

PETROL PRICES

The New Zealand oil industry follows a vertical integration structure in which the major oil companies, BP, Caltex, and Mobil are active in the entire supply chain. Meaning they are involved in oil production, refining, transportation and retailing. Only recently has the New Zealand market seen growth of independent petroleum retailers which was partly due to diminishing margins in retailing. An example of this is where Shell departed the New Zealand retail sector and had their assets acquired by Z Energy.

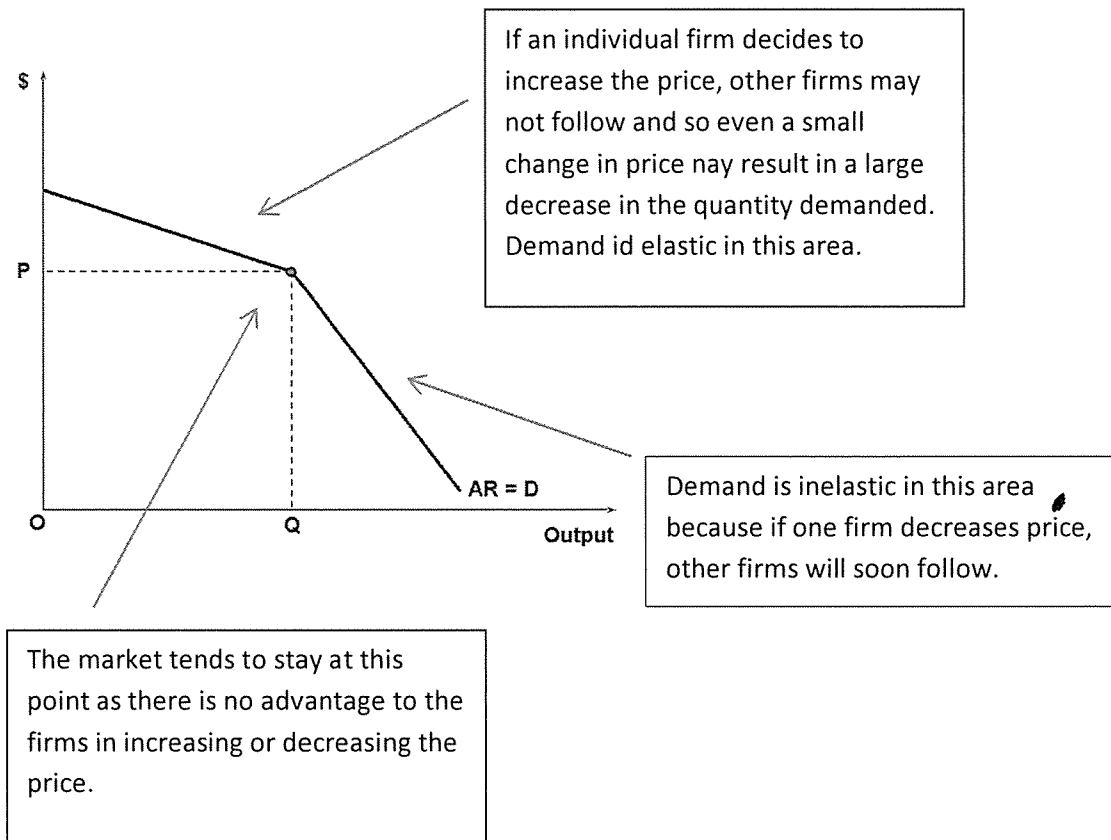
Oligopoly is the type of market structure the oil industry has. An oligopoly is a situation in which a particular market is controlled by a small group of firms selling a differentiated product, which are close substitutes. The retail gas market follows an oligopoly market structure because only a small number of firms control a large majority of the market. There are also strong barriers to entry as there are large start-up costs for a service station.

An important characteristic of an oligopoly is interdependence between firms (strong barriers to entry). This means that each firm must take into account the likely reactions of other firms in the market when making pricing and investment decisions. For example, petrol prices for all firms are around the same price - if BP decides to increase its market share by reducing price, it must take into account the possibility that close rivals, such as Z and Caltex, may reduce their price in retaliation which usually happens in a short amount of time. For example, according to the September 2013 petrol and diesel prices, by Mark Stockdale, as of 17 September 2013, petrol prices are around NZ\$2.26 per litre, a 3c decrease from 11 September at the price of around NZ\$2.29, caused by a strengthening Kiwi dollar¹.

The kinked demand curve model makes a prediction that a business might reach a stable profit-maximising equilibrium as price P_1 and output Q_1 and have little incentive to alter prices. Under an oligopoly, the kinked demand curve also predicts that there will be periods of relative price stability with firms focusing on non-price competition as a means of reinforcing their market position and increasing their supernormal profits. Short-lived price wars are still common under the kinked demand curve model. This is because firms in the market during a price war are looking to gain a short-term advantage and win some extra market share. In regards to the petrol industry, some petrol firms offer lower prices than others but often for only a short period of time. The kinked demand curve model below shows that for a price increase, demand is price elastic because if one firm increases price, other firms won't follow suit. In addition, if one firm cuts price other firms will follow suit because they don't want to lose market share. Therefore, for a price decrease, demand is price inelastic.

¹ <http://www.aa.co.nz/cars/maintenance/fuel-prices-and-types/petrolwatch-weekly-and-monthly-updates/petrolwatch/august-2013-petrol-and-diesel-prices-2/> - 17 SEPTEMBER 2013

OLIGOPOLY



In addition, non-price competition exists as some petrol companies try to differentiate their product to attract consumers, such as BP and Wild Bean Café. This is effective because consumers can easily buy a coffee or something quick to eat when they go pay for their fuel. Z petrol stations market themselves as New Zealand owned which creates a brand loyalty effect. According to Z energy's official website, 'Z is the first letter of the last word of the first country we started business in. It reflects our national identity and our commitment to New Zealand'². BP offers a Megawash Bonus Card which guarantees a free megawash the fifth time a purchase is made. Caltex offers an AA Smartfuel card which saves 6 cents per litre when customers spend \$40 or more on petrol or diesel³. If promotions as such are successful, they can lead to a market share gain of 1-2%⁴.

² <http://z.co.nz/about-z/help-and-support/faqs/brand-launch/why-z/> - 12/05/2011 - Brand launch

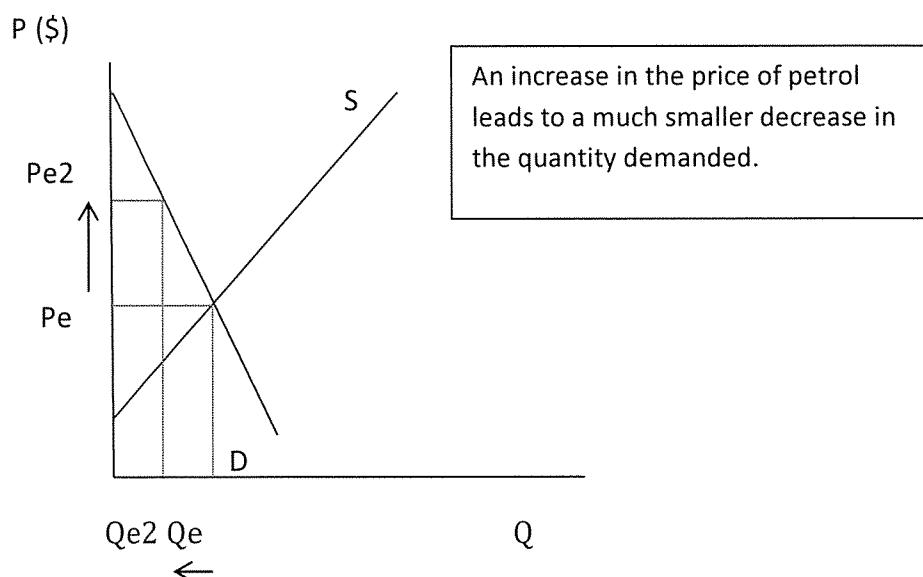
³ <http://www.caltex.com/nz/promotions/> - 2006-2013

⁴ Scott, G. (1997), Conditions of Entry into Petrol Importing, Wholesaling and Retailing in New Zealand, Wellington: LECG.

ELASTICITY OF DEMAND FOR PETROL

Price elasticity of demand measures the responsiveness of the quantity demanded of a commodity to a change in its price. The more elastic the good is the more a change in price will affect the demand for it. For example, if the price of a good changes by 10% and the resulting change in the quantity demanded changes by 40% then the good is elastic as there is a only a small change in price which has caused a much larger change in the quantity demanded. The more inelastic the good is the little effect on the demand for a product, meaning a 10% increase in price will lead to only an 11% change in the quantity demanded. Demand for petrol is price inelastic because there are relatively few substitutes for petrol and most cars depend on petrol to run accordingly. When the price for petrol rises, total revenue also rises. When the price for petrol falls, total revenue also falls. Petrol is a necessity because people find it difficult to live without it as there are no close substitutes to petrol. Apart from the very low amount of cars that run on alternate substances to petrol, most cars require petrol for them to run properly. Another relevant point is that "almost all of our goods and services are delivered using oil, AA Petrol Watch spokesman Mr Stockdale says. He also adds that "many nations still rely on the fossil fuel as a source of heating and electricity. Food production in particular is almost wholly dependent on oil. Without it we wouldn't be able to plough fields, harvest food, transport crops for processing and truck the processed food to markets"⁵. Because demand for petrol is price inelastic, even if price increases, the increase in price is always greater than the decrease in quantity demanded.

INELASTIC DEMAND CURVE



⁵ http://www.nzherald.co.nz/bay-of-plenty-times/news/article.cfm?c_id=1503343&objectid=11095673 - 5:20 PM Monday Apr 8, 2013

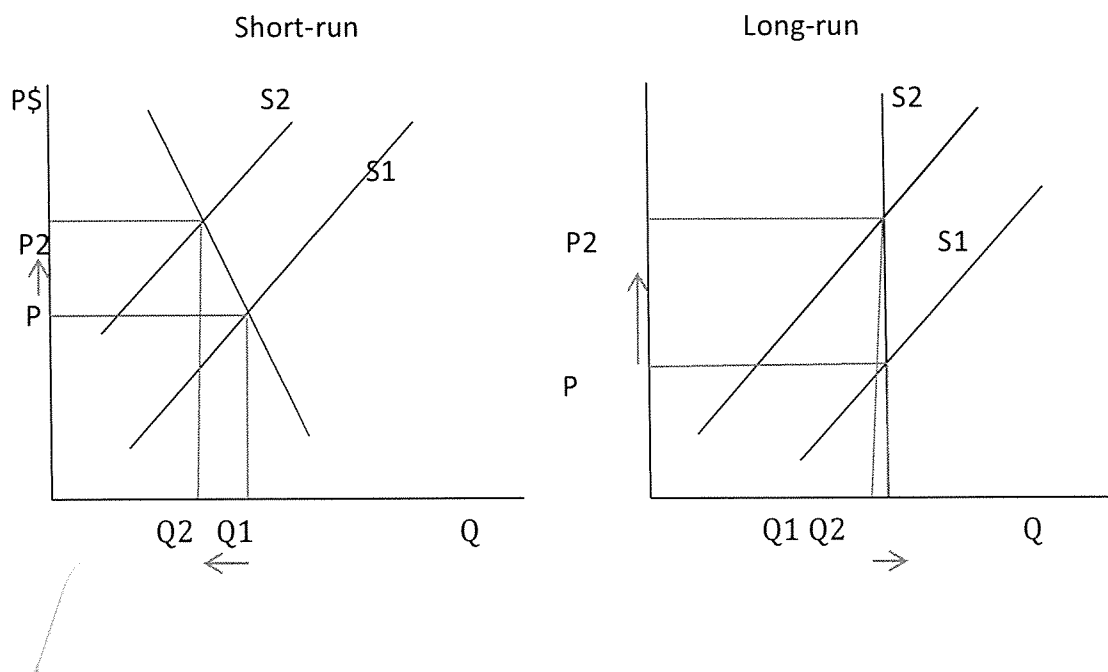
IMPACT OF INCREASING PETROL PRICES ON CONSUMER DEMAND

When petrol prices increase, consumer demand is not significantly impacted as it is difficult to reduce your own petrol consumption without making big changes. For example, if petrol prices rise, consumers may choose to resort to alternative methods of transport to decrease the impacts of high petrol prices, such as opting to use public transport, walking, biking and possibly avoiding unnecessary travel. However these options would only really work in the short run where demand is price inelastic. For a more long term solution, a consumer may seek to invest in a more fuel efficient car to reduce the effects of high petrol prices. This would cut down on their fuel bill in the long run. According to Sandra A. Barns from the University of Waikato, Department of Economics, "a price rise reduces short-run demand, but in the long run, consumers switch to vehicles that are more efficient which lowers the marginal cost of travel, and in doing so encourages a greater demand for travel"⁶. The long-run demand curve for petrol is likely to be more price elastic. An example of this scenario took place when a sharp rise in price occurred in New Zealand in response to the first "oil crisis" of 1973-75. According to the report, *The Petrol Industry: Deregulation, entry and competition*, the price rise in the 1970s had various consequences internationally, such as an increase in the use of smaller cars and a switch to cheaper substitute fuels such as coal, natural gas. Over the period 1974-77 in New Zealand, petrol consumption per registered car decreased from 2,005 to 1,850 litres per year, and the proportion of newly registered cars having an engine capacity of over 2.6 litres decreased from 37% in 1973 to only 10% in 1977. This shows that the demand for petrol is more price elastic over the long term during which users can more readily adjust their consumption patterns⁷.

An Auckland Transport Study found that 7% decrease in car volumes with a 26% increase in price of petrol – elasticity of 0.28.

⁶ Fuel Price and Fuel Consumption in New Zealand: Would a fuel tax reduce consumption? – Sandra A Barns (2001) Department of Economics, University of Waikato

⁷ THE PETROL INDUSTRY: DEREGULATION, ENTRY AND COMPETITION - Michael Pickford* and Cameron Wheeler 2001



WHAT INDIRECT TAXES ARE INCLUDED IN THE PRICE OF PETROL

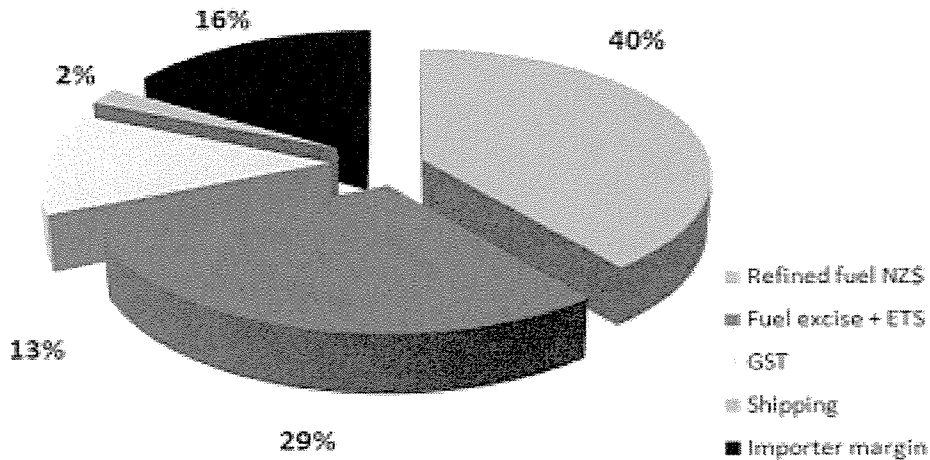
A fuel tax is an excise tax (a tax charged on the sale of a particular good) that is imposed on the sale of fuel. A significant amount of the price of every tank of fuel is made up of Government taxes and levies (29%). At the moment, 64.13 cents per litre is accumulated by the government as fuel excise (excluding GST). GST of 15% is also collected on the overall price of fuel including excise, amounting to a tax on a tax. An increase in petrol prices will mean more tax revenue for the government and so could be able to increase spending in other areas. These areas are usually on roads, road safety policing and public transport. In addition, according to AA Petrol Watch spokesman Mark Stockdale, "The government has to keep raising taxes as a result of more efficient fuels and hybrid cars on the market because it means there's less demand for fuel... Any drop in demand brings a decrease in the excise pool that relies on a certain amount of money to sustain the transport fund. Because it's only road users that contribute to that fund, the only way to top it up is to increase tax"⁸. However, it is often argued that the government benefits when prices increase as this means more GST is collected. In July 2010 for example there was additional 3.5% tax on petrol due to ETS (Emission Trading Scheme) which is a tax paid to the government to encourage reduction in carbon emission.

⁸ <http://www.stuff.co.nz/dominion-post/business/8716534/Paying-through-the-nozzle> - Mark Stockdale, Last updated 09:01 26/05/2013



Price components of a litre of petrol (\$2.22)

as at 11 September 2013

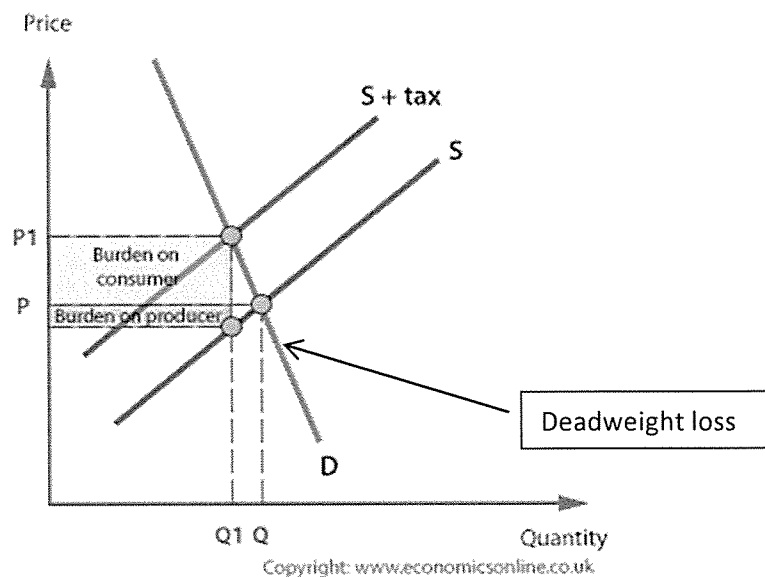


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Apart from GST and a small land authority petroleum tax and monitoring levy, there are no taxes on diesel. Instead, diesel vehicles pay Road User Charges. All fuels also pay an Emissions Trading Scheme levy which is approximately 1 cent per litre.

An increase in indirect taxes on the price of fuel results in a loss of allocative efficiency. As shown in the model below, an increase in tax will result in a shift to the left of the supply curve and deadweight loss.

A TAX WHEN DEMAND IS PRICE INELASTIC



⁹ <http://www.aa.co.nz/cars/maintenance/fuel-prices-and-types/how-petrol-prices-are-calculated/> - 2013

The shift of the supply curve to the left means that both consumer and producer surpluses are reduced, but because the price of fuel is inelastic, the burden will fall mainly on the consumer as they will have to pay more for their fuel, leaving fewer amount of money for other necessities such as food and accommodation. This in particularly puts more pressure on low income families. According to Progressive Wigram MP Jim Anderton, "Petrol prices are always fast to increase and slow to fall...putting pressure on the New Zealand consumer"¹⁰. The government benefits from the imposed taxes on fuel as they experience an increase in revenue. Increased revenue permits the governments to fund other projects to allow them to correct other market failures.

WHAT IMPACT WILL AN INCREASE IN THE PRICE OF PETROL HAVE ON CONSUMERS, PRODUCERS, AND THE GOVERNMENT? IMPACT OF PRICE INCREASES ON OTHER GOODS (SUBSTITUTES AND COMPLEMENTS)

An increase in the price of petrol means that a greater percentage of consumer income will be spent on petrol. Low income families are especially affected as there is less money to spend on other necessities such as food; accommodation etc. This leads to a decrease in spending (consumption) in other areas of the economy and less money available for savings. The purchasing of larger cars, which are complements, decreases.

People try to sell their larger cars, which leads to a surplus and a decrease in the price of the larger cars. Smaller cars become more popular, which are also complements, become more popular as they are more fuel efficient. According to the report, *The Petrol Industry: Deregulation, entry and competition*, "In response to a sharp and sustained rise in price, the size of the vehicle can be reduced, car makers can design and produce more fuel-efficient cars, and people can move house closer to their workplace or use alternative modes of transport. As a consequence, the long-run demand curve for petrol is likely to be more price elastic"¹¹.

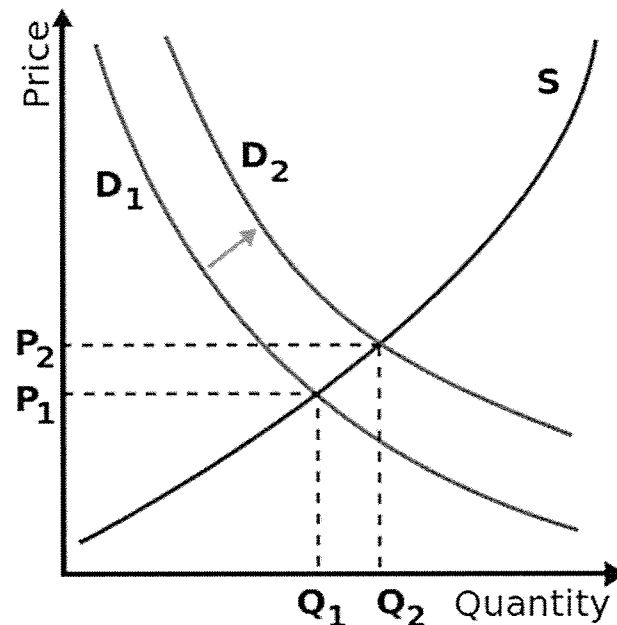
Small cars, which are also complements, become more popular. Mark Stockdale states that increasing fuel prices have caused "a shift in vehicle purchase preferences in recent years. People have moved away from buying big, family sedans and SUVs and they've moved into buying smaller, more fuel efficient vehicles. Just a few years ago, the Holden Commodore was the number one selling car in New Zealand, and it was for many years - that's history now"¹².

¹⁰ <http://www.voxy.co.nz/politics/progressive-petrol-price-margins-record-high/5/90091> - Monday, 16 May, 2011 - 13:59

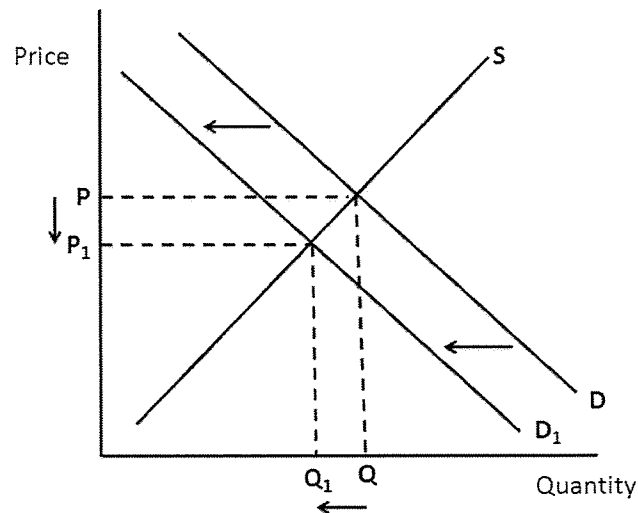
¹¹ THE PETROL INDUSTRY: DEREGULATION, ENTRY AND COMPETITION - Michael Pickford* and Cameron Wheeler 2001

¹² http://www.nzherald.co.nz/bay-of-plenty-times/news/article.cfm?c_id=1503343&objectid=11095673 - 5:20 PM Monday Apr 8, 2013

Complementary goods are goods that people tend to use together. The price of petrol and the price of a car are considered complementary. This is because when the price of cars decreases, it will most likely mean that more cars would be sold. If this happens, then the new car owners will need to buy petrol. As a result, the demand for petrol will increase from D_1 to D_2 , as shown in the graph below.



Substitute goods are goods that are used in place of one another. An important aspect of substitutes and complements is that a change in price of one of the goods has an impact on the demand for the other good. For substitutes, an increase in the price of one of the goods will increase demand for the substitute good. A decrease in the price of one of the goods will decrease demand for the substitute good, as shown in the graph below where demand has decreased from D to D_1 . For complements, an increase in the price of one of the goods will decrease demand for the complementary good. A decrease in the price of one of the goods will increase demand for the complementary good.



When the price of petrol increases, the demand for public transport will increase as public transport is a substitute product - people still need to travel around the city and if they don't want to pay the high fuel prices, they will most likely take public transport to work, school etc. The end result is an increase in demand for the alternative. In addition, increases in petrol prices would spur an increase in alternative fuels usage such as bio-fuel or other greener transportation means. However, consumers in most cases resort back to purchasing petrol, despite the increased price. According to Mark Stockdale, "While many motorists changed their driving behaviour when petrol prices first shot up over \$2 a litre, most now seem to have grudgingly accepted the high costs. After a while, motorists become used to higher petrol prices". He continues by saying, "If they have upgraded their car and bought a more fuel- efficient car, they've actually noticed that their fuel bill is lower and so maybe they're finding, 'Oh well, I can manage that' and so they're not cutting back on their travel"¹³.

EFFECTS ON PRODUCERS

Just as consumers tend to spend more on the increased oil and less on other goods and services, higher oil prices tend to make production more expensive for businesses, just as they make it more expensive for households to do the things they normally do.

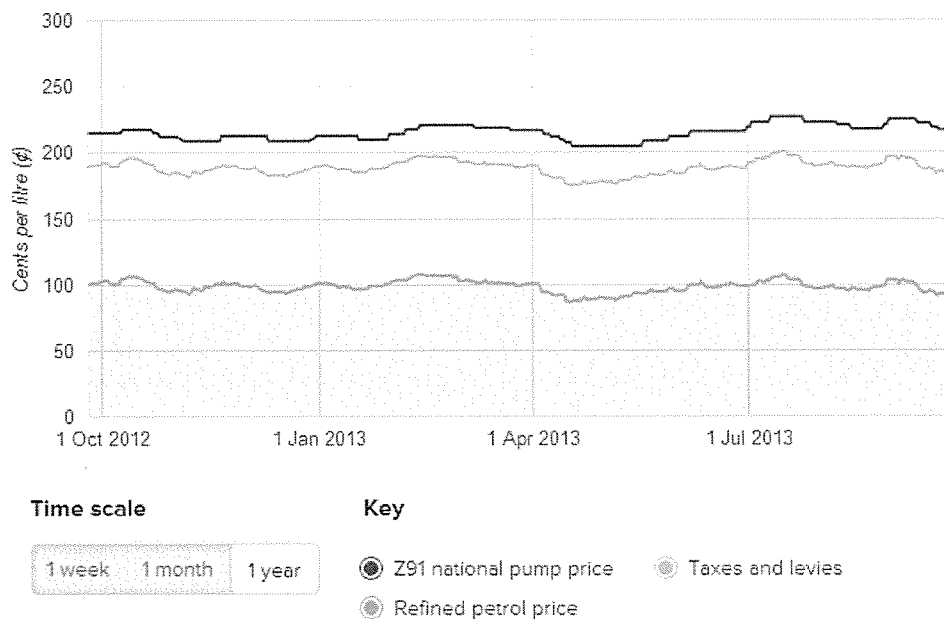
The effect on producers will depend on whether producers pass on the increase in production onto consumers through increased imported refined oil prices. Because petrol prices are inelastic, producers are more likely to pass on any increase in the cost of production onto consumers. Producers are hugely affected by the cost of production. Transport is a major cost of production in New Zealand. This is especially troublesome for

¹³ http://www.nzherald.co.nz/bay-of-plenty-times/news/article.cfm?c_id=1503343&objectid=11095673 - 5:20 PM Monday Apr 8, 2013

producers whose goods must be shipped from place to place or that use fuel as a major input, such as the retail gas market, the airline industry etc. Cost of production of other goods will increase and if these other goods are necessities and elastic demand curve, it is more difficult for producers to pass on increased cost to consumers.

The graphs below shows the cost price we pay for petrol and diesel, against the national pump price, which is the price we charge at the majority of our service stations. The cost price, expressed in New Zealand dollars, is made up of the price of the refined product on the Singapore market, the cost to ship it to New Zealand and storage and handling fees.

Refined petrol price vs Z national pump price



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CONSEQUENCES FOR THE GOVERNMENT

The area in yellow in the above graph represents the revenue received by the government for every litre of petrol. Revenue from tax will increase when petrol prices increase. Because the quantity demanded for petrol is inelastic, quantity demanded will not decrease by a lot so the government will gain a lot more from petrol taxation. Increased revenue from tax could be spent in other areas. Households end up worse off because they pay a greater burden of the tax.

¹⁴ <http://z.co.nz/motorists/fuel-pricing/>

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