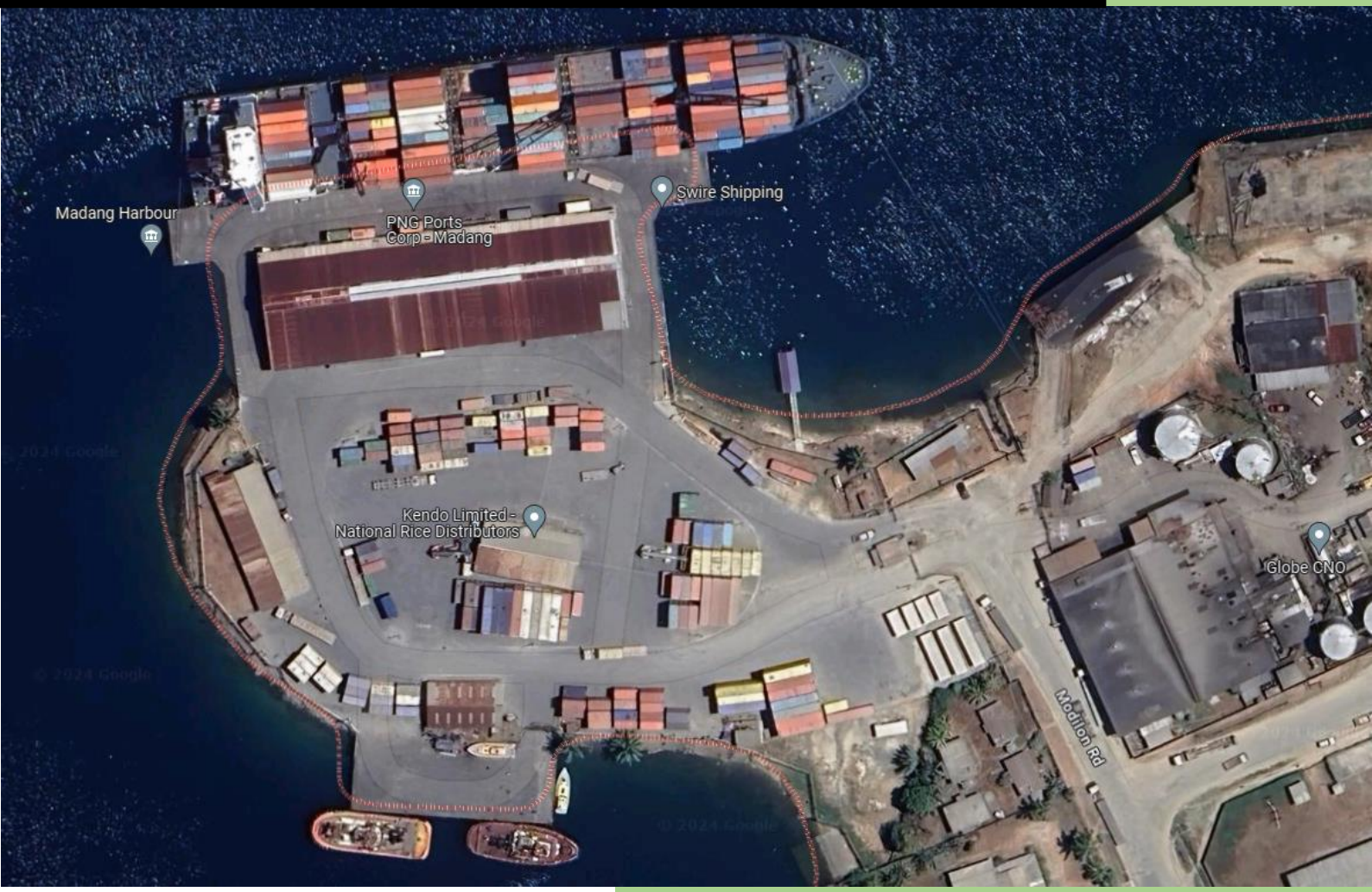
INDEPENDENT CONSUMER & COMPETITION COMMISSION

The Review of the PNG Ports Regulatory Contract



Final Report

September 2025

Enquiries

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About the ICCC

The Independent Consumer and Competition Commission (ICCC) is a statutory body established under the provisions of the Independent Consumer and Competition Commission Act 2002 (the ICCC Act) to promote competition and fair trading, regulate prices of certain declared goods and services, and to protect consumers' interests, and other related purposes. The ICCC is empowered under the ICCC Act to have one full-time Commissioner and two part-time Commissioners who form the ICCC Board. At the time of compiling this Report, the Board comprises:

Mr. Paulus Ain **- Commissioner and Chief Executive Officer**

Mr Jack Timi **- Associate Commissioner (Resident)**

Mr. Marcus Bezzi **- Associate Commissioner (Non-Resident)**

Definitions

ADB	Asian Development Bank
Coastal	This refers to domestic freight which is being delivered from one PNG Port to another PNG Port.
ICCC	Independent Consumer and Competition Commission
Inwards	This refers to freight that is be unloaded at a port. For international freight this is an import.
KCH	Kumul Consolidated Holdings. This is the government agency which holds the shares of SOE's including PNG Ports, on behalf of the PNG Government.
NEC	National Executive Council. This is the principal decision-making body of the PNG Government
Outwards	This refers to freight that is to be loaded on a vessel to be taken away from a port. For international freight this is an export.
Overseas	This refers to freight that is either being imported or exported.
PNG Ports	PNG Ports Corporation Limited
RAB	Regulatory asset base. This is all the assets that are used to provide regulated services.
SOE	State Owned Entity
TEU	Twenty foot equivalent unit. This is the equivalent to a standard-sized overseas shipping container which is twenty foot long. It is used to standardise measurements. For example, a single forty foot container would be considered to be two TEU's.
WACC	Weighted average cost of capital
Revenue Requirement	The revenue which prices must deliver. It is calculated as the total of the building blocks.
Regulatory Revenue	The regulated prices times the forecast volume
DOT	Department of Transport
CSO	Community Service obligation
DDM	Dividend discount model. This is a method for estimating forward-looking market risk premiums used to calculate a WACC.
MRP	Market Risk Premium. This is an input into calculating a WACC.
CRP	Country Risk Premium. This is an input into calculating a WACC.

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1 Executive Summary

The ICCC has completed its review of PNG Ports' prices and the Regulatory Contract that governs them. This report describes its findings.

This is a brief summary of the ICCC's determination and findings, and readers should consult the details of the report for more detail and the rationale behind them.

PNG Ports is facing competition in the domestic coastal shipping market in Lae, Port Moresby, Rabaul Wewak and Kieta. In these ports it has lost market share. However, it still has market power in the international market where it has little or no competition at the two largest international container terminals. Therefore, the ICCC will continue to regulate PNG Ports' prices under the Regulatory Contract.

Competition has implications for the pricing model that has been used to cross-subsidise loss-making ports. As competition increases and spreads, it may no longer be possible to provide cross-subsidies between profitable and loss-making ports, as this will only make PNG Ports uncompetitive at the profitable ports.

Schedule 9

Competition has highlighted the need for changes to the Regulatory Contract. Schedule 9 of the 2020-2024 Regulatory Contract protected PNG Ports' revenues against volume declines, which reduced its incentive to compete actively. Since the ICCC is required to use incentive regulation, this protection was counterproductive.

Additionally, Schedule 9 inadvertently compromised PNG Ports' long-term sustainability; if PNG Ports loses market share and prices rise as a result, this could trigger further market share losses in a damaging feedback loop. To address these issues, the ICCC has decided to remove Schedule 9 from the Regulatory Contract.

Prices are expensive

Price benchmarking of PNG Ports' prices against other international ports shows that its prices are more than twice as high as the average price of ports in the benchmarking study. The ICCC did not find any other port where prices were as high as PNG Ports' prices.

This has immediate implications for PNG Ports' prices, especially now that it is facing competition. The ICCC has a duty of care to the people of PNG to ensure that PNG prices do not continue to increase. PNG Ports must reduce its operating costs, seek efficiency gains and avoid over capitalising investments in port infrastructure.

It also means that ongoing funding of community service obligations by PNG Ports must be limited. Instead, these will need to be funded via gifting from either Government or third parties. If this is not possible, cheaper forms of service provision will need to be found. Ignoring this will only lead PNG Ports to a position where it is no longer financially sustainable.

This finding has had a material impact upon the ICCC's view of the future direction of PNG Ports' prices. The long-term strategic approach must be to reduce prices. The immediate challenge is that PNG Ports' capital spending plans are likely to push them up significantly.

Changing the method for valuing the RAB

The ICCC is proposing to change its methodology for valuing the regulatory assets of PNG Ports. The current method uses a Real WACC and adjusts both the value of the assets and depreciation by the rate of inflation. The new method will instead use a nominal WACC (which builds in the cost of inflation) and will no longer inflate the value of the assets or depreciation. The effect will be that new investments will drive up prices faster in the short term, but prices will also fall faster as assets depreciate and will be lower in the longer term after PNG Ports' current wharf replacement programme is complete.

This change means, that each year only the operating cost portion of the building blocks will be adjusted for inflation. For the next regulatory period this is about 30% of the revenue requirement but it varies from year to year.

Strategic Plan

The new contract requires PNG Ports to provide the ICCC with a strategic plan by 30th of October 2026. If they do not, then the ICCC will not approve price changes for 2027. The contents of the plan are described in Schedule 13 of the Regulatory Contract. They include the capital plan and the future standards for wharf weight loading that PNG Ports will be required to meet.

Misuse of Grants

The ICCC has identified what it considers to be an anti-competitive act by PNG Ports. While this may be unintentional, the effect is the same. By using grant funds from the AIFFP for the purchase of new pilot boats, it is using its position as an SOE providing CSO services to gain funding which it has then applied to a commercially competitive business.

The ICCC is considering what further action it might take in response to this.

Price Path

The ICCC has followed the pricing principles outlined in the 2020 to 2024 Regulatory Contract as required to set a price path for the next regulatory period.

The price path has been determined with the following inputs

- **Operating costs:** The ICCC has determined that PNG Ports still has the potential to reduce its operating costs and so has reduced the allowance for regulated operating cost by 2% per annum. This is a continuation from the previous regulatory period.

  2019 to 2024 capital costs: The ICCC has assessed PNG Ports actual capital spending for prudence. After this assessment the ICCC has added K21.8 to the RAB for spending in the years 2019 to 2023, plus a further K1.7 million estimate for 2024.

- **Future period capital costs:** PNG Ports did not provide the ICCC with a capital spending plan for 2025 to 2029 but requested that the ICCC allow a budget of K50 million per year. Consequently, the ICCC has included K250 million spread over 2025 to 2029.

- **Demand:** The ICCC is proposing to set forecast volume growth at the following values.

	2025	2026	2027	2028	2029
TEU Growth	2.0%	2.0%	2.0%	2.0%	2.0%

- **WACC:** The ICCC has used a pre-tax nominal weighted cost of capital of 21.64%.

The outcome of these inputs is the revenue requirement shown in Table 1

Table 1: Building Blocks and Revenue Requirement (K millions)

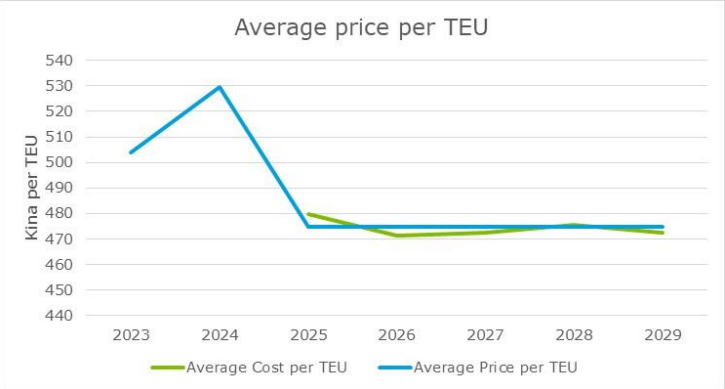
	2025	2026	2027	2028	2029
Total Regulated Opex	85	84	82	80	79
Return Of Capital	27	28	29	32	34
Return On Assets	157	159	165	171	175
Revenue Requirement	270	270	276	284	287

Prices have then been adjusted to ensure that the NPV of the regulatory revenue equals the NPV of the regulated revenue. (See Table 2 and Figure 1). Proposed prices for 2026 will be 10.3% lower than in 2024 driven principally by higher cargo volumes in 2024.

Table 2: Comparing Regulated Revenue to the Revenue Requirement

	2024 Actual	2025	2026	2027	2028	2029
Revenue Requirement (Km)		270	270	276	284	287
Regulatory Revenue (Km)	292	267	272	278	283	289

Figure 1



To set 2025 prices to deliver these revenues, the ICCC has merged Tier 1 and Tier 2 prices using the following process.

- Tier 1 wharfage prices were set to 2024 Tier 2 prices.
- Tier 2 berthage prices were set to 2024 Tier 1 prices.
- All prices were then increased by 3.43%, so when they are multiplied by the determined sales volumes, they deliver the regulated revenue.

Prices will remain flat over the regulatory period in real terms with an x factor of 0%.

The proposed price reduction of 10.3% is in contrast to the real terms annual increase of 5.5% per year over the regulatory period, proposed by PNG Ports in its January 2024 submission. All the submissions received by the ICCC reacted strongly and negatively to PNG Ports' proposal. There was a strong message coming from all the submissions that, just like everyone else, PNG Ports needs to learn to live within a budget and must control its costs.

The determined prices for 2025 are shown in section 14.5. These will be adjusted for inflation and then will come into effect from 1st January 2026.

Future Capital Expenditure

The new Regulatory Contract includes a capital cost recovery clause. This means that if PNG Ports underspends the capital budget allowed for in the price path, prices will fall further in the next regulatory period (2030 to 2034) to fully recover the additional value it has gained during the 2025 to 2029 regulatory period. Or, if it spends more than the capital budget, prices will increase in the next regulatory period to fully compensate for this.

Any future capital spending will still be subject to the ICCC's assessment of whether it is prudent. To support this the ICCC has provided, in this report, an assessment of what it would consider to be the maximum prudent capital spending at each port over the next 50 years. It is noted that this is substantially lower than the amounts listed in PNG Ports' 30 year plan.

This report also contains a description of what prudent capital expenditure is, from the ICCC's perspective.

Minimum Service Standards

The ICCC has determined that the minimum services standards in the 2020 to 2024 Regulatory Contract were not adequate. PNG Ports' wharves are mostly in very poor condition, and this is constraining their use. However, they still passed the previous standards. The new standards include wharf weight loading standards, and minimum container stacking capacity. The contract gives PNG Ports the opportunity to propose new standards by 30th October 2026.

Other Price Adjustments

The new Regulatory Contract also makes provision to adjust prices if additional stevedoring access revenues are discovered. This relates to revenue that PNG Ports receives from ICTSI that is not currently classified as being a stevedoring access fee. However, there is a possibility that this view may change as the ICCC progresses the regulation of ICTSI's prices over the next 12 months. The Regulatory Contract describes how this adjustment will be made if the clause is activated.

Other Issues

In response to submissions, the ICCC is highlighting the conflict of interest that PNG Ports' regulatory role creates and the anti-competitive behaviour it potentially supports. The ICCC is recommending to the Department of Transport that this role is removed from PNG Ports and to PNG Ports that it should voluntarily pass this delegation back to the Department of Transport.

The ICCC has accepted PNG Ports' proposal to remove the distinction between Tier 1 and Tier 2 ports. To merge the prices between the tiers, the ICCC has set all Tier 1 wharfage prices to the Tier 2 price and all Tier 2 berthage prices to the Tier 1 price and then applied determined price adjustments to the resultant reduced list.

Funding

The price path provides after tax funding of K664 million. This funding could potentially be used to service debt, pay dividends and invest in new assets. Along with access to other loans and grants, PNG Ports currently have ample funds available to improve the quality of its assets. However, careful choices need to be made to ensure optimal outcomes both for itself and the people of PNG.

This report is accompanied by a copy of the Regulatory Contract for 2025 to 2029.

2 Background

The ICCC regulates the prices of PNG Ports Corporation (**PNG Ports**) by means of a Regulatory Contract under the ICCC Act. The prices and the contract are reviewed every five years. The ICCC has therefore now initiated this review of the contract which was in place for 2019 to 2024. The outcome of this review will be a new contract and a new set of prices which will apply from 2025 to 2029.

This is the fourth review of the PNG Ports' Regulatory Contract. The previous contracts covered the following periods:

- 2003 to 2009
- 2010 to 2014
- 2015 to 2019
- 2020 to 2024.

The contract specifies the prices PNG Ports may charge, any terms and conditions related to those prices, how prices are to be adjusted during the contract period and the quality of the services that PNG Ports must provide.

2.1 Delayed Draft Final Report

This is the ICCC's draft final report on its findings. It is accompanied by a draft final regulatory contract for 2025 to 2029. The ICCC is publishing this draft so that stakeholders and interested parties can provide feedback and submissions outlining any concerns raised by the Commission.

The ICCC completed most elements of this report in November 2024. At that time it was intended to be the final report. At that time the report was provided to PNG Ports for their comments. PNG Ports noted that the intended final report had a major methodology change that had not been included in the draft.

Also, at that time both parties noted that

a) The ICCC had only one commissioner. And the ICCC is unable under the ICCC Act to make determinations with less than two commissioners.

b) If PNG Ports wanted to appeal the determination, the ICCC Act provides for them to take their appeal to an Appeals Panel. However, at that time there were no "members" appointed to the Appeals Panel. This meant that PNG Ports were unable to appeal.

Because of these circumstances it was agreed by both parties that the final report would be delayed by a year and that the current contract should be continued for this year. This means that the new contract will start from January 1st 2026.

Since this time:

- Two new commissioners have been appointed to the ICCC, so that the ICCC can once again make determinations under the ICCC Act.
- PNG Ports has made a further written submission to the ICCC raising issues concerning the November 2024 Draft final report.
- The ICCC has held further meetings and discussions to resolve issues raised.

2.2 Major changes since the November 2024 report.

The majority of this report was written in 2024 and not been substantively rewritten.

The major change in this report when compared to the draft report is the method used to value the RAB.

In March and April 2025, the ICCC prepared a comprehensive paper examining methods of valuing regulatory assets. The paper focused principally on two methods. These are:

- Indexed historic cost of assets using a Real WACC (method used by ICCC in previous reviews).
- Unindexed historic cost of assets using a Nominal WACC.

Based upon this analysis and a follow up meeting with PNG Ports, the ICCC has determined that it will now use an unindexed historic cost with a nominal WACC. This also differs from the November 2024 version of the report which proposed an unindexed historic cost method with a Real WACC.

The full paper prepared on this topic is attached as an appendix to this report. A summary of this analysis and the rationale for the ICCC's determination are included in Section 5 of this report.

Other changes include more detail on benchmarking (Section 7), requirements of the strategic plan (Section 4), 2024 capital spending assessment, and updated prices to reflect these changes.

2.3 PNG Ports Corporation Limited

PNG Ports Corporation Limited (**PNG Ports)** is a state-owned entity (SOE). Its shares are held by Kumul Consolidated Holdings (KCH) on behalf of the PNGG.

PNG Ports owns and manages port facilities at 15 of the 23 declared ports[1] in PNG. Under the Regulatory Contract, the ports are classified as either Tier 1 or Tier 2 ports (see Table 3).

Table 3: Ports by Tier

Tier 1 Ports	Tier 2 Ports
Kimbe	Aitape
Lae	Alotau
Motukea	Buka
Vanimo	Daru
	Kavieng
	Kieta
	Lorengau
	Madang
	Oro Bay
	Rabaul
	Wewak

[1] A "declared port" is a designated port under section 2 of the Harbours Act 1963.

At all these ports, PNG Ports must provide facilities for loading and unloading vessels.

In additional to owning port facilitates, PNG Ports is vested as a delegated authority by the Department of Transport (DoT) to provide harbour management and maritime compliance responsibilities at all land/water interfaces (wharves and jetties) declared and non-declared ports and harbours throughout the country.

The company is managed by a Board of Directors whose members are appointed by the National Executive Council (NEC) on recommendation from KCH. The Board of Directors then appoints the Chief Executive Officer.

2.4 Services Provided by PNG Ports

The role of PNG Ports is generally that of a landlord. It owns port facilities, and is responsible for maintaining and developing these facilities, but it does not load or unload ships. The following is a list of services provided by PNG Ports split between those services that are regulated by the ICCC and those that are not.

Table 4: Regulated and Unregulated Services provided by PNG Ports

Regulated Services	Unregulated Services
Essential Port Services	a) storage
a) wharfage services	b) pilotage
b) berthing services	c) commercial building rentals
c) berth reservation services	
d) stevedoring access	
Services supplied in connection with the supply of Essential Port Services	
a) gate passes	
b) cleaning of wharf	
c) yard maintenance	
d) ash levy removal	
e) casual labour pool maintenance	
f) commercial vehicle and tourist bus passes	
g) stevedoring tonnage fee	

2.5 The Regulatory Contract

The Regulatory Contract is a contract between the ICCC and PNG Ports which is established under the ICCC Act. Legally, the essential port services provided by PNG Ports have been declared by the Minister to be regulated services under section 32 of the ICCC Act.

Both the ICCC and PNG Ports have agreed that the term of the next Regulatory Contract should be for four years.

The contract for 2026 to 2029, accompanies this report. It includes the following things.

- It sets the prices at the beginning of the regulatory period.

- It specifies how prices will change during the regulatory period.
- It lists the principles which the ICCC must follow when prices are determined in the following regulatory period (2030 to 2034).
- It specifies the service standards with which PNG Ports must comply.
- It describes what must happen if certain things occur. This includes force majeure events, tax changes, changes in competition and port closures.
- It describes reporting requirements and other information which PNG Ports must provide to the ICCC.

2.6 Contractual Requirements to Set a New Contract

The Regulatory Contract specifies that the ICCC must consider various things as it prepares the new contract. These include:

- The legitimate business interests of PNG Ports.
- The legitimate interests of suppliers to and customers of PNG Ports.
- The nature and uses of the regulated services.
- The cost to supply services.
- The cost of complying with health, safety, environmental, social and other legal requirements.
- The financial returns necessary to sustain PNG Ports.
- Any relevant international benchmarks for prices, costs and financial returns.
- Any Government policy regarding regulated services.
- Any under-recovery of revenue that may have occurred in the 2019 to the 2024 period.

2.7 How Prices are Established

The Regulatory Contract requires that prices must be calculated using the building block method. There are three building blocks. These are:

- Operating expenditure
- Return on capital and
- Return of capital (equivalent to depreciation).

The sum of these three things is equal to the revenue requirement. This revenue is the equivalent to the economic cost for PNG Ports to provide the regulated services. The regulated prices multiplied by the forecast volumes should equal this revenue.

To calculate the return on capital, a weighted average cost of capital (WACC) is used.

In simple terms,

- If operating costs go up, prices will go up.

- If more capital is spent, prices will go up.
- As capital gets older and is depreciated, prices will go down.
- If the WACC increases, prices will increase.

In carrying out this review the ICCC must assess the economic efficiency of PNG Ports and evaluate whether or not its spending is reasonable. This means assessing both its capital spending and operating costs.

2.8 Review Process

The ICCC has sought to carry out a public and transparent review process. The major steps in this process were as follows.

Table 5: Review Process

Step	Comment	Timing
PNG Ports presented a submission to the ICCC	The submission included any issues which PNG Ports wanted the ICCC to address in reviewing the contract. It also includes their proposed new version of the contract.	Jan 31st 2024
Release of an issues paper	Interested stakeholders were provided with one month to make submissions in response.	Released 5th April 2024
Submissions on the issues paper closed	The ICCC received six submissions from industry participants.	5th May 2024
PNG Ports provided information	The ICCC met with PNG Ports and sought additional information, in order to carry out the review. During this process there was free and frank discussion between the officials of both PNG Ports and the ICCC.	Between 5th May and 30th Jun
Draft report and draft contract published	This report included the draft findings and draft determination of the ICCC. It was based upon its analysis of information provided to it by PNG Ports and submissions made to the ICCC. The report described the ICCC's proposed new prices, new contract and the rationale for this proposal.	30th June 2024
Submissions on the draft	Any interested stakeholder including PNG Ports could make submissions on any aspect of the draft report and draft contract.	Submissions closed 31st July 2024
Meetings held between the ICCC, PNG Ports and other stakeholders	The ICCC held various meetings with PNG Ports to get clarification on various issues arising from the draft and their submission on the draft. The ICCC also met with other stakeholders.	Between 31st July and 30th October
Draft final report	After considering all the issues raised and information received, the ICCC has finalised its report. This was provided to the PNG Ports.	November 2024
PNG Ports submission to the ICCC	PNG Ports provides submissions to the ICCC on the Draft final report	December 2024

Agreement to delay	The ICCC and PNG Ports agreed to delay finalising the review for 1 year.	December 2024
Meetings with PNG Ports	The ICCC met with PNG Ports by teams meetings to discussion various issues raised in submissions	April 2025
RAB valuation methodology	The ICCC completed its review of the methodology it uses to value PNG Ports regulatory assets. This paper was provided to the PNG Ports,	May 2025
Meeting with PNG Ports	PNG Ports and its consultants met with the ICCC and its consultant, to discuss the RAB Valuation methodology and other outstanding issues.	July 2025
Publishing the draft final report	To ensure that the review process remains transparent the ICCC has determined that it once again publish a draft final report and invite any further submissions on the major changes to the report.	August 2025
Submissions close	All stakeholders and members of the public can make submissions to the ICCC on any aspect of the review.	30th September 2025
Review of submission	The ICCC will consider any submissions raised	October 2025
Final report published	The final report and the final contract will be published.	November 2025
Commencement of new contract	The new contract will be in place from 1st January 2026 until 31st December 2029	1st January 2026
Initiation of the next review	The review of the next regulatory contract will begin with a proposed new contract by PNG Ports.	31st January 2029

2.9 Other Reviews

Stevedoring and Handling

In 2023 the ICCC conducted a review of stevedoring and handling services in PNG. That review is now completed. Note that while stevedoring and handling occurs at ports managed by PNG Ports, PNG Ports does not provide these services. Therefore, that review did not include PNG Ports.

Coastal Shipping

Also, in 2023 the ICCC initiated a review of coastal shipping. This review was completed in 2024. It focused on the transport services which occur between PNG Ports' ports. But it does not focus on the ports themselves.

Both of these other reviews are separate to this review of PNG Ports' Regulatory Contract.

2.10 Is Regulation Working?

In the issues paper published in April 2024, as part of this review, the ICCC asked the question "Is regulation working?"

Analysis in the issues paper showed that:

- In the last 21 years, since the Regulatory Contract was put in place, prices have generally risen, in real terms (see Figure 2).
- But they have also supported substantial investment in port infrastructure. On average, PNG Ports has spent K63 million per year, in 2024 values, which is a total of K1.32 billion (see Table 6).

Figure 2

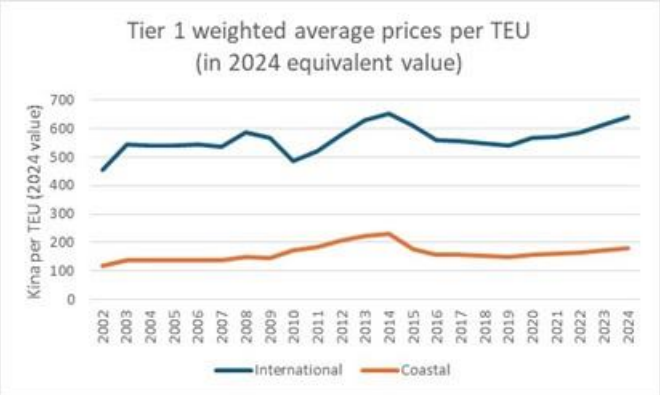


Table 6: Capital Expenditure

Period	Capital spending (in 2024 values)
2003 to 2009	K148 million
2010 to 2014	K538 million
2015 to 2019	K475 million
2020 to 2024	K163 million

For this current review the ICCC has had no choice but to continue with the current approach to regulation as required by the pricing principles in the 2020 to 2024 Regulatory Contract. Because the ICCC wants to make changes to the way it sets PNG Port prices in future, it must determine these changes now, so that they can be applied in 2029 for the 2030 to 2034 Regulatory Contract.

2.11 Submissions

The ICCC received six written submissions from stakeholders and also met in person with several stakeholders.

All of the submissions responded strongly and negatively to the PNG Ports' proposal to increase prices by 5.5% per annum. Concerns about the poor quality of PNG Ports' infrastructure was also a strong theme.

Where appropriate the ICCC has included extracts from submissions throughout this report but also taken care not to identify the source of the submission, where this might be detrimental to the submitter. When quotes from submissions have been included in this report, they have been put in "quote marks" and in *italics.*

The ICCC thanks all those who made submissions and met with the ICCC. The submissions have been very helpful and informative in carrying out this review.

3 Review of Competition

In carrying out this price review, the ICCC must consider whether ongoing regulation of PNG Ports' prices is required.

Section 33 of the ICCC Act 2002 describes the requirements for the ICCC to declare an entity to be regulated. The entity must have market power in a market where that entity is capable of providing a service. The Act is silent in regard to de-regulation.

Therefore, in reviewing competition for PNG Ports, first the ICCC must define a market, and then PNG Ports' market power in those markets should be evaluated.

3.1 The Role of Competition

Effective competition is valuable wherever it occurs. Competition can produce better outcomes for consumers than regulation can. As defined by the ICCC Act, the role of the ICCC is to promote competition and to protect the interests of consumers. So, if there are opportunities to promote competition, the ICCC will seek to do so.

The ICCC uses regulation to protect the interests of consumers when competition is not effective, as described by the Act. Therefore, in carrying out this review, the ICCC emphasises that it seeks to promote competition where it can.

3.2 Market Definition

The declared services which PNG Ports provide include wharfage services, berthing services, berth reservation services and stevedoring access. All of these services are supported by the provision of a wharf at which a ship can berth to load and unload cargo.

In past reviews the ICCC defined each port in which PNG Ports operates as a separate market. Because there is limited road infrastructure throughout the country, port users cannot choose between ports. Therefore, each port is a discrete market and does not compete with other ports.

The ICCC has also distinguished between specialised port facilities, such as Puma's wharf facilities at Napa Napa, and general cargo wharves. Because PNG Ports is not set up to provide a service for discharging flammable fuels, Napa Napa does not compete with PNG Ports at Motukea. [2]

There are some areas in PNG where logs are being exported. These generally use an alternative wharf to a PNG Ports' wharf. It might be assumed that logs are messy, that specialised infrastructure

[2] "Review or PNG Harbours Regulatory Contract Final Report 28th January 2010, page 28.

is required to load them onto ships, and that this is the reason they use a different wharf. However, in New Zealand there are multiple ports which load both containers and logs from the same wharf. These include Centre Port, Port of Nelson, Port Napier, and South Port. Generally, to support a log loading operation, logs need to be stored in a separate area from containers. The same wharf can be used to load ships with both types of cargo. So, the ICCC has not defined logs as a separate market from general cargo.

There is also a wharf size consideration. A large vessel cannot berth at a wharf which is too short or does not have sufficient draft. For example, many of the international vessels that call at Lae could not berth at smaller wharves. However, this does not by itself define a market. A smaller international vessel could berth at a smaller wharf, and so, arguably, a smaller wharf could provide some limited competition in the market. However, small international vessels are not competitive in today's international markets. Consequently, international vessels require longer wharves with a deeper draft. In effect, this makes international services a different market from coastal services.

For the purpose of assessing competition, in this report markets are defined as follows.

- Each of the 15 ports in which PNG Ports operates represents a market.
- General cargo is separate from cargo which requires specialist infrastructure.
- International is a separate market from coastal.

3.3 Current Levels of Competition

The ICCC has assessed each port for the availability of alternatives to PNG Ports' wharves. The findings are shown in Table 7.

Table 7: Alternatives to PNG Ports' Coastal Shipping Wharves.

Port	Alternative Wharves to PNG Ports	Comments
Lae	Bismark Shipping	Bismark own and operate this wharf to provide an integrated coastal shipping service.
	Taiheiya Cement	A specialist wharf that does not compete with PNG Ports
	Frabelle Shipping	Used for loading fish and fish products
	South Sea Lines	
Fairfax Harbour	AES wharf	Bismark use the AES wharf for their coastal shipping operations. AES may also offer their services to other parties.
	Puma Napa Napa Refinery Wharf	A specialist wharf for petroleum products that does not compete with PNG Ports
	Curtain Brothers Wharf	Serves Oki Tedi Mining Limited's project cargos and supplies.
	Wharf used by Pacific Towing	Not large enough to unload containers.

Rabaul	Bismark Shipping	Have their own wharf used for their own vessels. Not currently used provide services to third party vessels.
	Carpenters shipping wharf	Located at Coconut Products Limited yard. Handle general cargo.
Madang	Lutheran Shipping	Have a small wharf which appears to be used by themselves
Kimbe	Hargi operate a wharf at Bialla which is connected by road to Kimbe and could provide an alternative to using PNG Ports.	The ICCC is unsure if Hargi allow other users to use their wharf.
Aitape	No alternatives	
Alotau	Alotau Government wharf	The ICCC does not know what this is used for.
Buka	No alternatives	
Daru	No alternatives	
Kavieng	No alternatives	
Kieta	Bismark provide an alternative service from Loloho	Because Loloho is connected to Kieta by road, this can be viewed as competition to PNG Ports
Lorengau	No alternatives	
Oro Bay	Another wharf is used for loading logs	
Wewak	No alternatives	
Vanimo	An alternative wharf is used for loading logs	

The following observations can be made.

- PNG Ports have little or no competition in the international market.
- There is significant competition in Lae, Motukea and Rabaul in the coastal market.
- There are some alternatives available to PNG Ports at Alotau, Kimbe, Kieta, Madang, Oro Bay and Vanimo.
- There are no alternatives at Aitape, Buka, Daru, Kavieng, Lorengau and Wewak.

The nature of the competition PNG Ports faces in the coastal market tends to be indirect. Bismark are primarily focused upon providing shipping services. However, they have chosen to operate their own ports in Lae, Rabaul and Loloho. Discussions with stakeholders seem to confirm that it is cheaper for Bismark to operate their own wharf than to use PNG Ports. They also benefit from operational efficiencies. By having their own wharf, they can ensure their ships always have priority rather than waiting their turn at a busy PNG Ports' wharf. Bismark say that by having their own wharf they are able to offer their customers a better service.

Once Bismark have established their own wharf, they could use it to offer services to other companies who do not have their own wharf. However, currently these wharves appear to be

exclusively for their own use. While it may not have been Bismark's intention to compete against PNG Ports, the effect is the same. At Lae, Motukea and Rabaul a material portion of the coastal shipping market does not use PNG Ports wharves.

3.4 Barriers to Entry

To enter the market in competition to PNG Ports, a service provider must have a wharf.

In some cases, there are existing wharves which can be used. For example, Bismark have taken the opportunity to use disused wharves in Rabaul and Loloho.

In other cases, new wharves could be built. To build a new wharf will generally require land or support from landowners. However, this is not an insurmountable barrier. In the last 20 years, new wharves have been built at Napa Napa (AES) and Motukea (Curtain Brothers).

However, while it is possible to build a new wharf, it is a major sunk investment. In most cases, new wharves have been built to support major projects. Usually when this occurs, the economics of the major project will support the wharf. It is a bonus if other services can also be provided at the wharf.

3.5 Sustaining Loss Making Ports

The Government relies upon PNG Ports to sustain loss-making Tier 2 ports by using cross-subsidies from profitable ports. The building block methodology used to set their prices supports this. All of PNG Ports' costs are included in the building block model and prices are then set to cover these costs. This enables profits from international terminals to be used to subsidise loss-making ports.

It could also have the unintended effect of limiting competition by other providers. If PNG Ports was allowed to set its own prices in areas where it faced competition, it could set prices at rates that were lower than its competition to retain market share.

Using cross-subsidies to sustain loss-making parts of a business is problematic when part of the business is exposed to competition. Competitors will compete in the profitable parts of a business, while leaving the unprofitable parts to the incumbent provider.

3.6 Market Power

While PNG Ports does have competition in some coastal shipping markets, it still remains in a dominant position. This is due to its position in the profitable international market and its ability to cross-subsidise services between ports.

PNG Ports is expected to retain its dominant position in the international market due to the scale and quality of its two international terminals at the Lae Tidal Basin and Motukea.[3] Because the

[3] In the Stevedoring Market Review carried by the ICCC in 2023, the ICCC encouraged competition for international stevedoring business from those operating at other wharves. However, the ICCC noted at the time that these opportunities were likely to be limited, because other wharves did not have

international terminals can offer faster turnaround times for large vessels, it is likely that international vessels will only choose to go to other wharves in particular circumstances, such as when the international terminal is already in use. The lower prices which a competing wharf might be able to offer for wharfage, berthage and stevedoring services are likely to be a small saving for a shipping company, compared to the cost of taking longer to unload the vessel.

The market can be split into three parts as shown in Figure 3. This illustrates the challenge that the ICCC sees in managing prices across the market in which PNG Ports operates.

Figure 3

If competition in Lae, Motukea and Rabaul increases, the ICCC expects that prices for wharfage services in these markets will eventually fall, and this will reduce the profits that PNG Ports is able to earn from these markets. This will then reduce PNG Ports' ability to subsidise loss-making ports.

If PNG Ports is to continue to subsidise the loss-making ports, it will need to ensure that it does not over invest in these ports.

3.7 The Cost of Competition

An alternative view of competition might be that it is decreasing the scale of PNG Ports' operations and that the net effect will be higher prices. This is a conceivable outcome because regulated prices are set by dividing all the costs by the volume. If volume is lost to the competition but costs remain the same, the regulated prices will go up.

This will have already occurred due to the volume that Bismark have won in the market.

However, ICCC's benchmarking of PNG Ports' prices shows that they are high compared to other port companies of similar size, and this is likely to be because PNG Ports' costs are high. In the long run, if PNG Ports is going to compete in the competitive coastal markets, it will need to reduce its costs.

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the scale and layout advantages that the international terminals provided. Therefore, it is likely that international vessels will only go to other wharves in particular circumstances.

The prices that the ICCC sets for PNG Ports are maximum prices. PNG Ports may choose to lower them at any time.

3.8 Ongoing Regulation

The ICCC's findings are that:

- PNG Ports operates in three general markets and that each port is a separate market.
- It is currently in a dominant position and has market power in the international market. This gives it the opportunity to subsidise coastal markets.
- PNG Ports is facing competition in some coastal markets. The ICCC therefore wants to ensure that it does not use its dominant position in these markets to hinder competition.
- In loss-making coastal markets, the ICCC wants to ensure that PNG Ports can continue to subsidise these markets from profits made in the international market.

The ICCC is proposing to continue to regulate PNG Ports' prices by setting maximum prices which it can charge in each market. The ICCC will continue to do this by means of a Regulatory Contract with PNG Ports.

3.9 Contract Provision for Review of Competition.

Clause 7.3 of the Regulatory Contract 2020 to 2024 allows PNG Ports to apply to the ICCC for a mid-term review of the ongoing needs for and extent of regulation. The ICCC is proposing to retain this in the contract for 2025 to 2029.

PNG Ports have indicated to the ICCC that they intend to activate this clause in the contract. However because of their limited resources, they have decided to delay this until this current review is complete.

3.10 PNG Ports as a Regulator

One submission raised concerns that PNG Ports was abusing its role as a regulator.

PNG Ports is delegated the role of harbour management and maritime compliance monitoring at all land/water interfaces (wharves and jetties) at declared and non-declared ports and harbours throughout the country. The submission says,

> *"This should not be the case as PNG Ports is also a provider of pilotage services and other services for profit and is therefore taking on responsibility as player and regulator. A conflict of interest is likely to occur. The maritime safety functions must be given entirely to NMSA because at the moment NMSA is not serving its purpose and the possibility for Cartel behaviour is emerging, specifically by PNG Ports using the Non-regulated services such as Pilotage to secure contracts. An example was when they award contracts*

using the abovementioned tactics. The Maritime Compliance Division for PNG Ports must be abolished."

The submission named several companies who they say had been awarded contracts in this way. The ICCC is reserving its right to investigate this further, but the accusation of anti-competitive behaviour is clear.

The submitter completes their comment by saying *"The Maritime compliance division of the PNG Ports must be abolished."*

The ICCC agrees with this submission, that having this delegated authority does put PNG Ports in a conflicted position. There are several solutions available.

- The Department of Transport could take back the delegation and carry out this role itself.
- The Department of Transport could delegate the responsibility to an alternative organisation instead of PNG Ports. This could include NMSA as proposed by the submission.
- PNG Ports could voluntarily hand back the delegated authority to the Department of Transport.

The ICCC therefore requests both the Department of Transport and PNG Ports consider this issue and come up with an alternative to the current arrangements.

3.11 PNG Customs

Another submission raised a concern that the actions of the PNG Customs was diminishing competition and increasing market power for a single entity.

"More recently, PNG Customs selected and accredited only Express Freight Management (EFM) as a sole trusted trader giving supply chain exclusivity for three years in Port Moresby and Lae. Since it is a pilot project, there is no legislation and with no criteria for selection available, there was also no dialog with the Chamber of Commerce for a suitable operator. Although there is now an alternative for storage services other than ICTSI, EFM now has a virtual monopoly on customs clearance and transport at these two ports. This will make ***it*** *very difficult for smaller operators to compete."*

The ICCC has met with PNG Customs and discussed this issue. The ICCC understands the situation described was temporary and was a trial. PNG Customs took this approach because of previous security concerns and poor practices by the industry.

Since the draft report was written this has progressed further.

As of April 2025, PNG Customs has signed agreements with three freight forwarders.

1. Express Freight Management (EFM) - the original participant
2. Lae Inland Logistics
3. East West Transport[4]

[4] https://customs.gov.pg/noticeboard/press_release/png-customs-and-east-west-transport-sign-moi

Customs are calling this “The Trusted Trader Program”. They have stated that they intend to bring on board importers and exporters also. This indicates the program is actively expanding beyond just freight forwarders.

The Trusted Trader Program is now operating under the World Customs Organization's (WCO) SAFE Framework of Standards, providing it with international legitimacy and structure that was previously lacking.

4 The Strategic Plan

4.1 Background and Strategic Plan Requirements

Under its Regulatory Contract for 2020 to 2024, PNG Ports was required to submit a comprehensive strategic plan to the Independent Consumer and Competition Commission (ICCC) by 2021. The purpose of this strategic plan was to enable the ICCC to evaluate proposed capital expenditures and ensure that prudent and necessary spending was incorporated within the approved price path. The contract specifically outlined requirements for the plan, expecting it to provide a detailed, robust analysis to substantiate anticipated investments.

In response, PNG Ports submitted a 30-year plan, which outlined a total spending projection of K3.5 billion, with a major component dedicated to replacing a large portion of its aging wharf infrastructure. However, the plan presented to the ICCC was high-level and lacked supporting analysis. Although PNG Ports claimed that substantial analyses were performed to underpin the plan, these were not provided to the ICCC despite repeated requests.

4.2 Costs Exceeded Initial Estimates

The 30-year plan initially envisaged a K3.5 billion expenditure, drawing from various funding sources, including AFFIP loans, other external loans, and cash flow. However, as tender processes began, it became apparent that certain wharf replacements would exceed the plan’s cost estimates. This has cast doubt on the feasibility of some of the proposed expenditures. Further discussions in 2024 with PNG Ports revealed a downward adjustment in their projections to K2.2 billion[5].

In July 2025, PNG Ports again presented the ICCC with its current list of major capital projects out to 2032. The regulated portion of these projects add up to about K1.6 billion.[6]

4.3 ICCC’s Role in Assessing Prudent Investment Levels

The ICCC’s regulatory role mandates that any assets included in the Regulatory Asset Base (RAB) meet prudence standards. To support this, the ICCC has requested copies of the business cases supporting major capital investments over the past five years. PNG Ports therefore provided the various board papers and business case documents that were available.

In discussing these documents with PNG Ports, the ICCC has been critical of the quality of materials provided. Generally, in the ICCC’s view, they did not follow good business case practices. The major focus of most of these documents was engineering requirements, ensuring procurement rules were

[5] This figure has varied with each conversation held between the ICCC and PNG Ports.
[6] Based upon a rough estimate of the split between regulated and non-regulated portions of projects.

adhered to and ensuring companies who were awarded contracts were capable of carrying out the work. However, in general the documents,

- Did not consider alternative options to solve the problems they were addressing,
- Did not consider customer demand and
- Did not identify benefits and, therefore, did not consider whether the cost of the projects exceeded the benefits.

The exception to this is the business case for the Kimbe Wharf replacement. This was provided to the ICCC in 2025 after the contracts to commence the work had been signed.

PNG Ports has argued in its submissions that the ICCC should not be involved in the day-to-day decisions of the entities it regulates. The implication is that if the ICCC was requesting to see business case documents prior to major business decisions, this would be regulatory overreach.

However, PNG Ports are making once-in-50-year investment decisions that will determine the quality of wharves across several ports. This will have a major impact on port prices for decades to come. Given that the ICCC not only has a mandate to protect consumers but is responsible for setting port prices, it is good practice for PNG Ports to present transparent, well-justified business cases before contracts are signed. This allows the ICCC to ensure prudent investments that safeguard public interests, avoid unnecessary cost burdens, and uphold affordable, reliable infrastructure for PNG into the future.

In response to PNG Ports' plans for large scale capital investment, seemingly without cost benefit analysis, the ICCC has established indicative prudent investment levels (see section 12.1). The purpose of this is to indicate to PNG Ports, what the ICCC considers to be a prudent cap on investment. This was done with a view to rejecting any spending that exceeds these levels unless PNG Ports provides robust business cases demonstrating prudence. General assertions that wharves must be replaced due to community service obligations are insufficient; investments must be justified through rigorous economic analysis and clear evidence of necessity.

In response to this PNG Ports has initiated an economic impact assessment of its wharf facility on local economies. This work should identify the contribution that having a wharf in a local area makes to the local economy. This work should identify the maximum amount that should be spent on a local wharf or equivalent facility. The output of this study should become a core input into future cost benefit analysis. The study has been funded by the Australian Government through DT Global. The ICCC expects to rely upon this study in 2029 when it assesses the prudence of capital investments in loss-making ports.

Should PNG Ports undertake substantial capital investments and later demonstrate their prudence, the ICCC will, in accordance with its mandate, include these amounts in the RAB and adjust prices to cover the associated costs. However, the absence of a structured capital spending plan poses a significant challenge to the ICCC. The next section describes what has been agreed to resolve this issue.

4.4 Strategic Plan Requirements

The Regulatory Contract 2020 to 2024 described the requirements of a strategic plan. While PNG Ports did not meet all of these requirements, it would appear that PNG Ports thought that they had.[7] The ICCC has therefore reviewed these requirements to make them clearer.

The ICCC presented its proposed changes to the PNG Ports in November 2024 in the draft final report. In a meeting held in July 2025, the ICCC discussed this further with PNG Ports. Consequently, the two parties agreed to the following.

Contents of PNG Ports Strategic Plan

1. Whole of business context
    - overview of current business and operating environment
    - overall investment drivers

Sections 3 to 5 to be prepared for each port

2. Description of each port
    - current facilities
    - key services provided – role in the community
    - role in the supply chain
    - SWOT
3. The service needs of each port over the next 10 years, informed by the socio-economic analysis:
    - demand forecast – quantified
        - identify needs for specific wharves if appropriate/necessary
        - key growth opportunities/trends
    - service requirements
    - capacity requirements
    - link to existing KPIs
    - level of service/service standards
4. Current capacity and asset condition
5. Gap analysis: having regard to (3) and (4), what are the gaps:
    - what are the options to address the gaps (including opex and capex solutions)
    - how important is it to address these gaps, i.e. what are the benefits of investment (including the risks of the 'do nothing' option (the base case))
    - what is the current investment plan for each port
        - major projects
        - other expenditure
        - current cost estimates

Consolidated/whole of business

6. Consolidated financial analysis
    - indicative cashflow analysis – timing and magnitude
    - other potential funding sources
    - risk assessment, including scenario analysis
7. Consolidated plan: current view of investment plan after considering financial impacts
    - prioritisation

[7] Through the presentation of their 30 year plan.

- indicative timeframes
- delivery strategy

These requirements for the strategic plan have been listed in Schedule 13 of the Regulatory Contract.

Should PNG Ports fail to provide a strategic plan which fully meets the requirements specified in the contract, then the ICCC will regards PNG Ports to be in breach of the contract. Consequently, prices for 2027 will not be approved and the ICCC will issue an order issue consistent with Section 38 of the ICCC Act.

5 Pricing Principles

The Regulatory Contract specifies the pricing principles which the ICCC must follow when carrying out the next prices review. The 2019 contract specifies the principles for the current review. And the pricing principles which are included in the next contract will specify the principles for the 2029 review.

The ICCC is proposing to change the principles which determine the value of the RAB. The current method uses indexed historic costs with a Real Terms WACC. The new method will use unindexed historic costs with a nominal WACC.

This section provides a summary of the rationale and analysis behind this proposed determination. A more detailed paper investigating alternative methods of RAB valuation accompanies this report.

5.1 Rationale for the Change

Valuing the RAB on an unindexed (historic cost) basis means that once an asset is included at its original cost, its book value going forward is not adjusted for inflation. In contrast, the previous system annually increased the RAB (and associated depreciation) by % change in the CPI, and applied a “real” (inflation-excluded) WACC. Under the new method, compensation for inflation is embedded directly in the nominal WACC, rather than by indexing the assets themselves.

The key reason for adopting the new method is long term affordability. By ceasing to inflate historic asset costs, long-term prices for port users will be lower, especially after periods of high investment have ended.

The method is used extensively around the world and so has regulatory precedent.

5.2 How the New Method Works

Under the previous approach:

- RAB = Indexed annually for inflation (e.g., CPI).
- WACC = Real (excludes inflation).
- Return = Indexed RAB × Real WACC.

Under the new approach:

- RAB = Original cost, depreciated (not indexed).
- WACC = Nominal (includes inflation).
- Return = Depreciated Historic Cost RAB × Nominal WACC.

Inflation is now only recognized through the return on capital, not in the value of the asset base itself. Only the operating costs portion of the revenue requirement will be adjusted for inflation during the regulatory period.

Impact on Prices – Illustrative Modelling

Extensive scenario modelling in the ICCC's technical report demonstrates that both indexed and unindexed historic cost methodologies will recover the full cost of infrastructure and deliver an NPV of zero over the asset life. So, PNG Ports will recover exactly their investment and a return which is equal to the WACC. However, the change notably affects the timing and profile of regulated prices. The new method produces higher prices in the early years after investment, but these decline more rapidly as assets age.

- The indexed (current) approaches keep prices higher for longer, even as depreciation should reduce capital charges.
- During periods of low or no new investment, prices under historic cost methods fall sooner and further.

Figure 4 illustrates the effect, using a stylized example with a K1,000 investment, 5-year asset life, inflation at 4.8%, nominal WACC at 21.65%, and real WACC at 16.07%. It shows that with the new unindexed historic cost method, initial prices are higher than with the indexed method, but prices fall faster over the life of the asset.

Figure 4

The indexed method spreads the recovery of capital more evenly. However, this has the effect of delaying the recovery of capital, so the return on capital component of the price must remain higher for longer to compensate. Because the unindexed method pays back the capital faster, the required return payments fall faster.

To illustrate this effect, think of paying off the mortgage on a house sooner. The sooner you pay it off the less interest must be paid on the mortgage.

5.3 Hybrid between the Old and New

The pricing principles in the 2019 contract require that the ICCC must set the opening RAB for 2020 at a value of K799 million. And it specifies how any new assets acquired between 2019 and 2024 must be treated. So, the new method can only be brought into effect from the beginning of 2025.

This means that, in effect, there will be a hybrid of the old and the new. From 1st January 2025, no further CPI adjustments will be made to the value of the RAB or the amount of depreciation. Therefore, the existing assets as at 1st January 2025 will be valued based upon an indexed depreciated historic cost. But, going forward, these existing assets will continue to be depreciated without further indexing.

5.4 Benefits of the Adopting the New Method

The exact impact of the change in methods will depend upon timing and the size of PNG Ports asset replacement. To model this the ICCC has used various scenarios. The attached paper illustrates these in more detail, but here we show two scenarios to illustrate the effect.

Figure 5 show the difference between the two methods if PNG Ports invests K3.5 billion in the next five years. Under both methods, prices increase quickly. However, once investment in complete, prices will fall with the new (non-indexed) method. But with the old method, prices will continue to be pushed up by inflation. [8]

Figure 5:

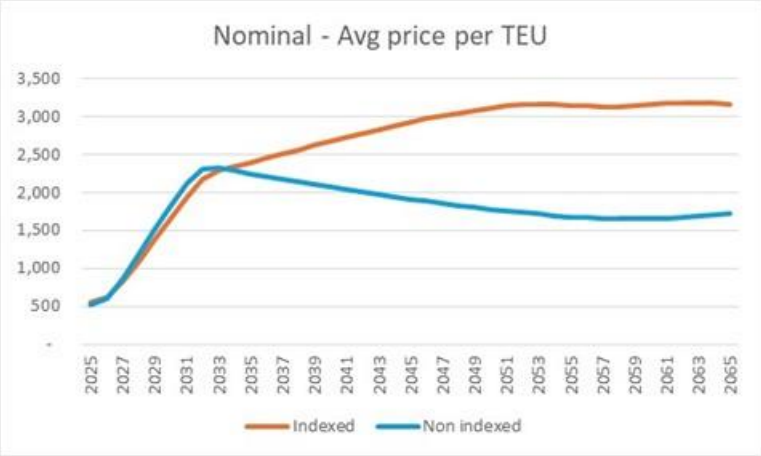
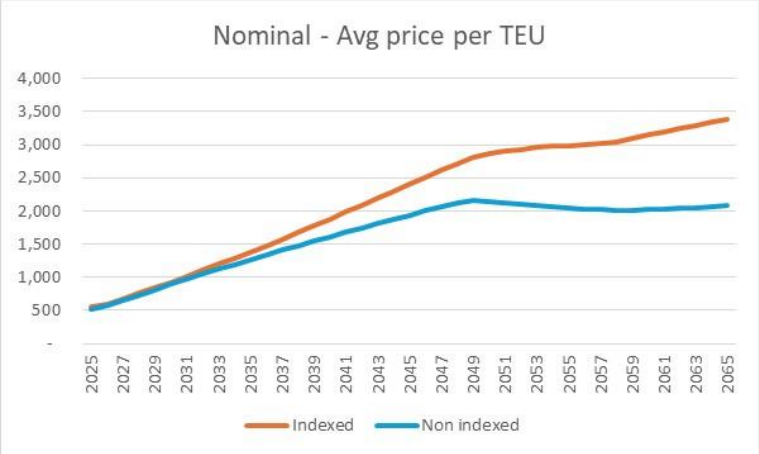


Figure 6 shows the pricing effect if PNG Ports invest K3.5 billion evenly out until 2049. In this scenario, prices will rise more slowly, but the gap in prices between the two methods is still very significant.

[8] The modelling assumed an inflation rate of 4.8%.

Figure 6:



The analysis demonstrates the main advantage that consumers will benefit from—lower long-term prices, particularly after the current capital replacement cycle, because legacy assets are no longer artificially indexed upward.

And investment incentive neutrality is maintained; with correct parameter settings, both methods return the investor's required return and principal, but timing and bill impact is improved.

It is also worth noting that price shocks can be mitigated by smoothing investment. The modelling strongly supports prioritizing and spreading necessary wharf replacements and deferring less urgent projects to prevent excessive price spikes.

Summary

The ICCC's adoption of the unindexed historic cost approach with a nominal WACC for new assets, and freezing indexation for the existing RAB, is expected to produce a flatter, more affordable price path for PNG Ports' customers. The move balances infrastructure renewal with affordability, removes systematic price escalation, and reflects international regulatory standards.

A more in-depth analysis can be found in the paper "Regulatory Asset Base Valuation Methodology" which accompanies this report.

5.5 New Pricing Principles

To enable the RAB value methodology, Pricing Principle 1 in Schedule 4 of the Regulatory Contract describes how the RAB is to be updated in the next pricing review in 2029. Table 8 shows the changes being made to achieve the ICCC's determination.

Table 8: Changes to Principle 1.

	2020 to 2024 contract wording	2025 to 2029 contract
1.	The opening Regulatory Asset Base (RAB) for the next regulatory period is to be calculated using a roll forward	The opening Regulatory Asset Base (RAB) for the next regulatory period is to be

	approach, based on the following components: a) The 2020 opening RAB will be set at K799 million in 2019 terms. b) Actual prudent capital expenditure incurred by PNG Ports during the regulatory period (2020 to 2024). Consideration must be given as to whether or not any particular capital project was prudent. c) Forecast depreciation for the 2020 to 2024 regulatory period. d) Disposals or write downs of regulated assets during the regulatory period. e) No gifted assets should be included in the RAB. f) All amounts should be inflated into money of the day values using indexation.	calculated using a roll forward approach, based on the following components: a) The 2024 opening RAB will be set at K829 million in 2029 terms. b) Actual prudent capital expenditure incurred by PNG Ports during the regulatory period (2024 to 2029). Consideration must be given as to whether or not any particular capital project was prudent. c) Actual straight-line depreciation for each asset based upon its economic life. d) Disposals or write downs of regulated assets during the regulatory period. e) No gifted assets should be included in the RAB f) Going forward, assets in the RAB will be at cost. The opening RAB value will remain at its 2024 value, but all new assets added to the RAB will be added at historic cost. No assets in the RAB will be inflated into Money of the day values using indexation.

Item c) in the old regulatory principles has been changed due to the introduction of the Capex Cost Recovery. In the old pricing principles, forecast depreciation was used instead of actual depreciation. This meant that if PNG Ports spent less capital than was allowed for in the price path, RAB was depreciated to reflect that PNG Ports had already recovered this portion of the RAB. This is no longer necessary because the value of any over or under capital spending will be allowed for using the Capex Cost Recovery adjustment. This is described in more detail in section 12.

The previous requirement to roll forward the RAB using forecast depreciation has been removed. This has been replaced with a requirement to make a Capex Cost Recovery adjustment to prices in the subsequent regulatory period. This later item has been added to the principles as principle 7.

Pricing Principle 7. A Capital Cost Recovery adjustment must be done to reflect any under or overspending of the capital allowance in the previous price path. This adjustment must allow for the time value of money and should reflect the NPV of the difference between actual capital spending and forecast capital spending in the 2024 to 2028 regulatory period.

The other pricing principles in the Regulatory Contract remain unchanged from the 2020 to 2024 Regulatory Contract.

5.6 Submission from PNG Ports

PNG Ports and the ICCC have met to discuss this change and PNG Ports has agreed to it, on the basis that both methods have an NPV of zero for any new investment. This meeting occurred in July 2025 after the ICCC presented the paper "Regulatory Asset Base Valuation Methodology" which accompanies this report.

Prior to this meeting, other discussions and submissions occurred between PNG Ports and the ICCC. These are described here to support transparency of the ICCC's review process.

The ICCC met with PNG Ports on 4th of October 2024 and advised that it was proposing to change the pricing principles so that assets were no longer inflated. The ICCC followed this up with a letter on 10th October again advising PNG Ports that it was proposing to change the pricing principles. PNG Ports responded with a letter dated 18th October. In this letter it said,

> *"We consider that an incentive-based framework remains the most appropriate model, despite some of the challenges in applying it in this context. As we stated in our response to the Draft Decision, any review of the regulatory framework—including consequent changes to the Regulatory Principles—is considered beyond the scope of the current review. The nature and extent of the changes currently contemplated by the ICCC are currently not known. Further, any changes that the ICCC considers to be relatively minor could be material from the perspective of PNGPCL and/or users.*
>
> *We therefore do not consider that any such changes should be introduced at this late stage in the process, particularly without any opportunity for engagement and consultation. Any changes to the regulatory framework require adequate time for consideration and engagement, including being able to work through the potential consequences.*
>
> *As such, we consider that this should be undertaken as a separate process over an appropriate timeframe, allowing for stakeholder consultation. This issue is discussed further below."*

> *"Having regard to the above issues, if a review of the regulatory framework is contemplated by the ICCC, we consider that this should be undertaken as a separate process over an appropriate timeframe, allowing for stakeholder consultation. This could consider matters such as:*
>
> - *the timing and content of PNGPCL's Strategic Capital Plan, including the type of assessment that should be undertaken in substantiating port investments;*

- *if considered relevant to the regulatory contract, the provision of external funding;*
- *related to the first two points, the role, nature and scope of a "comprehensive financial plan";*
- *a refreshed competition analysis for the purpose of reviewing the role and scope of regulation;*
- *the form of regulation (i.e., price/revenue cap);*
- *the capacity to implement appropriate mechanisms to mitigate pricing impacts; and*
- *the Regulatory Principles.*

This review could be included in the 2025-29 regulatory contract for completion by the end of the second year of the regulatory period (2026). Any consequential changes to the Regulatory Principles would then govern the following review of the regulatory contract. PNGPCL is not proposing that there would be any changes to allowed revenues and prices as part of such a review i.e., it would only focus on regulatory framework matters."

In response to these comments, the ICCC noted that:

- "Pricing principles are subject to review every five years as part of the price review process. This is therefore fully within scope.
- Because of the imminent capital spending program, and for the reasons described in this current section of the report, the review of the pricing principles cannot be delayed. Any delay would be too late."

The ICCC and PNG Ports then agreed to delay finalising the prices review. This gave ICCC the time and opportunity to conduct a thorough analysis of the impact of the change and to refine the calculations required to implement the change[9].

5.7 Conclusion

The ICCC's adjustments to PNG Ports' pricing principles aim to balance the need for significant infrastructure investments with the necessity of maintaining sustainable price levels. By shifting to a historic cost valuation for the RAB, the ICCC ensures that PNG Ports can undertake essential wharf replacements while avoiding drastic and unsustainable price hikes. This new approach reflects best regulatory practices, enhances affordability, and aligns with the ICCC's commitment to prudent and responsible oversight of essential infrastructure pricing.

[9] See paper accompanying this report titled "Regulatory Asset Base Valuation Methodology" May 2025.

6 Review of Pricing Structures

6.1 Tier 1 and Tier 2

Currently ports are classified as either being Tier 1 or Tier 2 and the ports are grouped as follows.

- Tier 1: Motukea, Lae, Kimbe and Vanimo.
- Tier 2: Madang, Alotau, Oro Bay, Kavieng, Daru, Buka, Kieta, Aitape, Lorengau, Rabaul and Wewak.

The original grouping was based on an assessment of the profitability of the ports, with Tier 2 being loss-making ports. Figure 7 shows how Tier 1 and Tier 2 prices have changed when compared to each other over the last two regulatory periods. Currently, Tier 2 prices are now lower than Tier 1, but previously they were higher.

Figure 7

There are two conflicting views about whether Tier 2 should be higher or lower than Tier 1.

- One view is that because Tier 2 ports cost more per TEU, prices should be higher to provide a better cost signal to users. Economic theory says that when prices reflect costs, the result will be a better allocation of resources.
- The counter view is that to promote economic development in the regions, Tier 2 ports should be cheaper than Tier 1 ports.

PNG Ports have proposed that the distinction between Tier 1 and Tier 2 should be removed.

Generally, most cargos which are loaded or unloaded at a Tier 2 port, have come from, or are going to a Tier 1 port. Therefore, simply averaging Tier 1 and Tier 2 prices should make little difference to the cost of a transporting coastal cargo.

As one submitter says

> *"It will not change anything; the tariffs will still rise to compensate for the loss making ports"*

Determination

The ICCC has determined to remove the distinction between Tier 1 and Tier 2 ports.

Several stakeholders, in submissions and discussions with the ICCC, have commented that that Tier 2 prices should not be increased to Tier 1 levels. So, it should be noted that the ICCC is proposing to set Tier 1 prices for wharfage to Tier 2 levels. And for berthage, the ICCC is proposing to set Tier 2 prices to Tier 1 prices. However, this is a mere formality, as if the reverse approach is taken, the X factor will be a larger negative number and overall, the average price per TEU will be the same.

6.2 PNG Ports Review of Pricing Structures

In the 2019 review, concerns were raised by some shippers that price structures were discouraging containerisation of some products, particularly for commodities like wheat and rice. So, in preparation for the upcoming 2025-29 review, PNG Ports conducted its own review, focusing on wharfage charges, which make up the majority of its revenue.

It examined practices in other ports worldwide and compared wharfage costs for containerised versus bulk shipping of commodities like rice and palm oil. The analysis showed differences in relative costs across ports, but PNG Ports' rates were not outliers.

PNG Ports also consulted some stakeholders about its pricing structures. Consultations revealed no specific issues with the current tariff structure, and feedback indicated no evidence that the rates were discouraging containerisation of bulk commodities.

PNG Ports concluded that no changes to the tariff structure were warranted for the next regulatory period but says it will continue monitoring and welcomes further feedback from stakeholders.

6.3 Other Pricing Structures

There are multiple options when it comes to structuring prices. Because of changes that are occurring in the coastal shipping industry in PNG, there may be changes to pricing structures that could be helpful.

Currently the following structure is in place.

- International prices are higher than coastal prices.
- Inbound international prices are higher than outbound international prices.
- Empty containers are cheaper than full containers.

No other comments or submissions have been received regarding these elements of the pricing structure, so it is reasonable to assume that users have no issues with the structure as it stands.

The current structure is designed for social and economic elements of the local economy. For example, coastal prices are lower than international prices to support regional development. A more cost-focused approach could be used instead. For example, prices could be set based upon the quality of the wharf. If a wharf was a class 10 wharf, its prices could be set lower than if it was a class 5 wharf (see Table 15 in section 9.3 on minimum wharf standards). Such an approach would mean that prices would better reflect the service that the customers were receiving. Lower prices would provide some compensation for poor conditions at some wharves. They would also provide an incentive for PNG Ports to raise the standard of a wharf if it meant that it could increase its revenues by doing so.

The ICCC has determined not to make any other changes to the structure of PNG Ports' charges.

6.4 Prices for Landing Ramps

In Daru the wharf is not currently useable. This means that PNG Ports' customers use a landing ramp to load and unload cargo at this port.

The ICCC understands that PNG Ports' current practice is to only charge 50% of berthage under such circumstances. However, customers still pay standard wharfage charges.

7 Benchmarking

Several stakeholders have commented on how expensive PNG Ports is compared to port prices in other countries. The ICCC has therefore carried out a price benchmarking exercise.

The findings clearly demonstrated that PNG Ports' prices were more expensive than all other ports in the ICCC's sample.

Benchmarking is often difficult. Ideally the companies which are used as benchmarks should have the same characteristics to be comparable. There are several reasons why prices at a port might vary. These might include:

- Government subsidies being used to set prices below costs.
- Scale—ports with large throughput may get better utilisation of assets and so be able to charge lower prices.
- The intensity of competition driving efficiency which supports lower prices.
- The quality of the wharf and other infrastructure.
- Whether a company has only one port or many ports. Many companies operate a mix of small and large ports.

Whether or not any of these factors are present at a particular port, it is still possible to simply compare prices and observe if they are higher or lower.

The practical limitations to benchmarking are mostly associated with finding data. The ICCC sourced all the pricing data from websites published by port companies. However, some port companies do not have pricing structures that support comparisons with PNG Ports. For example, many ports do not charge separate wharfage fees, but instead combine stevedoring and wharfage charges together.

Language is also a challenge when looking for price information. Different ports will use different terminology to refer to the same thing and many ports do not provide explanations of their prices in English. However, prices for 24 international ports were successfully identified.

7.1 Methodology

To calculate the average price per TEU, the ICCC chose a ship which would be representative of the size of vessels that load and unload containers at Motukea or Lae. The approach then is to calculate

what it would cost to load or unload the same sized cargo using the same sized ship at any of the ports in the sample. The assumptions used are shown in Table 9 and Table 10.

Table 9: Vessel and Cargo Assumptions

Vessel tonnage (GRT)	6245
Vessel length alongside (m)	115
Containers loaded (off and on)	600
Loading rate (containers per hour)	15
Time at wharf (hours)	40

Table 10: Container split by Price Category

	Overseas	Coastal
% Full inwards	33%	11%
% Full outwards	9%	9%
Empty inwards	1%	5%
Empty outwards	25%	7%

It should be noted that many ports will have much better loading rates than 15 per containers per hour. This will mean that the ship will spend less time at berth and charges will often be lower as a consequence. However, we are testing PNG Ports' prices and so for the purposes of the benchmarking exercise, we have applied the same rate to all ports.

For each overseas port for which the ICCC could find prices, these assumptions were used to calculate an average price per TEU. Prices were converted from local currencies to kina per TEU by using the current exchange rates.

7.2 Findings

Figure 8 shows the benchmarked price for each port mapped against its annual TEU volume. Table 11 shows the full list of ports in the benchmarking sample.

The following observations can be made.

- Motukea and Lae are the most expensive ports of all the ports sampled. The average price in the sample was K192 per TEU. Therefore, PNG Ports was more than twice as expensive as the average price of ports in the sample.
- There is no clear relationship between the size of a port and the prices it might charge. For example, the largest port in the sample was Melbourne, with an annual volume of 3.2 million TEU, yet its prices were much higher than Karachi, which only charged 21 Kina per TEU.
- Several ports had lower volumes than PNG Ports and had lower prices. These ports would have poorer scale than PNG Ports and therefore might be expected to have higher prices.
- Several ports were owned by an entity that managed multiple ports. This is important because PNG Ports also manages multiple ports, including loss-making ports, which drives up prices. The benchmarking included Dar es Salaam and Tanga (Port Authority of Tanzania), the South African Ports (Cape Town, Port Elizabeth, Port Ngqura), Adelaide (Flinders), Cairns

(North Ports), Rockhampton (Gladestone Ports) and Mombasa (Port Authority of Kenya). In each case these companies appeared to be setting prices which covered multiple ports. However, the ICCC does not know if there were loss-making ports within their portfolio.

Figure 8

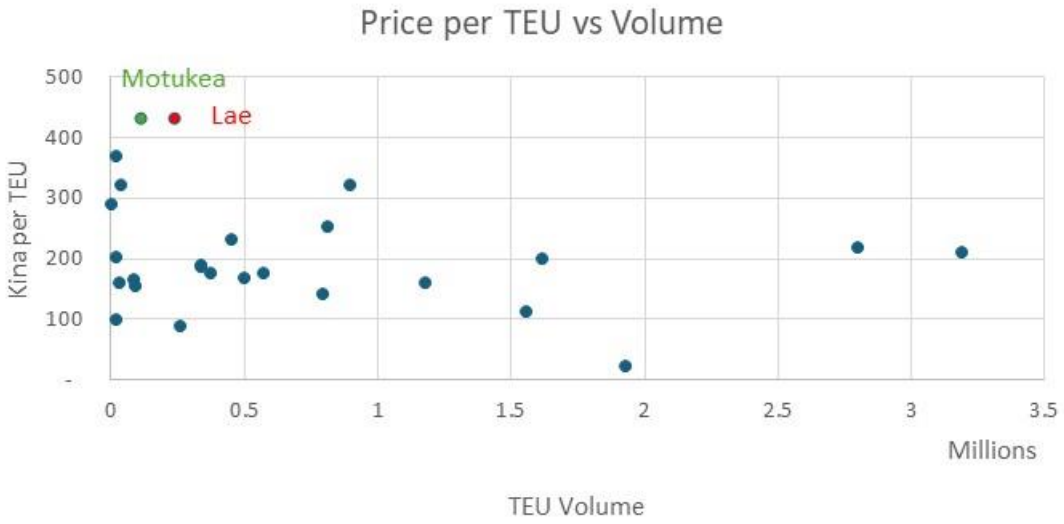


Table 11: Average Price per TEU by Port

	Annual TEU Volume	Price (Kina per TEU)
Karachi	1,930,000	21
Fiji Ports Corporation	260,000	89
East Timor (Dili)	20,000	100
Brisbane	1,560,000	112
Cambodia (Sihanoukville)	797,000	140
Centreport Wellington	95,753	153
Solomons	31,000	158
Port of Tauranga	1,180,000	158
Port of East London	90,000	163
Cape Town	500,000	166
Port Elizabeth	375,000	174
Port Ngqura	572,000	174
Other Tas Ports		187
Port Adelaide (Tas ports)	337,000	190
Average Price (excluding PNG Ports		192
Mombasa	1,620,000	198
Cairns	23,638	201
Melbourne	3,190,000	209
Botany Sydney	2,800,000	218
Lyttleton	455,457	232
Port of Auckland	811,565	251
Rockhampton	1,115	288

Tanga	40,000	322
Dar es Salaam	900,000	322
Tonga	23,882	369
Motukea	111,000	432
Lae	237,774	432

7.3 Factors Contributing to High Prices

The benchmarking has shown that PNG Ports' prices are among the highest in the world. However, many of PNG Ports' wharves are very old. It might be expected that a building block method would produce prices that are lower than in other ports.

So, it is reasonable to ask the question "why are PNG Ports prices so expensive?"

Several factors were investigated to see how much they might be contributing to high prices. These included,

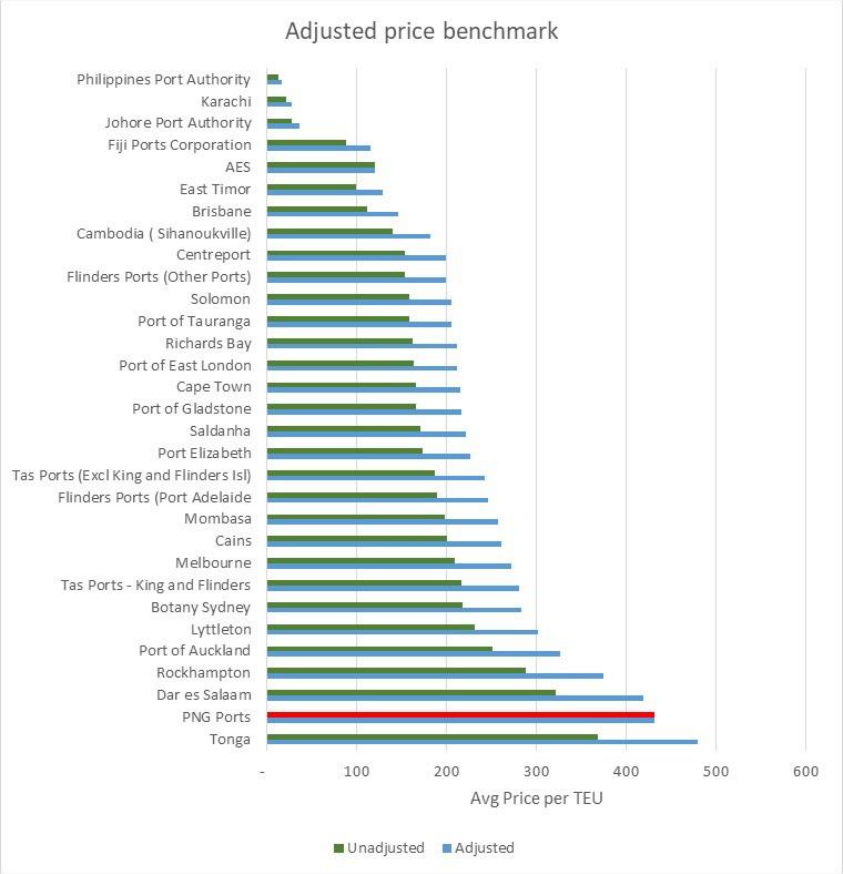
- Kina overvaluation
- PNG's High cost of capital
- PNG Ports' poor asset utilisation
- Low profitability at ports with lower prices

The following observations are extracted from section 6 of the accompanying report "Regulatory Asset Valuation Methodology".

Kina Overvaluation

The Kina currency is currently considered to be overvalued, resulting in PNG port prices appearing higher when converted to foreign currencies. International Monetary Fund estimates place the overvaluation at between 10% and 20%, and recent assessments suggest that a nominal currency reduction of 33% would be required to achieve a real reduction of 20%. When the PNG benchmark study's exchange rates are adjusted downward (devaluing the Kina by 30%), PNG Ports' price gap narrows, and ports like Tonga become the most expensive, though PNG Ports remains second highest (see Figure 9).

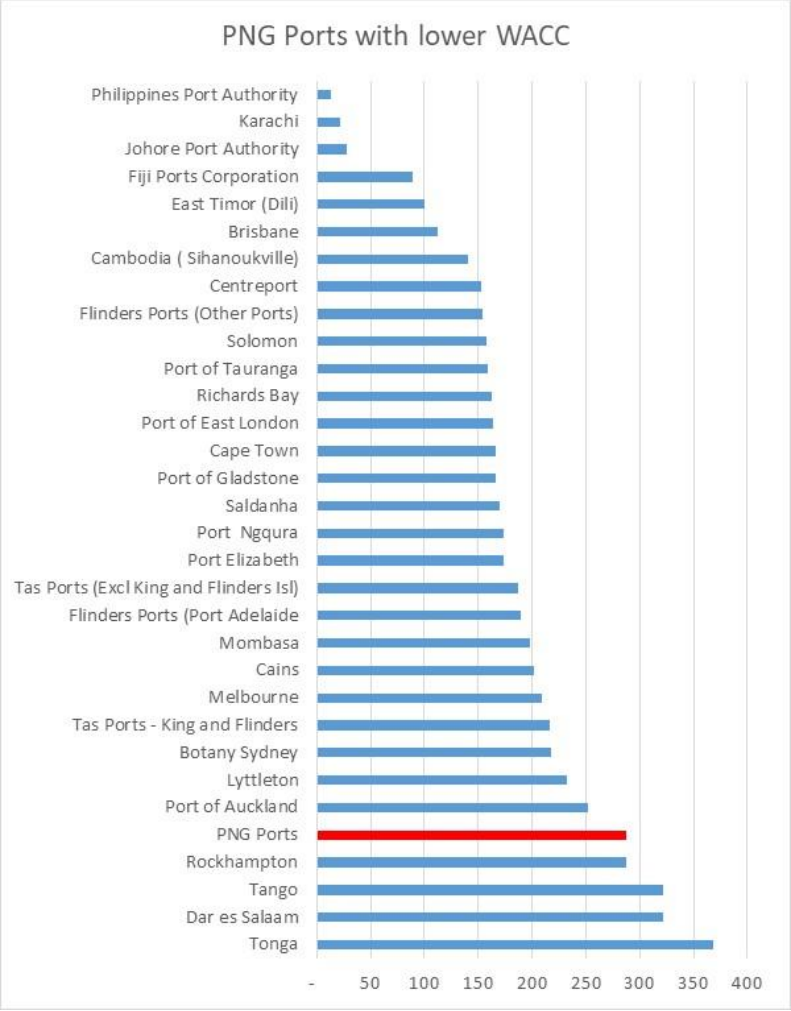
Figure 9



High Cost of Capital

Papua New Guinea faces a high cost of capital compared to other economies. The current pre-tax real Weighted Average Cost of Capital (WACC) is more than double that of some benchmark markets, such as New Zealand. When the pricing model uses a lower, New Zealand-equivalent WACC, PNG's price per TEU drops sharply but still ranks high versus other ports in the benchmark group (see Figure 10).

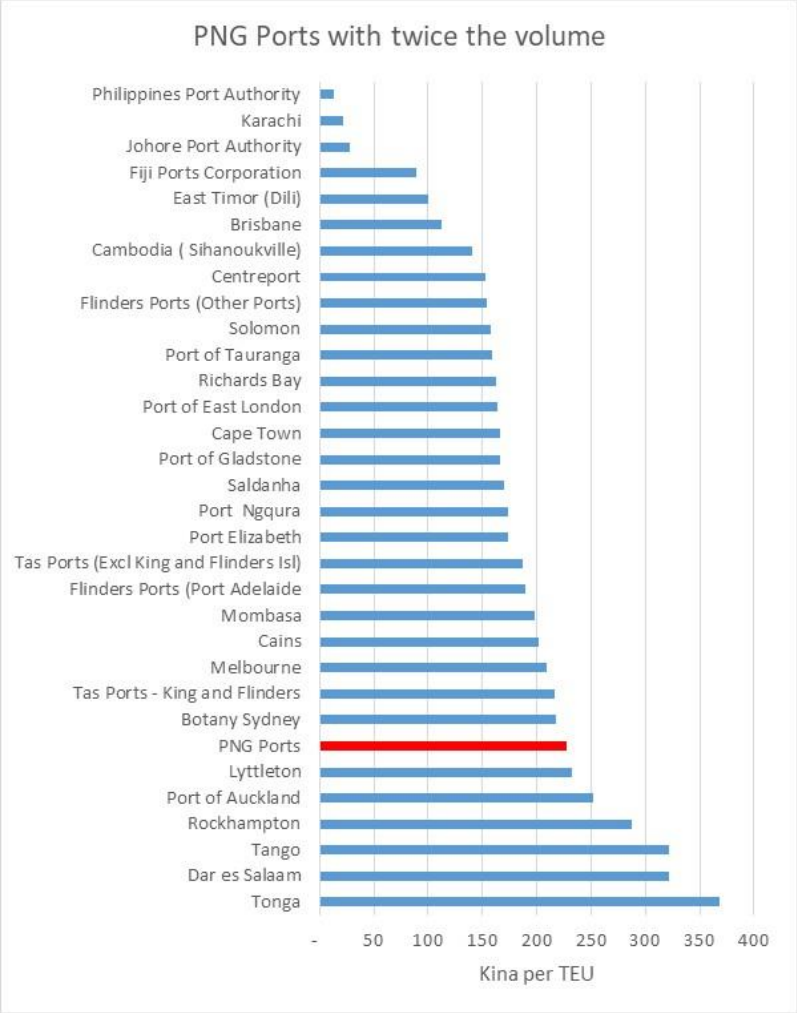
Figure 10



Asset Utilisation

Other countries' ports tend to have better asset utilisation. Doubling the volume of containers handled by PNG Ports would, in theory, halve the tariff per TEU. However, actual benchmarking shows little correlation between container volume and port pricing, suggesting that under-utilisation is only a partial explanation (Figure 11).

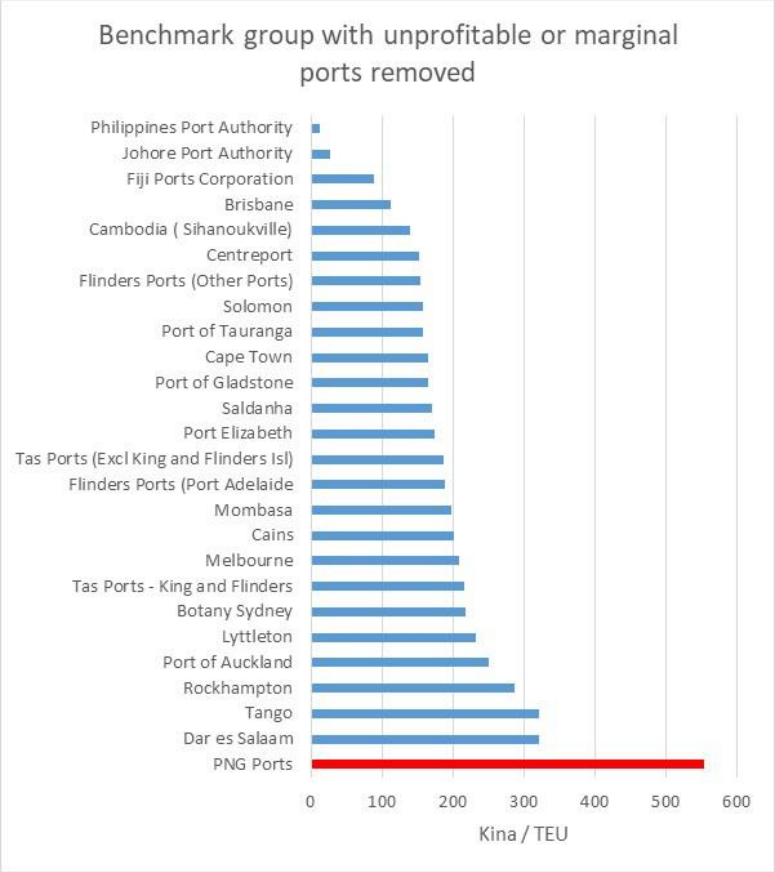
Figure 11



Profitability and Cost Coverage

Most ports in the benchmarking study are profitable and set fees to recover the full cost of infrastructure. When ports not covering their costs are excluded, PNG's pricing still remains near the upper end of the international spectrum (see Figure 12).

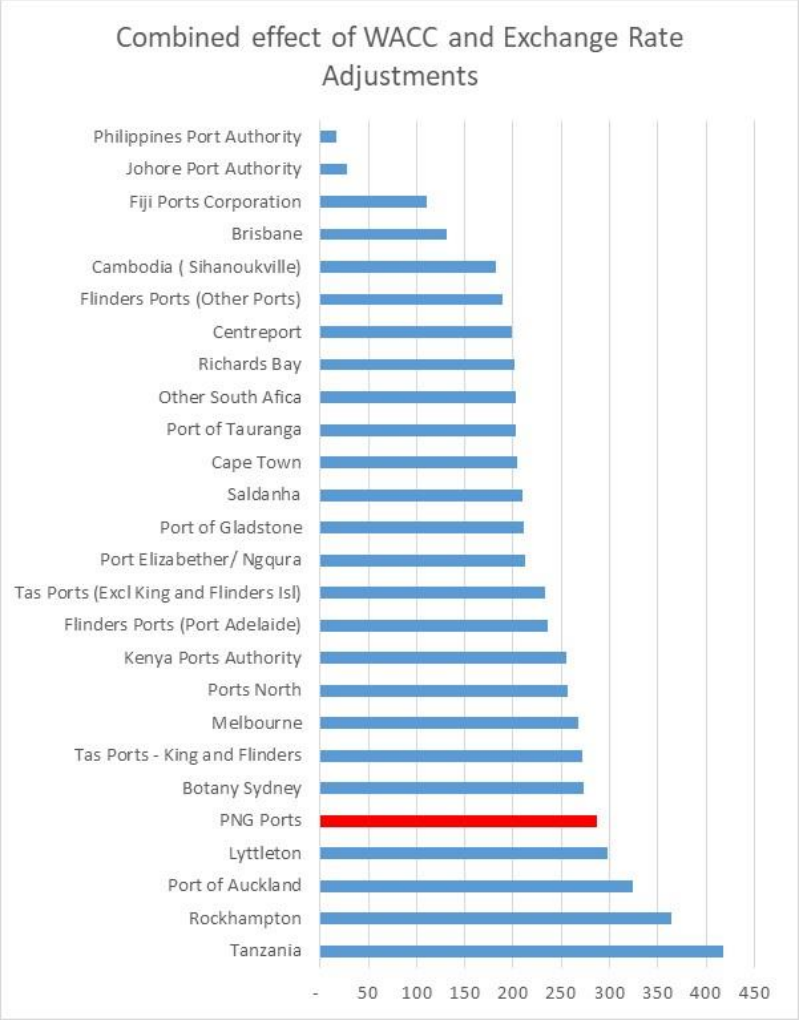
Figure 12



Combined Effects

When factoring both currency adjustment and a lower cost of capital, PNG Ports' prices move closer to the middle of the benchmark group, but often still fall into the higher range. Unprofitable ports are excluded in the comparison below (see Figure 13).

Figure 13



Conclusion

While overvaluation of the Kina and a high WACC do explain part of the price difference, these factors alone do not account for the full premium charged by PNG Ports. Even after major price drivers are adjusted, structural and operational differences continue to set PNG's port charges above most peers in the benchmark group.

7.4 Conclusion

PNG Ports' prices are expensive compared to ports in other countries, with charges more than double the average in the benchmarking sample. While the analysis did not identify how prices are set in all other jurisdictions, it is clear that PNG Ports' prices remain high even after accounting for factors such as the inflated value of the Kina and PNG's high cost of capital. Although increasing port volumes could potentially reduce prices, this is beyond the direct control of PNG Ports or the ICCC.

Given PNG's reliance on coastal infrastructure for both domestic and international trade, the ICCC considers the benchmarking results valid are a matter of major concern. The conclusion from this

analysis is that strategic efforts—including future price reviews—must focus on reducing costs and prices, as current evidence justifies concern about PNG Ports' prices rising further above already uncompetitive levels.

7.5 Further Benchmarking and Best Practice

One submission had a strong focus on the benefits of benchmarking. The submitter encouraged both the ICCC and PNG Ports to reach out to the Maritime Port Authority of Singapore to explore options for improved efficiency and performance.

8 Market Demand

8.1 Market Risk

The price setting mechanism defined in the Regulatory Contract sets prices by dividing forecast costs by forecast sales volume. The higher the sales volume the lower the price. This means that PNG Ports has an incentive to underestimate future demand. It also creates risk for PNG Ports. If the ICCC set future demand too high, PNG Ports will not earn sufficient revenue to cover its costs.

8.2 How to Forecast Demand

In its January 2024 submission, PNG Ports provided the ICCC with an analysis of different methodologies that could potentially be used to forecast future demand for port services.

It examined three methods

- Use of macro-economic forecasts, on the basis that over time, port throughput maintains a reasonable correlation with real GDP.
- Econometric time-series modelling. It used three different approaches to test this.
- Surveying port users.

Based upon this analysis, PNG Ports concluded that a demand forecast that is based on the projected growth in real GDP in PNG will produce the most realistic and defensible forecast for the 2025-2029 regulatory period. These forecasts are available from the PNG Treasury.

PNG Ports notes that this approach has the benefit of being:

- transparent
- objective and independent
- simpler as it avoids unnecessary complexity.

PNG Ports also found that the forecast produced was consistent with the view expressed by the port users who participated in its consultations.

In the draft report, the ICCC proposed to accept PNG Ports' proposed methodology to set demand forecasts for the 2025 to 2029 regulatory period. Parts of PNG Ports' submission were published in the appendix of the draft report.

The method chosen by PNG Ports would have resulted in a 3.7% annual increase in sales volumes. This was based upon an analysis completed in 2023.

However, because the ICCC has removed Schedule 9 from the Regulatory Contract, PNG Ports' protection against demand forecast errors was removed from the contract. PNG Ports therefore requested an opportunity to reassess its demand forecast.

The ICCC agreed to this. In agreeing to this, the ICCC considered that PNG Ports' forecast was based upon the Government forecast of GDP in 2023 and that there had been various changes in the economy since that time.

PNG Ports have reassessed its forecast and reduced it from 3.7% growth per annum to 2% growth per annum.

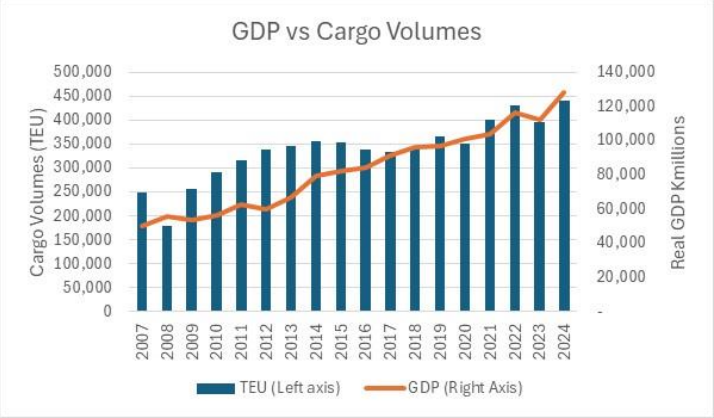
The ICCC thinks that over the next five years there could be factors which drive growth at higher or lower rates than this.

- If the kina is devalued, this would be likely to drive down import volumes and drive up export volumes.
- If a major new gas-field development project is signed off, this would be likely to increase import volumes and stimulate the economy.

8.3 The Forecast Model

The ICCC has confirmed PNG Ports analysis the GDP is a good indicator of port cargo volumes. Figure 14 shows both Real GDP and PNG Ports sales volume since 2007. The relationship with GDP is not perfect. For example, in 2008 cargo volumes fell significantly while GDP actually increased (driven by strong inflation). A regression analysis shows the relationship has an adjusted R^2 of 0.66. This means that 66% of the changes in cargo volumes can be explained by GDP.

Figure 14

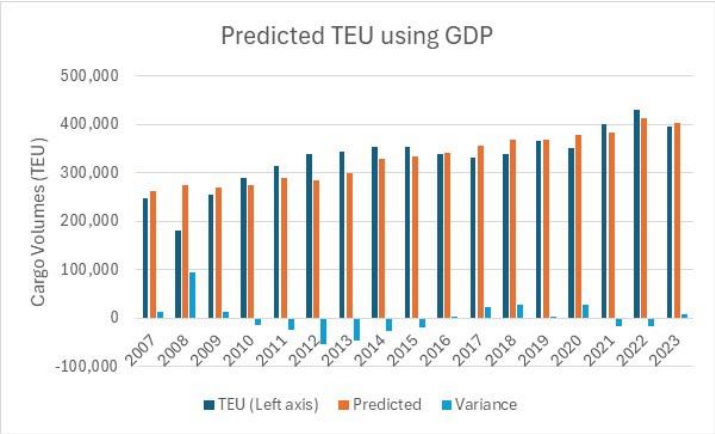


The regression analysis gives us a formula for predicting Cargo volumes (in TEU) from GDP forecasts.

TEU = GDP (in Kmillions) x 2.2846 + 147,475

This formula can be used to estimate future cargo volumes using PNG Treasury forecasts of GDP growth. Using this formula, we can compare predicted cargo volumes against actual (see Figure 15).

Figure 15



From Figure 15 we can see the years when the variance between the predicted cargo volumes and actual volumes is highest. This occurred in 2008 when the Global Financial Crisis occurred and 2013 when GDP was being lifted by PNG LNG Project. The effect of the gas project was to drive up volumes across PNG Ports' wharves during construction. However, when gas production started, these volumes fell, while GDP went up.

The forecast approach seems to work well in normal years but cannot predict the impact of major events.

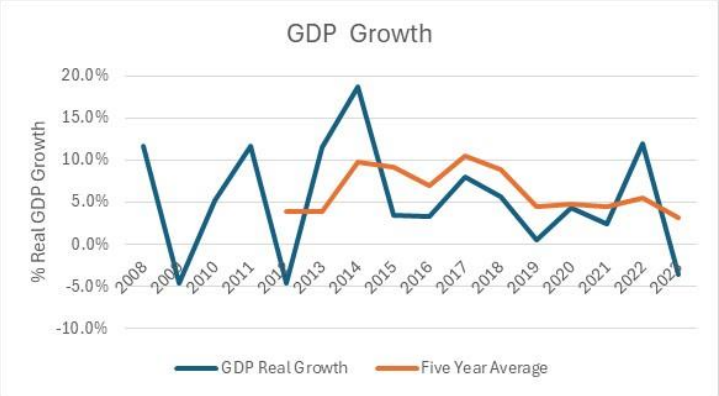
8.4 Forecast Risk

The ICCC is aware that having removed Schedule 9 from the contract puts PNG Ports in a higher risk of not receiving the revenue requirement calculated from the building block model due to lower cargo volumes.

The ICCC cannot predict the likely occurrence of major events which might have an impact on cargo volumes. Figure 20 shows actual GDP growth since 2007. Over this time there have been four peaks and four troughs. In the peaks, GDP growth exceeded 10% in real terms. In the troughs, GDP fell to zero or below with the worst being -5%.

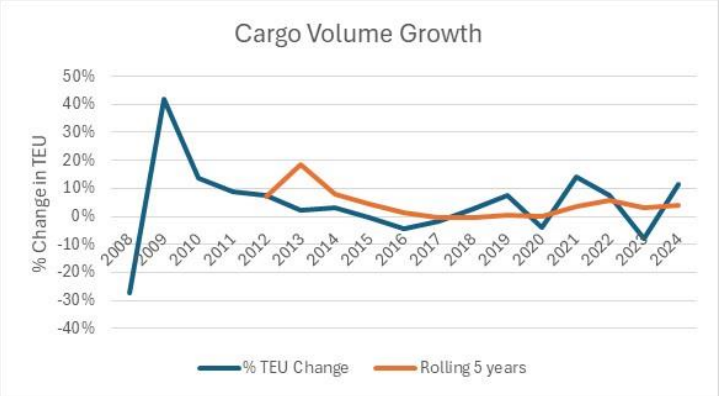
To examine the practicality of the risk, it should be considered that the ICCC typically forecasts volumes for the next five years when carrying out a price review. Figure 16 also shows the rolling five year percentage change in GDP. This shows that even when major events occurred, the lowest GDP growth over a five year period was 3.2%.

Figure 16



However, the ICCC must forecast TEU volumes not GDP. When the same percentage change chart is produced for TEU, the outcomes do look riskier for PNG Ports. Figure 17 shows the five year rolling percentage change in TEU volumes. This shows that while the peaks and troughs are evened out over time, there have been significant periods when growth was very low even though GDP was higher. From 2016 to 2020, the five year average growth was less than 1.5% and in three of these years it was negative. Despite this, it is also interesting to note that when volumes fell by 27% in 2008, they increased by 42% the following year.

Figure 17.



The ICCC also notes that the WACC used to calculates PNG Ports' prices and return on investment takes this risk into account. However, this does not take away from the importance the ICCC places upon estimating future growth.

8.5 Determining the Demand Forecast

PNG Ports' sales volumes have a major impact upon its revenues and the ICCC's price setting methodology. The higher the volume the ICCC sets, the lower its prices will be.

The ICCC has updated the volumes in the building block model with PNG Ports' actual 2024 sales volumes. In 2024, TEU volumes grew by 11% and this has had a substantial impact upon the regulated price.

Current GDP forecasts for PNG for a variety of sources are shown in Table 12. For 2025, the average forecast is 4.3% GDP growth and, for 2026, the average forecast is 3.4%. There is only one forecast available for 2027 and none for 2028 and 2029.

Table 12: GDP Forecast

Source	2025	2026	2027	2028	2029
World Bank Economic Update	4.70%				
KPMG PNG	4.70%				
Westpac Bank	4.70%				
PNG Treasury Dept (Budget 2025)	4.70%	4.2%	3.8%	3.8%	3.9%
IMF (March 2025)	4.60%				
IMF (Latest, June 2025)	4.60%				
World Bank Macro Poverty Outlook	4.30%	3.20%	3.10%		
Asian Development Bank (ADB)	4.20%	3.80%			
Bank of Papua New Guinea (Central Bank)	4.00%				
Trading Economics	2.60%	3.20%			

In determining its forecast, the ICCC has considered:

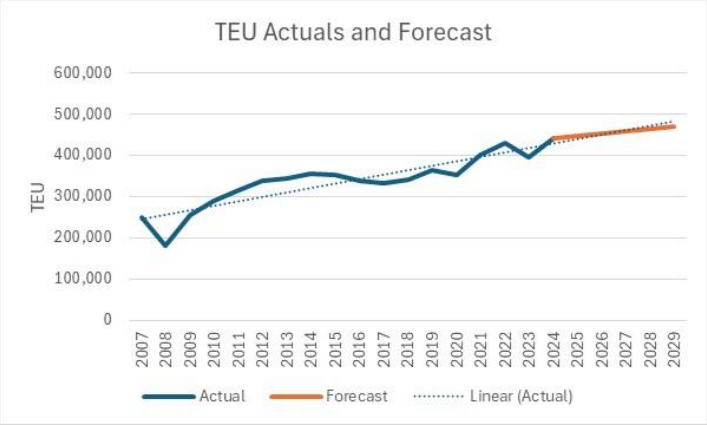
- PNG Ports submission which asked for a 2% TEU growth forecast across the regulatory period.
- The significantly higher TEU volumes than predicted by PNG Ports for 2024.
- The consensus forecast for 2025 and 2026.
- The lack of forecasts available for 2027 to 2029.
- The higher risk in outer years (2026 to 2029) of an unpredictable event.

Based upon these considerations, the ICCC is proposing to use the forecast shown in Table 13. This implies volumes will grow from 440,000 TEU in 2024 to 471,000 TEU in 2029 (see Figure 18).

Table 13: ICCC proposed TEU % Growth forecast

	2025	2026	2027	2028	2029
ICCC forecast TEU Growth	2.0%	2.0%	2.0%	2.0%	2.0%

Figure 18



In setting this forecast, the ICCC has set a lower forecast than the consensus (and adopted PNG Ports' submission figures for 2025 to 2029.

9 Minimum Service Standards

9.1 Introduction

Service standards are a fundamental component of any regulatory contract. The current contract allows PNG Ports to charge a defined schedule of prices, contingent upon meeting service standards. If PNG Ports fails to meet the standards, effective enforcement requires meaningful consequences.

Service standards ultimately shape the regulatory costs of PNG Ports' operations, with the largest cost being its wharves. There is an inherent trade-off between the cost and quality of a wharf; for instance, constructing a wharf capable of supporting higher weight loads is more expensive.

The ICCC has concluded that the service standards in the Regulatory Contract 2020–2024 are insufficient. Specifically, the standards fail to include weight load requirements, which currently restrict the use of certain wharves—Kavieng's wharf being one example.

This review period provides an ideal opportunity to address these shortcomings, especially as PNG Ports is already planning to replace several wharves. However, PNG Ports has not provided the ICCC with details of its replacement plans, despite indicating that these replacements are imminent. The ICCC is concerned that replacement wharves must meet minimum load standards and be designed to serve PNG's long-term needs.

To address this, the ICCC requested feedback from PNG Ports, asking for input on appropriate standards for ICCC consideration. In an October 24 letter to the ICCC, PNG Ports stated,

> "*PNG Ports is not proposing any changes to the existing service standards. If investment in new infrastructure at individual ports warrants a change to relevant service standards, we may consider a mid-period reopening of the regulatory contract to revise the relevant service standards.*"

PNG Ports now has until October 30, 2026 to supply adequate information to allow the ICCC to update the contract's service standards. This will be done as part of the requirements of the Strategic Plan as described in section 4 of this report.

In the meantime, the ICCC has populated the minimum wharf loading standards in the Regulatory Contract based on Australian standards. These will come into force in the contract by 2030 if PNG Ports does not provide adequate information to support alternatives. The standards chosen by the ICCC are suitable for this purpose, given the intended use of the PNG Ports' infrastructure and the absence of better information.

9.2 Submission on Infrastructure Quality

Several submissions were received which raised concerns about the current state of PNG Ports' wharves.

> "*Our experiences validate the ICCC's concerns about the state of PNG Ports' wharves*".

"It is noted that all wharfs were found to be compliant with the ICCC's standards. However, there are several ports within the PNG Ports network that require large amounts of investment to bring them to the efficiency and operational levels seen in POM i.e. Kavieng and Vanimo amongst others."

"Contrary to the self-reporting table on page 28, a physical inspection of each port would show major non-compliances with the required minimum standards. This increases the cost of operation for shipping companies and reduces the efficiency of operations."

We "agree with the ICCC's finding that the PNG Ports infrastructure is in a poor state of repair and in bad need of upgrading".

The ICCC's interpretation of these submissions is that more focus in required by PNG Ports in bringing wharves up to standard. The comments also indicate that the current Minimum Wharf Standards are not adequate and need to be modified. In addition, it indicates that the ICCC needs to change its approach to monitoring compliance with the Minimum Standards.

9.3 Minimum Wharf Standards.

Table 14 shows the current Minimum Wharf Standards from Schedule 3 of the Regulatory Contract.

Table 14: Minimum Wharf Standards

		Length	Beam	Draft
Lae and Motukea - international		200m	20m	10m
Lae and Motukea - coastal		150m	10m	5m
Aitape	Berth 1	18m	6.2m	4.3m
	Berth 2&3	8m	4.4m	2.5m
Buka	Berth 1	60m	7m	7m
	Berth 2	31.4m	5.7m	4.7m
Daru		34m	15.5m	7.7m
Lorengau		40m	20.2m	1.5m
Vanimo		28.6m	10m	4.5m
All other ports		57m	9.8m	3.3m

Aitape cannot safety berth a ship of the size specified and has not been able to for almost a decade. Aitape therefore fails to meet the minimum wharf standards. The wharf is currently unused and therefore PNG Ports receives no revenue at this wharf. The ICCC has also removed the Aitape assets from the RAB.

The Daru wharf is also not currently usable and instead PNG Ports' customers must use a barge ramp. In PNG Ports recent submission, PNG Ports has indicated to reduce Daru wharf's maximum

draft from 7.7m to 2.4m. The ICCC considers that it will make a formal assessment as and when PNG Ports submits its full report on the Minimum Service Standards anticipated to be submitted in 2026.

One submission proposed that wharf standards should be updated using the Australian Standard for Maritime Structures (AS 4997 – 2005). The benefit of this standard is that it provides clarity for wharf users about the sort of equipment that they can safely use at any particular wharf. PNG Ports already provides this guidance, but using a standard such as AS 4997 – 2005 would provide assurance to shipping companies and stevedores that guidelines are backed by a recognised standard.

PNG Ports is planning to commence a major upgrade programme for the wharves across most of the ports it services so now is an opportune time to set expectations about current and future standards for the wharves.

Consequently, the ICCC has adopted these Australian standards in the contract. They will remain in the contract until such time as PNG Ports provide information that supports an alternative standard.

Table 15 lists all the wharves with the current permissible loading provided by PNG Ports. The table shows the standard that each wharf currently meets on AS 4997-2005.

Table 15: Wharf Loading

Port	Wharf	Permissible loading in tons per m2	Equivalent loading in kPA	Current AS 4997 Standard Class	Australian standard description of suitability
Aitape	Berth 1	1.46	14	10	Public boardwalk and passenger jetty, with emergency vehicle access
Alotau	International Berth	2.8	27	25	Secondary port general cargo wharf
	Coastal Berth	2.93	28	25	Secondary port general cargo wharf
Buka	International Berth	0.58	5	5	Public boardwalk and passenger jetty
	Coastal Berth	not rated			
Daru	Berth 1	1.5	14	10	Public boardwalk and passenger jetty, with emergency vehicle access
	Barge Ramp	not applicable			
Kavieng	Main Wharf	2.44	23	15	Light duty wharf of fishing, passenger ferry or light commercial activities
	Small Ships Wharf	0.97	9	5	Public boardwalk and passenger jetty

Kieta	Overseas Berth	3.3	32	25	Secondary port general cargo wharf
	Coastal Berth	2.44	23	15	Light duty wharf of fishing, passenger ferry or light commercial activities
	Feeder Berth	1.46	14	10	Public boardwalk and passenger jetty, with emergency vehicle access
	Barge Ramp	not applicable			
Kimbe	Berth 1 International	2.44	23	15	Light duty wharf of fishing, passenger ferry or light commercial activities
	Berth 2 Coastal	2.5	24	15	Light duty wharf of fishing, passenger ferry or light commercial activities
Lae	Berth 1 Coastal	3.9	38	25	Secondary port general cargo wharf
	Berth 2 Coastal	3.9	38	25	Secondary port general cargo wharf
	Berth 3 Coastal	1.95	19	15	Light duty wharf of fishing, passenger ferry or light commercial activities
	Berth 4 Coastal	1.95	19	15	Light duty wharf of fishing, passenger ferry or light commercial activities
	Berth 5 Coastal	3.9	38	25	Secondary port general cargo wharf
	Berth 6 Coastal	3.9	38	25	Secondary port general cargo wharf
	LT Basin International	5.1	50	50	Primary port, international gateway container terminal, for containers staked 2 high ship side
Madang	International Berth	2.44	23	15	Light duty wharf of fishing, passenger ferry or light commercial activities
	Small Ships Wharf	0.97	9	5	Public boardwalk and passenger jetty
Motukea	Berth 1 Coastal	4.09	40	40	General cargo wharf or container wharf for containers staked 2 high ship side
	Berth 2 Coastal	4.09	40	40	General cargo wharf or container wharf for containers staked 2 high ship side
	Berth 3 Coastal	4.09	40	40	General cargo wharf or container wharf for containers staked 2 high ship side
	Berth 4 International	4.09	40	40	General cargo wharf or container wharf for

					containers staked 2 high ship side
Oro Bay	International Berth	2.93	28	25	Secondary port general cargo wharf
	Coastal Berth	2.93	28	25	Secondary port general cargo wharf
Rabaul	Berth 1 Coastal	2.44	23	15	Light duty wharf of fishing, passenger ferry or light commercial activities
	Berth 2 International	2.44	23	15	Light duty wharf of fishing, passenger ferry or light commercial activities
Wewak	Overseas Wharf	2.2	21	15	Light duty wharf of fishing, passenger ferry or light commercial activities
	Coastal 2&3	2.2	21	15	Light duty wharf of fishing, passenger ferry or light commercial activities
Vanimo	Main Wharf	1.46	14	10	Public boardwalk and passenger jetty, with emergency vehicle access

The submitter proposed that all ports should be brought up to a standard where at least one wharf in the port meets the standard of Class 40 of the AS 4997-2005. Class 40 is for a general cargo wharf capable of supporting a 100t mobile crane and other machinery required to lift 40 foot containers. The next class down from this is Class 25, which is described as a secondary general cargo wharf capable of supporting a 50 tonne mobile crane and generally only suitable for 20 foot containers.

It is expected that the additional cost to develop class 40 wharves will be substantial compared to a class 25 wharf. This additional cost is expected to be covered by future port prices. It is therefore important that PNG Ports consults closely with stakeholders to determine which wharves should be brought up to which standard.

Table 16 lists the standard for each wharf, as defined in Schedule 3 of the regulatory contract.

Table 16: New Minimum Wharf Standards

Port	Wharf	Current AS 4997 Standard Class	Future AS 4997 Standard Class	Year new standard achieved
Aitape	Berth 1	10	Nil	
Alotau	International Berth	25	40	2030
	Coastal Berth	25	Not specified	2030
Buka	International Berth	5	Nil	

	Coastal Berth		Nil	
Daru	Berth 1	10	40	2030
	Barge Ramp			
Kavieng	Main Wharf	15	25	2028
	Small Ships Wharf	5	Nil	
Kieta	Overseas Berth	25	25	2028
	Coastal Berth	15	Nil	
	Feeder Berth	10	Nil	
	Barge Ramp	Not specified	40	2030
Kimbe	Berth 1 International	15	40	2030
	Berth 2 Coastal	15	40	2030
Lae	Berth 1 Coastal	25	40	2030
	Berth 2 Coastal	25	40	2030
	Berth 3 Coastal	15	40	2030
	Berth 4 Coastal	15	40	2030
	Berth 5 Coastal	25	25	2028
	Berth 6 Coastal	25	25	2028
	LT Basin International	50	50	2028
Madang	International Berth	15	40	2030
	Small Ships Wharf	5	?	
Motukea	Berth 1 Coastal	40	40	2030
	Berth 2 Coastal	40	40	2030
	Berth 3 Coastal	40	40	2030
	Berth 4 International	40	40	2030
Oro Bay	International Berth	25	25	2028
	Coastal Berth	25	25	2028
Rabaul	Berth 1 Coastal	15	40	2030

	Berth 2 International	15	40	2030
Wewak	Overseas Wharf	15	25	2030
	Coastal 2&3	15	25	2030
Vanimo	Main Wharf	10	25	2030

It was also submitted that that the stacking areas available when a ship is loading or unloading need to be upgraded. Table 17 shows a proposed set of future minimum areas for container stacking that would be available when loading or unloading vessels. Again, because PNG Ports is planning to commence a major redevelopment programme, now is a suitable time to identify industry requirements.

The ICCC has therefore defined future stacking requirements in the Regulatory Contract.

Table 17: Minimum Container Stacking Space available when Loading and Unloading

Ports	Current Minimum Container stacking area (TEU)	Future Minimum Container stacking area (TEU)	Year by which Future Container storage area must be available
Lae International	Not specified	1000	2030
Lae coastal	Not specified	500	2030
Motukea International	Not specified	1000	2030
Motukea Coastal	Not specified	300	2030
Alotau, Madang, Kavieng, Kimbe, Rabaul, Wewak	Not specified	150	2030
Oro Bay, Vanimo	Not specified	100	2030
Buka, Daru, Kieta, Lorengau	Not specified	30	2030

9.4 Other Minimum Service Standards

The ICCC is also proposing that "Other minimum service standards" should be updated and modified as follows.

1. A suitable hardstand area must be maintained at each wharf or end of causeway to allow for the maneuvering of a tractor and container-trailer without the requirement to drive on and reverse off.
2. As a minimum, the hardstand must be reasonably smooth with a level gravel, paved or concreted surface that is free-draining and free from sudden level changes. The gravel surface should be maintained to a degree that dust is contained, otherwise a suitable dust suppression system shall be deployed.
3. Container stacking areas to be free from potholes or significant variations in surface levels to ensure stable stacking is achievable.
4. Roads and pavements within a wharf must be maintained in a well graded condition,

free of large potholes or failed areas, freely draining and such that container trucks can load, unload and turn without undue hindrance.

5. Security must include a robust fence (in accordance with ISPS code) maintained around each wharf area, with lockable access gates which are a minimum of 4.2m wide. The fence must not have holes or gaps which would allow an unauthorised person to enter.
6. Security standards for international vessels must comply with International Ship and Port Facility Security Code (ISPS Code) requirements.
7. Adequate and efficient reefer points must be installed at all ports, except at the ports of Daru, Kieta, Lorengau, Oro Bay and Vanimo.
8. Adequate lighting of a minimum 60 LUX must be provided to support night operations at Motukea and Lae international and coastal wharves and as and when required to support night operations at all other ports.
9. Male and female toilets and washrooms are available 24hrs when the facility is open.
10. A suitably equipped office must be maintained and must be manned at least during normal office hours, with functioning radio facilities available for communication from, to and with vessels wishing to obtain Regulated Services or requiring any other service.
11. Water must be available to reprovision vessels.
12. Full telecommunications service must be supplied to the port office.
13. Backup power (Reefer 3ph 415 v and Office and amenity Single phase 240 v) must be available and connected via automatic change over switch (ATS) supported by a functioning back-up generator of suitable capacity.
14. Firefighting equipment must be available in appropriate size and quantity for that port size.

9.5 Key Performance Indicators

The Regulatory Contract contains a list of key performance indicators (KPIs) which are to be reported annually to the ICCC for each port. There are no targets for these measures, and no consequences in the contract if the measures go up or down. However, they provide the ICCC and the industry with important information about the adequacy of current wharf capacity to meet demand.

These KPIs are shown in Table 18 and the latest reported values are shown in a report which accompanies this report.

Table 18: KPI's

KPI name	KPI definition	KPI calculation
Berth availability	% of vessels waiting more than 2 hours	Total number of vessels that waited more than 2 hours to berth divided by total number of ships that berthed. Report separately for each port. In Port Moresby and Lae, report separately for international and coastal.
Berth availability	Average wait time	Total amount of time that vessels waited at anchor to berth divided by the total number of vessels that berthed.

		Report separately for each port. In Port Moresby and Lae, report separately for international and coastal.
Berth occupancy	% of berth time occupied	Billed LOA hours divided by total LOA hours– Where: Billed LOA hours are the sum of (total time at berth multiplied by the length of vessel) for all vessels that berthed. Total LOA hours = the total length of all wharves available x 24 hours x 365 days. Report separately for each port. In Port Moresby and Lae, report separately for international and coastal.
Berth utilisation	% of berth time worked	Total vessel gross working time *divided by* total vessel time at berth. Report separately for each port. In Port Moresby and Lae, report separately for international and coastal.

All berth indicators are to be calculated based on the total number of vessels that berthed (i.e. excluding vessels that arrived at the port but did not berth).

A submission was received that proposed that KPI's should also address security and the environment. The ICCC has considered these issues and is proposing to add one additional measure as shown in Table 19.

Table 19: Additional KPI's

KPI name	KPI definition	KPI calculation
Security breaches	Number of incidents per annum	Total incidents per year. Report separately for each port. In Port Moresby and Lae, report separately for international and coastal.

The ICCC considers that security is a relevant KPI for PNG Ports because of the service standards required and because of the various security related costs that are included in the building blocks.

In the draft report the ICCC also considered some other potential KPI's. However, PNG Ports noted that it was unusual for a regulator to use these sorts of KPI's for a regulatory contract and questioned the relevance of them. Consequently, the ICCC has determined only to introduce one addition KPI.

9.6 Customer Complaints about Minimum Standards

The ICCC carries out inspections of wharves from time to time to ensure that they meet minimum standards. If they do not, under the Regulatory Contract the ICCC can issue PNG Ports with a "Default

Notice". If a default notice is issued, PNG Ports can only charge 80% of the maximum prices for regulated services. This continues until such time as the minimum standard is achieved again.

Regular port users are well placed to identify when port facilities fail to meet the minimum standards, so the ICCC invited their comments on this issue. More than one stakeholder commented that PNG Ports is not particularly customer focused. The ICCC is concerned about this, particularly now that PNG Ports is facing domestic competition. Therefore, the ICCC has asked customers of PNG Ports what would be helpful in this regard.

Two ideas were proposed.

- **A confidential complaints channel** could be used so that a user could confidentially raise a matter with the ICCC. If the ICCC believed the complaint was valid, it could then take further action with PNG Ports. If further action was found to be needed and none taken, then as already described, a default notice could be issued, and prices reduced until the minimum standard was restored.
- **Use of monthly port user meetings to provide feedback**. The ICCC understands that each month at most ports, a port user meeting is held. This meeting could be used as an opportunity to specifically and deliberately review the check list of minimum service standards to ensure that all were being met. Reviewing the check list would be a regular agenda item at every meeting. If there was agreement at the meeting that one of the standards had not been met, the ICCC could take further action with PNG Ports. The ICCC would attend these meetings from time to time to receive feedback from users, or, if the ICCC were not present, they could be informed of the agreed assessment at the meeting.

The ICCC sought feedback on these ideas. There was mix of responses.

- Some were supportive of the idea of having a formal complaints channel.
- One stakeholder suggested that it would not be helpful to have a regulator present at port user meetings.

On balance, the ICCC has decided not to proceed with the idea. However, it should be noted that any stakeholder can contact the ICCC at any time and raise concerns about PNG Ports' services and infrastructure standards. Because stakeholders can do this, it is unnecessary to have a formal complaints mechanism.

9.7 Penalty for Non-compliance

Section 5.2 of the regulatory contract described a penalty process which can be used if PNG Ports fails to meet service standards. The provision allows for prices to be reduced to 80% of the prices that normally would apply at that port, if it fails to meet the service standard.

The ICCC considers that there are two wharves that currently fail to meet the standards specified in the 2020 to 2024 regulatory contract. These are Daru and Kavieng.

Consequently, the ICCC plans to issue PNG Ports with a notice of non-compliance. The ICCC will do this separately from this report.

10 Operating Costs

10.1 Summary

The ICCC has determined to continue to apply an annual efficiency factor of 2% to PNG Ports' operating costs. This means that the allowance for PNG Ports' operating costs in the regulated prices will decline by 2% each year in real terms.

While PNG Ports has argued that its costs are increasing and this is insufficient, the total amount spent by PNG Ports on operating costs between 2019 and 2023 was less than the amount allowed for in the 2019 price review process. Consequently, PNG Ports costs do not appear to have increased in the way it has described. The ICCC continues to hold its view that PNG Ports can continue to find efficiencies in the operation of its regulated business.

10.2 Background Submissions on Operating Costs

PNG Ports' January Submission

In its January 2024 submission to the ICCC, PNG Ports wrote the following.

> *"The annual rate of change combines expected output change, real price change and productivity change.*
>
> - *Real price change - the forecast change in the real cost of labour and materials.*
> - *Productivity change - the productivity expected to be achieved by the business throughout the regulatory period.*
>
> *Taking the budget for 2023, PNG Ports reviewed each line item to formulate a view of what it would be in 2024. PNG Ports expects direct expenses to rise from 2024 onwards, with staff costs rising by 5 per cent per annum, while indirect expenses (staff and insurance costs) are also expected to rise by at least 5 per cent per annum. Taking 2023 full year data, with expectations of cost increases in certain line items, (and adding forecast CPI for 2024 for other line items), leads to an estimate of 2024 full year operating expenditure of K139 million.*
>
> *As the AIFFP projects get underway, it is likely that PNG Ports would employ an extra number of staff either as permanent or short-term contracts during the implementation of the projects. This will potentially drive an increase in the salary/wage cost for the years to come."*[10]

Submissions in Response

All submissions to the ICCC which responded to the ICCC's issues paper (April 2024), commented on PNG Ports' operating costs. The following statements have been taken directly from submissions.

> "*The noted 50% increase in PNG Ports' operational costs in real terms, without the anticipated efficiency gains, necessitates a thorough examination of the PNG Ports' financial activities and methods of infrastructure funding*"
>
> "*The draft report highlights some alarming changes in costs. Labour cost was not explained however 9M increase with less head count must be explained. These cost*

[10] PNG Ports January 2024 submission.

increases occurred at the same time PNG Ports started receiving the ICTSI concession revenues which should have seen a major decrease in spending but has gone the opposite way".

"….. is alarmed by the proposed amount of inflation increase"

"*Emphasizing cost management will encourage PNG Ports to operate more efficiently. This can involve streamlining processes, eliminating waste, optimizing resource allocation, and adopting cost- effective technologies. Improving efficiency would allow PNG Ports to achieve their objectives with fewer resources, enhancing their competitiveness and financial performance*."

***"Public Accountability**: As an entity entrusted with serving the public interest, PNG Ports has a responsibility to use resources efficiently and effectively."*

"PNG Ports is not controlling its operating costs so funds for investment are significantly reduced; there seems to be too much unplanned spending. PNG Ports' costs have increased by 50% and they have not been able to provide a satisfactory explanation".

"The cost of providing security has increased due to the engagement of private security firms and doing away with their own internal PNG Ports security…. believes that it would have been less costly if they retained their own security".

"Inefficient cost management and lack of cost control mechanisms contribute to this problem, hindering PNG Ports' ability to manage its finances effectively".

"PNG Ports pricing cannot be allowed to exceed CPI. PNG Ports Pricing must be based on the same conditions that privately run wharves experience. By allowing 5.5% + CPI increases (as proposed) won't encourage efficiency and productivity, but instead an ongoing culture of feeling protected and that cost control isn't required. This is not a sustainable way forward and will lead to existing customers finding or developing other alternatives. At that point it is too late for PNG Ports as its commitments outstrip its revenues leading to further pricing increases to the remaining customer base."

The Draft Report

In its draft report the ICCC proposed not to accept PNG Ports' proposed increases in the allowance for operating costs in the price path. Instead, the ICCC proposed that the allowance should continue to decrease by 2% per annum in real terms, as it had over the previous regulatory period.

PNG Ports Submission on the Draft Report

In response to the Draft Report, PNG ports submitted that.

"It is PNG Ports' view that the ICCC has not properly assessed the proposed operating costs included in its January submission, and further, has not provided any analysis or justification for its proposed allowance, but rather used previous benchmarks that PNG Ports contends are no longer valid."

Further Analysis by the ICCC

In response to the PNG Ports' submission,

- the ICCC has met with PNG Ports to discuss its operating costs and
- shared its operating costs analysis spreadsheets with PNG Ports.
- PNG Ports provided the ICCC with its 2023 operating costs, which were not available at the time of writing the draft report and further detail about other major factors in its operating costs.
- The ICCC requested more details about the roles of PNG Ports staff. Consequently, PNG Ports provided a list of the job titles of all its operational staff. The ICCC has analysed this and estimated that 110 of PNG Ports' 472 staff were fully employed by PNG Ports to work in the unregulated part of its business. Consequently, the ICCC has removed the cost of these staff from its assessment of the PNG Ports regulated operating costs.

10.3 Actual vs Determined Operating Costs

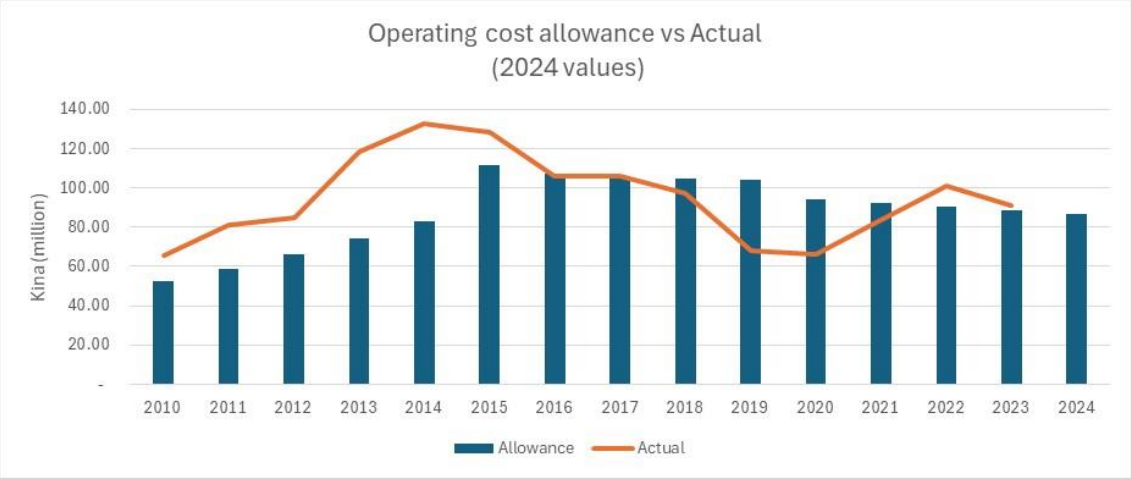
Figure 19 shows the amount of operating costs the ICCC has made allowance for in its past determinations compared to PNG Ports' actual regulated operating costs as accessed by the ICCC.

Over the review period PNG Ports has spent less than the regulated allowance. The total allowance for the years of 2019 to 2023 was K471 million (in 2024 values). The actual spending by PNG Ports, as assessed by the ICCC, was K400 million, which was K71 million less than the allowance.

However, there has been an upwards trend since 2020. But PNG Ports appears to have arrested this with a decline from 2022 to 2023. In 2023 PNG Ports' actual costs, at K91 million, were only slightly higher than the allowance of K89 million (in 2024 values).

The ICCC's assessment has changed since the Draft Report was published. The following sections provide more clarification on some of the changes that have occurred.

Figure 19[11]



Reasons for differences in assessment of regulated operating costs

In the draft report, it was noted that the ICCC had used a different categorisation of operating expenditures than PNG Ports. Some of these differences are shown in Table 20[12].

Table 20: Categorisation of Costs

Cost item	PNG Ports Categorisation	ICCC Categorisation
Direct Expenses		
Labour and on-costs	Regulated	Shared
Port operations	Regulated	Shared
Pilotage expenses	Unregulated	Unregulated
Other operations	Unregulated	Shared
Port security & escort service	Regulated	Shared
R & M - Port wharves & sheds	Shared	Some shared some
First aid & safety expenses	Shared	Shared
Indirect Expenses		
Board	Unregulated	Shared
Insurances	Shared	Shared
Pilotage - overhead expenses	Unregulated	Unregulated
Office expenses	Shared	Shared
Other expenses	Shared	Shred
Corporate related expenses	Shared	Shared
MV expenses	Unregulated	Shared
Staff employment costs	Regulated	Shared
Travel	Unregulated	Shared
Social costs	Unregulated	Shared

[11] At the time of writing, PNG Ports had still not provided the ICCC with a detailed report of operating costs for 2023.

[12] The ICCC did its analysis at individual GL code level. This means that for some items shown in Table 20, there was a mix of regulated, unregulated and shared items.

R & M - company assets	Shared	Shared
Residential security	Unregulated	Unregulated

In response to this PNG Ports reanalysed its operating costs using a similar approach to the ICCC. This mostly aligned its view of the split between regulated and unregulated costs with the view of the ICCC, with some differences.

PNG Ports raised several issues in its submission where it thought the ICCC has incorrectly assessed its operating costs. These are shown in Table 21 which outlines PNG Ports' position with the ICCC's response.

Table 21: PNG Ports Issues raised and ICCC Responses

Issue	PNG Ports' position	ICCC's Response
Realised Foreign Exchange Losses	Should be shared between regulated and unregulated services, as they apply across PNG Ports' business as a whole.	These are funding costs which are covered by the WACC. The WACC includes a sizeable allowance for country risk. Including this cost in the operating cost allowance would be double counting. Therefore, the ICCC has continued to exclude this cost
Consultancy – commercial Services	The consultancy expenditure category includes costs related to engineering, IT, and HR, which are all part of providing regulated services. Therefore, they should be shared between regulated and unregulated services.	The ICCC has accepted this and treated this cost as a shared cost in its analysis.
Interest Income	*"PNG Ports does not accept the ICCC's rejection of the exclusion of interest income when calculating the ratio of regulated income to total income for the purposes of allocating shared operating costs. This interest income relates to funds that are required to be held for self-insurance purposes for assets providing regulated services and therefore should not be included in this calculation."*[13]	In discussions, PNG Ports said that the funds to earn this interest had not come from regulated revenues. In the ICCC's view, this principal has not been invested, as yet, to provide regulated services. At some point in the future PNG Ports may decide to or not to invest these funds in its regulated business. But until it does, this is not part of PNG Ports' regulated business.
Regulatory Accounts	PNG Ports believes that it would be appropriate to establish a set of regulatory accounts that can be agreed upon by the ICCC and PNG Ports and reported on annually. PNG Ports is willing to consult with the ICCC on this between	The ICCC is sympathetic to this idea and discussed it briefly with the PNG Ports. If the majority of PNG Ports' operating costs were easily identifiable as either being driven by

[13] PNG Ports submission July 2024

	now and the finalisation of the 2025-29 Regulatory Contract	regulated services or not, this would be worthwhile. However, most of PNG Ports' head office costs are shared costs which means there is little to be gained from such as exercise. PNG Ports are, of course, free to organise its financial accounts as it wishes and the ICCC reserves the right to review them in detail during any future review it may carry out.

Analysis of Staff Costs

The ICCC has also carried out more in-depth analysis of staff costs. It found that a large number of staff, whose costs were previously shared between the regulated and unregulated parts of the business were, in fact, dedicated to unregulated services. This has made a substantial difference to the ICCC's findings on the current size of PNG Ports' operating costs for its regulated business. This is described further in section 10.7.

Allocation of shared Costs

When costs relate to an asset or an activity that supports both regulated and unregulated parts of PNG Ports' business, the Regulatory Contract specifies that these costs should be apportioned using the percentage of total revenue that is regulated. The ICCC has estimated this percentage split based upon the information provided by PNG Ports.

The ICCC's estimates differ from what PNG Ports reported in its submission (see Table 22). This will be another source of difference between the ICCC's estimate of regulated operating costs and PNG Ports' estimate.

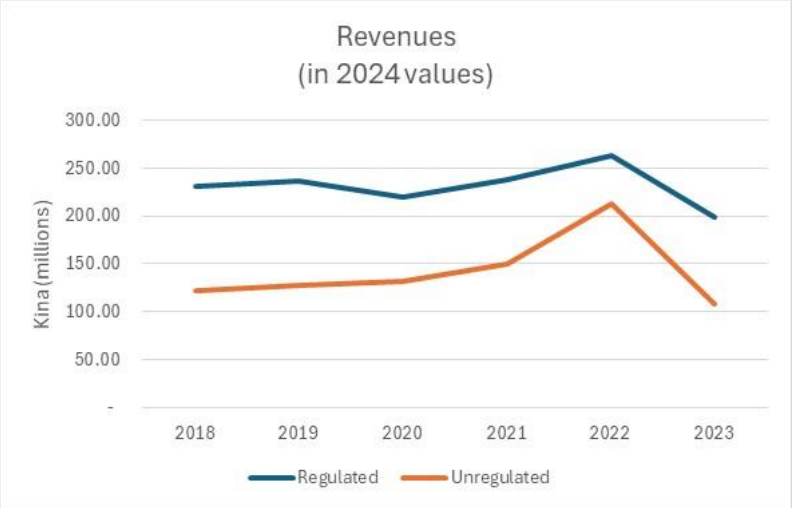
Table 22: Regulated Revenue as a % of Total Revenue[14]

	2018	2019	2020	2021	2022	2023
ICCC	65%	65%	63%	61%	55%	65%
PNG Ports	66%	63%	63%	61%	62%	

Figure 20 shows how regulated and unregulated revenues have changed over recent years.

[14] The ICCC has included interest as unregulated income.

Figure 20



10.4 PNG Ports Commentary on Changes in Operating Cost

PNG Ports has provided an analysis of its operating costs in its submission[15]. It describes the most material changes since 2019.

- For direct regulatory costs:
    - Labour costs have increased by K9 million per year due to salary and wages being restructured in 2022. This is despite staff numbers having reduced from 564 to 520 people.
    - Port operations costs increased by K1 million per year. This is due to electricity and fuel cost increases.
    - Port security costs increased by K2 million per year. This is due to an increase in the number of security guards posted by the security provider.
- For indirect costs (shared between regulated and unregulated services):
    - Insurance costs increased by K8 million per year. This is driven by increased assets values due to asset upgrades and purchase of new assets, increased perception of risk and foreign exchange changes.
    - Travel costs have increased by K3 million per year due to increased travel activity.
    - Motor vehicle costs have increased by K1.5 million per year. This is due to the purchase of new vehicles.
    - Corporate expenses have increased by K4 million per year. This is driven by increased consultation.

Table 23: % Change in Opex Since 2019

Indirect cost item	% Change since 2019
Insurances	107.4%
Office expenses	-32.4%

[15] PNG Ports' January 2024 submission.

Other expenses	44.5%
Corporate related expenses	74.3%
Staff employment costs	1.2%
R & M - Company Assets	-15.0%

Insurance

"The cost of insurances went up K10 million from 2019 to 2023. Some of the explanations for this are as follows.

- The Pacific insurance market has tightened with more insurers and reinsurers ceasing to participate in this market.
- PNG Ports undertook a risk assessment of all facilities as part of the insurance renewal resulting in a revised risk profile, including Lae port assessed as facing potential losses of up to USD$340 million, with USD$100 million initial coverage (the maximum that could be accessed at that time). Coverage has now increased to USD$200 million.
- Port insurance premiums also increased after the Lebanon port explosion and implications for volatile substances being held at PNG Ports.
- Insurance coverage was also increased for staff, including payouts for fatalities.
- Insurance costs are expected to remain elevated with further increases expected over the course of the next regulatory period due to factors such as a volatile international situation and increasing concerns over climate change impacts, especially for small, exposed insurers such as PNG Ports."[16]

Corporate expenses

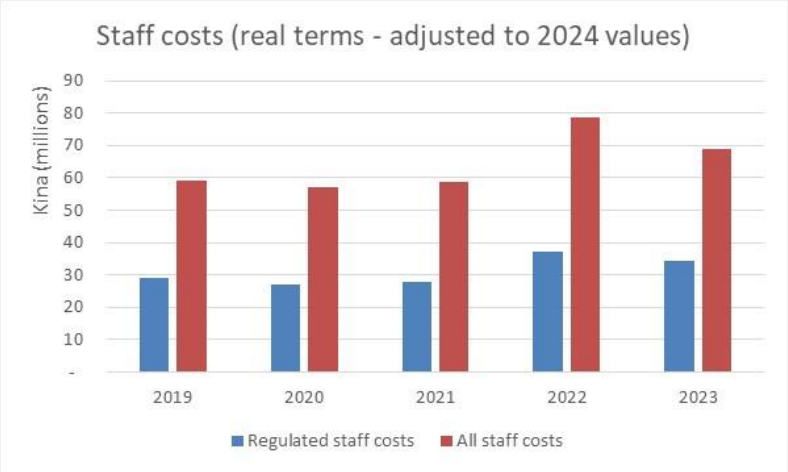
- "Legal consultation in relation to PNG Ports versus Curtain Brothers and Niugini Pilots, Development of the 30 Year Master Plan and other corporate related expenses. These items incurred costs over budget and were the main drivers for the 2020 increased costs.
- Main drivers for the 2021 increase were legal consultations (Port environmental impact, cyber security projects, legal advice for Motukea arbitration); commercial consultation (Motukea Arbitration advice - Topographic & Cadastral Survey), engineering consultancy (Master Plan and wharf asset valuation) and other corporate related expenses.
- 2022 main cost drivers were the CEPA consultation which was circa K2 million, and mostly other corporate related expenses."[17]

10.5 Increased Payments to Staff

Figure 21 shows how PNG Ports' staff costs have changed since 2019.

[16] From PNGPNG Ports's January 2024 submission to the ICCC
[17] From PNGPNG Ports' January 2024 submission to the ICCC

Figure 21



Background to changes in staff costs

In 2022 PNG Ports used an external consultant to compare their current salary costs to other organisations using a privately owned commercial database of different organisations salaries. The reports provided do not indicate the types of companies or the location of companies that were included in this database.

The review found that there were inequities in the pay rates of some staff. Some staff doing the same jobs were getting paid different amounts. Based upon these findings, PNG Ports increased the salaries and superannuation benefits of all its staff.

Overall, total staff costs increased by 34% in real terms from 2022 to 2023. The company also decided to increase contribution to superannuation benefits from 8% to 15%.

PNG Ports says its rational for these decisions was as follows. [18]

- It wanted to address inequities
- It wanted to retain its best staff
- It wanted salaries to be higher than other equivalent organisations.
- It had the money to cover the increase.

ICCC's response

In the ICCC's view these changes were not driven by external factors to PNG Ports.

- PNG Ports did not provide evidence that they had a staff retention problem. In discussions, it was mentioned that two of their key staff had been recruited to work directly for their shareholder (KCH). In any given year, a company the size of PNG ports could be expected to lose between 12% and 20% of their staff through natural turnover.
- The papers provided to the ICCC by PNG Ports also did not show that they had considered other ways of addressing pay inequities. This might have included mechanisms such as using different annual adjustments.

[18] PNG Ports' board paper seeking approval for the increase.

- The ICCC sees no reason why PNG Ports should pay higher salaries, and staff benefits than other similar organisations do. There is no evidence that paying higher rates has or will result in better outcomes for the people of PNG. The conditions of PNG Ports' wharves remain in very poor condition and the ICCC has been unimpressed by the quality of information provided to it during this review.
- Having the money available is not a good reason to increase staff salaries. The ICCC would have preferred to see this money spent on improving the conditions of PNG Ports' wharves.
- PNG Ports do not appear to have considered the 2% efficiency gain built into 2019 price determination, as a relevant consideration. The paper advising the board about the proposed changes did not identify that regulated prices did not support staff costs increases in real terms.
- It seems that cashflow from non-regulated sources has been used to fund salary and staff benefit increases. Because of the way shared costs are allocated between regulated and unregulated services, this flows through to the cost of providing regulated services.

10.6 Employment of Contractors

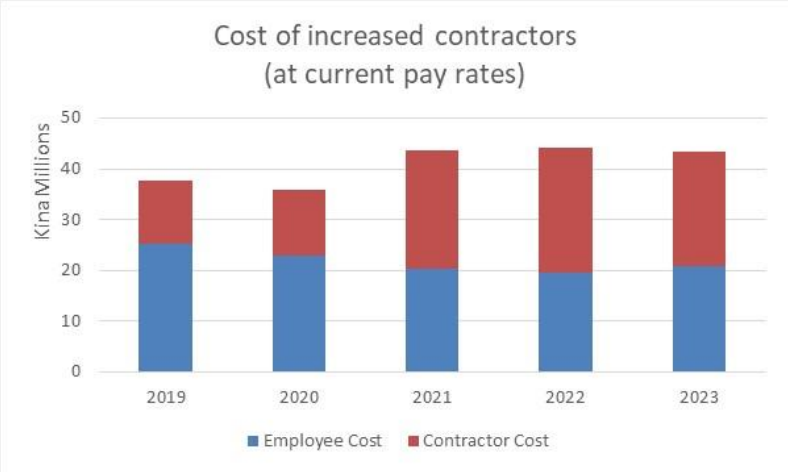
Since 2019 PNG Ports has increased the number of contractors it employs compared to full-time staff. This has been a major contributor to increased staff costs. Table 24 shows the number of staff and contractors employed by PNG Ports. In 2021 some 46 full-time employees were replaced by contractors.

Table 24: PNG Ports' Staff Numbers

	2019	2020	2021	2022	2023
Executive	8	8	8	8	8
Full-time employees	441	404	358	344	365
Contractors	55	56	102	108	99
All	504	468	468	460	472

In 2023, the average cost of a contractor was K228,245 per annum compared to K56,969 for a full-time employee. Figure 22 shows the total cost of employment of both staff and contractors using 2023 pay rates. This illustrates how the substantial increase in the contractors in 2021 had the effect of increasing employment costs by 22%.

Figure 22



This demonstrates that PNG Ports has a substantial opportunity to reduce its staff costs by replacing contractors with full-time employees, should it choose to do so.

The ICCC does not know what roles the contractors perform and how much of this is directly related to regulated services.

10.7 Staff Dedicated to Unregulated Services

The ICCC has also evaluated data provided by PNG Ports about its employees. This indicated that a substantial number of staff are dedicated to parts of PNG Ports' business that is unregulated. Most of these staff work in the piloting part of PNG Ports' business. Others are dedicated to Maritime Compliance, which is part of PNG Ports' delegated regulatory function and mooring vessels.

Overall, the ICCC estimated that in 2023 there were 110 staff, out of 472, dedicated to non-regulated parts of the PNG Ports' business. Table 25 shows the number of staff in each category. Shared staff are those whose roles require them to do work for both regulated and unregulated services. Regulated staff are those whose jobs the ICCC expects will only do work related to regulated services.

Table 25: Regulated and Unregulated Staff

	2019	2020	2021	2022	2023
Shared	370	348	350	346	357
Unregulated	127	115	113	109	110
Regulated	5	5	5	5	5
Total	502	468	468	460	472

When this is taken into account, it substantially lowers PNG Ports' regulated operating costs.

10.8 Insurance Costs

In 2022, PNG Ports paid an independent insurance consultant to carry out a risk review. The consultant advised that they were underinsured and recommended they increase their insurance cover. PNG Ports had this report reviewed by another consultant which confirmed the first

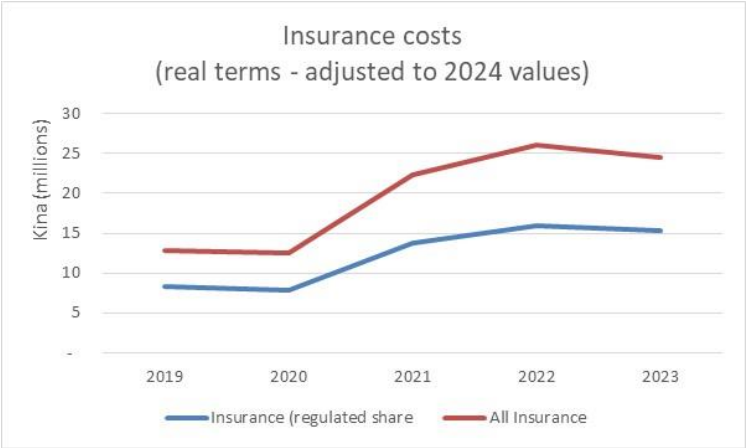
consultant's recommendations. From PNG Ports' perspective, they were underinsured at a time when there were increasing risks from climate change.

PNG Ports then accepted all of the consultant's recommendations and consequently increased their level of insurance cover.

This occurred at a time when international insurance costs were increasing. While is it difficult to find specific information about global trends, from 2020 to 2024 premiums for infrastructure appear to have increased on average by 5% to 8% per annum, or a cumulative increase of 20% to 35%. [19] This compares to PNG inflation over the same period of 16%.

The regulated share of insurance costs has increased since 2019 by 83% from K8.4m to K15.3m in real terms (see Figure 23).

Figure 23



In discussions with PNG Ports, the ICCC requested that PNG Ports provide more background to this decision and that, in particular, it elaborate on what other options had been explored to contain this cost. From these discussions it appears that PNG Ports did not consider any alternatives other than the recommendations. PNG Ports took the approach that they were not insurance experts and had therefore acted on the advice of an expert. The ICCC thinks that PNG Ports may need to improve its knowledge of insurance as they are now spending K25 million per annum on it. And the ICCC notes that PNG Ports can choose to evaluate other options at any time.

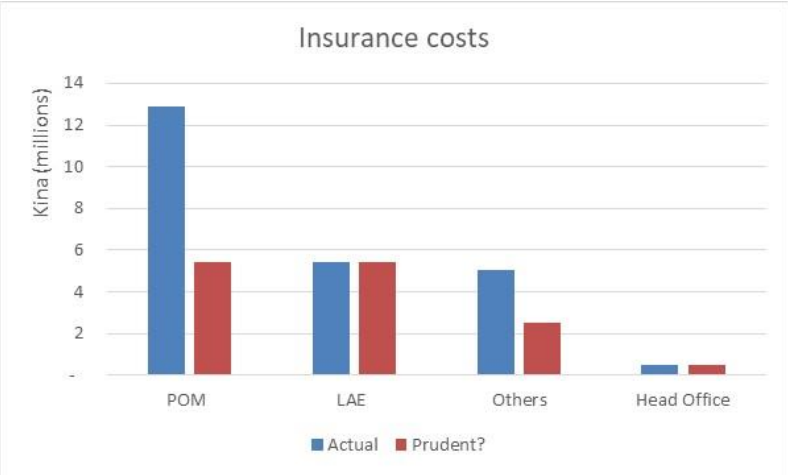
The ICCC is also not an insurance expert. However, in its attempt to carry out an assessment of the prudence of this decision, it has observed the following.

- Regulatory revenue from Lae is almost three times higher than the revenue at Motukea (K166 million vs K66m). It therefore might be expected that money spent on insurance at Motukea should be no more than the cost of insurance at LAE.
- Many of the wharves are very old and PNG Ports has stated that it intends to replace them very soon. It may well therefore not be prudent to spend anything on insuring these wharves.

[19] Source: The International Union of Marine Insurance (IUMI) Stats Report 2024.

The potential cost savings from these two adjustments are illustrated in Figure 24. This approach could potentially reduce PNG Ports' total insurance costs by K13 million. This would mean that insurance costs would be only 8% higher in real terms than they were in 2019.

Figure 24



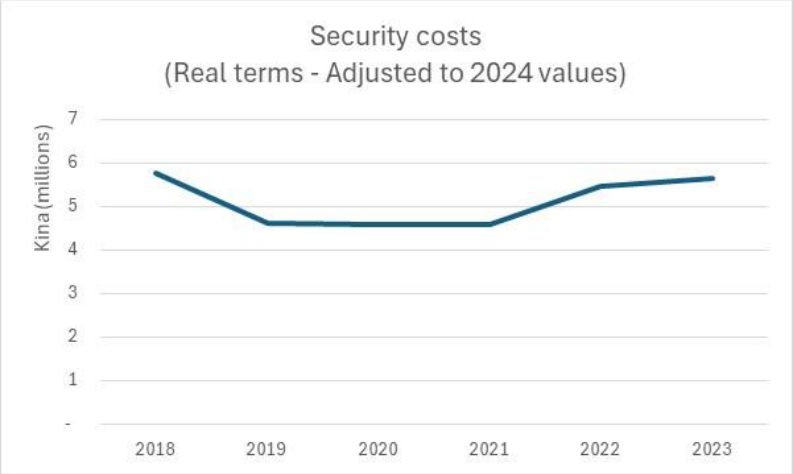
10.9 Security and Other Costs

The other item that PNG Ports raised in its discussion with the ICCC about operating costs was security costs. During the regulatory period, PNG Ports has employed external security companies to provide security at many of its ports. This has increased its costs.

PNG Ports said that many of the ports were not as safe as they used to be and therefore it needed to increase security. It also wanted to outsource the risk of managing security so that if an event occurs which results in injury, the security company would absorb this blame rather than PNG Ports.

In real terms, security costs are similar now to what they were in 2018 (see Figure 25).

Figure 25



No other costs were specifically focused upon by PNG Ports in its discussions with the ICCC. When other costs are added up (see Figure 26), they are substantial and, in total, have fluctuated significantly over the period. However, they are lower now than they were in 2018.

Figure 26

10.10 The ICCC has Determined to Apply an Efficiency Factor

The ICCC has determined that it will continue to apply an efficiency factor of 2% to PNG Ports' operating costs

The ICCC is generally concerned by the appearance that PNG Ports does not manage its business to contain its costs. As mentioned in one submission, there does appear to be *"an ongoing culture of feeling protected and that cost control isn't required".* This attitude appears to have been demonstrated in both its approach to staff costs and insurance costs.

PNG Ports argued strongly in discussions with the ICCC that it was careful with the way it spends money. Certainly, the ICCC did see evidence that PNG Ports' staff are careful to follow due process for getting approval to spend. However, the ICCC could not find evidence that alternative options were explored before major spending was carried out, despite repeatedly requesting this from PNG Ports. The ICCC expects that any prudent company would evaluate

alternatives by carrying out cost benefit analysis and other ways of reducing its costs, prior to making major spending decisions.

It is common for regulators around the world to allow for efficiency gains when setting regulated prices. In competitive markets, there is significant pressure on companies to find ways of reducing their costs while maintaining or increasing their outputs or service quality. Without competition, PNG Ports would have no natural incentive to reduce its costs, especially if the ICCC keeps pushing up prices to cover them. While PNG Ports is now facing some competition in parts of its business, it is still important that the ICCC keeps pressure on PNG Ports to reduce its costs.

In both the 2014 and the 2019 reviews, the ICCC included an allowance for efficiency gains when determining the allowance for operating costs. For the 2015 to 2019 period, this was based upon an expected decline in staff numbers. For 2020 to 2024, a 2% efficiency gain was applied. In hindsight, this was a reasonable approach for the ICCC to take as PNG Ports' operating costs have been lower than the allowance in seven out of the nine years included in the analysis.

The ICCC is also concerned that cashflows from unregulated services are supporting the opportunity to increase some spending, particularly spending upon staff. While PNG Ports may have the discretion and approval from its shareholders to do this, it does flow over into the costs that are allocated to regulated services. This is another reason why the ICCC has determined to continue to apply an efficiency factor.

10.11 Potential for Further Efficiency Improvements

The ICCC has considered the legitimate commercial costs of PNG Ports to provide the regulated services. There are strong indications that PNG Ports will be able to achieve greater efficiency gains than 2% and therefore will be able to share the benefit of these gains.

Some of the potential opportunities to improve its efficiency include the following.

- It appears that staff costs can be reduced in real terms over time, so that pay rates are equal to those paid by similar organisations in the market.
- Contractors who are more expensive than full-time staff can be replaced by full-time staff.
- Staff numbers still appear to be high in some areas so there may be opportunities to continue to reduce the number of staff.
- Better use of IT systems may support improved productivity.
- There may be opportunities to limit insurance cover, where commercial interests do not substantiate current levels.

However, the ICCC recognises that PNG Ports must manage its own costs, and that PNG Ports is in the best position to identify opportunities such as these.

The pricing principles in the Regulatory Contract require the ICCC to also consider the sharing of efficiency gains. Over the review period, PNG Ports has spent some K71 million less on operating costs than what was allowed for in regulated prices. Under the contract it can keep these savings. This is a core element of incentive regulation, where an organisation has the incentive to reduce its costs and be better off as a consequence.

10.12 Operating Cost Allowance Determination

The ICCC has determined to continue to apply an ongoing efficiency gain of 2% to its operating costs for the purposes of setting regulated prices. (see Figure 27). Using this approach the 2024 operating cost allowance of K86.99 million (inflated to 2024 values) will form the starting point for the 2026 to 2029 regulatory period. Each year this allowance will decrease by 2% in real terms. However, an annual adjustment will still be made to cover inflation using the CPI.

Figure 27

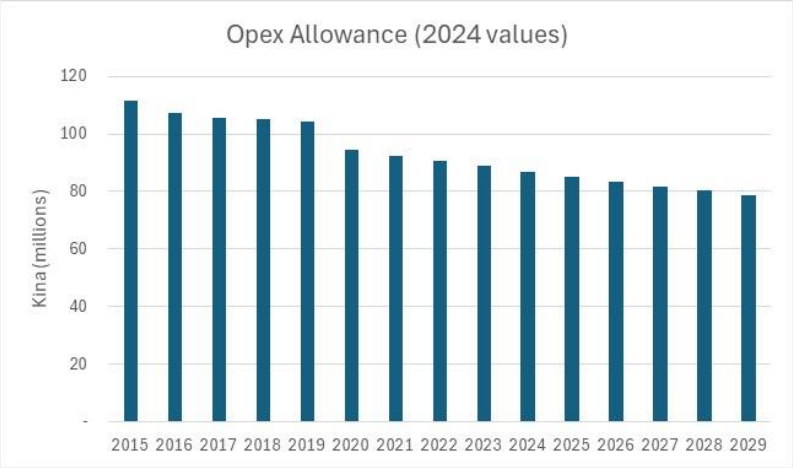


Table 26: Determined Allowance for Operating Costs

	2025	2026	2027	2028	2029
Operating cost allowance (K million)	85.25	83.55	81.87	80.24	78.63

11 Current Period Capital Expenditure

11.1 Prudence

The ICCC is required by the Regulatory Contract to assess PNG Ports' actual capital spending for prudence. If spending is deemed to be prudent, the ICCC must include it in the RAB and the cost associated with this asset will be covered by the price path. If the ICCC determines that some items are not prudent, they cannot be included in the RAB and prices will not cover the costs of these assets.

The ICCC has reviewed PNG Ports' actual capital spending in detail. It has assessed which items are dedicated assets for its regulated services and which items are shared between regulated and unregulated parts of PNG Ports' business. The ICCC has reviewed these items for prudence and has consequently included and excluded items based upon this assessment. This section describes the ICCC's findings.

What is Prudence?

In general terms, prudent capital spending from a price regulator's perspective involves ensuring that a regulated business's investments are necessary, efficient, and in line with the long-term interest of consumers. Here is what regulators typically consider:

- **Necessity**: Investments should be essential for maintaining, upgrading, or expanding infrastructure to meet regulatory standards, service demand, and safety requirements. This means distinguishing between "must-have" and "nice-to-have" projects.
- **Efficiency**: Capital spending should be executed at the lowest sustainable cost. Regulators often assess whether alternative options (such as upgrading existing infrastructure instead of full replacement) have been considered and whether procurement and project management practices support cost-efficiency.
- **Asset Lifecycle Alignment**: Spending should align with the lifecycle of assets, which includes maintenance and replacement schedules based on the expected economic life of the infrastructure. Premature replacement or over-investment in infrastructure with extended serviceable lives can be seen as imprudent.
- **Customer and Stakeholder Impact**: Spending decisions should reflect the needs and preferences of consumers, with an aim to avoid unnecessary price increases. If spending leads to higher prices, regulators assess whether the benefits justify these costs in terms of service quality, reliability, and long-term affordability.
- **Risk Management**: Prudent capital spending includes risk assessment and mitigation, ensuring investments account for potential future challenges (e.g., environmental factors, regulatory changes, technological obsolescence) without overestimating or underestimating.
- **Transparency and Accountability**: Regulators expect detailed reporting and justification for proposed spending. Companies often need to provide cost-benefit analyses, risk assessments, and alternative options to support the prudence of their capital plans.

By focusing on these aspects, price regulators aim to prevent companies from engaging in excessive or inefficient spending that could lead to unnecessary cost burdens for consumers, while ensuring that infrastructure remains safe, reliable, and aligned with public interest.

More specifically in the current context for PNG Ports, the ICCC also expects that:

- When making decisions about capital investment, PNG Ports should be evaluating alternatives from a cost benefit perspective. Both costs and benefits should be quantified. This is especially true when a wharf is being replaced. This represents a once-in-a-generation opportunity, and therefore a thorough analysis is essential to identify the optimal long-term solution to meeting PNG's needs.
- If a wharf replacement or continued operation of a wharf cannot be justified on its own merits (e.g, a CSO wharf), the benefits to the local community should be assessed and quantified. These benefits should exceed the cost of the wharf. If they do not, the investment should not proceed. Alternative options should then be evaluated (e.g. replacing a wharf with a landing ramp).
- Whenever possible CSO's should be sustained by grants or gifted funding. If no grant funding

is available, the impact upon PNG Ports' regulated prices should be assessed. If the CSO cost will increase regulated prices by more than 5%[20], the investment should not proceed.

- Any major investment should have a business case produced. For guidance the ICCC might consider a major investment to be greater than K5 million. Such a business case should include a full cashflow analysis of at least two options, demonstrating that alternatives have been considered and the option with the best benefit to cost ratio has been chosen.
- Without such business cases being developed PNG Ports risks having the ICCC assess its capital spending as imprudent. This would mean that it will not be able to recover its costs from its regulated prices.

11.2 Current Period Spending

Most of PNG Ports' spending over the review period was spent on its unregulated business. Only 7% of its capital spending was directly on its regulated business (see Table 27).

Table 27: Capital Spending by Business Area

	2019 to 2023	% of spending
Regulated	13,133,256	7%
Shared	25,824,505	14%
Unregulated	144,596,726	79%
All Capital Spending	183,554,487	100%

** Shared capital spending is where the assets are used for both PNG Ports regulated and its unregulated parts of its business.*

Table 28 shows a breakdown of shared capital spending by asset category.

Table 28: Breakdown of Shared Capital Spending by Category[21]

	Kina	% of Spending
Comp Equip.	5,100,873	20%
Furn and fit Office	295,610	1%
Motor Vehicles	6,264,252	24%
Operations	11,169,474	43%
Plant and Equip.	2,994,296	12%
All Shared Investment	**25,824,505**	100%

11.3 ICCC's Assessment of Prudence

Evaluation Process

[20] Whether or not 5% is the appropriate metric is somewhat arbitrary. The principle is that continued increases to costs which cannot be recovered by a business will push that business closer to an unstainable position.
[21] This includes all of PNG Ports' spending on shared assets. A proportion of this is allocated to the regulated services.

The ICCC evaluated all items in PNG Ports' asset register that were more than K100,000. More information was requested on 40 of these. After discussing these items, PNG Ports provided the ICCC with various board papers seeking approval for these amounts.

Overall, the ICCC's assessment of PNG Ports' documentation was as follows.

- PNG Ports appears to be very careful to follow approval processes prior to spending capital. This included careful evaluation of tenders and care taken to ensure that any party being awarded a contract was capable of carrying out the work.
- Documents which PNG Ports referred to as business cases did not include any of the analysis or commentary that would normally be expected to be included in business cases. There was no consideration of the benefits of carrying out work. And there was no discussion of alternative options to the proposed spending. In all cases only one option was presented to the board.
- There was no evidence of attempts to reduce costs.

When we discussed these issues, PNG Ports said that internally it understood the needs of the business and that this reduced the need to write things down in board papers. The ICCC is of the view that this is very poor practice. High performing businesses document the reasons for their decisions. Also, conversations with PNG Ports about this topic appeared to show a very poor understanding of what a business case is.

A lack of cost benefit analysis by PNG Ports required the ICCC to form its own views about the benefits of capital spending relative to the cost incurred.

The ICCC has provided a description of some of its assessment of capital projects in the remainder of this section.

Markam River Cryones (Included)

K5.3 million was spent in 2021 to protect the Lae Tidal Basin wharf from damage. This wharf is currently valued by PNG Ports at K714 million and is the source of a major portion of PNG Ports' regulated and unregulated income. The ICCC expects that, over its lifetime, the wharf and the seabed around the wharf will need to be maintained.

The ICCC has accepted this as prudent spending and included it in the RAB.

Kavieng Wharf (Excluded)

K4.9 million was spent in 2022 on temporary repairs to the wharf.

Due to the very poor state of the wharf, there was a risk that it would collapse. PNG Ports therefore carried out this work. The business case provided to the ICCC did not provide any cost benefit analysis. Nor did it consider any alternatives to this short-term fix. The repair is temporary and has created obstacles on the wharf so that most of the wharf cannot be used. Stevedores can only back a vehicle onto a small portion of the wharf to unload cargo from a vessel.

In the ICCC's view, this wharf no longer meets the minimum service standards required by the Regulatory Contract. The repair work did not bring the wharf back up to these minimum standards.

The ICCC has assessed the direct commercial benefits of the current wharf. This analysis shows that the maximum amount of capital that should be prudently spent at Kavieng is K15million. No

assessment has been made by PNG Ports to evaluate the wider benefits of the wharf to the local community, which may or may not justify increased levels of spending. While PNG Ports says it has carried out an assessment of potential future demand, this was never presented to the ICCC despite repeated requests for this.

PNG Ports is proposing to invest considerably more than K15 million to replace this wharf. However, no business case has been prepared which considers the costs and benefits of either its proposed spending or alternative structures that might be used to replace the current wharf.

PNG Ports has not maintained this asset in a useable state and, by default, has consistently chosen the option to "do nothing" over a number of years. This has then put it in a position that it felt that it urgently needed to spend money on it, without a thorough assessment of alternatives.

The ICCC does not believe that this is a prudent investment and that it does not demonstrate the quality of management that the people of PNG expect. The ICCC has therefore not included this item in the RAB.

Wewak Wharf (Included)

K4.5 million has been spent in 2022, strengthening piles of the overseas berth, rehabilitation of the wharf deck, and rehabilitation of the causeway. A conditional assessment carried out in 2020 outlined the need to carry out this work.

The ICCC understands that PNG Ports currently has no plans to replace this wharf.[22] So this maintenance work appears to be justified and provides the benefit of extending the life of these wharf facilities at a cost that is considerably less than replacing it.

Damages by vessels (Excluded)

K0.7 million was spent repairing bollards and a mooring dolphin damaged by vessels. The ICCC understands that these funds should be recovered from the owner of the vessel which caused the damage. Consequently, these costs have not been included in the RAB.

Lighting and CCTV (Included)

K3.2 million was spent repairing, maintaining or upgrading lighting poles at Lae and Port Moresby. The ICCC accepts that these are important for security and safe operating conditions at night.

Gensets (Included)

K0.8 million was spent on Genset equipment and installation in Alotau, Motukea and Rabaul. The ICCC accepts the ongoing reliable supply of power is essential for efficient operations at each port and a requirement of minimum service standards.

Roading (Included)

K0.3 million was spent on roading work at Motukea. The ICCC accepts that ongoing maintenance work will be required to ensure that wharf can operate efficiently.

Surfaces (Included)

[22] PNG Ports has included a replacement wharf for Wewak in its 30-year plan. However, in discussions with PNG Ports, it indicated that there currently no plans to proceed with this replacement.

K0.6 million was spent improving the laydown area at Motukea, replacing water supply manhole covers at Lae and yard levelling in Rabaul. Much of this is required to meet the minimum service standards specified in the regulatory contract.

Madang office (Excluded)

K0.3 million was spent on architectural and engineering work to upgrade the Madang office. No documentation was provided to the ICCC that showed how this might fit with the longer-term development plans for the port at Madang. Consequently, this spending was determined to be not prudent.

Computer Equipment (Included)

The ICCC has accepted all PNG Ports' capital spending on IT and related infrastructure. While the ICCC has not specifically evaluated PNG Ports' IT capability, improved use of IT is generally accepted as a positive approach to achieving efficiency gains.

Motor Vehicles (Reduced**)**

The ICCC considered PNG Ports' total spending on motor vehicles and the number of vehicles required. In particular, the ICCC noted the number of vehicles which cost more than K165,000. The ICCC thinks that spending more than this is unnecessarily expensive and so has written down the cost of any vehicle that cost more than K165,000 to K165,000. Overall, this is a relatively minor effect and only reduces the RAB by about K600,000.

11.4 Gifting

The ICCC is concerned that PNG Ports has used grants for an anti-competitive purpose. This section describes and addresses the issue.

AIFFP Grants

PNG Ports has a signed agreement with AIFFP which includes a mix of favourable commercial loans and grant funding. The ICCC understand that the grant funding has a total value of AU$100 million (about K245 million). The funding is expected to be used as shown in Table 29 and some of this funding has already been spent.

Table 29: Grant Funding by Project

	Targeted Spending	Value in Kina	Value in AUD
Port Infrastructure and Development	Daru Wharf	K63 million	K26 million
	Umi Island Freight Hub	K49 million	$20 million
Other Works	Pilot Boats	K30 million	$12 million
	Cyber Security	K7.35 million	$3 million
	Consulting	K100 million	$39 million
Total Value		K245 million	$100 million

In the ICCC's view, the use of these funds is disappointing. The ICCC would have expected to see such grants to be focused upon upgrading port infrastructure which cannot be sustained on a commercial basis (i.e. CSO's). However, it appears that only a very small portion of the grants will be spent on

port infrastructure. Most of the other items the grant money is likely to be spent on could potentially be funded by PNG Ports' commercial activities.

Pilot Boats

PNG Ports is using AIFFP grants to replace five of its pilot boats. This gives it an unfair advantage over other pilotage companies. These other competing companies must purchase their pilot boats without the assistance of foreign governments.

Essentially, it appears that PNG Ports is using grant money to compete in a commercial market.[23] At best this is unfair and at its worst it is possibly illegal anti-competitive behaviour.

Market Distortion

When a state-owned enterprise (SOE) like PNG Ports receives government grants, particularly for capital investment like the purchase of new pilot boats, it can create an uneven playing field. This is because private companies typically need to fund their investments through internal profits or external financing, which comes at a cost. Government grants, by contrast, are a form of subsidy, which may give PNG Ports a financial advantage, potentially allowing it to undercut private competitors.

Purpose of Government Grants

If the Australian Government's AIFFP grant was intended to improve public infrastructure or enhance public service delivery, the investment would be expected to benefit the broader economy. However, if these funds are being used specifically to give PNG Ports a competitive edge in the pilotage market, it may undermine private sector participation in the market.

Private sector competition is a positive part of the PNG economy and can be expected to lead to cheaper and better services.

The ICCC is considering this issue and may take further steps regarding this potentially anti-competitive behaviour. This issue will be dealt separately and an investigation will be conducted into this potential anticompetitive behaviour. The ICCC will formally write to PNG Ports regarding this issue.

Other Grants

PNG Ports is also using some of grants to improve its cyber security. This will have shared benefits between PNG Ports' regulated and unregulated business. PNG Ports has not yet included any assets associated with this work in its asset register. But if it does, in any future review, the ICCC would not include these assets in the RAB. This is a requirement of the pricing principles in the Regulatory Contract.

Value of Grants

[23] In previous reviews, the ICCC has considered competition in the pilotage market. It concluded from the evidence available at that time that there was sufficient competition in this market and that it did not need to be regulated.

The following shows the value of Grants by the amounts shown and, in the years, shown in Table 30.

Table 30: Gifts applied to the RAB

	2022	2023	2024	2025
Pilot Boat Funding applied elsewhere	K6 million	K12 million		K12 million
Cyber Security				K7.35 million

11.5 Determination on Capital Spending to Add to the RAB

Table 31 show the values that the ICCC has added to the RAB.

Shared spending is split between the regulated and unregulated parts of PNG Ports' business using the percentage of PNG Ports' total revenue which is regulated. These sums are then added to the regulated capital. The value of gifting for new pilot boats is subtracted.

Table 31: Additions to the RAB

	2019	2020	2021	2022	2023	2019 to 2023
Shared	2,411,520	1,482,885	10,286,093	7,699,809	3,143,734	25,024,041
% Regulated Revenue	65%	63%	61%	61%	64%	
Regulated portion of shared capital	1,568,381	929,468	6,311,734	4,696,884	2,015,790	15,522,257
Regulated capital			1,394,016	4,228,786	678,702	6,301,505
Gifting				-6,000,000	-12,000,000	18,000,000
Total Capital added to RAB	1,568,381	929,468	7,705,751	2,925,670	-9,305,508	3,823,761

Table 32 shows the actual capital spending on regulated assets at each port and the amount allowed for by the ICCC in the 2019 determination.

Table 32: 2019 Forecast vs Actual Capital Spending for 2019 to 2023.

	Forecast	Actual
Aitape	0	0
Alotau	0	253,624
Buka	2,600,000	53,218
Daru	1,350,000	0
Kavieng	8,410,000	227,336
Kieta	4,460,000	10,427
Kimbe	2,550,000	948,797
Lae	66,310,000	6,803,912
Lorengau	9,480,000	37,490
Madang	6,160,000	32,794
Motukea	16,590,000	3,298,598
Oro Bay	6,790,000	196,554
Rabaul	0	1,097,696
Vanimo	590,000	121,986
Wewak	0	4,704,977
Head Office	0	4,036,353
Total	**125,300,000**	**21,823,761**
Pilot boats	0	18,000,000
Addition to the RAB		3,823,761

It can be seen from Table 32 that PNG Ports has spent more than what was forecasted. The ICCC has noted that this is as a result of using the AIFFP grant to purchase the pilot boats. PNG Ports was made aware of this finding during our consultation meetings. The ICCC will be formally investigating this further and will determine what appropriate actions to take.

A portion of this overcharging is recovered by the pricing principle in the contract which specifies that the RAB must be rolled forward using forecast depreciation, not actual depreciation. This means that the RAB for the next regulatory period will be adjusted downwards to reflect that PNG Ports has already recovered a portion of its investment in these assets. This is described in section 12.4.

The new Regulatory Contract will include the revenue recovery adjustment, described in section 16, which will enable it to fully recover the cost of underspending in future reviews.

11.6 Opening Value of the RAB.

The first pricing principle in Schedule 4 of the Regulatory Contract for 2020 to 2024 says:

1. The opening Regulatory Asset Base (RAB) for the next regulatory period is to be calculated using a roll forward approach, based on the following components:

    a) the 2020 opening RAB will be set at K 799,367,521 in 2019 terms

b) actual prudent capital expenditure incurred by PNG Ports during the regulatory period (2020 to 2024). Consideration must be given as to whether or not any particular capital project was prudent

c) forecast depreciation for the 2020 to 2024 regulatory period

d) disposals or write downs of regulated assets during the regulatory period

e) no gifted assets should be included in the RAB

f) all amounts should be inflated into money of the day values using indexation.

The ICCC has followed these requirements to calculate the opening value of the RAB for 2025. This included removing disposed assets and write downs. This included assets for the Ports of Aitape and Samarai which are no longer in use. Aitape assets in the RAB were valued at K1.1 million and Samarai at K0.6 million.

For indexing, the ICCC has used the CPI published by the PNG National Statistics Office for "All groupings excluding alcoholic beverages, tobacco and betelnut". For each year the index value for June was calculated as the average of the last four quarters (including June).

The result of this calculation is that the 2024 opening value of the RAB is set at K **829,671,500** in 2024 terms.

11.7 2024 Capital Spending

Due to the delay in finalising the review, this has created the opportunity for PNG Ports to inform ICCC about its actual capital spending in 2024. The ICCC has done a simple analysis of this spending to identify what proportion of it was for regulated services, unregulated services and what was shared between them. The split is:

Total Capital Spending	K91 million
Regulated Capital Spending	K2.4 million
Shared Capital Spending	K1.4 million
Regulated Share of Shared Capital Spending	K0.9 million
Capital added to the RAB	K3.8 million

Only 2.6% of PNG Ports' capital spending in 2024 was for regulated assets. Once shared assets are included, only 3.6% of total capital spending was added to the RAB.

The ICCC has not assessed the prudence of this capital spending but will do so in its 2029 price review.

The 2024 capital spending added to the RAB was classified as:

Office Furniture and Fittings	K134,079
Operations Assets	K3,568,942
Plant and Equipment	K76,408

12 The Capital Development Plan

In its submission to the ICCC, PNG Ports said that it did not yet know how much capital it would spend in the 2025 to 2029 regulatory period. As a placeholder, it requested that the ICCC allow for K50 million per year. It has also proposed that the ICCC create a provision for a revenue recovery fund to allow for any under or overspending of capital compared to the amount allowed for. This is covered in section 12.2 of this report.

In past reviews, the ICCC has been concerned that PNG Ports did not have a capital spending plan and was not able to present the ICCC with a programme for future spending. Consequently, the ICCC included requirements in the Regulatory Contract for PNG Ports to present such a plan to the ICCC. The requirements of this plan are described in the contract as follows.

"For the Subsequent Regulatory Years' tariffs to be approved, the Regulator will need to be provided by PNG Ports with a Strategic Capital Plan for Subsequent Regulatory Years'. The Regulator requires PNG Ports to prepare and publish a detailed strategic capital plan by 30 November 2020 on its website. PNG Ports must publish a notice in one of the daily newspapers with respect to the strategic capital plan publication on its website. The Strategic Capital Plan will have, but is not limited to having, due regard for:

- *the scalability of projects;*
- *the potential that individual projects will be stranded by alternative decisions taken by management;*
- *the financial benefits associated with each project, including a cost/benefit analysis;*
- *the earning capacity of a port and its ability to cover the cost of expenditure at that port from the regulated revenue earned directly by the port;*
- *the level of cross subsidy required to cover the cost an investment at any particular port;*
- *the underlying investment need;*
- *the prioritization of Capital Expenditure;*
- *the improvements to underlying services which will be delivered by the Capital Expenditure;*
- *the potential involvement of additional parties through either funding or delivery of required services;*
- *the timeframe required to scope, tender and deliver the services required, and assessment of a port t be able to cover the costs; and*
- *the identification and assessment of the probability of the risk factors associated with not undertaking the Capital Expenditure and associated costs."*

PNG Ports subsequently developed what it refers to as its "30 Year Infrastructure Master Plan". The plan is considered to be commercially sensitive so the details from the plan that can be included in this report are limited.

The version of the plan that has been presented to the ICCC includes the following:

- a description of the state of the wharf at each port
- a simple description of work that is required

- an estimate of the likely cost of work
- a timetable showing when the work might be carried out
- an indication of potential growth (e.g. flat line, steady, moderate, strong)
- key trade items and strategic opportunities.

The plan does not identify:

- the potential that individual projects will be stranded by alternative decisions taken by management
- the financial benefits associated with each project, including a cost/benefit analysis
- the earning capacity of a port and its ability to cover the cost of expenditure at that port from the regulated revenue earned directly by the port
- the level of cross subsidy required to cover the cost an investment at any particular port
- the underlying investment need
- the prioritisation of capital expenditure
- the improvements to underlying services which will be delivered by the capital expenditure
- the potential involvement of additional parties through either funding or delivery of required services
- the timeframe required to scope, tender and deliver the services required, and assessment of a port to be able to cover the costs and
- the identification and assessment of the probability of the risk factors associated with not undertaking the capital expenditure and associated costs.

All of these unidentified items are required by the Regulatory Contract.

It is possible that PNG Ports has done this analysis and has simply not included it in the document that it has sent to the ICCC. However, without this information, is it is difficult for the ICCC to assess whether or not the combined plan, or any of the individual projects included in it, might be "prudent". The ICCC has requested this additional analysis from PNG Ports on several occasions. Each time it has said it would provide it and has not done so.

The total of all development costs listed in the plan is K3.5 billion. For spending of this magnitude, the ICCC considers it essential that a thorough plan is developed which includes all of the items listed in the contract. Without this information, the ICCC will not be able to make allowance for them in future price path.

Section 4.4 outlines the new requirements for the Strategic Plan which PNG Ports must deliver to the ICCC by October 2026.

12.1 Long-term Spending Capacity

The ICCC has estimated the maximum investment that might be prudently invested at each port. This is essentially a simple cost benefit analysis, where the only benefit considered is the financial return to PNG Ports.

To do this, the ICCC has used the information provided by PNG Ports. This includes the following assumptions:

- Returns were estimated over a 50 year period.
- The national average price per TEU was K554, and this remained constant in real terms over the 50 year period. This includes all regulated charges.
- Demand was assumed to grow at all ports by 2.0% per annum.
- A post tax WACC of 12.4% (equivalent to a pre-tax WACC of 16.07%)
- A tax rate of 30%.
- Operating costs at each port remained constant at current levels.
- The current value of the RAB for each port was used as a starting point.
- To estimate the prudent limits under the old pricing principles, all values were calculated in real terms.
- To estimate the prudent limits under the new pricing principles all inflation was assumed to be 4% per annum. This inflation rate was applied to the regulated price and to the operating costs, but not to the value of the assets. This had the effect of valuing assets at historic cost.

Using these assumptions, a cashflow model was constructed, which included an amount of capex being spent in year zero. The size of the capex was set so that the net present value of cashflow was equal to zero. This amount was then taken to be the maximum amount that could be spent at a port if an investment was commercially prudent for PNG Ports.

The results are shown in Table 33 (note values have been blacked out in the public version of this report to protect commercially sensitive information, whereby such information could impact upon future awarding of contracts). The table shows the prudent limits that would have applied if the old pricing principles were applied and what they will be now that the pricing principles have been changed.

In the table we have entered a negative amount for head office which has no revenue. This does not mean that spending on assets is not prudent, but it does mean that any spending on head office assets will reduce what can be spent at a port.

Table 33: Maximum Prudent Capital Spending by Port (K millions)

	30 year plan	Prudent Cap under old pricing principles	Prudent cap under new pricing principles
Aitape	[redacted]		
Alotau			
Buka			
Daru			
Kavieng			

Kieta	[redacted]
Kimbe	
Lae	
Lorengau	
Madang	
Motukea	
Oro Bay	
Rabaul	
Vanimo	
Wewak	
Head Office	
Total	

There are several observations than can be made from this analysis.

- Under the old pricing principles, total prudent capital spending would have been limited to 35% of the total value included in the 30 year plan.
- If the plan was fully implemented prices would need to rise substantially. As discussed elsewhere in the report, the ICCC believes that prices are already too high and that such increases would be unstainable. This means that the plan needs a major revision.
- Daru is over capitalized. This indicates the no further capital spending at Daru can be justified on a commercial basis.
- The value of head office assets represents about 5% of the total capital that might be spent on the whole business. Any spending on assets at head office means that there is less capex available for spending on operational assets at ports.
- The capital amount relies upon 2.0% compound growth in demand over a 50 year period. So, for example, this would mean that a port which currently handles about 10,000 TEU per year, would be handling about 59,000 TEU per year by 2074. We think this is optimistic for many PNG ports in the current economic climate, so actual prudent investment limits could easily be revised downwards. While the level of change over a 50 year period can be substantial, the ICCC would want to see evidence that change was starting to occur before substantial investments were made.

The ICCC is providing this information to PNG Ports as a signal of an upper limit to capital spending in the future. However, it does not mean that the ICCC will necessarily approve all of this capital spending, even if it is less than this limit.

A description of the what the ICCC regards as prudent is provided in section 11.1.

12.2 Capex Cost Recovery

A common problem faced by the ICCC is how much future capex spending it should allow for, when setting regulated prices. More often than not, at the end of a regulatory period, the ICCC finds that a regulated entity has spent less than the amount allowed for by the ICCC. This means that prices have

been set higher than they needed to be, and that consumers have paid for something that they did not receive.

The opposite effect would occur if the regulated entity spent more on capex than the ICCC had allowed for in the price path. In this case, the regulated entity would not be recovering all their economic costs.

PNG Ports is concerned about this latter situation because it is about to embark on a major capital spending program. To address the issue, it has proposed that the ICCC adopt a mechanism which enables PNG Ports to claw back this cost in a subsequent regulatory period. [24]

The ICCC has considered this proposal and has developed its own approach to the problem. The ICCC has determined that it will adopt this approach.

The methodology is as follows.

1. The ICCC sets an allowance for capital spending when it determines the price path for a new regulatory period.
2. As part of the calculations to set the price path, the return on capital and return of capital which is directly due to this capital spending is calculated.
3. At the end of the regulatory period the ICCC determines actual prudent capital spending.
4. The return on capital and the return of capital for actual prudent capital is calculated. This is the amount that would have been used as part of setting the price path, if this had been the value of capex allowed for.
5. The difference in the values for step 2 and step 4 is identified for each year of the regulatory period that is just coming to an end.
6. An adjustment is built into the prices of the next regulatory period so that the difference in cost identified is recovered or paid back in the next regulatory period. The calculation to identify the amount that must be recovered or paid back allows for the time value of money. The value of the adjustment is set so that the Net Present Value of the resultant cashflows over a 10 year period equals zero.

Figure 28 and Figure 29 illustrate how the effect of this adjustment would work.

Figure 28 illustrates the scenario when PNG Ports spends more than the capital allowed for by the ICCC in the price path. The negative amounts in the first five years represent the revenue that PNG Ports has missed out on because the additional capital spent was not allowed for in the price path. The positive amounts shown for the next five years are the additional amounts that PNG Ports would earn in the next regulatory period to compensate for the missed revenue in the first five years. This adjustment would result in a price increase.

[24] PNG Ports labelled its mechanism as a “Revenue Recovery Fund”. However, the word “fund” is misleading, as it implies there is money sitting in an account somewhere, which would not be the case. The ICCC has therefore referred to the same idea as “Capital Cost Recovery”.

Figure 28

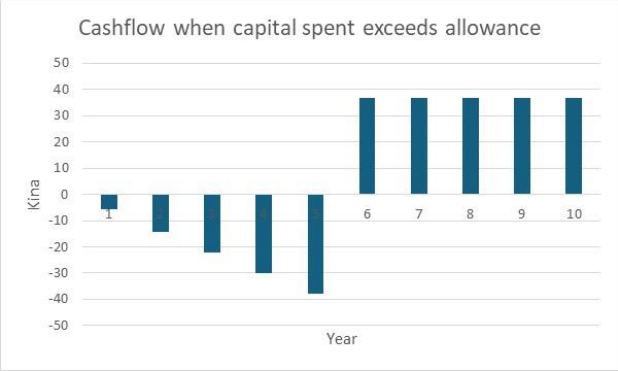
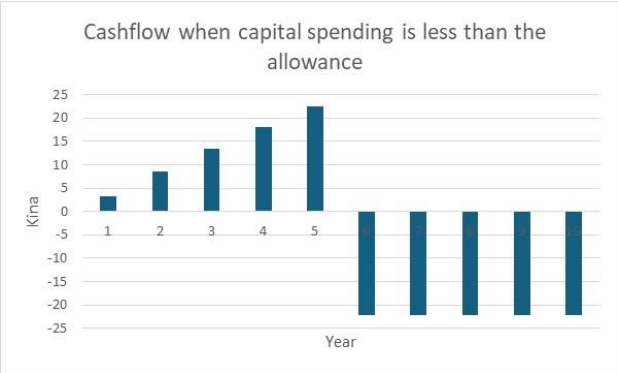


Figure 29 illustrates the scenario when PNG Ports spends less than the capital allowed for by the ICCC in the price path. The positive amounts in the first five years represent the revenue that PNG Ports has received because of the unspent capital. The negative amounts shown for the last five years are the reduction in revenue that PNG Ports would earn in the next regulatory period to compensate for the additional revenue it earned in the first five years. This adjustment would result in a price decrease.

Figure 29



In the ICCC's view, including this adjustment in the Regulatory Contract will remove the incentive for PNG Ports to overstate its intended capital spending in the next regulatory period. It will also, remove any incentive to delay additional capital spending because it wasn't previously budgeted for. Any such spending will still need to be justified as being "prudent".

Including this capex recovery adjustment in the Regulatory Contract means that it will apply in the 2030 to 2034 regulatory period, but not the 2025 to 2029 regulatory period. This is because the current period contract already specifies how prices must be set for 2025 to 2029. But to be clear, in 2029, the ICCC will adjust future prices to reflect actual spending in 2025 to 2029.

It should be noted that if there is a large discrepancy between budgeted capital and actual capital spending, the price change required to address this could be substantial. It is therefore preferable to try to ensure the allowance for future capital spending is realistic.

12.3 Capital Allowance for 2025 to 2029

In the absence of a capital plan the ICCC must determine how much new capital spending it will allow for in the 2025 to 2029 period.

PNG Ports has requested that the ICCC allows K50 million per year or a total of K250 million per year. PNG ports has made this request on the understanding that a capital costs recovery mechanism will be built into the next regulatory contract (see section 12.2).

Having the Capital cost recovery mechanism built into the contract protects both the PNG consumers as well as PNG Ports from over or under forecasting of actual capital spending, so PNG Ports no longer has an incentive to ask for more capital than it intends to spend.

The ICCC has therefore determined that it will allow for this level of capital spending. The allowance is shown in Table 34. The table also shows what was spent by PNG Ports in the year five years previous to each year. The ICCC has used this an indication of a normal level of capital spending when no major projects are underway.

Table 34: Allowance for Capital Spending in the 2025 to 2029 Price Path

Year	Amount spent five years previously	Wharf Replacement	Total Allowance
2024			3,779,429
2025	1,743,666	23,256,334	25,000,000
2026	7,771,472	42,228,528	50,000,000
2027	8,257,386	66,742,614	75,000,000
2028	2,210,699	47,789,301	50,000,000
2029	2,482,111	47,517,889	50,000,000

The largest capital spending item in the regulatory period will be the Kimbe wharf upgrade. The ICCC does know the contracted amounts for this project but understands from public sources that the estimated cost for marine portion of the project is about K260 million. So an allowance of K250 million is reasonable in the interim.

12.4 Depreciation Adjustment

The pricing principles in the current contract require the ICCC to roll forward the RAB using forecast depreciation, instead of actual depreciation. The intention of this is similar to that in section 12.2. The effect is that if PNG Ports spends less capital than was budgeted for, the value of the regulatory asset base for the next regulatory period is calculated based upon what the forecast depreciation was, not what the actual depreciation was. This will reduce the value of the RAB and result in a lower price in the next regulatory period.

The logic behind this adjustment is that PNG Ports has already recovered this portion of its investment and therefore the value investment that it still has in the RAB is now lower.

To make this adjustment the ICCC has used the following methodology.

1) Identify total forecast depreciation in the 2019 determination.

2) Adjust these values for inflation, so that the value in each regulatory year is equivalent to the value of the kina in that year (i.e. “money of the day”).

3) Calculate the depreciation that would have been allowed for if actual capital spending was used to calculate the value of the regulatory asset base.

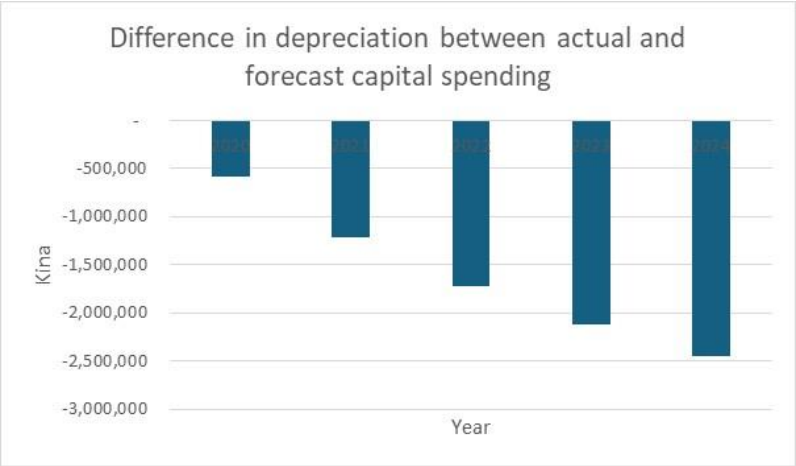
4) The values in step 3) are also in “money of the day” values.

5) The difference between 2) and 4) is calculated and the subsequent difference in the value of the RAB is calculated.

6) The opening value of the RAB for the new regulatory period is adjusted up or down as appropriate, and the allowance for recovery of capital is adjusted up or down as appropriate.

Figure 30 shows the difference in depreciation between actual and forecast depreciation for the 2020 to 2024 regulatory period. This has the effect of reducing the opening RAB for 2025 by K7.9 million and reducing the recovery of capital (depreciation) by K1.7 million throughout the next regulatory period. The adjustment for the RAB is treated as though it is an asset with a five year life. So, the adjustment will be complete by the end of the next regulatory period (i.e. 2029) and no further adjustment will be required in the subsequent regulatory period (2030 to 2034).

Figure 30



The ICCC has determined to remove this requirement to use forecast depreciation from the pricing principles in the regulatory pricing principles in the 2025 to 2029 Regulatory Contract and to replace it with the “Capex cost recovery” mechanism described in section 12.2.

The main difference between these two mechanisms is that rolling forward the RAB using forecast depreciation recovers the effect of depreciation on capital but not the effect on return on capital for differences in capital spending, whereas the proposed “Capex cost recovery” recovers both the effect of depreciation and return on capital resulting from the difference in actual and budgeted capital spending.

Determination

The ICCC has determined to replace the requirement to roll forward the RAB using forecast depreciation with the requirement to adjust for the difference between actual and allowed for capital spending using a "Capex cost recovery" mechanism

13 Weighted Average Cost of Capital

The ICCC is required to determine a weighted average cost of capital that will be used to calculate the return on the RAB. The ICCC has used its standard methodology for calculating a WACC. This requires the use of the following inputs.

- A US risk free rate
- A market risk premium
- A country risk premium for PNG
- An asset beta
- A debt margin
- A debt percentage
- US and PNG inflation rates

The ICCC's selection of each of these is described in this section of the report.

13.1 PNG Ports Submission on Risk Free Rates and MRP

In a letter to the ICCC[25], PNG Ports outlined its concerns about the ICCC's proposed Market Risk Premium. What PNG Ports said about this topic is summarised here.

> *A primary difficulty lies in determining the MRP reliably due to recent low government bond yields impacting risk-free rate assumptions. Australian regulators, having faced similar MRP estimation challenges, mostly rely on historical excess returns, noting that it is a contentious issue even there. This practice, summarized by PNG Ports, is considered a best practice reference, especially given the extensive regulatory scrutiny and expert analysis in Australia.*
>
> *GravelRoad's April 2024 report evaluated several approaches, including historical perspectives, Damodaran's method, and the Wright approach, suggesting these offer insights into MRP trends but do not definitively resolve the estimation issue. The analysis underscored the stability of equity returns despite changing risk-free rates, recommending Damodaran's latest MRP estimate as reasonable.*
>
> *FTI Consulting generally agreed with GravelRoad's theoretical points but questioned the reliability of using Damodaran's DDM (Dividend Discount Model)-based implied*

[25] Letter to the ICCC dated 24th October.

ERP without alternative estimates or robustness tests. Australian regulators like AER have assessed DDM but ultimately prefer historical return-based MRP estimations due to practical limitations of the DDM, such as bias in analyst forecasts and variable assumptions on growth rates.

Only IPART applies a mixed method, incorporating both backward- and forward-looking MRP estimates, balancing conditional measures with historical data, and providing a semi-annual MRP estimate. This approach acknowledges the complexity and resources required for such mixed methods.

PNG Ports maintains that Australian regulatory precedents offer the most suitable model for PNG's regulatory needs due to its rigorous, evidence-based process, avoiding the time and cost of replicating this analysis in PNG, where no significant benefit over these established practices is evident.

The ICCC observes that:

- The PNG economy is heavily reliant on gas exports, which are denominated in USD. Given this dependence, it is logical to use metrics aligned with the U.S. economy, particularly for financial parameters like the Market Risk Premium (MRP) and the risk-free rate.
- For consistency across financial metrics, both the MRP and risk-free rates should ideally be based on U.S. figures.
- The U.S. MRP does generally differ from the rates used for MRP by Australian regulators. This is presumably due to distinct economic conditions, risk perceptions, and market dynamics in each country. Using a U.S.-based MRP could therefore yield a more relevant estimate for PNG than relying on Australian regulators figures.
- The MRP does vary over time, reflecting changes in economic expectations, market conditions, and investor sentiment. While there is no definitive relationship between the MRP and the risk-free rate, these two factors often exhibit an inverse relationship, though not consistently. This inverse relationship is widely recognized, including by Australian regulators, and helps explain fluctuations in expected equity returns relative to bond yields. [26]
- Although Australian regulators tend to rely on historical returns for MRP estimation due to challenges in accurately measuring forward-looking MRP, these challenges do not negate the potential benefits of aligning MRP calculations with market expectations. While a forward-looking MRP can be difficult to measure precisely, its relevance to current market conditions can provide valuable insights. And it is clear from the analysis carried out by the Australian regulators that they agree with this.
- Measuring WACC in PNG is inherently inaccurate due to the difficulty in accurately estimating the Country Risk Premium (CRP), which adjusts for economic, political, and institutional risks unique to PNG. While CRP is not necessarily highly volatile, it remains difficult to measure with precision. It is generally inferred by data from other developing countries who may face a quite different set of risks than PNG. The CRP generally increases the WACC by about a

[26] See appendix section 20.1

50%, so the inaccuracy produced by this likely to be greater or at least equal to any inaccuracy of a forward-looking MRP. This weakens the argument for not using a forward-looking MRP.

- Australian regulators, appear to prioritize WACC stability to encourage long-term investment. PNG lacks market stability, as reflected in its higher country risk premium. Overall, the ICCC does not think that WACC stability will be a major factor in encouraging SOE's in PNG to invest.

Why using a forward-looking MRP remains attractive

In their January 2024 submission, the WACC calculated by PNG Ports had increased substantially from the WACC used in 2019. This was primarily due to the higher risk-free rate at that time. While PNG Ports was arguing for a higher risk-free rate, it wanted the MRP to remain the same. The risk-free rate used was essentially a forward-looking rate, while the MRP was essentially a backward-looking rate. The ICCC saw this an inconsistent and that this was artificially pushing up the WACC. With market conditions prevailing at the time the ICCC thought that a historic view of MRP reflected the current market.

In the period prior to the 2019 determination, risk free rates had remained relatively stable ranging from a high of just over 3% to a low of about 1.5% with an average rate of 2.3% (see Figure 31). Given this stability it was reasonable for the ICCC to use the same MRP it had used in the 2014 determination (i.e. 6.0%). However, following this period, COVID-19 occurred, and US Treasury yields fell further, then increased steadily reaching a peak of 5% in 2023. The last time US Treasuries reached 5% occurred in 2006, just prior to the Global Financial Crisis (GFC). The world economic outlook in 2024 is very different from 2019, and the world economy from 2019 to 2024 has been very different from what was experienced from 2014 to the 2019. It is therefore and reasonable for the ICCC to review the MRP and consider whether or not using the same rate is still appropriate.

Figure 31

13.2 Setting the MRP

Having noted PNG Ports' comments on MRP, the ICCC wants to ensure that its approach to estimating a WACC is robust. It has therefore decided to use the approach used by IPART which was described by PNG Ports.

> *"The one Australian regulator that continues to give weight to DDM estimates, is the Independent Pricing and Regulatory Tribunal (IPART). Its approach involves estimating the MRP using a combination of backward-looking measures (based on historical excess returns) and forward-looking approaches (involving current estimates)."*[27]

The ICCC has adopted this method for the following reasons.

- The ICCC wants to ensure that the MRP is consistent with the risk-free rate used. This means that both the MRP and the risk-free rate should be either forward-looking or backward looking over the same time periods.
- Both the risk-free rate and the MRP should be based upon data from the same economy.
- The US economy is the most appropriate economy to use as PNG's economy is highly dependent upon gas prices which are denominated in USD.
- The US and world economic outlook is still recovering from inflationary pressures and is quite different now than it was in 2019. The ICCC therefore considers that it is more important now to consider the forward-looking view when choosing an MRP than it was in 2019.
- US stock markets are at an all-time high with high price to earnings multiples. This implies that market premiums have a higher probability of being lower over the next regulatory period. This increases the value of having a forward-looking estimate of MRP.

IPART's Approach

IPART describes their rational for their method in two review documents published in 2013[28] and 2018[29]. From these documents we note the following points.

- IPART is estimating MRP's for the Australian market, so the ICCC cannot simply use their numbers, but must instead derive numbers from the US market.
- IPART estimates a historical MRP and a forward-looking MRP and then takes the midpoint between them. This provides an equal weighting on backward looking and forward-looking MRP's.
- IPART always calculates the MRP by using the risk-free rate and total market return from the same time period. This is based upon confirmed observations that over time, MRP and the risk-free rates tend to vary inversely.

[27] PNG Ports letter to ICCC dated 24th October 2024.
[28] Review of WACC Methodology- IPART 2013
https://www.ipart.nsw.gov.au/sites/default/files/documents/final_report_-_review_of_wacc_methodology_-_december_2013.pdf
[29] Review of Our WACC Method - IPART 2018
https://www.ipart.nsw.gov.au/sites/default/files/documents/final-report-review-of-our-wacc-method-february-2018_0.pdf

- IPART used six methodologies to estimate a forward-looking MRP. It takes the median of the results and use this as its forward-looking estimate of MRP. The six methodologies are

    - Damodaran 2013 method
    - Bank of England 2002 method
    - Bank of England 2010 method
    - Bloomberg method
    - SFG (now Frontier Economics) analysts forecast method
    - SFG (now Frontier Economics) market indicator method.

- The ICCC is relying upon the Damodaran methodology, because the results are freely published and the ICCC does not have the resources to purchase the data and analysis required to use the other methods. IPART's analysis confirms that it is reasonable to do this because Damodaran's results are close to the median of the methods it uses. In January 2024, results of 3 of the methods were above and two were below the result using Damodaran. [30]

Using Analyst Surveys

Ferandez et al of IESE Business School, University of Navarra carry out an annual survey of market analysts to identify what MRP's are being used[31]. In 2024 their survey showed that the average rate used in the US was 5.5% with a median of 5.5%. The survey was based upon 1,287 responses.

IPART also evaluated the use of this survey.

In its 2013 review it employed SFG consulting who wrote:

"Of most concern in the application of the survey is the sources used to support the MRP estimate. These responses suggest that respondents relied primarily upon historic average returns to estimate the MRP. There were 1,719 sources listed by respondents to justify their answer and at least 40% of sources are likely to represent estimates based upon historical returns. We have no way of knowing whether the participants rely upon historic returns because they consider this to be the best estimate of the prevailing market risk premium, or because they simply use a long-term MRP estimate for all valuations, regardless of market conditions."

Consequently IPART does not use this survey because it did not view it as being representative of a forward-looking view.

However the ICCC's reading of this survey is that it does represent what market experts in the US are currently usings in their decisions. And it is based upon a large number of responses. While it might be a mix of historic and forward-looking views of MRP, this is still a valuable consensus. Consequently, the ICCC has chosen to include this value in the mix of values to determine an MRP.

[30] IPART WACC Fact Sheet Biannual Update 2024 – Table 3. https://www.ipart.nsw.gov.au/sites/default/files/cm9_documents/Fact-sheet-WACC-Biannual-Update-22-February-2024.PDF

[31] Market Risk Premium and Risk Free Rate used for 96 countries in 2024. Pablo Fernadez et al.

The ICCC's Approach

Consistent with the IPART methodology, the ICCC has chosen the approach described in Table 35. The approach is to place equal weighting on historic and forward-looking views and a survey of analysts' current practice.

The historic MRP is weighted 50% to 50 year market returns and 10 year market returns. The 50-year view captures both periods of high inflation and low inflation as well as major economic events, such as the 1970's oil crisis.

Table 35: Mix of Methods used to Determine MRP and Risk-free Rates.

MRP	Risk-free Rate	Weighting
50 year historic returns on the US market (S&P 500) (1974 to 2023) calculated as a geometric average.	Average of historic yields over 50 years on US 10-year Treasuries, calculated as a geometric average.	16.5%
10 year historic returns on the US market (S&P 500) (2014 to 2023) calculated as a geometric average.	Average of historic yields over 10 years on US 10-year Treasuries	16.5%
Forward-looking view using DDM (Dividend Discount Model and a 2024 survey of market analysts MRP expectations. Each of these will have 50% weighting.	Average of September yields on 10 year US Treasury yields as reflective of the current market's forward-looking view.	33%
Survey of analysts	Average of September yields on 10 year US Treasury yields as reflective of the current market's forward-looking view.	33%

This is a balanced approach. While the weighting used is somewhat arbitrary, testing of the results by changing the weighting of each of these inputs did not materially change the WACC. For example removing the survey of analysts from the inputs and using a 50% weighting on the forward-looking DDM, produced almost the same result.

The values derived from this methodology are shown in Table 36.

Table 36: Risk- free rates and MRP's from Chosen Methods.

Measure	Risk- Free Rate	MRP
50 Year historic returns	6.12%	4.97%
10 Year historic returns	1.46%	10.44%
DDM using Damodaran published results	3.72%[32]	4.63%
Survey of analysts	3.72%	5.50%
Weighted average	3.74%	5.94%
PNG Ports' proposed rates	3.7%	6.0%

[32] https://fred.stlouisfed.org/tags/series?t=treasury

It should be noted that both the risk-free rate and the MPR derived by this methodology are very close to the rate recently proposed by PNG Ports[33]. But the risk-free rate is now substantially different from what it was its January 2024 submission.

Damodaran as a data source

In choosing to use Damodaran as a source for a current measure of forward-looking MRP, the ICCC has noted that PNG Ports' view of Damodaran is as follows.

> *The ICCC "is endorsing an estimation approach consistent with that theory without considering whether that approach actually results in a reliable estimate of the MRP. At minimum, there should be some explanation of Damodaran's methodology and the reasonableness of the assumptions applied. This includes an objective critique of the strengths and weaknesses of this method. If the DDM is to be applied, it may need to be in combination with other specifications."*

The ICCC notes that this view appears to conflict with PNG Ports' view that Australian regulators demonstrate best practice. IPART in particular has tested Damodaran's methodology and has continued to use it over the last decade following two reviews of its methodology. However, to support the ICCC's decision to use Damodaran's results we have described his methodology further in this this section.

The DDM estimates the expected market return by combining the current dividend yield with an assumed growth rate of dividends or earnings.

The formula is:

Expected Market Return = Dividend Yield + Growth Rate

The MRP is then calculated as the difference between this expected market return and the current risk-free rate.

Damodaran calculates an implied forward-looking MRP by using an adjusted DDM on broad market indices, such as the S&P 500. His method combines dividend yields, earnings forecasts, and long-term GDP growth to calculate an expected return. A more detailed explanation can be found on his web page[34].

The Appendix (section 20.2) provides a description of the range of options available for estimating forward-looking MRP's.

A key factor for the ICCC in choosing to use Damodaran as a source is that he freely publishes his findings. The ICCC could find no other source of DDM analysis that was freely available.

Damodaran is a professor at Sturn School of Business at New York University. His method for calculating the Market Risk Premium (MRP) is widely used and respected for its ability to incorporate current market conditions through an implied equity risk premium approach based on the Dividend Discount Model (DDM). This method is considered valid for capturing investor expectations, particularly in volatile markets, as it reflects real-time data on dividends and growth forecasts. However, its reliability is often debated due to its sensitivity to assumptions, such as growth rates and analyst forecasts, which can lead to significant variations and volatility in the MRP estimate. Studies suggest that while Damodaran's method is valuable, it should ideally be used alongside other approaches—such as historical averages or multi-model estimates—to offset its inherent sensitivity and improve stability in long-term applications. This balanced approach is often favored by

[33] PNG Ports provided their updated assessment of WACC in a letter to the ICCC is October 2024.
[34] https://pages.stern.nyu.edu/~adamodar/New_Home_Page/home.htm

regulators and practitioners to achieve a more comprehensive and robust MRP estimate.

Section 20.3 in the appendix provides further assessment of the validity of using Damodaran.

13.3 Recommended Beta

In their report, Gravelroad considered the effect of Schedule 9 in the Regulatory Contract. Their hypothesis was that Schedule 9 provided PNG Ports with protection from changes in market demand. Because port companies operating in open markets do not have the benefits of this protection, the beta values of publicly listed port companies do not reflect the reduced level of risk currently enjoyed by PNG Ports.

Instead of using port companies as the benchmark for a beta value for PNG Ports, Gravelroad proposed that electricity distribution businesses were a more appropriate benchmark. Regulated electricity distribution businesses have very stable revenue streams. Demand for their services is highly inelastic. Because they neither buy nor sell electricity but only rent out the use of the infrastructure, their revenue streams are very predictable. Including Schedule 9 in PNG Ports' Regulatory Contract had the effect of providing PNG Ports with a similarly very stable regulated revenue stream. Thus, the beta should be closer to that of a regulated electricity distribution business.

In New Zealand there are 29 regulated electricity distribution companies, whose prices are controlled by the New Zealand Commerce Commission. For these companies, the New Zealand Commerce Commission has determined to use a beta of 0.35. However, the ICCC considered that PNG Ports' revenue risk was slightly higher than an electricity distribution, therefore the ICCC tentatively proposed to use a beta value of 0.40.

Subsequently, the ICCC has determined to remove Schedule 9 from the Regulatory Contract. Due to this, and also the ICCC's view of the effects of competition at some domestic wharves, the ICCC has determined to use the higher beta value of 0.7, which it previously used in 2019.

FTI's report also proposed a beta value of 0.7, which was benchmarked using a group of ports without any regulatory protection.

13.4 International Risk Factor

One submission raised concerns that PNG Ports proposed WACC was too high and made the following comments.

> *"A WACC of 17.1% may be appropriate for an investor looking at an investment in PNG from outside, but for KCH (and any domestic investor), the appropriate metric would be of alternative uses of that capital within PNG; country risk premium is not relevant. Whilst WACC is an effective tool, and appropriate here, the applicable WACC should be WACC that a PNG domiciled investor would use and not the international WACC".*

Gravelroad addressed this issue in their report to the ICCC. They wrote:

> *"We note that in both Australia and New Zealand, regulators do not include a country risk factor when deriving the WACC's they use to set prices. This is despite a country risk existing. Allan Huang identifies the country risk for both Australia and New Zealand as being 0.65%.*

However, when regulators determine WACC's in Australia and New Zealand, they determine a risk-free rate based upon their own country's government bonds. These bonds are highly liquid and are domestically traded in the respective countries. This provides a local domestic investor's perspective on what is a risk-free return. Therefore, this is consistent with not including a country risk premium.

In PNG we think this approach would be valid if investment in PNG Ports was limited to PNG entities.

It could be argued that the PNG Government, as an equity investor in PNG Ports, should have a local PNG view of risk and so would not consider country risk in their investment decisions. However, this argument may not be valid if the PNG Government is financing its equity investment with overseas debt.

We also expect the most likely sources of debt for PNG Ports are also likely to be overseas investors, who would consider country risk as material part of their decision-making.

The other consideration for this to be a valid approach would be the liquidity of PNG Government bonds. To adequately evaluate a domestic perspective of risk using this approach, the PNG Government bond price would need to be driven by domestic purchases by PNG investors and to be frequently traded. We expect that this is not currently occurring.

Common practice continues to be to include a country risk premium in the risk-free rate calculation. We don't think there is a strong argument for moving away from including a country risk premium.

Recommendation - continue to include a country risk premium with a US risk- free rate. "

The ICCC considered the option of taking a more domestic view of capital costs by using PNG Government bonds as the basis for a risk-free rate.

The Bank of PNG's 10 year Treasury Bonds currently have a yield of 11.01%.[35] If this was used as a PNG risk-free rate, when inflation was adjusted for, the pre-tax real WACC would be 16.75%. This is higher than the rate the ICCC has determined to use (i.e. 16.07%) but is in a similar range. The ICCC therefore thinks that attempting to use domestic inputs would not necessarily result in lower estimates of the cost of capital. Also, because of a lack of data points the approach would be less reliable.

13.1 Determined WACC

With the change in RAB valuation methodology from a indexed depreciated historic cost to an unindexed depreciated historic cost method, the ICCC will now use a nominal WACC instead of a real WACC.

The ICCC has determined to use a pre-tax nominal WACC of 21.65%. This is equivalent to a pre-tax real WACC of 16.07% with the assumed levels of inflation. The parameters which the ICCC has used are shown in Table 37, which also compares these to previous determinations.

No submissions were received questioning the use of the other parameters proposed by the ICCC in the draft report. Therefore, the ICCC has determined to use these as inputs into its calculation of the

[35] https://www.bankpng.gov.pg/financial-markets/domestic-money-and-bond-market-operations-and-development/central-bank-bill-tap-facility/tap-results/

WACC. This includes the country risk premium, the tax rate, the debt level and the inflation rates for the US and PNG. A detailed explanation of these other parameters is provided in Gravelroad's report which was published with the draft report.

Debt margins have been updated by subtracting the average yield on 10 year US Treasuries from average yields on BBB rated US corporate bonds as reported by the FRED.[36]

Table 37 lists the parameters determined by the ICCC and compared these to previous year and to PNG Ports proposed parameters.

Table 37: Summary of Inputs used to Estimate the WACC

	2009 Determined	2014 Determined	2019 Determined	2024 Determined	FTI (PNG Ports) Proposal
US Risk-free Rate	3.7%	2.72%	1.72%	3.72%	3.7%
Country Risk Prem.	3.0%	3.0%	3.0%	5.8%	5.9%
US Inflation	1.8%	2.0%	2.0%	2.1%	2.2%
PNG Inflation	10.0%	5.0%	4.5%	4.8%	4.7%
Debt Margin	4.3%	2.8%	1.5%	1.24%	1.2%
Market Risk Premium	6.0%	6.0%	6.0%	5.94%	6.0%
Asset Beta	0.769	0.65	0.75	0.7	0.7
Debt %	40%	40%	40%	40%	40%

Table 38 shows the estimated cost of capital compared to PNG Ports' proposed rates and to previous determinations.

Table 38: Comparison of the Determined WACC with Previous Determinations

	2009 Determined	2014 Determined	2019 Determined	2024 Determined	PNG Ports Proposal
PNG Risk-free Rate	15.4%	8.9%	9.7%	12.7%	12.5%
Return on Debt (pre-tax)	19.7%	11.7%	11.3%	13.9%	13.7%
Return on Equity	22.9%	15.3%	17.1%	18.8%	19.1%
Pre-tax Real WACC	16.0%	12.2%	14.1%	16.07%	16.4%

13.2 PNG Ports submission on WACC

While the PNG Ports found the ICCC's determination of the WACC to have produced an acceptable outcome they disagreed with the method used. However, it was agreed by the ICCC and PNG Ports for practical purposes to defer any further analysis or discussion on the topic until the next price review in 2029.

[36] Federal Reserve Bank of St. Louis https://fred.stlouisfed.org/categories/32348.

14 Price Path for 2025 to 2029

The pricing principles in the Regulatory Contract specify how prices must be set. The ICCC has followed these principles.

14.1 Regulatory Asset Base (RAB)

To set the value of the RAB, the following principles must be followed.

> The opening Regulatory Asset Base (RAB) for the next regulatory period is to be calculated using a roll forward approach, based on the following components:
>
> a) The 2020 opening RAB will be set at K 799,367,521 in 2019 terms.
>
> b) Actual prudent capital expenditure incurred by PNG Ports during the regulatory period (2020 to 2024). Consideration must be given as to whether any particular capital project was prudent.
>
> c) Forecast depreciation for the 2020 to 2024 regulatory period.
>
> d) Disposals or write downs of regulated assets during the regulatory period.
>
> e) No gifted assets should be included in the RAB.
>
> f) All amounts should be inflated into Money of the Day values using indexation.

The ICCC has used the depreciation, which was forecast in 2019, to roll forward the RAB.

PNG Ports has not notified the ICCC of any disposals. However, the ports at Samurai and Aitape are no longer in use and therefore the ICCC has removed them from the RAB. Motor vehicles are also assumed to be disposed of at their depreciated value after four years.

Table 39 shows the roll forward calculation of the RAB. Each year the opening value is calculated by inflating the previous year's closing value. The Inflation rate used is the annual % change in the June CPI as specified by the Regulatory Contract.[37]

Table 39: Roll forward Calculation of the RAB.

	2020	2021	2022	2023	2024
Opening Value	799,367,521	811,603,112	829,347,181	835,291,284	829,671,500
New Capex	929,468	7,705,751	8,925,670	2,694,492	3,802,186
Depreciation	23,661,819	25,057,552	26,780,800	28,181,197	28,999,832
Disposals	0	0	0	62,064	119,607
Closing Value	776,691,785	794,421,440	812,475,461	811,763,933	806,674,690

[37] The ICCC uses the "All groups excluding alcoholic beverages, tobacco and betelnut" provided by the National statistics office.

Inflation Rate	2.73%	4.52%	4.52%	3.06%	2.71%

The opening value of the RAB in 2020 has been set at K799 million as required by the 2020-2025 regulatory contract. For the 2025 to 2029 Regulatory Contract specifies that the opening value of the RAB for 2024 will K829.671 million. This will allow the ICCC to assess the prudence of 2024 spending when it conducts the price review in 2029.

14.2 The Building Blocks

The pricing principles in the contract specify the following requirements.

2. A building block approach must be adopted, consisting of the following components:
   a) opening RAB for the regulatory period;
   b) forecast new capital expenditure during the regulatory period required to maintain service levels and performance targets;
   c) return on capital (WACC);
   d) return of capital - economic depreciation; and
   e) forecast operating expenditure required to maintain service levels and performance targets, including any efficiency factor to be applied to operating expenditure.

The resultant building blocks are shown in Table 40.

Table 40: The Revenue Requirement (K millions)

	2025	2026	2027	2028	2029
Total Regulated Opex	85	84	82	80	79
Return Of Capital	27	28	29	32	34
Return On Assets	157	159	165	171	175
Revenue Requirement	270	270	276	284	287

Forecast capital expenditure is described in section 12.3. The WACC is discussed in section 13. Forecast operating expenditure is discussed in section 10.

14.3 The Price Path

The price path is set using the following method.

- Tier 1 and Tier 2 prices have been merged by setting all wharfage charges to Tier 2 prices and then setting all berthage charges to Tier 1 prices. This provides a single set of regulated prices with no distinction between Tier 1 and Tier 2.
- The regulated revenue is calculated by multiplying the regulated prices by the forecast sales volume.

- Prices are adjusted so that the NPV of the regulated revenue is equal to the NPV of the revenue requirement over the regulatory period. To do this the ICCC has made an initial adjustment by increasing all the merged prices by 2.62% and setting the X factor equal to 0%.

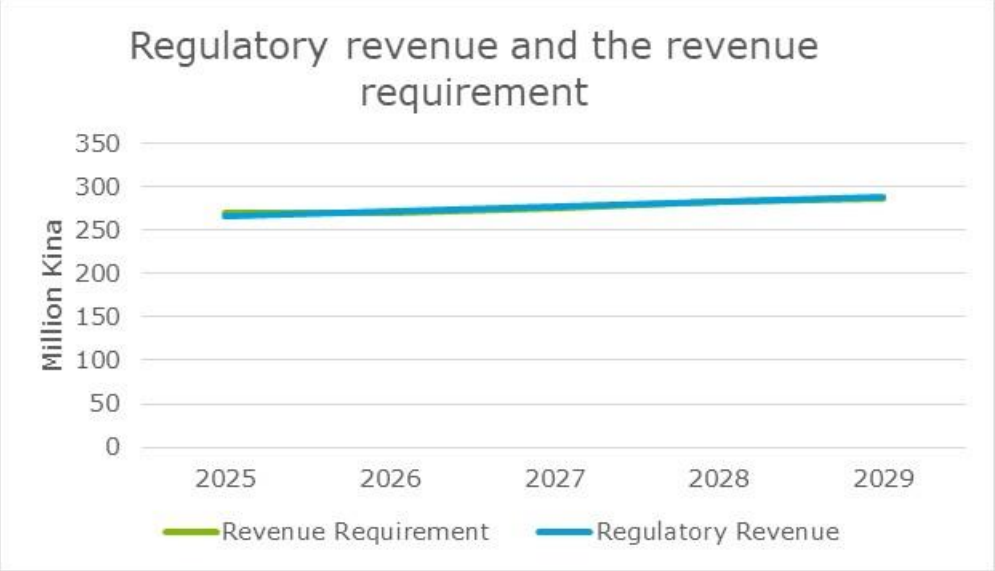
Table 41 shows that average prices will fall from K484 per TEU (2023 actual estimate), to K453 in 2025. This is a 6.4% decline. They will then remain relatively flat in real terms. While the regulated revenues are going up, volumes are also increasing so this will compensate and keep prices flat.

Table 41: The Revenue Requirement and the Regulatory Revenue (K millions)

	2024 Actual	2025	2026	2027	2028	2029
Revenue Requirement		270	270	276	284	287
Regulatory Revenue	292	267	272	278	283	289
Demand (TEU)[38]	508,273	528,808	539,384	550,172	561,175	572,398
Average Cost per TEU	0	480	471	472	476	473
Average Price per TEU	529	475	475	475	475	475

The revenue requirement and the regulatory revenue are shown in Figure 32 and Figure 33. The two graphs are the same but have different vertical scales. Figure 32 illustrates the total change, while Figure 33 shows more detail of how the revenue requirement and the regulated revenue differ each year.

Figure 32



[38] Note that TEU volumes shown in include all cargos expressed in terms of TEU and include empty container as well as containers that are lifted off and on to a vessel.

Figure 33

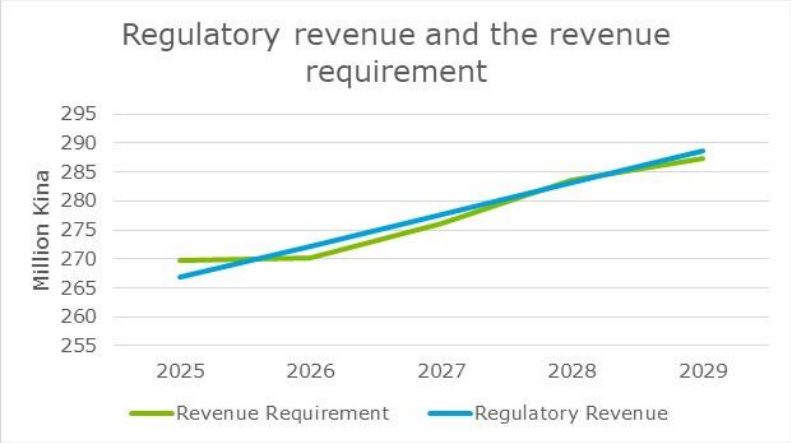
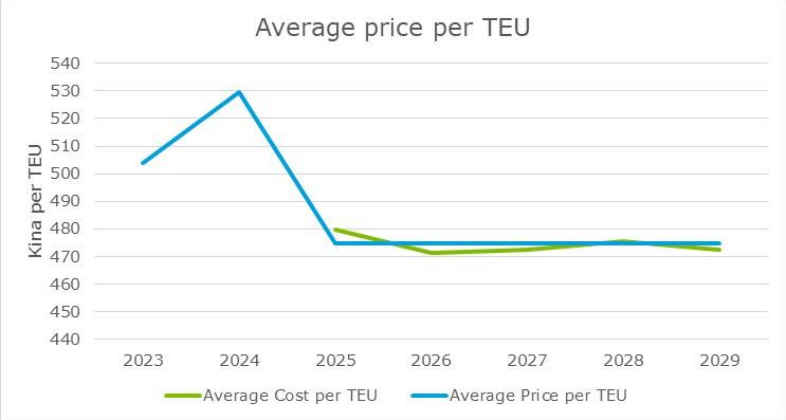


Figure 34 shows how the average price per TEU will change over the regulatory period and compares this to the average cost per TEU.

Figure 34



14.4 Annual Price Adjustment

Each year during the contract the ICCC will adjust prices to reflect the following

- Inflation
- Failure by PNG Ports to provide a strategic plan and adequate service standard information
- Newly discovered stevedoring access charges

Because the RAB and Depreciation are no longer indexed, this means that any inflation adjustment must only apply to the component of prices that is attributable to operating costs.

Detail of the annual adjustment are provided in the regulatory contract. However they may be summarised as the following.

If last years price = *P*, opex share = α, the change in CPI = *i*, and X factor is *X.*

Then

$$\text{Current Price} = [(\alpha \times P) \times (1 + i) + ((1 - \alpha) \times P)] \times (1 - X)$$

Where

- α : Is the proportion of the price attributable to opex
- *i : rate of change in CPI (expressed as a decimal)*
- *X* : the X factor (expressed as a decimal) (Note that X has been set to 0).
- *S* : is the strategic plan penalty

This formula will be applied to all on PNG Ports regulated prices

% CPI change

Because the ICCC has determined that it will no longer inflate regulatory assets, the annual inflation adjustment will now only apply to operating costs. Table 42 shows operating costs as a percentage of the revenue requirement for each year of the Regulatory Contract.

Table 42: Operating Costs as Percentage of the Revenue Requirement.

	2025	2026	2027	2028	2029
Opex. allowance	85	84	82	80	79
Revenue Requirement	265	266	272	280	283
Proportion of price which is attributable to opex.	31.61%	30.92%	29.64%	28.29%	27.36%

14.5 Prices for 2025

The prices shown in the following tables are the results of applying the changes determined in this report. Tier 1 and Tier 2 prices have been merged by setting all wharfage charges to Tier 2 prices and then setting all berthage charges to Tier 1 prices. All prices have then been adjusted upwards by 2.62%, so then when they are multiplied by the determined sales volumes, they deliver the regulated revenue.

Maximum tariffs for Wharfage Services (All ports – prices in Kina per unit)

Cargo	Unit	Overseas Inward	Overseas Outward	Coastal Inward	Coastal Outward
Livestock (Horse, Cattle, Dogs, Sheep, Goats, Pigs)	Each animal	7.24	9.05	10.86	7.24
Oils / Petroleum (in bulk)	Tonne of 1,000 litres	14.50	14.50	7.24	7.24
Palm Oil	Tonne of 1,000 litres	0.00	12.51	7.24	7.24
Fabrication (Boats, Iron Tanks (Empty))	Meter Length	54.28	54.26	14.50	14.50
Charcoal, Coal Coke, Road Metal, Sand, Soil	Tonne/Weight	36.21	21.71	10.87	10.87
Cement	Tonne/Weight	35.37	22.47	11.32	10.87
Agriculture Products (Copra, Cocoa, Coffee, Bagged Agriculture Produce)	Tonne/Weight	36.19	21.71	7.24	7.24
Goods not enumerated above and containerised cargo (FCL & LCL)	Tonne Weight or cubic meter whichever is greater	36.21	22.47	10.87	10.87

Containers (FCL/LCL/MT)	Per Forty Foot Equivalent Units (40ft)	1805.95	1120.32	487.63	487.63
Containers (FCL/LCL/MT)	Per Twenty Foot Equivalent Units (20ft)	902.97	560.16	243.82	243.82
Containers (FCL/LCL/MT)	Per 10/9m3	451.49	280.08	121.91	121.91
Containers (FCL/LCL/MT)	Per 4m3/DBox	180.59	112.03	48.76	48.76
Container (Empty)	Tonne/Weight	36.92	22.47	10.87	10.87

Containers Off/On	Rate per Unit/Activity
Overseas - 40ft	522.12
Overseas - 20ft	261.06
Overseas - Other (9m3, 10m3, "D" Box)	130.53
Coastal - 40ft	522.12
Coastal - 20ft	261.06
Coastal - Others (9m,10m3,"D" Box)	130.53
Overseas - General Break Bulk	122.77
Coastal - General Break Bulk	45.98

Maximum Passenger Fees (All Ports)

Cargo	Unit	Rate
Passenger Fees - Adult	Per Adult	9.81
Passenger Fees - Children	Per Child	4.92

B. Maximum Tariffs for Berth Reservations (All Ports)

Type of Vessel	Unit	Rate
Overseas Vessels - cargo and passenger vessels at the ports of Rabaul and Madang	Per Occasion	1650.45
Overseas Vessels - cargo and passenger vessels - at remaining ports	Per Occasion	825.20
Overseas Tankers - Large	Per Occasion	2499.94
Overseas Tankers - Small	Per Occasion	1254.00
Overseas Vessel of any type at any port - each alteration to arrival time	Per Occasion	420.74
Coastal Vessels - Port Moresby and Lae	Per Occasion	829.28
Coastal Vessels - at other ports	Per Occasion	420.74
Coastal Vessel - any, port each alteration to arrival time	Per Occasion	165.83

C. Maximum Tariffs for Berthing Services

Type of Vessel	Unit	Rate	Formula
Overseas vessels (including cargo, passenger and tankers)	Metre LOA per hour alongside	5.29	LOA x hours x rate
Coastal Vessels - under 20 metres (or part thereof)	Metre LOA per hour alongside	0.68	LOA x hours x rate
Coastal Vessel - great than or equal to 20 metres	Metre LOA per hour alongside	0.98	LOA x hours x rate
Tugs	Per Tug/Day	37.21	Rate per Day
Workboats (Quarterly Fee)	Alongside PNGPCL wharf	242.70	Rate Per Quarter

D. Utilities and Other Services

Utilities and Other Services	Rates (Kina)	Formula
Commercial Vehicle and Tourist Bus Pass Annual Pass- New or Renewal	29.40	Year x Rate
Commercial Vehicle One Time Pass	29.40	Per Occasion
Stevedoring Tonnage Fee (All Ports)	0.37	Tonne x Rate
Security Passes - Personal - New or Renewal	89.46	Year x Rate
Equipment Passes - Forklift and Crane Equipment - New or Renewal	961.47	Year x Rate
Surcharge Yard Maintenance (Port Moresby)	0.00	No Charge
Surcharge - Casual Labour Pool Maintenance (Port Moresby Only)	2.49	Tonne x Rate
Surcharge - Ash Levy (Rabaul)	0.00	No Charge
Cleaning of Wharf (Compulsory after wheat and rice cargo operation)	0.00	No Charge
Surcharge Generator	0.00	No Charge
Security Levy	0.00	No Charge

15 Investment Funding

The price path will provide investment funding of K690 from cashflow over the regulatory period (see Table 43). This is funding that it can use without needing to borrow from the banks or receive gifting from aid agencies.

Table 43: Capital Funding from Revenue (K million)

	2025	2026	2027	2028	2029
Return Of Capital	26	27	29	31	33
Cost of debt	39	40	42	43	44
Post tax cost of equity	56	56	59	61	63
Total Funding for capital development	122	123	129	136	140

There were several comments about dividends and funding in submissions.

> *"PNG Ports has paid several large dividends out in recent years. It perhaps would have been a better outcome for the PNG Ports' infrastructure if those dividends were directed into Port infrastructure rehabilitation projects. It seems like the ports have been managed for cash and in the interest of delivering a dividend rather than reinvesting into the port infrastructure network."*
>
> "*The Government secured a loan as well as a grant from the Australian Government through its Development Aid Program and so according to the wharves rehabilitation program it should end in 2026. The list of programs are: expansion of Lae Tidal Basin phase 2, new wharves for Oro and Kavieng and Port improvements for Wewak, Vanimo, Kimbe and Lorengau. This is a positive sign but whether full implementation takes place is yet to eventuate"*
>
> *"The figure quoted for the investment over the past 21 years is paltry compared to the investment made by the Government in other critical infrastructure projects. The quality of the present infrastructure is poor, and by comparison to international norms, sub-standard. Apart*

from the ICTSI managed Motukea and Lae (international) ports, all wharves, aprons, security perimeter, lighting and supporting infrastructure is in a poor state of repair."

"PNG Ports is highly unsure of the amount of capital it will spend in their 30 year infrastructure plan. we think that a 30 year expansion plan is too ambitious. They should look at a 10 - 15 year plan instead. They need to be more realistic."

"PNG Ports is not spending on intended projects and so no cost is incurred as otherwise stated. Are they spending elsewhere and if so, where?"

"*Ports are of national developmental significance and allowing them to degrade further in the coming years will have a detrimental impact on the communities surrounding the ports*."

The ICCC thinks that theses submissions make a good point. Maintaining wharf infrastructure will have a substantial impact upon provincial economies. Therefore, it would appear to be worth while for the Government to maintain its investment in PNG Ports by not collecting dividends.

At a minimum this means reinvesting the Return of Capital elements for revenues received on regulatory assets. The Cost of debt portion of revenues should sensibly be used to service debts.

This leaves the cost of equity element, which should in theory support dividend payments. However, if the Government removes these funds from PNG Ports via dividend payments, this does make it more difficult for PNG Ports to replace or upgrade their assets. By deferring dividend receipts now, the Government may earn higher returns in the future.

Clearly the price path supports substantial infrastructure investment. The capex cost recovery provision described in section 12.2 of this report also supports additional investment. With the additional potential of capital funding available from AIFFP, PNG Ports is not currently constrained by the availability of capital funding.

16 Over and Under Recovery of Revenue

This section considers Schedule 9 of the 2020 to 2024 Regulatory Contract. This should not be confused with the capex cost recovery mechanism that has been discussed in section 12.2.

The ICCC has determined to remove Schedule 9 from the contract and add the cost recovery mechanism.

16.1 Activation of Schedule 9

Schedule 9 is a clause in the 2020 to 2025 contract that is activated if there is an over or under recovery of the determined revenue. The purpose of the clause is to protect PNG Ports from sales volume forecasting errors.

The way the clause works is as follows.

- In 2019, the ICCC determined the revenue required to cover PNG Ports' costs during the

regulatory period of 2020 to 2024, based upon a demand forecast.

- If, at the end of the period, revenues are more than 105% of the determined value or less than 95% of the determined value, an adjustment will be made to prices in the following regulatory period.
- The adjustment must take into account inflation and the time value of money using a pre-tax discount rate of 11.27%.
- A forecast of 2024 revenue is to be used to make this assessment.

The ICCC has therefore reviewed PNG Ports' actual revenues and compared them to the 2019 determined revenues.

It is unlikely that actual revenues have exceeded the bounds of 105% or 95%. The regulatory period is not yet complete and so the ICCC does not yet have complete information on actual revenue. Table 44 compares actual revenues to the revenue requirement as determined by the ICCC in 2019. Both have been inflated into 2024 values using PNG CPI.

Table 44: Comparison of Actual Revenue to 2019 Revenue Requirement.

(millions)	2020	2021	2022	2023	2024
Revenue Requirement (2024 terms)	K245	K245	K245	K243	K238
Actual Revenue (2024 terms)	K221	K236	K261	K263	K292
Variance	-K24	-K9	K16	K20	K54

In 2020 and 2021 PNG Ports earned less than the determined revenue requirement, but this has now been balanced out by higher revenues in 2022 and 2023. When the NPV of these two sets of numbers are compared, the NPV of the actual revenue exceeded the NPV of the revenue requirement by 3%.

So, the ICCC's determination is that no adjustment needs to be made to prices in 2025 to 2029 to adjust for over or under recovery as required by Schedule 9 of the contract.

16.2 The Effect of Schedule 9

PNG Ports has proposed that Schedule 9 should be retained in the contract. The ICCC has therefore considered what changes might be required to Schedule 9, given the changing market conditions in which PNG Ports operates.

There are two issues to consider.

1) PNG Ports is now facing competition at the domestic wharves in three of its largest domestic ports. This means that potentially the reason for a fall in revenue of more than 5%, could be due to competition.
2) The pricing principles in the contract require that, "PNG Ports must be regulated using an incentive regulation approach".

The ICCC wants to promote competition. Therefore, a clause which protects PNG Ports from the effects of competition would be working against this objective. This would also decrease the incentives PNG Ports would have to improve its services to its customers and to improve its competitive position.

Having considered these issues, it is apparent that either Schedule 9 needs to be modified or removed from the contract.

To modify the Schedule, additional conditions would be needed to address the issues. The ICCC thinks there are three conditions that need to be considered.

1) Did the revenue variation occur due to a change in the volume of freight moving across PNG Ports wharves?

2) Did PNG Ports charge the maximum tariffs set out in Schedule 1 and Schedule 2? and

3) Did a major change in demand occur because a large customer chose to use a competing wharf?

If the answers to 1 and 2 were yes and the answer to 3 is no, only then should Schedule 9 be applied.

While this might be a solution to address the issues, it is still not perfect.

16.3 Is Schedule 9 Needed?

The purpose of Schedule 9 was to protect PNG Ports from the situation where major changes in demand occur which are beyond its control.

This occurred in during the current regulatory period because of COVID-19. In 2020 and in 2021, volumes fell because of reduced economic activity. However, the recovery in 2022 and 2023 has compensated for the previous downturn. So, it would appear even with a major worldwide event which had major impact upon PNG, Schedule 9 was not needed.

The intent of Schedule 9 is to protect PNG Ports from the effects of a major decline in the PNG economy, and also to prevent it from making excessive profits in the event of a major increase in the PNG economy. For Schedule 9 to be activated, this decline would need to last for a major portion of the regulatory period. Even though this occurred in 2020 to 2024, with COVID-19, the effect was still not enough to activate Schedule 9. It is therefore likely that if economic change of large enough magnitude to activate it were to occur, it would be structural in nature and there would be some indication that it might occur when the demand forecast was being made.

In the ICCC's view, the objective in setting the PNG Ports' prices is to set prices that would be similar to those a port company might enjoy if it were operating in an unprotected, competitive market. Such companies face fluctuations in their sales volumes as economic conditions change. Removing PNG Ports' exposure to these fluctuations works against this objective.

A company which is faced with potential downturns in future sales will carefully consider its levels of debt, the efficiency of its operating costs and will be careful not to build excess capacity or to over capitalise its business.

The philosophy that sits behind the regulatory pricing principles, the ICCC Act and the setting of returns on investment using a WACC are all consistent with this objective.

The following submission supports the removal of Schedule 9 from the Regulatory Contract.

> *"Costs have risen uncontrollably in recent years for PNG Ports and it is discouraging to read that the ICCC is required to ensure that PNG Ports can charge higher prices during the 2025 to 2029 regulatory period to ensure that revenue is recovered if freight volumes decrease"*

Another submission seems to be saying that PNG Ports should focus on cost management during downturns and not rely upon revenue protection.

> *"While revenue growth is important for the long-term success, focusing solely on revenue without considering cost implications can lead to financial inefficiencies and ultimately undermine the company's sustainability which can be clearly seen with the current approach by PNG Ports focusing too heavily on revenue and not on cost control."*

Determination

Having considered these issues, the ICCC has determined to remove Schedule 9 from the contract. The ICCC wants to promote competition and wants PNG Ports to be faced with the full effects of any competition that may exist in its market. The ICCC is required to ensure that PNG Ports is regulated using incentive regulation. Continuing to have Schedule 9 in the contract does not support this.

17 ICTSI and Stevedoring Access

17.1 Background

PNG Ports' two major overseas terminals at Lae and Motukea/Port Moresby are subject to exclusive long-term leases with the company International Container Terminal Services Inc (ICTSI).

PNG Ports remains the owner of the overseas container terminals and continues to provide the regulated services at these wharves.

As the services provided by ICTSI are not regulated services under the Regulatory Contract, they are excluded from this review. However, to provide clarity for readers of this report, ICTSI provides stevedoring and handling services as well as storage services. It manages and operates the overseas terminals and PNG Ports is its landlord. It therefore makes payments to PNG Ports for the exclusive right to operate these terminals.

Berth reservations which are a regulated service have been delegated by PNG Ports to ICTSI. However, PNG Ports remains responsible for these services, and these services are still governed by the Regulatory Contract.

17.2 The 2019 Determination

Stevedoring access is a regulated service defined in the contract as loading and unloading a ship, but excluding the movement of freight from the wharf to a stacking area. The exact wording in the Regulatory Contract is as follows.

Stevedoring Access means the right of stevedores to enter upon the port and associated facilities operated by PNG Ports for the purposes of loading and unloading ships and other vessels but does not include the right to move cargo directly between ships and other vessels and, stacking areas, or to store, sort, stack or deliver cargo within the transit sheds and open stacking areas within the boundaries of a declared port.

The 2019 draft report argued that at least part of what ICTSI payment to PNG Ports is for is the right of exclusive stevedoring access.

- PNG Ports argued that it considered ICTSI terminal operating fees are for rental space to provide services excluded from the definition of stevedoring access, that is, "the right to move cargo directly between ships and other vessels and stacking areas, or to store, sort, stack or deliver cargo within the transit sheds and open stacking areas within the boundaries of a declared port."
- ICTSI argued that it did not consider the fees paid to PNG Ports are for stevedoring access, rather they are annual general fees to operate the terminal.

In 2019, the ICCC was swayed by the agreement with ICTSI being a commercial contract arrived at by competitive tender and decided not regulate.

17.3 Definition of Stevedoring Access

The ICCC notes that the current definition of stevedoring access is not clear. There are two possible interpretations. In 2019, the interpretation presented by PNG Ports appeared to be that stevedoring access did not include moving cargo from the wharf to a staking area. This interpretation is inconsistent with modern stevedoring practices and could not be supported within the current constraints of PNG Ports wharf facilities. If this interpretation were correct, then

- This would mean that stevedores with stevedoring access could only lift a container off the ship directly onto a wharf or a waiting truck.
- The truck would then have to immediately leave PNG Ports' facilities as any other action would not be consistent with the definition of stevedoring access.
- There would need to be one truck waiting for every container that was unloaded. No containers could be stored in the wharf area. PNG Ports wharf facilities are generally not large enough to support this approach, and congestion would be a major problem, significantly slowing down the time to unload a vessel.
- When a vessel starts to load containers, each container would need be brought into the wharf by truck and then immediately loaded on to the vessel. No containers could be stored within the wharf area prior to the vessel loading. Any delay in vehicles arriving would delay the vessel.

It is far more likely that the intended definition of the stevedoring access does in fact allow movement to a stacking area, but not between stacking areas. Written another way the definition might say:

Stevedoring access means the right of stevedores to enter upon the port and associated facilities for the purposes of loading ships and other vessels. It does not include the right to

- *Move cargos directly between ships and other vessels.*
- *Move cargos directly between stacking areas*
- *Store, sort, stack or deliver cargo between transit sheds and open stacking areas within the boundaries of a declared port.*

Whichever definition of stevedoring access is used, it can still be argued that PNG Ports do not charge for "stevedoring access". However, if this is true, it has implications for the payments which PNG Ports receives from ICTSI. This is described in the next section.

17.4 The Problem

The ICCC is in the process of regulating the prices of ICTSI. In its review of ICTSI's prices in 2023, ICTSI provided its operating costs to the ICCC. These operating costs did not include any payment to PNG Ports. However, the ICCC's review of PNG Ports revenues clearly shows that it did receive this payment. When the ICCC tried to discuss this with ICTSI in 2023, ICTSI instead decided to launch legal proceedings, rather than clarifying any shortfalls in the information it had provided to the ICCC. Consequently, the ICCC's assessment of ICSTI's stevedoring services did not include the cost of payments to PNG Ports. If it had, then the costs would have been substantially higher.

When the ICCC progresses its regulation of ICTSI's prices, it is possible that ICTSI will insist that the regulated prices must also cover at least part of the cost of these payments to PNG Ports. This would mean that users of the international wharves operated by ICTSI could not avoid this cost by using a competitor's service or some other service[39].

The payment from ICTSI to PNG Ports is a substantial material amount, for both parties, [40] and would have a substantial impact upon ICTSI's prices if it were included in the relevant costs.

At present it appears that PNG Ports is receiving an unregulated monopoly rent.

The amount paid by ICTSI was apparently determined via a commercial bidding process. But, if ICTSI knew that it would be able to recover whatever payment it had to make in its prices it would have an incentive to bid as high as possible, knowing that it could recover any amount it chose to bid. Even if it was eventually regulated it would know that its costs would be covered by the regulated prices. This is not the intended outcome of a commercial bidding process.

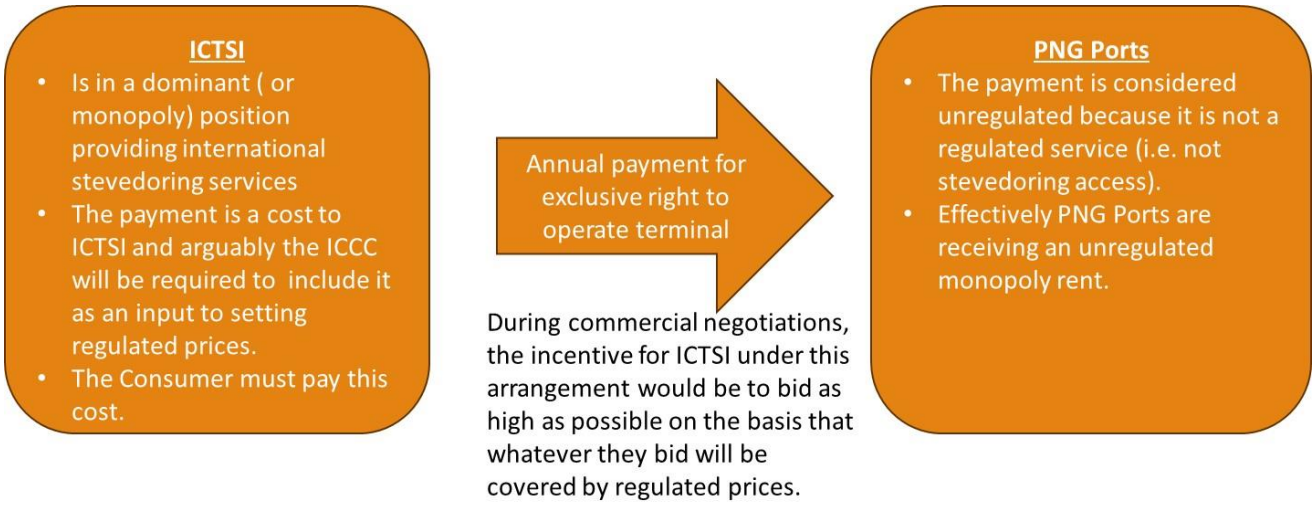
The ICCC expects the bidding process was intended to find an efficient provider of services at the lowest possible cost.

By providing ICTSI with exclusive rights to operate the two international terminals, the ICCC would have expected that any monopoly rents received by PNG Ports would be used to offset the cost of owning and maintaining the wharves used. Thus, if wharf users were paying higher stevedoring charges to ICTSI, this would be balanced out by lower wharfage and berthage charges. So far this has not occurred.

[39] A core part of the logic for not charging for services like storage, is that users of a wharf can avoid using these services and that there are competing services available. For this reason, these services have not been regulated and the cost of these services is excluded from regulated prices for both PNG Ports and ICTSI.
[40] This amount of this payment is commercially sensitive and therefore confidential.

The problem is illustrated in Figure 35.

Figure 35



It is still possible that this problem will not arise. If ICTSI do not present these charges to the ICCC as part of its regulated services, consumers of these services will not need to pay. But the ICCC must consider the possibility that they will be presented and that they will be included in the ICTSI's regulated charges. The next section describes what the ICCC has done to protect consumer form this possibility.

17.5 Provision in the Contract

The problem described in the previous section creates the possibility that the ICCC will discover a stevedoring access charge which it has not currently recognised. This may well occur in the process of regulating ICTSI's prices. Therefore, the ICCC has made two changes to the contract to provide for this possibility.

- The ICCC has changed the definition of stevedoring access so that it is clearer.
- The ICCC has added in a price adjustment for stevedoring access. This is described in part 2 of Schedule 1 of the Regulatory Contract.

The new definition of stevedoring access is:

> ***Stevedoring Access*** *means the right of stevedores to enter upon the port and associated facilities operated by PNG Ports for the purposes of loading and unloading ships and other vessels and moving these cargos to a stacking area. This does not include the right to move cargo directly between ships and other vessels and, does not include the right to move cargo between stacking areas, or to store, sort, stack or deliver cargo within the transit sheds and open stacking areas within the boundaries of a declared port.*

The adjustment to prices that will occur if a stevedoring assess charge is discovered is referred to in the contract as a DSA Factor (Discovered Stevedoring Access Factor). It is calculated as follows:

$$\text{DSAF} = \left(1 - \frac{Sum\ of\ DSA}{Sum\ of\ forecast\ demand} \times \frac{1}{493} \right)$$

Where

- Sum of DSA is the total stevedoring access which PNG Ports will receive during the regulatory period 2025 to 2029 which was not previously identified as stevedoring access.
- Sum of forecast demand is the total forecast demand used in the building block over the regulatory period 2025 to 2029 and expressed as TEU which equals 2,751,397 TEU.
- 493 is equal to the average regulatory revenue per TEU over the regulatory period 2025 to 2029 (in 2025 values).

The DSA Factor will only be activated if the ICCC is required to include charges from ICTSI to PNG Ports in any regulated price determination it may make for ICTSI's prices. And it will only apply if these charges exceed K1 million. To be clear, these would need to be additional stevedoring access charges that have not already been recognised as stevedoring access charges in this determination by the ICCC.

If the DSAF is applied, it will be multiplied by all PNG Ports' prices listed in Schedule 1. This will occur at the next annual price adjustment following the discovery.

For perspective, if the discovered stevedoring access charges were K10 million per year, this would reduce PNG Ports' regulated prices by 3.4%.

18 Gifted Assets

18.1 The Lae Tidal Basin

The Lae Tidal Basin is the international wharf in Lae. It was completed in 2014 and was funded by the PNG Government using funds provided by the Asian Development Bank (ADB).

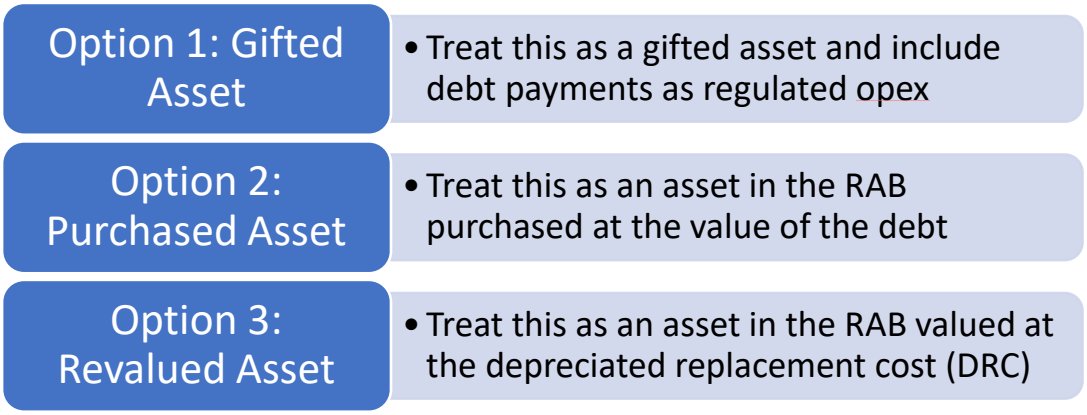
Until now the Government has continued to hold these wharf assets on its own balance sheet and to service the associated loans.

An NEC decision in October 2022 determined that the Lae Tidal Basin wharf assets will be transferred to PNG Ports along with the responsibility for the K552 million balance of Asia Development Bank loans associated with them. However, it was not made clear exactly what would be expected from PNG Ports in terms of payment.

Consequently, in 2022, PNG Ports initiated discussions with the ICCC to consider how this might be treated in the next pricing review. The outcome of these discussions was that the ICCC and PNG Ports would wait for confirmation of the exact terms of the asset transfer before any decisions were made about how the cost this asset might be treated in the Regulatory Contract.

During the discussions, the ICCC considered three broad options for how this might be treated, as shown in Figure 36.

Figure 36



During discussions, the ICCC proposed to adopt Option 1 as, with the information available at the time, it was the most appropriate under the circumstances. The asset would be a gifted asset, and the only financial change for PNG Ports would be it would become responsible for the debt obligation. Under Option 1, both the actual interest payments and the principal payments on the debt would be included as an operating cost.

If Option 1 were adopted, no changes would need to be made to the Regulatory Contract. Both Option 2 and Option 3 would breach the pricing principles in the Regulatory Contract which prevent a gifted asset being included in the RAB.

Under Option 1, the ICCC estimated that PNG Ports' prices would need to increase by 22% to service the debt[41]. Over time this would fall as the debt was paid off. So, by 2029, the increase would have fallen to 16%, depending upon the rate at which the debt is repaid.

Both Options 2 and Options 3 would have required larger price increases. But these options were not available as they would have breached the pricing principles in the Regulatory Contract which the ICCC is required to follow.

18.2 Definition of a Gifted Asset

Because the ICCC's choice of options above relied upon a determination of whether the Lae Tidal Basin is a gifted asset, PNG Ports[42] has proposed that the definition of a gifted asset should be clarified.

In the ICCC's opinion, gifted assets are typically gifted by a donor for the benefit of the local community. This normally occurs in circumstances where a commercial investment would not make economic sense because the local community would not be able to pay the prices required to support it. The donor therefore expects that, by making the donation, the local community will be able to enjoy the

[41] This assumes that the cost is applied to all prices at all ports. The ICCC is now proposing to only apply the cost to international prices at Lae.
[42] PNG Ports January 2024 submission.

use of the asset without having to pay for it. There are several examples of this in the Water PNG's network.

If the cost of such as asset were to be included in the RAB, this would have the effect of charging the users of the asset for the cost of the asset. Thus, this would go against the intention of the donor.

The current Regulatory Contract is consistent with this view. Section 2.4 of the contract is as follows.

> *"Section 2.4 a) Any assets acquired or capital projects carried out using funds from third parties in the form of gifts, donations, funded by the Government of Papua New Guinea or other parties, ('funding from third parties') and not repayable by PNG Ports must be identified separately in PNG Ports' asset register. For the purposes of clarity funding from third parties means that the third party has gifted, donated or made available funding which does not need to be paid back by PNG Ports.*
>
> *Section 2.4 b) The portion of any assets acquired or capital projects carried out using funds as described in clause 2.4(a) will not be considered to be part of PNG Ports' Capital Expenditure.*
>
> *Section 2.4 c)When the Regulator is required to set tariffs for Regulated Services for PNG Ports for the beginning of the next regulatory period commencing from 1 January 2030, the portion of any assets or capital spending which were funded using funds as described in clause 2.4(a) will be excluded from the Regulatory Asset Base and PNG Ports will not be entitled to a return on these portions of assets or to recover depreciation on these portions of assets through tariffs for Regulated Services.*
>
> *Section 2.4 d) The Regulator shall, if it considers it necessary or desirable, require PNG Ports to publicise at a time and in a manner the Regulator considers appropriate, the details of the assets and capital projects PNG Ports proposes to acquire using third party funding*."[43]

After considering the ICCC's opinion about gifted assets, PNG Ports has proposed to add the following clause to the contract.

> *"For the purpose of Regulatory Principle 1(e), an asset will be deemed to be gifted where there is clear contractual or policy evidence that the contribution (whether that be in the form of assets and/or funding) was made with the intention that it be excluded from the Regulatory Asset Base (RAB) for pricing purposes."*[44]

PNG Ports has based their argument for this definition on the Australian National Water Initiative Pricing Principles."[45]

The ICCC has considered this argument and does not think it is appropriate for the context of PNG Ports in a developing country like Papua New Guinea.

[43] 2019 to 2024 Regulatory Contract

[44] PNGPNG Ports January 2024 submission

[45] Council of Australian Governments. National Water Initiative Pricing Principles. https://www.dcceew.gov.au/sites/default/files/sitecollectiondocuments/water/national-water-initiative-pricing-principles.pdf

The National Water Initiative in Australia was a significant reform programme. One of its objectives was to promote better allocation of resources with more efficient water use in a context where water was a scarce resource. Pricing is often used as a tool to signal the underlying cost of resources to potential users, so that those who do not value it will not waste it. So, one of the purposes of the initiative was to ensure that full cost of assets was covered by the prices charged. This initiative involved establishing water resource management authorities at both a state and territory level. In some cases, there were transfers of ownership of specific water infrastructure and assets to better align with the goals of the initiative. Under these circumstances it would not have been appropriate for the cost of these assets to have been excluded from the price setting mechanisms. If the prices charged to end users did not include the cost of the assets, it would have worked against the purpose of the whole initiative.

The ICCC understands that both the National Water Initiative and the Lae Tidal Basin involve assets that were previously not charged for. However, the context of the two initiatives is quite different.

- One of the major purposes of the Australian National Water Initiative was to move the total system to full cost recovery.
- In PNG Ports case, a full cost recovery regime is already in place and the treatment of gifted assets is already explicitly provided for. Charging for gifted assets would work against the intention of the Regulatory Contract.

Because of the context, the ICCC is not convinced by this argument and does not think this example sets a useful precedent.

Under the current circumstances, if the Government wanted to receive a return on its investment in the Lae Tidal Basin, it could write a contract which required rental payments for the use of the asset. For the Government, this would have the same effect as including the asset in the RAB, which would then increase prices and potentially increase the dividend that PNG Ports pays to the Government through KCH.

However, since the completion of the Lae Tidal Basin wharf, the people of PNG have been enjoying the benefits of the wharf. Rather than directly paying for cost of the debt on the wharf, the Government has been paying it on behalf of the people of PNG. Shifting the debt to PNG Ports means that the direct beneficiaries of the wharf will pay, rather than everyone in PNG. If an additional rent were charged by the owner of the wharf for the use of the wharf, this would have had the effect of pushing up prices just because it was transferred from one state entity to another. This would be the equivalent of the Government placing a tax on port users. The ICCC thinks that if this is the Government's intention, there are more explicit ways for them to achieve this outcome.

The ICCC is not currently convinced that there is a need to make any modifications to the contract to clarify what a gifted asset is. Instead it prefers to simply require that for any asset to be included in the RAB, it must have been paid for by PNG Ports. The contract already supports this view.

If assets were included in the RAB when PNG Ports had not paid for them, PNG Ports would start to earn supernormal profits, because it would be earning additional revenue without any additional cost.

The ICCC's determination is not to modify section 2.4 of the contract.

19 Conclusions

The ICCC has conducted a review of PNG Ports' pricing and the Regulatory Contract governing it. This review considered the market conditions PNG Ports operates within and the challenges it faces in service provision. A key focus was on the condition of PNG Ports' wharves and its capital spending plans for their upgrades. The ICCC is also concerned with ensuring that PNG Ports remains financially sustainable while keeping prices manageable for users

Competition

PNG Ports is facing competition in the domestic coastal shipping market in Lae, Port Moresby, Rabaul Wewak and Kieta. In these ports it has lost market share. However, it still has market power in the international market where it has little or no competition at the two largest international container terminals. Therefore, the ICCC will continue to regulate PNG Ports' prices under the Regulatory Contract.

Competition has implications for the pricing model that has been used to cross-subsidise loss-making ports. As competition increases and spreads, it may no longer be possible to provide cross- subsidies between profitable and loss-making ports, as this will only make PNG Ports uncompetitive at the profitable ports.

Schedule 9

Competition has highlighted the need for changes to the Regulatory Contract. Schedule 9 of the 2020-2024 Regulatory Contract protected PNG Ports' revenues against volume declines, which reduced its incentive to compete actively. Since the ICCC is required to use incentive regulation, this protection was counterproductive.

Additionally, Schedule 9 inadvertently compromised PNG Ports' long-term sustainability; if PNG Ports loses market share and prices rise as a result, this could trigger further market share losses in a damaging feedback loop. To address these issues, the ICCC has decided to remove Schedule 9 from the Regulatory Contract.

Prices are expensive

Price benchmarking of PNG Ports prices against other international ports shows that its prices are more than twice as high as the average price of ports in the benchmarking study. The ICCC did not find any other port where prices were as high as PNG Ports' prices.

This has immediate implications for PNG Ports' prices, especially now that it is facing competition. The ICCC has a duty of care to the people of PNG to ensure that PNG prices do not continue to increase. PNG Ports must reduce its operating costs, seek efficiency gains and avoid over capitalising investments in port infrastructure.

It also means that ongoing funding of community service obligations by PNG Ports must be limited. Instead, these will need to be funded via gifting from either Government or third parties. If this is not possible, cheaper forms of service provision will need to be found. Ignoring this will only lead PNG Ports to a position where it is no longer financially sustainable.

This finding has had a material impact upon the ICCC's view of the future direction of PNG Ports' prices. The long-term strategic approach must be to reduce prices. The immediate challenge is that PNG Ports' capital spending plans are likely to push them up significantly.

Changing the method of valuing the RAB

The ICCC is proposing to change its methodology for valuing the regulatory assets of PNG Ports. The current method uses a Real WACC and adjusts both the value of the assets and depreciation by the rate of inflation. The new method will instead use a nominal WACC (which builds in the cost of inflation) and will no longer inflate the value of the assets or depreciation. The effect will be that new investments will drive up prices faster in the short term, but prices will also fall faster as assets depreciate and will be lower in the longer term after PNG Ports' current wharf replacement programme is complete.

This change means, that each year only the operating cost portion of the building blocks will be adjusted for inflation. For the next regulatory period this is about 30% of the revenue requirement but it varies from year to year.

Strategic Plan

The new contract requires PNG Ports to provide the ICCC with a strategic plan by 30th of October 2026. If they do not, then the ICCC will not approve price changes for 2027. The required contents of the plan are described in Schedule 13 of the Regulatory Contract. They include the capital plan and the future standards for wharf weight loading that PNG Ports will be required to meet.

Misuse of Grants

The ICCC has identified what it considers to be an anti-competitive act by PNG Ports. While this may be unintentional, the effect is the same. By using grant funds from the AIFFP for the purchase of new pilot boats, it is using its position as an SOE providing CSO services to gain funding which it has then applied to a commercially competitive business.

The ICCC is considering what further action it might take in response to this.

Price Path

The ICCC has followed the pricing principles outlined in the Regulatory Contract 2020 to 2024 as required to set a price path for the next regulatory period.

The price path has been determined with the following inputs:

- **Operating costs:** The ICCC has determined that PNG Ports still has the potential to reduce its operating costs and so has reduced the allowance for regulated operating costs by 2% per annum. This is a continuation from the previous regulatory period.

- **2019 to 2024 capital costs**: The ICCC has assessed PNG Ports actual capital spending for prudence. After this assessment the ICCC has added K21.8 to the RAB for spending in the years 2019 to 2023, plus a further K3.8 million estimate for 2024.

- **Future period capital costs:** PNG Ports did not provide the ICCC with a capital spending plan for 2025 to 2029 but requested that the ICCC allow a budget of K50 million per year. Consequently, the ICCC has included K250 million spread over 2025 to 2029.

- **Demand:** The ICCC has accepted PNG Ports' forecast that sales volumes will increase by 2% per year.

- **WACC:** The ICCC has used a pre-tax nominal weighted cost of capital of 21.64%.

The outcome of these inputs is the revenue requirement shown in Table 45.

Table 45: Building Blocks and Revenue Requirement

	2025	2026	2027	2028	2029
Total Regulated Opex	85	84	82	80	79
Return Of Capital	26	26	28	30	32
Return On Assets	152	153	160	166	170
Revenue Requirement	264	263	269	277	281

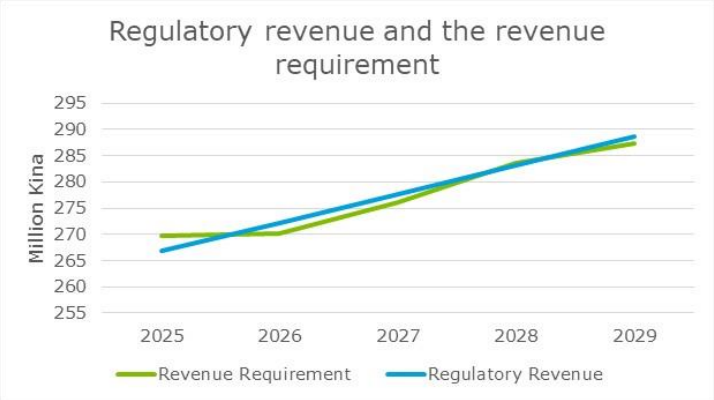
Prices have then been adjusted to ensure that the NPV of the regulatory revenue equals the NPV of the regulated revenue. (See Table 46 and Figure 37).

Table 46: Comparing Regulated Revenue to the Revenue Requirement

	2024 Actual	2025	2026	2027	2028	2029
Revenue Requirement (Km)		270	270	276	284	287
Regulatory Revenue (Km)	292	267	272	278	283	289

Demand (TEU)[46]	550,884	561,902	573,140	584,603	596,295	608,221
Average Cost per TEU	0	480	471	472	476	473
Average Price per TEU	530	475	475	475	475	475

Figure 37



To set 2025 prices to deliver these revenues, the ICCC has merged Tier 1 and Tier 2 prices using the following process:

- Tier 1 wharfage prices were set to 2024 Tier 2 prices.
- Tier 2 berthage prices were set to 2024 Tier 1 prices.

[46] Note that TEU volumes shown in include all cargos expressed in terms of TEU and include empty container as well as containers that are lifted off and on to a vessel.

- All prices were then increased by 3.43%, so when they are multiplied by the determined sales volumes, they deliver the regulated revenue.

Prices will remain flat over the regulatory period in real terms with an x factor of 0%.

Overall, prices in 2026 will be 10.3% lower than they were in 2024 in real terms. This price reduction is in contrast to the real terms annual increase of 5.5% per year over the regulatory period, proposed by PNG Ports in its January 2024 submission. All the submissions received by the ICCC reacted strongly and negatively to PNG Ports' proposal. There was a strong message coming from all the submissions that, just like everyone else, PNG Ports needs to learn to live within a budget and must control its costs.

The determined prices for 2025 are shown in section 14.4. These will be adjusted for inflation prior to coming into effect from the beginning of 2026.

Future Capital Expenditure

The new Regulatory Contract includes a capital cost recovery clause. This means that if PNG Ports underspends the capital budget allowed for in the price path, prices will fall further in the next regulatory period (2030 to 2034) to fully recover the additional value it has gained during the 2025 to 2029 regulatory period. Alternatively, if it spends more than the capital budget, prices will increase in the next regulatory period to fully compensate for this.

Any future capital spending will still be subject to the ICCC's assessment of whether it is prudent. To support this the ICCC has provided, in this report, an assessment of what it would consider to be the maximum prudent capital spending at each port over the next 50 years. It is noted that this is substantially lower than the amounts listed in PNG Ports' 30 year plan.

This report also contains a description of what prudent capital expenditure is, from the ICCC's perspective.

Minimum Service Standards

The ICCC has determined that the minimum services standards in the Regulatory Contract 2020 to 2024 were not adequate. PNG Ports' wharves are mostly in very poor condition and this is constraining their use. However, they still passed the previous standards. The new standards include wharf weight loading standards, and minimum container stacking capacity. The contract gives PNG Ports the opportunity to propose new standards by 30th October 2026.

Other Price Adjustments

The new Regulatory Contract also makes provision to adjust prices if additional stevedoring access revenues are discovered. This relates to revenue that PNG Ports receives from ICTSI that is not currently classified as being a stevedoring access fee. However, there is a possibility that this view may change as the ICCC progresses the regulation of ICTSI's prices over the next 12 months. The Regulatory Contract describes how this adjustment will be made if the clause is activated.

Other Issues

In response to submissions, the ICCC is highlighting the conflict of interest PNG Ports' regulatory role creates and the anti-competitive behaviour it potentially supports. The ICCC is recommending to the

Department of Transport that this role is removed from PNG Ports and to PNG Ports that it should voluntarily pass this delegation back to the Department of Transport.

The ICCC has accepted PNG Ports' proposal to remove the distinction between Tier 1 and Tier 2 ports. To merge the prices between the tiers, the ICCC has set all Tier 1 wharfage prices to the Tier 2 price and all Tier 2 berthage prices to the Tier 1 price and then applied price adjustments to the resultant reduced list.

Funding

The price path provides after tax funding of K664 million. This funding could potentially be used to service debt, pay dividends and invest in new assets. Along with access to other loans and grants, PNG Ports currently has ample funds available to improve the quality of its assets. However, careful choices need to be made to ensure optimal outcomes both for itself and the people of PNG.

This report is accompanied with a copy of the Regulatory Contract for 2025 to 2029.

20 Appendix: Market Risk Premium

20.1 Risk Free Rates and MRP

The idea that when risk-free rates (such as U.S. 10-year Treasury yields) increase, market risk premiums (MRPs) tend to decrease, is not a widely accepted principle in finance, but there are several **theoretical foundations** and **empirical observations** that support a relationship between risk-free rates and the market risk premium.

Here is how the argument is structured and the key precedents that support this idea:

1. Inverse Relationship between Risk-Free Rates and Risk Premiums:

- **Equity Risk Premium (ERP)**: The equity risk premium represents the excess return that investors require for taking on equity market risk over a "risk-free" rate (often represented by government bonds like the U.S. 10-year Treasury). When risk-free rates are low, investors may demand higher risk premiums to compensate for the lack of returns from safe assets. Conversely, as risk-free rates rise, the compensation required for taking on equity market risk may decline because bonds become a more attractive investment relative to equities.

  Key Precedent:

- **Fed Model**: The Fed Model, which was popularized by the Federal Reserve, suggests that there is an inverse relationship between bond yields (risk-free rates) and the equity risk premium. When bond yields rise, expected returns on equities (and hence the risk premium) may fall, and when bond yields are low, equities become relatively more attractive, leading to higher risk premiums.
    - Criticism: This model has been controversial and not universally accepted, especially in periods of persistently low interest rates.

2. Gordon Growth Model (Dividend Discount Model):

- The **Gordon Growth Model** implies that expected stock market returns (which contribute to the MRP) are inversely related to interest rates. This model states that stock prices are a function of expected dividends and the discount rate (which includes the risk-free rate). As risk-free rates increase, the discount rate rises, which can reduce the present value of expected future dividends, leading to a lower expected equity return, and thus a lower equity risk premium.

  Key Precedent:

- **Discount Rate Effect**: According to this model, as the risk-free rate increases, the discount rate used to value equities increases, lowering stock valuations and expected returns. Therefore, the MRP might decline because the higher risk-free rate reduces the need for a large risk premium to justify equity investment.

3. Empirical Studies:

- Empirical research has provided some support for the idea that there is a relationship between the level of interest rates and the market risk premium, although the exact nature of the relationship can vary by time period, market conditions, and regions. When risk-free rates are very low, investors might demand a higher equity risk premium because bond yields are insufficient to meet their return expectations. Conversely, when risk-free rates are high, bonds offer a competitive risk-adjusted return, and the equity risk premium may decrease.

  Key Precedents:

- **Fama and French (2002)**: In their paper *The Equity Premium*, Fama and French argue that the long-term equity premium is influenced by the level of interest rates. They find that historically, periods of high interest rates (risk-free rates) are associated with lower equity premiums.
- **Campbell and Shiller (1988)**: In their research, Campbell and Shiller argue that stock market valuations (price-to-earnings ratios) and bond yields are inversely related. As bond yields increase (reflecting rising risk-free rates), expected returns on equities tend to decrease, which would be consistent with a declining risk premium.

4. Expected Return on Equities and Bond Yield Substitution:

- A higher risk-free rate increases the attractiveness of bonds relative to stocks, leading to a potential shift in investor portfolios toward safer assets like bonds. As demand for equities diminishes, the expected return on equities may decline, thus lowering the market risk premium.

  Key Precedent:

- **Tactical Asset Allocation**: This concept is used by investors and portfolio managers who adjust their equity-bond allocations based on relative returns. If bond yields (risk-free rates) rise, investors may shift towards bonds, reducing the required return (and thus the equity risk premium) for holding equities.
- **Siegel's Paradox (Siegel 1992)**: Economist Jeremy Siegel's research suggests that when real interest rates (closely related to risk-free rates) rise, stock returns tend to fall, which could indicate a lowering of the MRP when risk-free rates increase.

5. Regulatory Precedents:

- In regulatory price-setting contexts, the Weighted Average Cost of Capital (WACC) is calculated using both the risk-free rate and the equity risk premium. Some regulators have acknowledged the potential for inverse relationships between these components:

  Key Precedents:

- **UK's Ofgem (Office of Gas and Electricity Markets)**: In some regulatory determinations, Ofgem has acknowledged that periods of rising risk-free rates may coincide with a decline in the market risk premium, based on observed capital market conditions.
- **Australia's AER (Australian Energy Regulator)**: In certain cases, the AER has discussed the inverse relationship between risk-free rates and the equity risk premium, acknowledging that

an increase in government bond yields may lead to a recalibration of the required risk premium.

6. Implied vs. Historical Risk Premiums:

- When risk-free rates increase, the implied market risk premium (calculated by subtracting the risk-free rate from the expected market return) might decrease, as equity returns adjust to the higher base rate. The **historical equity risk premium** may not adjust as quickly, but there is an expectation that investors will recalibrate their required returns over time.

  Key Precedent:

- **Damodaran's Implied Equity Risk Premium Model**: Financial professor Aswath Damodaran has shown in his analysis that when risk-free rates increase, the implied equity risk premium often adjusts downwards to reflect higher expected returns from safer assets, supporting the idea that the MRP is influenced by changes in risk-free rates.

- **Conclusion:**

  While there is not a universally accepted, strict rule that market risk premiums always decrease when risk-free rates increase, there is a body of theoretical and empirical evidence that supports the idea of an **inverse relationship** between risk-free rates and market risk premiums. The relationship is complex and depends on market conditions, investor behaviour, and broader economic factors, but precedents from financial models, academic studies, and regulatory contexts provide some support for this view.

The **validity and reliability of Damodaran's method** for calculating the **Market Risk Premium (MRP)** have been widely discussed in both academic and practitioner circles. Damodaran's method is based on an implied equity risk premium (ERP), using a **Dividend Discount Model (DDM)** framework that incorporates current dividend yields and earnings growth expectations. Here is an overview of research and analysis that has examined the strengths and limitations of this method:

20.2 Methods of estimating forward-looking MRP

Determining a forward-looking Market Risk Premium (MRP) involves using current market data, models, and expectations to estimate the excess return investors require for holding equities over risk-free assets. Here are several methods commonly used to calculate a forward-looking MRP:

1. Dividend Discount Model (DDM) / Gordon Growth Model

- **Approach**: The DDM estimates the expected market return by combining the current dividend yield with an assumed growth rate of dividends or earnings. The formula is:

  $$\text{Expected Market Return} = \text{Dividend Yield} + \text{Growth Rate}$$

  The MRP is then calculated as the difference between this expected market return and the current risk-free rate.

- **Application**: This approach relies on assumptions about future dividend growth, often based on historical averages or forecasts, which makes it responsive to current market valuations.

- **Limitations**: DDM is sensitive to assumptions about growth rates and may be biased by analyst projections, which can lead to inconsistencies if growth estimates are inaccurate.

2. Implied Equity Risk Premium (ERP) from Market Prices

- **Approach**: This method calculates the implied ERP based on current market prices and expected cash flows. By using a valuation model, such as a reverse-engineered DCF (discounted cash flow), the implied return on the market is derived by calculating the discount rate that equates the current market price to expected future cash flows.
- **Application**: This approach is widely used because it aligns with current investor expectations and market conditions, adjusting the MRP in real time as prices fluctuate.
- **Limitations**: Implied ERP models can be volatile, as they are sensitive to changes in market conditions, and can also be affected by the accuracy of cash flow projections and assumptions about discount rates.

3. Survey-Based Approach

- **Approach**: This method involves collecting MRP estimates directly from financial professionals, economists, and investors. Organizations such as CFA Institute, PWC, and other consulting firms conduct surveys to gather forward-looking MRP expectations.
- **Application**: Survey-based estimates are valuable because they incorporate the expectations of market participants, who consider both current market conditions and anticipated risks.
- **Limitations**: Surveys are subjective and can vary significantly depending on the participants' market outlooks, leading to a range of responses that might not reflect a consensus view.

4. Damodaran's Method

- **Approach**: Professor Aswath Damodaran calculates an implied forward-looking MRP by using an adjusted DDM on broad market indices, such as the S&P 500. Damodaran's method combines dividend yields, earnings forecasts, and long-term GDP growth to calculate an expected return.
- **Application**: This approach provides a reliable and regularly updated MRP estimate that reflects broad economic assumptions and is widely referenced.
- **Limitations**: Damodaran's method assumes a stable growth rate in perpetuity, which might not align with short-term market dynamics or accurately reflect changing economic conditions.

5. The Wright Approach

- **Approach**: Developed by Stephen Wright, this method assumes an inverse relationship between the MRP and the risk-free rate. As risk-free rates decline, MRP tends to increase, reflecting investor demand for higher risk compensation during low-interest-rate periods.
- **Application**: This approach aligns with the view that low bond yields indicate increased equity risk premiums. It is particularly useful when interest rates are unusually low or high.
- **Limitations**: The inverse relationship is not always consistent, and this method may be less applicable in stable or high-interest environments.

6. Adjusted Historical Average Method

- **Approach**: This hybrid approach takes historical MRP averages and adjusts them based on current market conditions, inflation expectations, or economic forecasts.
- **Application**: Some regulators and analysts prefer this method as it provides stability while incorporating forward-looking adjustments.
- **Limitations**: This approach may lag in reflecting real-time market changes since it relies partially on historical data.

7. Conditional Market Models

- **Approach**: Conditional models estimate MRP based on macroeconomic factors like GDP growth, inflation, or market volatility. The MRP is adjusted dynamically based on expected market conditions.
- **Application**: This approach can offer more precise MRP estimates during periods of economic volatility.
- **Limitations**: Conditional models are complex and require detailed economic data, making them resource-intensive and dependent on accurate economic forecasts.

Summary:

Each method has strengths and limitations, and many analysts and regulators use a combination of these methods to determine a forward-looking MRP that balances responsiveness with stability. For instance, IPART in Australia uses a mixed approach, combining both historical and forward-looking estimates, while many rely on Damodaran's implied MRP as a benchmark.

These methods reflect different views on how closely the MRP should track current market conditions, with the chosen approach often tailored to the specific needs of investors, analysts, or regulatory frameworks.

20.3 Validity of Damodaran's Method:

1. **Theoretical Basis**:
    - Damodaran's implied ERP is grounded in financial theory, using the DDM to calculate the expected return on equities based on current market valuations and forward-looking growth expectations. This method aligns with the principle that the market's current price should reflect the discounted value of expected future cash flows.
    - The model's validity rests on its assumption that growth rates and dividend yields reflect future market conditions. Studies like those by Claus and Thomas (2001) and Gebhardt, Lee, and Swaminathan (2001) support the DDM's use in estimating forward-looking ERPs, suggesting that these models can provide a reasonable approximation of investor expectations.
2. **Practical Use in Industry**:
    - Many practitioners and institutions, including investment firms, central banks, and consulting groups, utilise Damodaran's ERP estimates as a reference point, indicating broad acceptance and perceived validity in real-world applications. These estimates are frequently used alongside other models to verify MRP assumptions in valuation, mergers, and acquisition analyses.
3. **Alignment with Market Conditions**:
    - One of the strengths of Damodaran's method is its responsiveness to real-time market conditions. By using current market data (such as dividend yields and earnings forecasts), the implied ERP can adjust to fluctuations in the market, reflecting investor sentiment more dynamically than historical averages.
    - Bekaert and Harvey (2000) highlight that implied ERPs tend to align with periods of market volatility, meaning that Damodaran's method can capture risk expectations more effectively than backward-looking estimates.

Reliability of Damodaran's Method:

1. **Sensitivity to Assumptions**:
    - The method's reliability is often questioned due to its sensitivity to assumptions, especially regarding growth rates and dividend forecasts. Analyst biases and variations in growth assumptions can impact the implied MRP calculation, making it prone to fluctuation based on subjective inputs. Easton and Monahan (2005) found that variations in growth rate assumptions could cause significant differences in implied ERPs, potentially impacting reliability.

2. **Comparative Studies**:
    - Comparative analyses with historical MRP methods and other forward-looking models suggest mixed reliability. Studies like those by Fernández (2015) indicate that implied ERP estimates can sometimes deviate substantially from realized returns, particularly during market extremes or economic downturns. This deviation suggests that while Damodaran's method is useful, it may benefit from being used in conjunction with other estimation techniques.
3. **Critiques on Volatility and Stability**:
    - Critics argue that Damodaran's ERP estimates can be overly volatile, as they react to short-term market conditions. This can lead to abrupt changes in estimated MRPs, which may be less reliable for long-term planning and investment decisions. The Australian Energy Regulator (AER), for example, has highlighted this volatility in rejecting DDM-based approaches in favour of more stable, historically grounded MRP estimates.
4. **Academic Validation:**
    - Some studies, such as those by Harris and Marston (2013), have validated the implied ERP's value in capturing short-term investor expectations, finding it particularly useful in rapidly changing market environments. However, these studies also recommend using multiple MRP models to avoid over-reliance on any single estimate, especially during periods of economic uncertainty.

Conclusion:

Damodaran's method is widely regarded as a valid approach for estimating forward-looking MRPs, particularly for its ability to adjust to current market conditions. However, the reliability of the method is often challenged due to its sensitivity to input assumptions and potential volatility. As a result, it is commonly used alongside other models to triangulate a more stable and robust MRP estimate. Many regulators and practitioners rely on Damodaran's ERP as one part of a broader estimation process to balance accuracy with stability.