Petroleum Industry Pricing Review

Draft Report

31st October, 2014

© Independent Consumer & Competition Commission
The Independent Consumer and Competition Commission (“the Commission”) is a statutory body established under the provisions of the Independent Consumer and Competition Commission Act 2002 (“the ICCC Act”). The Commission is vested with responsibilities under the ICCC Act to promote competition and fair trading, regulate prices of certain declared goods and services, protect consumer’s interests and undertake other related responsibilities. Under the Prices Regulation Act Chapter 320 (“PR Act”), the Commission amongst others is responsible for the regulation of prices for certain oil based refined petroleum products such as Petrol, Diesel, Kerosene and Aviation Gasoline.

The current price setting arrangements for petroleum products commenced on 1st November 2010 and will expire on 31st December 2014. In view of the expiration of the current regulatory period at the end of this year, the Commission in accordance with Section 25A (6) of the PR Act and Section 5 of the ICCC Act, has undertaken this review to determine whether or not the current determination and the form of regulation for the pricing of petroleum products should continue, and if so, the appropriate form of regulation to apply in the forthcoming regulatory period.

The Commission is undertaking this review in an open and transparent manner which will involve a wider stakeholder and public consultation prior to making any determination on the current pricing arrangements going forward. As part of this review process, the Commission released a public notice outlining the relevant issues of discussion, announcing the commencement of the Petroleum Industry Pricing Review on the 5th of March 2014. The public notice contained certain issues that were identified by the Commission as pertaining to this review and invited the petroleum companies and other relevant stakeholders to provide comments on these issues.

Following this announcement, the Commission received submissions from the four main fuel wholesalers in PNG and a few retailers. Moreover the Commission had consultations with the four main petroleum companies. The submissions and comments received during the consultations have been invaluable in assisting the Commission in making its draft determinations that are contained in this Draft Report. A schedule of the respondents who provided submissions and comments to the issues paper and during the consultations is set out in Appendix 1 of this Draft Report.

This Draft Report contains the Commission’s Draft Determinations that it has proposed after taking into consideration the views, comments and submissions made by the relevant stakeholders and the Commission’s own assessment of the issues pertaining to the petroleum industry.

The Commission urges the fuel wholesalers, retailers and other stakeholders including Government departments and agencies to participate in this review process by providing views and comments to the Commission’s draft determinations contained in this report. The Commission will release the Final Report which will, among other things, detail the final pricing arrangements that will apply to the petroleum industry for the next regulatory period after thoroughly assessing the comments and submissions made to this Draft Report.
The remaining stages of the review process are as follows with their corresponding date of release and close of receipt and submissions to the Draft Report:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close of Submissions to the Draft Report</td>
<td>30th November, 2014</td>
</tr>
<tr>
<td>Release of Final Report &amp; Prices Order</td>
<td>22 December, 2014</td>
</tr>
</tbody>
</table>

Those intending to make submissions should be aware that provisions of the ICCC Act allows for transparency in the review process and therefore the Commissions publishes all submissions made to its enquiries and makes them available to the public. Unless there is a specific claim for information to be treated as confidential and the Commission agrees with the claim, it will be kept in-confidence. Submissions are published on the Commission’s website and are available for public viewing.

Submissions to the Draft Report should be received by the Commission no later than 30th November 2014 and be directed to the Commission as indicated below:

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Commissioner and Chief Executive Officer  
Independent Consumer and Competition Commission  
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P O Box 6394  
BOROKO, 111  
National Capital District

For further information about making a submission or to obtain a copy of the Draft Report, please contact Mr. Brian Ivosa, Executive Manager for Prices and Productivity Division or Mr. Jimmy Yareba, Manager for Prices on telephone 325 2144 or by fax on 325 3980 or via email: bivosa@iccc.gov.pg or jyareba@iccc.gov.pg.

Copies of the Draft Report can be obtained from the Commission’s website at www.iccc.gov.pg.

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DR.BILLY MANOKA, (PhD)  
Commissioner & Chief Executive Officer  

31st October, 2014
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1 EXECUTIVE SUMMARY

This Executive Summary provides an overview of the Commission’s key findings and its draft determinations contained in this Draft Report.

The purpose of releasing this report is to provide the opportunity for comments and consultation with all relevant stakeholders in relation to the issues highlighted in the report. The Commission is concerned about a number of issues in the provision of fuel products. All of these issues are discussed in more detail within the report.

- The Commission is proposing to continue to regulate the retail price of petrol, diesel and kerosene under the Prices Regulation Act Chapter 320.
- The Commission has modelled and analysed the cost of retail fuel sales, wholesaling, road transport, coastal shipping and drum filling. The results of this indicate the following:
  - Retail margins are currently too low and need to increase. Retail costs vary significantly between regions so the Commission is proposing to have different rates for Port Moresby, Lae, Regions and Remote areas. The Commission is in the process of collecting further data to quantify what the costs should be in each geographic area.
  - Wholesale margins appear to be too high and so the Commission is proposing to reduce them to 22 toea per litre and then apply a negative X factor of 1.0%.
  - The Commission is proposing to change its approach to setting the wholesale margin. Rather than using the costs of one wholesaler as representative of all wholesalers, the Commission is proposing to model the costs of the whole industry. The building block method will still be used to do this, but it will include the costs of the whole industry’s assets. The allowance for the industry’s operating costs will be set using the results of benchmarking carried out by the Commission. The proposed approach seeks to identify the cost of an efficient operator rather than simply identifying the costs of a single operator, which was the approach taken in the last review.
  - The Commission is proposing to move away from the cost pass-through approach currently used for coastal and road freight. Instead the Commission will determine the cost allowance for each area. The Commission is of a view that this will create incentives for wholesalers to find the lowest cost means of delivery and will also reduce costs for consumers.
  - For coastal shipping costs the Commission is proposing to set costs at current levels and adjust them monthly by means of a coastal shipping index. In Port Moresby the Commission is proposing to remove the current allowance for cross harbour shipping and to include the cost of road transport instead.
  - For road freight the Commission has built a model based upon information provided by wholesalers. The model estimates the cost to move one litre of fuel one kilometre.
  - For drum filling the Commission is proposing to leave the margin unchanged.

- The Commission is proposing that there is no longer any need to monitor Av Gas as demand is now so low that the product is largely irrelevant to the airline industry.
- However the Commission is proposing to continue to monitor Jet A1 ex the refinery gate.
- The Commission has also considered regulating Zoom prices but has not found any need to do so.

The following table provide an indication of how prices might change in Port Moresby and Mt Hagen for comparison purposes. The proposed changes will make only small changes for consumers in some areas, but will be more dramatic in others.

<table>
<thead>
<tr>
<th>Cost element</th>
<th>Port Moresby</th>
<th>Mt Hagen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current Cost (toea per litre)</td>
<td>Proposed Cost (toea per litre)</td>
</tr>
<tr>
<td>IPP</td>
<td>189</td>
<td>189</td>
</tr>
<tr>
<td>Excise Duty</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>Sea freight</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Road freight</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Wholesale margin</td>
<td>37</td>
<td>22</td>
</tr>
<tr>
<td>Retail margin</td>
<td>21</td>
<td>31</td>
</tr>
<tr>
<td>GST (10%)</td>
<td>32</td>
<td>31</td>
</tr>
<tr>
<td>Total (Retail Price)</td>
<td>354</td>
<td>335</td>
</tr>
</tbody>
</table>

For all issues covered in this report the Commission invites interested parties or affected stakeholders to make submissions to the Commission.
2 OVERVIEW

2.1 Background

2.1.1 Overview of the dynamics of the petroleum industry before 2004

Up to and including 2004 oil companies in the PNG market were importing all of their petroleum products and were generally extensively involved in wholesaling and retailing operations. However, just prior to the Commission undertaking its initial review of the petroleum industry in 2004 significant changes were occurring in the market including, amongst others, the acquisition of British Petroleum (BP) PNG Limited by InterOil Corporation ("InterOil") and InterOil's proposal to enter into an agreement with Shell PNG Ltd ("Shell") to buy and lease back the wholesale business in PNG. At that time, InterOil was also in the process of commencing production at its Napa Napa refinery and this would change the way oil-based products were supplied in the country.

Given these developments, the Commission decided that it was timely to undertake a review of the petroleum industry in 2004 to assess competitive tensions and to determine whether or not price regulation was still required and if so, the appropriate form of regulation to apply.

2.1.2 Summary of 2004 Review

In undertaking the review in 2004, the Commission identified that there was limited competition at most levels of the industry, thus warranting the need to apply some form of regulatory oversight. The Commission therefore determined a five year regulatory price path with the following determinations applying over a five year period commencing 1st January, 2005:

a) The refined petroleum products (petrol, diesel and kerosene) ex the refinery were to be regulated under Sections 10 and 32A of the PR Act for price monitoring purposes (these products were subject to a Project Agreement (the "Agreement") between InterOil and the State of Papua New Guinea which specifies the purchase price of petroleum products at the Napa Napa refinery gate);

b) The price of Avgas was to be regulated under Sections 10 and 32A of the PR Act for price monitoring purposes;

c) The freight costs including shipping and road cartage were to be regulated under Sections 10 and 32A of the PR Act for monitoring purposes; and

d) The wholesale and retail margins for petrol, diesel, kerosene and aviation gasoline and the drum filling margin be regulated under Sections 10 and 21 of the PRA whereby the wholesale, retail and drum filling margins will be adjusted annually based on the CPI-X formula.

e) These regulatory and pricing arrangements were scheduled to end on 31st December 2009, but were extended until the date of effect of the final determination, being 1st November 2010.

2.1.3 Summary of 2009 Review

In 2009/10, the Commission largely determined to continue with the same regulatory framework. Once the review was completed it was applied commencing November 2010 to December 2014. The determination included the following:
a) Continuation of the monitoring of the IPP for petrol, diesel and kerosene ex the Napa Napa refinery under Section 32A of the PR Act. In addition, the Commission will also monitor volumes of petrol, diesel and kerosene produced at the Napa Napa refinery.

b) Continuation to regulate the wholesale margin for petrol, diesel and kerosene under Section 21 of the PR Act via a direct price control by applying a uniform margin across the country.

c) The Commission will continue to monitor road freight charges under Section 32A of the PR Act;

d) The Commission will continue to regulate the drum filling margins under Section 21 of the PR Act. The drum filling margin will be set at 6 toea per litre in 2010 and adjusted using a CPI-X price path over the next regulatory period;

e) The Commission will continue to regulate the retail margin for petrol, diesel and kerosene under Section 21 of the PR Act for the next regulatory period.

f) The Commission to regulate Avgas and Jet A1 prices under Section 32A of the PR Act and will monitor the landed price of an actual price at which Avgas and Jet A1 are sold to customers

These regulatory and pricing arrangements will end on 31\textsuperscript{st} December 2014. Therefore, the Commission is undertaking this review to decide whether there is a need to continue regulation of the price of petroleum products, and if so, set appropriate form of regulation to apply from 1\textsuperscript{st} January, 2015.

2.2 Legislative requirements

The existing regulatory and pricing arrangements applying to petroleum products (petrol, diesel and kerosene) prices ex the Napa Napa refinery and prices of Avgas, domestic shipping and road freight rates and wholesale, retail and drum filling margins are governed under Sections 10,32A and 21 of the PR Act. The Government through the Minister for Treasury has declared these prices of petroleum products under Section 10 of PR Act for price regulation purposes while the Commission sets the maximum wholesale, retail and drum fillings margins pursuant to Section 21 of the PR Act. In addition, the Commission under Section 32A of the PR Act monitors the prices of petrol, diesel and kerosene ex-Napa Napa set under the Project Agreement between the State and InterOil, as well as the prices of Avgas and the sea and road freight cost components of fuel prices.

The provisions of Section 25A (6) of the PR Act provide for the Commission to initiate a review of its own accord when it considers appropriate. Section 25B outlines the processes by which a review of a Pricing Order can be undertaken including the timelines within which such reviews can be undertaken, the requirement to publish details of its decisions, and the form of decisions that can be made as a consequence of the review. Furthermore, Section 25C (3) of PR Act specifies that in response to a review, the Commission may decide to:

- continue to operate the existing price control arrangements in their present form;
- vary the existing price control arrangements; or
- terminate the present price control arrangements, through a recommendation to the Minister to revoke the declaration of goods or services for the purpose of price control by the Commission under Section 32A.

In undertaking this review, the Commission was required to have regard to the following regulatory principles under Section 21(2A) of the PR Act:
a) the need to protect consumers and users of the declared goods or services from misuse of market power in terms of prices, pricing policies (including policies relating to the level or structure of prices) and the standard of the declared goods or services;
b) the cost of making, producing or supplying the declared goods or services;
c) the desirability of encouraging greater efficiency in relation to making, producing or supplying the declared goods or services;
d) the need to ensure an appropriate rate of return on any investment in relation to the declared goods or services;
e) the borrowing, capital and cash flow requirements of persons making, producing or supplying the declared goods or services;
f) considerations of demand management and least-cost planning;
g) existing standards of quality, reliability and safety of the declared goods or services, and the desirability of encouraging improvements in those standards;
h) the effect any proposed order on general price inflation over the medium term;
i) the economic and social impact of any proposed order; and
j) any other matters the Commission considers relevant.

The Commission must also take into consideration its primary objectives pursuant to section 5 of the ICCC Act which are to:

- enhance the welfare of the people of PNG through the promotion of competition, fair trade and protection of consumers’ interest;
- promote economic efficiency in industry structure, investment and conduct; and
- protect the long term interests of the people of PNG with regard to price, quality and reliability of significant goods and services.

2.3 **Conduct of the review**

The Commission is conducting this review in a transparent manner, undertaking the following key stages:

- Request for submissions from industry participants and interested stakeholders
- release of a Draft Report and Draft Determinations and the invitation of submissions on that Draft Report and Draft Determinations;
- release of a draft Final Report and draft Final Determinations to industry stakeholders for final comment; and
- release of the Final Report and Final Determinations.

Stakeholders and other interested parties have provided submissions to the Commissions questionnaire and Issues Paper. The Commission encourages this to assist in making a fair and reasonable Proposal which is consistent with the ICCC and PR Acts and beneficial to all parties, and also supports the consumer protection and other regulatory principles provided in Section 21(2A) of the PR Act.

2.4 **Puma Energy**

In May of 2014, Puma announced that they had purchased all the Refinery and Downstream assets of InterOil. InterOil will only continue to operate its exploration and extraction business and will cease to operate in the refining and wholesale markets. Puma emphasised at the time that this was only a name change and that there would be no immediate changes to operations and services.
The name Puma rather than InterOil will be used throughout the rest of this report, except where it refers to a historical event.
3 NEED FOR REGULATION

3.1 The Value of Competition

In the process of this review the Commission has considered two questions.

1. Does the industry need to continue to be regulated?
2. Should all parts of the industry be regulated? In particular does both the wholesale price and retail price need to be regulated?

Price regulation is generally used to protect the interests of consumers when free markets are not able to do so. But where competition is effective, the outcomes from a free market are usually better for consumers than they are under price regulation.

Efficient competitive free markets automatically adjust prices to reflect changes in input costs, demand and scale. If prices are too high then more players will enter the market and supply will increase which normally reduces prices. If prices are too low then players will exit the market and supply will decline which tends to drive up prices. In this way markets self-adjust as the demands and inputs of the market change.

By comparison it is much harder for a regulator to achieve similar outcomes. If a regulator sets prices too high, then industry players will receive higher than normal profits. Even if more players enter the market, the price will not go down. The market cannot self-adjust. Depending upon the regulatory mechanisms used, higher prices can lead to over investment or inefficient investment in infrastructure.

If a regulator sets prices too low, then industry players will not receive an adequate return on their investments. No further investment is likely to occur and if their assets need replacing, participants are likely to exit the market. It is therefore more desirable for industries to operate in competitive environments than in regulated environments.

Because there are multiple players in both the retail and wholesale markets of the petroleum industry in PNG, it is important for the Commission to consider whether or not there is effective competition? Or whether or not effective competition could be encouraged? If there is then the Commission should consider the possibility of removing price regulation or decreasing the level of price regulation.

The Commission notes that a decision to regulate the retail price is effectively a decision to regulate all the input components that go into setting that price. That includes the wholesale price, road freight and coastal shipping. However if retail pricing was not regulated, then the possibility of not regulating the other components also arises.

The Commission has evaluated the level of effective competition for both the retail and the wholesale markets separately. In this evaluation, the Commission has focused on petrol, diesel and kerosene.

*The Commission invites comments and submissions from the relevant stakeholders, interested parties and the general public on its view that, “A decision to regulate the retail price is effectively a decision to regulate all the input components that go into setting that price. That includes the wholesale price, road freight and coastal shipping.”*
3.2 Retail competition

3.2.1 Observations about the Retail Market

The Commission notes that the retail industry has a number of important features:

- A large number of individual businesses
- The number of service stations has been declining slowly over time
  - Between 2005 and 2009 20% of InterOil’s stations closed
  - Between 2009 and 2014 the total number of Petrol stations has reduced by 23%.
- Multiple brands of oil based products. This includes InterOil (Puma), Mobil, Islands Petroleum, Niugini Oil and Bige Petroleum.
- Wholesalers do not generally operate retail sites, but in some circumstances they own retail assets.
- There are close ties between retailers and the particular wholesale companies whose brand they use.
- While the businesses notionally competed with each other, even in larger towns there is limited evidence that this takes the form of price competition.
- In rural and remote locations there is no opportunity for price competition due to the limited number of service stations in any particular geographic region.

Some of these features including the number of independent sites would support an argument that competition could exist in some areas. However a number of these factors imply that this competition will be constrained. In particular, the close relationship between the retailer and the wholesaler implies that price competition will be limited to the number of wholesalers operating in any one area. In most areas there are only two wholesalers operating.

The Commission requested copies of retail contracts from 4 of the wholesalers. Mobil provided copies of two contracts. These contracts restrict the retailer from using any other wholesaler as long as they continue to operate and for a year after they cease to operate a particular site. The Commission is assuming that the contracts provided are representative of contracts generally used within the industry.

Another important concern is the decline in the number of service stations. The Commission expects that the number of service stations will be driven by a combination of the following factors;

- Demand for petroleum products
- Scale requirements – larger service stations may be able to derive higher margins due to improved scale efficiencies. This will results in a lower number of stations meeting the same volume of demand by customers. Older smaller stations would close while new larger stations would open.
- The availability of land to build new service stations.
- The value of land – if land values increase and retail margins do not, the land owners will choose to find other uses for the land.

In addition to urban service stations described above, in the more remote and rural areas, fuel is often sold in an informal sector using smaller containers (4 litres and 20 litres) with irregular supplies. The cost of fuel at these outlets is likely to be high due to the high cost of transportation and storage, and the low volume through each outlet.
The total number of retail service stations across the country is not a real indicator of choice available to customers. Firstly, there are many towns and regions where customers only have access to one station. Only in the larger towns are there a large number of service stations which actively compete with each other for business.

**Table 1: Estimate of service station numbers within urban boundaries**

<table>
<thead>
<tr>
<th>Market</th>
<th>Number of retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Moresby</td>
<td>18</td>
</tr>
<tr>
<td>Lae</td>
<td>11</td>
</tr>
<tr>
<td>Mt Hagen</td>
<td>12</td>
</tr>
<tr>
<td>Goroka</td>
<td>11</td>
</tr>
<tr>
<td>Madang</td>
<td>4</td>
</tr>
<tr>
<td>Rabaul</td>
<td>2</td>
</tr>
<tr>
<td>Kimbe</td>
<td>4</td>
</tr>
<tr>
<td>Wewak</td>
<td>2</td>
</tr>
<tr>
<td>Alotau</td>
<td>3</td>
</tr>
<tr>
<td>Kavieng</td>
<td>2</td>
</tr>
<tr>
<td>Popondetta</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: InterOil*

Competition between retail outlets is apparent in some forms. Customers in major centres will choose between stations based on factors including the safety and cleanliness of the site, likely queuing times and the availability of other retail products. From time to time retailers will run 'promotions' in order to attract additional traffic. However, this competition will not exist in areas where customers have no alternative supplies. However this is not the same as price based competition.

### 3.2.2 Barriers to Entry

The availability of land and the cost of acquiring or leasing land are in the Commission’s opinion, likely to represent a barrier to building new service stations. Conversations with the wholesalers supported this. However the Commission did note that some new service stations are being developed.

Other possible barriers of entry include:

- The initial capital required to establish a service station. Including the cost of land in a relatively attractive site, and construction of infrastructure, various parties have estimated this cost as being between K1.5 and K3 million in Port Moresby, with lesser amounts in other towns.
- Meeting zoning and safety requirements imposed by local government regulations.

Neither of these barriers is overly onerous in the Commission’s opinion.

Another deterrent to entry will be the size of the market in any particular geographic area. Before entering any market an operator must consider their ability to achieve the sales volumes necessary to cover the fixed cost of operating a retail site. This will include their assessment of their ability to take volume away from existing operators. This is not unique to petroleum markets but is the same for any competitive market.

The Commission is not generally aware of any other barriers to entry.
3.2.3 No observed Price Competition

The monthly retail prices published by the Commission currently provide a range in which retailers can set their price. However the Commission observes that retailers generally choose the top of the price range. So while competing retailers could choose to compete on price, it has been observed that they do not.

It is the Commission’s opinion that there is scope for competition on the basis of price in major centres. The fact that it does not occur could be due to:

- Retailers don't believe price competition will help them win more business
- Retail margins may not support lower prices.
- The nature of the retail petroleum business does not support price competition. The Commission observes that in other countries, where retail prices are not regulated, price differentiation between retail sites in the same area tends not to occur or to be relatively minor. Instead industry players move prices in unison as oil prices and exchange rates move.

3.2.4 Countervailing power held by Customers

The majority of customers buying fuel direct from retailers are likely to have limited countervailing power as any attempt to bypass anyone retailer will not result in a significant loss of business for that retailer. In remote locations customers will often not even have the option of bypassing one retailer in favour of another.

Although some larger customers may have countervailing power, e.g.: a transport company with a truck fleet, this is not the situation usually experienced by end-use customers.

3.2.5 Conclusion on the need for Regulation

In its 2004 Final Report the Commission concluded that the retail market needed to be regulated for the following reasons:

- In rural and remote locations there was no opportunity for competition;
- Wholesalers exercised considerable influence over the retailing behaviour and functions of the retailers; and
- There was a distinct lack of price competition, even in main urban areas.

In the Final 2010 Report, the Commission took the view that the current level of competition, or indeed the potential for future competition, had not materially changed, and if anything may have reduced consistent with reductions in the number of wholesalers and the number of retail outlets. The Commission’s view was therefore that it would be appropriate for the retail sector to continue to be regulated in some form.

Current analysis suggests the market has not changed materially since 2010.

- There still appears to be a strong relationship between wholesalers and retailers.
- As the number of wholesalers in any particular area is low, wholesalers will effectively hold some market power in the retail market.
- Consumers have little market power.
- Price competition does not appear to occur even though there is scope for it.
- Land may be a barrier to entry in some areas.
No submissions opposing regulation of the retail price have been received to date. Furthermore discussions between the commission and various stakeholders indicated that stakeholders were either indifferent or in favour of continued regulation.

Given the above, the Commission’s Proposal is to continue to regulate the retail sector over the next regulatory period.

The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision to continue to regulate the retail sector over the next regulatory period. The Commission is also seeking submissions from interested parties suggesting ways in which price competition could be encouraged at the retail level.

3.3 The need for regulation in the Wholesale market

3.3.1 Observations about the wholesale market

The wholesale market has the following characteristics
- In most areas there are only two providers
- New entrants can enter the wholesale market
- A decision to regulate the retail price is effectively a decision to also regulate the wholesale price
- Wholesalers supply two separate markets. These are;
  - The retail market described earlier and
  - Large fuel consumers such as mining companies

3.3.2 Wholesale Operators

There are currently 6 wholesale operators in PNG. However in most areas there are only two operators with the exception of Port Moresby and Lae. Puma distribute product to most areas, while Mobil and Islands Petroleum effectively co-operate with each other and do not compete in any geographic area. Historically when Mobil have decided to exit a particular area, Islands Petroleum have generally taken over Mobil’s operations in that area. Mobil also supplies fuel to Islands Petroleum in most areas except in Port Moresby.

The other operators are focused upon a limited geographic area. NOC operates terminals in Lae and Mt Hagen from which it services the Highlands region.

Table 2: Regional centres service by wholesale distribution companies

<table>
<thead>
<tr>
<th></th>
<th>POM</th>
<th>Lae</th>
<th>Mading</th>
<th>Rabaul</th>
<th>Kimbe</th>
<th>Kavieng</th>
<th>Wewak</th>
<th>Aitau</th>
<th>Oro Bay</th>
<th>Manus</th>
<th>Mt. Hagen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puma</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mobil</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islands Petroleum</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOC</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Bige Petroleum</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: does not include the supply of unregulated petroleum products.
The Commission has estimated the market shares shown in the following table. While Puma with 42% share have the largest market share of any one company, the Mobil / Islands Petroleum combination has 49% market share.

**Table 3: Approximate market share**

<table>
<thead>
<tr>
<th>Wholesale Distributors</th>
<th>Market Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puma Energy (InterOil)</td>
<td>42</td>
</tr>
<tr>
<td>Mobil</td>
<td>32</td>
</tr>
<tr>
<td>Islands Petroleum</td>
<td>17</td>
</tr>
<tr>
<td>NOC</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
</tr>
<tr>
<td>Bige Petroleum</td>
<td>1</td>
</tr>
</tbody>
</table>

The above market shares should be viewed in the context of the extent of operations of each company at various locations. The commission does not have information about volumes sold by particular companies in particular areas and so has not estimated market shares in any particular region.

### 3.3.3 Market power of Wholesalers

The existence of the Project Agreement, which requires all wholesalers to purchase petrol, diesel and kerosene from Puma, would imply that Puma may possibly have more market power than others. The Project Agreement requires Puma to sell product to all wholesale operators under the same terms and conditions. This should therefore limit the ability for Puma to use their position in an anticompetitive manner. Furthermore, the observation that Mobil, Islands Petroleum and NOC purchase at least a portion of their supplies directly from overseas implies that in practice Puma do not exert market power over the other operators.

The wholesalers however are likely to have some market power over retailers. While retailers have a choice of which Wholesaler they use, this choice is somewhat confined to a point in time. Once a retailer has chosen a wholesale supplier, then there are likely to be material barriers to switching. These include:

- Contract agreements with wholesalers
- The cost of changing branding at a site.
- Retail assets owned by wholesalers

As previously noted the Commission only received copies of contract agreements from Mobil. Based on this and a lack of further response from other Wholesalers the Commission must assume that agreements are likely to create some sort of barrier to switching.

Discussions with wholesalers indicated that wholesalers had a variety of different arrangements with retailers. In some cases the wholesaler would own particular assets such as pumps or underground tanks. Wholesalers would also provide assistance to a new retailer to help them set up their site. This might take the form of planning and designing systems. In most cases the wholesaler did not operate any retail sites directly.

The Commission is of a view that while wholesalers may not be vertically integrated with retailers, because of the relationship between wholesalers and retailers competition between retailers is somewhat constrained by the level of competition between wholesalers.
3.3.4 Large Fuel Customers

In previous determinations the Commission has not regulated the price of fuel to large customers. Such customers were considered to have market power because of their size. Essentially the attractiveness of large volumes is enough for a wholesaler to offer more competitive prices. Equally as important, a large consumer of fuel could choose to either import fuel directly or to bypass the wholesaler.

In the Commission’s view these large customers have sufficient market power, that they do not need price protection. Therefore the Commission is proposing to continue to leave prices for these customers unregulated.

The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision to continue to leave prices for large customers unregulated.

3.3.5 New entrants

The recent entry into the wholesale market by both Total and Big Petroleum, confirms that new entry is possible.

The Commission noted the concern of some wholesalers that some of the new entrants did not meet all regulations. In particular their sites were not necessarily bunded and there may be serious risk of environmental contamination at their sites. The Commission also notes that such concerns are the role of the Department of Petroleum and Energy and the Department of Environment and Conservation.

Entry into the wholesale market requires investment in storage and distribution infrastructure. Generally in free markets, new entrants will enter if they are convinced that the returns available to them in the market are greater than the cost of capital. The Commission considers that the entry of new wholesalers indicates that wholesale margins may be too high.

The Commission is proposing that the Wholesale market continues to be regulated in effect via the regulation of the retail price.

The Commission is seeking comments from stakeholders, interested parties and the general public on its proposal that the wholesale market continues to be regulated in effect via the regulation of the retail price.

3.4 Domestic Freight – Coastal Shipping

Currently coastal shipping costs for domestic freight are monitored rather than regulated. The Commission receives information from wholesalers about actual coastal shipping costs. This information is used to calculate retail prices.

In the Commission’s view there is little or no incentive for wholesalers to attempt to drive down coastal shipping costs, because any costs incurred are simply passed on. In the 2009 review the Commission noted that there were a number of reasons why wholesalers might choose to have ships with spare capacity to provide operational flexibility. Also because wholesalers are not sharing shipping capacity the size of the ships used is potentially smaller and therefore more expensive on a per litre basis.

To address this issue Puma provided the Commission with the following information. The information provided the level of utilisation during each voyage, but does not indicated whether or not more voyages could have been made during the periods covered.
Table 4: Vessel Utilisation

<table>
<thead>
<tr>
<th>Voyage Date</th>
<th>Utilisation</th>
<th>Voyage Date</th>
<th>Utilisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-Jul-13</td>
<td>70.35%</td>
<td>9-Jul-13</td>
<td>95.13%</td>
</tr>
<tr>
<td>22-Jul-13</td>
<td>64.27%</td>
<td>30-Jul-13</td>
<td>93.41%</td>
</tr>
<tr>
<td>6-Aug-13</td>
<td>66.91%</td>
<td>17-Aug-13</td>
<td>93.89%</td>
</tr>
<tr>
<td>24-Aug-13</td>
<td>90.31%</td>
<td>8-Sep-13</td>
<td>96.18%</td>
</tr>
<tr>
<td>15-Sep-13</td>
<td>80.73%</td>
<td>23-Sep-13</td>
<td>98.35%</td>
</tr>
<tr>
<td>1-Oct-13</td>
<td>74.32%</td>
<td>11-Oct-13</td>
<td>99.27%</td>
</tr>
<tr>
<td>22-Oct-13</td>
<td>72.34%</td>
<td>30-Oct-13</td>
<td>95.20%</td>
</tr>
<tr>
<td>7-Nov-13</td>
<td>70.08%</td>
<td>16-Nov-13</td>
<td>96.57%</td>
</tr>
<tr>
<td>23-Nov-13</td>
<td>52.04%</td>
<td>9-Dec-13</td>
<td>94.89%</td>
</tr>
<tr>
<td>7-Dec-13</td>
<td>72.82%</td>
<td>23-Dec-13</td>
<td>80.95%</td>
</tr>
<tr>
<td>10-Dec-13</td>
<td>57.79%</td>
<td>5-Jan-14</td>
<td>89.10%</td>
</tr>
<tr>
<td>25-Dec-13</td>
<td>85.03%</td>
<td>24-Jan-14</td>
<td>72.99%</td>
</tr>
<tr>
<td>11-Jan-14</td>
<td>64.78%</td>
<td>5-Feb-14</td>
<td>87.63%</td>
</tr>
<tr>
<td>27-Jan-14</td>
<td>47.92%</td>
<td>2-Mar-14</td>
<td>85.08%</td>
</tr>
<tr>
<td>12-Feb-14</td>
<td>52.49%</td>
<td>20-Mar-14</td>
<td>52.95%</td>
</tr>
<tr>
<td>27-Feb-14</td>
<td>55.21%</td>
<td>6-Apr-14</td>
<td>83.30%</td>
</tr>
<tr>
<td>24-Mar-14</td>
<td>38.22%</td>
<td>26-Apr-14</td>
<td>96.73%</td>
</tr>
<tr>
<td>1-Apr-14</td>
<td>52.73%</td>
<td>17-May-14</td>
<td>93.63%</td>
</tr>
<tr>
<td>18-Apr-14</td>
<td>62.12%</td>
<td>8-Jun-14</td>
<td>94.73%</td>
</tr>
<tr>
<td>6-May-14</td>
<td>54.04%</td>
<td>23-Jun-14</td>
<td>82.52%</td>
</tr>
<tr>
<td>22-May-14</td>
<td>63.43%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-Jun-14</td>
<td>58.93%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-Jun-14</td>
<td>57.65%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Puma Energy

The Commission notes that in practice there is a significant proportion of the total market volume which does not incur any coastal shipping cost in practice.

In the 2009 review, the Commission determined to establish a coastal shipping index and to use this to set coastal shipping costs. It was envisaged that the Commission would work with the wholesalers to do this. However this has never happened.

The Commission is proposing to put this index in place for the next regulatory period. In effect this will mean that actual shipping costs will no longer passed through, but will be set by the Commission.

*The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision to set the freight rates for Coastal Shipping.*

3.5 Domestic Freight – Road Transport

Currently domestic road freight costs are monitored by the Commission. The Commission collects actual cost information from wholesalers and includes this in the calculation of monthly retail prices. Effectively the actual costs of road freight are passed on to consumers via the retail price.

In the Commission's view there is no incentive for wholesale providers to find ways of reducing the cost of road transport. Any costs they incur can simply be passed on.
The challenges around road freight, as outlined above remain. This is highlighted by a submission from Matara No. 8 Ltd, which cites the case of damage caused by cyclone Guba in 2007, destroying road infrastructure in the Northern Province which has yet to be rebuilt. Temporary bridges were built, but have subsequently been washed away and rebuilt several times. InterOil also acknowledge the road transport challenges, noting that “no one should be deluded to think that the road transport network that is available to residents in Port Moresby is representative of the conditions of the road infrastructure in the rest of the country.”

One of the discussions that the Commission had with one wholesaler also raised the possibility that trucking companies were communicating with each other regarding the setting of freight rates, and that there was potentially collusion occurring to keep rates higher than economically necessary.

Given the continuing challenges presented in terms of transporting product by road, the obvious wide range of conditions that face trucking firms operating in various parts of the country and the concerns raised in terms of potential collusion, the Commission proposes to regulate road freight. The form of regulation is outlined below.

In discussions with wholesalers, the Commission asked them about the process they went through to issue contracts to third parties to transport their products. There was a clear focus upon reliability and safety, which is to be commended. The processes appeared to be robust and professional. However it was not clear, to the commission, that the process used was competitive, in that only a limited number of companies were involved in the selection.

In theory road transport costs could be driven by a competitive bidding process. However in practice there are likely to be a limited number of road transport companies in any one area which have the vehicles and expertise to deliver bulk quantities of flammable goods. It is therefore not clear to the Commission just how competitive a bidding process is likely to be in practice.

Also, the Commission would expect that any road transport operator having made an investment in a specialised vehicle would want to have a contract which covered a time period which was long enough to recover the costs of their investment. The commission would expect that this is likely to be 3 or 4 years. So in practical terms it is likely that competitive bidding processes are going to be carried out only once during the term of a regulatory contract.

In view of the above market dynamics, the Commission is proposing that road transport costs be set by the Commission, for the purpose of setting retail prices, rather than simply being passed through. The Commission is open to persuasion that road transport bids can be competitive. In order to be competitive, the Commission would want to be assured that at least three separate bids were received for any particular delivery route. This does appear to be the case at present. Also if the Commission sets road freight charges, then the various parties will have an incentive to reduce their actual costs. Any cost savings they can make will accrue to them as increased profits.

The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision to set road transport costs for the purpose of setting the domestic fuel prices. The Commission is also inviting stakeholders to make submissions on the viability of holding competitive tenders for road transport.

### 3.6 Av Gas

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2. InterOil submission on issues paper 2014, p 18.
3.6.1 Current Regulation of Av Gas

Avgas is a high octane aviation fuel used in piston powered aircraft. In PNG, Avgas has mostly been used by third level and charter operators who utilise smaller piston driven aircraft which service the remote areas of PNG. However modern aircraft increasingly use Jet A1 and Avgas usage has declined to very low levels. Avgas is not produced at the Napa Napa refinery and is imported into PNG in 200 litre drums.

Avgas is currently declared under section 10 of the PR Act for price monitoring under Section 32A of the PR Act and is regulated in the following manner:

- the Commission performs a price monitoring role in respect of the monthly landed cost of Avgas. Wholesalers provide landed costs to the Commission which then examines these costs to see if they are trending in the same manner as a benchmark. The Commission has adopted the IPP kerosene price as the appropriate benchmark; and
- as with petrol, diesel and kerosene, the standard wholesale margin applies to Avgas.

3.6.2 Competition in the Avgas market

The Commission noted in the last review that the demand for Avgas had declined substantially over the last twenty years, and consequently it was being imported in 200 litre drums, not bulk quantities. The latest volume forecasts indicate that only Puma Energy intends to sell Avgas in 2015, some 51,000 litres, and that it doesn't forecast sales beyond that point.

Operators of Avgas powered aircraft were expected to upgrade their aircraft to Jet A1 powered turbine engines, and this would appear to have happened, given the low forecast sales for 2015. InterOil pointed out in its submission to the last review that because Avgas is imported in drums, no special facilities are required and hence barriers to entry are low. At that time, in light of the potential competition and small (and declining) size of the Avgas market, InterOil suggested that price regulation of Avgas was not required. The Commission determined that it was appropriate to maintain some form of relatively light handed regulation of Avgas, and determined that it would continue to monitor the landed price of Avgas under the existing arrangements.

3.6.3 Commission’s Assessment

Given that the projected sales of Avgas has now reached a level where only one wholesaler is forecasting to sell it in 2015 and none beyond this point, continued regulation does not appear to be warranted. The Commission therefore proposes that it is now time to cease regulation of Avgas in any form.

The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision to cease the regulation of Avgas in any form.

3.7 Consideration of regulating Jet A1 Fuel

3.7.1 Overview of Jet A1 Fuel

Jet A1 is used in turbine aircraft engines and is produced at the Napa Napa refinery. Jet fuel is similar to kerosene.
Over the past 25 years jet fuel, including Jet A1, has been increasingly used in the airline industry, both worldwide and in PNG, rather than Avgas. This is because environmental and cost considerations have led to increasing numbers of aircraft being fitted with highly fuel-efficient engines.

The price of Jet A1 at the Refinery gate is currently monitored by the Commission under Section 10 and 32A.

### 3.7.2 Rationale for Regulation

The Commission notes that there is some contestability in the Jet A1 Market. International airlines travelling to Port Moresby typically have the capability to fill up their fuel tanks sufficiently at other international airports so that they do not need to refuel at Port Moresby. This creates a competitive limit to the price that can be charged for fuel in Port Moresby.

Similarly domestic flights can choose to carry additional fuel so that they do not have to refuel at any one particular airport. Again this creates some price contestability between airports.

The Commission notes that at Jackson’s Airport (Port Moresby) there are two distributors of Jet A1.
- PNG Ground Services is owned by Airlines PNG and supplies all their requirements exclusively.
- Pacific Energy Aviation serves the rest of the market and has contracts in place to supply Air Niugini.

From this it can be seen that airlines have some countervailing market power. Airlines PNG provide an example of this in that they have chosen to supply their Jet A1 rather than purchasing product from Pacific Energy Aviation. This enables them to purchase product directly from the refinery.

Puma in their submission noted that they supported the ongoing monitoring of Jet A1 at the refinery gate. They did not however support the monitoring of Jet A1 prices to users. They noted that there were additional costs for Jet A1 due to the following;
- Degree of complexity involved in managing and distributing the product
- The requirement for specialised and dedicated equipment for handling, storing, distributing and dispensing of this product into aircraft.

The Commission notes that Pacific Energy Aviation is planning substantial new investments in infrastructure at Jackson’s Airport. If the Commission did choose to regulate Jet A1 prices to end users then the cost of airport infrastructure would need to be considered. This would require some cost and complexity in determining a price.

### 3.7.3 Draft Proposal on Jet A1 fuel

Given the countervailing market power of airlines and because of the effective competition for fuel supply between airports, the Commission does not see any need to change the current price monitoring arrangements. Consequently the Commission is proposing to continue to monitor the price and volumes of Jet A1 under Section 10 and 32A of the Price Regulation Act.

*The Commission is seeking comments from airlines, stakeholders, interested parties and the general public on its draft decision to continue to monitor the price and volumes of Jet A1 under Section 10 and 32A of the Price Regulation Act.*
4  REFINING AND THE PRICE OF LANDED PRODUCT

This review of pricing of petroleum products focuses primarily upon the pricing of wholesale, retail and transport activities. However, it is important to consider these issues in the context of the structure of the whole industry in PNG, including the refining sector. Furthermore, where the present arrangements that apply to aspects of the supply of petroleum products from the refinery have an impact upon the Commissions decisions, then it is appropriate that the Commission consider these issues holistically.

The ex-refinery prices paid by wholesalers for refined product are set by the Project Agreement which is described in the following section. These prices have a significant impact and contribute to more 60 percent of the final retail pump price of regulated petroleum products. For this reason the Commission has included this section within this report, even though the Commission has no authority over the setting of these ex-refinery prices.

4.1 The Project Agreement

In 1997, the PNG government entered into an agreement with InterOil, referred to as the Project Agreement. The agreement was that InterOil would build a refinery in PNG and that in return for doing so, InterOil would have a monopoly on the supply of petrol, diesel and kerosene to PNG. Since that time all wholesalers have been required under the agreement to purchase these products from InterOil, now Puma.

Following the signing of the Project Agreement, InterOil built the refinery at Napa Napa on the outskirts of Port Moresby. This is still the only refinery in PNG.

The refinery is a hydro skimming refinery. This type of refinery is simple and is equipped with atmospheric distillation, naphtha reforming and the necessary treating processes. In this type of refinery, crude oil is passed through a heating system to be heated to a temperature of about 400°C and then passed to a distillation and fractional column. A temperature grade is created in the distillation column so products with different boiling points can be separately collected.

According to Puma, the configuration uses light sweet crude oil to avoid the need for hydro-treating or complex and expensive heavy oil processing such as catalytic cracking and coking. The Napa Napa refinery consists of only atmospheric distillation plus a modest catalytic reformer for production of gasoline blend stock.

The Commission understands that the primary purpose of establishing the Napa Napa refinery, under the Project Agreement, was to refine the crude oil sourced from the Kutubu oil fields in the Highlands of PNG. However the Commission also understands that this does not occur. Currently crude from the Kutubu oil fields is exported and Puma import crude to refine in the Napa Napa refinery. The Commission understands that this is likely to be a breach of the Project Agreement.

Also the Commission understands that Mobil and Niugini Oil import much of their own product, rather than purchasing their entire product from Puma. The Commission understands that this also is likely to be a breach of the Project Agreement. The Commission understands that Mobil began importing in 2007 when InterOil closed the refinery and stopped supplying the market for a short period of time. Since then Mobil has continued to import its own product.

4.2 Import Parity Pricing (IPP)

The Project Agreement specifies the price that wholesalers must pay Puma for Petrol, diesel and kerosene. This is referred to as the IPP or Import Parity Pricing. The idea was that a wholesaler would pay Puma a price which reflected what they would pay if they were purchasing product on the international market and importing it into PNG. It is assumed that the most likely place to purchase product into PNG would be Singapore. So the IPP is calculated to reflect the international
price of refined fuel products delivered into PNG from Singapore. In addition to these costs there is also a margin added. This was presumably included to reflect that a small refinery in PNG could not be economically competitive with Singapore refineries.

The component of the IPP formula as per the Project Agreement is outlined below.

**Average Singapore Product Prices (US cents/gallon)**

- **Puma Margin (USD / BBL)**
- **International Freight Charge (tpl)**
- **Other costs at specified rates (tpl)**
  - marine insurance
  - ocean loss
  - landing charges
  - inland loss
  - additives
  - demurrage
- **Import Parity Prices (tpl)**

### 4.3 Impact of the Project Agreement on the market

In the Commission’s view the Project agreement has had two impacts upon the market.

- It has created a market distortion
- It has increased the price to consumers above what they would pay if the agreement did not exist.

#### 4.3.1 Market Distortion

The Project Agreement requires all wholesalers to purchase 100% of their product from Puma, however this does not occur. The Project Agreement also envisaged that wholesalers would share coastal shipping and in this way take advantage of lower per litre transport costs available from the scale of using larger vessels. This occurs, but only to a limited extent. Niugini Oil use Puma’s coastal shipping arrangement to supply product which they purchase ex Napa Napa. But Mobil operate its own coastal shipping.

Direct import of product into Lae, Port Moresby and Madang has the following effects.

1. Importers avoid paying Puma the margin built into the IPP.
2. Importers avoid the cost of shipping product from Port Moresby to Lae and Madang.
3. The total quantity transported from Port Moresby to Lae and Madang is reduced so that the average cost per litre is increased due to smaller vessels being used.
4. The regulated retail price includes the cost of Puma’s margin and the costs of domestic coastal shipping, so those wholesalers that import product directly earn higher margins. Specifically they earn higher margins than Puma does and also higher margins than the regulated retail price is designed to give them.
Because of these factors the overall effect of the IPP pricing mechanism is that the market is not a level playing field. Furthermore some operators are making excess profits. And these excess profits are paid for by consumers through higher petroleum prices.

At current prices and exchange rates, the Commission estimates that an importer will be paying 19 toea per litre less than the IPP price for product delivered directly to PNG ports outside of Port Moresby. For product imported into Port Moresby the saving would be about 16 toea per litre. This is about 5% of the retail price.

The Commission also expects that Mobil can also make savings by integrating their shipping arrangements with requirements for other markets where they operate in the Asia/Pacific region.

There are two ways that this market distortion could be removed.

1. Enforcement of the Project Agreement
2. Termination of the Project Agreement

Both of these solutions are outside of the Commission's control.

**4.3.2 Options for Puma**

The Commission notes that Puma have not chosen to take Mobil or Niugini Oil to court to enforce the Project Agreement. The Commission can only speculate as to why not. Possibly this is due to Puma being in breach of the agreement themselves. Equally the Commission notes that Mobil and Niugini Oil are not deterred by the possibility of being taken to court. The benefit of direct importing for Mobil in particular is worth many millions of dollars per year. The Commission would expect this to far outweigh the risk of being taken to court.

The Commission also notes that Puma could also choose, if they wished and were allowed under the Project Agreement, to directly import refined product to PNG. At present they are importing crude oil to the refinery and they carry the capital and operating costs of the refinery itself. Such a decision to import would depend upon Puma's view of the economic efficiency of their refinery. The Commission would expect that larger more modern refineries would be more economically efficient and that at some point, Puma will elect to either close the refinery or replace it with a modern one. (The current refinery was second hand when it was installed 17 years ago). Singapore refineries tend to have processing capacity of 400,000 to 600,000 barrels per day while the Napa Napa refinery has a capacity of only 30,000 barrels per day.

Depending on the supply and demand in the international market place, as reflected in the price of petroleum products in Singapore, Puma will have varying incentives to source and refine crude oil within its refinery at Napa Napa. For example, if Singapore prices are low it may be more cost effective for Puma to import refined products from overseas. Importation may also occur due to scheduled and unscheduled outages at the refinery and the availability of crude from domestic sources.

**4.3.3 The IPP cost to consumers**

The commission estimates that the overall cost to consumers of the IPP is about 150 million kina per year at today's exchange rates and freight costs. As shown in the following table this includes the cost of the IPP margin and the cost of coastal freight that would be avoided if product were directly imported.

<table>
<thead>
<tr>
<th>Table 5: Cost of the IPP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of IPP Margin</td>
<td>K90 million</td>
</tr>
<tr>
<td>Avoided cost of transport from Napa Napa to cross harbour</td>
<td>K40 million</td>
</tr>
<tr>
<td>Avoided cost of transport to Lae and Madang</td>
<td>K20 million</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Estimated cost of IPP</td>
<td>K150 million</td>
</tr>
</tbody>
</table>

### 4.4 Price Monitoring

The Project Agreement set the IPP formula in place prior to the Commission's establishment in 2002. The Commission is not a party to the Project Agreement and is not mandated to control the prices at the IPP level.

Nevertheless, the Commission decided in its 2004 and 2009 Final Determinations that it would regulate the IPP for price monitoring purposes.

Under this price monitoring approach, the Commission receives daily updates from Puma Energy on the Singapore refined product prices which is usually referred to as Mean of Platts Singapore ("MOPS"). At the end of each month the Commission verifies the calculation of the variables in the IPP to ensure that Puma’s calculation is consistent with the above IPP formula in the Project Agreement.

As part of this monitoring arrangement, the Commission informs the Minister for Treasury on the monthly IPP changes and its impact on the maximum retail prices. A public notice is also provided to media outlets describing the price changes for Port Moresby, and the details of the pricing for all other regions in PNG is made available to all wholesalers so they can adjust their prices under the various price control or monitoring arrangements.

### 4.5 Continued Monitoring

The Commission has reviewed the current state of the industry and has concluded that very little has changed since the 2009 review.

_Mobil stressed that it was important that the Import Parity Prices (IPP) reflects the true costs of importing to ensure the viability of imports.

Imports of fuel provide an additional source of supply enhancing supply security and reliability to the growing fuel industry in PNG. As there is no competition in the domestic refining sector, there is a need for ICCC to regulate and monitor IPP to ensure that the prices sold out of the Napa Napa refinery are fair and competitive. Mobil also stressed that it was critical to ensure that there is transparency of product pricing and a level playing field for wholesalers and marketers in PNG._

_InterOil also supported the continued monitoring of the IPP by the Commission, but on the basis that the IPP is used common to all domestic distributors. InterOil stated that the use of the IPP to establish a base upon which maximum margins are determined worked reasonably well when all downstream distributors were adhering to the intent of the Project Agreement and were all purchasing their refined product from the Napa Napa refinery. However since some distributors started importing their fuel supplies, their cost of product associated with these imports must be consistently less than the IPP costs._

_The benefits of monitoring the IPP as stated by InterOil include:_

1. The IPP formula contains a variety of data and calculations. The monitoring process by the ICCC adds a level of confidence to all IPP users that there are no errors in the calculated prices.
2. The Commission provides a focal point for all pricing enquiries within PNG.
3. The ICCC can build a public understanding of the impacts of international market changes upon the components of the IPP formula.\textsuperscript{4}

4.5.1 The Commission’s Proposal
From the above analysis, the Commission is of the view that it will continue to monitor the Import Parity Prices. The Commission will continue to monitor the IPP for petrol, diesel and kerosene ex the Napa Napa refinery under Section 32A of the PR Act. The Commission will monitor volumes of petrol, diesel and kerosene produced at the Napa Napa refinery, the advance nominations for supply from each distributor and imports of regulated products by each distributor including Puma Energy.

\textit{The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision to continue to monitor the IPP and volumes of petrol, diesel and kerosene ex the Napa Napa refinery under Section 32A of the PR Act.}

\textsuperscript{4} InterOil submission to issues paper, pg 12
5 WHOLESALE AND DISTRIBUTION

5.1 Current regulatory arrangement

In its 2009 Final Report, the Commission elected to apply different forms of regulation to the separate elements of the wholesale and distribution chain. The current arrangements provide for the following:

- Sea freight charges from the Napa Napa refinery to the sea ports of Maritime Provinces are price monitored under a ‘pass through’ type arrangement in accordance with Section 32A of the PR Act. The industry informs the Commission of actual freight costs on a quarterly basis, and any under or over recovery from the previous quarter are adjusted for in the following quarter;
- Road freight charges from the wholesalers’ depot gate are monitored under a similar ‘pass through’ arrangement. These costs are included in the final retail price paid for by the consumers;
- The wholesale margin for petrol, diesel, kerosene and Avgas is capped under a price control mechanism, as provided for by Sections 10 and 21 of the PR Act. The maximum wholesale margin is set and adjusted annually using a CPI+X price path at 2.4% so CPI+2.4%; and
- The retail margin for petrol, diesel, kerosene and Avgas is capped under a price control mechanism, as provided for by Sections 10 and 21 of the PR Act. The maximum retail margin is set and adjusted annually using a CPI-X price path at 0.7% so CPI-0.7%; and
- There is an additional margin on top of the wholesale margin for petrol, diesel and kerosene sold in drums. This margin is subject to the same CPI+X formula as the wholesale margin and is CPI+2.4%.

The table below illustrates the relative magnitude of the various components of the fuel price (including the retail margin) that a customer buying diesel at a service station in Port Moresby paid in June 2014. As can be seen, the IPP is the dominant component and represents around three quarters of the total price. In contrast, combined sea and road freight costs are only 7% for Port Moresby, although they are significantly higher in other locations. For example, sea and road freight costs are around 45 toea in Mt Hagen, three times the amount for Port Moresby.

<table>
<thead>
<tr>
<th>Cost element</th>
<th>Cost (toea per litre)</th>
<th>% of final price</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPP</td>
<td>256.88</td>
<td>68</td>
</tr>
<tr>
<td>Excise Duty</td>
<td>6.0</td>
<td>2</td>
</tr>
<tr>
<td>Sea freight</td>
<td>13.88</td>
<td>4</td>
</tr>
<tr>
<td>Road freight</td>
<td>5.75</td>
<td>2</td>
</tr>
<tr>
<td>Wholesale margin</td>
<td>36.6</td>
<td>10</td>
</tr>
<tr>
<td>Retail margin</td>
<td>20.5</td>
<td>5</td>
</tr>
<tr>
<td>GST (10%)</td>
<td>33.96</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total (Retail Price)</strong></td>
<td><strong>373.57</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: ICCC

5.2 Demand and supply for petroleum products

In undertaking this review, it has been necessary for the Commission to consider likely demand for petroleum products. The Commission has considered the submissions of the wholesalers and has formed its own view.
5.2.1 Demand and supply in the current regulatory period

The 2010 Final Report projected a significant growth for 2009 over 2008 petroleum sales, in the order of 9% overall (while the report was issued post 2009, the forecast was not replaced with actual figures). This was then followed by much more muted annual growth of around 1.5% per annum over the period to 2014, well below the projected 5.6% pa GDP growth. The table below provides data on actual growth and forecasts over the next period, though limited by the fact that some respondents did not submit data for some of the years requested – the missing data has been modelled off trend data in order to form a view.

As illustrated in Chart 1, the growth rate from 2010 to 2013 below for petrol is around 2.8 times the previous projection, while diesel growth has been more than 3 times the projected amount. The actual GDP growth, at 7.8%, was around 1.4 times the previous projection. Kerosene was forecast to grow by 1.7%, but in fact declined by 12.6%. The 2014 versus 2013 figures look out of line with the previous trend for diesel and Kerosene.

![Chart1: Forecast growth compared to actual growth](image)

The increase in sales to 2013 reflects higher shares for InterOil and NOC, and to a lesser degree for Island’s Petroleum. Part of the change in share will relate to the sale of Mobil assets to Islands petroleum.

<table>
<thead>
<tr>
<th>Product</th>
<th>Previous Forecast 2009 to 2014 growth</th>
<th>Actual 2010 to 2013 growth rate</th>
<th>2014 forecast increase in sales over 2013</th>
<th>Forecast 2014 to 2019 growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrol</td>
<td>1.8%</td>
<td>5.0%</td>
<td>3.1%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Diesel</td>
<td>1.5%</td>
<td>4.9%</td>
<td>-2.3%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Kerosene</td>
<td>1.7%</td>
<td>-12.6%</td>
<td>18.2%</td>
<td>0.7%</td>
</tr>
<tr>
<td>All products</td>
<td>1.5%</td>
<td>4.6%</td>
<td>-1.5%</td>
<td>2.2%</td>
</tr>
<tr>
<td>GDP increase</td>
<td>5.6%</td>
<td>7.8%</td>
<td>6.0%</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

Source: Mobil, InterOil, NOC, Islands Petroleum, 2014 Budget Strategy Paper

5.2.2 Demand and supply in the next regulatory period

Puma has commented that their actual volumes were considerably higher than projected, and says part of the reason for this was the PNG LNG project reaching “financial closure” just prior to the issuing of the last final report, and the fact that Puma achieved a share of project related sales.
beyond its expectation given it was led by ExxonMobil. Puma further comments that flow on effects of the project, including growth in demand from construction and road transport, further fuelled demand for petroleum products, facilitating higher growth than previously forecast.

Puma argues that imported fuel will reduce its market share in the coming period, and that other wholesale market participants should be projecting an increase in market share, and therefore higher volume growth. Currently, Mobil have not provided a projection for sales from 2015 to 2019. For 2015 to 2019 Islands Petroleum shows growth of around 3.5% on average in volumes, with NOC projecting an average 2% growth. Both of these figures look low compared to the previous period, though Islands Petroleum showed a peak in growth in 2011, and NOC hasn't provided actual data for 2010.

Overall the forecast growth for the coming period looks light when compared with projected GDP growth, and the trends from 2010 to 2014. Furthermore the current petroleum growth forecast over the coming period is even more conservative than that for 2009 to 2014, which was significantly below the actual outcome.

Future demand for oil products in PNG will be determined by a number of factors although the key factors will be general growth in the economy. The following table sets out the Government's projections for real GDP growth for the next regulatory period.

Table 7: Treasury projections of GDP growth

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP growth</td>
<td>6.0%</td>
<td>21.5%</td>
<td>3.1%</td>
<td>3.3%</td>
<td>1.9%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Department of Treasury, 2019 forecast not available

Growth is projected to ease to 6.0 per cent in 2014 with the winding down of the PNG LNG project construction phase in 2014 before increasing to 21.5 per cent in 2015 reflective of the commencement of PNG LNG project production towards the end of 2014 before returning to a growth of around 3.0 per cent thereafter. Other sectors of the economy are also expected to grow over the medium term in line with the major drivers of the economy.

The IEA Oil Market Report for June forecast a 1.3 million barrel-per-year (mb/d) rise in global oil demand for this year, to 92.8 mb/d, a modest acceleration on 2013 as the macroeconomic backdrop improves. Global oil demand is set to increase sharply from a low of 91.4 mb/d in the first quarter to a high of 94 mb/d in the fourth. Currently the spot price of crude oil is around US$97 a barrel, and the one year forecast price is around US$110 per barrel.

Given the ongoing growth forecast for the PNG economy, growth over the last period of petrol, diesel and kerosene sales, at 3.6%, were around a level of 47% of the GDP growth and forecast growth in world demand, it is reasonable to expect demand over the next period to sit at a similar ratio to GDP. The forecast average GDP growth from 2014 to 2019 is 7.2%, which assuming the same ratio of sales of petrol, diesel and kerosene to GDP growth of 47% would suggest growth of around 3.3%, so the Commission will review demand forecasts with a view to adjusting for any shortfall in the submitted petrol and diesel forecasts.

The Commission has applied a growth per annum assumption of 3.3% to the projected total 2014 sales of petrol, diesel and kerosene. Table 7 below shows the comparison of the projected total sales from the submitted data, and the adjusted demand, as determined by the Commission, which has been used to calculate the wholesale X factor.
### Table 7: Total industry demand - petrol, diesel and kerosene (’000 litres)(million litres)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected sales</td>
<td>1,082</td>
<td>1,080</td>
<td>1,092</td>
<td>1,109</td>
<td>1,118</td>
<td>1,131</td>
</tr>
<tr>
<td>% change</td>
<td>-0.2%</td>
<td>1.1%</td>
<td>1.6%</td>
<td>0.8%</td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>Commission's assessment</td>
<td>1,082</td>
<td>1,118</td>
<td>1,155</td>
<td>1,193</td>
<td>1,233</td>
<td>1,273</td>
</tr>
<tr>
<td>% change</td>
<td>3.3%</td>
<td>3.3%</td>
<td>3.3%</td>
<td>3.3%</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>Drum Sales</td>
<td>83</td>
<td>85</td>
<td>88</td>
<td>91</td>
<td>94</td>
<td>97</td>
</tr>
</tbody>
</table>

The Commission is seeking comments and submissions from all stakeholders on the forecasts used for total industry demand.

### 5.3 Wholesale Margin

#### 5.3.1 The form of regulation

As noted above, the current form of regulation for the wholesale margin is price control under sections 10 and 21 of the PR Act. Under this arrangement, the Commission has adjusted the wholesale margin annually based on a CPI +2.4% formula since the last review. It should be noted that this was higher than the CPI+2% escalation that was to apply from the 1 January 2010, to allow for the fact that the commencement date of the new X factor was from 1 November 2010. The margin applies to petrol, diesel, kerosene and Avgas. The table below sets out the wholesale margin that has applied for each year of the current regulatory period.

<table>
<thead>
<tr>
<th>Year</th>
<th>Wholesale margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>29.3 toea/litre</td>
</tr>
<tr>
<td>2011</td>
<td>31.3 toea/litre</td>
</tr>
<tr>
<td>2012</td>
<td>34.2 toea/litre</td>
</tr>
<tr>
<td>2013</td>
<td>35.8 toea/litre</td>
</tr>
<tr>
<td>2014</td>
<td>36.6 toea/litre</td>
</tr>
</tbody>
</table>

Having decided that regulation of the wholesale and distribution margin should continue, the Commission must decide upon the form of price regulation to be applied.

Under the PR Act, the Commission has two broad options in terms of the form of prices regulation it can adopt. Section 10 of the PR Act provides for the declaration of goods or services which allows the Commission to declare a maximum price for these goods or services (Section 21). The specification of a maximum price under Section 21 requires the Commission to undertake a public and transparent process whereby the details of the proposed determination are explained and opportunity given for the wider community to consider and comment upon the Commission's proposed price determination (see Sections 20A and 20B).

Under Section 32A of the PR Act, the Commission may monitor the prices of any services declared as monitored goods and services by the Minister under this Section. The monitoring process is less interventionist than the price declaration process and does not require the Commission's approval each time a price changes. However, the Commission is required to maintain a supervisory role of these monitored prices. If after a period of price monitoring, the Commission forms a view that changes in prices are not reflecting movements in underlying costs based on movements in some...
benchmark index or price, the Commission can report to the Minister the desirability of having the relevant goods and services declared under Section 10 for purposes of setting a maximum price under Section 21. In the context of the petroleum industry, the Commission has used the price monitoring process to allow businesses to ‘pass through’ changes in input costs (for example sea freight and road freight) and reflect them in final customer prices.

As noted, the current form of regulation for the wholesale margin is price control.

In their submission, Puma remained generally supportive of the Commission reviewing and setting the Wholesale margin. Concerns they raised were:

- The potential for the wholesale margin to provide over recovery or “super margins” to those wholesalers who are importing refined product
- The potential for importers to cherry pick high volume business (presumably via an importing cost advantage allowing sharper volume discounts)
- The viability of the Napa Napa refinery could be threatened by imported product reducing its viability.

Mobil was also supportive of the current form of regulation. They saw importing as reducing risk for PNG, in terms of reliance on a single refinery, and portrayed importing as offering the industry options to balance supply from multiple sources.

As the Commission has reviewed the costs of wholesalers, it has been apparent that some are more efficient than others. This is discussed in more detail in later sections of this report. The role of the Commission is to ensure that regulated products are delivered efficiently. It is therefore inappropriate for the Commission to allow the pass through of costs if they reflect a level of inefficiency. Therefore the Commission’s Draft Proposal is that it will continue to regulate the wholesale margin under Section 21 of the PR Act via direct price control by applying a uniform margin across the country.

The Commission is seeking comments from stakeholders, interested parties and the general public on its draft determination to continue to regulate the wholesale margin under Section 21 of the PR Act via direct price control by applying a uniform margin across the country.

5.3.2 Previous approaches to calculating the Wholesale Margin

In the 2009 determination the wholesale margin was calculated using a building block approach. Under this approach, the Commission calculated a revenue requirement for the wholesale distribution companies based on what was deemed to be their efficient operating expenditure forecasts with an allowance for an appropriate return on and of capital investments. The process for determining the revenue requirement was as follows:

\[
\text{Revenue requirement} = \text{Efficient operating expenditure} + \text{Return on capital (calculated by applying a specified rate of return to value of the regulated asset base)} + \ldots
\]

5Mobil submission on issues paper 2014, p13.
Return of capital (an allowance for depreciation of the regulated asset base based on the remaining economic life of the company’s infrastructure assets).

The revenue requirement was then divided by forecast sales volumes to determine the per unit rate that the companies must recover from the sale of their product to cover their costs. This rate is the current per litre wholesale margin.

In its 2004 determination, the Commission used an industry average approach to determine the building blocks and margin to apply. That is, the sales and expenditure forecasts of each company were combined and averaged to determine what the wholesale margin should be for the entire industry. This approach was designed to recognise that some firms were more capital intensive than others (that is, have different balances between operating and capital costs), and to allow each company to determine its own appropriate balance between operating and capital costs (as long as they conform to pricing within the margin).

However, in its 2009 submission to the Issues Paper, InterOil suggested that differences between the scale and scope of operations of wholesale distribution companies meant that applying an industry average approach was unfair.6

The Commission at that time noted that InterOil’s argument had merit and that the scale, scope and markets of each of the entities in the industry are quite different:

- Islands Petroleum and NOC provided services mainly to the Islands and Highlands Regions respectively;
- Mobil directly serviced only the main urban centres of Port Moresby, Lae and Madang; and
- InterOil appeared to service a wider customer base, encompassing both the main urban centres and also most of the Island Region and some of the Highlands Region.
- The commission assumed that a smaller scale operation would cost more on a per litre basis and therefore the cost of owning and operating wholesale infrastructure in smaller centres would be more expensive than in the larger centres. The commission therefore assumed that these smaller centres would generally be less attractive to wholesalers.

The Commission also noted that alternative building block approaches could be applied. These included:

- The hypothetical business approach - the Commission could decide to determine the wholesale margin based on assumptions about the building block costs of a hypothetical business of servicing a market such as PNG’s;
- The representative business approach – similar to the above, the Commission could use an existing business (for example, InterOil) whose operations are relatively widespread and broadly representative of the cost of supplying the entire PNG market; and
- The business-specific approach – a specific margin could be calculated for each wholesaler. For example, the Commission could calculate a different (and lower) margin for Mobil based on the fact that it services large and relatively inexpensive markets, compared to NOC which services more remote and smaller markets.

Each of the above approaches has a number of advantages and disadvantages and will impact existing industry participants in different ways due to their different cost bases.

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6 InterOil submission, July 2009, p.34
In deciding on the most appropriate approach, a key objective for the Commission was to encourage competition and ensure that businesses had an incentive to provide a wide range of services across the country. The Commission was also cognisant of the need to encourage investment in infrastructure. On this basis, the Commission was reluctant to adopt the business-specific approach as this would mean that, for example, Mobil would have little incentive to expand its operations into higher cost areas, as it would be earning an insufficient margin to do so.

In the final 2009 decision, the Commission noted that by electing to use InterOil as a representative business, it may be the case that businesses with lower costs are able to earn greater returns than InterOil in some areas of the market. However, as the largest business in the market and with the highest market reach within PNG, InterOil should be able to achieve economies of scale that enable it to compete strongly with the other businesses, and its reach should allow cross subsidies between regions which are not available to other industry participants. In addition, the issue of different wholesale businesses earning different levels of profit is an outcome of applying a uniform margin across the industry. This is not unique to the approach of using InterOil as a representative business. The Commission also thought that the alternative approach of calculating individual margins for each business or geographic area may have the effect of providing a disincentive for other businesses to expand their services to higher cost areas of the market. The Commission therefore decided to use the representative business approach by calculating the wholesale margin, using InterOil’s costs for the building blocks.

In the submissions and discussions on the latest issues paper (2014), InterOil supported the continued use of the methodology used for the last review. Mobil stated support in their submission for the current form of regulation, and there were no specific submissions advocating an alternative method.

5.3.3 Evaluation of wholesalers’ costs

The following table shows the results of the Commissions analysis of Wholesalers’ costs in 2014. These should be considered along with the notes shown below the table

<table>
<thead>
<tr>
<th>Table 9: Estimated wholesalers’ operation costs</th>
<th>Average Cost Toea per Litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puma</td>
<td>23.9</td>
</tr>
<tr>
<td>Mobil</td>
<td>19.8</td>
</tr>
<tr>
<td>Islands Petroleum</td>
<td>20.2</td>
</tr>
<tr>
<td>Mobil &amp; Islands Petroleum Weighted Average</td>
<td>19.9</td>
</tr>
<tr>
<td>Niugini Oil</td>
<td>Did not provide information requested</td>
</tr>
<tr>
<td>Bige Petroleum</td>
<td>Not analysed</td>
</tr>
<tr>
<td>2014 Wholesale Margin</td>
<td>36.6</td>
</tr>
</tbody>
</table>

Notes about the analysis

- For each company the Commission used the building block process to calculate their costs in 2014.
- The analysis used information provided by each company. This information was inconsistent and sometimes incomplete.
- Information provided by the companies appeared to include assets used for products such as Jet A1, and bunkering. To avoid the need to separate these assets out, a whole of

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7 InterOil submission on issues paper 2014, p19.
8 Mobil submission on issues paper 2014, p15.
business approach was taken to establishing the cost of operating. Therefore no costs or volumes relating to large customers were removed. The analysis was based upon all of the wholesaler’s sales volumes including stated volumes for non-regulated products (which included lubricants).

- Mobil did not report any non-regulated volumes, so it is likely that Mobil’s cost per litre will be lower than shown above once these are included in the analysis.
- The results are based upon a forecast of 2014 volumes for each company.
- Any assets that appeared to be retail assets were removed from the RAB.
- Any operating costs which in the Commissions view should not be included in the wholesale margin were removed (see later section).

The Commission draws the following conclusions from this analysis.

- Smaller regions are not necessarily materially more expensive for wholesalers, than the main centres. For example Islands Petroleum who operate mainly in smaller centres have a per litre costs which is similar to Mobil’s and lower than Puma’s.
- Larger companies are not necessarily more economically efficient than smaller companies.
- The argument used by InterOil in 2009, that differences between the scale and scope of operations of wholesale distribution companies meant that applying an industry average approach was unfair, is not a valid argument. The Commission notes that the combination of Mobil and Islands Petroleum should be the equivalent in cost to a national operator. The volume weighed average cost of Mobil and Islands Petroleum is less than Mobil. And the cost of Mobil and Islands Petroleum are also very similar to each other, even though they operate in arguably different economic environments.
- Using Puma as a representative business will result in consumers paying more than the average costs of the industry. Puma appear to be less economically efficient than either Mobil or Islands Petroleum.
- The current wholesale margin appears to be excessively high when compared to average costs.
- Some companies have been more helpful than others when requested to provide information.

The Commission is concerned that the current approach has demonstrated a number of weaknesses.

- The representative company chosen was not necessarily representative of the economic efficiency of the industry.
- The acceptance of one company’s costs without comparison to others does not support an assessment of economic efficiency.
- The use of the building block process using high level numbers without any deeper analysis is likely to result in what is effectively a pass through cost mechanism. While pass through amounts are only revisited every five years, there is little incentive for the representative business to become more efficient in the long term.

On the other hand, the current approach has encouraged the entry of new players into the market with the arrival of Bige Petroleum. One of the Commission’s original reasons for using the representative business approach was the acknowledgement that if the representative business’s costs were high then it would encourage others to enter the market or expand. The Commission notes that Mobil has contracted its business with Islands Petroleum taking over the areas where they have exited.
The Commission is seeking comments and submissions from stakeholders, interested parties and the general public on its evaluation of the wholesalers’ costs.

5.3.4 Selling to Large Customers

The Commission is proposing not to regulate the price of petroleum products sold to large customers (see earlier section in this report). However the cost of selling to these customers must still be understood in order to determine the cost of selling regulated products.

In 2009 the Commission accepted the argument that the cost of selling to these customers should be excluded as they did not use wholesale assets. In practical terms this meant excluding the cost and volume of these sales from the building block calculation.

From this arose the issue of how to determine these costs and what portion of the overheads of a company should be allocated to them. In 2009 the Commission chose to allocate 10% of InterOil’s operating costs to large customers’ product costs. However InterOil was not happy with this and Puma have raised the issue again in their 2014 submission.

In their submission Puma argue the cost of selling to large customers is around 1% of operating costs. This is based on their view that operational costs of loading mining company vessels are either covered by the vessel owners or sit as part of normal refinery operations. They propose that the only differentiable wholesale costs incurred are for billing. This is very similar to their response to the last review.

The Commission disagrees with this view.

- These volumes represent around a third of Puma’s total prescribed volumes. Suggesting these sales account for around 1% of total cost appears to understate the full range of operating costs associated with serving large customers.
- For example, direct expenses relating to these large customers would likely include client relationship managers, legal costs for contract preparation and costs of preparing bids.
- These sales should share costs associated with the investment in and operation of the refinery bunkering wharf.
- It is also appropriate, given the volumes associated with these customers, to attribute a portion of general company overhead to them. For such a substantial portion of the company’s business it would be surprising if management did not devote a material portion of their time to it.

The Commission also understands that investments will be made to specifically support serving these customers, such as in relation to large scale storage facilities. Niugini Oil noted that they had to invest in 2 new 5 Million litre tanks to service a contract, previously held by InterOil that Niugini Oil had won from a mining company. This appears to have left InterOil with two similar tanks of its own, now empty. So it is reasonable to assume that some of InterOil’s capital investment in storage facilities will service large contract customers. The Commission must decide how to separate these costs from the cost of regulated products.

Puma have also submitted figures for the percentage of operating and capital costs that relate to unregulated product. These are:

- Operating cost range from 15% to 16% of total costs.
- Capital costs are 18% of total capital costs.

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9 InterOil submission on issues paper 2014, p24.
The Commission acknowledges that there is no direct relationship between most overhead costs and the costs of individual products or customers. Therefore any allocation of this nature is at best arbitrary. In 2009 the approach taken was to think about what costs could be avoided by not selling to large customers. InterOil argued that very little cost could be avoided and that most of its overhead would remain the same. The Commission notes that the same argument could also be made about selling regulated products. If Puma stopped selling regulated products but continued to sell to large customers, most of their overhead costs would remain unchanged.

The Commission notes that there are two other approaches which avoid an arbitrary allocation.

- Calculate an "all in average" cost for both regulated and not regulated products. Thus the building block calculation would include 100% of a company's costs and 100% of their volumes. Use the average cost to set the whole margin for regulated products.
- Calculate an average operating cost using 100% of the operating cost and 100% of the volumes. Use this in the building block method. But for capital costs only include assets used for regulated products and only use regulated product volumes.

Neither of these approaches will solve the problem. The first approach will not differentiate between products which require more servicing relative to their volumes. Lubricants might be an example of this. The effect of including items which have higher service costs and lower volumes will effectively increase the wholesale margin allowance.

The second approach falls down because many of the assets of a business are associated with both regulated and non-regulated products equally. Examples of this are motor vehicles, office buildings used to house staff who manage the whole business and IT assets that support order taking, shipping management, and financial reporting. The cost of all these shared assets is normally a material cost.

In the commissions view, the all in average approach is likely to be more reliable and fairer, than using an arbitrary allocation.

The Commission notes that one common approach to allocating common costs is to use the proportion of total revenue earned from each product. However this is problematic in this case because the purpose of the exercise is to determine the revenue that needs to be earned. However the Commission expects that if this method were used, then more than 10% of the costs would be allocated to large customer sales.

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*The Commission is seeking comments and submissions from stakeholders, interested parties and the general public on its draft decision not to regulate the price of petroleum products sold to large customers and its proposed handling of operating costs related to these customers.*

5.3.5 Proposed approach to setting the Wholesale Margin

Having considered these issues, the Commission is proposing to;

- Estimate a margin based upon the whole industry's costs, using efficient operator costs to determine these costs.
- Use benchmarking between different wholesalers to estimate the costs of an efficient operator. Then apply these costs to the whole industry production volumes.
• Not to try and separate out assets and operating costs of large customers, but instead to calculate an “all in average” cost per litre for the business including both regulated and non-regulated products. Continue to use the building block method to determine the wholesale margin.

The Commission invites comments and submissions from all stakeholders, interested parties and the general public on its proposed approach to setting the wholesale margin.

5.3.6 Operating Costs

5.3.6.1 Approach to analysing Operating Costs

The Commission usually receives information about wholesale costs structured in typical accounting forms. It is impossible to tell from this information alone whether or not the costs are reasonable or reflect the costs of an economically efficient business. There are two general approaches to get a more informed indication of economic efficiency.

1. Relate the operating costs to the outputs of the business.
2. Bench mark these costs against other similar businesses.

The Commission has attempted to pursue both of these approaches. Firstly the commission has considered the question as to “what is driving the magnitude of costs?” The costs in question exclude most direct product costs because these are covered elsewhere in the determination of the retail petroleum prices (i.e. product purchase costs/IPP, freight costs and the cost of storage). The remaining costs are mostly made up of salaries and the general business expenses expected in any business.

In an attempt to understand what is driving these costs the Commission split them into three typical cost drivers.

<table>
<thead>
<tr>
<th>Table 10: Business cost drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Driver</strong></td>
</tr>
<tr>
<td>The Size of the business</td>
</tr>
</tbody>
</table>
geographic layout of a business.

The larger a business is the more it can afford to employ professional services such as those or lawyers and economists.

<table>
<thead>
<tr>
<th>The Value of the assets</th>
<th>These are operating costs which reflect the value of a business’s assets. They include things like insurance, and maintenance costs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of geographic sites or regions served</td>
<td>The more locations a business operates out of, the more particular types of costs will grow. Examples of this would be rent, utilities, security and environmental remediation.</td>
</tr>
</tbody>
</table>
| Excluded costs | These are costs which in the Commission’s view should not be included in the Wholesale margin. They include items such as
  - Financing costs which are allowed for in the cost of capital calculations used in the building block method.
  - Costs associated with drum filling. Drum filling costs are separately allowed for and so this cost must be removed from the general pool of costs which go into calculating the wholesale margin
  - Retail costs – this might include advertising, or costs associated with ownership of retail assets such as bowsers, underground tanks
  - Public relations – these costs are typically similar to advertising costs. A company incurs these costs because of the positive long term impact upon their sales volumes and the higher margins which result. In deciding to spend money on such things the company is trading off the cost against the value of higher sales at the margin available. |

The Commission classified all operating costs into these four categories. The following benchmarks ratios were then calculated and used to benchmark each company against each other.

- Size driven Opex to Volume ratio expressed as Kina per litre.
- The ratio of Asset driven costs to Depreciation. Depreciation was used as a proxy to reflect the original purchase price of assets, which tends to be the driver of maintenance costs rather than current book value.
- The ratio of Site driven costs to the number of sites. The Commission used the number of geographic areas served as a proxy for the number of sites, as the commission did not know the exact number of sites used by each business.

Excluded costs were ignored and not included anywhere in the wholesale margin calculation.

_The Commission is seeking comments and submissions from all stakeholders on its proposed approach to analysing the costs drivers of the wholesale businesses._

### 5.3.6.2 Benchmarking Results

The following table show the results of the Commission’s benchmarking analysis.
<table>
<thead>
<tr>
<th></th>
<th>Size Driven Cost to Volume Ratio (Kina / Litre)</th>
<th>Asset Driven Cost to Depreciation Ratio</th>
<th>Site driven costs to number of sites ratio (Kina / site)</th>
<th>Depreciation to Volume Ratio (Kina / Litre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islands Petroleum</td>
<td>0.08</td>
<td>4.2</td>
<td>1.07 million</td>
<td>0.008</td>
</tr>
<tr>
<td>Mobil</td>
<td>0.12</td>
<td>5.0</td>
<td>1.82 million</td>
<td>0.008</td>
</tr>
<tr>
<td>Puma</td>
<td>0.11</td>
<td>3.7</td>
<td>1.48 million</td>
<td>0.014</td>
</tr>
</tbody>
</table>

Islands Petroleum has the lowest size driven costs for their volume. This result was surprising to the Commission as it was generally expected that larger businesses would have more scale and therefore be more efficient. Mobil and Puma’s results are close which may reflect that it is more expensive to employ staff in places such as Port Moresby or Lae, than in more regional locations.

The following chart shows that forecasts of operating costs and volume provided by each operator indicate that all operators expect to improve their efficiency over time.

Puma noted in their submission that in nominal terms salaries have grown by 49% between 2010 and 2013, versus inflation over this period of 20%. Puma credit this real terms increase to be due to pressure on salaries due to increased demand for skilled labour as a result of the LNG project\textsuperscript{10}. Puma also proposed that salaries would increase by 2.5% in real terms over the forecast period. In spite of these increases, the following chart still indicates that they will improve their efficiency over the regulatory period.

In the Commission’s view, it is unlikely that there will be real terms increases in labour rates in the immediate future. While the positive GDP growth resulting from the LNG project cash-flows may be inflationary, the Commission expects that with the end of the project there will be less pressure on demand for skill labour, and that salary increases will be more in line with actual inflation.

\textbf{Figure 1: Forecast of size driven cost to volume ratio}

\textsuperscript{10}InterOil submission on issues paper 2014, p24.
Puma had the lowest asset driven costs to depreciation ratio. This was also surprising as the Commission suspects that asset information provided by Mobil is incomplete. Islands Petroleum and Puma both spent more on maintaining assets relative to their historic costs, than Mobil. One possibility is that Mobil are not maintaining their assets adequately. Other possibilities are that they are more efficient or may use in house staff to maintain assets rather than outsourcing this work.

Using forecast information provided by operators, both Mobil and Islands Petroleum expect to spend less maintaining assets over the regulatory period (see chart below).

**Figure 2: Forecast of Asset Driven Opex to Depreciation ratio**

![Chart showing forecast of Asset Driven Opex to Depreciation ratio for Islands Petroleum, Puma, and Mobil from 2014 to 2019.]

Islands Petroleum had the lowest site driven costs. This possibly reflects that operating a site in locations such as Port Moresby and Lae (where Islands Petroleum does not sell bulk liquids) is more expensive. Also Puma may also have costs included which are associated with some of their other business activities, such as operating the refinery. However in the Commission’s view it is valid to take a weighted average view of Islands Petroleum plus Mobil and compare this to Puma. This comparison effectively compares the cost of two operators covering most centres throughout the country. The weighted average number for Mobil and Islands Petroleum combined is 1.35 million Kina per site. So the combination of Mobil and Islands Petroleum is slightly cheaper than Puma’s site costs at 1.48 million Kina per site.

One of the arguments against this analysis might be that a company might choose to invest more in assets in order to reduce operating costs. So if a company has low operating costs, it may be because they have higher asset costs. To test this Commission also benchmarked the Depreciation to volume ratio. Again depreciation was used because this reflects the purchase cost of the asset rather than its current age. The results again are shown in the table above alongside the other benchmarks.

From this we see no evidence that Islands Petroleum, who have lower operating costs have spent more on assets. Again it is interesting to note that Puma have spent more on assets than either Mobil or Islands Petroleum.

### 5.3.6.3 Results & Conclusions
The Commission is proposing to use these ratios, to estimate the total operating costs for the industry. Thus the total operating cost will be equal to the sum of the following three elements.

- [Industry Size Driven Cost to volume ratio] x [Total Industry Volume]
- [Asset Driven Opex to Depreciation Ratio] x [Industry Depreciation]
- [Site Driven Cost to Area Volume ratio] x [the sum of the number of areas serviced by each company]

For the benchmarks the commission is proposing to use the following numbers.

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Industry Assumption</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size driven cost ratio</td>
<td>0.08 Kina / Litre</td>
<td>Use the costs of the most efficient operator.</td>
</tr>
<tr>
<td>Asset driven Opex to depreciation ratio</td>
<td>4.3</td>
<td>Use the industry average to reflect the average amount spent on assets. The Commission did not choose the lowest cost as it is not necessarily true that spending less on items like maintenance is good in the long term.</td>
</tr>
<tr>
<td>Site driven cost ratio</td>
<td>1.35 million Kina per area</td>
<td>Use the weighted average combination of Mobil and Islands petroleum. This reflects a higher level of efficiency and still covers the cost of all regions of the country.</td>
</tr>
</tbody>
</table>

The Commission notes that if margins are set at a level which is lower than an operator’s costs, then that operator can choose to do one of two things. They can either exit the market or improve their efficiency to reduce their costs. If an operator did choose to exit the market their assets would probably be purchased by another company. Often when this occurs under circumstances just described, the assets are sold at less than book value. This would effectively give the new operator time to improve the efficiency of the business before the assets needed to be replaced. In the Commission’s view if such an occurrence did occur, it would be unfortunate, but petroleum products would continue to be delivered on a commercial basis throughout the country.

In the Commission's view it is important to provide immediate incentives for operators to become more efficient.

The Commission does not plan to include Bige Petroleum in this calculation. Both Bige Petroleum's costs and volumes will be excluded from the margin calculation. The rationale for this is because more than one company expressed concerns that Bige Petroleum's sites did not meet regulations and therefore they had an unfair advantage. While it is not the Commission's role to address industry specific Health, Safety or Environment regulations, if they are not compliant then they do not reflect the cost of an efficient operator.

Using the approach described above and the information provided by the industry operating cost would be as described in the following table.

| Table 12: Proposed operating cost to use in the building block calculation |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                             | 186.6 | 193.1 | 197.4 | 197.7 | 197.9 |
The Commission is seeking comments and submissions from stakeholders, interested parties and the general public on its benchmarking analysis and the proposed approach for estimating the total operating costs for the industry.

5.3.7 The Regulatory Asset Base

The return on capital and the return of capital elements of the building block approach require the Commission to determine both an appropriate asset value and an appropriate rate of return that can be applied to that asset value.

The asset value used in the building blocks is known as the regulatory asset base ("RAB"). The RAB represents the value of past capital investments for pricing purposes. The companies earn a return on their capital investments via the application of a regulated rate of return (known as the weighted average cost of capital, or "WACC") to the RAB.

The Commission has estimated a weighted average cost of capital and this is explained later in this report.

5.3.7.1 Draft Proposal on RAB roll-forward for current Regulatory Period

Because the Commission is proposing to establish the wholesale margin based upon the whole industry, the Commission must establish a RAB for the whole industry.

To do this the Commission requested copies of the detailed asset registers for Niugini Oil, Mobil, Islands Petroleum and Puma. Niugini Oil and Mobil did not provide this information. Mobil did however provide information about the opening book value of their assets in 2010 and their capital spending since that date. Niugini Oil did not provide any information about their assets despite being requested three times to do so. In the absence of any information about assets, the Commission must conclude that either Niugini Oil has no assets or that their assets have no value.

The Commission has used the detailed asset register information provided or other information available to establish a RAB for the industry. To do this the Commission separately calculated a RAB for each company and then added these together. To create each RAB the commission used the roll-forward method as follows.

\[
\text{Opening value at the start of the year} + \\
\text{Capital expenditure (additions to the capital base)} - \\
\text{Depreciation and disposals of assets} + \\
\text{Indexation of the asset base to maintain its real value in nominal terms} = \\
\text{Closing value at the end of the year.}
\]

Any asset which has reached its full economic life is assumed to be disposed of and any residual value for this asset is removed from the RAB.

For future years during the next regulatory period, the Commission took the nominal information about forecast capital spending provided, deflated this into 2014 Kina values using forecasted
inflation rates. This was then rolled into the RAB using the roll-forward method as already described.

In this way all capital spending by the four wholesale companies is effectively included in the RAB and will earn a return to the industry via the Wholesale margin.

The Commission has not made an assessment of the prudence of capital spending by wholesalers, as it normally would when setting regulated prices. Instead the Commission is proposing to accept the actual capital spending of the four companies in question.

Analysis carried out by the Commission and already discussed in this report (see table below), indicates that Puma has invested more than the other companies analysed relative to their volumes. The Commission understands that while there is little or no price competition in the industry, there is still competition to win the business. The effect of this will be that volumes will shift from time to time between different industry players. So at any particular point in time one participant may have surplus capacity. However this creates an opportunity for them to use this capacity in the future to support growth and to win back business they may have lost in the past.

Table 13: Indication of level of capital spending

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Depreciation to Volume Ratio (Kina / Litre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islands Petroleum</td>
<td>0.008</td>
</tr>
<tr>
<td>Mobil</td>
<td>0.008</td>
</tr>
<tr>
<td>Puma</td>
<td>0.014</td>
</tr>
</tbody>
</table>

The Commission is proposing to accept the asset registers and forecast capital spending of the Islands Petroleum, Mobil, Niugini Oil and Puma as submitted and to use this information to calculate a RAB using the roll-forward method.

5.3.8 Depreciation Rates

In applying the roll-forward method, the Commission is proposing to use the following depreciation rates.

Table 14: Economic lives of assets used to set depreciation rates

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Economic Life (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings Life</td>
<td>80</td>
</tr>
<tr>
<td>Marine Vessels Life</td>
<td>15</td>
</tr>
<tr>
<td>Motor Vehicles Life</td>
<td>10</td>
</tr>
<tr>
<td>Office and Computing Life</td>
<td>10</td>
</tr>
<tr>
<td>Plant &amp; Equipment Life</td>
<td>20</td>
</tr>
<tr>
<td>Pumps Bowsers Life</td>
<td>20</td>
</tr>
<tr>
<td>Pumps General Life</td>
<td>20</td>
</tr>
<tr>
<td>Tanks and Storage Life</td>
<td>30</td>
</tr>
<tr>
<td>Tanks Self Bunded Life</td>
<td>30</td>
</tr>
<tr>
<td>Tanks Skid Mounted Life</td>
<td>30</td>
</tr>
<tr>
<td>Tanks Underground Life</td>
<td>30</td>
</tr>
</tbody>
</table>
The Commission expects that these rates may be different from those used by the various wholesalers for accounting purposes.

The Commission is seeking comments and submissions from stakeholders, interested parties and the general public about the economic life (s) that the Commission is proposing to use.

5.3.9 Treatment of Land

The Commission has also considered the effect of inflation in the value of land. As land does not depreciate any inflation in the value of land over time will increase the value of assets to the business and is in effect a capital gain. To address this Commission has considered two possible approaches.

1. Remove land from the RAB and do not provide a return on the cost of land to wholesalers.
2. Include the value of land at current value in the RAB and allow for a return on the capital cost of the land. But deduct capital gains in the land value from the revenue requirement in the building block calculation.

The Commission considers that land costs are major factor in determining the costs of a business in PNG. Furthermore in some cases the availability of land may be a barrier to entry. It is important therefore that the cost of land ownership is included in the wholesale margin.

Therefore the Commission is proposing to use the second approach shown above. This means that Land values will be included and will earn a return as part of the building block calculation. However, any appreciation in land value will be deducted from the revenue requirement.

The Commission has used the following assumptions about increases in land values over the regulatory period.

<table>
<thead>
<tr>
<th>Table 15: Forecast land appreciation rates used</th>
</tr>
</thead>
<tbody>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The resulting RAB is shown in the following table.

<table>
<thead>
<tr>
<th>Table 16: The proposed regulatory asset base</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Kina millions)</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Opening Value</td>
</tr>
<tr>
<td>Closing Value</td>
</tr>
<tr>
<td>Depreciation</td>
</tr>
</tbody>
</table>

The Commission is seeking comments from stakeholders, interested parties and the general public on its proposed treatment of capital costs.

5.3.10 Working Capital

In the 2009 determination, the Commission rejected InterOil’s requests to include an allowance for the cost of working capital. However since that time the Commission has made allowance for working capital cost in other industries for which the Commission determines prices. The Commission has therefore reviewed its prior decision not allow for working capital costs in the Petroleum industry.
The Commission considers that Petroleum is different from other industries such as water and power, in that the immediate withholding of service is not likely to be life threatening. This gives Petroleum companies more scope to withhold service where payment is late.

The Commission has estimated the cost of working capital. Assuming an average of 30 day payments for both Debtors and Creditors, working capital costs for the whole industry amounted to less than 1 million kina per year.

In the Commission’s view, working capital costs are not material enough to consider. Given the accuracy of the inputs provided by industry participants, the cost of working capital is less than the likely margin of error within the building block method.

The Commission is proposing not to make an allowance for working capital within the wholesale margin.

The Commission invites comments and submissions from all stakeholders on its draft decision not to make allowance for working capital within the wholesale margin.

### 5.3.11 Inventory Costs

In addition to a return on the RAB, the Commission considers it reasonable that the wholesalers earn a return on their fuel stocks, reflecting the costs and value associated with holding stocks of fuel products. The rate of return applied by the Commission is the same as that for the RAB (i.e. the WACC).

Three companies provided information about the quantity of stock they have held over the past four years.

<table>
<thead>
<tr>
<th></th>
<th>Stock held as % of sales volume – Actual Average 2010 to 2013</th>
<th>Forecast stock holding as % of forecast volume 2014 to 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islands Petroleum</td>
<td>7.4%</td>
<td>10%</td>
</tr>
<tr>
<td>Mobil</td>
<td>10.5%</td>
<td>Not provided</td>
</tr>
<tr>
<td>Puma</td>
<td>7.9%</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

Both Islands Petroleum and Puma held less than 8% of their annual sales volume in stock on a monthly basis. Mobil appears to hold more stock than the industry average. Both Islands Petroleum and Puma have forecast that the quantity of product they hold in stock will increase relative to their sales.

The Commission is proposing to make an allowance for 8% of annual industry sales as the inventory volume.

To estimate the value of inventory the Commission is proposing to multiply the inventory volume by the IPP plus the coastal shipping cost to transport product to Lae. The Commission recognises that not all stock is held in Lae. However the Commission is proposing to use Lae as representative of the average inventory stock, recognising the approximate distribution of inventory volumes across the country.

Using this method of valuing inventory to total regulated and non-regulated volume results in a total inventory value of approximately 200 million Kina. Multiplying this value by the WACC results...
in an increase to the revenue requirement of in excess of 30 million Kina per year, which equates to about 2 toea per litre.

The Commission has also considered the need to make annual adjustments to the value of inventory. The requirement to make adjustments would be driven by the material change in the IPP price and coastal shipping costs. To simplify this adjustment, considering materiality, the Commission proposes to make an annual adjustment to the wholesale margin to allow for the change in the value of inventory with fluctuations in the IPP. The adjustment would be calculated as follows.

\[
\text{[New Wholesale Margin]} = \text{[Old wholesale margin]} \times 11.4\% \times \% \text{[Change in IPP]} + \text{[Old wholesale margin]} \times 88.6\%
\]

The Commission invites all stakeholders to provide submissions on the proposed handling of inventory costs.

5.3.12 Deduction of Drum Filling Costs

As in the 2009 determination, the Commission is proposing to continue to have a separate allowance for the cost of drum filling. The drum filling assets are included in the RAB and the operating costs associated with drum filling are already included in the operating expenditure. Therefore the Commission proposes to make a separate deduction of these costs from the revenue requirement calculated in the building block model. This is to avoid counting these costs twice.

The deduction is calculated as the total quantity of both regulated and unregulated sold in drums by the industry, multiplied by the current drum filling margin.

The Commission invites all stakeholders to provide submissions on its draft decision to continue to have a separate allowance for the costs of drum filling.

5.3.13 Revenue requirement, X Factor and Wholesale Margin

The building blocks set out above provide the basis for the Commission's proposed calculation of a revenue requirement for an efficient wholesale distribution business operating in PNG.

The revenue requirement using the approach described above results is shown in the following table.

<table>
<thead>
<tr>
<th>Table 18: The Building Blocks</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Kina millions)</td>
<td>Return on Assets</td>
<td>74</td>
<td>78</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Operating Expenditure</td>
<td>194</td>
<td>200</td>
<td>203</td>
<td>202</td>
<td>201</td>
</tr>
<tr>
<td>Drum fillers margin deduction</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Unsmoothed Revenue Requirement</td>
<td>275</td>
<td>286</td>
<td>291</td>
<td>289</td>
<td>286</td>
</tr>
<tr>
<td>Average Wholesale Cost per litre</td>
<td>21.5</td>
<td>21.8</td>
<td>21.7</td>
<td>21.0</td>
<td>20.3</td>
</tr>
</tbody>
</table>

It is the commission's normal practice to smooth the revenue requirement when using the building block method, by means of an X factor. The purpose of smoothing is to avoid any large fluctuations in the price. The method for doing this is to apply an X factor to the annual price. The X factor is set so that the NPV of the revenue requirement is equal to the NPV of the regulated revenue where the regulated revenue equals the determined wholesale margin times the determined forecast demand.
The Commission is proposing that:

- The starting Wholesale Margin for 2015 will be 22 toea per litre.
- And the X factor for the regulatory period will be –1.0%

The Commission could elect to start the regulatory period with a higher margin and a more negative X factor. The rationale for doing this would be to give wholesalers with above average costs time to reduce their costs. However starting with a higher wholesale margin would result in a lower wholesale margin by the end of the regulatory period, which would then increase the likely need for an increase in 2020.

Currently the Commission makes an annual adjustment to the Wholesale margin to reflect the impact of inflation. The Commission proposes to continue to do this using the same process and calculation.

The movement in the CPI will be determined by using the following formula:

$$ CPI_t = \frac{CPI_{Mar(t-1)} + CPI_{Jun(t-1)} + CPI_{Sept(t-1)} + CPI_{Dec(t-2)}}{CPI_{Mar(t-2)} + CPI_{Jun(t-2)} + CPI_{Sept(t-2)} + CPI_{Dec(t-3)}} - 1 $$

Where:
- CPI means the underlying Consumer Price Index (excluding alcoholic drinks, tobacco and betel-nut) published by the National Statistical Office
- Year $t$ is the year for which wholesale margin is being set;
- Year $t-1$ is the previous regulatory year;
- Year $t-2$ is the regulatory year two years previous; and
- Year $t-3$ is the regulatory year three years previous.

The Commission has previously arranged with the PNG NSO for the provision of the underlying CPI figures to the industry, and this has been delivered on a regular basis.

The Commission will confirm to the industry no later than the 15th day of December each year the new margin for wholesaling and drum filling to take effect from the 8th day of the new year consistent with the Commission’s monthly price announcements done on the 8th day of each month. The Commission will make available to the industry its calculations of the movements in the CPI and the conversion of this movement in the CPI to the new margin that is to apply.

The Commission is proposing that the wholesale margin will be set at 22 toea per litre and will be adjusted using a CPI+X price path over the next regulatory period where the X Factor will be negative 1.0%.

The Commission is seeking comments from the wholesalers, other stakeholders and the general public on its draft decision that the wholesale margin will be set at 22 toea and will be adjusted using a CPI+X price path over the regulatory period where the X factor will be negative 1.0%.

5.4 Domestic freight – Sea transport

5.4.1 Background and current Regulatory Arrangements

Transportation of fuel products by sea is an important component of the cost build-up of the final retail prices. While it only represents around 4 to 5% of the retail price of diesel in Port Moresby it is significantly higher in the more remote locations.
In its 2004 Final Report, the Commission adopted a form of regulation under Section 32A which was based on a number of assumptions about how freighting of products from Napa Napa and other ports would actually occur. Key amongst the assumptions were:

- In order to ensure efficient costs, wholesalers would enter into a joint shipping arrangement with a charter operator to transport products from Napa Napa in a medium range tanker (MRT) to the main ports of Lae, Madang, Rabaul and Kimbe; and
- A local coastal trader (LCT) would be jointly chartered to operate from Lae and Rabaul to send products to outlying ports.

Based on this arrangement, the Commission established a price monitoring regulatory arrangement for sea freight which effectively provides a pass through of sea freight costs within certain constraints. The Commission allows for:

- A common set of freight costs for Lae, Rabaul, Madang and Kimbe based on an average cost per litre across the four ports;
- Freight costs to outlying ports to be based on a cost reflective charge for each port, with no averaging;
- Freight costs for Port Moresby to be based on actual cost to serve; and
- Freight costs to be established separately for each product.

The Commission’s rationale for setting common prices across the main ports (excluding Port Moresby) in part recognised the requirement of the Project Agreement that all products be sourced from Napa Napa. Setting separate freight costs for outlying ports recognised historical precedent whereby sea freight to these ports had traditionally reflected actual costs.

Initial sea freight charges were estimated in 2004 as follows:

<table>
<thead>
<tr>
<th>Port</th>
<th>Petrol (tpl)</th>
<th>Diesel (tpl)</th>
<th>Kerosene (tpl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Moresby</td>
<td>2.06</td>
<td>2.38</td>
<td>2.19</td>
</tr>
<tr>
<td>Lae, Madang, Rabaul, Kimbe</td>
<td>7.04</td>
<td>8.14</td>
<td>7.51</td>
</tr>
<tr>
<td>Alotau</td>
<td>15.6</td>
<td>18.0</td>
<td>16.6</td>
</tr>
<tr>
<td>Oro Bay</td>
<td>n/a</td>
<td>13.0</td>
<td>n/a</td>
</tr>
<tr>
<td>Wewak</td>
<td>9.9</td>
<td>11.5</td>
<td>10.6</td>
</tr>
<tr>
<td>Lihir</td>
<td>n/a</td>
<td>7.0</td>
<td>n/a</td>
</tr>
<tr>
<td>Kavieng</td>
<td>9.6</td>
<td>11.1</td>
<td>10.2</td>
</tr>
<tr>
<td>Manus</td>
<td>36.2</td>
<td>41.9</td>
<td>38.6</td>
</tr>
</tbody>
</table>

Under the Commission’s price monitoring approach the oil industry has been required to submit the MRT and LCT charter rates at the end of each quarter for the Commission to review. The quarterly review essentially involved a reconciliation of estimated costs against actual costs incurred and product volume over the quarter. If the assessment indicates that there is either an over or under recovery of freight costs, then the forward rates are adjusted for this over or under recovery and are applied for the next quarter. The new freight rates arrived at as part of this reconciliation process apply to all ports for the next quarter and these rates form part of the final cost-build up and are passed to the customers.

However, as discussed earlier current sea freight arrangements are quite different to those assumed in 2004. The Commission understands the current situation to be:

- Puma runs an MRT (the Gunes K) out of Napa Napa to serve the larger ports and the LCT (the Ipsilantis) from Napa Napa to the smaller ports;
The lease on InterOil’s previous MRT expired in January 2010, at which point it was replaced by a smaller vessel. InterOil previously indicated that this was necessary due to berth works at Lae preventing larger vessels from docking; However the Commission would expect that this would no longer be a restriction.

- Mobil has its own MRT vessel which it uses to import products directly into Port Moresby, Lae, Madang and Rabaul. It also charters a LCT (the Lukianos) to move some of its fuel from Napa Napa to supply smaller ports where it operates;
- NOC imports diesel to Lae but uses the Puma’s chartered MRT from Napa Napa to obtain petrol and kerosene; and
- Rather than LCTs operating from the main ports to serve the smaller ports as originally envisaged, they operate directly from Napa Napa.

The Commission currently receives sea freight data separately from both Puma and Mobil. The costs, on a per litre basis, differ for the different ports, with Puma being more expensive in some ports and Mobil more expensive in others. For the purpose of estimating benchmark wholesale and retail prices, the Commission generally only has had regard to Puma’s costs.

### 5.4.2 Key principles for sea freight regulatory arrangements

The issues around the need for, and form of regulation, of sea freight charges are complex and many matters need to be considered. Several of these relate in some way to the Project Agreement, its enforcement, and whether the Project Agreement may change in future.

A key principle for any regulatory arrangements is that they must be consistent with the Project Agreement. It is not the Commission’s role to enforce the Project Agreement and its compliance is clearly a matter for the Government to pursue. If parties act outside the requirements of the Project Agreement ultimately the Commission cannot prevent this. However, the Commission considers that the regulatory arrangements should not encourage or provide incentives for parties to breach the Project Agreement.

Another key principle is that the regulatory arrangements should, as much as possible, encourage the provision of sea freight on an efficient, least cost basis. The Commission is concerned that at present wholesalers can take extremely risk averse-positions – such as chartering multiple vessels with excess capacity - and simply pass through the costs to consumers. Wholesalers should have normal commercial incentives to reduce sea freight costs to efficient levels, commensurate with an appropriate risk position. And ultimately the benefits of these more efficient and lower cost arrangements should be passed on to consumers.

Ultimately the Commission cannot force joint shipping arrangements however wholesalers should have an incentive to enter into such arrangements where they will result in lower costs to customers or improvements in the overall efficiency and reliability of shipment. The Commission can see that concerns over product quality, the mixing of like product from different sources, the ready and timely availability of product and the ability of supply to meet demand schedules can lead to strong incentives for wholesalers to move away from joint shipping arrangements. However, regulatory incentives should not be added to this list of reasons for separate shipping arrangements.

In order to reduce the impact on industry behaviour, the regulatory arrangements need to be flexible and predictable. They must be able to cater for changes in the petroleum market – for example the entry or exit of wholesalers into or out of various markets – as well as the entry and exit of shippers within the market for sea freight. They must provide incentives for wholesalers to continue to supply and compete in various markets across the country.
Finally, the regulation of sea freight needs to be practical and should minimise the administrative burden on businesses and the Commission.

5.4.3 Introducing a Coastal Shipping Index

In the 2010 determination, the Commission determined that it would implement a coastal shipping index to regulate the allowance in the Retail price for coastal shipping costs. The Commission noted in the 2010 report that further work would be necessary to define and develop the index and the Commission would consult with the wholesalers in doing so. The Commission therefore proposed to continue with the existing price monitoring approach until the work required to develop the index was complete. The Commission did carry out this work, but for a variety of reasons it was never published or implemented.

The Commission is proposing to implement the use of a coastal Sea Freight index now.

The index will be of the form $SFI = (a*CI + b*BI + c*PI)$ where:
- $SFI$ = Sea freight Index;
- $a$, $b$, and $c$ are the weights for the charter costs, the bunkering costs and the port costs respectively and will add to 100%;
- $CI$, $BI$, and $PI$ are indices for the charter cost, bunkering costs, and port costs respectively;
- Volume is the total volume carried by InterOil (as some product will be imported into Lae and elsewhere by Mobil and others).
- The formula would be presented as an index and would be based as 100 = January 2015, or as otherwise agreed.
- The starting freight cost would be those costs at this time (excluding any catch up or other adjustments required)
- The Commission will create two indexes. One for a MRX type vessel to reflect the costs of delivering to the main ports and one for an LCT type vessel to reflect the costs of delivering to smaller ports.

The Commission is proposing to use the following data series to create these indexes.

<table>
<thead>
<tr>
<th>Table 20: Data sources for indexes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Charter Index</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Bunkering Index</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Ports Index</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The Commission notes that there are several indexes and sources of information which could be used to monitor charter and bunkering prices.

*The Commission is requesting submissions from stakeholders, interested parties and the general public on which index or data source the Commission should use to establish the coastal shipping index.*
The Commission is proposing to use the weightings shown in the following table.

### Table 21: Index Weighting

<table>
<thead>
<tr>
<th></th>
<th>Main Ports</th>
<th>Smaller Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter Index (a)</td>
<td>58.9%</td>
<td>72.8%</td>
</tr>
<tr>
<td>Bunkering Index (b)</td>
<td>23.9%</td>
<td>16.0%</td>
</tr>
<tr>
<td>Ports Index (c)</td>
<td>17.2%</td>
<td>11.2%</td>
</tr>
<tr>
<td>Sea Freight Index</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

These weightings have been established from the last 12 months of actual coastal shipping data provided by Puma. The data identifies the costs of
- Chartering vessels
- Bunkering
- Ports charges
- Losses
- Survey
- Insurance.

The Commission is proposing to include the cost of Losses into the weighting for bunkering as the bunkering index should provide a proxy for movement of the IPP. Survey costs are proposed to be included with ports charges because both go up and down with CPI. Insurance costs are relatively trivial but the Commission proposed to include these with charter costs because this cost determines the insurance cost.

To illustrate how index calculations will work the commission has calculated the index for the past nine months and these are shown in the following table.

### Table 22: Index

<table>
<thead>
<tr>
<th></th>
<th>Dec-13</th>
<th>Jan-14</th>
<th>Feb-14</th>
<th>Mar-14</th>
<th>Apr-14</th>
<th>May-14</th>
<th>Jun-14</th>
<th>Jul-14</th>
<th>Aug-14</th>
<th>Sep-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter Index</td>
<td>100</td>
<td>106</td>
<td>106</td>
<td>104</td>
<td>103</td>
<td>106</td>
<td>111</td>
<td>110</td>
<td>106</td>
<td>100</td>
</tr>
<tr>
<td>Bunkering Index</td>
<td>100</td>
<td>104</td>
<td>106</td>
<td>106</td>
<td>106</td>
<td>106</td>
<td>107</td>
<td>103</td>
<td>98</td>
<td>91</td>
</tr>
<tr>
<td>Main Ports Freight</td>
<td>100</td>
<td>106</td>
<td>107</td>
<td>105</td>
<td>105</td>
<td>107</td>
<td>110</td>
<td>108</td>
<td>105</td>
<td>100</td>
</tr>
<tr>
<td>Small Ports Freight</td>
<td>100</td>
<td>107</td>
<td>108</td>
<td>106</td>
<td>105</td>
<td>108</td>
<td>111</td>
<td>110</td>
<td>106</td>
<td>101</td>
</tr>
</tbody>
</table>

The indexes are calculated using the following steps.
2. Calculated 4 month rolling averages.
3. Divide the data point for each month by the data point for the starting month of the series then multiply by 100, so that each series starts with a value of 100 and then continues to be a proportion of 100.
4. Calculate the Sea Freight indexes using the weighting listed above and using the following formula already described (i.e. \( SFI = a*CI + b*BI + c*PI \))

The percentage change in the index each month will then be applied to the coastal freight cost allowance for main ports and for smaller ports. In this way the allowance for freight costs will go up and down each month with the index.
The Commission is proposing to only have two coastal freight allowances which will see one for main ports and one for small ports. This is different from the current arrangements where there are different rates for petrol, diesel and kerosene. The Commission understands that different rates for different products arise because of the way Puma has calculated costs in the past using the density for each product. However as the cost for all products is ultimately determined by their volume and not their weight, the Commission is of a view that a single cost for all products should be adequate.

The Commission is also proposing not to distinguish between costs at different ports. In the Commission’s view, costs are determined by the space used on the vessel and the number of days the vessel is used. As there is no opportunity to restock a vessel part way through its voyage, then whether or not product is discharged at the first port of call or the last port of call makes no difference to the incremental cost of delivering product. Port charge variations are also mainly due to whether or not the port is a main port or a small port.

The Commission has applied the indexes calculated above to nominal prices to illustrate how the prices would change over a period of time (see following table).

<table>
<thead>
<tr>
<th>Table 23: Illustrative sea freight cost allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec-13</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Main Ports (toea / Litre)</td>
</tr>
<tr>
<td>Small Ports (toea / Litre)</td>
</tr>
</tbody>
</table>

The Commission proposes to establish starting costs for Main Ports and Small Ports for December 2014. The changes in the index will be applied to these starting costs to calculate the coastal freight cost allowance throughout the regulatory period.

To establish starting costs the Commission is proposing to use the coastal freight cost information currently provided by Puma. The Commission is cognisant of the expectations of the Project Agreement which envisaged that the operator of the project would provide joint shipping arrangements for product delivered to other ports. The Commission also wants to ensure that only costs actually incurred at the present time are passed on to consumers. So the Commission is proposing to calculate starting cost per litre figures by dividing actual costs by total industry volumes. The actual costs will be those provide by Puma as these are assumed to represent the costs of shared coastal shipping envisaged by the Project Agreement. The total industry volumes will include 100% of the estimated national consumption of petrol, diesel, kerosene and zoom plus any other bulk product transported on these vessels, which would have been transported if it were all sourced from the Napa Napa refinery.

The effect of Commission’s proposed method to determine starting costs will be to lower the average cost allowance for coastal shipping below the actual cost per litre of product actually transported. For Puma this may mean that their actual costs are higher than the cost allowance. But for Mobil and Niugini Oil (where they import product), the allowance will be higher than their actual costs. This is a consequence of the market distortion already described by the Commission earlier in this report.

The Commission is proposing to use a coastal shipping index to calculate a coastal shipping cost allowance. Monthly percentage changes in the index will be applied to estimated starting cost per litre for both main ports and smaller ports.

The Commission is of the view that by setting coastal freight allowances using the shipping index, wholesalers will have an incentive to find the cheapest method of transporting their products. At present there is little incentive to do this as any cost reductions simply result in lower retail prices.
However with the new method, cost allowances will be set at current costs, so the benefit of any efficiency gains will result in higher profits for wholesalers.

The Commission is seeking comments and submissions from all relevant stakeholders on the Commission’s proposed method of providing for the cost of coastal shipping in retail prices.

5.4.4 Cross-harbour shipping costs in Port Moresby

Currently there is an allowance in the calculation of Port Moresby fuel prices, for shipping product across the harbour from Napa Napa to Kanudi. The Commission understands that InterOil began using its coastal shipping capacity to transport product across the harbour when land owners along the road between Napa Napa and Kanudi closed the road. The Commission understands that this was only a temporary situation.

The cost of Cross-harbour shipping is current estimated to be 8.3 toea per litre. The Commission has estimated that the cost of using road freight as an alternative would be about 1.2 toea per litre (based upon a distance of 33km).

While the reliability of fuel supplies to Port Moresby is critical, having permanent shipping arrangements across the harbour appears to be an expensive solution. The Commission also notes that the reliability of road transport will be jointly shared with all other shipping into Port Moresby once the Port is shifted to Motukea (planned for 2017).

Because there are currently no restrictions upon the use of the road, the Commission is proposing to only allow for the cost of road transport in Port Moresby prices.

The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision to only allow for road transport costs in Port Moresby prices.

5.5 Domestic road freight charges

Road freight in PNG is challenging. This is highlighted by a submission from Matara No. 8 Ltd, which cites the case of damage caused by cyclone Guba in 2007, destroying roading infrastructure in the Northern Province which has yet to be rebuilt. Temporary bridges were built, but have subsequently been washed away and rebuilt several times. Puma also acknowledge the road transport challenges, noting that “no one should be deluded to think that the road transport network that is available to residents in Port Moresby is representative of the conditions of the road infrastructure in the rest of the country”.

5.5.1 Background and previous determinations

As with sea freight, road freight costs are a matter of some importance within PNG. They represent a significant component of the final price paid for oil products by consumers in remote areas of PNG. In part, this reflects the geographic realities of PNG, a country which features a limited road network and topography and climatic conditions that cause serious maintenance problems for the upkeep of those roads.

Prior to 2004, road freight was regulated using a ‘freight differential’ model. However this model was ineffective in reflecting the different costs of freight across the country, particularly in remote areas. Prior to 2004 the following scenarios were becoming more common:

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\[12\] InterOil submission on issues paper 2014, p 18.
• Fuel needed to be sold in some remote locations at technically illegal prices in order to reflect freight costs;
• Some wholesalers were finding it necessary to cross-subsidise fuel sales in remote locations from sales in other areas; and
• Some wholesalers were withdrawing their presence from remote areas.

In its 2004 Final Report, the Commission therefore elected to regulate road freight prices on a price monitoring basis whereby road freight costs effectively become a direct pass through subject to the Commission being satisfied they are reasonable. This approach, which had general support from the industry, was designed to overcome the rigidities involved in the freight differential model. The Commission developed a price monitoring model whereby it obtains quarterly information on road freight costs from oil companies and retailers on the freight costs from depots. This information is then compared with a freight cost index ("FCI") developed by the Commission and which uses information from the National Statistical Office ("NSO"). The FCI included the following costs and weightings based on information provided from trucking companies:

• Vehicle purchase (a weighting of 25.7%);
• Licenses and insurance (13.4%);
• Repairs and servicing (7.2%);
• Staff costs - as measured by the change in public sector wage rates (22.2%);
• Fuel (9.6%);
• Tyres and tubes (8.1%); and
• Overheads – as measured by the CPI (13.8%).

However the price monitoring model adopted by the Commission was not as effective as envisaged. Problems arose both with calculating the FCI and in collecting information from the industry.

In relation to the FCI, the Commission has been unable to receive information from the NSO on a timely manner, particularly since June 2006. Recently, the NSO has also changed the manner in which individual cost items are calculated.

It has also been difficult for the Commission to perform its monitoring role because in some cases information on transport costs has not been provided by the retailers and wholesalers.

At the last review the Commission decided to continue monitoring road freight charges under Section 32A of the PR Act, by accessing data from the Wholesale distributors and selected Retail distributors. As part of this monitoring responsibility, the Commission proposed to compare the freight cost on individual routes with competitive routes or the market overall. Where the cost change on one route was inconsistent with changes occurring more generally in the market, the Commission would then seek explanation as to the reason for the divergence and if the Commission was not satisfied with the road freight being charged or the explanation provided, the Commission may recommend to the Minister that road freight be declared for price control purposes.

As with the other elements of the petroleum supply chain, the Commission once again needs to consider whether road freight charges should be regulated or not. In addition, where regulation is supported, whether the current monitoring approach is sufficient and robust for purpose.

5.5.2 Modelling road freight costs

The Commission requested, and was provided with, information on road freight costs for various routes by various wholesalers. The Commission has used this information to model the cost of road freight.
In the Commission’s view Road Freight vary according to;
- The distance of the route.
- The size of the vehicle
- The speed at which the vehicle can travel reflecting road conditions
- The need for security

While some costs are directly driven by the distance travelled, other costs are driven by the time it takes to make the journey. The Commission has converted time based costs into distance costs using the assumed average speed.

The Commission’s model identifies two things.
- The cost to transport a litre of product one kilometre. (toea per litre km)
- The cost to load a litre of product (toea per litre)

To calculate the cost to transport a litre of product one km, the model uses the following inputs.

Distance Costs
- The cost to purchase and fit out a new vehicle
- The expected number of km’s the vehicle can travel in its lifetime.
- Insurance and maintenance costs associated with the vehicle.
- Tyre Replacement
- Fuel consumption rates (km per litre)

Distance cost information is used to calculate the cost per km travelled for a vehicle.

Time Costs
- The cost of employing, training and supervising a driver.
- The additional cost of security for a vehicle while on the road.

Time costs are used to calculate the cost per hour. This is then converted into a cost per km using the average speed at which a vehicle can travel. This is then divided by the volume of petroleum product that the vehicle can carry in litres, to give a cost per litre.

Loading Costs
Loading costs are calculated using the following inputs
- The average time to load the vehicle
- The labour rate of the driver
- The capacity of the vehicle

This provides the cost of loading expressed in Kina / Litre

It is assumed that the time to load is the same the time to unload. No other infrastructure costs are considered, in the cost of loading and unloading a vehicle.

Results

In response to its request for information the Commission received data about five vehicle types travelling on particular routes.

The results were as follows;
Table 24: Results of Vehicle Cost Analysis

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Vehicle Type 1</th>
<th>Vehicle Type 2</th>
<th>Vehicle Type 3</th>
<th>Vehicle Type 4</th>
<th>Vehicle Type 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Cost (Kina / km)</td>
<td>10.5</td>
<td>8.0</td>
<td>6.7</td>
<td>8.4</td>
<td>16.1</td>
</tr>
<tr>
<td>Time Costs (Kina / Hour)</td>
<td>23.2</td>
<td>7.7</td>
<td>7.7</td>
<td>31.8</td>
<td>9.0</td>
</tr>
<tr>
<td>Average Speed Reported</td>
<td>27</td>
<td>22</td>
<td>22</td>
<td>27</td>
<td>40</td>
</tr>
<tr>
<td>Average Speed Used</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Capacity (litres)</td>
<td>40,000</td>
<td>36,000</td>
<td>20,000</td>
<td>20,000</td>
<td>18,000</td>
</tr>
<tr>
<td>Cost to carry a litre 1 km (Toea / litre) *</td>
<td>0.029</td>
<td>0.03</td>
<td>0.035</td>
<td>0.048</td>
<td>0.051</td>
</tr>
<tr>
<td>Loading Cost (toea / litre)</td>
<td>0.06</td>
<td>0.06</td>
<td>0.14</td>
<td>0.11</td>
<td>0.05</td>
</tr>
<tr>
<td>Security Costs</td>
<td>88</td>
<td>324</td>
<td>35</td>
<td>48</td>
<td>51</td>
</tr>
</tbody>
</table>

*Excludes security costs

The results of the Commission's analysis show a range of costs. Generally, larger vehicles were cheaper to transport product than smaller vehicles. They were also cheaper to load.

5.5.3 Setting the road freight allowance

The role of the Commission in setting prices is to estimate the cost of an economically efficient organisation. Therefore, the Commission is proposing to assume that each organisation can choose from the same range of vehicles and therefore has access to the cheapest vehicle. The Commission is proposing to choose the cheapest vehicle in each size range. Therefore the Commission is proposing to use the costs of the Type 2 Vehicle for larger vehicles and the Type 3 Vehicle for smaller vehicles. Thus the Commission is proposing to use the following costs and route description information to calculate allowances for Road Freight costs.

Table 25: Proposed cost inputs for Road Freight model

<table>
<thead>
<tr>
<th></th>
<th>Large Vehicle</th>
<th>Small Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Cost (Kina / km)</td>
<td>8.0</td>
<td>6.7</td>
</tr>
<tr>
<td>Time Based Cost (Kina / hour)</td>
<td>7.7</td>
<td>7.7</td>
</tr>
<tr>
<td>Size of Vehicle (litres)</td>
<td>36,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Loading Charge (Toea / litre)</td>
<td>0.056</td>
<td>0.135</td>
</tr>
</tbody>
</table>

Table 26: Route description inputs used for Road Freight model

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>One way distance (km)</th>
<th>Security Required Flag (1 = Yes)</th>
<th>Large Vehicle Flag (1 = Yes)</th>
<th>Average Speed (km / hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lae</td>
<td>Bulolo</td>
<td>133</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Lae</td>
<td>Lae</td>
<td>55</td>
<td>-</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>Lae</td>
<td>Ramu</td>
<td>186</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Lae</td>
<td>Goroka</td>
<td>302</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Lae</td>
<td>Kainantu</td>
<td>215</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Lae</td>
<td>Mt.Hagen</td>
<td>485</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Lae</td>
<td>Banz</td>
<td>436</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Lae</td>
<td>Minj</td>
<td>451</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Mt Hagen</td>
<td>Wabag</td>
<td>100</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Mt Hagen</td>
<td>Pogera</td>
<td>186</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Mt Hagen</td>
<td>Mendi</td>
<td>120</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Madang</td>
<td>Madang</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>22</td>
</tr>
</tbody>
</table>
The following table shows the resultant amounts the Commission is proposing to use for the road freight cost allowance.

**Table 27: Proposed allowance for road freight costs**

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Proposed allowance (toea / litre)</th>
<th>Current allowance (toea / litre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lae</td>
<td>Bulolo</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Lae</td>
<td>Lae</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Lae</td>
<td>Ramu</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Lae</td>
<td>Goroka</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td>Lae</td>
<td>Kainantu</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td>Lae</td>
<td>Mt.Hagen</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Lae</td>
<td>Banz</td>
<td>35</td>
<td>41</td>
</tr>
<tr>
<td>Lae</td>
<td>Minj</td>
<td>37</td>
<td>41</td>
</tr>
<tr>
<td>Mt Hagen</td>
<td>Wabag</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Mt Hagen</td>
<td>Pogera</td>
<td>15</td>
<td>40</td>
</tr>
<tr>
<td>Mt Hagen</td>
<td>Mendi</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Madang</td>
<td>Madang</td>
<td>0.21</td>
<td>6</td>
</tr>
<tr>
<td>Wewak</td>
<td>Wewak</td>
<td>0.18</td>
<td>5</td>
</tr>
<tr>
<td>Alotau</td>
<td>Alotau</td>
<td>0.18</td>
<td>7</td>
</tr>
<tr>
<td>Goroka</td>
<td>Kundiawa</td>
<td>0.27</td>
<td>11</td>
</tr>
<tr>
<td>Port Moresby</td>
<td>Port Moresby</td>
<td>1.2</td>
<td>7</td>
</tr>
<tr>
<td>Port Moresby</td>
<td>Kerema</td>
<td>40</td>
<td>49</td>
</tr>
<tr>
<td>Kavieng</td>
<td>Kavieng</td>
<td>0.18</td>
<td>9</td>
</tr>
<tr>
<td>Kavieng</td>
<td>Namatanai</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>Kimbe</td>
<td>Kimbe</td>
<td>0.21</td>
<td>10</td>
</tr>
<tr>
<td>Kimbe</td>
<td>Bialla</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Rabaul</td>
<td>Rabaul</td>
<td>0.21</td>
<td>6</td>
</tr>
<tr>
<td>Rabaul</td>
<td>Kokopo</td>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>

The Commission proposes to adjust road freight month by month to reflect changes in fuel prices and annually to reflect changes in inflation.
Approximately 14.4% of the cost of road transport is attributed to fuel costs at current prices. So the Commission is proposing that the following monthly and annual adjustments will be made.

**Monthly adjustment**

\[
[\text{New Road Freight Allowance}] = [\text{Old Road Freight Allowance}] \times 0.144 \times \% \text{ change in IPP} \\
+ 0.856 \times [\text{Old Road Freight Allowance}]
\]

The percentage change in IPP is the percentage change from the previous month.

**Annual Adjustment**

\[
[\text{New Road Freight Allowance}] = [\text{Old Road Freight Allowance}] \times (1 + \% \text{ CPI Change})
\]

At the year-end both the Monthly and the Annual adjustments will be made.

---

The Commission is seeking submissions from all stakeholders, interested parties and the general public on its proposed allowances for road freight costs.

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### 5.6 Drum Filling

#### 5.6.1 Background

Due to the absence of local service stations in coastal and remote regions, a substantial proportion of fuel used in PNG is sold in drums. Each of the major wholesalers has a drum filling operation. Each drum is sold based on 200 litres of product, although a drum can hold up to 208 litres. The Commission understands that drums cost around 200 Kina each.

The first time a consumer purchases a drum of petroleum product she or he will buy the product as well as the drum. However drums can be reused and, provided a drum is returned in serviceable condition, subsequent fillings (usually of a different drum; sometimes of the same one) do not require the drum to be purchased again. The number of times a drum can be refilled will depend upon the manner in which it has been transported, stored and handled during usage. Estimates of the average number of reuses range from around three (3) to fifteen (15) times. Drums are often transported on the back of private vehicles. A common method of getting a drum off a vehicle is to drop it to the ground. This tends to damage the drum.

Drum filling, which involves transferring fuel from bulk storage to the drum, is a relatively time consuming and labour intensive task. Each time a drum is received it generally needs inspection, cleaning, painting and seals and caps checked. In addition, drums take up storage space at depots.

Data was not submitted on drum sales by all wholesalers, and the data that was provided suggested that drum sales have grown in line with overall petroleum sales volumes. For those wholesalers who did submit forecast drum sales volumes for the coming period, the figures suggest an expectation of relatively flat demand for drum sales, though given there is little to suggest a reduction in the need for drum sales, and still increasing demand, it is likely drum sales will continue to grow.

#### 5.6.2 Current Drum Pricing Arrangements

Fuel sold in drums is subject to the same pricing and regulatory arrangements as other petroleum sales (including the wholesale margin). The Commission, in its 2010 Final Report set the drum filling margin at 7 toea per litre and adjusted annually using a CPI +2.4% adjustment.
In its 2004 Final Report, the Commission elected not to regulate the deposit paid/refund arrangement for drums, and this approach was continued in the 2010 Final Report.

The submissions and discussions the Commission have had suggest that a separate drum filling margin remains necessary. Puma’s submission suggests that actual costs are well above the current drum filling margin of 8.75 toea per litre.

**5.6.3 Rationale for Regulation of Drum Filling Costs**

There are a number of reasons why the drum filling margin is regulated. Firstly, it was clear to the Commission when preparing its 2004 Final Report that the cost of selling fuel in a drum is materially greater than other bulk sales and hence it needed to be treated separately in order to avoid cross-subsidisation, and to reduce barriers to entry into the market for supply of drummed petroleum products. At the same time, many of the costs associated with drum filling (including drum storage areas, bulk fuel facilities and general overheads) are shared with other parts of the wholesale fuel operation. Thus it was logical to regulate drum filling costs consistent with the regulation of general wholesale sales. Finally, fuel sold in drums is typically sold in regions where there are little or no alternative fuel supply options for consumers. Therefore, it was also desirable to regulate drum filling costs from a consumer protection perspective to avoid any perception of potential anticompetitive behaviour by industry participants even if such is non-existent in practice.

The Commission considered that these matters remained salient at the last review, and that is also the Commission’s view at the present time. Increasing volumes of drum sales, driven by growing overall demand, suggest the need for regulation of drum filling costs is perhaps more important. The Commission will therefore continue to regulate drum filling in the next regulatory period using direct price control.

The Commission’s position appears to have general industry support. Puma believes community and regulatory expectations and requirements around standards of operation for drum filling have intensified since the last review. They state that “compliance with those standards comes at a cost and the drum filling margin needs to accommodate those costs.” Nuigini Oil Company submitted that a separate drum filling margin should be charged. Islands Petroleum also referred to a specific cost of drum filling, and also applies additional charges if drums are damaged.

In its 2004 Final Report the Commission elected not to regulate the deposit paid/refund arrangement for the drum itself and instead to allow contestability in the market to regulate the price. The Commission, once again, did not receive any submissions from consumers on this matter, but information previously provided by the wholesalers suggests that the price at which the drum is sold to consumers is consistent with the cost to the wholesalers of purchasing the drum. Given this the Commission does not propose to subject this item to regulation.

**5.6.4 Estimating Drum Filling Costs**

Puma stated in their submission, that their costs of drum filling have averaged 12.5 toea per litre over the last 3 years and that this figure can be supported by reference to actual costs incurred. Puma provided this information to the Commission.

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13 InterOil submission to the issues paper 2014, p. 20
14 NOC submission to issues paper 2014, p. 5.
15 Discussion between Commission and Islands Petroleum, July 2014.
16 InterOil submission to the issues paper 2014, p. 20.
The Commission requested specific information about drum filling from all four wholesalers being evaluated. None of them responded to this request. So the Commission has undertaken its own modelling using the limited information available.

The Commission observed that Puma’s analysis included several items which were not relevant. In particular they included inventory costs which are covered by the wholesale margin and drum write off costs. The cost of the drum is not included in the drum filling margin. After removing these costs the Commission observes that Puma’s costs per litre had generally declined over the last five years. The 2013 estimated cost was 9.1 Toea / Litre.

The Commission also observed that Puma’s costs appear to have used estimated depreciation and estimated employee costs and these are by nature not particularly accurate. Puma provided a breakdown of the activities required to fill a drum and some estimates about the time required to do so.

Table 28: Activities required to fill a drum

<table>
<thead>
<tr>
<th>Activity</th>
<th>New Drum</th>
<th>Return Drum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unloading</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Integrity Check</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Storage</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Cleaning</td>
<td></td>
<td>Sometimes</td>
</tr>
<tr>
<td>Painting</td>
<td></td>
<td>Sometimes</td>
</tr>
<tr>
<td>Stencil</td>
<td></td>
<td>Sometimes</td>
</tr>
<tr>
<td>Filling</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Loading</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Gate / Admin</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>

Puma stated that with a new drum the direct handling time was about 30 minutes, but that if all activities were required, the handling time was more like 3 hours. On average Puma said it took 1 hour and fifteen minutes of direct handling time with fifteen minutes of administration and gate checking per drum.

The Commission has undertaken some simple modelling of drum filling costs, and this modelling, based on assumptions in terms of key input costs and processing factors, does not suggest that the drum filling margin is inadequate. Therefore the Commission proposes to leave the drum filling margin as it currently stands, but subject to an annual CPI adjustment. Because no information has been received from wholesalers to support it, the Commission does not propose to add an X factor to this annual adjustment.

The Commission will continue to regulate the drum filling margin under Section 21 of the PR Act. The drum filling margin will be set at the current 8.75 toea per litre with an annual CPI adjustment.

*The Commission is seeking submissions from stakeholders, interested parties and the general public on its draft decision to continue to regulate the drum filling and set the drum filling margin at the current rate of 8.75 toea per litre with an annual CPI adjustment.*
6 RETAIL MARKET

6.1 Form of regulation

Having taken the Proposal that continued regulation of retail activities is necessary (see earlier section), the question arises as to the form that such regulation should take. As set out earlier in this report, the broad options open to the Commission are direct price regulation and price monitoring.

The current form of regulation is direct price regulation through the establishment of a defined retail margin across all retail outlets. In submissions to the Issues Paper, there was broad support across the industry for maintaining this approach:

- InterOil indicated that they ‘support the Commission's existing regulation of the retail margin’\(^\text{17}\)
- Lifu Holdings Limited indicated that ‘we agree that the ICCC should continue the regulation of pricing’\(^\text{18}\)
- Matara No 8 Ltd submitted that the rate of margin for rural and remote service stations should be able to be increased, and suggested that the ICCC should convert to a price monitoring system for these areas, though appeared supportive of regulation of other retailers outside this category\(^\text{19}\)

Given the continued lack of price competition in the industry at the present time, the Commission does not consider that price monitoring is a realistic option. The Commission also considers that price monitoring of all retail outlets across the country would be a cumbersome and costly process: for price monitoring to be effective, it would require prices to be monitored on a day-to-day basis at all sites. This is not realistic.

Therefore, the Commission is proposing to continue to regulate the retail sector under price control arrangements over the next regulatory period.

The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision to continue to regulate the retail sector under price control arrangements over the next regulatory period.

6.2 Methodology for setting the retail margin

In establishing the retail margin for the 2004 regulatory period, in contrast to the approach to determining the wholesale margin, the Commission did not apply a ‘building block’ approach. Rather, the Commission obtained cost and revenue information from the Retailers Association and conducted modelling of costs and returns based on certain assumptions about margins and sales volumes. In doing so the Commission allowed a return on the value of stock held. The Commission identified that a margin of 15 toea per litre would be sufficient to meet costs and provide an appropriate profit margin for larger service stations, while returns would be smaller (but still positive) for smaller operations.

At the last review the Commission based its analysis of the required retail margin primarily on information it received from a large retailer in Port Moresby.

\(^{17}\) InterOil submission on issues paper 2014, p.20
\(^{18}\) Lifu Holdings submission on issues paper 2014, p. 1
\(^{19}\) Matara No 8 Submission to issues paper 2014, page 3.
The Commission concluded that using data from this retailer had a number of advantages, including that:

- The retailer only sold fuel and (with one small exception) did not operate a Kwik shop or similar retail facility. This meant that there was no need to allocate costs across petroleum products and other activities;
- The retailer rented the sites in question from the wholesaler, ensuring that the various site and asset costs were reflected in the lease payment; and
- The size of the retailer meant that its costs were reflective of a large proportion of the market in Port Moresby.

At the same time the Commission acknowledged that this information was not necessarily reflective of the industry as a whole given that it is based purely on a large urban retailer.

In recognition of the issues faced by smaller retailers in more remote areas, it is proposed to move away from a single retail margin to be applied throughout PNG, to a set of margins that take in to account geography and demand. This will seek to address the issues raised in the submission from Matara No.8 Ltd, with the aim of reducing the risk of retailers in more remote areas becoming unviable.

6.3 Calculation of the Retail Margin

To calculate retail costs the Commission has built a model using available information.

The model identifies both the replacement cost of retail assets and the cost of operating a retail site. The Commission has estimated the following costs.

Retails Assets
- Underground tanks
- Bowsers
- Development of a site
- A building to house a cashier
- Land

Operating costs
- The cost of staff working on the forecourt and the cashier
- Supervision of staff
- The cost of maintaining assets
- The cost of holding inventory
- Utility Costs
- Security
- Office supplies and Stationary

The model takes the approach of annualising asset costs by using annuities. Thus the total annual cost of owning and operating a site is established. This is divided by the annual regulated volume to establish a cost per litre.
The Commission also considered the margins which a retail site might make by selling other non-regulated products such as grocery items and lubricants. Including the costs and revenues of these non-regulated products would have the effect of introducing a cross subsidy from non-regulated products to regulated products. It is likely that in other jurisdictions retail operators do in fact cross subsidise their fuel sales with non-fuel products. However the Commission is aware that the number of retailers appears to be declining overall and the availability of land also creates a barrier to entry. The Commission is therefore concerned that the margin available to retailers should adequately cover all the direct costs associated with the sale of regulated petroleum products. Therefore the Commission is not proposing to introduce a cross subsidy.

The Commission has therefore attempted to estimate only the direct costs required to retail petroleum products. To do so the Commission needs to split the assets on retail sites between those required to sell regulated products and other assets. To support this the Commission has made the following assumptions.

- 90% of the land at an average retail site is associated with fuel sales.
- 10% of the building on an average retail site is associated with fuel sales.

The Commission considers that the only building requirements for a retail site to sell fuel alone is one where there is sufficient space for a cashier in a secure area, plus toilet facilities for staff.

The Commission recognises that there are a large number of variants between sites which will affect costs. These include:

- The size and number of underground tanks
- The number of bowsers and the use of single or dual bowsers
- The size of the site.
- The number of staff who work on the site (this is likely to be reflected in the number of bowsers).
- The daily hours in which a site might operate.
- The annual sales volume which is likely to reflect the demand in the particular geographic region and the number of competing sites in the region.
- The inventory requirements which may be dictated by the frequency of deliveries.
- The level of security required in a particular area.
- The value of land in a particular area.

The commission is in the process of carrying out a survey of retailers to develop a better understanding of how these costs might vary around the country. However based upon the limited information currently available to the Commission the margins identified in the following table are approximately indicative of the relative costs

<table>
<thead>
<tr>
<th></th>
<th>Port Moresby</th>
<th>Lae</th>
<th>Regions</th>
<th>Remote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicative Retail Costs (Toea / litre)</td>
<td>31</td>
<td>28</td>
<td>35</td>
<td>44</td>
</tr>
</tbody>
</table>

The Commission expects that these numbers will be change before the final report, and once the Commission has received responses to the survey currently being carried out. The Commission notes that while some costs may be cheaper in some areas, sales volumes also tend to be lower, which make achieving a profit position more challenging in these areas. The Commission is therefore proposing to set different retail margins in different geographic regions.
In particular the Commission needs to ascertain not only the costs of operating a site but also the minimum volume required to make a site sustainable. In the last review the commission set this value at 140,000 litres per month. The Commission received one submission from Popondetta, which argued that it was impossible for small stations in more remote areas to achieve these sales volumes because there were insufficient sales in a region. The commission expects that there will be some minimum volume below which it is more economically efficient for the local community to purchase fuel product in drums. However the Commission has not yet established what the level is.

The Commission is proposing to continue to annually adjust retail margins using the current CPI adjustment mechanism. Thus the Commission will continue to regulate the retail margin for petrol, diesel and kerosene under Section 21 of the PR Act for the next regulatory period. The Commission is proposing to differentiate the margin by geographic areas to reflect the different costs involved. The retail margin will be adjusted annually to reflect changes in the CPI.

**The Commission is seeking comments from stakeholders, interested parties and the general public on its draft determinations of the retail margin and the Commission’s proposal to continue to regulate the retail margin for petrol, diesel and kerosene for the next regulatory period. The Commission is also seeking comments from all stakeholders on its proposal to differentiate the margin by geographic areas to reflect the different costs involved.**
7 LENGTH OF REGULATORY PERIOD

The current regulatory period is for five years. This length of regulatory price path was designed to provide a degree of price certainty to oil industry participants, particularly in terms of wholesale and retail margins.

The Commission received three submissions on this issue.

- **Mobil** takes no exception to the proposed regulatory period of five (5) years (Mobil).
- The current 5 years between regulatory periods is adequate to allow for expenditure and capital decisions to be made (NOC).
- Given the likely changes with another major player (Total) entering the wholesale market and the impact of increasing volumes of imported fuel, InterOil believes the forthcoming review period is limited to three (3) years (Puma).

As there are already several operators in the wholesale market, the Commission does not think the entry of one operator is likely to require changes to the regulatory environment.

In the 2010 Draft Report the Commission considered using regulatory price control arrangements of anywhere between three years and ten years. In practice there needs to be a balance between the level of certainty provided to the regulated entities and the need to respond to external economic and business events which may have an impact on the regulatory settings.

The Commission took the view that while ten years is likely to be too long a regulatory period in the current circumstances, there is evidence that three to five year periods have worked well in PNG and in other similar regulatory environments. Bearing this in mind, as well as submissions from stakeholders, the Commission’s is proposing to maintain a five year price path for the forthcoming regulatory period.

Over a 10 year period the possibility of material changes to the market is higher than for a 5 year period. If such changes occur during a 5 year period, the time before the next review is not likely to be excessively long. This means that under a 5 year review period, any such market changes can be addressed within a reasonable time period.

However, the Commission does accept that there may be some circumstances where a particular event might drive the need to change regulatory structures prior to the end of a regulatory period. The Commission therefore invites stakeholders to suggest what circumstances might drive the need for an earlier review.

The Commission has proposed to adopt a time frame of approximately five years as the next regulatory period, commencing 1st January 2015 and ending 31st December 2019.

*The Commission is seeking submissions from stakeholders, interested parties and the general public on its draft decision to adopt a time frame of approximately five years as the next regulatory period, commencing 1st January 2015 and ending 31st December 2019.*
8 ZOOM

Zoom is a fifty to one mixture of petrol and oil. It is widely used in Papua New Guinea in boat engines. The product is normally sold in drums. The price of zoom is not currently regulated. The Commission is therefore reviewing whether or not the price of zoom should be regulated, particularly because petrol, as the main ingredient, is price regulated.

The Commission expects that a consumer could choose to purchase a 200 litre drum of petrol and add the appropriate oil to this drum to produce their own zoom. The constraint will be the consumer's ability to adequately mix the product. Alternatively the consumer could choose to mix both ingredients in a smaller more manageable container. Thus in the Commission's view the consumer has a viable alternative to purchasing zoom which is already mixed.

The Commission would also expect that the barriers to entering the Zoom market would be relatively low. Thus if participants in the market were selling zoom at prices that were excessive, then new entrants could easily enter and sell at a lower price.

Because consumers have alternatives to purchasing zoom and because barriers to entry are low, the Commission does not propose to regulate the price of zoom. However the Commission invites stakeholders to make submissions on this issue.

*The Commission is seeking comments from stakeholders, interested parties and the general public on its draft decision not to regulate the price of zoom.*
9 WACC

Having determined the RAB to apply over the regulatory period commencing 1st January 2015, an appropriate return on capital needs to be calculated. This return is multiplied by the asset base to determine the minimum required revenue to meet the cost of capital of the oil companies.

The return on capital or weighted average cost of capital ("WACC"), as referred to in most finance literature, represents the opportunity cost of capital to the regulated business and therefore should be set at a level that is deemed to adequately compensate the wholesalers for providing petroleum products. The WACC methodology has been developed from the capital asset pricing model ("CAPM") to form a reasonable basis for regulatory cost of capital and is designed to calculate the minimum rate of return required by providers of debt and equity to allow the regulated business to operate as a wholesaler of petroleum products.

Weighted Average Cost of Capital

The weighted average costs of capital (WACC) calculation formula are outlined below;

\[
\text{Post-tax WACC} = \frac{R_e \times E}{V} + \frac{R_d \times (1-t) \times D}{V} \quad (1)
\]

where:
- \(R_e\) = return on equity;
- \(R_d\) = return on debt;
- \(t\) = tax rate;
- \(E\) = market value of equity;
- \(D\) = market value of debt; and
- \(V\) = market value of business (i.e. \(D + E\)).

The return on debt (\(R_d\)) is calculated by adding a debt margin to the risk-free market rate.

\[
R_d = R_f + DM \quad (2)
\]

where:
- \(R_f\) is the risk free rate in PNG; and
- DM is the debt margin.

The return on equity (\(R_e\)) as indicated in the above WACC formula is derived by using the CAPM and the formula is outlined below;

\[
R_e = R_{f\text{international}} + \beta_e \times (R_m - R_f) \quad (3)
\]

where:
- \(R_{f\text{international}}\) is the risk free rate;
- \(\beta_e\) (equity beta) is a measure of correlation between a business’s risk and that of the overall market;
- \(R_m\) is the market rate of return;
- \(R_f\) is the risk free rate in PNG; and
- \((R_m - R_f)\) is the Market Risk Premium ("MRP").

The international risk free rate (\(R_{f\text{international}}\)) is calculated as follows;
\[ R_{f,\text{international}} = \left( \frac{1 + R_f}{(1 + \text{USA CPI}) \times (1 + \text{PNG CPI}) \times (1 + \text{CRP})} - 1 \right) \] (4)

where:

- \( R_f \) is the risk free rate in USA;
- USA CPI is the inflation rate in USA;
- PNG CPI is the inflation rate in PNG; and
- CRP is the country risk premium assigned for PNG.

According to the CAPM formula, the return on equity for a particular business is derived by adding the international risk free rate to the product of the equity beta and the Market Risk Premium (i.e. difference between the market return and the risk free rate). The margin, that is the equity beta (\( \beta_e \)), reflects how risky a business is relative to the overall market.

The Commission prefers using the Monkhouse formula as shown below to calculate the equity beta.

\[ \beta_e = \beta_a + \left( \beta_a - \beta_d \right) \times \left( \frac{1 - \frac{R_d}{(1 + R_d) \times t}}{E} \right) \times \frac{D}{E} \] (5)

Where \( \beta_a \) is the correlation between return to assets of the business and the market (known as asset beta) and \( \beta_d \) is the correlation between the return to debt and the debt returns generally in the market (known as debt beta).

Given the above equations for the calculation of the WACC, the Commission has to decide on the range of parameters used in the WACC calculation. These include:

- Risk Free Rate;
- Inflation;
- Debt margins;
- Taxation;
- Market Risk Premium;
- Equity beta; and
- Gearing ratio.

**Risk free rate**

The risk free rate of return represents the rate of return on a security, or portfolio of securities, that has no default risk and is not correlated with returns on other assets in the economy. The general accepted approach by regulators is to use the yield from certain long term government securities to generate an estimate of the risk free rates. These instruments are commonly-accepted as the lowest risk debt instrument observable, and as a result are viewed as reasonable proxies for a ‘risk free’ rate of return.

Due to the lack of an appropriately traded government bond in PNG, in the 2004 Review the Commission has used the 10-year US government bond rate plus an allowance for country risk premium and an adjustment for the difference between US and PNG Inflation. The Commission has decided to adopt a similar approach for this review, but with some minor changes. Because of the nature of the businesses under review, where the average asset life duration is in excess of 50 years, a
10 year bond appeared too short. As information about 20 year bonds is available the commission has chosen to use these to set the risk free rate.

The formula (4) above is used to estimate the risk free rate. As indicated in the formula, the US risk free rate is used as an initial proxy to determine the international risk free rate. Consistent with previous reviews, the Commission has used US bonds with a 20-year term to maturity as a proxy to calculate the risk free rate for purpose of determining the WACC.

Using the data on the US Treasury's website and taking a one month average (March 2014) of the 20 year US Treasury yield gives a rate of 3.35%.


**Inflation**

The above risk free rate of 3.35% includes an expected rate of inflation which poses a problem as PNG has a different inflation expectation than the US. Therefore we firstly need to adjust the US risk free rate for this difference in country inflation expectations.

The following observations were noted on the US inflation rate:

- Current inflation is at 1.5%
- Long term inflation expectation is 1.8% (countryeconomy.com)
- 20 year indexed Treasury yield spread – 2.3%

Considering this the Commission is proposing to use 2.0% for US inflation as a midpoint between the Treasury indexed spread and the long term inflation expectation.

For PNG the following data was available:

**Table 29**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PNG Actual Inflation</td>
<td>5.6%</td>
<td>8.6%</td>
<td>3.6%</td>
<td>2.8%</td>
<td>6.50%</td>
<td>5.5%</td>
<td>4.0%</td>
<td>5.2%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Bank of PNG (Monetary Policy Stmt)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PNG Budget (2014)</td>
<td>5.80%</td>
<td>4.5%</td>
<td>5.2%</td>
<td>5.2%</td>
<td>5.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The commission is proposing to use 5.2% for PNG inflation.

**Country Risk Premium**

Having estimated the inflation, the Commission has to estimate the Country Risk Premium (“CRP”) which will be applied to the derived US treasury securities yield that reflects PNG inflation. CRP reflects risks inherent to investing in different sovereign territories. It is close to zero for most developed and stable countries, but can be substantially higher in emerging markets. Generally, it can be attributed to variations in the degree of economic, political, financial and institutional stability in different countries.

In previous determinations, the ICCC has used a CRP of 3%. The Water and Sewerage determination (2009), the PNG Harbours determination (2009) and the PNG Power Determination (2012) all used 3%.
This rate was originally set by Rothschild’s at the time of the 2001 privatisation processes. It was considered to be the rate which was appropriate over the long term in PNG, despite other estimates at the time generating a much higher CRP. The ICCC does not possess a copy of any report from Rothschild’s which explains the basis for this rate.

In 2009, the ICCC commissioned Price Waterhouse Coopers ("PwC") to provide advice on the country risk premium. PwC provided the ICCC with estimates of the range of CRP for PNG over the six quarters to the end of March 2009. The PwC estimates ranged from 2.5% to 8.1% depending on the quarter. However, the ICCC was concerned that this range was heavily skewed by the impact of credit market dislocation associated with the Global Financial Crisis occurring at that time. Therefore the ICCC sought the council of Ross Garnaut formerly of Rothschild’s. Professor Garnaut suggested that in his experience the long term average CRP in PNG was 3%. At that time, given the amount of capital deployed by both companies in PNG, the ICCC decided to defer to Professor Garnaut regarding the CRP.

The Commission values remaining consistent with previous determinations and is therefore proposing to use 3% in this price review.

**Debt Margins**

The Independent Authority and Pricing Tribunal of New South Wales has recently issued a fact sheet (New Approach to Estimating the Cost of Debt: Use of the RBA’s Corporate Credit Spreads - February 2014) outlining a new data set they are proposing to use to establish a regulatory debt margin. This is based on credit spreads for Australian non-financial corporate bonds and is compiled by the Reserve Bank of Australia. The graph below shows the credit spreads or debt margins against Government Securities for the last nine years.

**Figure 3: Australian Corporate Bond Debt Margins**

![Australian Corporate Bond Debt Margins](image)

The above graph shows a sustained step change in debt margins after the GFC, in part due to the continuing Euro crisis. Spreads have also increased between A and BBB rated securities, evidence of a sustained transition to quality.

Based on this data the average BBB debit margin for March 2014 was 2.8%.
It would seem reasonable, in the first instance, to adopt this metric as the estimation of debt margin for the pricing reviews.

In consideration of the above margin, a summary table below captures the debt margins used in the previous determinations compared to that proposed above.

### Table 31

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology</td>
<td>4.0%</td>
<td>2.7%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Methodology</td>
<td>Based on AU corporate bonds with a BBB+ credit rating and a 10-year term to maturity. The PWC report calculated the rate at 3.1%.</td>
<td>Estimate by PWC based on 10 yr AU BBB+ Corp bonds and recent regulator estimations.</td>
<td>Based on the PWC calculation for Ports.</td>
</tr>
<tr>
<td>Proposed 2014</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methodology</td>
<td>Australian 10 Year Non-financial BBB Corporate Bond Spread Against CGS – one month average.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt Margin</td>
<td>2.8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Therefore the commission is proposing to use 2.8% as the debt margin.

### Market risk premium

The market risk premium ("MRP") reflects the additional return over and above the risk free rate that an investor would expect to earn by holding a well-diversified portfolio of assets. Survey evidence is one way in which forward-looking expectations of market participants can be observed. In fact, since the risk premium is an average of the premium demanded by investors, surveying investors about their expectations for the future can be a valid approach.

### Figure 4
The chart above shows that survey participants are for Australia, predominantly using an MRP of 6%. For the US market, the spread is more evenly across the 5%, 6% and 7% while for the UK market the predominant rate used is 5%.

The MRP section of the KPMG survey report referenced above concludes ‘...there is good reason to believe that a more appropriate figure for Australia looking forward would be closer to 5%. While 6% is currently the preferred risk premium for Australian regulators, this is currently under review.’

The Commission has also considered other methods of estimating the MRP including measuring historic premiums and implied premiums. There is currently no common ground on which to base a clear argument for moving from the 6% MRP used by the ICCC in past determinations. This position is also supported by the fact that the majority of practitioners and regulators in Australia are still using a 6% MRP.

The Commission is proposing to use an MRP of 6.0%.

**Taxation**

In previous determinations, the Commission has adopted a statutory tax rate of 30% in the WACC calculation. Given the relative cost and the level of intrusion associated with the calculation of an effective tax rate the Commission has been reluctant to alter its position from using the statutory tax rate. Hence the commission is proposing to continue to use a tax rate of 30%.

**Equity beta**

The equity beta ($\beta_e$) represents the degree of riskiness of a business compared to the overall market. Equity beta is estimated by assessing the movement in a particular business’s share price relative to the average of the overall market. Therefore, the equity beta indicates the level at which the business’s risk correlates with the risk of the market as a whole. A low equity beta (less than 1.0) indicates that the stock is less volatile or less risky than the market in general, and reacts less to movements in the average market. An equity beta of 1.0 means that the stock moves in line with the market or is as risky as the market itself and an equity beta greater than 1.0 means that the stock is more sensitive to any
moves by the market. Ultimately, the equity beta incorporates the market’s perceptions of the risk of that business in comparison with the rest of the market.

The value of equity beta has a significant effect on the value of WACC and it could be said that there is a positive relationship with the value of equity beta and the WACC because the WACC increases as the value of equity beta increases. This is because increase in the value of equity beta indicates that there is increase in the level of the sensitivity of the particular stock to movements in the overall market conditions thus indicating an increase in the level of risks. Therefore the WACC has to increase as a result to compensate investors in bearing the additional risk by investing in the business.

The following table list source and resultant beta for petroleum companies.

<table>
<thead>
<tr>
<th>Description</th>
<th>Asset Beta</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholesale Business</td>
<td>75 oil and gas distribution companies in the emerging market. 0.77</td>
<td>Damodaran – refer <a href="http://pages.stern.nyu.edu/~adamodar/">http://pages.stern.nyu.edu/~adamodar/</a></td>
</tr>
<tr>
<td>Retail Business</td>
<td>51 retail – food and grocery companies in the emerging market. 0.78</td>
<td>Damodaran and PWC NZ – refer <a href="http://pages.stern.nyu.edu/~adamodar/">http://pages.stern.nyu.edu/~adamodar/</a></td>
</tr>
<tr>
<td>ICCP</td>
<td>Port price review. 0.894 - Regulator estimate</td>
<td>ICCCP - Petroleum Industry Pricing Review – Oct 2010</td>
</tr>
</tbody>
</table>

Proposal: - The Commission is proposing to use 0.77 as the as the asset beta for Wholesale Petroleum Products and 0.78 for Retail Petroleum Products.

### Gearing ratio

In order to construct the WACC, a gearing ratio needs to be determined to apply the appropriate weights within the WACC. Gearing is defined as the proportion of debt to equity in the total capital structure of the business. The Commission could use a long-term industry average for the gearing levels, or a capital structure deemed to an efficient structure given the risks faced by the business rather than the actual ratio faced by the regulated entity. This approach is usually adopted by regulators to ensure that the regulated business is not rewarded for inefficiency in its capital structure.

The pricing review entails calculating a wholesale and retail margin. In this regard in our opinion, two specific business activities are being undertaken. Therefore we think it is appropriate to establish two separate WACCs covering these two business types.

The wholesale business, which is primarily involved with storage and distribution of the petroleum products, is comparable to companies in the ‘oil and gas distribution’ business. In this regard a selection of such companies has been made from the emerging market sector.

In regard to the ‘retail’ part of the activities, this proves more difficult as many retail petrol and diesel distributors are part of larger integrated oil companies. To overcome this issue we suggest that the supermarket business is a close proxy. This view is based on similarities around the retail operation concept from a financial risk perspective and that the base products of both entities are similarly non-discretionary. Therefore companies from the emerging market in the ‘retail –grocery and food’ category have been selected as comparable businesses to the regulated petroleum retail business.
The following table lists sources and resultant gearing levels for oil and gas distribution companies and food retailers.

### Table 33

<table>
<thead>
<tr>
<th>Description</th>
<th>Gearing %</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholesale Business</td>
<td>75 oil and gas distribution companies in the emerging market.</td>
<td>47%</td>
</tr>
<tr>
<td>Retail Business</td>
<td>51 retail – food and grocery companies in the emerging market.</td>
<td>21%</td>
</tr>
<tr>
<td>ICCC</td>
<td>Port price review.</td>
<td>10% - Regulator estimate</td>
</tr>
</tbody>
</table>

Proposal: The Commission is proposing to use 47% as the gearing for Petroleum Products – Wholesale and 21% for Petroleum Products - Retail.

### Summary of WACC parameters

Having considered all the above, the following are the parameters the Commission is proposing to use.

### Table 34

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Risk Free Rate</td>
<td>3.35%</td>
</tr>
<tr>
<td>US Inflation</td>
<td>2.0%</td>
</tr>
<tr>
<td>PNG Inflation</td>
<td>5.2%</td>
</tr>
<tr>
<td>Country Risk Premium</td>
<td>4.3%</td>
</tr>
<tr>
<td>PNG Risk Free Rate</td>
<td>11.2%</td>
</tr>
<tr>
<td>Market Risk Premium</td>
<td>6.0%</td>
</tr>
<tr>
<td>Debt Margin</td>
<td>2.8%</td>
</tr>
<tr>
<td>Return on Debt</td>
<td>14.0%</td>
</tr>
<tr>
<td>Tax Rate</td>
<td>30%</td>
</tr>
<tr>
<td>Gearing – Wholesale</td>
<td>47%</td>
</tr>
<tr>
<td>Gearing - Retail</td>
<td>21%</td>
</tr>
<tr>
<td>Asset Beta – Wholesale</td>
<td>0.77</td>
</tr>
<tr>
<td>Asset Beta - Retail</td>
<td>0.78</td>
</tr>
<tr>
<td>Equity Beta</td>
<td>0.81</td>
</tr>
<tr>
<td>Return on Equity</td>
<td>16.0%</td>
</tr>
</tbody>
</table>

This results in the WACC as shown in the following tables

### Table 35: Proposed weighted average cost of capital for Wholesale

| WACC (Post Tax- Nominal) | 15.1% |
| WACC (Pre Tax- Nominal)  | 21.5% |
| WACC (Post Tax- Real)    | 9.4%  |
The Commission seeks comments and submissions from stakeholders, interested parties and the general public on its proposed figures to use for the WACC parameters.
10 DRAFT PRICE ORDER

This section details the Commission’s Draft Price Order for petroleum products for the forthcoming regulatory period to allow public comment. The Commission is proposing that the Draft Price Order will be published in the Gazette.

Period of price direction

The forms of regulation as specified below will apply to petroleum products for a period of approximately five years as the next regulatory period, commencing 1st January 2015 and ending on 31st December 2019.

Forms of regulation

The following are the forms of regulation that will apply to each component of petroleum products (petrol, diesel and kerosene) as well as other petroleum products such as aviation gasoline and Jet A1.

IPP

The Commission will continue to monitor the IPP for petrol, diesel and kerosene under Section 32A of the PR Act. In addition, the Commission will also monitor the volume of petrol, diesel and kerosene produced from the Napa Napa refinery under Section 32A of the PR Act.

Puma Energy will continue to provide updates to the Commission on the components of the IPP as specified in the Project Agreement (as amended by the State as per the May 20, 20008 NEC decision or according to any decision made by the State after the release of the Final Report on this Review). At the end of each month and prior to the 8th day of each month, Puma Energy must provide the impact of the change in IPP to the Commission for verification.

Wholesale margin

The Commission will continue to regulate the wholesale margin under Section 21 of the PR Act. The starting Wholesale Margin for 2015 will be 22 toea per litre and will be adjusted each year by \((1 + \text{CPI} \cdot X)\) where the X factor for each year of the regulatory period is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>-1.0%</td>
</tr>
<tr>
<td>2016</td>
<td>-1.0%</td>
</tr>
<tr>
<td>2017</td>
<td>-1.0%</td>
</tr>
<tr>
<td>2018</td>
<td>-1.0%</td>
</tr>
<tr>
<td>2019</td>
<td>-1.0%</td>
</tr>
</tbody>
</table>

The CPI for each year \(t\) (excluding tobacco, betel-nut and alcohol) will be calculated as follows:

\[
\text{CPI}_t = \left( \frac{\text{CPI}_{\text{Mar}(t-1)} + \text{CPI}_{\text{Jun}(t-1)} + \text{CPI}_{\text{Sept}(t-1)} + \text{CPI}_{\text{Dec}(t-2)}}{\text{CPI}_{\text{Mar}(t-2)} + \text{CPI}_{\text{Jun}(t-2)} + \text{CPI}_{\text{Sept}(t-2)} + \text{CPI}_{\text{Dec}(t-3)}} \right) - 1
\]

Where:
- \(\text{CPI}\) means the underlying Consumer Price Index (excluding alcoholic drinks, tobacco and betel-nut) published by the National Statistical Office
- \(\text{Year}_t\) is the year for which wholesale margin is being set;
- \(\text{Year}_{t-1}\) is the previous regulatory year;
- \(\text{Year}_{t-2}\) is the regulatory year two years previous; and
Year \( t-3 \) is the regulatory year three years previous.

The Commission will inform the industry by or before 15th of December of the new wholesale margin to take effect from 1 January of each year of the regulatory period.

**Domestic sea freight charges**

The Commission will set the sea freight rates for petrol, diesel and kerosene. The sea freight rate will be regulated by implementing the use of a Coastal Sea Freight Index. A coastal sea freight index will be calculated using a charter index, bunkering index and a ports index.

The index will be of the form \( SFI = (a*CI + b*BI + c*PI) \) where:
- \( SFI \) = Sea freight Index;
- \( a, b, \) and \( c \) are the weights for the charter costs, the bunkering costs and the port costs respectively and will add to 100%;
- \( CI, BI, \) and \( PI \) are indices for the charter cost, bunkering costs, and port costs respectively;
- Volume is the total volume carried by InterOil (as some product will be imported into Lae and elsewhere by Mobil and others).
- The formula would be presented as an index and would be based as 100 = January 2015, or as otherwise agreed.
- The starting freight cost would be those costs at this time (excluding any catch up or other adjustments required)
- The Commission will create two indexes. One for a MRX type vessel to reflect the costs of delivering to the main ports and one for an LCT type vessel to reflect the costs of delivering to smaller ports.

The Commission will use the following data series to create these indexes

### Data sources for indexes

<table>
<thead>
<tr>
<th>Data Source</th>
<th>AFRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter Index</td>
<td>AFRA</td>
</tr>
<tr>
<td>Data will be smoothed by calculating a 4 month rolling average.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Platts Singapore Heavy Distillates Monthly Averages for Ex-Wharf 380</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bunkering Index</td>
<td>Platts Singapore Heavy Distillates Monthly Averages for Ex-Wharf 380</td>
</tr>
<tr>
<td>Data will be smoothed by calculating a 4 month rolling average</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ports Index</th>
<th>% annual change in ports charges as determined from time to time by the commission</th>
</tr>
</thead>
</table>

The Commission will use the weightings shown in the table below.

### Index Weighting

<table>
<thead>
<tr>
<th>Index Weighting</th>
<th>Main Ports</th>
<th>Smaller Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter Index (a)</td>
<td>58.9%</td>
<td>72.8%</td>
</tr>
<tr>
<td>Bunkering Index (b)</td>
<td>23.9%</td>
<td>16.0%</td>
</tr>
<tr>
<td>Ports Index (c)</td>
<td>17.2%</td>
<td>11.2%</td>
</tr>
</tbody>
</table>
Drum filling margin

The Commission will continue to regulate the drum filling margins under Section 21 of the PR Act. The drum filling margin will be set at the current margin of 8.75 toea per litre with an annual CPI adjustment with no X-factor to this annual adjustment.

The CPI calculation is the same as that specified above. The Commission will inform the industry by or before 15th of December of the new drum filling margin to take effect from 1st January of each year of the regulatory period.

Road freight charges

The Commission will set road freight rates for petrol, diesel and kerosene. Road freight rates will be set by calculating what it would costs to transport both a litre of product one kilometre (toea per km) and the costs to load a litre of product (toea per litre).

To calculate the costs to transport a litre of product over a kilometre, the road freight model will use inputs on distance costs and time costs.

Distance costs
The costs to purchase and fit out a new vehicle
The expected number of kilometres the vehicle can travel in its lifetime
Insurance and maintenance costs associated with the vehicle
Tyre replacement
Fuel consumption rates (litres per km)
Distance costs will be used to calculate the costs per km travelled for a vehicle.

Time Costs
The costs of employing, training and supervising a driver
The additional costs of security for a vehicle while on the road.
Time costs will be used to calculate the cost per hour. This is then divided by the volume of petroleum product that the vehicle can carry in litres, to give a cost per litre.

Loading Costs will be calculated using the following inputs
The average time to load the vehicle
The labour rate of the driver
The capacity of the vehicle
This will provide the cost of loading expressed in kina per litre.

The Commission will choose the costs of Type 2 vehicle for larger vehicles and Type 3 vehicle for smaller vehicles as they are the cheapest in each respective size range.

Proposed cost inputs for Road Freight model

<table>
<thead>
<tr>
<th></th>
<th>Large Vehicle</th>
<th>Small Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Cost (Kina / km)</td>
<td>8.0</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Time Based Cost (Kina / hour) | 7.7 | 7.7  
Size of Vehicle (litres) | 36,000 | 20,000  
Loading Charge (Toea / litre) | 0.056 | 0.135

The Commission will adjust road freight monthly to reflect changes in fuel prices and annual to reflect changes in inflation.

**Retail margin**

The Commission will continue to regulate the retail margin for petrol, diesel and kerosene under Section 21 of the PR Act for the next regulatory period and the margin will be adjusted annually using a \((1+CPI+X)\) price path. The Commission will differentiate the margin by geographic areas to reflect the different costs involved.

The margins identified below are approximately indicative of relative costs.

<table>
<thead>
<tr>
<th></th>
<th>Port Moresby</th>
<th>Lae</th>
<th>Regions</th>
<th>Remote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicative Retail Costs (Toea / litre)</td>
<td>31</td>
<td>28</td>
<td>35</td>
<td>44</td>
</tr>
</tbody>
</table>

The CPI calculation is the same as that specified above.

The Commission will inform the industry by or before 15\(^{th}\) of December of the new retail margin to take effect from 1 January of each year of the regulatory period.

**Aviation gasoline (Avgas)**

The Commission will cease the regulation of Avgas in any form.

**Jet A1**

The Commission will continue to monitor the price of Jet A1 under Section 20 and 32 of the Price Regulation Act. The Commission will monitor the prices ex Napa Napa refinery and the final price. To the extent that the margin between the prices ex Napa Napa and the final prices vary over time, the Commission will seek an explanation for the changes and if the Commission is not satisfied with the retail price being charged the Commission may recommend to the Minister for Treasury that Jet A1 be declared for price control purposes.

Puma Energy is required to provide monthly data on prices ex the Napa Napa refinery. Wholesalers are required to provide monthly data on the volumes and final price sold to customers.
Appendix 1: Submissions and comments to the Issues Paper and Consultations

- Puma Energy (formerly InterOil)
- Mobil Oil New Guinea Limited
- Islands Petroleum Limited
- Niugini Oil Limited
- Bige Petroleum
- Pacific Energy Aviation
- Lifu Holdings Limited
- Matara No.8 Limited
- Rimbunan Hijau (RH) Group of Companies