led to efficiencies and cost savings in the sector but, together with PFS closures, has led to a reduction in spare capacity in the system.

The proximity of PFS to consumers and the impact of PFS closures between 2001 and 2011 have been estimated.[3] The impact on consumers has been measured by estimating:

a) the minimum indicative driving time for a consumer to reach the nearest PFS and how this has changed over time;

b) the number of PFS available within a 10 minute driving time and how this has changed over time[4]; and

c) the number of motor vehicles per effective fuelling position[5], in order to assess the relative density of vehicles to PFS.

The analysis related to access and PFS availability is based on estimating driving time in 2001 and 2011 from a specified point (referred to as the 'centroid') within each postcode sector in the UK to the nearest ten PFS.[6] The analysis on density of vehicles has been undertaken for each postcode district[7] level.[8] The key observations from this analysis are summarised below and in Table 1.

- In terms of access, out of 9,451 postcode sectors, 98% have a PFS within a 10 minute driving time in 2011.
    - Of the 2% of postcode sectors that do not have a PFS within a 10 minute driving time, nearly 40% are located in Scotland.

[3] These estimates are based on assumptions set out in Appendix A.3.2.

[4] For further details on the rationale of using a ten minute threshold, refer to Section 3.5.3.

[5] Effective fuelling positions comprise the number of fuelling positions that can be used at any one time on a PFS forecourt. For further details, refer to Section 3.5.2.

[6] For further details on the approach, refer to Section 3.5 and Appendix A.3.2.

[7] A postcode sector consists of all delivery addresses comprising all but the last two letters of a full postcode (for example, UB7 0 from UB7 0EB). A postcode sector contains an average of approximately 2,900 households and is the most common unit of geography for door drops. A postcode district consists of all delivery addresses comprising the first half of the full postcode (e.g. UB7 from UB7 0EB). Thus, a postcode district consists of a number of postcode sectors.

[8] This is due to the count of motor vehicles not being available for each postcode sector.

  - For postcode sectors where the driving time in 2001 was less than 10 minutes to the nearest PFS, but in 2011 is more than 10 minutes, the average travel time to reach the nearest PFS has more than doubled from just over five minutes to over twelve minutes.

- In terms of PFS availability, 92% of postcode sectors have more than two PFS within a ten minute driving time.

  - Of the 8% of postcode sectors which have two or fewer PFS, these are mainly located in Scotland, South West England, Wales and East of England.

- In terms of density of vehicles, out of 2,729 postcode districts, 95% have up to 500 vehicles per effective fuelling position. There are some postcode districts (less than 3% of total), located in different parts of the UK, which have higher vehicle densities. There are also some postcode districts which do not have any effective fuelling positions within a driving time of ten minutes; these areas are mainly in Scotland.

Table 1: Summary of key results from the proximity analysis

Description	2001	2011	Net changes
Total number of PFS	12,258	8,677	-3,581 (-29%)
Access – In 2011, 98% of postcode sectors have a PFS within a ten minutes driving time			
Number of postcode sectors where minimum driving time to a PFS is more than ten minutes (% of total postcode sectors)	124 (1.3%)	183 (1.9%)	+59 (0.6%)
Choice – In 2011, 92% of postcode sectors have more than two PFS within a ten minutes driving time			
Number of postcode sectors which have two or fewer PFS within a ten minutes driving time (% of total postcode sectors)	481(5.1%)	713 (7.5%)	+232 (2.5%)

Source: Deloitte analysis

Potential risks in the UK fuel retail market

Going forward, some of the key risks in the sector are listed below.

- The pressure on business models of dealer-owned PFS is likely to continue, in particular, for smaller independent dealers with single sites, due to competition, but also due to working capital constraints. In addition, a change in the type of contracts offered by fuel suppliers, which removed an element of 'margin' protection for independent dealers, has increased the level of wholesale price exposure for these businesses. These pressures may result in further closures. At the same time, the presence and growth of hypermarkets in the fuel retailing market is likely to continue.

- Further closures will reduce onsite PFS storage capacity. However, as independent dealers typically do not fully utilise their storage capacity, this means that the reduction in the available fuel stock in the ground is less than the reduction in storage capacity.

- Further closures may increase minimum driving times to a PFS and may also reduce the number of PFS available within a reasonable driving time. The extent of this impact will vary across regions and types of areas (rural/urban).

- There may be further fragmentation of the fuel supply chain due to exit of major oil companies from the upstream and/or downstream petroleum market.

- Reliance on imported petroleum products is likely to increase as the primary source of fuel for hypermarket-owned PFS is imports which are sourced via independent fuel suppliers. However, growing reliance on imports may occur in any event if there are further refinery closures in the UK.

Implications for resilience and security of supply in the UK

For the purposes of this study, energy resilience is taken to mean the capacity of the system to cope with short term disruptions to supply, while security of supply is considered to be the capacity of the system to meet the demand for fuel in a secure way over the longer term. The key implications are discussed below.

PFS storage capacity

On the supply side, further closures will reduce onsite storage capacity in the PFS network. At the end of 2011, there were 8,677 sites in the UK PFS network. On an indicative basis, assuming an average daily consumption of 100 million litres, the existing PFS storage capacity may provide a cover for six to eight days in case of fuel supply disruptions if the PFS storage capacity is fully utilised.[9] Due to PFS closures between 2001 and 2011, storage capacity has been reduced by approximately 15% to 20% which implies a potential loss of up to two days of cover. The percentage reduction in the number of PFS between 2001 and 2011 (29%) relative to the percentage reduction in storage capacity during this period (15-20%) is higher due to the closure of smaller PFS which will typically have lower storage capacity than the remaining PFS sites. As PFS closures may continue in the future, this may further reduce the days of cover in case of short-term supply disruptions and therefore have a negative impact on energy resilience.

Furthermore, the days of cover discussed above are based on the assumption of full utilisation of PFS storage capacity. However, some PFS owners do not fully utilise their storage capacity as they seek to manage their stock levels and minimise their associated working capital costs. Moreover, fuel in storage will be depleted prior to storage tanks being refilled. This means that in practice the fuel stored in PFS at any particular point in time provides less than six to eight days of cover.

As the number of PFS closures is higher than the number of new PFS being opened (which are primarily hypermarket-owned PFS), there is limited scope to significantly expand overall PFS storage capacity by considering placing minimum capacity requirements on new PFS. Furthermore, discussions with industry participants indicate that the costs of upgrading capacity by a significant

[9] PFS storage capacity has been estimated on the basis of high-level assumptions which link fuel volumes sold by PFS to their storage capacity (ratio of fuel volumes to storage capacity). Further details on these assumptions are included in Appendix C.2.3

scale on existing sites could be substantial. This means that the potential to increase the resilience of the system by encouraging capacity expansion is limited.

Supply chain fragmentation

There has been considerable fragmentation in the fuel supply chain over the last few decades. This includes the rationalisation of storage terminals, outsourcing of the fuel road distribution network and the exit from refining by some oil majors. As a result of these changes, while the supply chain may have become more efficient, there is reduced spare capacity in the system (including the road tanker distribution capacity) which in turn is likely to reduce the resilience of the system in case of supply disruptions.

Domestic production versus imports of petroleum products

Hypermarkets have grown significantly in the last decade, both in terms of the number of PFS and market volumes sold, and this growth may continue. Hypermarkets mainly source fuel from independent fuel suppliers and these suppliers in turn primarily import fuel to meet this demand. If these current fuel sourcing arrangements are maintained by hypermarkets, it is likely that going forward fuel imports will meet an increasing share of overall demand for petroleum products in the UK. The penetration of imported petroleum products may increase energy resilience and security by increasing the flexibility of the supply chain in case of domestic refinery supply disruptions. But conversely, the higher levels of imported petroleum products increase the UK's exposure to the international petroleum product supply chain.

Increase in sites with higher volumes

As noted earlier, there is a changing mix of market players with hypermarkets gaining a larger share of market volumes through larger PFS sites selling higher annual volumes relative to companies and dealers. Hypermarkets fulfil this demand for high volumes through more frequent refuelling of storage capacity, given the potential space limitations at sites and additional cost of installing larger storage. This may mean that at times of supply disruptions, such sites will dry out quite quickly because of being reliant on frequent refuelling. However, this may also mean that fewer sites will be required to be refuelled during times of supply disruptions.

Consumers' access to a PFS and availability of PFS

In terms of the impact on consumers, PFS closures between 2001 and 2011 reduced access and choice for consumers in some areas. Additional closures may lead to a further deterioration in access and choice which can lead to consumers facing longer driving times to access the nearest PFS. In the event of a supply disruption, the nearest PFS could also run out of fuel, which means that consumers may have to travel even further to find fuel, given reduced PFS availability within their local area. However, the overall impact on access and choice on the basis of the criteria used in this report has not been substantial.

Tank capacity of vehicles

Consumers may not fill their fuel tanks fully each time they go to a PFS to purchase fuel. This may reduce resilience of energy supply by reducing the stock of fuel in vehicle tanks at any point in time, which in turn reduces the number of days of cover, in case disruptions to supply are

sustained over a brief period. Given that there are close to 38 million vehicles in the UK and assuming that, on average, a vehicle tank has a capacity of 55 litres and is 50% utilised at any point in time, the estimated number of days of fuel stock in vehicles is close to 10 days based on an average daily consumption of 100 million litres. However, the extent of vehicle tank utilisation may vary depending on consumers' willingness to fill their tanks.

1 Introduction

The Department of Energy and Climate Change ('DECC') has the objective of ensuring the UK's energy supplies are reliable, secure, and of adequate quality and scale to meet expected future demand. As part of this responsibility, DECC has commissioned a study on the UK petroleum retail market to understand whether the recent trends in the number of petrol filling stations ('PFS') have implications for the overall security of supply and the resilience of the downstream oil sector.

For the purposes of this study, the UK petroleum retail market is defined as retail sales of road transport fuel (petrol[10] and diesel) to consumers and businesses via the UK's network of PFS.

1.1 Background

There have been a number of developments and trends in the UK petroleum retail market since the 1970s. These trends include:

- a reduction in the number of PFS in the UK to less than 8,700 towards the end of 2011 from a peak of nearly 40,000 in the late 1960s;
- an increase in the volume of road fuel sold between 2004 and 2007; however, since the peak in 2007, higher prices, increased efficiency and the economic downturn have led to a decline in volumes;
- a change in the mix of fuel consumed between petrol and diesel due to the increasing number of diesel vehicles in the UK; and
- a change in the ownership profile of PFS, with an increasing number of PFS owned by hypermarkets[11].

The UK petroleum retail market is characterised by low retail margins and significant differences in the business models of fuel providers. Increases in retail prices over the last decade have predominantly been driven by increases in crude oil prices, refining costs and changes in taxation.

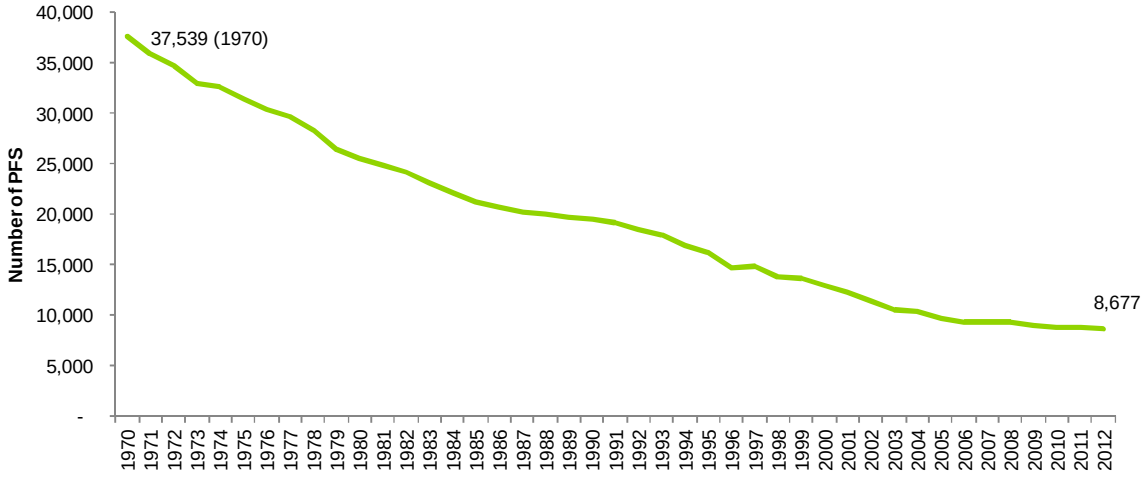
Decline in the total number of PFS

The number of PFS has declined from a peak of nearly 40,000 in the late 1960s to less than 9,000 by the end of 2011 (see Figure 1), although the speed of decline appears to have decreased in the last five years or so. In the last ten years, over 4,000 PFS have closed in the UK, an average of around 35 a month. The closure of the PFS has not been evenly spread throughout the country, with a large share of the PFS that have closed being smaller stations in rural areas that became unprofitable (and as such unsustainable over the long term) due to their relatively low volumes sold.

[10] Throughout this report, 'petrol' is used to refer to motor spirit or motor gasoline.

[11] The term 'hypermarkets' is used throughout this report to refer to the main supermarket groups in the UK that retail petrol and diesel through PFS in the UK alongside their grocery stores.

Figure 1: Total number of PFS in the UK - 1970 to 2012

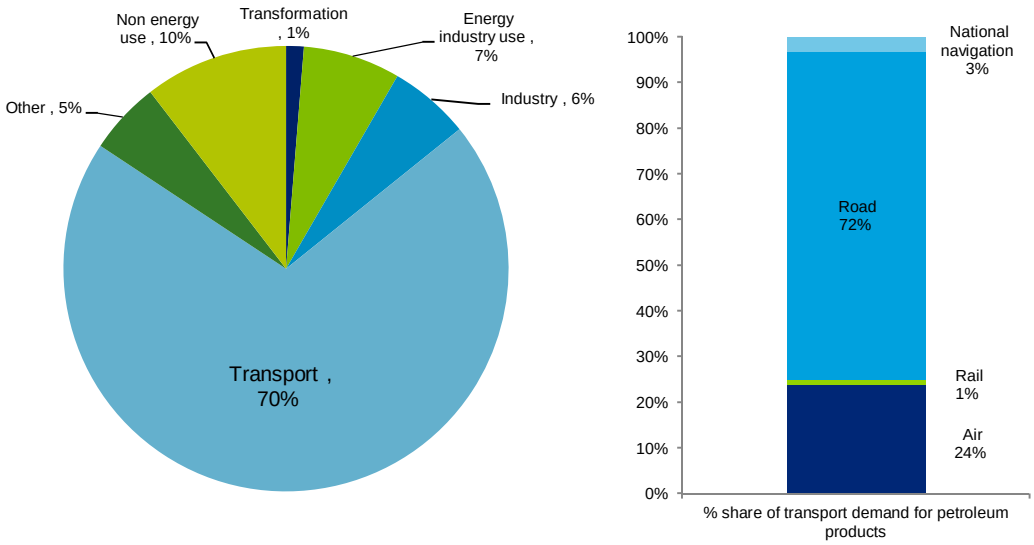


Source: 1970-2010 - Retail Marketing Survey 2011, Energy Institute, March 2011; 2011-2012 – Fuel Market Report ('FMR') 2011, 2012. Note: 1970-2010 figures are as of yearend; 2011-2012 as of May end or prior months.

Demand for road fuels in the UK

UK demand for petroleum products is primarily driven by demand from the transport sector. The share of transport in total demand has increased from 61% in 1998 to 70% in 2011. Within the transport sector, road transport remains the largest sector for consumption of petroleum products, accounting for 72% of total transport product demand in 2011. The share of road transport in total transport demand for petroleum products has remained above 70% in the last decade.

Figure 2: Petroleum product usage (volumes) by main sector (2011)

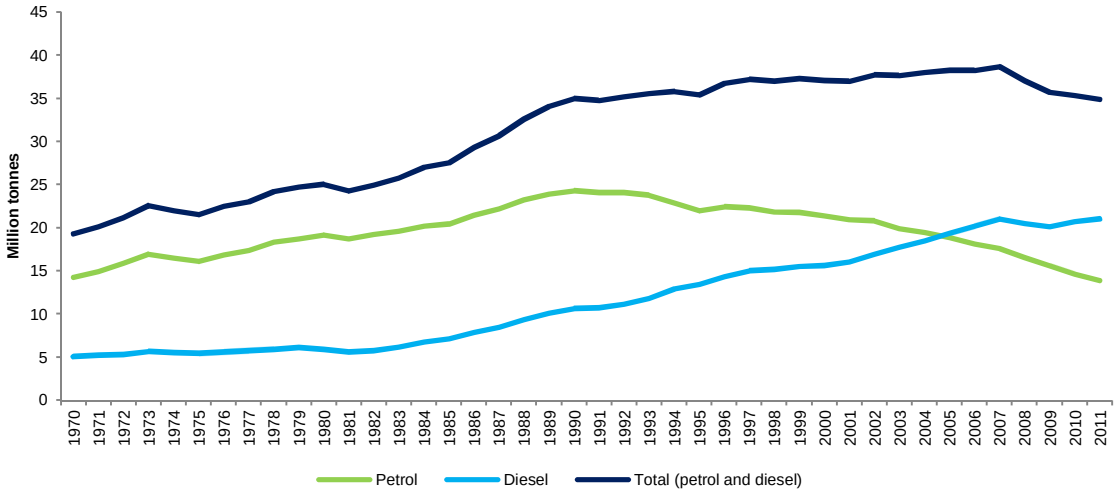


Source: Digest of UK Energy Statistics ('DUKES') 2012, DECC.

Total volumes of petrol and diesel supplied in the UK have been in the range of 36 million tonnes to 39 million tonnes over the last 15 years. The main driver behind the moderate increase in volumes sold prior to 2007 has been the increase in the total number of registered vehicles by 33% between 1996 and 2010, which has been mitigated by improved fuel consumption and a decrease in passenger kilometres per person per year over the last decade. Higher fuel prices observed over the last five years, together with the recession, will also have contributed to a reduction in the overall demand for petrol and diesel in the UK since 2007 peak.

The most significant change has been in the structure of the UK demand for petroleum products with a shift away from gasoline towards diesel products driven by the increased prevalence of diesel engine vehicles. This has mirrored the pattern of demand changes in Europe as a whole. Figure 3 shows the change in UK demand for petrol and diesel between 1970 and 2010. While petrol demand in 2011 is just below the 1970 level, diesel demand has increased fourfold over the same period.

Figure 3: UK demand for petroleum products – Total inland deliveries of petroleum to the UK market - 1970 to 2011 (million tonnes)



Source: Table 3.1.12, DUKES, 2012, DECC.

Changes in ownership and level of competition

The entry and growth of hypermarkets in fuel retailing has increased the range and penetration of different business models in this sector. While hypermarkets own around 14% of PFS, they supply nearly 40% of total road fuel volumes. This has put competitive pressure on PFS owned by oil companies and independent dealers. Historically, oil companies used to be the leading market players in fuel retailing, however, they have lost significant market share in the last 10 years. For example, Tesco recently surpassed BP as the largest retailer in terms of fuel volumes sold. The growth in hypermarket-owned PFS is broadly consistent with the growth of hypermarkets in the grocery retailing business. The retail fuel price is a key competitive factor, with hypermarkets offering significant price discounts at times to attract consumers and increase footfall for their hypermarket shops. In addition, some oil companies have exited the fuel retailing market while focusing on upstream oil and gas production. For example, Total has recently disposed of its retail PFS network to Rontec, with some of those PFS being sold on to Shell.

1.2 Scope of work

The scope of work required by DECC to complete this study has the following key components.

- An overview of the evolution and development of the petroleum retail sector over the last 40 years in terms of market size, the main participants, changes in the supply chain, number and location of petrol stations.
- An understanding of the business models operating in the retail sector, including the key business drivers affecting the retail market.
- An analysis of the implications of these developments for both the UK petroleum retail sector and for UK security of supply and resilience.

For the purposes of assessing the implications of changes in the market, energy resilience is taken to mean the capacity of the system to cope with short term disruptions to supply, while security of supply is considered to be the capacity of the system to meet the demand for fuel in a secure way over the longer term.

Approach

The approach to this work has included the following key elements.

- Reviewing the demand and supply side factors affecting the UK retail petroleum market.
- Analysing the characteristics and strategies of different types of market players.
- Providing a high-level analysis of the implications of these elements for both the UK petroleum retail sector and for UK security of supply and resilience.

This approach uses a variety of publicly available sources of data to understand trends, including government statistics, market research reports and PFS data acquired from Experian Catalist. The approach also included a number of meetings with key players in the market, covering oil companies, fuel suppliers, hypermarkets and independent dealers. There have also been meetings with trade associations (namely the Downstream Fuels Association and the RMI Petrol) which have provided some valuable insights into this study.

Structure of report

The remainder of this Report is organised as follows.

- **Section 2** gives an overview of the UK petroleum retail market, the key drivers of this market and how this market fits within the broader downstream oil industry.
- **Section 3** covers the structure of the UK petroleum retail market in terms of the types of retailers active in the market, how this has changed over time and presents the results of the analysis on the proximity of PFS.

- **Section 4** presents a review of the key business drivers in the UK petroleum retail market that can explain the changes and developments described in Sections 2 and 3.

- **Section 5** presents an illustration of the business models of the different participants in the UK market and discusses how these businesses are able to respond to the key business drivers discussed in Section 4.

Additional information has also been provided in the appendices to this report.

2 UK petroleum retail market

This section sets out the characteristics of the UK petroleum retail market and describes the main changes and trends that have occurred over the last 30 to 40 years. This covers the market definition and size, how the market relates to the rest of the downstream oil sector, and identifies the main players in the market. The section then goes on to highlight changes in the pattern of associated imports and exports of petroleum products. The final part of this section summarises the key implications for resilience and security of supply of the changes that are described.

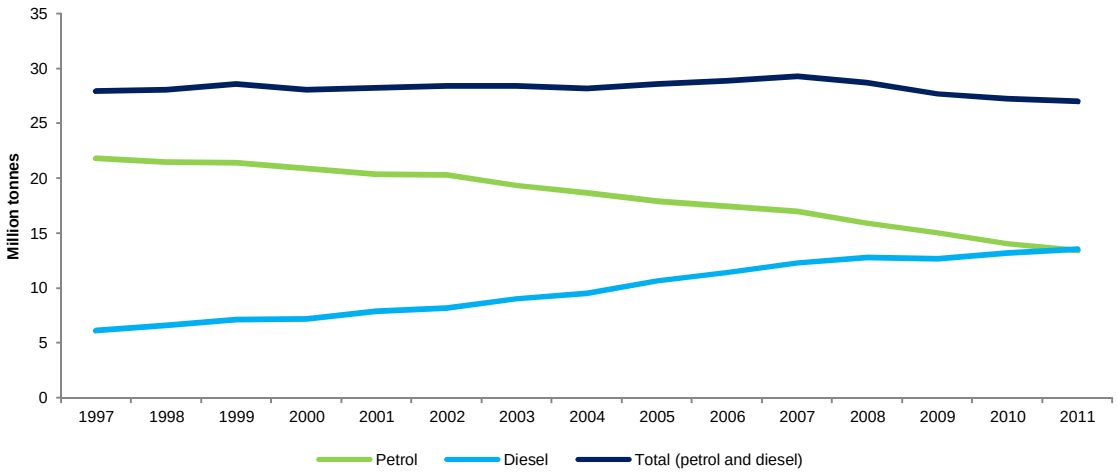
2.1 Petroleum retail market: definition, size and key drivers

2.1.1 Market definition and size

For the purpose of this study, the petroleum retail market is defined as sales of petrol and diesel in the UK from retail fuel forecourts (referred to as 'petrol filling stations' or 'PFS'). Other fuels may also be sold at PFS (such as LPG), but the analysis and data presented in this study is focused on the sale of petrol and diesel for road use.

Figure 4 shows the total volume of retail sales[12] at PFS for petrol and diesel in the UK over the last 15 years. Overall volume increased from around 28 million tonnes in 1997 to a peak of 29.3 million tonnes in 2007. Since this peak, total retail volumes have declined to under 27 million tonnes in 2011, a decrease of just under 8% in total over the last four years. Retail diesel volumes have increased while retail petrol volumes have decreased during this period.

Figure 4: Total retail (inland) deliveries of petrol and diesel – 1997 to 2011

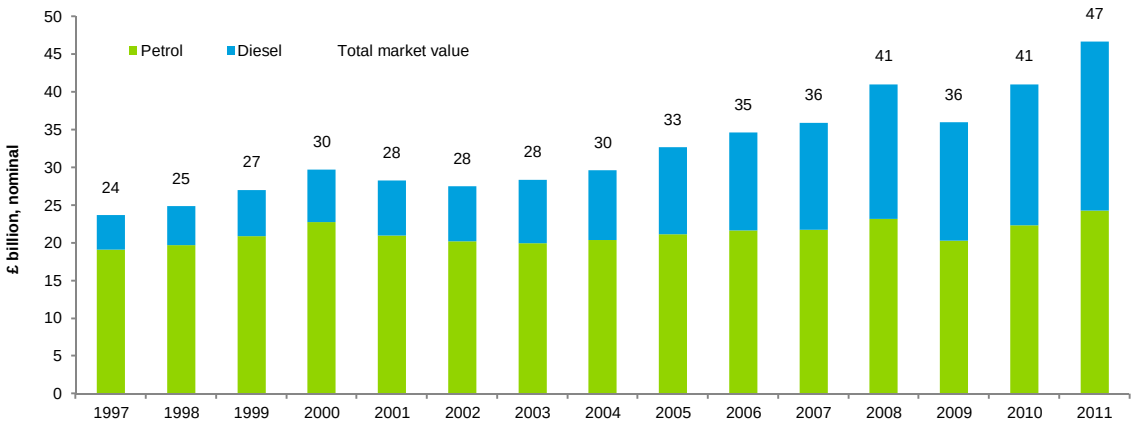


Source: Table 3.6, DUKES, 2012, DECC. Note: Figures exclude sales to commercial consumers, which are consumers that receive direct deliveries for use in their own business.

[12] Retail sales exclude non-retail/commercial sales which are made by fuel suppliers directly to commercial consumers (such as bus or truck fleets), which have their own on-site fuel storage and do not use the PFS retail network.

Total value of the UK petroleum retail market can be calculated by taking the product of average annual price of fuel in a given year and annual volume. Figure 5 shows the total market size by value (in nominal terms) and how this is split between petrol and diesel. It is estimated that the petrol and diesel retail market was worth around £47 billion in 2011, with the increase over time being driven mainly by the rising cost of petrol and diesel, which is highlighted in Figure 6.

Figure 5: Estimate of market size of retail petrol and diesel products (including taxes)

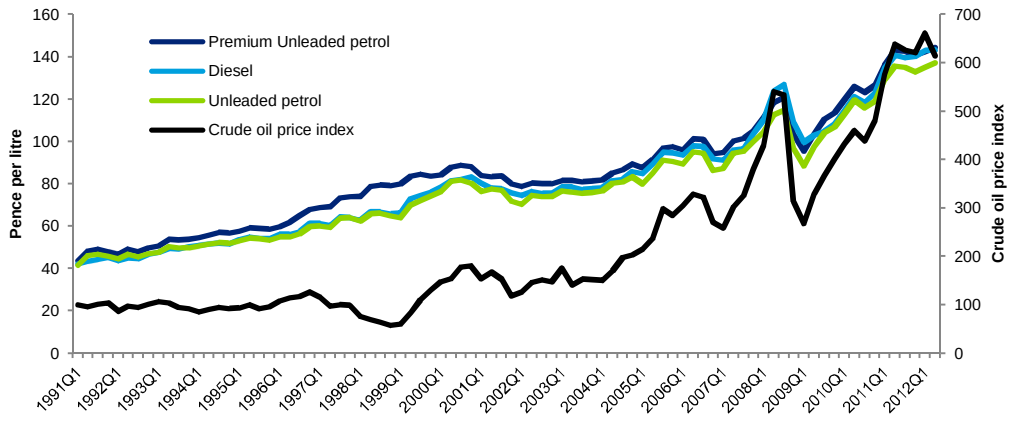


Source: Deloitte analysis based on DUKES 2012, DECC data (annual quantities and prices) including Fuel Duty and VAT. Note: Annual retail prices (pence per litre) for super premium and premium gasoline have been weighted using relative annual quantities of super-premium and premium gasoline (tonnes). The weighted annual prices are applied to annual gasoline quantities (litres).

2.1.2 Retail fuel prices

Retail petrol and diesel prices have increased significantly in the last few decades. Petrol and diesel prices have more than doubled since 1991. Significant changes in retail fuel prices coincide with changes in crude oil prices. However, the magnitude of changes varies between the two as crude oil prices are only one component of retail fuel prices. Retail fuel prices are also affected by the cost of refining crude into products, costs of storage, transportation and distribution, together with taxes and duties. These trends are shown in Figure 6.

Figure 6: Quarterly retail prices of petrol and diesel between 1991 and 2012



Source: Quarterly Energy Prices, DECC, September 2012.

Breakdown of retail fuel prices

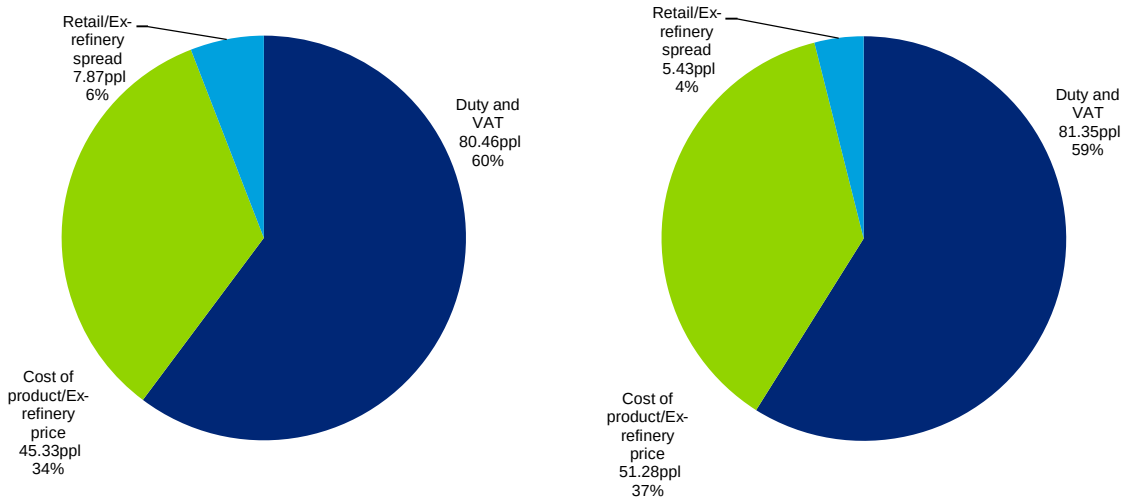
There are three major components of retail fuel prices.

- **Cost of the product/ex-refinery price:** this represents the wholesale market price of fuel.
- **Retail/ex-refinery spread:** this component includes costs and profits of the fuel wholesaler and the fuel retailer. Major costs include fuel transportation (to a terminal or depot, storage and distribution to a PFS), marketing and promotion (by wholesaler and retailer) and the cost of operating a PFS. The remaining amount is profit which is split between wholesalers and retailers.
- **Fuel Duty and VAT**: this is charged by the UK Government.

The largest component of average UK petrol and diesel prices in 2011 was duty and VAT, followed by the ex-refinery price and then the ex-refinery spread. The breakdown of petrol and diesel prices is shown in Figure 7.

Figure 7: Breakdown of average retail petrol and diesel prices in 2011

Breakdown of average unleaded petrol price (133.66 pence per litre) in 2011 - (pence per litre; percentage of total price)	Breakdown of average diesel price (138.06 pence per litre) in Jan-Jul 2011 - (pence per litre; percentage of total price)



Source: 2011 petrol prices breakdown - "Understanding pump prices", UKPIA, March 2012; Half-year (Jan-Jul) 2011 diesel prices breakdown - UKPIA Briefing Note, November 2011.

Figure 7 shows that the ex-refinery spread for petrol and diesel in 2011 was on average 7.87 and 5.43 pence per litre respectively, which covered the costs and profits of fuel wholesalers and retailers. Over the last five years, the ex-refinery spread has varied between five and 10 pence depending on market conditions.[13]

[13] Source: "Understanding pump prices", UKPIA, March 2012.

2.1.3 Key drivers of market size

The key drivers of market size are the volumes of fuel sold and the retail price. Fuel volumes are driven by the following factors.

- The **total number of vehicles** registered in the UK has risen from just under 27 million in 1997 to over 34.6 million in 2011, an annual growth rate of just under 2%. This increase in the number of vehicles is also reflected in the reduction in the number of households without a vehicle in Great Britain which decreased from 30% in the mid-1990s to 25% in 2005, remaining at this level in 2010. The number of households with two or more vehicles has also increased from 25% to 33% over the same period.[14]

- The **fuel type** of the total vehicles in circulation also has an impact on the market size for petrol and diesel. Department for Transport statistics for Great Britain[15] show that in 1997, 89% of cars licensed had a petrol engine and the remaining 11% were diesel. However, by 2011, just under 69% of vehicles registered were petrol, with nearly 31% of vehicles registered being diesel. This 'dieselisation' of vehicles has been driven by better fuel economy from diesel engines and taxes that favour lower CO_2 emitting vehicles. Assuming no changes to legislation and continuing high prices of fuels, this trend is expected to continue into the future.

- The **average annual mileage** travelled by each vehicle is another key determinant of retail fuel volumes. With an increase in the number of vehicles registered, the National Travel Survey has estimated that the average annual mileage per car has decreased from about 9,700 in the mid-1990s to 8,430 in 2010.[16]

- The **average fuel consumption of vehicles** is another important factor driving total volumes of retail fuels in the market. New car fuel consumption has been improving over the last decade, as car manufacturers develop new technologies to reduce the overall level of CO_2 emission (and thereby fuel consumption) of the vehicles they produce. Between 1997 and 2010, the average new car fuel consumption in Great Britain[17] for petrol vehicles has improved from 33.3 miles per gallon ('mpg') to 44 mpg. For new diesel cars, the consumption has improved from 40.4 mpg to 52.1 mpg over the same period. Part of this change may also be due to consumers buying smaller, more fuel efficient vehicles in response to higher fuel prices.

The impact of these drivers on fuel volumes can be varied, with some drivers (such as, the number of vehicles) leading to an increase in fuel volumes consumed while others (such as a decrease in annual mileage) leading to a decrease in fuel consumption. The current combination of higher fuel

[14] Department for Transport, National Travel Survey: 2010 - Statistical Release, 28 July 2011; http://assets.dft.gov.uk/statistics/releases/national-travel-survey-2010/nts2010-01.pdf.

[15] Department for Transport, Vehicle Licensing Statistics, Table VEH203, Cars licensed by propulsion / fuel type, Great Britain, 1994 to 2011.

[16] Department for Transport, National Travel Survey: 2010, Table 0901.

[17] Department for Transport Statistics, Table ENV0103.

prices, improved fuel consumption and reduced average vehicle distances is leading to a flat or a declining market in terms of total volumes, even though the total number of registered vehicles is rising. The implication is that PFS are competing in a contracting market. The trends in the growth of diesel volumes and decline in petrol volumes is likely to continue into the future under the current vehicle road tax and benefit-in-kind tax regimes which levy lower taxes on diesel vehicles because of their lower carbon dioxide emissions.

2.2 How the petroleum retail market fits in with the broader downstream oil industry

2.2.1 Overview of the downstream supply chain of petroleum products

The UK petroleum retail market for petrol and diesel is part of a wider downstream oil market which includes a number of key elements in the supply chain of fuels to PFS.

- **Domestic refineries** which convert crude oil into a variety of petroleum products, including petrol and diesel. The refineries also have associated import infrastructure for crude and imported products.
- **Import terminals** are located at coastal locations providing an entry point for petroleum products imported from Europe and other regions, such as the Middle East.
- **Primary distribution infrastructure** which includes pipelines (between domestic refineries and key storage terminals), rail and sea (using coastal tankers).
- **Regional distribution terminals** are located inland and supplied with petroleum products from domestic refineries or import terminals using primary distribution infrastructure. This includes some smaller, secondary distribution depots.
- **Secondary distribution infrastructure** is largely road based with large and medium sized road tankers delivering fuel products to either smaller secondary distribution depots or to retail fuel outlets.
- **PFS retailers** are distributed throughout the country and provide end users with access to petrol and diesel through fuel pumps and in some cases to other petroleum products.
- **Vehicles tanks** in which consumers store fuel purchased from PFS retailers (both commercial and non-commercial vehicles).

2.2.2 Changes to downstream oil supply chain

This section covers, at a high level, the changes that have occurred over the last 30 to 40 years in the UK's downstream oil industry and some of the drivers behind these changes.

Vertically integrated supply chain in the 1960s and 1970s

In the 1960s and 1970s, the UK had around 18 to 19 operating refineries supplying the market. The industry was characterised by a vertically integrated supply chain provided by the major

international oil companies. Companies that owned refining assets would also be present in the retail market through their PFS, quite often being supplied through their own secondary distribution terminals to feed the product to their branded PFS. These retail outlets were either company owned or independent dealer sites. This meant that in most cases, the fuel being sold at branded PFS was being manufactured in the refineries owned by the same oil company.

Rationalisation of assets and distribution of fuels in the 1980s

After the second oil price shock in the late 1970s, crude oil prices fell during the first half of the 1980s to under US$20 a barrel by 1986, and remained broadly at this level until 2000. The reduction in the oil prices during the 1980s led oil companies to reassess their cost base and look for opportunities to reduce costs. Given the vertically integrated nature of the downstream oil supply chain, there was some duplication of network assets and oil companies took the view that they did not need their own dedicated distribution terminals. A more cost effective approach was to close down a number of distribution terminals and share the use of distribution terminals between oil companies. This lead to the development of exchanges and partnerships between oil companies, and companies were also sharing petroleum products to minimise distribution costs. This meant that the fuel being sold at a branded PFS may have been produced at a refinery owned by another oil company.

Oil companies also reviewed their logistical arrangements for the distribution of fuel products by road. Until the mid-1980s, the oil companies mostly had their own road tanker fleets and directly employed their drivers, with road hauliers only providing vehicles on an ad-hoc basis to meet seasonal demand. However, in 1985, Amoco was the first oil company to outsource the delivery of fuel to Wincanton.[18] In 1988, Esso became the first of the big three oil majors to move part of its distribution to a third party. This trend carried on through the 1990s to the point where the majority of all deliveries to PFS were made through third party operators[19]. As these haulage companies are specialists in logistics, efficiency savings have been made with fewer road tankers being needed to deliver volumes to PFS. The impact of outsourcing fuel distribution has been that the road tankers are more heavily utilised, leaving less spare capacity in the distribution of fuels. The number of refineries in the UK also reduced from 18 in the late 1970s to 11 by the mid-1980s. As a consequence of these changes, the distribution of fuels became more cost efficient, but spare storage capacity at distribution terminals, as well as geographical reach of these distribution terminals, was reduced.

Growth of hypermarkets

The late 1980s and early 1990s were characterised by the growth of hypermarkets in fuel retailing. Discussions with industry have indicated that the underlying objective of having a PFS at a hypermarket location is to attract customers to the main retail store. This could include using offers on fuel, such as discounts on the price of fuel if a given level of spending is made in the main store. These promotions can still yield a net benefit to the retailer as the typical margins made in hypermarkets are higher compared to margins made for the retail of fuel. The major hypermarkets include Tesco, Morrisons, Sainsbury's and ASDA.

[18] Commercial Motor, 'Oil Boom', 5th January 1989

[19] BP Oil UK Limited is the remaining oil major that operates its own tanker fleet of around 150 vehicles.

The early 1990s was also the point at which demand for petrol began to decline and demand for diesel continued to grow (see Figure 3 in Section 1.1). UK refineries were set-up mainly to refine petrol for vehicles and fuel oil for heating and power generation. The change in the demand mix meant that there was oversupply of petrol in the market which needed to be sold. This would typically be exported to the US. Moreover, the growth in hypermarket fuel sales also gave an opportunity for fuel importers to develop their product offerings and position in the market, as the retailers were not necessarily tied to any particular brand. This had the effect of further displacing demand for domestically refined products.

As a result of these changes in the market, hypermarkets were undercutting prices at traditional PFS owned by oil companies or independent dealers and gaining market share. There were 434 hypermarket sites selling petrol at the end of 1990 in the UK, but by 1995, there were 776 sites[20] and 1,063 sites by 2001. This contrasts with the overall industry where PFS declined from 19,465 in 1990 to 16,244 in 1995 to 12,201 in 2001. The oil companies responded, with BP announcing a pricing policy towards the end of 1994 in response to hypermarket prices. Esso also developed its pricing policy relative to the hypermarkets through its Esso 'Price Watch' campaign where it promised to match the lowest petrol price within three miles of their PFS. This pricing policy went nationwide in 1996. As a result of these promotions, retail margins on fuel were significantly reduced at UK PFS in the second half of the 1990s. This meant that the oil companies started to look more at non-fuel retail options for their sites in order to increase "convenience" spend and cover the costs of operating the sites. In some cases, this has led to oil companies and retailers providing an integrated fuel/convenience store at a single site (for example, Esso and Tesco Express).

Review of downstream business activities

The decline in the number of PFS has continued over the last 10 years, as profit margins on fuel have been reduced due to increasing competitive activity in this sector. The growing importance of non-fuel sales at sites has led to the development of larger independent PFS dealer networks, which offer both fuel and convenience products to customers. Smaller independent retailers have typically not been able to offer such a competitive package of fuel and retail products at their sites, which has led to the closure of a large number of smaller sites. Further discussion on business models of independent dealers is provided in Section 5.

Oil companies have also been assessing their position in the downstream oil market. As margins and returns on fuel sales have declined, and as the PFS business model is becoming increasingly reliant on non-fuel sales, some oil companies have decided to exit the market. For example, in 2011, Total sold all of its 810 company owned sites to Rontec Investments[21], with 254 of those sites being sold on to Shell.

There have also been significant changes in the upstream oil market, with Shell selling its Stanlow refinery to Essar and Chevron selling its Pembroke refinery and retail network to Valero. Murco and Total have also been looking for a buyer of their refineries (respectively, Milford Haven and

[20] Institute of Petroleum, UK Retail Marketing Survey 1997, 'Price Watch - the aftermath' by Adrian Camps.

[21] A consortium comprising of forecourt retailer Snax 24, investment bank Investec and private equity group Grovepoint.

Lindsey). These changes are in part driven by companies seeking higher returns in their upstream activities of exploration and production relative to downstream oil activities. Average returns on capital employed for UKPIA members has been 6.9% between 1997 and 2010, which compares to over 18% for upstream oil production[22] over the same period.

As a result of these changes, the downstream oil industry has become more efficient and cost effective in the production and distribution of fuel products to final consumers. However, these changes have reduced spare capacity in the fuel distribution network which can impact the overall resilience of the system to particular shocks.

Table 2 summarises the key players in the UK downstream oil supply chain and includes a number of comments on the trends that have been observed over the last 30 to 40 years.

Table 2: Summary of key participants in the UK downstream oil supply chain

Activity	Current key players	Key developments	Comments
Domestic refiners	Company name (refinery) • Essar (Stanlow) • ExxonMobil (Fawley) • Murco (Milford Haven) • PetroIneos - JV between PetroChina and Ineos (Grangemouth) • Phillips66 (Humber) • Total (Lindsey) • Valero (Pembroke)	UK Refinery closures: Coryton closure in 2012; Teesside's economic closure in late 2009 Changes in ownership: Stanlow sold to the Indian based Essar Group by Shell in 2011 PetroChina has acquired a 50% stake in the Grangemouth refinery Pembroke refinery sold by Chevron to Valero in 2011 Other refineries put up for sale: Murco Milford Haven (and retail network sites) up for sale Total Lindsey was put up for sale, but at the start of 2012 Total confirmed that it will continue to operate the refinery Investment in middle distillate to better match supply/demand	Excess refining capacity in North West Europe is likely to have contributed to closures in UK refining capacity. Higher returns from upstream oil are leading certain major oil companies to divest and exit downstream oil operations. There is a greater proportion of UK refining capacity owned by conglomerates and merchant refiners instead of oil companies.
Importers and distribution terminal operators	Vopak NuStar Oikos SemLogistics ASCO Oils Greenergy Simon Storage GB Oils Major oil companies still also hold on to distribution terminals in the UK	Some investments are being made in import terminals at former refinery sites. For example, the investment by Shell, Vopak and Greenergy in developing an import terminal at the site of the Coryton refinery.	Some investments are being made at strategic locations or where refineries have been closed. A potential driver for investments in import terminals may be the increase in volume of fuel imports (in particular, by hypermarkets). However, interviews have indicated that some secondary storage terminals require further investment which may not be forthcoming.

[22] UKPIA, Statistical Review 2012, page 13

Activity	Current key players	Key developments	Comments
Pipeline operators	Pipeline (ownership) • U.K.O.P (Shell, BP, Valero, Total) • Esso Pipeline System (ExxonMobil) • Mainline Pipeline System (Esso, Valero, Total, Shell) • Walton Gatwick Pipeline (BP, Shell, Valero) • West London Pipeline (BP, Shell, Valero, Total) • Final-Line (Total) • Government Pipeline and Storage System (GPSS)	The main changes in ownership have resulted from sales in refining capacity (for example, sale of Pembroke refinery by Chevron to Valero).	Changes in the ownership of UK pipelines have been limited compared to other parts of the oil downstream supply chain.
Secondary distribution (road)	BP Oil UK DHL Hoyer Norbert Dentressangle Suckling Transport Suttons Transport Group Turners (Soham) Wincanton	There has been growth in third party deliveries of fuel to PFS since the mid-1980s. Currently, all but one of the major oil companies uses a third party haulier to undertake deliveries on their behalf.	There has been an increased efficiency in deliveries through the use of logistical expertise. However, fewer road tankers are being used to deliver total volumes which have reduced spare capacity in the supply chain, and which may therefore reduce resilience in case of short-term supply disruptions.
Petrol Filling Station retailers	Hypermarkets (Sainsbury's, Tesco, Morrisons and ASDA) Oil companies with company owned sites (BP, Shell, Esso, Valero Energy (Texaco), Murco) Independent dealers	Total sold its retail network to Rontec Investments. Chevron sold its retail network (Texaco brand) to Valero as part of the sale of Pembroke refinery.	The exit of oil majors from the retail market in part is attributed by market participants to higher margins being made in upstream oil exploration and production compared to downstream oil. Average daily volume sold by PFS retailers is 100 million litres (2011). Given these volumes, existing PFS storage capacity may provide a cover of six to eight days (indicative estimate).[23] However, actual days of cover is likely to be lower, as some PFS do not fully utilise their storage capacity as they seek to manage their stock levels to minimise working capital costs. PFS closures since 2001 have

[23] Existing storage capacity has been estimated on the basis of high-level assumptions linking sale of fuel volumes to storage capacity. For further details, refer to Appendix C.2.3.

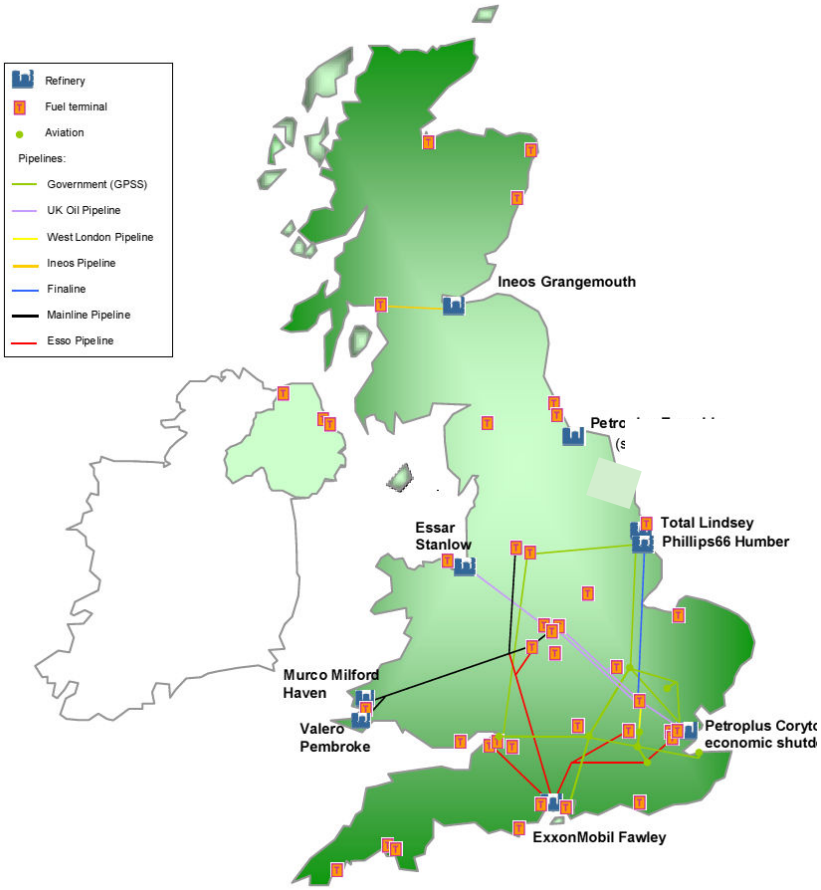
Activity	Current key players	Key developments	Comments
			led to a reduction in storage capacity by 15% to 20% (indicative estimate) and may reduce further with more PFS closures in the future.
Vehicles tanks	Commercial and non-commercial vehicles	Significant increase in the number of vehicles in circulation (2011: 38 million vehicles)	Assuming an average tank capacity of 55 litres, 50% utilisation and daily consumption of 100 million litres, days of cover close to 10 days (indicative estimate)..

Source: Deloitte analysis based on discussions with the industry.

2.2.3 Source of supply for petrol and diesel

The UK is a net importer of diesel and a net exporter of petrol. The current configuration of the UK refineries relative to demand means that they have sufficient capacity to meet UK demand for petrol, but the middle distillate refining capacity is insufficient to meet the growing demand for diesel. As a result, an increasing proportion of the diesel sold in the UK is imported.

Figure 8: UK refineries and product distribution terminals



Source: © UKPIA, July 2012; NB: indicative summary only - does not show all locations.

The product distribution terminals are either owned by oil companies or by independent companies (fuel importers, fuel suppliers or terminal operators). The refineries are linked to distribution terminals either directly by pipelines, or supplied by rail, sea or road. According to UKPIA's 2012 Statistical Review, around half of all terminals are supplied by pipelines, a third are supplied by sea and 15% by rail.

As shown in Figure 8, the southern half of the UK is reliant on a pipeline network connecting a number of refineries (Milford Haven, Pembroke, Fawley, Stanlow and Lindsey) with the distribution terminals serving the key demand centres in those areas. This contrasts with the north of the UK which is more dependent on road transport for distribution of product from refineries to the distribution centres. The Grangemouth refinery plays a crucial role in supplying Scotland with fuels, while product sold in Northern Ireland is delivered through the Belfast port.

Production, import and export of crude oil

The development and expansion of crude production in the UK's Continental Shelf ('UKCS') meant that the UK was a net exporter of crude, with over 40 million tonnes of net exports in the late 1990s. However, the decline in UKCS oil production has led to the UK becoming a net importer of crude oil in 2005. Since then, the UK has increased its levels of import dependency as the decline in UKCS production continues. In 2011, UK crude oil imports were predominantly from Norway, Russia and OPEC.

Production and imports of petroleum products

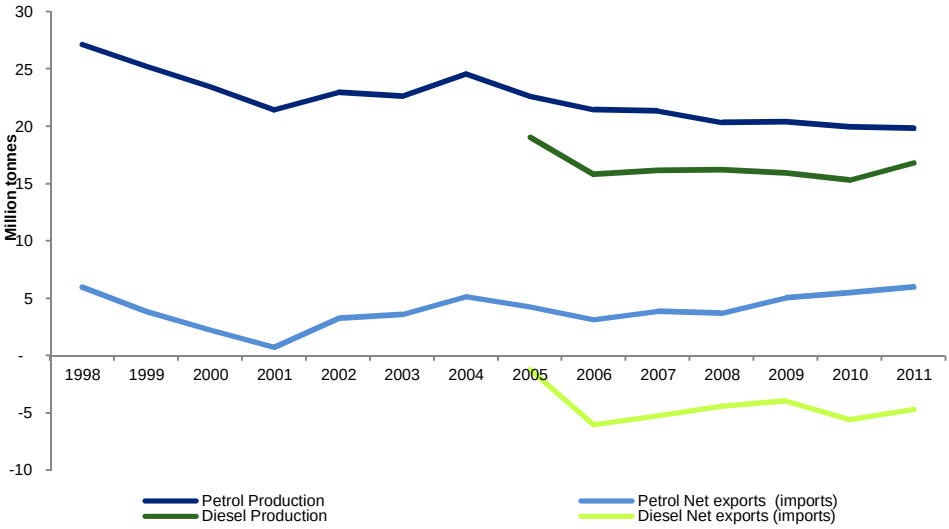
UK refineries were originally designed to meet product demand at the time they were built. This meant, as stated above, that they were configured to produce petrol for the transport sector and fuel oil for power generation. As demand for transport fuels has changed and the UK power generation has become increasingly become reliant on natural gas, UK refinery production is no longer aligned to UK demand. This is illustrated in Figure 9 which shows domestic petrol and diesel production, together with the net exports of petrol and net imports of diesel.

The reduction in overall production since the late 1990s reflects closures of UK refineries due to overcapacity in North West Europe. Even with refinery closures, the volumes of petrol being exported have actually increased between 2006 and 2011. The increase in diesel production in 2011 reflects the £200 million investment made by the Total Lindsey refinery in a new hydro de-sulphurisation unit (HDS-3). This has allowed the refinery to process higher volumes of high sulphur crude oil feed stocks, up from 10% to 70% of refining capacity. Although total refining capacity is unchanged, this investment has enabled the refinery to double its diesel production to meet increasing diesel demand.

The closure of the Coryton refinery will lead to a decline in production and an increase in the level of imports in 2012 and subsequent years. In this case, Shell, Vopak and Greenergy completed the acquisition of Coryton refinery at the end of September 2012. The three companies plan to develop this facility into an import and distribution terminal (to be named Thames Oil Port) and managed by

Vopak. It has been reported that the initial storage capacity will be around 500,000 cubic metres ('cbm'), with potential to expand to up to 1 million cbm in later stages.[24]

Figure 9: Production, imports and exports of petrol and diesel (1998 to 2011)



Source: DUKES 2012, DECC. Note: Diesel data is not separately available for the period prior to 2005.

Although the UK is a net exporter of petrol, it still imported 3.8 million tonnes of gasoline in 2011, an increase of 0.5 million tonnes from 2008. In 2011, over 90% of these imports (3.5million tonnes) came from European countries, with Norway and the Netherlands together accounting for 72% of UK imports.

In 2011, 9.4 million tonnes of diesel/gas oil were imported by the UK, around 65% from European countries with the Netherlands, Sweden and Belgium providing the bulk of the imports from Europe. This represented an increase of nearly 2 million tonnes from 2008 import levels. Russia and USA are also important sources of gas/diesel oil imports.

2.3 Implications of these changes and trends

A number of implications can be drawn from recent trends and changes to the supply chain of the UK petroleum retail market.

- Fragmentation of supply chain from vertically integrated oil companies has increased efficiency and reduced costs of supplying transport fuels to final consumers at PFS.
- Increased efficiency has however reduced the spare capacity in the distribution system (for example as storage terminals were rationalised and closed) which will in turn have reduced the overall resilience of the system.

[24] Dow Jones Newswires, 1 October 2012

- Fuel suppliers are one step removed from the physical deliveries of fuels undertaken by road hauliers, which have recently been the focus of labour disputes. Pressure to keep costs low at each stage of the supply chain can increase the potential for disputes.

- The exit from refining by some of the oil majors in the UK may reduce their need to push the product through their retail networks, which means they could possibly rationalise their networks to better suit demand in the UK (rather than to ensure that it provides an outlet for the refinery production).

- Imports provide an additional source of supplies to the UK, which can enhance security of supply through diversity of sources (reducing reliance on UK domestic production only) as long as import capacity and storage can be maintained. For further discussion on energy resilience and security in the UK, refer to Deloitte's report in 2010 titled "Downstream oil – short term resilience and longer term security of supply".

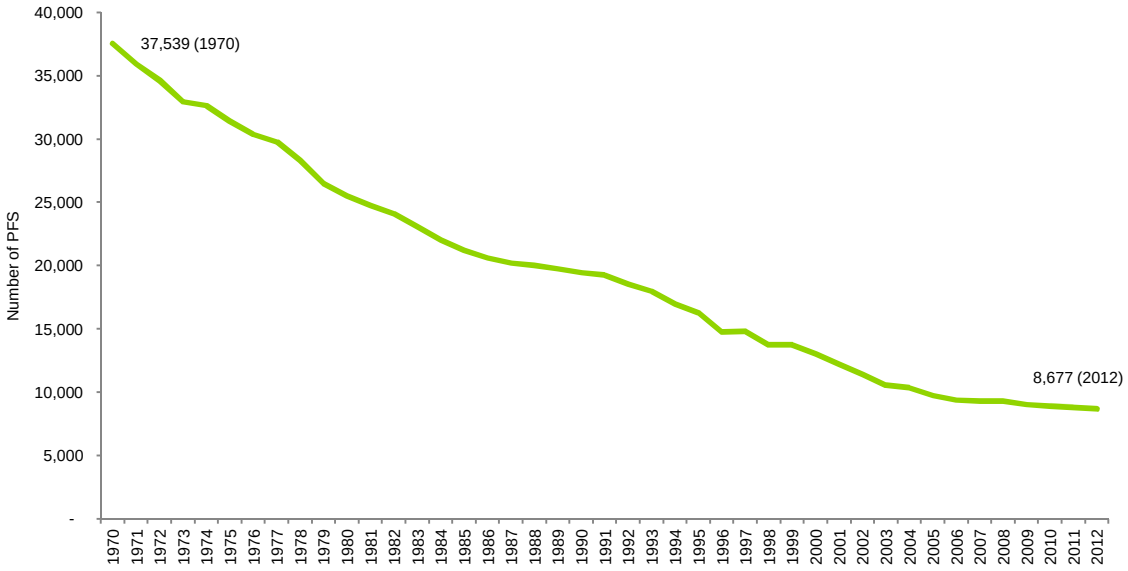
3 Structure of the UK petroleum retailing sector

This section provides an overview of the structure of the UK petroleum retailing sector, covering number of PFS in the UK and related trends, motor fuel volumes, regional variations, different ownership types and major brands.[25]

3.1 Overview

The number of PFS in the UK has decreased significantly in the last few decades. However, the rate of decline in the number of PFS has decreased in the last five years or so. This trend in the number of PFS is shown in Figure 10.

Figure 10: Total number of PFS in the UK – 1970 to 2012



Source: 1970-2010 - Retail Marketing Survey 2011, Energy Institute, March 2011; 2011-2012 – FMR 2011, 2012. Note: 1970-2010 figures are as of year-end; 2011-2012 as of May end or prior months; the rate of decline in the number of PFS has been over 20% in each of the last four decades, but only 6% over the last five years.

During 2004-2012, the number of PFS has declined by 20%. The number of motor fuelling positions[26] has also declined, albeit at a slower rate of 11% compared to rate of decline in number of PFS. The sharper decline in number of PFS relative to number of fuelling positions has resulted

[25] Unless otherwise stated, the figures in this section are based on Deloitte's analysis of PFS data provided by Experian Catalist. Some of the trend analysis in this section is based on Fuel Market Review ('FMR') data. FMRs are published by Forecourt Trader and use Experian Catalist data. Data in FMRs is not as of calendar yearend and relates to an early part of the calendar year (May end or prior months). 2012 figures are also as of an early part of the calendar year (May end or prior months).

[26] The number of motor fuelling positions on each PFS refers to number of vehicles that can be positioned at a PFS at the same time, irrespective of whether or not there are nozzles on both sides of the pump. (Source: Experian Catalist)

in an increase in the average number of fuelling positions per PFS (from 6.8 in 2004 to 7.6 in 2012).[27] This increase reflects the closure of smaller PFS with fewer fuelling positions and the opening of larger PFS by hypermarkets during this period.

3.2 Regional changes

South East England has the highest number of PFS, followed by North West England, Scotland and South West England. Wales, Northern Ireland and North East England have the lowest number of PFS. In terms of total motor fuel volumes sold in 2011, South East England has the highest share, followed by North West England and East of England. The lowest fuel volumes were sold in North East England and Northern Ireland.

In terms of decline in the number of PFS, while the total number of PFS decreased by 29% between 2001 and 2011, there were significant variations between regions in the rate of this decline. The largest decrease was in Yorkshire and the Humber (-33%), followed by London (-32%) and South West England (-31%). The lowest percentage drop was in Northern Ireland (-22%), followed by Scotland (-24%) and South East England (-25%).

The regional breakdown of number of PFS as of 2011 year end, the percentage decrease in number of PFS between 2001 and 2011 and total motor fuel volumes sold in 2011 is shown in Table 3.

[27] Figures are based on FMR 2004 and FMR 2012 (source data is from Experian Catalist).

Table 3: Number of PFS as of 2011 year end, percentage change in number of PFS from 2001-2011 and motor fuel volumes sold in 2011, by region

Region	Number of PFS (2011)	% of total PFS (2011)	% change in number of PFS from 2001-2011	Motor fuel volumes (2011, million litres)	% of volumes (2011)
South East (England)	1,117	12.9%	-25%	5,688	15.6%
North West (England)	897	10.3%	-30%	4,123	11.3%
Scotland	892	10.3%	-24%	3,130	8.6%
South West (England)	869	10.0%	-31%	3,448	9.4%
East of England	825	9.5%	-28%	3,840	10.5%
West Midlands (England)	735	8.5%	-30%	3,319	9.1%
Yorkshire and the Humber	682	7.9%	-33%	2,836	7.8%
East Midlands (England)	670	7.7%	-29%	2,701	7.4%
London	572	6.6%	-32%	3,203	8.8%
Wales	550	6.3%	-29%	1,946	5.3%
Northern Ireland	532	6.1%	-22%	907	2.5%
North East (England)	300	3.5%	-30%	1,267	3.5%
Isle of Man	20	0.2%	-17%	46	0.1%
Grand Total	**8,677**	**100.0%**	**-29%**	**36,538**	**100.0%**

Source: Deloitte analysis based on Experian Catalist data. Note: The table above does not include PFS for which the region was not identifiable due to data limitations; however, number of such PFS is small and not likely to have a material impact on figures.

3.3 Ownership structures

There are three types of PFS owners in the UK. These comprise the following.

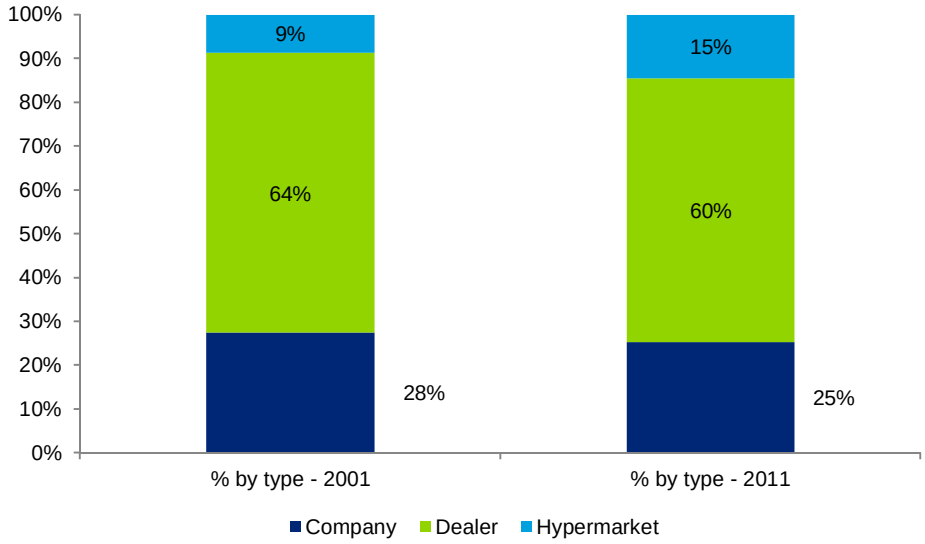
- Hypermarkets: this refers to PFS owned by a hypermarket and retailing their own brand fuel (such as, Tesco selling fuel under its own brand). A hypermarket that retails another brand is regarded as dealer-owned.

- Companies: this refers to PFS owned or leased by an oil company, whose name appears on the brand sign (such as, BP owning and operating a PFS under its own brand). Such a PFS can be operated by the company's own retail subsidiary or leased/licensed to another individual or group.

- Dealers: this refers to PFS owned and operated by an individual or a group which is not part of an oil company or a hypermarket. The majority of these dealers use the brand name of oil companies (such as, an independent dealer owning and operating a PFS while sourcing fuels and using the brand name of the fuel supplier, such as Shell). The number of unbranded PFS is a small percentage of total number of PFS.

The percentage breakdown of number of PFS by ownership type in 2001 and 2011 is shown in Figure 11.

Figure 11: Number of PFS and their percentage breakdown by ownership type (2001, 2011)



Source: Deloitte analysis based on Experian Catalist data.

The large majority of PFS are owned by dealers, followed by companies and hypermarkets. As noted in Section 3.1, the total number of PFS has declined significantly during the last few decades. During 2004-2011, the total number of PFS declined by 19%. However, there were considerable variations in the rate of decline (or growth) between different types of PFS owners. In terms of the percentage decline in the number of PFS during 2004-2011, company-owned PFS decreased most markedly with a 28% decrease, followed by dealer-owned PFS with a 21% decrease. However, in term of actual net decline in the number of PFS during this period, there was a larger decline in dealer-owned PFS (1,415 PFS), followed by company-owned PFS (849). In contrast to company- and dealer-owned PFS, hypermarket-owned PFS have actually increased during this period by an additional 162 PFS, representing an increase of 15% over 2004.[28] These trends are indicative of business models of company- and dealer-owned PFS coming under pressure during this period relative to hypermarket-owned PFS. The breakdown of PFS by ownership type in 2004 and 2011 is shown in Table 4.

Table 4: Number of PFS in 2004 and 2011 by ownership type

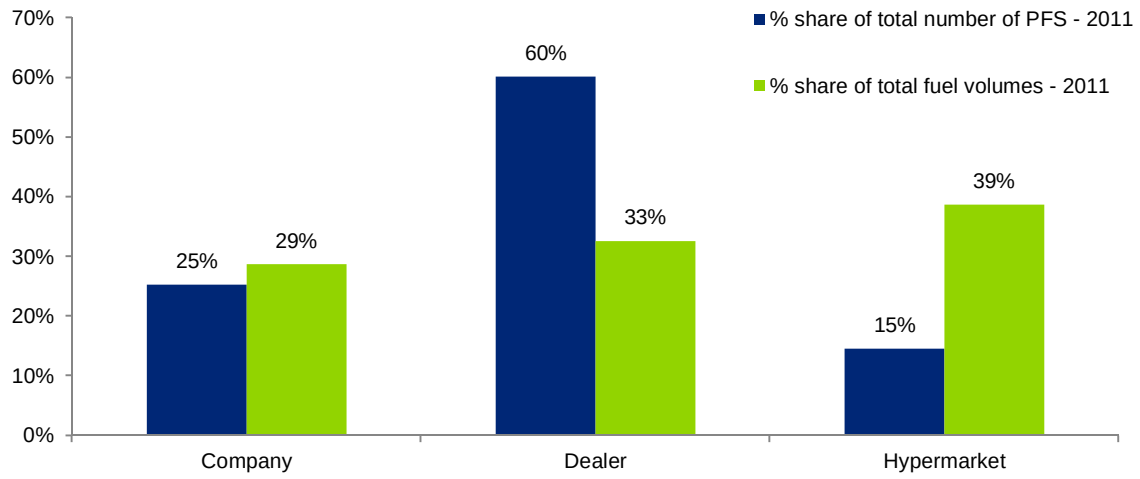
Ownership type	2004	2011	% decrease in number of PFS between 2004 and 2011	Absolute decrease in number of PFS between 2004 and 2011
Company	3,047	2,198	-28%	-849
Dealer	6,716	5,301	-21%	-1,415
Hypermarket	1,104	1,266	15%	162
Grand total	**10,867**	**8,765**	**-19%**	**-2,101**

Source: FMR 2004 and FMR 2011 (source data is from Experian Catalist).

[28] FMR 2004 and FMR 2011 (source data is from Experian Catalist).

Though there has been a significant decline in company- and dealer-owned PFS, companies and dealers still own a combined share of 85% of total number of PFS in 2011. However, their share of total motor fuel volumes sold in 2011 is much lower while the share of volumes sold by hypermarket-owned PFS is much higher relative to their share of the total number of PFS. This is shown in Figure 12.

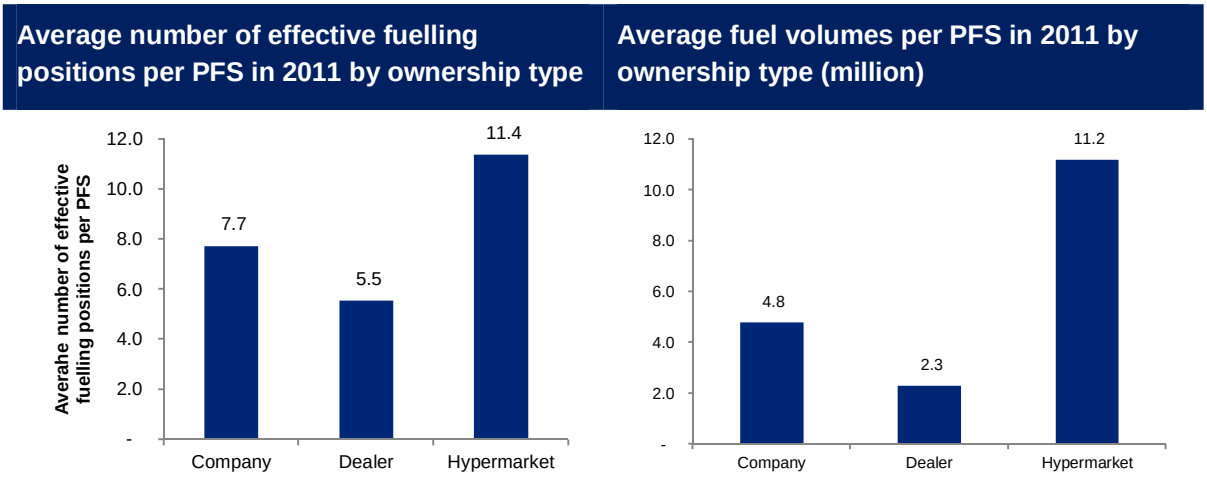
Figure 12: Share of total number of PFS and total fuel volumes sold (2011) by ownership type



Source: Deloitte analysis based on Experian Catalist data.

As shown in Figure 12, for each ownership type, there are significant differences in their share of total fuel volumes sold relative to their share of the total number of PFS. These differences are indicative of variations in the business models of company-owned, dealer-owned and hypermarket-owned PFS. Hypermarket-owned PFS sell much higher average fuel volumes, followed by company-owned and dealer-owned PFS, as shown in Figure 13.

Figure 13: Average effective fuelling positions[29] (2011) and average fuel volumes (2011) per PFS by ownership type



Source: Deloitte analysis based on Experian Catalist data.

On average, hypermarkets sold 11.2 million litres of motor fuel per PFS in 2011, which is more than four times the average for dealer-owned PFS and more than twice the average for company-owned PFS. Hypermarkets also have more fuelling positions per PFS relative to dealer- and company-owned fuel stations. This is indicative of hypermarket-owned PFS operating under a business model which has higher fuelling capacity and sells larger volumes relative to other ownership types. This is discussed further in Section 5. In contrast, dealer-owned PFS tend to have smaller fuelling capacity and sell lower volumes on average which could put potentially put pressure on their business model and profitability if faced with competition, in particular, price competition, from company- and hypermarket-owned PFS. The business models of each ownership type are discussed in more detail in Section 5.

3.4 Retail brands

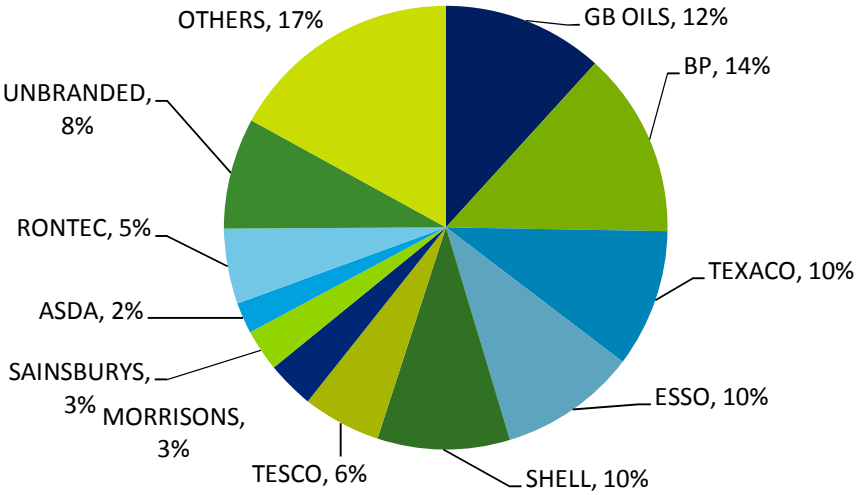
Number of PFS

BP has the largest number of branded PFS, followed by GB Oils[30], Texaco and Esso. Among hypermarkets, Tesco has the largest number of PFS, followed by Morrisons, Sainsbury's and ASDA. The share of each major brand in total number of PFS in 2012 is shown in Figure 14.

[29] Effective fuelling positions refer to the number of fuelling positions that can be used at any one time on a PFS. This number is estimated by Experian Catalist, taking into account grade/nozzle distribution, forecourt manoeuvrability, pump accessibility and blockages.

[30] GB Oils has PFS sites with the following brands: Gulf, Pace, Power, Scottish Fuels, Total, UK and other brands. Rontec has PFS sites with Snax 24 and Total brands.

Figure 14: Share of the number of PFS for each major brand in 2012



Source: FMR 2012 (source data is from Experian Catalist).

Tesco, Sainsbury's and ASDA have significantly increased the number of PFS during 2004-2012, with Tesco registering a growth of more 30% in the number of PFS during this period while Sainsbury's and ASDA registered a growth of 14% and 27% respectively. In contrast, all major oil brands have experienced a significant decline in the number of PFS during this period.[31]

Across major oil brands, there are significant variations in the relative split of company- and dealer-owned PFS. Esso and Shell have more than 50% of PFS being company-owned while Texaco and Jet do not have any company-owned PFS. These variations are shown in Table 5.

Table 5: Split of company- and dealer-owned PFS for major oil brands (2012)

Brand	Total number of PFS	Number of company-owned PFS	Number of dealer-owned PFS	% company-owned PFS
BP	1,175	306	869	26%
TEXACO	875	0	875	0%
ESSO	867	581	286	67%
SHELL	839	589	250	70%
MURCO	437	189	248	43%
JET	327	0	327	0%

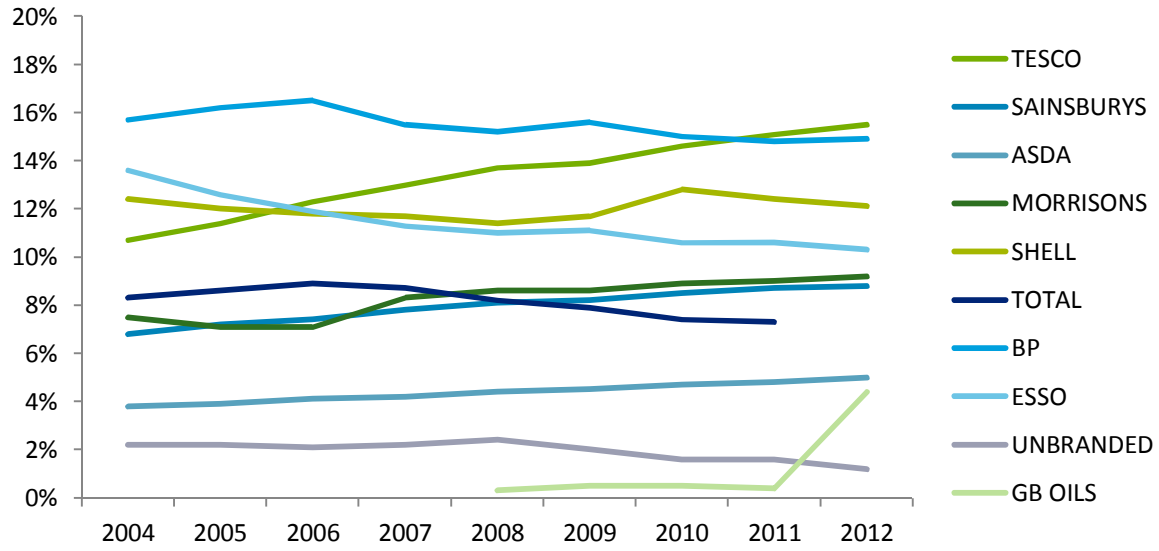
Source: FMR 2012 (source data is from Experian Catalist).

[31] Fuel Market Reports (2004-2012).

Market volumes

There has been significant growth in motor fuel volumes sold by hypermarkets, in line with their growth in PFS ownership which is further augmented by hypermarkets having more fuelling positions on average compared to company- and dealer-owned PFS. Tesco has become the market leader in fuel volumes sold in 2011, eclipsing BP which was the market leader during 2004-2010. The trend in market share of volumes for selected brands is shown in Figure 15.

Figure 15: Market share by volume for selected brands (%) (2004-2012)



Source: FMRs 2004-2012 (source data is from Experian Catalist).

Figure 15 shows that the major hypermarkets have increased their market share of volumes sold while the oil majors have faced declining market shares. The figure also indicates some major changes in the fuel retailing sector between 2011 and 2012 (such as, Total's exit from the fuel retailing sector). These changes are discussed below.

Key market changes in 2011-2012

There have been some significant changes in the petroleum retailing market in 2011-2012. In particular, Total, one of the leading fuel retailers in the UK, sold its company-owned PFS network to Rontec towards the end of 2011. Rontec is a consortium of companies comprising Snax 24 (an independent fuel retailer), Investec (an asset management company) and Grovepoint Capital (an investment company). This acquisition has increased Rontec's market share of fuel volumes and number of PFS. Rontec's acquisition is also indicative of independent dealers expanding their PFS network in order to achieve economies of scale and have greater bargaining power in their negotiations with fuel suppliers and distributors (such as, the ability to buy fuel at ex-rack prices and achieve lower rates for fuel distribution).

Subsequent to this transaction, Rontec sold a part of their PFS network to Shell, which already has a significant presence in the UK fuel retailing market. Shell's acquisition of PFS sites is indicative of potential market opportunities in this sector. In particular, convenience retailing along with fuel

retailing may be a major growth driver in this market. An example of opportunities in convenience retailing is Shell having its own brand 'deli2go' for food operations.

As part of Total's exit from the fuel retailing market, GB Oils, a subsidiary of DCC Energy, took over the responsibility for supplying fuel to Total branded dealer-owned PFS. As part of this transaction, GB Oils acquired Total's depots and distribution assets. GB Oils also acquired the Pace brand in 2011 while its flagship brand continues to be Gulf. As a result of these acquisitions by GB Oils, their market share of volumes increased from less than 1% in early 2011 to more than 4% in early 2012 while their share of number of PFS increased from less than 3% to more than 11%.

These changes are indicative of the pursuit of different strategies by players in this market, with some, in particular, dealers, expanding their networks while others are exiting from the market.

The business models of different fuel retailers and related market opportunities are discussed in further detail in Section 5.

3.5 Proximity to PFS

3.5.1 Overview

PFS closures may affect consumers' access to a PFS, in terms of driving distance and time to reach a PFS. These closures may also affect the number of PFS available to consumers within a reasonable driving distance and time. Reduced access and fewer PFS available to consumers within a reasonable driving time may have an impact on fuel prices by reducing competition in particular areas (such as, some rural areas). In contrast, in other areas, there may be more competition due to the opening of new PFS, in particular, by hypermarkets.

In order to assess the impact of PFS closures between 2001 and 2011 on consumers, a proximity analysis of PFS to postcode sectors in the UK has been undertaken. In addition, in order to take account of the number of vehicles in different areas of the UK, an analysis of vehicle density relative to the PFS network in 2011 has also been completed. The approach to proximity analysis is discussed in the next section.

It should be noted that the assessment of competition in the UK fuel retailing market is beyond the scope of this report.[32]

3.5.2 Approach

For each postcode sector in the UK, driving distance and time has been estimated from the population-weighted centroid of the postcode sector to the nearest ten PFS in 2001 and 2011 (nearest in terms of driving time and distance separately).

Driving times and distances have been estimated for the nearest ten PFS in order to assess the number of PFS available to consumers within a reasonable driving time and distance. To analyse

[32] The Office of Fair Trading (OFT) will be considering the implications that the number and type of PFS have on competition in local areas as part of its Call for Information on the UK petrol and diesel sector which is due to be published in January 2013.

changes in PFS availability, the number of PFS within ten minutes of driving time has been identified for each postcode sector, and how it has changed between 2001 and 2011. The driving time threshold of ten minutes has been informed by data on the average minimum car travel times to reach key services in England (such as, place of employment, hospital and food store). This is discussed in further detail in the next section. A lower number of PFS within a driving time of ten minutes means that consumers have fewer PFS options to choose from in 2011 relative to 2001 as a result of closures.

In order to assess changes in consumers' access to a PFS, an indicative minimum driving time and distance has been identified for each postcode sector in 2001 and 2011. For a given postcode sector, an increase in minimum driving time/distance between 2001 and 2011 means that consumers in that postcode sector (assuming consumers are located in the centroid of the postcode sector) will have to travel longer distances or take more time to access the nearest PFS.

In order to assess vehicle density in relation to the PFS network, the number of vehicles relative to the number of effective PFS fuelling positions available within a driving time of ten minutes, has been estimated. Further details of this approach are included in Section 3.5.6.

The key inputs and assumptions used for the proximity analysis are listed in Appendix A.3. Data on UK road networks has been sourced from Ordnance Survey[33]. As this data does not contain detailed information on road speeds, restrictions and connectivity between road links, assumptions related to speed and road connectivity have been made (see Appendix A.3).

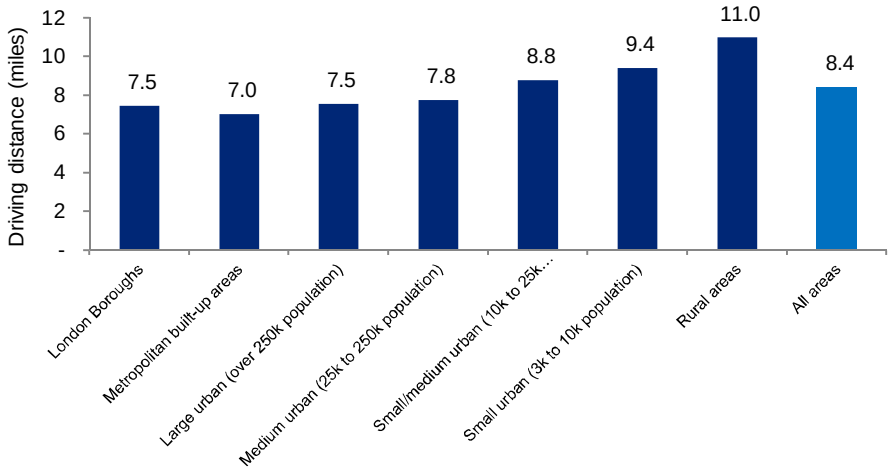
3.5.3 Driving time and distance comparators

In order to determine thresholds for reasonable driving time and distance, both in terms of access to a PFS and choice of PFS, it is important to understand consumers' driving behaviours, in particular, their driving times and distances to access different services. This information could also be helpful in assessing whether consumers would be significantly affected if driving times and distances to the nearest PFS increase beyond a certain threshold.

The average length of a car trip in Great Britain was 8.43 miles (13.56 kilometres) in 2009-2010, and this has not changed much since 2002-2003. However, there were variations by area type, with car trips in rural areas having an average length of 10.75 miles (17.30 kilometres) while they varied between 6.91 miles (11.12 kilometres) and 9.85 miles (15.85 kilometres) in different types of urban areas. These variations are shown in Figure 16.

[33] http://www.ordnancesurvey.co.uk/oswebsite/products/meridian2/index.html.

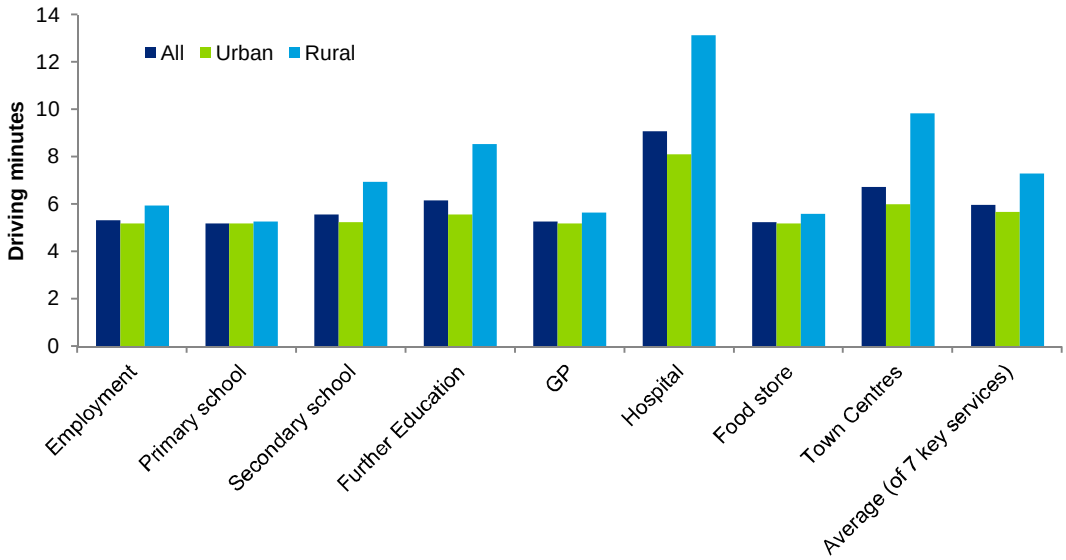
Figure 16: Average length of trip (miles) for car/van driver by area type in Great Britain in 2009-10



Source: Table NTS9910, Department for Transport statistics, UK.

In terms of driving time, average minimum travel time to reach key services is between five to nine minutes in 2011. The variations for rural and urban areas and across different services are shown in Figure 17.

Figure 17: Average minimum travel time to reach the nearest key services by car, England, 2011 (minutes)



Source: Department for Transport statistics, UK

Figure 17 shows that the average minimum travel time for key services is between four to nine minutes in urban areas. Minimum driving times in rural areas have a greater range (between six and 13 minutes) depending on the type of service.

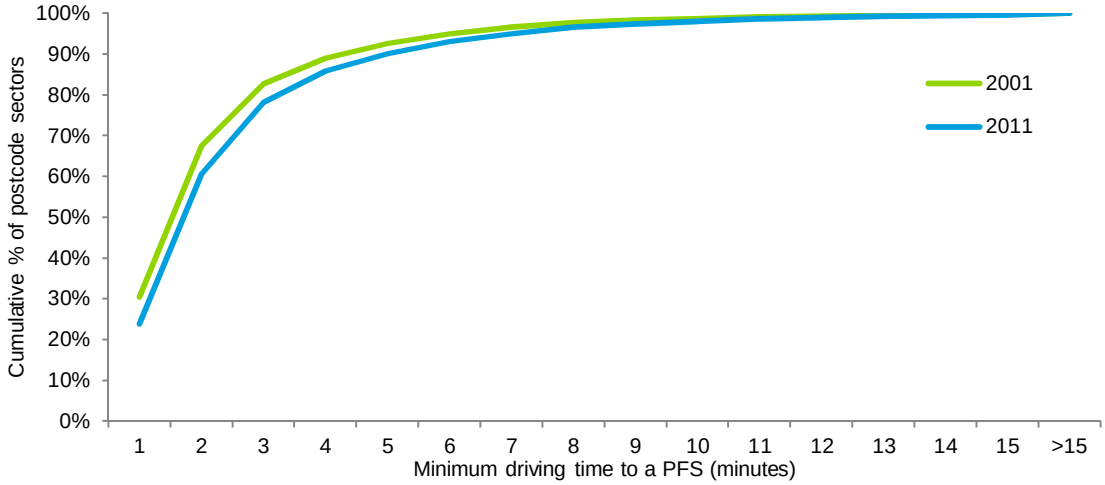
The driving time patterns discussed above illustrate that for most key services, average minimum driving time is within ten minutes, both in urban and rural areas. Therefore, it is possible that

vehicle drivers would not face significant difficulties in accessing a PFS if these are within ten minutes of driving time, both in urban and rural areas. In light of these driving time patterns, it can be considered reasonable to assume a driving time threshold of 10 minutes in analysing consumers' PFS choices (that is, the count of PFS within a driving time of up to ten minutes). In addition, in analysing changes in access to a PFS, a driving time threshold of 10 minutes has been used to indicate postcode sectors which have been more or less significantly affected due to PFS closures.

3.5.4 Impact on access

Out of 9,451 postcode sectors, more than 98% have a PFS within a driving time of 10 minutes, both in 2001 and 2011 (2001 - 9,327; 2011: 9,268). This information is shown in Figure 18.

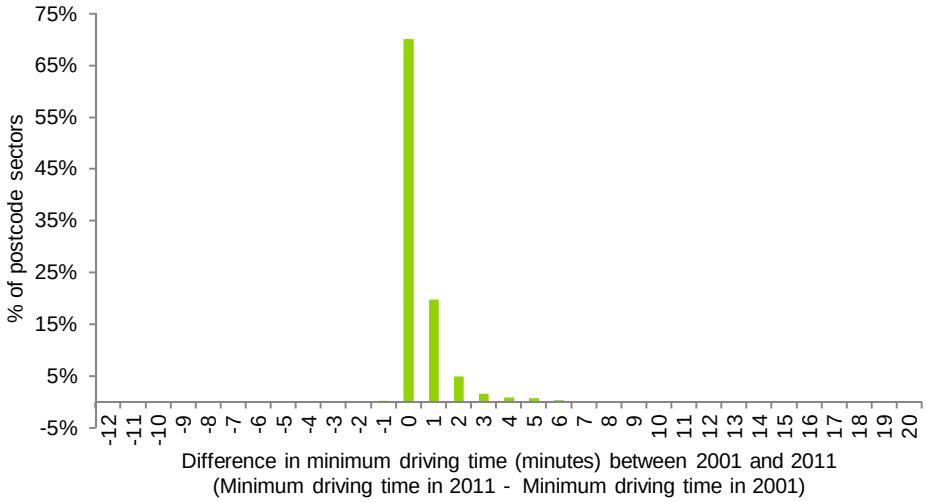
Figure 18: Cumulative percentage of postcode sectors with minimum driving time (minutes) to a PFS (2001, 2011)



Source: Deloitte analysis.

In Figure 18, there is a downward shift between 2001 and 2011. This means that for a given minimum driving time, there are fewer postcode sectors in 2011 relative to 2001 which have a PFS within that minimum driving time threshold. This indicates that there are some postcode sectors where minimum driving times have increased from 2001 to 2011 due to PFS closures. Though 29% of postcode sectors have been negatively affected (that is, there is an increase in minimum driving time to a PFS from 2001 to 2011), the magnitude of the increase in driving time is three minutes or less for most of these postcode sectors. For 69% of postcode sectors, driving times remain unchanged, with an additional 26% facing an increase in driving time of up to three minutes. The distribution of differences in minimum driving time between 2001 and 2011 for each postcode sector (minimum driving time in 2011 less minimum driving time in 2001) is shown in Figure 19.

Figure 19: Percentage of postcode sectors with differences in minimum driving time (minutes) to a PFS between 2001 and 2011

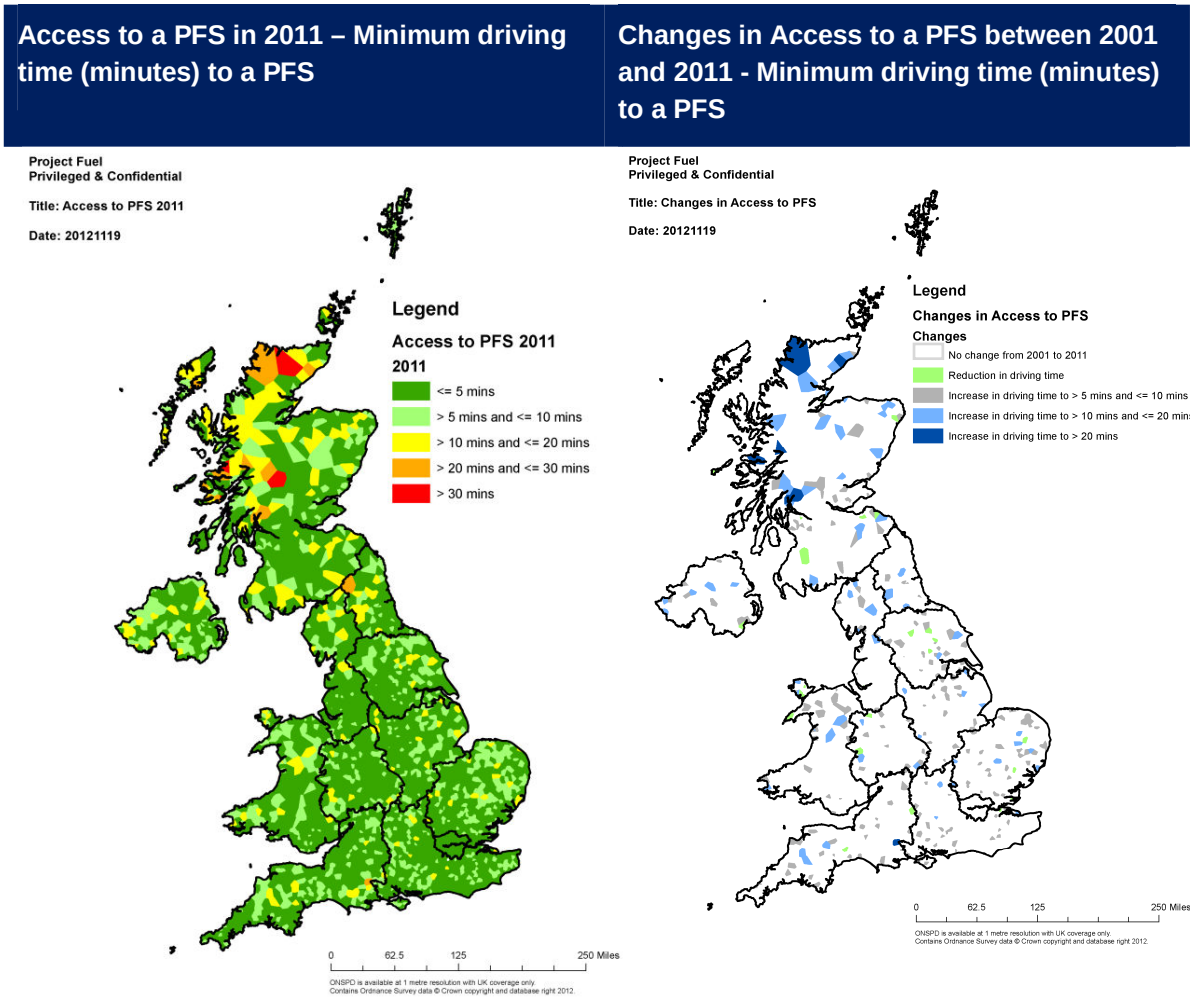


Source: Deloitte analysis. Positive values indicate an increase in minimum driving time between 2001 and 2001 (and vice versa for negative values).

The regional variations are illustrated for 2011 in Figure 20 below. The map shows that, as noted earlier, a large number of postcode sectors have a minimum driving time to a PFS of under ten minutes in 2011 (green colour in the access map)[34]. However, there are a few postcode sectors (around 2% of total postcode sectors in the UK) which have a minimum driving time of more than ten minutes to a PFS in 2011. These areas are mainly in Scotland, while the rest are dispersed across different regions.

[34] For the 2001 map on access, refer to Appendix A.1.1.

Figure 20: Access to a PFS in 2011 and Changes in Access to a PFS between 2001 and 2011, for each postcode sector



Source: Deloitte analysis. Note: In the changes map, no change refers to postcode sectors which were in same category in 2001 and 2011.Refer to Appendix A.1.2 and A.1.3 for larger sizes of these maps.

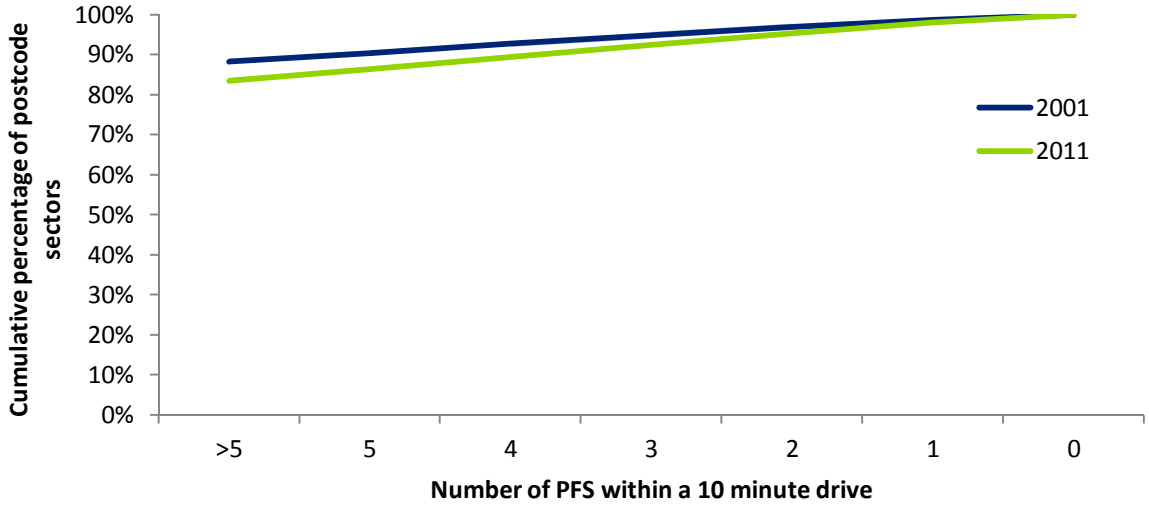
In terms of changes in access to a PFS between 2001 and 2011, the changes map above shows that large parts of the UK did not experience a change in driving times, as noted previously. However, there are some areas (less than 1% total postcode sectors in the UK) in which the minimum driving time to a PFS has either increased to more than 10 minutes or 20 minutes in 2011 due to PFS closures; in these areas, the average driving time is thirteen minutes in 2011 which represents an increase of more than 100% in driving time since 2001 (average increase in driving time of seven minutes). The percentage of postcode sectors in each region which have been negatively affected is listed in Appendix A.1.2.

The review of minimum driving times (by region and rural/urban/mixed nature of a postcode sector) indicates that, on average across relevant postcode sectors, the minimum driving time is lowest in urban areas, followed by mixed and rural areas. Urban and mixed postcode sectors have an average driving time of less than five minutes while in rural areas, it is approximately seven minutes. Average increases in minimum driving times from 2001 to 2011 have been under one minute across urban, mixed and rural areas. The results for each region are shown in Appendix A.1.5.

3.5.5 Impact on choice

Out of 9,451 postcode sectors, more than 92% of postcode sectors have more than two PFS within a driving time of 10 minutes in 2001 and 2011 (2001 – 8,970; 2011: 8,738). This information is shown in Figure 21.

Figure 21: Cumulative percentage of postcode sectors with count of PFS within driving time of 10 minutes (2001, 2011)



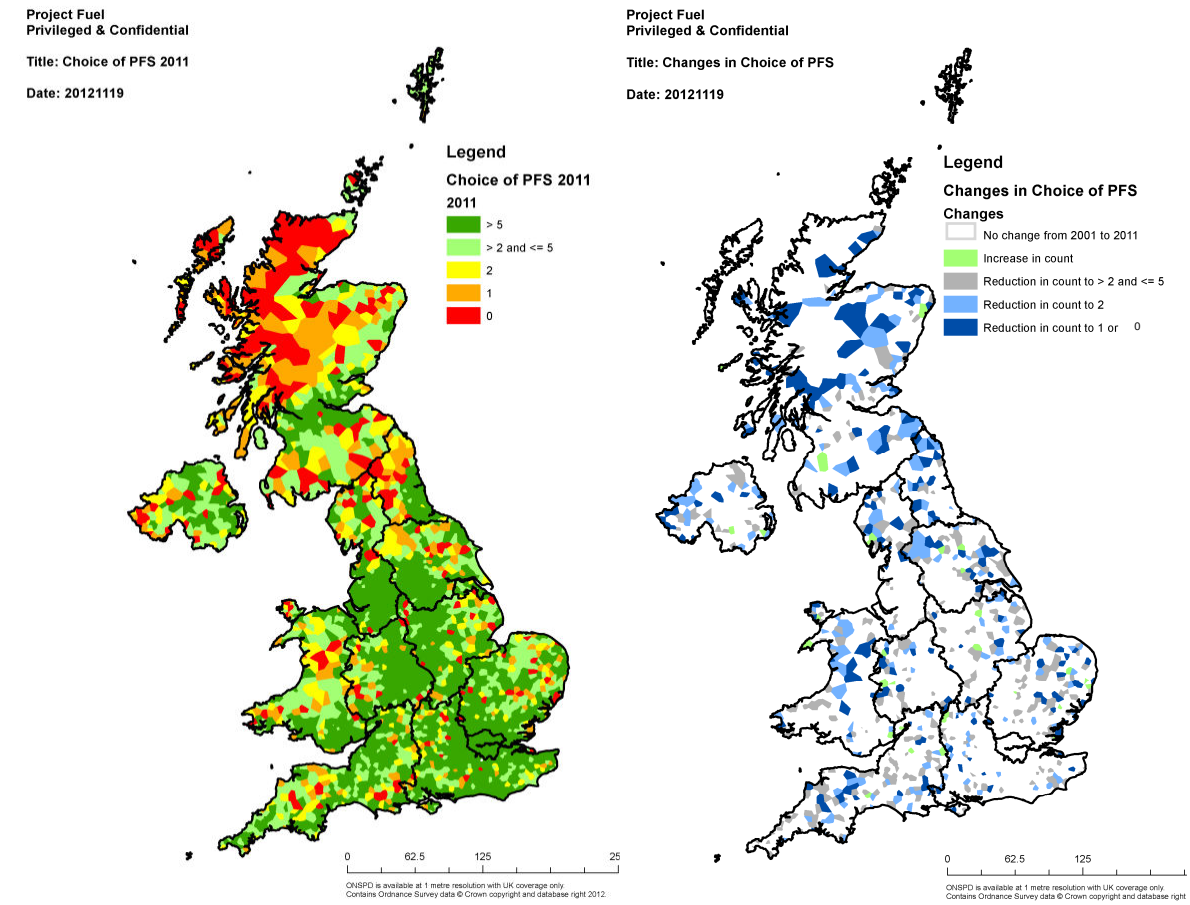
Source: Deloitte analysis.

In Figure 21, there is a downward shift from 2001 to 2011. This indicates that the number of postcode sectors for any given count of PFS within a driving time of 10 minutes is lower in 2011 compared to 2001. This means that consumers within some postcode sectors will have a reduced count of PFS available within a driving time of 10 minutes. For 79% of postcode sectors, the number of PFS available within a driving time of 10 minutes remains unchanged.

The regional variations in the impact of PFS closures on the count of PFS available within a driving time of 10 minutes are shown in Figure 22.

Figure 22: Number of PFS available within a driving time of 10 minutes in 2011, and changes to this number between 2001 and 2011, for each postcode sector

Count of PFS available within 10 minutes of driving time	Changes between 2001 and 2011 in the count of PFS available within 10 minutes of driving time



Source: Deloitte analysis. Note: In the changes map, no change refers to postcode sectors which were in same category in 2001 and 2011. Refer to Appendix A.2.2 and A.2.3 for larger sizes of these maps.

As noted earlier, it can be seen in the map above that large parts of the UK have more than two PFS available within a driving time of ten minutes in 2011 (light green and dark green colours in the map above[35]). However, there are a significant number of postcode sectors (close to 8% of total postcode sectors in the UK) which have two or fewer PFS within a driving time of ten minutes, which is indicative of reduced PFS availability; these areas are mainly in Scotland, South West England, Wales and East of England[36].

In terms of changes in PFS availability between 2001 and 2011, there are some postcode sectors (close to 4% of total postcode sectors in the UK) in which the count of PFS available within a driving time of 10 minutes or less has reduced to two or fewer PFS; in these areas, the average

[35] For the 2001 map on PFS availability within a driving time of ten minutes, refer to Appendix A.2.1.

[36] Refer to Appendix A.2.2 for breakdown by region.

count of PFS is 1.3 and has reduced by more than 100% since 2001 (average decrease in count of 1.7).[37]

3.5.6 Vehicle density

It is also important to take account of the number of vehicles in different areas of the UK in order to assess variations in the number of PFS available within a reasonable driving time relative to the number of vehicles.

Therefore, this section analyses the density of vehicles in 2011, in terms of the number of vehicles relative to the number of effective motor fuelling positions[38] available within a driving time of ten minutes. This analysis has been undertaken for each postcode district (that is, the number of vehicles in each postcode district is divided by the number of effective motor fuelling positions within a driving time of ten minutes in that district), while access and choice analyses in previous sections have been undertaken for each postcode sector.[39] This is due to the full count of vehicles not being available for each postcode sector.[40] The number of effective motor fuelling positions, rather than the number of PFS, has been used to assess vehicle density in order to take account of variations in the size of PFS (that is, the number of fuelling positions on a PFS).

High vehicle density in an area will indicate that within a driving time of ten minutes, there are more vehicles per effective fuelling position relative to a low vehicle density area. This may mean that during a short-term fuel supply disruption, an area with a high vehicle density may be more susceptible to running out of fuel stocks at PFS.

There are considerable regional variations in the density of vehicles. The relatively less dense areas (100 vehicles or fewer per effective fuelling position) are scattered across central and southern parts of the UK, in particular, London, South East England, and parts of South West England, West Midlands, North West England, and Yorkshire and the Humberside. Large areas in Wales, East of England and northern UK have a vehicle density between 100 and 500 vehicles per effective fuelling position. There are some areas, spread across different regions of the UK, where vehicle density is more than 500 vehicles; however, these areas represent less than 3% of total postcode districts (79 out of 2,729 postcode districts) and total vehicle population in the UK. There are also some postcode districts, in particular in Scotland, where there is no effective fuelling

[37] Refer to Appendix A.2.5 for breakdown by region.

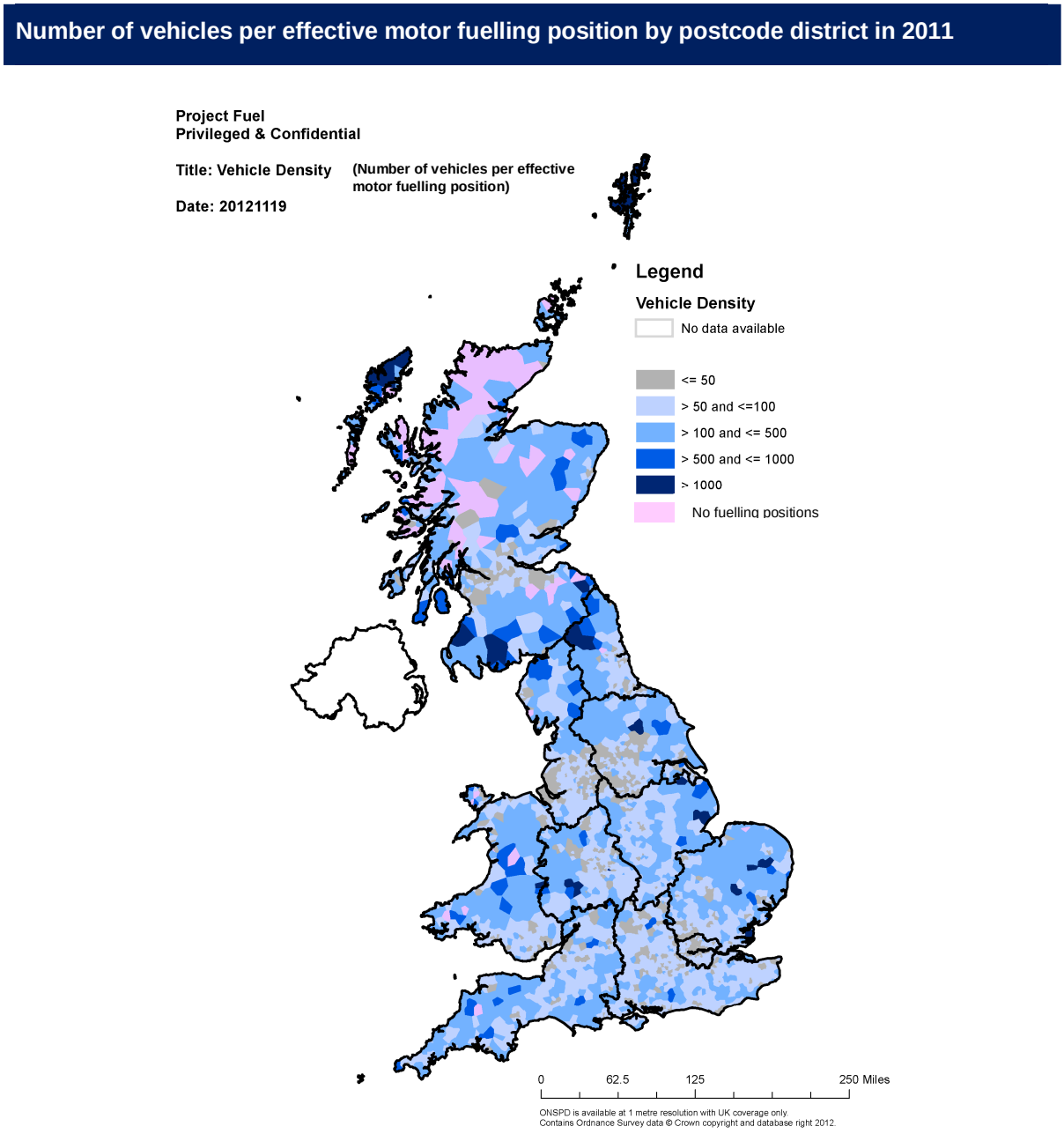
[38] As noted in Section 3.3, effective fuelling positions refer to the number of fuelling positions that can be used at any one time on a PFS. This number is estimated by Experian Catalist. It should be noted that the number of effective fuelling positions on a PFS may be equal to or lower than the actual number of fuelling positions.

[39] A postcode district comprises various postcode sectors. The number of effective fuelling positions within a driving time of ten minutes in a postcode district is determined by summing the number of fuelling positions across postcode sectors which lie within that postcode district. The number of fuelling positions within a driving time of ten minutes in a postcode sector is based on an assessment of driving times for the nearest ten PFS in that postcode sector.

[40] Data on the number of registered vehicles as of Q4 2011by postcode district has been provided by a third party (GMAP Consulting). The underlying source of this data is Driver and Vehicle Licensing Agency's (DVLA) PARC dataset. This data is not available for Northern Ireland.

position within a driving time of ten minutes; these areas represent less than 3% of total postcode districts and less than 0.5% of total vehicle population in the UK. The variation in vehicles density in 2011 is shown in Figure 23.

Figure 23: Density of vehicles (Number of vehicles per effective motor fuelling position) in 2011 by postcode district



Source: Deloitte analysis. Note: Data is not available for Northern Ireland.

3.6 Implications of changes to the structure of the UK petroleum retail market

Consumers' access to a PFS and PFS availability

The proximity analysis indicates that PFS closures had a negative impact on access to a PFS by increasing the minimum driving time required to reach the nearest PFS in some areas. These closures also reduced the number of PFS options available to consumers within a ten minute driving time in some areas. In the majority of postcode sectors in the UK (more than 90%), the extent of this negative impact has been limited between 2001 and 2011; however, there are some areas scattered in different parts of the UK which face reduced PFS access and availability due to closures between 2001 and 2011.

In such areas, if there are any short-term supply disruptions, consumers may not only face longer driving times to access the nearest PFS but in the event that the nearest PFS has run out of fuel, they may have to travel even longer due to reduced PFS availability within a reasonable driving time.

Besides short-term supply disruptions, there might also be wider competition effects from PFS closures in such areas, potentially resulting in consumers being faced with higher prices due to their reduced ability to substitute between different PFS.[41]

Impact on supply chain

Significant closures of PFS over the last few decades have reduced onsite PFS storage capacity. This may have a detrimental impact on resilience as it reduces the stock of total capacity available in the PFS network. On the contrary, this may also improve resilience as these closures reduce the number of PFS sites that will need to be filled in the event of short-term disruptions to supply; however, this impact on improving resilience is likely to be limited as onsite PFS storage capacity tends to be limited to a few days of stock or less which means that there may be logistical challenges in restocking the PFS network if supply disruption is sustained for a brief period. Onsite storage capacity may vary by ownership type; but, notably, high volume hypermarket- or company-owned sites tend to rely less on high storage capacity to meet demand and more on frequent restocking of sites. This implies that in the event of supply disruptions, while there will be fewer sites which will need to be filled, frequent restocking of existing sites will still be necessary to cope with these disruptions. Resilience could also reduce if some dealer-owned PFS manage their stock levels to minimise the average stock-holding and the associated working capital costs.[42] This implies that storage capacity is not fully utilised, which in turn reduces the ability of the retail network to cope with short-term supply disruption.

[41] Analysis of the number of PFS necessary for competition to be effective in an area is beyond the scope of this report.

[42] Interviews with independent dealers indicated that they face working capital constraints in refuelling their storage tanks.

4 Key business drivers in the UK petroleum retail market

This section sets out the key business drivers for companies operating in the UK petroleum retail market and how these drivers have been impacting the sector. The key drivers have been grouped into four areas representing the main factors that interact and affect the PFS businesses: consumers, suppliers, competitors and government. The information presented in this section has been primarily obtained through interviews with participants in the petroleum retail market. The participants have been interviewed based on their cooperation and availability. The list of participants covered is not an exhaustive list; however, it covers at least one participant from the major ownership types in this sector. Some information has also been sourced from external surveys. Further work would be required to verify some of the observations made by interviewees.

4.1 Consumer needs as a business driver

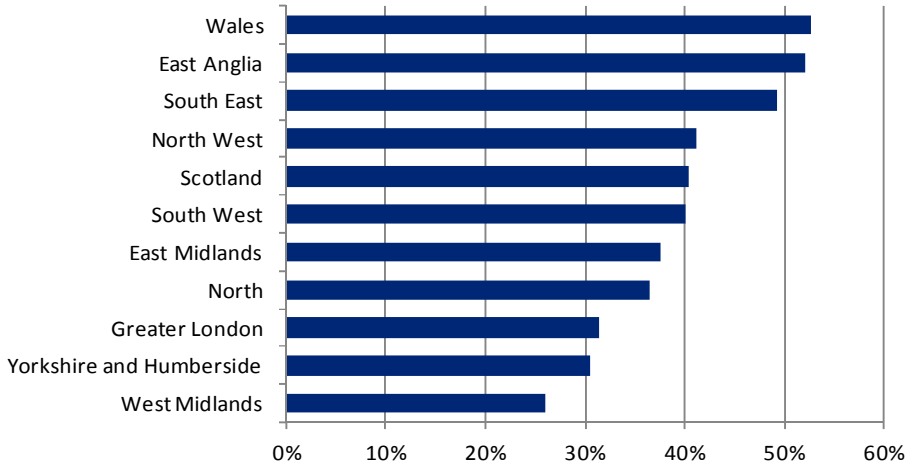
The two key factors that influence consumers when choosing which PFS to use are convenience and price. Convenience concerns the location of the PFS relative to the consumer. This may not necessarily be the nearest site to their home as their travel patterns may dictate a choice of an alternative site along their usual routes. Price is also an important factor, especially as fuel prices have increased significantly over the last 10 to 15 years; some consumers may be prepared to travel a considerable distance to purchase fuel at a lower price.

The extent to which these two factors have an influence will depend in part on the specific circumstances of the customer. If there is a wider choice of PFS locally (say within a 10 minute drive), then a consumer may focus more on price. If a consumer has more limited choice of PFS within a reasonable driving time or is running low on fuel, then the location may be more important.

In terms of recent changes in consumer preference, a report by Key Note Limited “Market Assessment 2012 - Forecourt Retailing” included a number of questions as part of a survey of around 1,000 consumers over the age of 16 in the UK, which showed that consumers have greater focus on price than in previous years. When asked “*I shop around for cheaper petrol/diesel more than I did a year ago*”, there has been a small increase in the overall percentage of respondents agreeing with this statement over the last three years. In 2009, 34.8% of respondents agreed with the statement whereas in 2012, 36.1% of those surveyed agreed.

An alternative question asked as part this survey was, “*I tend to fill my car where it is most convenient for me rather than shop around for cheaper petrol/diesel*“. The number of respondents agreeing with this statement was significantly lower in 2012 (at 40.6%) compared to 2009 (59.1%). This indicates that consumers are increasingly concerned about the price they pay for fuel and are prepared to shop around to find cheaper fuel. Figure 24 shows how the response to this question varied by region in Great Britain, with those located in Wales and East Anglia favouring convenience over price, possibly driven by more restricted choice in those areas. This contrasts with those in Greater London, Yorkshire and the Humberside and West Midlands where fewer respondents agreed with the statement.

Figure 24: Response to the question: "I tend to fill my car where it is most convenient for me rather than shop around for cheaper petrol/diesel by region"

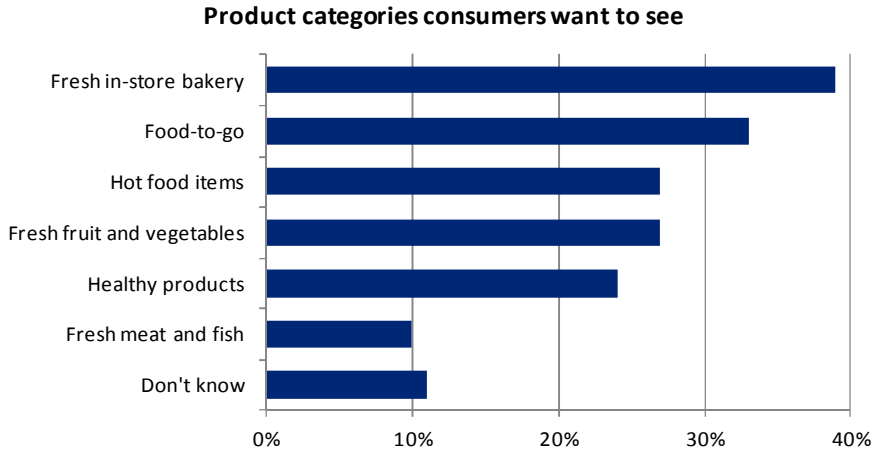


Source: Market Assessment 2012 - Forecourt Retailing, Key Note Limited.

A recent survey of motorists by Consumer Council for Northern Ireland[43] found that "*82 per cent of respondents have now changed their driving behaviour in response to the rising cost of fuel.*" The survey also found that a similar proportion of respondents indicated that they are now shopping around for the best deal on fuel.

In addition to price and location, consumers may also consider the additional offerings that are available at a PFS, such as the shop, loyalty card offerings or the availability of a cash-point or a car wash. A report by Palmer & Harvey[44] highlighted the product categories that consumers would like to see at a PFS. This is shown in Figure 25.

Figure 25: Product categories that consumers want to see at PFS



Source: The Forecourt Report 2012, Palmer & Harvey

43 http://www.consumercouncil.org.uk/newsroom/842/

44 The Forecourt Report 2012, Palmer & Harvey (http://www.palmerharvey.co.uk/)

The Palmer & Harvey report also provides a number of additional findings from its survey of 1,000 forecourt shoppers:

- forecourts are an increasingly popular choice for the purchase of gifts (flowers and chocolates);
- customers do not feel safe to use a forecourt at night; and
- more than half of the shoppers would like to see Post Offices and parcel pick-up services introduced at forecourts.

4.2 Relationships with fuel suppliers

PFS retailers purchase petrol and diesel either directly from the supply divisions of oil companies or from independent fuel suppliers. This is a key relationship for the PFS businesses as it determines what the PFS retailer pays for petrol and diesel. This is specified in a contract or a supply agreement between the two parties.

The contracts typically specify the price to be paid on a 'Platts Plus' basis. Platts refers to the international benchmark price published daily for petroleum products, quoted in US Dollars. The 'Plus' element refers to what the fuel supplier charges in addition to the quoted price. This covers the fuel supplier's own costs for product storage and distribution and a wholesale margin. Interviews with market participants have informed us that the 'Plus' element can range from around 1.5 pence per litre ('ppl') for a PFS supplied directly from a refinery (which does not incur any cost of using secondary distribution and storage) to 4.5ppl or higher for PFS that are located at longer distances from fuel depots. Depending on the contract, additional elements may also be included to cover services such as credit cards, fuel cards, pump maintenance or stock management services.

The wholesale price agreed can be a daily spot price (in other words, the quoted price on the day of delivery) or determined on a lagged basis, in which the quoted Platts price is averaged over a one or two week period (or longer). The difference between the wholesale delivered price and the retail price to consumers is the gross retail margin on fuel made by the PFS.

There are a number of characteristics that comprise the structure of the contractual relationship between the wholesaler and the retailer. These vary by the type of PFS owner and include:

- the availability and choice of fuel suppliers;
- the nature and type of contract between the fuel supplier and the PFS owner;
- the payment terms for purchasing the petroleum products;
- the reference wholesale price used in the contract for each product; and
- the logistical arrangements for the delivery of fuel to the PFS.

These characteristics and how they vary by the type of PFS owner are discussed in Table 6. This illustrates how the factors affecting the terms under which petrol and diesel is purchased differ by the type of PFS owner.

Table 6: Structure of the relationship between fuel suppliers and different types of PFS owners

Structure of relationship with fuel supplier	Hypermarket	Company owned site	Independent dealer
Choice of fuel supplier	Typically use one or more independent fuel suppliers, and are likely to be able to procure from a variety of independent suppliers if required, given their scale and coverage.	Procure fuel through the fuel supply division of the associated oil company.	Most commonly procure fuel from the oil company associated with the brand* at the PFS site (though some companies have withdrawn from the market). Some independent fuel suppliers now offer fuel supply contracts under their own brand (for example, Harvest Energy).
Type of contract	May have a contract with a single fuel supplier covering all sites, or multiple fuel suppliers.	Internal contractual relationship covering the supply of fuel. Can also have the form of an agreed business plan over a number of years with a retailer (similar to a franchise but with no equity from the retailer).	Commonly, a five year contract with the oil company. In some cases, there is a break clause to exit the contract before five years.
Payment terms	Payment terms can vary from 15 days to 45 days	Pricing of fuels managed and set by the oil company who will often also own the fuel stock at their PFS.	Typically one to three days direct debit after a delivery
Wholesale price	Set as 'Platts Plus' price, often based on an average two or two and a half week lag. May agree a national average price or regional prices.	Wholesale and retail pricing managed by the oil company, who will often set the retail price for each of their sites.	Interviews with independent dealers indicated that typically the 'delivered' price is based on the daily spot 'Platts Plus' price, with the Plus element set for each site to cover distribution costs, and that to get a weekly lag price would incur an additional cost of around 0.25 pence per litre (ppl) to 0.3ppl. May also have margin share agreements with oil companies; in these agreements, retail margins are agreed and at the end of a specified period, excess margin (if any) is split.
Logistical arrangements for delivery	Can purchase fuel at depot (referred to as 'ex-rack') and contract a haulage company to distribute fuel to PFS. Can also choose to have a 'delivered' price with the fuel supplier organising the delivery.	Organised by the oil company's own fuel supply division with delivery by a third party haulage company (with the exception of BP).	Branded independent dealers will have a supply contract with a fuel supplier, typically the associated oil company. Interviews have indicated that under these contracts independent dealers can only get product from the fuel supplier and are not able to buy 'ex-rack'.

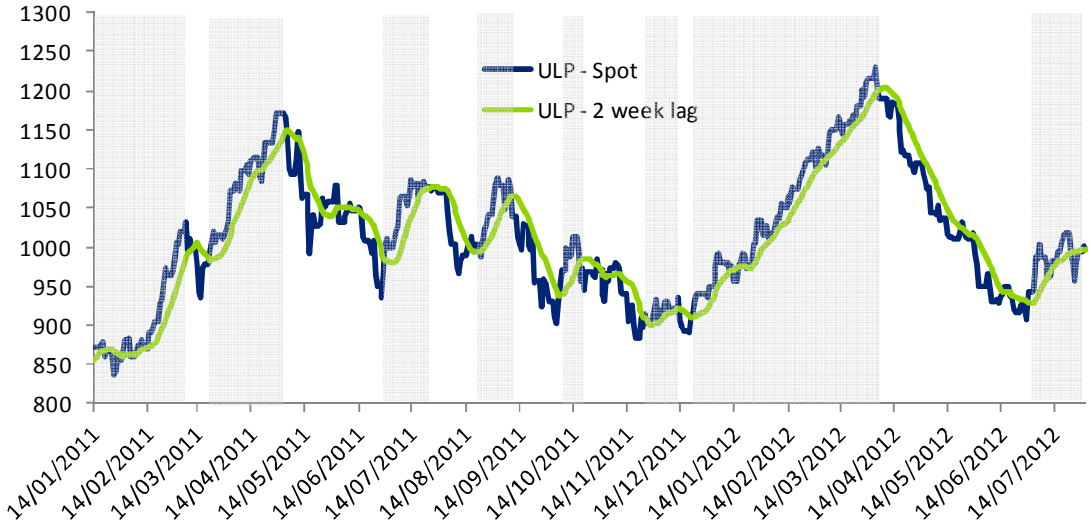
Source: Deloitte analysis following discussions with industry participants; (*) Some sites are unbranded and can source fuel products from different suppliers.

Independent dealers used to be offered 'margin protection deals' but Deloitte was informed that these deals have largely been withdrawn over the last five to seven years. Under these deals, the oil companies would sell petrol and diesel at prices which allowed the independent PFS to make a certain level of gross profit while ensuring that the retail prices remained competitive in the local area. However, faced with increasing price competition from hypermarkets, oil companies found that this was not a sustainable model and moved their fuel supply contracts with independent dealers primarily to a Platts Plus basis.

Under the current Platts Plus type contracts, retailers are exposed to wholesale price risk (including exchange rate risk as the Platts prices are quoted in US dollars), which is a significant change in the market compared to the previous contracts, in particular between oil companies and independent dealers, in which the wholesale price risk was limited for independent dealers.

Under Platts contracts, the use of a spot or a weekly lag price based on Platts has an impact on how each type of PFS may change their retail prices in response to increases in refined product prices. Any increase in quoted Platts prices are felt by PFS on a spot deal compared to PFS which are on a one or two week lag (or longer). This is illustrated in Figure 26.

Figure 26: Illustration of the difference in the reference price of using spot prices compared to a two week lag average price for unleaded petrol (ULP), £ per tonne



Source: Deloitte analysis based on ULP data provided by a member of the Petrol Retailers Association.

In addition, independent dealers also have a number of other differences in their commercial relationships with fuels suppliers relative to other types of PFS owners.

- **Shorter payment terms**. Interviews have indicated that independent dealers typically have to pay for fuel delivered (including duty and value added tax) by direct debit within three days of receiving the delivery. This implies a significant working capital requirement as payments for the fuel sold will not be received for a number of days, or even longer if the payment is made through credit card or fuel cards (which can be paid two weeks later)

- **Reduced choice**. With the reduction in the number of oil companies supplying fuel, or their withdrawal from some areas of the UK, interviews have indicated that there can be

instances where independent retailers only have two or three possible options for sourcing fuel from branded oil companies while the number of options would have been greater in previous years[45].

- **Contract terms**. Competitive conditions in the market have led to changes to the terms and conditions in the contracts for independent dealers which they consider to be onerous (for example, linking the 'Plus' element of the fuel pricing to RPI).

- **Delivery to site included in contract**. Independent dealers have indicated that their contracts with oil companies typically include delivery to the PFS, and they do not have the option for purchasing fuel at an 'ex-rack' price (unlike hypermarkets), unless they are an unbranded site. This follows, in part, from the branding support which they are provided with. However, it means that branded independent dealers do not have the flexibility to choose a haulage company for their deliveries.

Due to a combination of factors discussed above, in particular, non-availability of 'margin protection deals' and Platts Plus pricing, competition from hypermarkets and financial constraints, the business models of independent dealers have come under significant pressure. Independent dealers which were interviewed indicated that they used to make 5-6ppl margin on fuel that cost 60-70ppl (equivalent to a 7% to 10% gross margin on fuel) in the late 1990s while currently they are making 4-5ppl on a retail price of 135-140ppl (a 2.8% to 3.7% gross margin on fuel), This is likely to have contributed to the closure of dealer-owned PFS over the last 10 to 15 years. Company-owned PFS have also come under pressure due to competition from hypermarkets, resulting in closures and loss of market share to hypermarkets.

4.3 Level of competition

Although there is some brand loyalty among consumers, as discussed in Section 4.1, consumers are increasingly price sensitive. According to industry participants, the factors that affect the level of price competition principally include:

- the distance and time taken to reach an alternative PFS;

- the number and size of PFS within a certain geographical area; and

- the type of companies operating the PFS in the area.

The growth of hypermarkets in the UK petroleum retail market has increased the level of price competition in the market. This has put pressure on other types of PFS owners to compete with hypermarkets on the basis of retail prices, which is likely to have led to reduced gross margins. As noted in Section 4.2, independent dealers have indicated that gross margins as a percentage of the retail price have declined over the last 15 years. In some cases, this gross margin is considered by dealers to be just enough to cover the costs of running the PFS, which has therefore led to the development of non-fuel offerings at PFS.

[45] An assessment of how many wholesalers are required in order to generate competitive outcomes is beyond the scope of this report.

Hypermarkets often make offers on fuel to reward customers that shop at the main store. These offers have typically been for a given discount per litre of fuel (for example, 5 pence) if a customer spends more than a given amount in the hypermarket, such as £50. These offers appear, by virtue of being repeated, to have been quite successful in attracting customers to hypermarket filling stations, and independent retailers have indicated that they cannot match those types of offers themselves due to pressure on their gross margins. A recent promotion by Tesco in August 2012 is indicative of the extent of price discounting in fuel retailing by hypermarkets. In this case, customers could receive 10p off per litre for buying each product from a list of branded goods. The separate 10p discounts could then be combined to give shoppers up to 50p off per litre.

Growth in non-fuel sales

PFS used to provide basic services to customers other than fuel, with a payment kiosk selling mainly car related consumables (such as engine oil), tobacco and possibly confectionary. Some PFS had a larger forecourt shop that would sell car related consumables, tobacco, confectionery plus some food and drink items. Modern forecourts can cater for a wide range of services through a convenience store model. This will typically be over 60m^2 offering a wide range of products (such as newspapers, milk, bread and other basic food items) similar to a corner shop retailer. They will typically be open for at least 15 hours a day and include some customer parking on-site. Some PFS will offer coffee and freshly baked bread or pastries and have a cash-point to attract greater footfall to the site.

Given that the specific physical characteristics of a given PFS site vary, the services that can be offered to customers will also differ. For example, a PFS on a main A-road is more likely to stock food-to-go or sandwiches compared to one located in a more urban area, where essentials like bread, eggs and milk may be more important to local customers. The physical characteristics that affect the types of services offered include:

- location (urban, rural or main road/motorway);
- the size of site and access to petrol (such as number of pumps); and
- site layout, including the potential size of non-fuel retail space and parking on site.

Non-fuel sales today are a key part of the PFS business model and discussions with market participants have indicated that gross margins made from non-fuel sales are significantly higher (20% or more) than for fuel sales (which can be as low as 3%). The potential business models that operate in the UK petroleum retail market are discussed in more detail in Section 5.

4.4 Government and regulatory policy

Government policy and regulations have an impact on PFS businesses and are also a key driver for behaviour and investment needs. The various government related drivers have been grouped into fiscal drivers, environmental and safety standards and other regulatory policies.

4.4.1 Fiscal drivers

The main fiscal drivers relate to taxes that affect PFS businesses, namely Fuel Duty, VAT, Business Rates and Corporation Tax. These affect the PFS business in different ways.

Business Rates

Business rates for PFS are based on a rateable value ('RV') which is assessed every five years by the Valuations Office Agency ('VOA'). VOA's assessment of a PFS is based on the trading performance (turnover) of the PFS. This differs from a standalone shop where the RV is based upon the size of the building. As a result, it is possible that a PFS forecourt can incur a lower Business Rate if it were to operate as a shop only (closing the petrol forecourt) compared to a PFS. A paper by Barber Wadlow[46] indicated that, although the PRA successfully campaigned for a reduction in RV (in Jan 2011) of between 10-25%, some rural sites have seen no real reductions. Therefore, the paper argues that these rural sites still face a rates bill of between £10,000 and £15,000 per annum, which can be equivalent to 10% of gross profit of a rural PFS. There is some concern in the industry that rates may increase in 2015 following the revaluation by the VOA, which could lead to more forecourts closing.

Fuel Duty and VAT

Fuel Duty and VAT currently make up more than 60% of the final retail price. Fuel Duty is currently 57.95ppl (October 2012) for both petrol and diesel, with VAT being charged at 20%. In the last five to seven years, the main driver of the increase in final prices has been the product price. However, between 1990 and 2000 the main driver of petrol prices was the increase in fuel duty, which was increased from 19.49ppl in 1990 to 48.82ppl in 2000. These changes are shown in Table 7.

Table 7: Taxation of petrol and underlying product price growth (1990 to 2012)

Year	Average annual Petrol retail price (in pence)	CAGR %	Total tax (VAT and Fuel duty in pence)	CAGR %	Base cost excluding tax (pence)	CAGR %
1990	36.02		23.1		12.9	
1995	53.44	6.9%	39.3	**9.3%**	14.1	1.8%
2000	75.38	7.1%	60.1	**8.9%**	15.3	2.0%
2005	78.99	0.9%	60.9	0.1%	18.1	3.8%
2010	111.49	7.1%	76.7	4.6%	34.8	**13.4%**
*2012**	*138.91*	*9.2%*	*85.7*	*4.2%*	*53.3*	***18.3%***

Source: Deloitte analysis of DECC annual fuel price data; CAGR = Compound Annual Growth Rate; (*) data for 2012 covers the period of January to September

The impact that Fuel Duty and VAT have on different types of PFS owners differs because of the payment terms that independent dealers and hypermarkets are subject to. As hypermarkets typically pay for their fuel at least 15 days after delivery, they will have collected the fuel duty and VAT from final customer sales prior to making the payment to their fuel supplier. However, independent retailers will typically need to pay for the fuel between one and three days after delivery. As the delivered fuel may not be fully sold within three days, plus it can take time to

[46] "The impact of the 2010 Rating List on rural petrol filling stations", Barber Wadlow, September 2011

process fuel card and credit card payments (for example, credit cards can take three days for payment and fuel cards can take two weeks), there is a significant amount of working capital required. This working capital has increased as Fuel Duty and the underlying product prices have increased. In 2000, a typical 38,000 litre tanker delivery would cost under £25,000, with Fuel Duty and VAT accounting for just over £21,000. However, by 2012, the same volume cost over £50,000, with over £30,000 being taxes.

Some smaller independent dealer PFS manage their stock levels to minimise the average stock-holding and the associated working capital costs. Discussions with some independent dealers have indicated that, given they closely manage their stock levels, they are typically only filling a quarter to half of their on-site storage tanks.

Corporation Tax

The minimum rate of Corporate Tax has been reduced from 28% in 2010 to 23% in 2013. In some cases, smaller PFS businesses that make less than £300,000 profit in a year will pay the lower Small Profits Rate (previously known as the Small Companies' Rate) which has also decreased from 21% in 2010 to 20% in 2011.

4.4.2 Environmental and safety policy

PFS owners and the downstream oil sector in general are subject to a number of environmental and safety policy given the specific characteristics of petroleum products. In discussions with industry participants, two environmental and safety policies were raised with respect to PFS: biofuels and vapour recovery.

Biofuels and the introduction of E10

A few European countries have introduced E10 petrol (10% ethanol, 90% petrol) in order to increase the share of renewable sources in total energy consumed in the transport sector. This is in part driven by the Renewable Energy Directive ('RED') (Directive 2009/28/EC) which places a requirement on European member states to increase the share of renewable energy sources in total energy consumed.

In the UK, the current maximum blend of ethanol with petrol is 5% (referred to as 'E5' fuel).The E10 fuel standard is in the process of being established in the UK, pursuant to which it is up to the fuel suppliers to determine whether to introduce E10 in the UK. A number of issues have been raised by market participants with respect to its introduction. Although fuel tanks and pumps that currently supply E5 petrol should be able to take E10 with no additional investment, there is concern about the availability of alternative grades of unleaded petrol at PFS.

In particular, certain rural locations may only offer two grades of fuel (unleaded and diesel). If they are unable to continue supplying E5 petrol, they may need to choose either to stock E10 fuel (and risk passing motorists not filling up because they are unsure of whether or not to use E10) or stocking more expensive grade of super unleaded. The nature of the consumer response to the introduction of E10 is as yet quite uncertain. However, E10 may also lead to additional spending by PFS businesses on preventative maintenance to ensure that tanks and pumps continue to perform

at the required level. As a result, the PRA believes that this could lead to further closures of smaller PFS that are not able to include multiple grades of fuel.

Petrol Stage II vapour recovery

In order to reduce the emissions of volatile organic compounds ('VOCs') from the storage of petrol and dispensing of petrol by, vapour recovery systems are needed at PFS. The Petrol Vapour Recovery Stage I and Stage II Directives (94/63/EC + 2009/126/EC) regulate this.

- The Stage I (PVRI) Directive is aimed at minimising VOC emissions from the storage of petrol at terminals and petrol stations, as well as from loading and unloading at terminals and unloading at petrol stations. There are limited exclusions from the scope of the directive, mainly related to the size of the terminal or petrol station.

- The Stage II (PVRII) Directive deals with VOC emissions from filling vehicles with petrol at PFS and has come into effect from the 1st January 2012. However, there is already a requirement in England for vapour recovery for refuelling operations at larger petrol stations with an annual petrol throughput of 3.5 million litres.

As a result of PVRII, by the end of 2018, all petrol stations with an annual petrol throughput greater than 3 million litres must have PVRII vapour recovery fitted[47]. In addition, any new PFS or an existing PFS that goes through a major refurbishment with an actual or intended annual throughput of over 500,000 litres[48] will need to install PVRII. The impact of this is that there is an additional cost for new service stations and for those with an annual petrol throughput of between 3-3.5 million litres which will have to fit this equipment by 31 December 2018, at a likely cost of up to £100,000.

4.4.3 Other regulatory policies

There are a number of other regulatory policies that are likely to affect the PFS businesses.

- **Planning**. The planning system has, until recently, offered some protection to retailers in town centres by requiring any proposed development to pass a 'needs test'. In this case, consent for a new development was only granted for retail development if planners considered that more retail development was needed. An update to the National Planning Policy Framework ('NPPF') published in March 2012 has clarified the guidance and includes an impact and sequential test (but not a needs test). However, the development of a new PFS in an area is not subject to any sort of test. A hypermarket can build a new PFS at the site of its hypermarket store, and the planning process does not consider the existing availability and choice of PFS in the area. The PRA has indicated that given average annual volumes, the introduction of a new hypermarket PFS could lead to three to five independent dealers in the local area closing as customers purchase fuel at the hypermarket instead of the previous PFS.

[47] http://www.defra.gov.uk/industrial-emissions/eu-international/petrol-vapour-recovery-directives/

[48] Where petrol stations are located under permanent living quarters or working areas, the annual petrol throughput threshold is lower at 100,000 litres.

- **Measuring Instruments Directive** ('MID'). The MID was transposed into UK law in October 2006. This will require manufactures to certify new designs of forecourt equipment under a new set of European rules. After October 2016, all new equipment sold must have a "MID certificate". For existing sites there are rules relating to mixing equipment that has been 'nationally certified' with new 'MID certified' equipment. This could result in extra investment in equipment at existing PFS businesses to ensure they are fully compliant with the law.

- **National Emergency Plan for Fuel** ('NEP-F'). The UK Government has developed NEP-F to deal with supply disruptions to transport fuels. The measures in the NEP-F include limiting the amount of fuel that can be purchased per visit to a PFS and having designated filling stations ('DFS') for priority use customers (such as emergency services). However, the industry has expressed concern that there is insufficient clarity on how DFS are selected and what type of security arrangements by the police force (if any) will be provided to support DFS.

In addition, there are other policies affecting the wider downstream oil sector but not directly PFS businesses. Examples of this are the European Union Emissions Trading Scheme ('EU ETS') and the UK Government's introduction of a Carbon Floor Price which are likely to increase the costs of refining petroleum products. Similarly, the introduction by the UK Environment Agency of a revised Containment Policy under the Control of Major Accident Hazards ('COMAH') Regulations will also increase the investment required in storage facilities in the UK. Increases in the costs of producing and storing refined products are likely to be passed through to PFS businesses and final customers through higher retail prices.

4.5 Implications

The retail price of fuel has always been a key factor for customers; however, given the economic downturn, pressure on real incomes and rises in fuel prices, this appears to have grown in importance. Hypermarkets have been successful in growing their market share through offers and promotions linked to sales at their main stores. Due to the various business pressures discussed in this section, independent dealers are less likely to be in a position to offer equivalent price discounts on fuel. One of the key consequences of these pressures has been that independent dealers are increasingly reliant on additional non-fuel services and offerings to attract customers to the forecourt in order to generate margins from non-food sales. Many independent dealers have exited the market over the last 10 years.

The relationship of dealers and hypermarkets with fuels suppliers has also changed. Hypermarkets have developed relationships with independent fuel suppliers which have grown in the market. The 'margin protection deals' which used to be offered by the oil companies to dealers are no longer available due to competitive pressures and resulting change towards a 'Platts Plus' deal means that the PFS businesses are now faced with wholesale price, exchange rate and trading risk.

The increase in product prices and Fuel Duty and VAT means a considerable working capital requirement, in particular for independent dealers. These types of PFS owners have to pay for VAT and Fuel Duty before being able to collect this from customers. This is one reason why the PRA argue that the duty point should be moved from the refinery/import terminal gate to the sale point of fuel.

Regulatory policies in the sector will lead to some operators having to incur additional costs in order to comply with legislation over the coming years. This includes Phase II Vapour Recovery, the potential impact of the Measuring Instruments Directive and the growth in biofuel content of road transport fuels. Although these individual measures can be accommodated by the PFS owners affected, the combined impact on additional costs and investment may lead to further PFS closures.

5 Business models in the UK market

5.1 Retail market participants and characteristics

Section 3 included a description of the different types of PFS owners and outlined the trends in the market in terms of the number of PFS by type of operator and how this has changed over time. Setting up a new PFS requires significant upfront investment costs in terms of purchasing land, getting the required permits and construction costs. Even with existing sites, a major upgrade with new fuel tanks, fuel lines, fuel pumps, canopy and shop can cost between £1 million and £1.5 million.

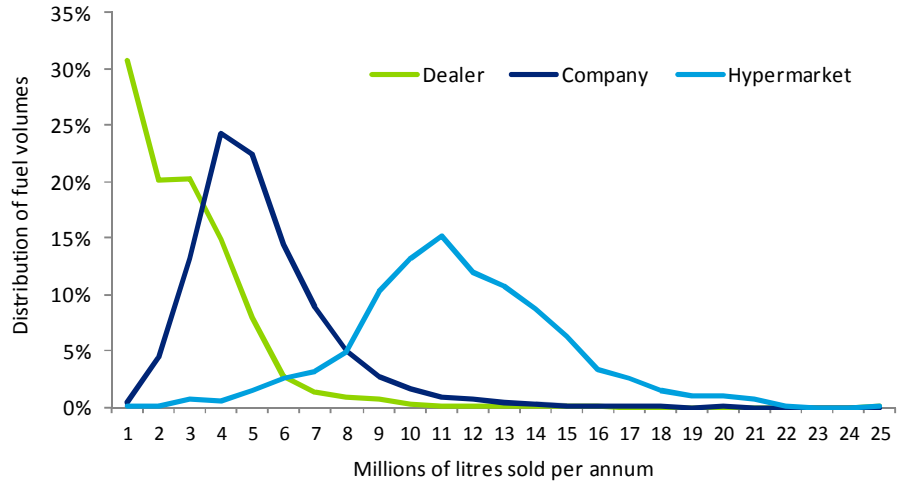
The day to day costs of running a PFS are largely fixed and will depend on the level of service that the PFS wants to offer its customers. For example, an operator with limited shop turnover may only have a single shop attendant at the till. On the other hand, a PFS that relies on shop sales may want to minimise queues at the till and therefore employ two or more people to provide a better level of service. The opening hours of a site and additional services they may provide (such as coffee shop or bakery) will also affect the level of operating costs.

PFS sites across the UK vary significantly in terms of size, fuel volumes sold, location, access and the types of services that they offer. For example, some sites offer a car wash while others provide bunkering services to trucks. There is a wide range of business types and business models in operation across the market. Nevertheless, there are a number of main cost categories (in addition to the cost of purchasing the fuel discussed in Section 4.2) that are common to all PFS, including;

- staff costs of people working on site;
- Business Rates;
- credit cards/loyalty cards and cash handling;
- the cost of utilities and insurance;
- maintenance and testing, together with repairs or replacements;
- shrinkage of fuel;
- wastage of products sold through the shop; and
- in some cases, financing costs or cost of having an overdraft.

PFS profitability is largely dependent on volumes that go through the PFS, both in terms of fuel sales and non-fuel sales. Fuel volumes vary significantly by the type of PFS owner, as shown in Figure 27. Hypermarket and company owned sites have a higher volume throughput compared to the majority of independent dealers in the UK.

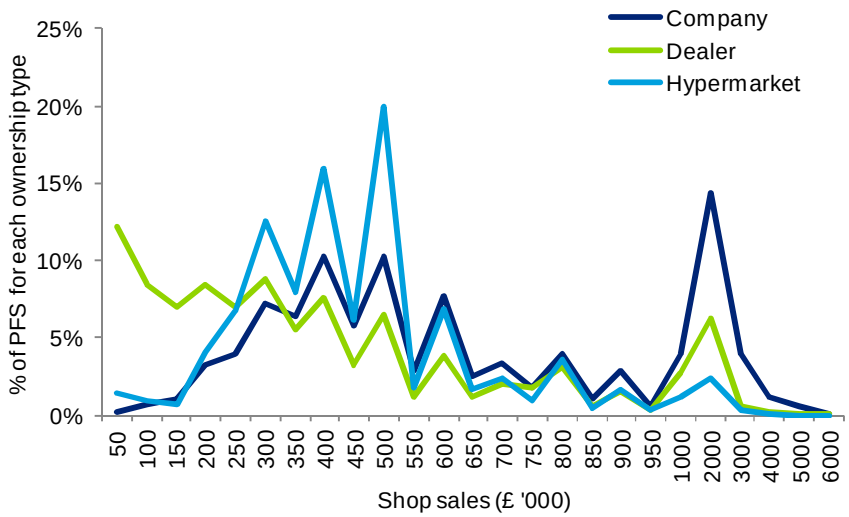
Figure 27: Distribution of volumes by type of PFS owner (2011)



Source: Deloitte analysis based on Experian Catalist data

Non-fuel sales tend to have higher gross margins than fuel sales. For example, some shop items may have a 30% margin, with alcohol sales having a 20% margin and tobacco a 10% margin (based on information provided during interviews). Depending on the actual mix of products sold at the PFS shop, the average gross margin for non-fuel sales is likely to be in the range of 20% to 25%. It has been indicated in interviews that these margins are much higher compared with fuel sales that seem to have a gross margin of 3% to 4% at current fuel prices. The variation in shop sales volumes is not as clear-cut as for fuel volumes (see Figure 28). Independent dealers typically have smaller shop volumes, reflecting the smaller overall size of the business. It is also noticeable that there are a number of PFS that have an estimated shop turnover in excess of £1 million, in particular for company owned sites, which reflects some of the more successful convenience store models that operate in the market. There are also a few independent dealers with shop sales in excess of £1 million.

Figure 28: Distribution of shop turnover by type of PFS owner (2011)



Source: Deloitte analysis based on Experian Catalist data

A high level description of the three main types of operators is included in Table 8.

Table 8: Key business characteristics by type of PFS owner

Type of PFS	Typical business model characteristics
Hypermarket	- Very high volumes of fuel sales and less emphasis on non-fuel sales at the PFS shop - Offer fuel under own brand and compete on price and promotions - Seen as another product category and sometimes used to attract customers and drive footfall to the main retail store
Company owned	- High volumes of fuel sales and sales of non-fuel items, some of which are associated with major retailers - Rely on fuel brand and quality service while also trying to be competitive on price - Depending on site, may offer additional services to customers such as car wash
Independent dealer	- Typically smaller volume sites and having varying amounts of non-fuel sales, though there are some larger dealers with high fuel and non-fuel sales - Also rely on fuel brand loyalty of the associated oil company to attract customers - Try to develop services to the local area and attract local customers

Source: Deloitte analysis following discussions with market participants

5.2 Alternative business models in the UK market

As discussed in Section 5.1, there are a number of types of business operating in the UK petroleum retail market, with different business models for PFS being observed in the UK market. It is not possible to cover all the different permutations in this report so we have selected a few 'stylised' models to highlight the key differences between the main types of PFS owners in the UK.

Based on discussions with PRA members, four 'stylised' business models for PFS businesses run by independent dealers have been developed. These four models vary by fuel volumes (6 million litres for 'High' and 2 million litres for 'Low' volume sites) and by turnover at the PFS shop (High equivalent to £2 million and Low equivalent to £300,000). There may well be differences in costs between independent dealers and company owned sites, but for the purpose of this exercise the company owned sites can be seen to be those stylised models with the higher fuel volumes, reflecting what is observed in Figure 27.

A stylised model for a Hypermarket site has also been developed (giving a total of five stylised models). In this case, a higher fuel volume has been assumed (10 million litres per annum) and a lower level of PFS shop turnover at £400,000[49]. In the course of this study, only one meeting was held with a hypermarket, with the remaining three declining the meeting invitation. It has not been possible to validate the figures in the 'stylised' model directly with the hypermarkets. Appendix D shows the cost assumptions used for the five stylised models, together with the assumed level of shop turnover, shop gross margin assumptions and the fuel volume throughput for each case.

The stylised models have been used to illustrate the potential 'break-even' point. This has been calculated by taking the total costs of operating the PFS (including the shop and financing costs), subtracting the gross margin made from non-fuel sales from total costs to get a figure for the residual operating costs. The margin on fuel required to break-even is then calculated by taking the residual operating costs and dividing that by an assumed fuel volume through-put. The results of

[49] This excludes sales of the hypermarket store that is co-located with the hypermarket PFS.

this analysis are shown in Figure 29. For the two stylised models with High shop turnover, the gross margin made in the PFS shop covers the operating costs of the PFS and are therefore not shown in Figure 29.

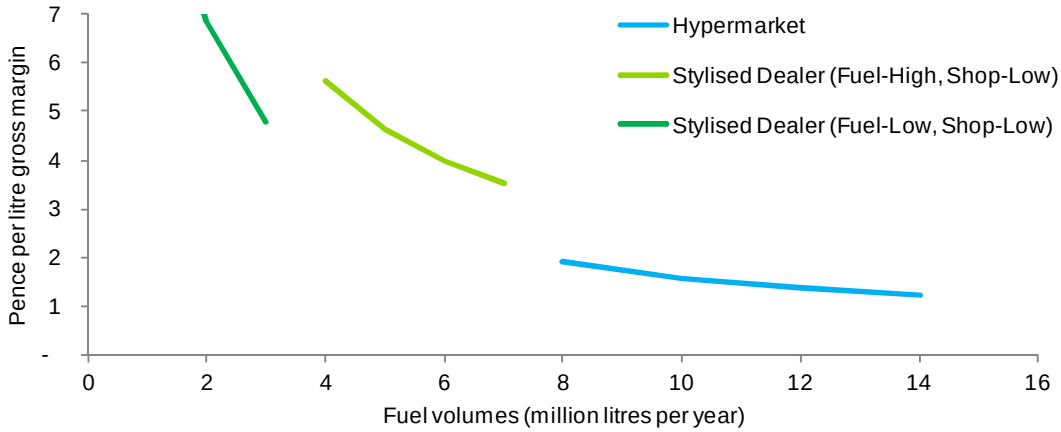
The key result from this analysis is the different levels of gross margin required from fuel sales required for each business model.

- **High shop turnover business model**. In this case, the assumed gross margin (25%) made through non-fuel sales at this type of PFS is broadly sufficient to cover the assumed operating costs of the business (and hence are not included in Figure 29).

- **Low shop turnover business model**. Under this stylised business model, the gross margin on fuel required to cover operating costs and breakeven will vary depending on the fuel volumes sold. However, even at an annual fuel volume of 6 million litres, a gross margin on fuel of around 4ppl is required to break-even. With lower fuel volumes, given the nature of some of the fixed costs that have to be incurred, a higher gross margin on fuel is required. Based on the assumptions used, 5-6ppl or more is needed to fully cover the operating costs of the PFS for sites with annual fuel volumes of around 2 million litres. This demonstrates the importance of non-fuel sales in the current PFS business model.

- **Hypermarket business model**. Hypermarket sites show the highest average fuel volume through-put compared to other types of PFS owners. As a standalone business (excluding the main store), they may be able to achieve lower operating costs at their sites per litre of fuel sold and therefore, given the fuel volumes, can achieve a break-even point with a gross margin on fuel of only 1.5ppl to 2.5ppl. This is considerably lower than an independent dealer site unless they have a significant turnover in their shop.

Figure 29: Illustration of break-even points for different types of PFS business models



Source: Deloitte analysis based on assumptions included in the stylised models following discussions with industry. NB: based on the assumptions used, the 'break-even point for the 'High' shop turnover business models is not shown above as the gross margin from the non-fuel sales is sufficient to cover the total operating costs of the PFS.

A PFS in a rural location will have lower volumes (1 million litres per annum or less) and will need to adjust its cost base accordingly. It may offer additional services from the local shop which may

support the overall business and cover part of the operating costs. Nevertheless, it is also likely to still require a relatively high gross margin on fuel sales to break-even. If this cannot be achieved because of competition from a larger site in the area, then it will not be able to make a profit.

The break-even point illustrations outline the differences required in terms of gross fuel margin for different types of PFS business. As smaller sites are likely to require a higher gross margin on fuel (unless they can cover a significant part of their costs through non-fuel sales) which may be challenging to achieve due to competition from other types of PFS, then these sites are more likely to close as has been observed over the last 10 years.

As larger sites open, which have a lower unit cost of retailing fuel, this will have an impact on the remaining PFS in the market. With the total volumes of fuel sold in the UK being flat or facing a slight decline, the opening of a new large site (or expansion of an existing site) in a given area is likely to result in a significant volume of fuel sales being taken away from other PFS in the area. This may lead to closures of some PFS in the affected area.

5.3 Ability to respond to key business drivers

Section 4 outlined a number of the key business drivers that affect PFS businesses in the UK petroleum retail market. This section sets out the ability of different types of PFS owners to respond to these business drivers, which is summarised in Table 9.

Table 9: Summary of the ability to respond to key business drivers by type of PFS owner

Category of driver	Hypermarket	Company owned site	Independent dealer
Consumer needs			
- Price	Are able to offer different pricing arrangements to customers, including discounts per litre of fuel offers given the scale of complementary non-fuel purchases by consumers at the hypermarket store.	Are able to offer different pricing arrangements in association with other retailers or food/drink companies (for example, combined Shell and Waitrose promotion) or specific products (BP and beverage company).	Independent dealers have suggested that they have limited ability to offer discounts on fuel to their customers.
- Convenience	Main store products and 24hour opening is convenient for consumers looking to do their weekly shopping and purchase fuel in one place.	Manage geographical coverage through their company owned sites and their dealer network, but also rely on additional offerings such as coffee and convenience store products.	Rely on location, oil company brand and other complementary services to attract customers and generate sales (such as brand loyalty, convenience store and additional on-site services).
- New services	A wide range of services are offered by the hypermarket store located next to the PFS.	Likely to have financial capacity to develop new services if new services required by customers.	New services and shop offering can improve the profitability of a site but will require funding.

Category of driver	Hypermarket	Company owned site	Independent dealer
Suppliers	Ability to contract with multiple fuel suppliers and enjoy purchasing economies. Hypermarkets are also able to buy 'ex-rack' and procure and manage the deliveries of fuel products directly with the hauliers.	Oil companies procure fuel from their own fuel supply divisions, and have expertise to manage price and exchange rate risk. With the exception of BP, delivery has been outsourced to third party hauliers.	Branded independent dealers can obtain offers from a number of fuel suppliers including new entrants (such as Harvest Energy) before signing a fuel supply contract. These contracts include delivery and independent dealers have indicated that they are not able to buy 'ex-rack' under these contracts.
Competition	Key source of competitive advantage is associated with hypermarket store.	Managing a portfolio of sites around the country allows returns and risk to be averaged throughout the country.	Smaller groups or single site independent dealers will be subject to the competitive conditions of the local market. Some larger dealer groups with a geographical spread can average out the returns made by their PFS in different areas.
Government and regulatory policy	The introduction of E10 may pose challenges to hypermarkets as they may not be able to offer a protection grade at their sites if they only sell standard petrol and diesel.	Company owned sites may be interested in introducing E10 to differentiate their offering and attract customers back to the brand.	Stock levels managed to minimise the average stock-holding and associated working capital costs. Regulatory policy may incur additional cost for equipment (for example, vapour recovery) which is likely to be funded through borrowing. Introduction of E10 may be difficult for rural sites as they may not be able to provide a protection grade during a transition period.

Source: Deloitte analysis following discussions with market participants

In summary, given the scale and financial position of hypermarkets, they seem well placed to deal with the various key business drivers facing the industry. They are likely to continue to be able to bargain effectively in negotiating contracts with fuel suppliers which along with their expansion plans on the retail side are indicative of further expansion and gains in market share for hypermarkets in the UK petroleum retail market.

For company owned sites, the parent oil company may be under financial pressure to reduce costs, in particular if they own refining capacity in Europe. In the short term, companies should be able to borrow and finance the required investments in their PFS network, and their expertise in the petroleum markets should support their competitive position. However, the combination of various regulatory requirements may lead companies to reassess their position in the UK petroleum retail market. They may decide that the additional investments required will not provide them with a

sufficient return and choose to exit the market (for example, the sale of Total company owned sites in 2011).

Small independent dealers with low volume throughputs and limited shop sales seem to be the most vulnerable to the business drivers operating in the market given their lack of scale and limited financing options. In particular, single site independent dealers are likely to find it difficult to compete with hypermarkets or to upgrade their facilities to offer a wider range of services to their customers. This may lead to further closures of smaller independent PFS in the coming years.

The increasing importance of non-fuel sales at PFS has led to an increase in the number of multi-site dealer operated sites. These businesses are able to negotiate better prices for their shop products relative to small dealers and develop a more compelling retail offer given their scale and expertise. They will also be in better financial standing than a single site dealer to be able to afford further investments in the fuel forecourt. This could lead to a number of sites providing non-fuel sales as their main business, with fuel as an additional service (rather than the main offering).

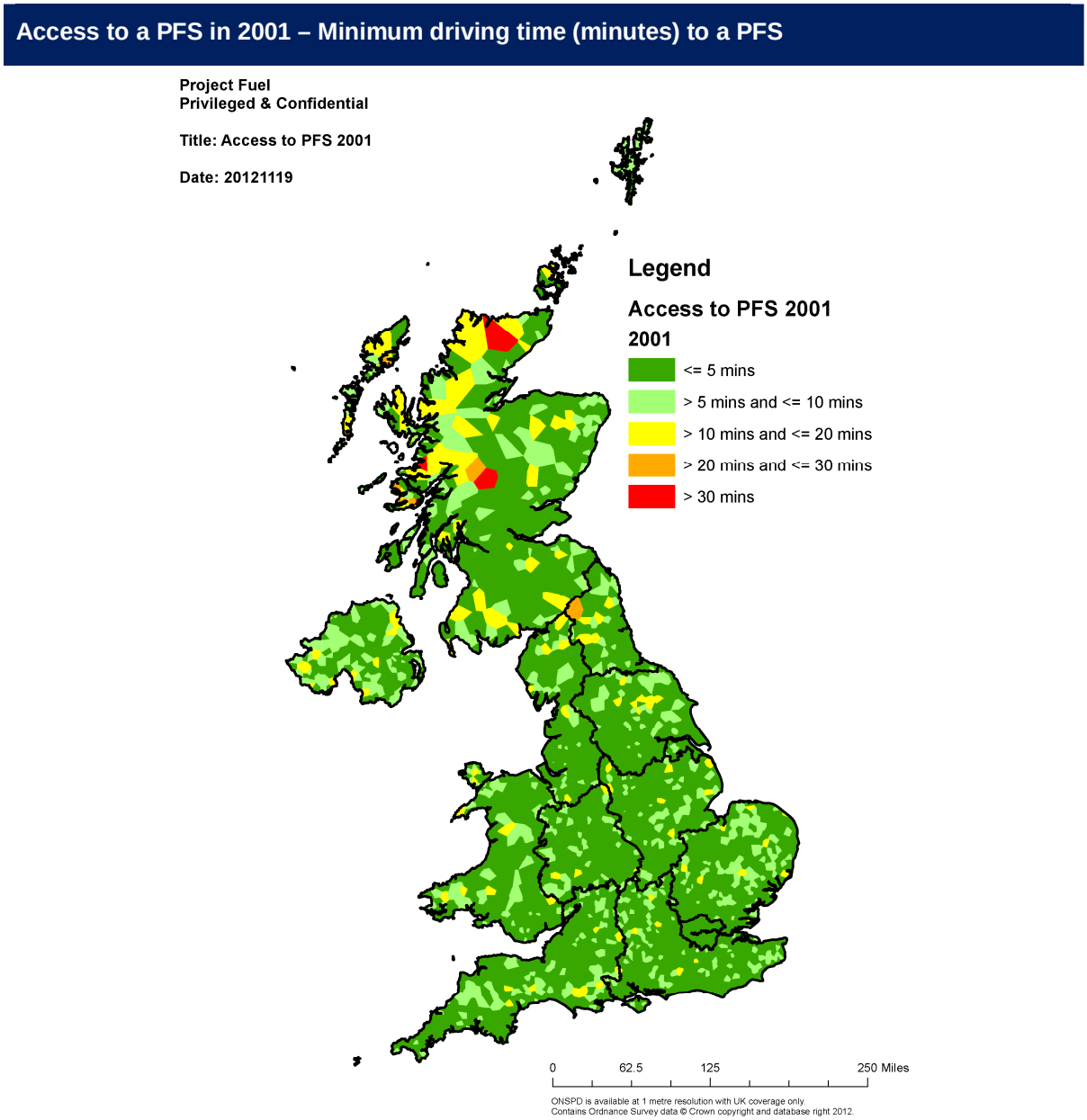
Appendix A Proximity analysis

A.1 Access to PFS analysis

A.1.1 Access to a PFS in 2001

Figure 30 below illustrates the minimum driving time to a PFS in 2001 for each postcode sector in the UK. In 2001, out of 9,451 postcode sectors, 9,327 (99% of total) postcode sectors in the UK had a minimum driving time to a PFS of ten minutes or less (green colours in the map below).

Figure 30: Access to a PFS in 2001 – Minimum driving time (minutes) to a PFS

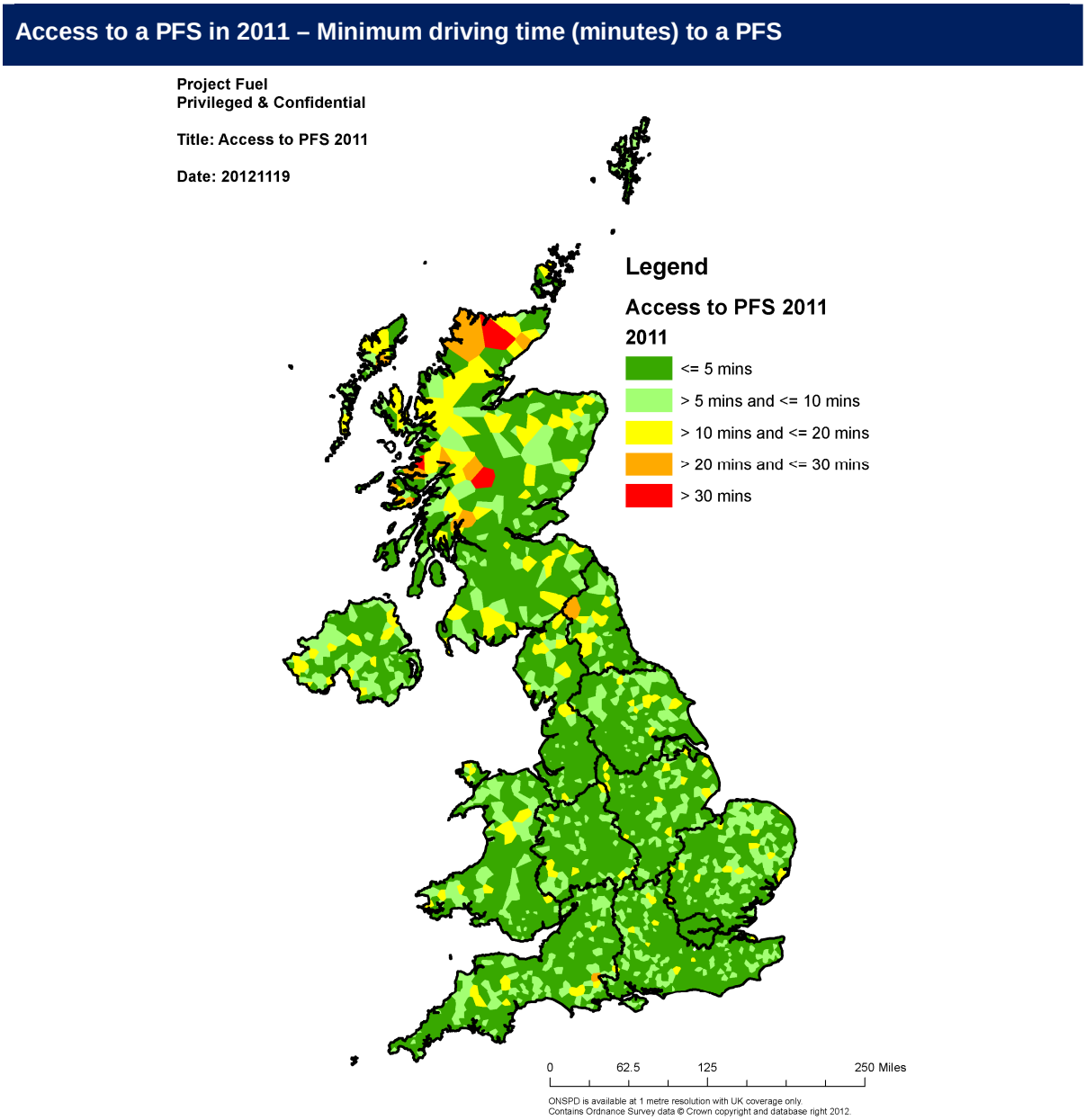


Source: Deloitte analysis.

A.1.2 Access to a PFS in 2011

Figure 31 below illustrates the minimum driving time to a PFS in 2011 for each postcode sector in the UK.

Figure 31: Access to a PFS in 2011 – Minimum driving time (minutes) to a PFS

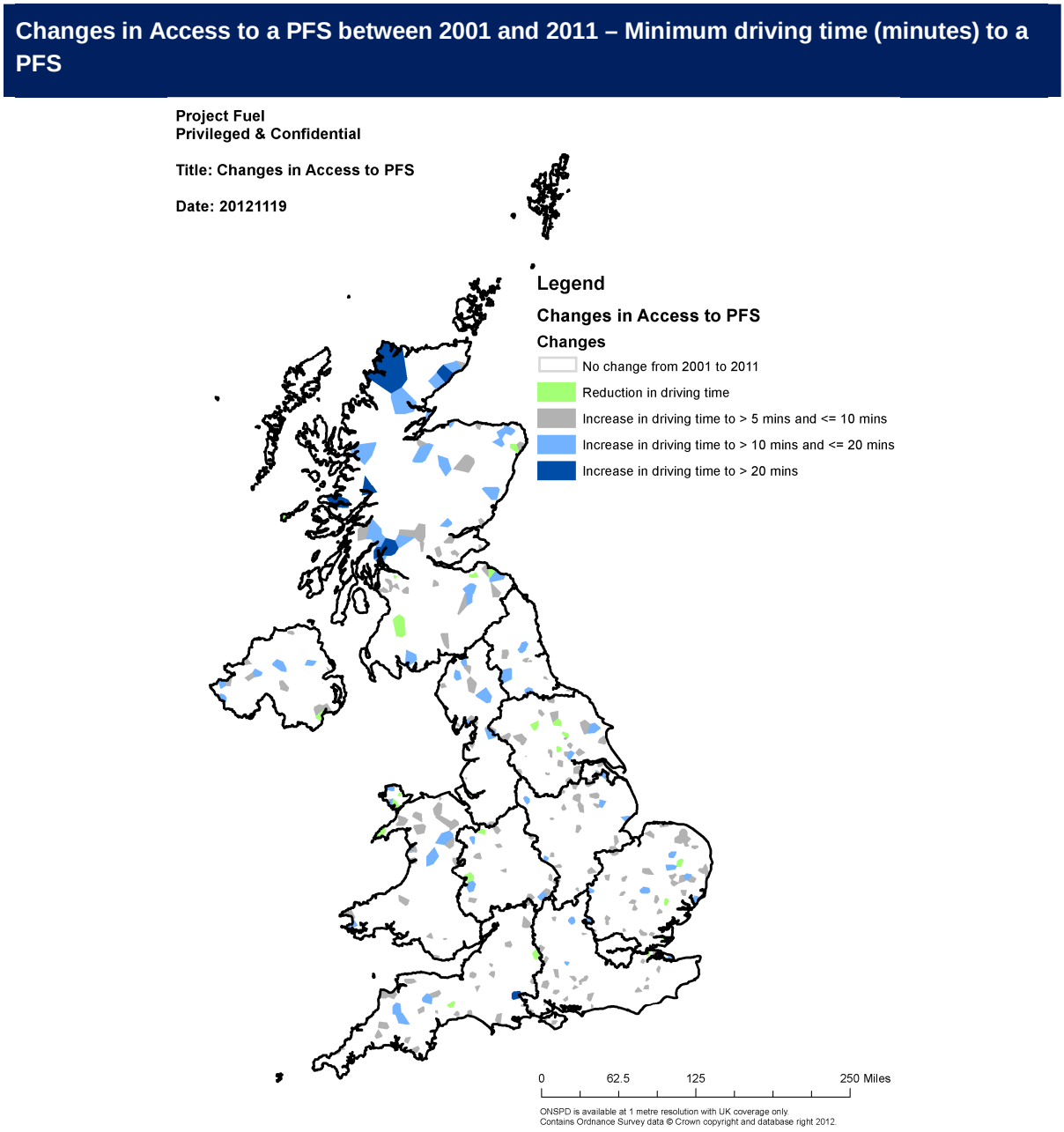


Source: Deloitte analysis.

A.1.3 Changes in Access to a PFS

Figure 32 below illustrates changes in access to a PFS between 2001 and 2011 for each postcode sector in the UK.

Figure 32: Changes in Access to a PFS between 2001 and 2011 for each postcode sector

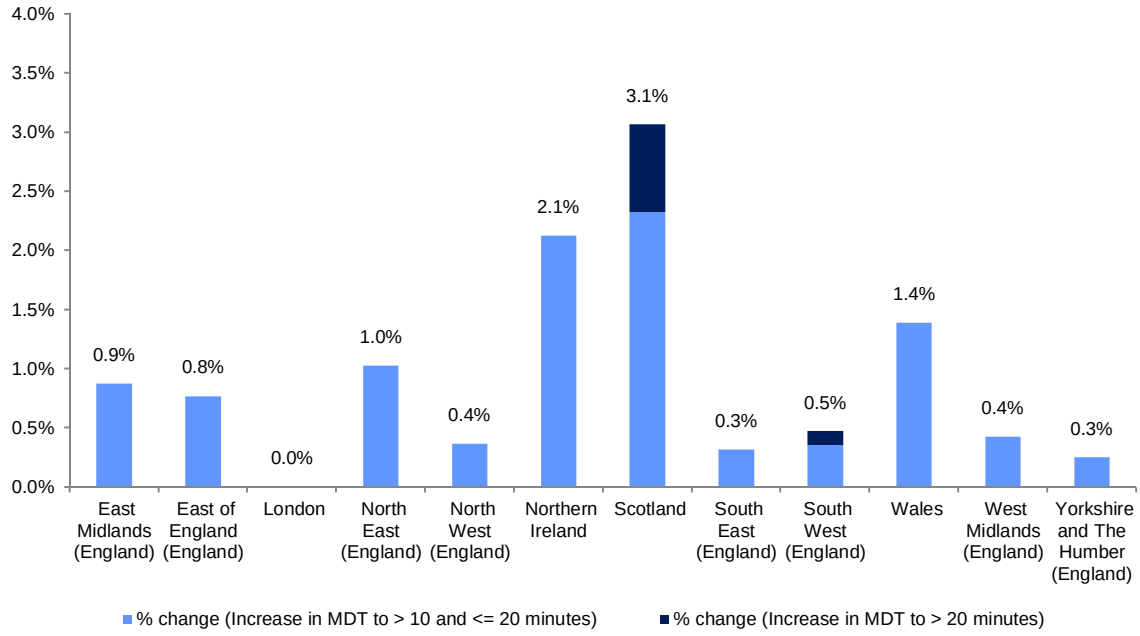


Source: Deloitte analysis.

A.1.4 Regional changes in access

There are 74 postcode sectors (0.8% of total) in which the minimum driving to a PFS increases to more than ten minutes between 2001 and 2011 due to PFS closures. For each region, the percentage of postcode sectors (relative to the total number of postcode sectors in that region) which have been negatively affected are shown in Figure 33.

Figure 33: Percentage of postcode sectors in each region which have been negatively affected between 2001 and 2011



Source: Deloitte analysis.MDT stands for Minimum Driving Time.

A.1.5 Changes in access in rural and urban areas

For each region, access in 2011 and changes in access between 2001 and 2011 for urban, mixed and rural areas are shown in Table 10 below.

Table 10: Average minimum driving time (minutes) to a PFS in 2011 and average difference in minimum driving time to a PFS between 2001 and 2011 (by region)

Minutes	2011			Difference between 2001 and 2011 *(2011 time minus 2001 time)*		
Region	**URBAN**	**MIXED**	**RURAL**	**URBAN**	**MIXED**	**RURAL**
East Midlands (England)	1	3	6	0.2	0.4	1.0
East of England (England)	2	3	4	0.2	0.5	1.2
London	1	2		0.2	0.1	
North East (England)	2	3	10	0.1	0.7	0.8
North West (England)	1	3	4	0.1	0.4	0.7
Northern Ireland	3	5	6	0.4	0.2	0.4
Scotland	1	3	8	0.1	0.5	1.1
South East (England)	2	3		0.1	0.4	
South West (England)	2	3	4	0.2	0.4	1.0
Wales	2	3	4	0.3	0.6	0.6
West Midlands (England)	1	3	3	0.2	0.4	0.0
Yorkshire and The Humber (England)	2	3	7	0.2	0.5	-1.7
Average	**1**	**3**	**7**	**0.2**	**0.4**	**0.8**

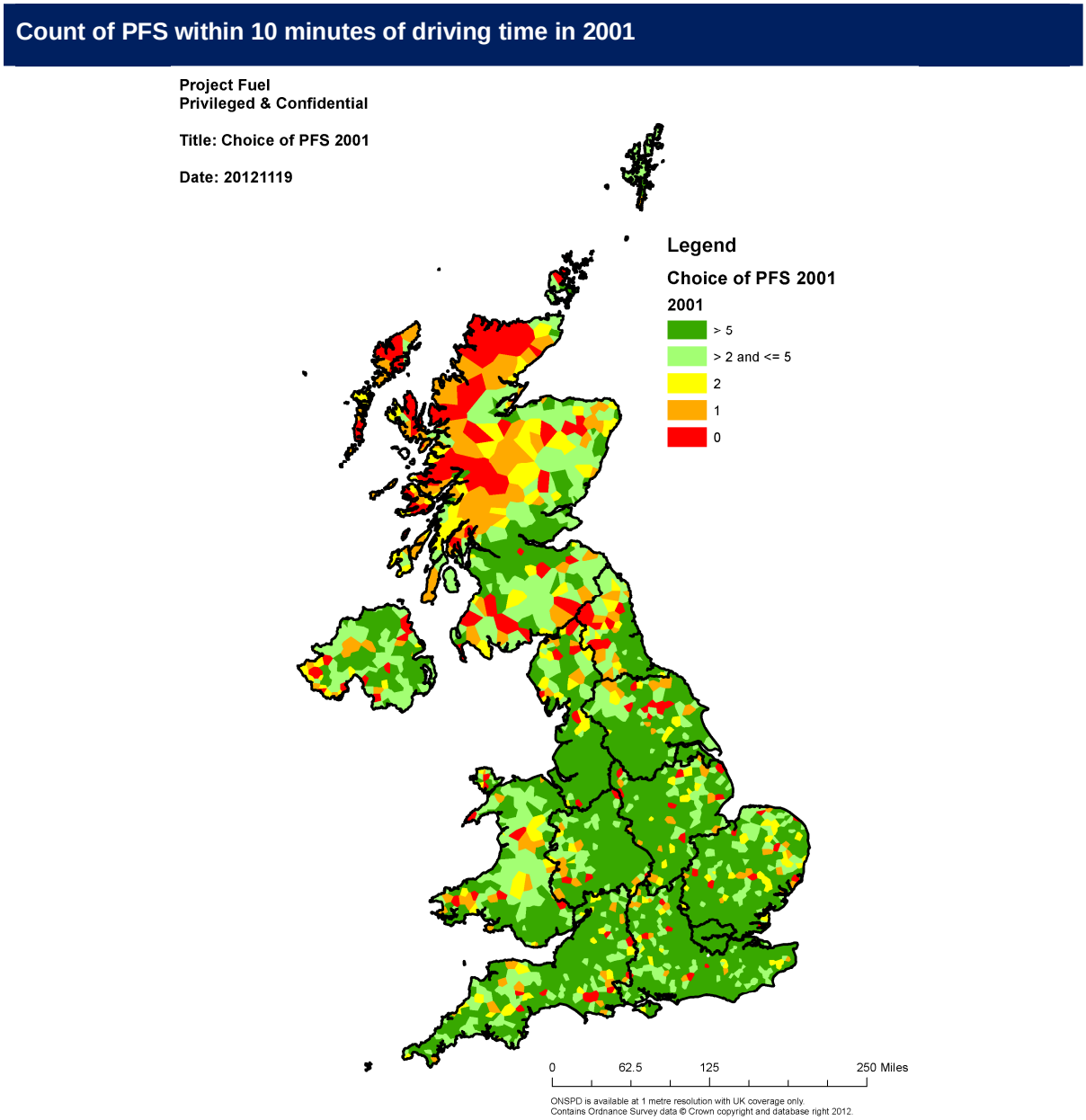
Source: Deloitte analysis.

A.2 Choice of PFS analysis

A.2.1 Choice of PFS in 2001

Figure 34 below illustrates the count of PFS within a driving time of ten minutes in 2001 for each postcode sector in the UK. In 2001, out of 9,451 postcode sectors, 8,970 (95% of total) postcode sectors in the UK had a count of more than two PFS within a driving time of ten minutes or less (green colours in the map below). However, there were a number of postcode sectors (less than 5.5% of total postcode sectors) which had a count of two or fewer PFS.

Figure 34: Count of PFS within 10 minutes of driving time in 2001

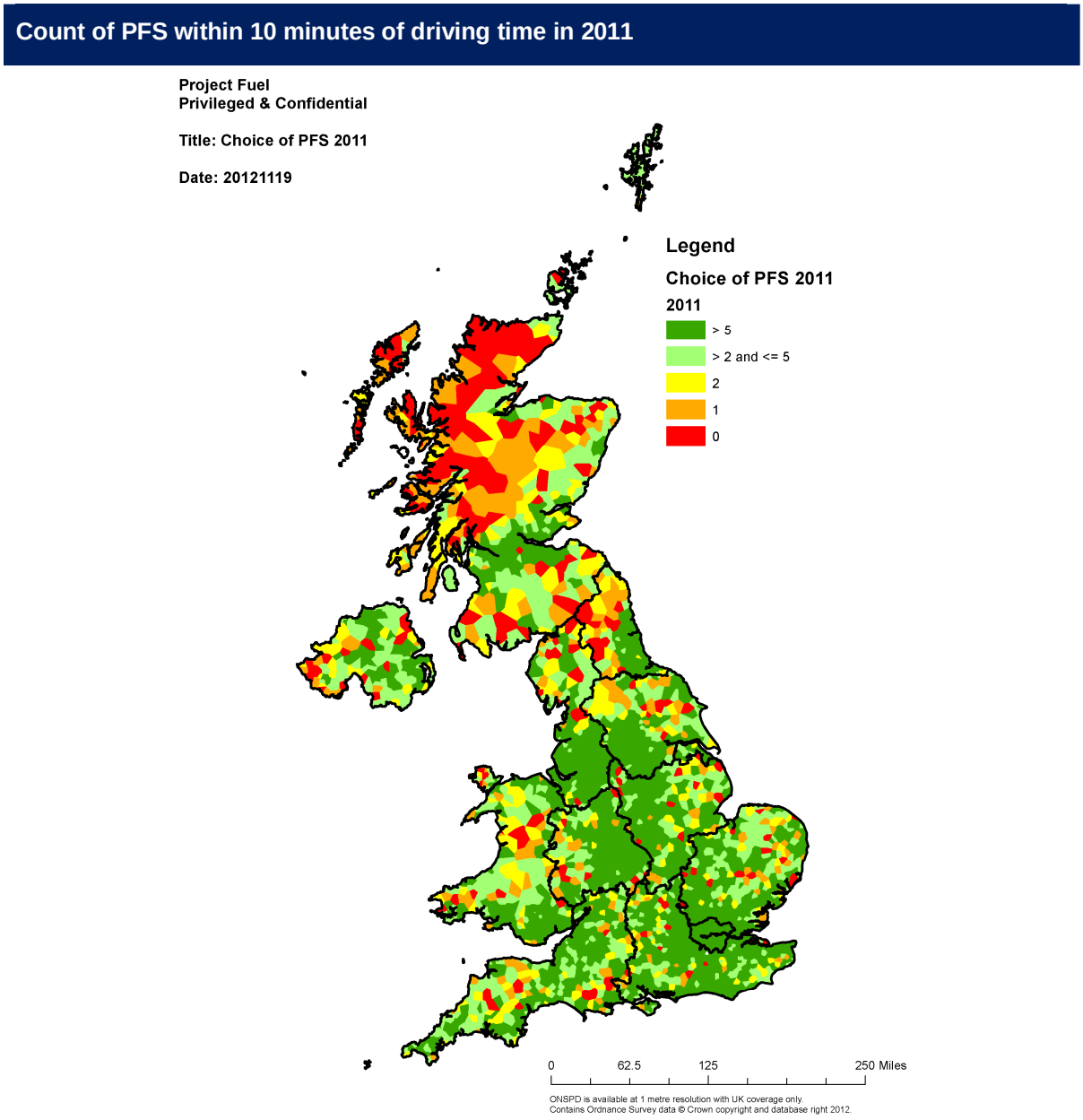


Source: Deloitte analysis.

A.2.2 Choice of PFS in 2011

Figure 35 below illustrates the count of PFS within a driving time of ten minutes in 2011 for each postcode sector in the UK.

Figure 35: Count of PFS within 10 minutes of driving time in 2011

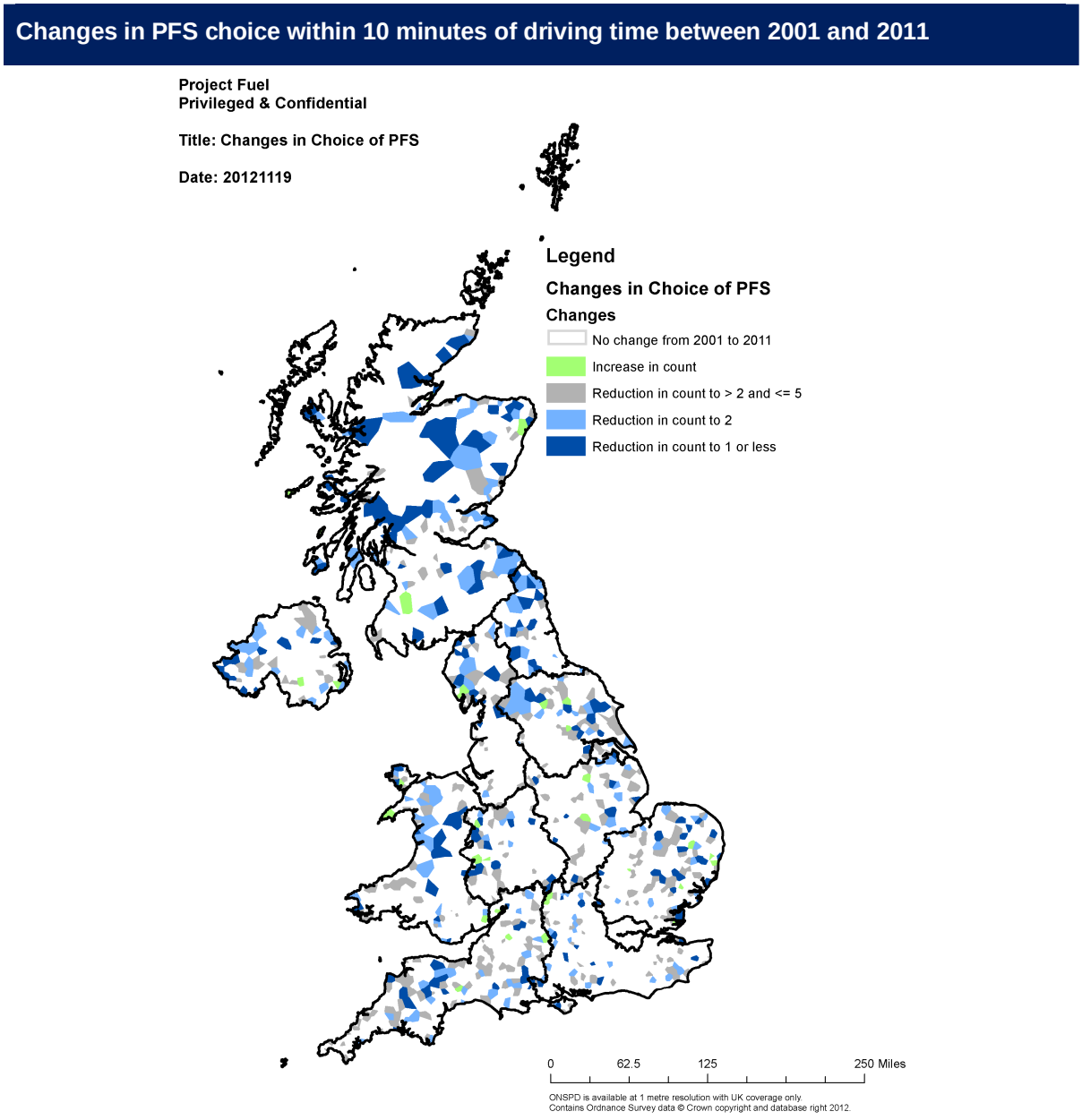


Source: Deloitte analysis.

A.2.3 Changes in PFS choice

Figure 36 below illustrates changes in PFS choice for each postcode sector in the UK.

Figure 36: Changes between 2001 and 2011 in the number of PFS available within 10 minutes of driving time

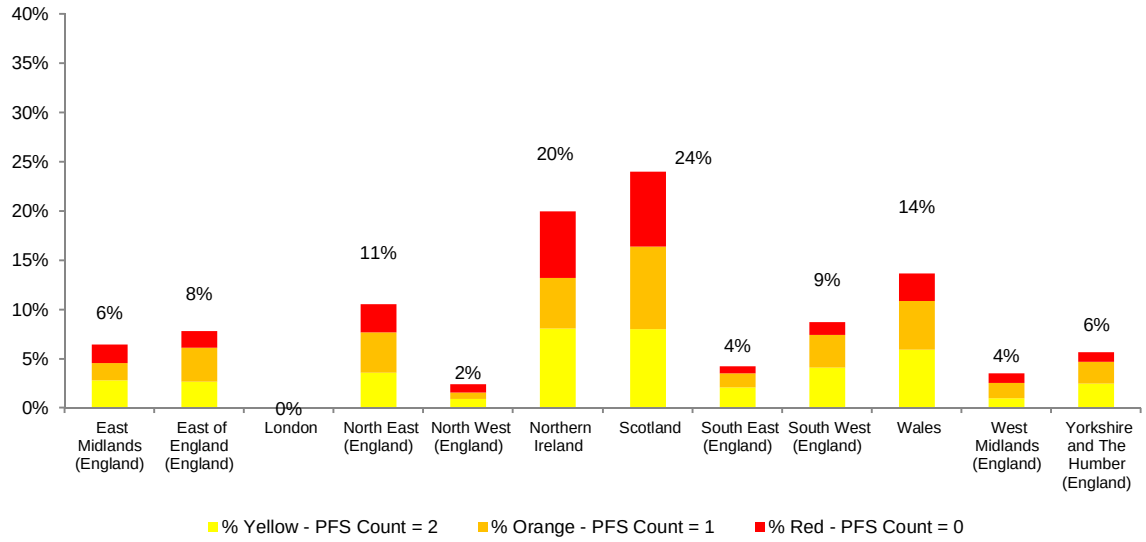


Source: Deloitte analysis.

A.2.4 Regional variations in PFS choice in 2011

There are 713 postcode sectors (8% of total) which have a count of two or fewer PFS available within a driving time of ten minutes or less in 2011. For each region, the percentage of postcode sectors (relative to the total number of postcode sectors in that region) which have a count of two or fewer PFS in 2011 is shown in Figure 37.

Figure 37: Percentage of postcode sectors in each region which have a count of two or fewer PFS within a driving time of ten minutes in 2011

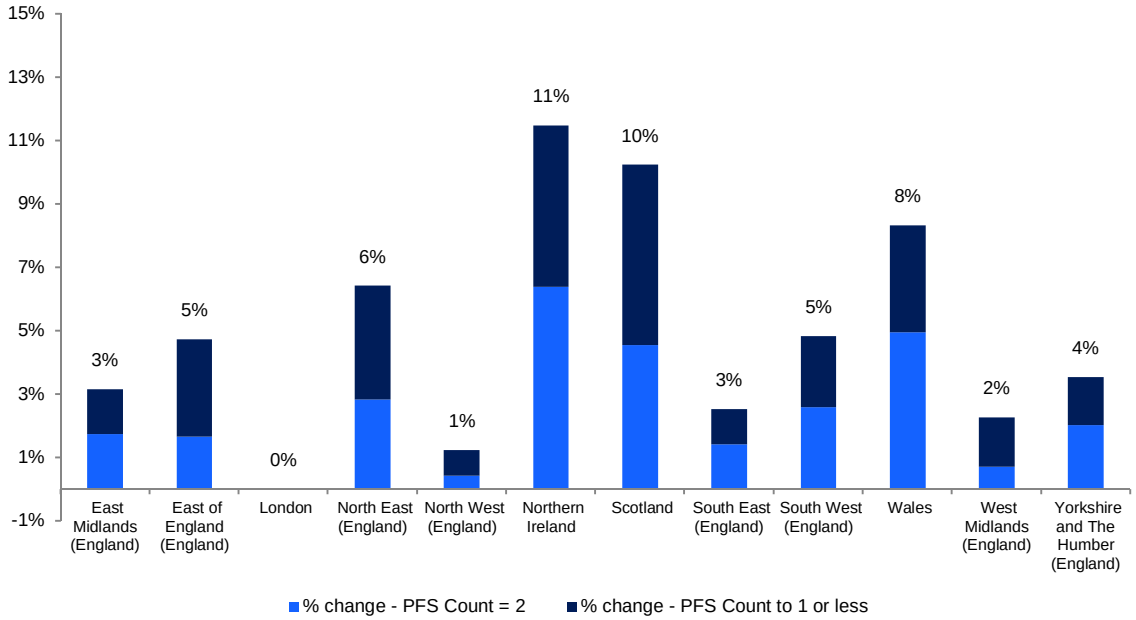


Source: Deloitte analysis. Note: The colour scheme in the figure above is consistent with the 2011 PFS choice map in Figure 22.

A.2.5 Regional changes in PFS choice

There are 380 postcode sectors (4% of total) in which the count of PFS available within a driving time of ten minutes or less has reduced to two or fewer PFS between 2001 and 2011.For each region, the percentage of postcode sectors which were negatively affected in terms of having a reduced count of 2 or fewer PFS within a driving time of ten minutes between 2001 and 2011 is illustrated in Figure 38.

Figure 38: Percentage of postcode sectors in each region which were negatively affected between 2001 and 2011



Source: Deloitte analysis.

A.3 Inputs and Assumptions

A.3.1 Key inputs

The key inputs include the following.

- List of PFS open in 2001 and 2011, including their location (postcode).[50]
- List of postcode sectors with full geographical coverage of the UK, including location of population-weighted centroid for each postcode sector.[51]
- Ordnance Survey data[52] which is used to represent road networks in the UK (excluding Northern Ireland). For road networks in Northern Ireland, Microsoft MapPoint is used. ArcGIS ArcInfo 10.0 and Network Analyst extension is used to estimate driving times and distances, except in Northern Ireland for which Microsoft MapPoint is used.

[50] The list of PFS has been sourced from a third party (Experian Catalist) and has been processed in order to be used for proximity analysis. The steps involved in processing of this data are described in Appendix B.

[51] The list of postcode sectors has been sourced from a third party (GMAP Consulting).

[52] http://www.ordnancesurvey.co.uk/oswebsite/products/meridian2/index.html.

A.3.2 Key assumptions

The key assumptions include the following.

- Driving times and distances are calculated from the centroid of each postcode sector to the nearest ten PFS, using UK's road network.

- Data on UK road networks does not contain detailed information on road speeds, restrictions and connectivity between road links. Therefore, the following assumptions have been made to estimate driving times and distances:

    - Speeds: Motorways – 70 miles per hour (mph); A roads – 50 mph; B Roads - 35 mph; and Minor roads - 20mph. This implies that one minute driving time covers between 0.3 miles and 1.2 miles, depending on the type of road used.

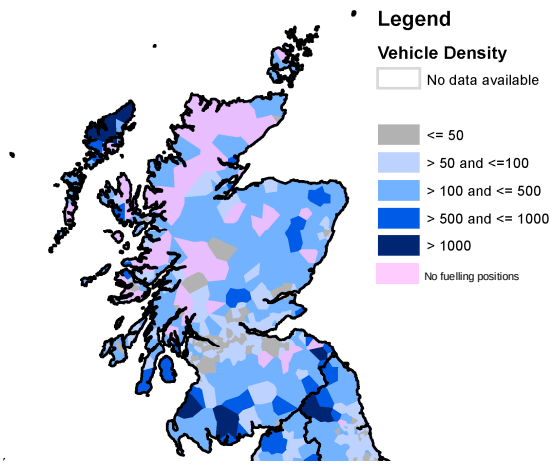
    - Due to information on road restrictions and connectivity between road links not being available, it is assumed that drivers will be travelling along the same road type to the extent it is possible and thereby avoid interconnections between road types. As PFS proximity analysis covers relatively short driving distances and times (that is, to the nearest PFS) which makes it less likely to require connecting between different types of roads, the impact of not having connectivity data on driving times and distances is not likely to be very material.

Appendix B Regional analysis

B.1 Scotland

Key observations - Vehicle density in Scotland (Number of vehicles per effective motor fuelling position)

- More than 80% of postcode districts have 500 or fewer vehicles per effective motor fuelling position, with vehicle densities of 100 or fewer being mostly concentrated in central and southern areas.
- However, a number of postcode districts (more than 6%) have higher vehicles densities. In addition, more than 10% of postcode districts (particularly in Northern Scotland) do not have any effective fuelling position within a driving time of ten minutes.



Key statistics

Number of PFS (2011):	892 (10.3% of UK total)
Change since 2001:	24% drop
Fuel volumes (2011):	3.1bn litres (8.6% of UK total)

PFS count and volumes by ownership type (%)	*% of PFS count in region (2011)*	*% of volume in region (2011)*
Company-owned	20%	26%
Dealer-owned	64%	30%
Hypermarket-owned	17%	44%

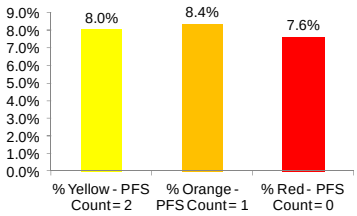
Average minimum driving time (minutes, 2011)

Rural	7.7 minutes (16% increase from 2001)
Mixed	3.1minutes (20% increase from 2001)
Urban	1.5 minutes (10% increase from 2001)

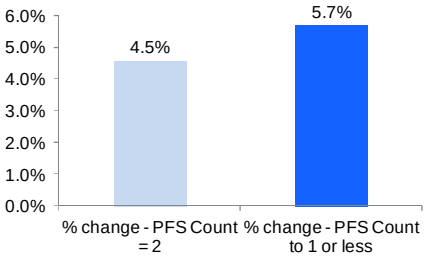
Terminals	2 in Aberdeen, 2 in Grangemouth, 1 each in Clydebank, Peterhead and Inverness

PFS choice

Close to 25% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



More than 10% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by more than 50% (2001: 2.6, 2011: 1.2)

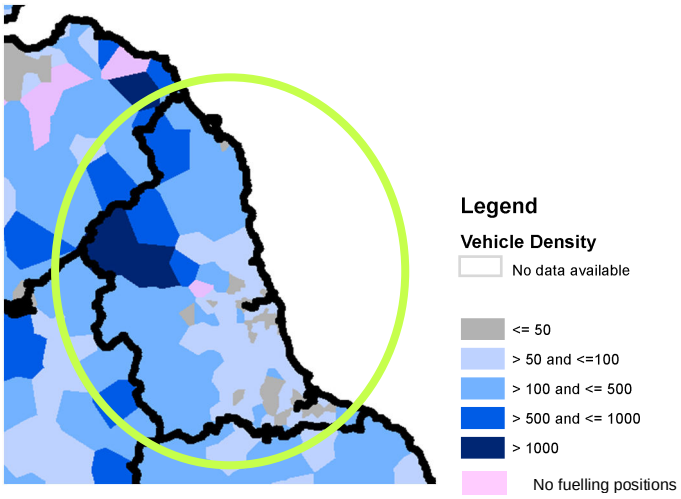


Source: Deloitte analysis.

B.2 North East England

Key observations - Vehicle density in North East England (Number of vehicles per effective motor fuelling position)

- More than 95% of postcode districts have 500 or fewer vehicles per effective motor fuelling position, with vehicle densities of 100 or less being mostly concentrated in south eastern areas.
- Only a few postcode districts with either a vehicle density of more than 500 or with no fuelling position within a count of ten minutes of driving time.



Key statistics

Number of PFS (2011):	300 (3.5% of UK total)	
Change since 2001:	30% drop	
Fuel volumes (2011):	1.3bn litres (3.5% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	19%	17%
Dealer-owned	63%	36%
Hypermarket-owned	18%	48%

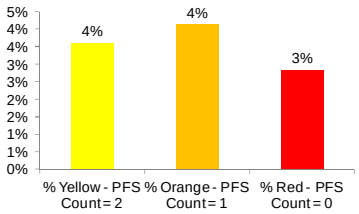
Average minimum driving time (minutes, 2011)

Rural	9.6 minutes (10% increase from 2001)
Mixed	2.9 minutes (30% increase from 2001)
Urban	1.7 minutes (10% increase from 2001)

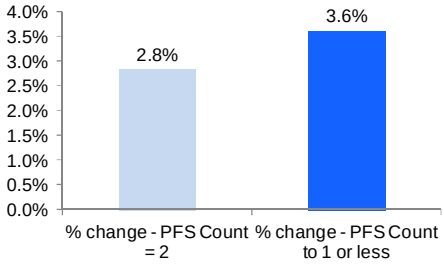
Terminals: Jarrow, Seal Sands, Teesside, Tyne

PFS choices

Close to 11% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



More than 6% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by more than 50% (2001: 2.8, 2011: 1.3)

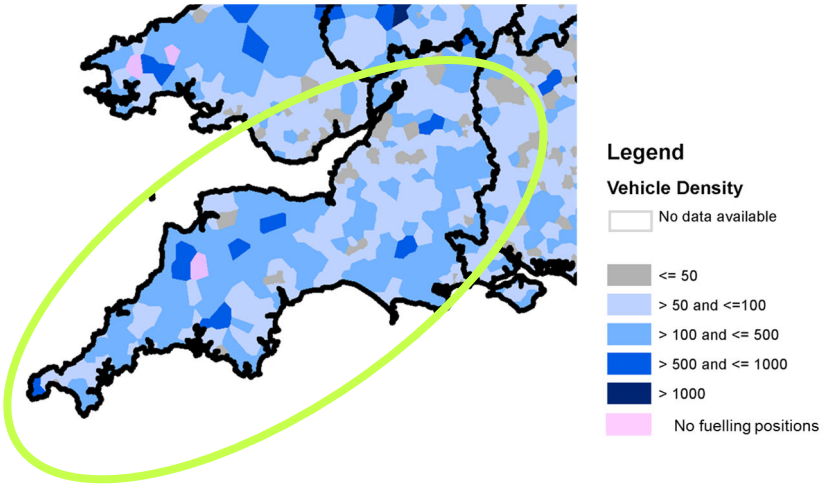


Source: Deloitte analysis

B.3 South West England

Key observations - Vehicle density in South West England (Number of vehicles per effective motor fuelling position)

- More than 96% of postcode districts have 500 or fewer vehicles per effective motor fuelling position, with vehicle densities of 100 or less being mostly concentrated in eastern areas.
- Only a few postcode districts with either a vehicle density of more than 500 or with no fuelling position within a count of ten minutes of driving time.



Key statistics

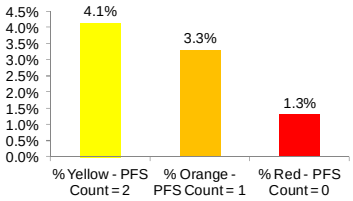
Number of PFS (2011):	869 (10% of UK total)	
Change since 2001:	31% drop	
Fuel volumes (2011):	3.4bn litres (9.4% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	17%	19%
Dealer-owned	68%	37%
Hypermarket-owned	15%	44%

Average minimum driving time (minutes, 2011)

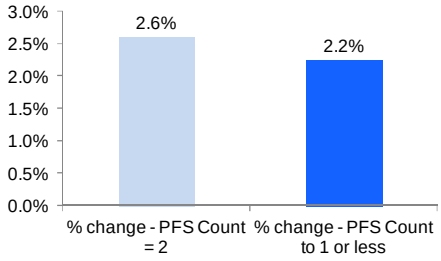
Rural	4.3 minutes (32% increase from 2001)
Mixed	3.1 minutes (14% increase from 2001)
Urban	1.5 minutes (15% increase from 2001)
Terminals	2 in Avonmouth, 2 in Plymouth, 1 in Westerleigh

PFS choices

Close to 9% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



Close to 5% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by more than 50% (2001: 3.1, 2011: 1.4)

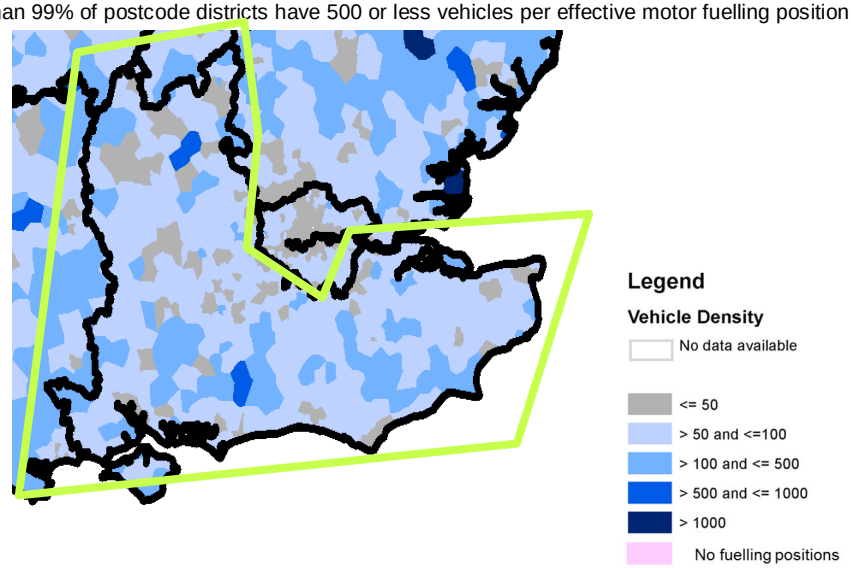


Source: Deloitte analysis

B.4 South East England (excluding London)

Key observations - Vehicle density in South East England (Number of vehicles per effective motor fuelling position)

- More than 99% of postcode districts have 500 or less vehicles per effective motor fuelling position.



Key statistics

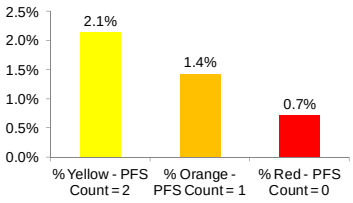
Number of PFS (2011):	1,117 (12.9% of UK total)	
Change since 2001:	25% drop	
Fuel volumes (2011):	5.7bn litres (15.6% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	42%	42%
Dealer-owned	46%	25%
Hypermarket-owned	12%	32%

Average minimum driving time (minutes, 2011)

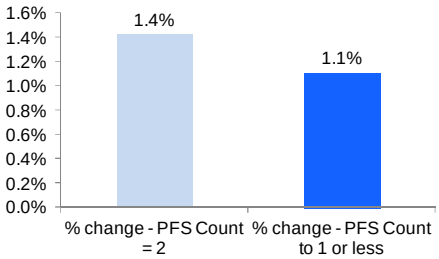
Mixed	2.8 minutes (15% increase from 2001)
Urban	1.6 minutes (10% increase from 2001)
Terminals	Brighton, Hamble, Hythe, Isle of Grain, Theal

PFS choices

More than 4% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



Close to 3% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by close to 50% (2001: 2.9, 2011: 1.4)

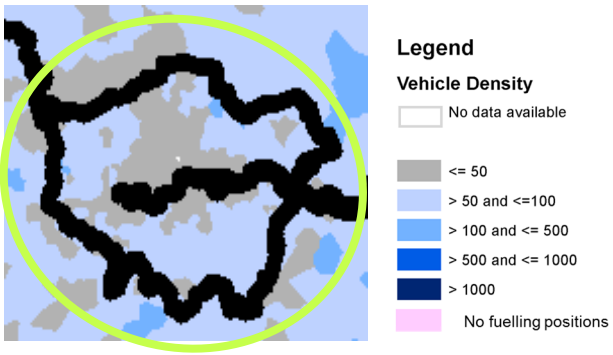


Source: Deloitte analysis

B.5 London

Key observations - Vehicle density in London (Number of vehicles per effective motor fuelling position)

- All postcode districts have 500 or fewer vehicles per effective motor fuelling position.
- 60% of postcode districts have 50 or fewer vehicles per effective motor fuelling position with another 38% having between 50 and 100 vehicles.



Key statistics

Number of PFS (2011):	572 (6.6% of UK total)	
Change since 2001:	32% drop	
Fuel volumes (2011):	3.2bn litres (8.8% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	55%	52%
Dealer-owned	34%	20%
Hypermarket-owned	11%	28%

Average minimum driving time (minutes, 2011)

Mixed	1.6 minutes (8% increase from 2001)
Urban	1.2 minutes (17% increase from 2001)

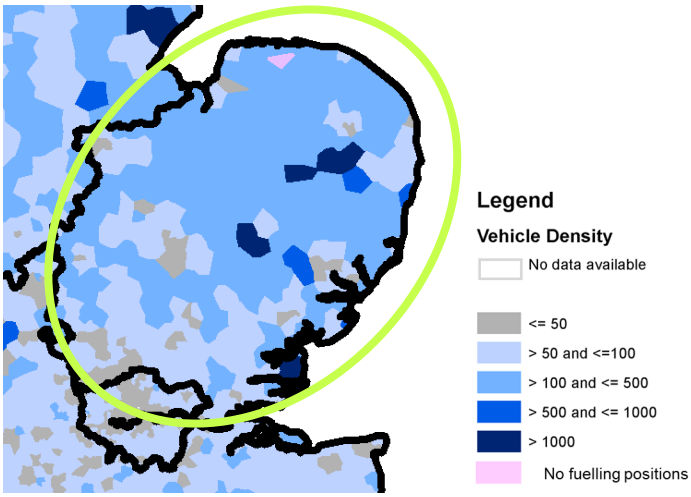
PFS availability	All postcode sectors have a count of more than 5 PFS in 2011 within a 10 minute driving time (assuming no constraints on average speed by road due to traffic congestion)
Terminals	Dagenam, West London

Source: Deloitte analysis

B.6 East of England

Key observations - Vehicle density in East of England (Number of vehicles per effective motor fuelling position)

- More than 95% of postcode districts have 500 or less vehicles per effective motor fuelling position.
- Only a few postcode districts with either a vehicle density of more than 500 or with no fuelling position within a count of ten minutes of driving time.



Key statistics

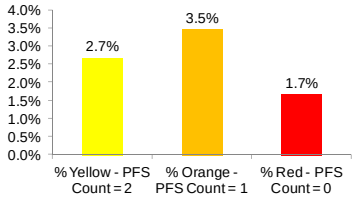
Number of PFS (2011):	825 (9.5% of UK total)	
Change since 2001:	28% drop	
Fuel volumes (2011):	3.8bn litres (10.5% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	31%	33%
Dealer-owned	53%	26%
Hypermarket-owned	17%	41%

Average minimum driving time (minutes, 2011)

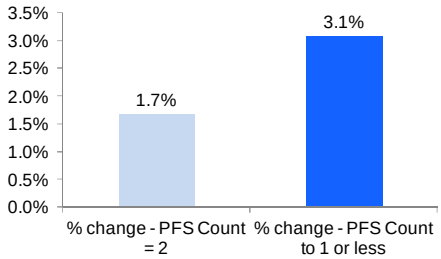
Rural	3.6 minutes (49% increase from 2001)
Mixed	3.3 minutes (16% increase from 2001)
Urban	1.5 minutes (14% increase from 2001
Terminals	Grays, Coryton, Hemel Hempstead, Purfleet, Shell Haven, West Thurrock

PFS choices

Close to 8% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



Close to 5% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by 60% (2001: 3.0, 2011: 1.2)

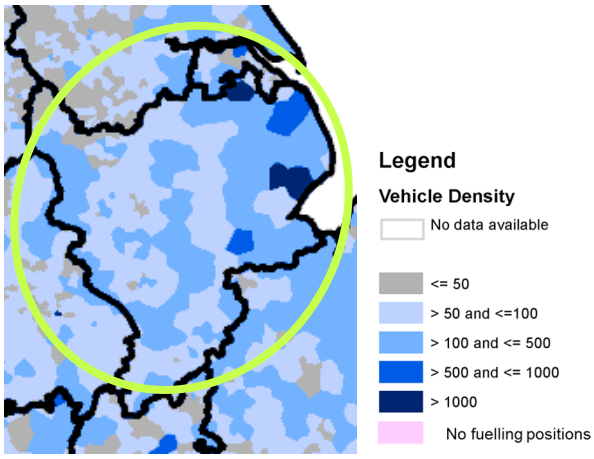


Source: Deloitte analysis

B.7 East Midlands

Key observations - Vehicle density in East Midlands (Number of vehicles per effective motor fuelling position)

- More than 97% of postcode districts have 500 or less vehicles per effective motor fuelling position.
- Low vehicle density areas are concentrated in central and southern parts of the region.



Key statistics

Number of PFS (2011):	670 (7.7% of UK total)	
Change since 2001:	29% drop	
Fuel volumes (2011):	2.7bn litres (7.4% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	20%	23%
Dealer-owned	64%	35%
Hypermarket-owned	16%	43%

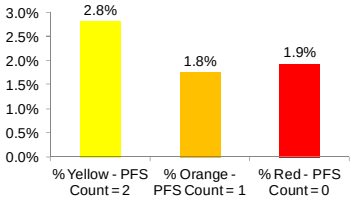
Average minimum driving time (minutes, 2011)

Rural	5.7 minutes (20% increase from 2001)
Mixed	3.1 minutes (16% increase from 2001)
Urban	1.5 minutes (12% increase from 2001)

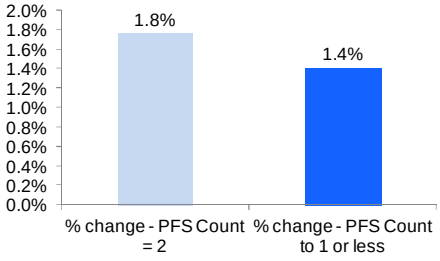
Terminals: Northampton, Nottingham

PFS choices

More than 6% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



More than 3% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by more than 60% (2001: 3.3, 2011: 1.3)

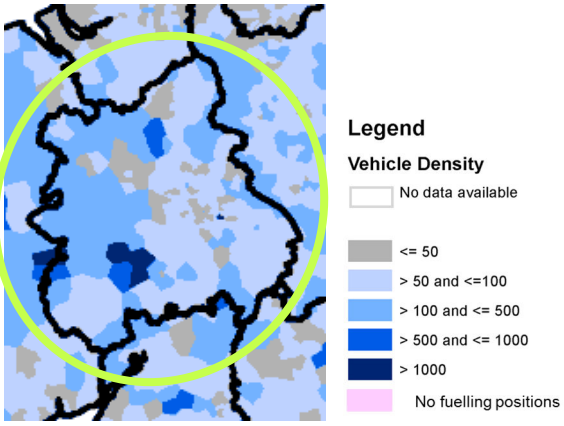


Source: Deloitte analysis

B.8 West Midlands

Key observations - Vehicle density in West Midlands (Number of vehicles per effective motor fuelling position)

- More than 96% of postcode districts have 500 or less vehicles per effective motor fuelling position.
- Low vehicle density areas are concentrated in the east.



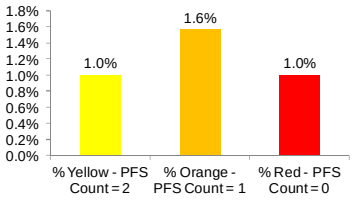
Key statistics

Number of PFS (2011):	735 (8.5% of UK total)	
Change since 2001:	30% drop	
Fuel volumes (2011):	3.3bn litres (9.1% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	27%	28%
Dealer-owned	59%	35%
Hypermarket-owned	14%	38%

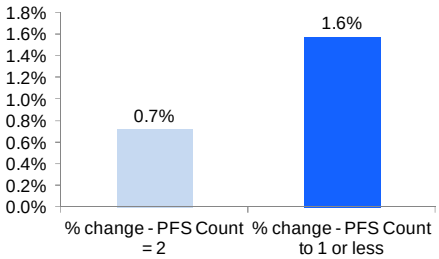
Average minimum driving time (minutes, 2011)	
Rural	2.7 minutes (No increase from 2001)
Mixed	2.8 minutes (14% increase from 2001)
Urban	1.4 minutes (13% increase from 2001)
Terminals	3 in Kingsbury, 1 each in Bedworth, Eastham and Birmingham

PFS choices

Close to 4% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



More than 2% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by more than 60% (2001: 2.9, 2011: 1.1)

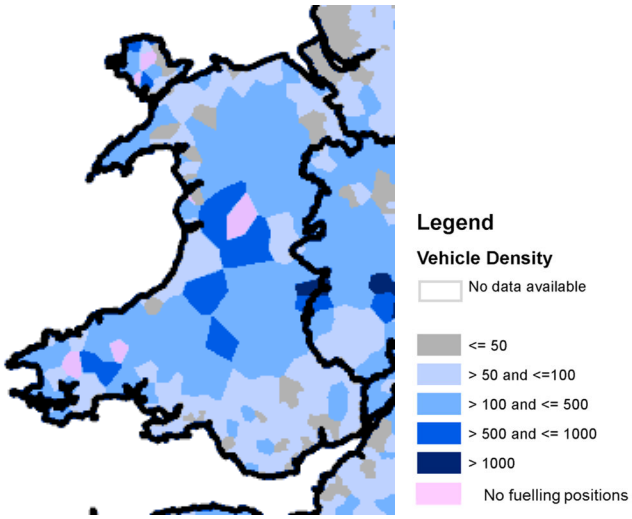


Source: Deloitte analysis

B.9 Wales

Key observations - Vehicle density in Wales (Number of vehicles per effective motor fuelling position)

- More than 91% of postcode districts have 500 or less vehicles per effective motor fuelling position.
- Only a few postcode districts with either a vehicle density of more than 500 or with no fuelling position within a count of ten minutes of driving time.



Key statistics

Number of PFS (2011):	550 (6.3% of UK total)
Change since 2001:	29% drop
Fuel volumes (2011):	1.9bn litres (5.3% of UK total)

PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	14%	16%
Dealer-owned	71%	36%
Hypermarket-owned	15%	47%

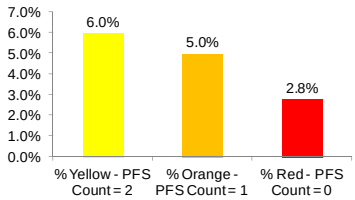
Average minimum driving time (minutes, 2011)

Rural	4.0 minutes (16% increase from 2001)
Mixed	3.3 minutes (22% increase from 2001)
Urban	1.7 minutes (22% increase from 2001)

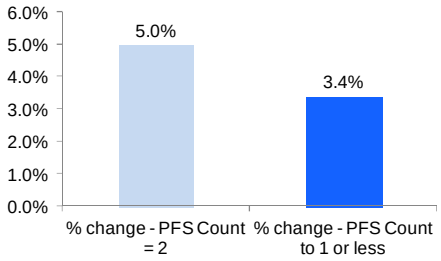
Terminals	3 in Cardiff, 1 each in Milford Haven and Pembroke

PFS choices

Close to 14% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



More than 8% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by close to 60% (2001: 3.5, 2011: 1.4)

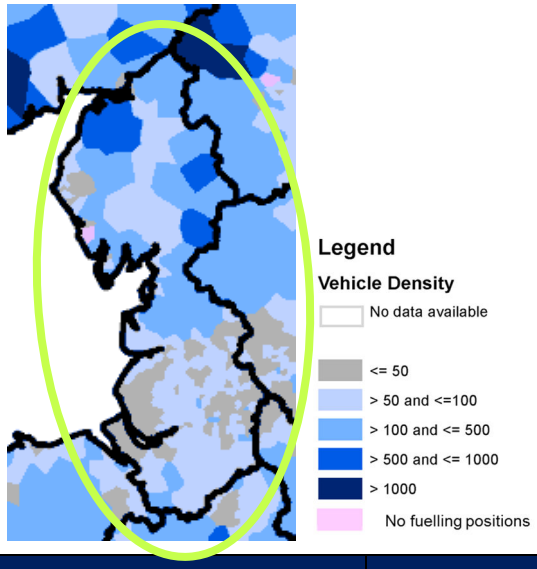


Source: Deloitte analysis

B.10 North West England

Key observations - Vehicle density in North West England (Number of vehicles per effective motor fuelling position)

- More than 98% of postcode districts have 500 or less vehicles per effective motor fuelling position.
- Lower vehicle density areas are concentrated in the south of the region.



Key statistics

Number of PFS (2011):	897 (10.3% of UK total)
Change since 2001:	30% drop
Fuel volumes (2011):	4.1bn litres (11.3% of UK total)

PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	22%	24%
Dealer-owned	62%	37%
Hypermarket-owned	16%	39%

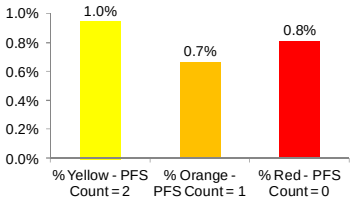
Average minimum driving time (minutes, 2011)

Rural	3.9 minutes (24% increase from 2001)
Mixed	2.5 minutes (20% increase from 2001)
Urban	1.4 minutes (11% increase from 2001)

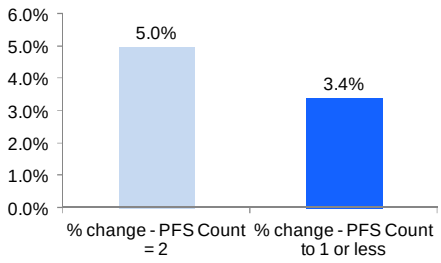
Terminals	Bramhall, Dalston, Stanlow

PFS choices

Less than 3% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



1.2% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by close to 60% (2001: 2.7, 2011: 1.1)

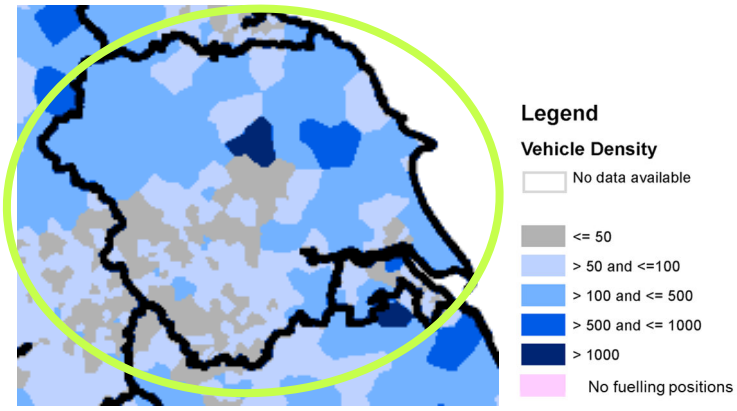


Source: Deloitte analysis

B.11 Yorkshire and Humberside

Key observations - Vehicle density in Yorkshire and Humberside (Number of vehicles per effective motor fuelling position)

- More than 98% of postcode districts have 500 or less vehicles per effective motor fuelling position.
- Lower vehicle density areas are concentrated in the south of the region.



Key statistics

Number of PFS (2011):	682 (7.9% of UK total)	
Change since 2001:	33% drop	
Fuel volumes (2011):	2.8bn litres (7.8% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	20%	20%
Dealer-owned	65%	40%
Hypermarket-owned	15%	40%

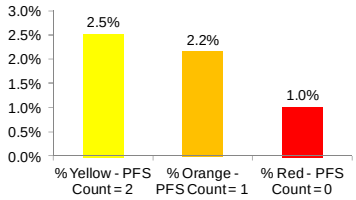
Average minimum driving time (minutes, 2011)

Rural	7.4 minutes (19% decrease from 2001)
Mixed	2.8 minutes (19% increase from 2001)
Urban	1.6 minutes (17% increase from 2001)

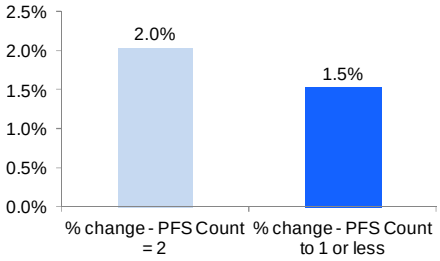
Terminals: 2 in Immingham, 1 in Lindsey

PFS choices

Close to 6% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



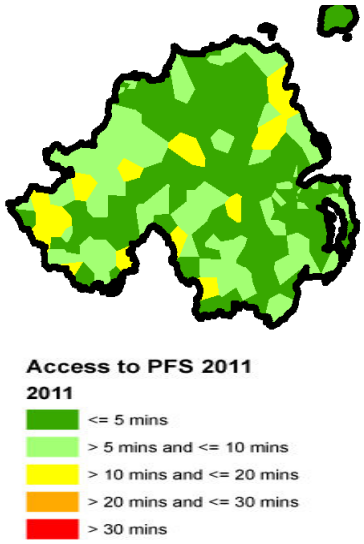
3.5% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by more than 60% (2001: 3.8, 2011: 1.5)

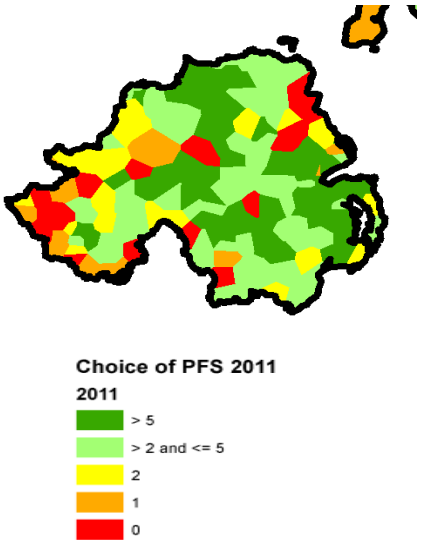


Source: Deloitte analysis

B.12 Northern Ireland

Northern Ireland – Access and Choice of PFS





Key statistics

Number of PFS (2011):	532 (6.1% of UK total)	
Change since 2001:	22% drop	
Fuel volumes (2011):	0.9bn litres (2.5% of UK total)	
PFS count and volumes by ownership type (%)	*% of PFS count in region*	*% of volume in region*
Company-owned	5%	7%
Dealer-owned	88%	66%
Hypermarket-owned	6%	27%

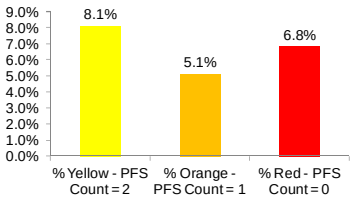
Average minimum driving time (minutes, 2011)

Rural	6.3 minutes (6% increase from 2001)
Mixed	4.8 minutes (4% increase from 2001)
Urban	3.3 minutes (14% increase from 2001)

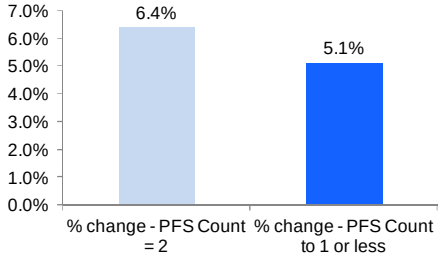
Terminals: 2 in Belfast, 1 in Londonderry

PFS choices

More than 20% of postcode sectors have a count of 2 or fewer PFS in 2011 within a 10 minutes driving time



More than 11% of postcode sectors registered a reduced count of 2 or fewer PFS in 2011 due to PFS closures between 2001 and 2011; average reduction in count by close to 50% (2001: 2.7, 2011: 1.4)



Source: Deloitte analysis

Appendix C Data processing

C.1 Overview

- Data on location (postcode) of PFS and its other characteristics (such as, ownership type, motor fuel volumes) was purchased from a third party, Experian Catalist. This included:
    - Data for all sites open as of 2011 year end (8,706 sites);
    - Data for all sites open in 2001 and closed in 2011 (3,988 sites);
    - Unique ID for each site opened after 2001, including site status field (538 sites).

C.2 Data processing

C.2.1 PFS sites open in 2011 and 2001

Sites which are marked as being under development as of 2011 year end have been excluded. This leaves a total of 8,677 PFS sites which were open as of 2011 year end. These sites have been used for proximity analysis and other descriptive information in this report.

Based on data for: (a) sites open in 2001 and closed in 2011; (b) sites opened after 2001; and (c) sites open in 2011 (excluding sites under development), sites open in 2001 have been identified. This process gives a total of 12,258 sites which were open in 2001. This list of sites has been used for proximity analysis and other descriptive information in this report.

C.2.2 Proximity analysis

Overview

- List of postcode sectors with full geographical coverage of the UK was matched with Nomenclature of Units for Territorial Statistics (NUTS) Level 1 region data[53] to identify the region for each postcode sector. Postcode sectors have been grouped in NUTS Level 1 region.
- Each postcode sector was classified as ‘Urban’, ‘Rural’ or ‘Mixed’. A ‘Mixed’ postcode sector refers to a postcode sector which has a mix of rural and urban postcode units within it. This classification of postcode sectors was based on data supplied in the Office for National Statistics Postcode Directory. The classification rules are set out in Table 11.

53 http://epp.eurostat.ec.europa.eu/portal/page/portal/gisco_Geographical_information_maps/popups/references/administrative_units_statistical_units_1

Table 11: Rules for classifying postcode sectors as 'Urban', 'Rural' or 'Mixed'

Region	Urban codes	Rural codes	Descriptive note
England and Wales - ONS codes	1, 2, 5, 6	3, 4, 7, 8	Relevant field name in ONS data is URINDEW. If any postcode sector has a mix of urban and rural codes, it is separately categorised as 'Mixed'.
Scotland - ONS codes	1, 2, 3, 4, 5	6, 7, 8	Relevant field name in ONS data is URINDSC. If any postcode sector has a mix of urban and rural codes, it is separately categorised as 'Mixed'.
Northern Ireland - ONS codes	A, B, C, D, E	F, G, H	Relevant field name in ONS data is URINDNI. If any postcode sector has a mix of urban and rural codes, it is separately categorised as 'Mixed'.

Source: Deloitte analysis based on ONSPD data.

- For each postcode sector, driving times and distances are estimated for the nearest 10 PFS which were open as of 2011 year end. The same process is repeated for each postcode sector to estimate driving times and distances for the nearest 10 PFS which were open as of 2001 year end.

- The resulting data is used to estimate minimum driving times and distances for each postcode sector in 2001 and 2011.

- The resulting data is also used to estimate the count of PFS within 10 minutes of driving time in 2001 and 2011.

Identifying location and region of PFS sites

- Data on postcodes of PFS sites was matched to ONSPD database to identify the location of these PFS which could be then be used for proximity analysis. This ONS database includes the list of both current and terminated postcodes in the UK.

- As noted earlier, there were 12,258 PFS sites open in 2001. For close to 1% of these sites, the location and region could not be identified as postcode information about these PFS did not match with the postcodes in ONSPD database. This is due to postcode information for these sites not being accurate or complete. However, as these PFS sites represent a small percentage of total sites open in 2001, the likely impact of excluding these sites is not expected to be very material on proximity analysis.

- Similarly, for PFS sites open in 2011, the location and region could not be identified for less than 0.2% of PFS sites open in 2011. The likely impact of excluding these sites is not expected to be very material as these PFS sites represent a small percentage of total sites.

Other information

- Due to data limitations, driving times and distances could not be estimated for less than 0.1% of postcode sectors. Data limitations related to either road network data not being

available or no PFS being available for some islands. However, as the number of these postcode sectors is limited, it is not likely to have material impact on the results of proximity analysis.

- Based on the location of centroids of each postcode sector, the boundaries for each postcode sector have been estimated for proximity maps. However, these boundaries are likely to cover a significant portion of actual postcode sector boundaries. Therefore, any differences are likely to be small and are not likely to have a material impact on illustrations in the maps.

C.2.3 Assumptions for estimating PFS storage capacity

High-level assumptions have been made to estimate storage capacity of different types of PFS, in order to then estimate total PFS storage capacity in the UK. These assumptions link PFS fuel volumes sold to their storage capacity; ratio of daily fuel volumes sold to storage capacity has been assumed and this ratio varies for PFS with different levels of daily throughput; the higher the daily throughput, the lower is the ratio; this has been assumed in order to take account that PFS retailers with higher throughputs rely more on refuelling of storage capacity rather than building of especially large storage tanks. These assumptions have been developed on the basis of data on PFS fuel volumes sold and storage capacity for a small number of sites; this data was provided by a multi-site independent PFS retailer in the UK. These assumptions are listed in Table 12.

Table 12: Assumptions linking PFS fuel volumes sold to storage capacity

Type of site (volume in '000 litres)	Ratio: Number of days of daily volume ('000 litres) covered
Annual volume <= 6,000 (Daily volume <= 16)	11
Annual volume > 6,000 & <= 9,000 (Daily volume > 16 & <= 25)	7.3
Annual volume > 9,000 & <= 12,000 (Daily volume > 25 & <= 33)	5.5
Annual volume > 12,000 & <= 15,000 (Daily volume > 33 & <= 41)	3.7
Annual volume > 15,000 (Daily volume > 41)	Not applicable. For such sites, storage capacity of 300,000 litres has been assumed.

Source: Deloitte analysis based on data provided by a multi-site independent PFS retailer in the UK

Actual daily fuel volumes ('000 litres) sold by a PFS is multiplied with the relevant ratio from the table above to estimate the storage capacity of that PFS. For sites with actual daily fuel volume of more than 41,000 litres, storage capacity of 300,000 has been assumed.

Appendix D Stylised business models

Dealers

Table 13: Indicative revenues and costs for different types of 'stylised' dealer-owned PFS

		Stylised Model 1		Stylised Model 2		Stylised Model 3		Stylised Model 4	
Category	**Units**	**Fuel=High; Shop=High**		**Fuel=Low; Shop=High**		**Fuel=Low; Shop=Low**		**Fuel=High; Shop=Low**	
Volume - fuel	**litres**	6,000,000		2,000,000		2,000,000		6,000,000	
Shop - turnover	**£**	2,000,000		2,000,000		300,000		300,000	
Non-fuel margin	%	25%		25%		20%		20%	
Shop - gross profit	£	500,000		500,000		60,000		60,000	
Costs			**%**		**%**		**%**		**%**
Wages (min)	£	100,000	25.2%	100,000	27.4%	100,000	50.8%	100,000	33.4%
Wages (var)	£	100,000	25.2%	100,000	27.4%		0.0%	50,000	16.7%
Rates	£	40,000	10.1%	35,000	9.6%	20,000	10.2%	30,000	10.0%
Utilities	£	18,000	4.5%	18,000	4.9%	10,000	5.1%	15,000	5.0%
Loyalty/CC/Cash handling	£	30,000	7.6%	10,000	2.7%	10,000	5.1%	30,000	10.0%
Shrinkage	£	10,800	2.7%	3,600	1.0%	3,600	1.8%	10,800	3.6%
Wastage	£	16,000	4.0%	16,000	4.4%	2,400	1.2%	2,400	0.8%
Insurance	£	6,500	1.6%	6,500	1.8%	4,500	2.3%	5,500	1.8%
Maintenance and testing	£	12,000	3.0%	12,000	3.3%	8,000	4.1%	12,000	4.0%
Repairs/replacements	£	6,000	1.5%	6,000	1.6%	6,000	3.0%	6,000	2.0%
Servicing debt	£	7,500	1.9%	7,500	2.1%	7,500	3.8%	7,500	2.5%
Other	£	50,000	12.6%	50,000	13.7%	25,000	12.7%	30,000	10.0%
Total costs	**£**	**396,800**	**100.0%**	**364,600**	**100.0%**	**197,000**	**100.0%**	**299,200**	**100.0%**
Fixed costs	£	200,000		200,000		161,000		176,000	
Variable costs	£	91,300		79,100		40,500		63,700	

Source: Deloitte analysis based on discussions with market participants.

Hypermarkets

Table 14: Indicative revenues and costs for different types of 'stylised' hypermarket-owned PFS

Category	Units	Stylised Model	
Volume – fuel	litres	14,000,000	
Shop turnover	£	400,000	
Shop gross margin	%	25%	
Shop - gross profit	£	100,000	
Costs			**%**
Wages	£	100,000	37.0%
Rates	£	40,000	14.8%
Utilities	£	20,000	7.4%
Credit Card/cash handing	£	42,000	15.5%
Maintenance and testing	£	15,000	5.5%
Shop shrinkage/wastage	£	12,000	4.4%
Insurance	£	6,500	2.4%
Repairs/replacements	£	5,000	1.8%
Other	£	30,000	11.1%
Total	£	270,500	100.0%
Fixed	£	228,500	
Variable	£	42,000	

Source: Deloitte analysis based on discussions with market participants. Note: It has not been possible to validate these figures directly with the hypermarkets.