# Essential Services Commission

## Report on the Port of Melbourne's regulatory depreciation methodology

5 October 2021

**Final**

pwc

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# Key findings

## Background and engagement

The Port of Melbourne is regulated under the terms of a Pricing Order[1], a regulatory instrument which establishes the obligations of the Port and the jurisdiction of the Essential Services Commission (ESC), as an independent economic regulatory agency. The *Port Management Act 1995* (the Act), under which the Pricing Order is established, provides for the economic regulation of port services. The Act includes the statement that it is relevant legislation for the purposes of the *Essential Service Commission Act 2001* (the ESC Act).

The ESC has engaged PricewaterhouseCoopers Consulting (Australia) Pty Limited ("PwC") to undertake a review of the Port of Melbourne's approach to depreciation in respect of the pricing of Prescribed Services at the Port. This report has been requested as part of the ESC's first five year review of the Port's pricing practices.

Our analysis covers pricing practices up to the end of 2020-2021. The material we analyse for this report is contained in the Port's Tariff Compliance Statements (TCSs) up to and including its 2020-2021 TCS.[2] We have applied a particular focus to the 2020-2021 TCS as it contains information for the prior years, and matters raised by the ESC in respect of earlier TCS's appear to have been addressed by the Port by the time of the 2020-2021 statement.

The Pricing Order is a brief regulatory instrument, given the breadth of the principles and procedures it covers, and some interpretation issues arise. The objectives in section 48 of the Act are able to assist in applying the Pricing Order. The objective in section 48(1)(c) is, in part, contained in the principle applied by clause 2.1.1(a) of the Order.

Where we consider options in the application of the terms of the Pricing Order exist, we have sought to apply those terms in a context of the practical application and administration of a building block economic regulatory pricing regime.

***Has the Port, based on the information provided in its Tariff Compliance Statements during the period 1 July 2016 to 30 June 2021, demonstrated that its alternative depreciation methodology is consistent with the requirements of the Pricing Order?***

The Pricing Order envisages the default application of a particular form of pre tax building block methodology, within which depreciation would be calculated using a straight-line approach over a period no shorter than the reasonable economic life of the relevant assets, and no longer than the remaining term of the Port Lease. The depreciable capital base is defined by initial capital values included in the Pricing Order (refer clause 4.7) and then a conventional roll-forward procedure (refer clause 4.2.1).

The Port may adopt an alternative depreciation methodology, but only where it meets certain conditions as set out at clause 4.4.2.

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[1] Referring to the Pricing Order made under the *Port Management Act 1995*.
http://www.gazette.vic.gov.au/gazette/Gazettes2016/GG2016S201.pdf

[2] Our assessment in this report does not consider the more recent 2021-22 Tariff Compliance Statement. That Statement outlines a change in approach to depreciation, but that change applies only prospectively and beyond the term covered by the ESC's first five year review.
https://www.esc.vic.gov.au/transport/port-melbourne/port-melbourne-compliance-pricing-regulations#toc--tariff-compliance-statement-2017-18

In the 2020-2021 Port model, depreciation is calculated from capital base values and enters pricing calculations in an unusual manner. For the period 2017-2032, the straight line depreciation calculated for those years is not applied, but is accumulated, with the total accumulated value applied in 2033 (along with the depreciation charge calculated for that year). The calculated straight line depreciation charges from 2034 through to the end of the Port Lease are shown to be applied in a regular manner. Pricing impacts are not specified post 2021.

The Port's TCSs over the inquiry period present that its approach to depreciation constitutes an alternative to the straight line depreciation methodology and has, in effect, been initiated under, and is compliant with, clause 4.4.2(a) of the Pricing Order.

That clause provides for the Port to adopt an alternative where, in a Financial Year, the Aggregate Revenue Requirement (refer clause 4.1.1) calculated based on the application of the straight line depreciation methodology would exceed the Port's projected revenue for that year, as calculated from prices applied in the prior year escalated by CPI. The latter represents the effect of the Tariffs Adjustment Limit (TAL) specified in clause 3.1.1. The effect of this constraint must be such that the Port's return of capital derived using a straight line depreciation methodology is not capable of being recovered in the applicable Financial Year.

The default period over which the TAL constraint applies (refer clause 3.3.5) is 2017-2037, although on application by the Port, and on subsequent determination of the ESC under clause 3.3, the TAL could cease to apply as early as the 2033 Financial Year.

The Port has applied its particular depreciation approach as an alternative to the default straight line methodology on the basis that, in each Financial Year encompassed by the ESC's inquiry, its calculated Aggregate Revenue Requirement is shown to exceed the effective TAL revenue constraint, such that the Port's return of capital derived using a straight line depreciation methodology is not capable of being recovered in the applicable Financial Years. This is depicted in the Port's reference total revenue calculation provided at section 7.04, Alternative ARR Presentation, of the Required Revenue worksheet in the 2020-2021 Port model. This worksheet demonstrates that the Port's approach of applying a zero value for depreciation in its reference Aggregate Revenue Requirement calculation each of the Financial Years covered by the ESC's review complies with clause 4.4.2(a) of the Pricing Order.

In observing these matters in the Port model, other than where we expressly do so, we make no comment on the validity of the input values applied in the model, the arithmetic accuracy of the model, or the appropriateness of the output values calculated.

***Applying the alternative depreciation methodology, will the Port recover through depreciation charges an amount which is more than the value of the relevant assets at the time of their inclusion in the capital base?***

The Pricing Order at clause 4.4.1(c) provides that the Port may depreciate assets *"only once, meaning that the amount by which the asset or group of assets is depreciated over the Depreciation Period does not exceed the value of the asset or group of assets at the time of its or their inclusion in the capital base."*

The requirement that depreciation over the economic life of assets does not recover initial asset values more than once is typically a core principle of economic regulation. It affirms a key element of the financial capital maintenance foundations of required revenue calculations.

Because the building block methodology in the Pricing Order is predicated, amongst other things, on a current cost accounting (inflated) approach to determining Capital Base values in each Financial Year (clause 4.2.1), combined with a nominal rate of return value (clause 4.3.2), there is a need, at consolidation of component costs into aggregate required revenue at clause 4.1.1, to adjust for potential double-counting of inflation. This can be considered to be performed by clause 4.1.1(d).

Depreciation charges are determined by the Port using a straight line methodology over relevant depreciation periods in accordance with clauses 4.4.1(a) and (b). Depreciation charges based on the rolled forward capital base values from clause 4.2.1 include the effect of inflation.

The sum of such depreciation charges over the depreciation periods covered by the model accordingly yields a value greater than the sum of initial asset values (the value of assets at the time of their inclusion in the capital base).

From a direct, and narrow, approach to the condition in clause 4.4.1(c) – that the sum of depreciation charges not exceed that of the initial asset values – the Port's calculation of depreciation charges is not consistent with the requirement of that clause.

An alternative, and in our view more reasonable, approach is that when the inflation adjustment is taken into account, at the later stage of aggregate revenue calculation in clause 4.1.1, the sum of depreciation charges in the model, in real terms, would equate to that of the initial asset values. The Port's model includes formulas which, in effect, provide confirmation of compliance with this interpretation. We note this arrangement is similar to that in some other building block regimes that involve applying a nominal rate of return to inflated capital base values.

It should be noted that in the Port model, a zero value for annual depreciation is shown to be applied in respect of prescribed service pricing for each year until 2033. During that time, straight line depreciation charges determined by the model are retained in the capital base and are shown to be recovered as a lump sum at 2033. From 2033, the regular straight line depreciation charge calculated for each year through to the end of the port lease is then shown to be recovered. Our assessment of this matter is in relation to the depreciation charges as shown to be recovered in the model over the life of the assets. The real value of the amount recovered equates to the theoretical real recovery that would be achieved by applying the base year-to-year (2017-2066) straight line depreciation charges determined in the model. The real amounts recovered under both of these perspectives equate to the sum of the initial asset values.

***Is the application of a zero depreciation amount consistent with commonly applied regulatory, economic and accounting depreciation principles, and does the Port's approach constitute a 'methodology' in the context of those commonly applied principles?***

Frameworks for economic regulation of revenues and/or prices commonly target efficient cost recovery and in Australian regulatory regimes efficient costs are almost universally determined applying a building block approach.

Our review of Australian major economic regulatory regimes and regulator decisions in relation to depreciation indicates that the dominant depreciation approach is straight line depreciation, applied to an inflation adjusted asset base, in the context of the building block approach. The straight line approach is grounded in historical (accounting) practice and has been entrenched in the major economic regulatory regimes established largely since the 1990s.

Some alternative regimes to the building block approach exist and alternative depreciation methodologies are applied in some cases, such as the Total Service Long Run Incremental Cost (TSLRIC) method adopted in telecommunications and renewals annuity approaches applied in some parts of the water industry, amongst others.

Regulatory practice indicates that the return of capital component within the building block calculation can be determined on the basis of a wide range of depreciation methodologies, provided that accumulated depreciation under the methodology applied does not exceed the initial agreed or specified capital value of the assets.

Indeed, in its handbook released with the Post Tax Revenue Model (PTRM) building block model, the Australian Competition and Consumer Commission (ACCC) acknowledges that **"***Apart from this requirement not to double count, the time path for depreciation can be viewed as arbitrary.***"**[3]

The Act under which the Order is made provides for a form of economic regulation of the prescribed services. Economic regulation may accept a wide range of depreciation methodologies which comply with cost recovery principles and support revenue and price paths consistent with regulatory regime objectives. In this case, the regime and associated price path elements are specified by the Pricing Order. That framework includes the principle that the Port licence holder be allowed reasonable opportunity to recover the efficient cost of providing the prescribed services by application of the building block methodology specified in the Order. The Port's straight line deferred depreciation approach can be considered an alternative to the default straight line depreciation methodology in that particular regulatory context.

[3] ACCC (2001), *Post tax revenue handbook*, October, page 10

# Contents

# 1. Introduction

The Essential Services Commission (ESC) has engaged PricewaterhouseCoopers Consulting (Australia) Pty Limited ("PwC") to undertake a review of the Port of Melbourne's approach to depreciation in respect of the pricing of Prescribed Services at the Port. This report has been requested as part of the ESC's first five year review of the Port's pricing practices.

The ESC's inquiry covers the period of the first five years of the Pricing Order[4], commencing on 1 July 2016, and is in respect of information relating to the ESC's regulatory role for that particular five year period. Our analysis covers pricing practices up to the end of 2020-2021. The material we analyse for this report is contained in the Port's Tariff Compliance Statements (TCSs) up to and including its 2020-2021 TCS.[5]

The purpose of this report is to present our views on whether the depreciation methodology applied by the Port of Melbourne complies with the requirements of the Pricing Order.

The remainder of this report is structured as follows:

- Section 2 provides an overview of the regulatory framework applying to the Port of Melbourne, including the specific requirements of the Pricing Order, and introduces the Port's approach to depreciation in the context of setting charges for Prescribed Services
- Section 3 provides background to the economic, regulatory and accounting contexts in which depreciation may be applied, including discussing the various approaches adopted by Australian and international regulators to determining a depreciation expense within a building block approach to regulation
- Section 4 draws on that earlier material, and presents our assessment of the Port's approach to depreciation and its compliance with the requirements of the Pricing Order, and
- additional supporting material and analysis is presented in various appendixes, including a full list of the information provided by the Port to the ESC on which we have relied upon for this assessment.

[4] Referring to the Pricing Order made under the *Port Management Act 1995*. http://www.gazette.vic.gov.au/gazette/Gazettes2016/GG2016S201.pdf

[5] Our assessment in this report does not consider the more recent 2021-22 Tariff Compliance Statement. That Statement outlines a change in approach to depreciation, but that change applies only prospectively and beyond the term covered by the ESC's first five year review. https://www.esc.vic.gov.au/transport/port-melbourne/port-melbourne-compliance-pricing-regulations#toc--tariff-compliance-statement-2017-18

# 2. Background

## 2.1. Regulatory framework governing the Port of Melbourne

The Port of Melbourne is regulated under the *Port Management Act 1995* (the Act) which is relevant legislation for the purposes of the *Essential Service Commission Act 2001* (the ESC Act) and provides for the economic regulation of port services.

The Act and the ESC Act include provisions which have the effect of placing the prescribed services at the Port of Melbourne outside of the prescribed services price regulation provisions under Part 3 of the ESC Act.

The regulatory functions and powers of the ESC in relation to these Port of Melbourne services are prescribed by the Pricing Order made by the Governor in Council under section 49A of the Act. That section provides for the making of an Order for the regulation, in such manner as the Governor in Council thinks fit, of the prices for the provision of prescribed services.

Section 49A of the Act also provides in effect that an Order may declare whether the Order, compliance review (and related court enforcement of compliance) provisions of the Act, or market power review provisions of the Act, apply in relation to the provision of prescribed services.

Clause 1.1.2 of the Pricing Order declares that the Order, together with the compliance review and related enforcement provisions of the Act (Divisions 2A and 2B of Part 3), apply to the provision of prescribed services.

It also declares that the market power review provisions of the Act (Division 3 of Part 3) do not apply to these services.

The ESC's economic regulatory role is largely prescribed by, and contained within, the Pricing Order. The Pricing Order can be characterised generally as a 'light handed' monitoring regime. This can be contrasted with what is generally referred to as a 'heavy handed' regulatory regime, where regulatory authority extends to the setting and determination of revenues and/or prices.

Under Division 2A of Part 3 of the Act, Monitoring Compliance with Pricing Order, the ESC is required to conduct and complete an inquiry into the port licence holder's compliance with the Pricing Order every five years. Within six months after a five year review period, the ESC must report to the relevant Minister on whether the port licence holder has complied with the Pricing Order and, if there was non-compliance, whether that non-compliance was, in the ESC's view, 'significant and sustained'. The inquiry process in the Act is supported by information requirements applied to the Port by clauses 7-9 of the Pricing Order relating to Tariff Compliance Statements and the ESC's prescribed role in relation to those statements.

Our review has been requested as part of the ESC's inquiry process and is accordingly focused on the timeframe encompassed by the current inquiry, of the first five years of the application of Pricing Order, from 1 July 2016 to 30 June 2021. In considering the Pricing Order requirements in this report, we cover only those provisions which relate to determining or applying depreciation, or the return of capital.

## 2.2. Requirements of the Pricing Order

The Pricing Order is a brief regulatory instrument, given the breadth of the principles and procedures it covers, and some issues or questions about approach arise. The objectives in section 48 of the Act are able to assist in interpreting the Pricing Order. The objective in section 48(1)(c) is, in part, contained in the principle applied by clause 2.1.1(a) of the Order.

The Pricing Order is an economic regulatory instrument and we have applied an economic perspective to the principles and procedures set out in the Order which apply to the regulated entity in relation to the pricing of the provision of prescribed services and to the ESC in performing its prescribed role in regulating those prices.

Where we consider options in the application of the terms of the Pricing Order exist, we have sought to apply those terms in a context of the practical application and administration of a building block economic regulatory pricing regime.Building block principles are incorporated into the central clause of the Pricing Order relating to our review, clause 4, *Pricing Principles: Cost base for Setting Prescribed Service Tariffs*. The application of building block and related economic principles in this exercise must however be in accordance with the terms of the Pricing Order.

***Table 1: Summary of the requirements of the Pricing Order***

| **Pricing Order element** | **Discussion** |
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| **2. Pricing Principles: General** | |
| 2.1 Prescribed Service Tariffs Pricing Principles | Clause 2.1.1 Prescribed Service Tariffs must be set so as:<br><br>*"(a) to allow the Port Licence Holder a reasonable opportunity to recover the efficient cost of providing all Prescribed Services determined by application of an accrual building block methodology of the type described in clause 4 (Aggregate Revenue Requirement); …"*<br><br>While this clause refers to a non-specific outcome, it contains a general pricing principle, which encompasses the concept of the efficient cost of services. This concept underpins major economic regulatory regimes in Australia. For example, in Part IIIA, Access to Services, of the *Competition and Consumer Act 2010* (CC Act), and in the Electricity and Natural Gas Rules. |
| **4. Pricing Principles: Cost base for Setting Prescribed Service Tariffs** | |

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| 4.1 General - Accrual Building Block Methodology | Clause 4.1.1 sets out the Accrual Building Block Methodology to determine the Aggregate Revenue Requirement over a Regulatory Period. The methodology as set out comprises four building block elements summarised as follows:<br>(a) an allowance to recover the return on the capital base (clauses 4.2 and 4.3);<br>(b) an allowance to recover the return of capital (clause 4.4); and<br>(c) an allowance to recover forecast operating expenses (clause 4.5); less<br>(d) an indexation allowance (clause 4.6).<br>Three of the building block elements/allowances are additive in the calculation of Aggregate Revenue Requirement, while the indexation allowance is a deduction. Clause 4.1.1 does not prescribe all details for determining the indexation allowance for the context above and for applying the deduction at clause 4.1.1(d). Such arrangements, typically to a higher degree of specificity, are not uncommon in Australian economic regulatory regimes.<br>Arrangements similar to clause 4.1.1(d) are generally applied in order to address issues with some applications of current cost accounting (CCA) processes for rolling forward regulatory asset values, in combination with applying a nominal value for the rate of return. The Pricing Order regime could be interpreted as such an application (see the operation of clauses 4.2.1 and 4.3.2 below). Unless the effect of inflation is 'backed-out' of the returns otherwise determined, capital values recovered, by including the effect of inflation, can exceed amounts initially invested, even after adjustment for the opportunity cost of capital.<br>A conventional building block perspective on the application of the indexation allowance in clause 4.1.1 is that it is to be calculated by reference to the capital base value in the Financial Year concerned by applying the percentage values determined under clause 4.6, with the result then deducted expressly from the return of capital building block allowance at clause 4.4.1(b).<br>Notably, the Post Tax Revenue Models (PTRMs) used by the Australian Competition and Consumer Commission (ACCC) and the Australian Energy Regulator (AER) do not apply this specific procedure, as the PTRMs use a different roll-forward mechanism. It is however not uncommon, for example, the Queensland Competition Authority (QCA) has adopted this approach for determinations relating to the Dalrymple Bay Coal Terminal and the Aurizon Network. |
| 4.2 Capital Base | In relation to the issue of the return of capital, clause 4.2.1 provides that the capital base must be rolled forward and indexed (inflated) for each Financial Year:<br>The initial capital base value at commencement of the Pricing Order is given by clause 4.7.<br>The roll forward incorporates efficient and prudently incurred capital expenditure, which encompasses PCP Capital Expenditure, the definition of which in clause 14 includes a prescribed value for such expenditure as at 30 June 2016. That value can be added to the total value in clause 4.7 to form the effective initial capital base value at the commencement of the Pricing Order While we note that this 30 |

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| | June 2016 value may be included, we make no comment on the efficiency or prudency of the capital expenditure included in the rolled forward capital base values.<br><br>Clause 4.2.1(d) provides that the return of capital allowance is to be deducted from the rolled forward and inflated capital base. |
| 4.3 Return on Capital | Clause 4.3.1 specifies that the rate of return on capital used must be *"one or a combination of well accepted approaches that distinguish the cost of equity and debt, and so derive a weighted average cost of capital."*<br><br>The weighted average cost of capital is a related issue in terms of our review of depreciation, due to its potential to affect the application of clauses relating to depreciation through clause 4.4.2(a) discussed below. We make no comment on the appropriateness of the rate of return approach or values applied by the Port, other than the matter of form prescribed by clause 4.3.2.<br><br>Clause 4.3.2 requires that the rate of return must be determined on a pre-tax nominal basis.<br><br>Clause 4.3.2, combined with clause 4.2.1 above, can be considered to set out a CCA basis for determining regulatory asset values rolled forward, which combined with the application of a nominal rate of return value, requires that inflation be backed-out of calculated returns in order to avoid over-recovering asset values (the inferred procedure discussed in relation to clause 4.1.1(d) above). |
| 4.4 Return of Capital | Clause 4.4.1 provides that depreciation must be applied to assets so that they are depreciated using a straight line depreciation methodology:<br><br>● over a prescribed Depreciation Period (clause 4.4.1(a) and 4.4.1(b)); and<br>● *"only once, meaning that the amount by which the asset or group of assets is depreciated over the Depreciation Period does not exceed the value of the asset or group of assets at the time of its or their inclusion in the capital base"* (clause 4.4.1(c)).<br><br>Because the return of capital is calculated based on asset values that are inflated over time (from clause 4.2.1(b)) the resulting depreciation calculations to allocate the cost of assets across Depreciation Periods will accordingly incorporate the effects of inflation, the total return of capital over the Depreciation Periods for assets concerned could be expected to exceed *"the value of the asset or group of assets at the time of its or their inclusion in the capital base".*<br><br>A literal reading of clause 4.4.1 in combination with clause 4.2.1(b) suggests that the Pricing Order cost base provisions, by default, lead to the infringement of clause 4.4.1(c). Clause 4.4.1 provides for the calculation of depreciation charges for determining the return of capital allowance to be deducted from the nominal capital base values in clause 4.2. For consistency, the depreciation charges forming the return of capital allowance would accordingly be expressed in nominal terms. Nominal values are converted to real values under clause 4.1.1, which is a later stage of calculating the Aggregate Revenue Requirement than clause 4.4.1. The conversion of nominal to real values would be performed by clause 4.1.1(d). |

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| | While there is a lack of specificity in 4.1.1 about precisely how the nominal values from clauses 4.2 - 4.4, and potentially clause 4.5, are to be affected by the indexation allowance adjustment at 4.1.1(d), a broader approach to that clause is that it is to operate in a similar way to some other regimes that involve the application of a nominal rate of return to a current cost accounting asset base. In such regimes, the backing-out of inflation in the manner described above from the return of capital building block element, can result in a total value of the return of capital over economic life equaling the value of the assets when they first became regulated. This specific calculation process is not set out in the Pricing Order but it can be inferred to apply in this case based on conventional building block practice.<br><br>Clause 4.4.2 clause provides for an alternative, or alternatives, to the straight line depreciation methodology, to be applied under specific circumstances.<br><br>The optionality introduced by clause 4.4.2 appears to relate to the straight line depreciation methodology and not in respect of:<br><br>● the Depreciation Period in clause 4.4.1(a) and (b); and/or<br>● the "only once" condition in clause 4.4.1(c).<br><br>This approach is based on the structure of clause 4.4.1 and is supported by conventional regulatory practice. Recovery over the economic life of amounts initially invested is typically a core principle of economic regulatory regimes which apply the building block approach. It also is an element of the fundamental economic test of the efficacy of the application of a building block approach to regulated revenues and prices, that the efficient amounts initially invested are exactly recovered over economic life when discounted at the opportunity cost capital (ie, the so-called "NPV=$0" principle of economic regulation).<br><br>Our view of the limited optionality provided by clause 4.4.2 is consistent with the manner in which similar provisions in other regulatory regimes have been applied, for example:<br><br>● section 8.33 of the Victorian (later, National) Gas Code for Natural Gas Pipeline Systems, a seminal regulatory instrument; and<br>● equivalent provisions under the current National Gas Rules (Rule 89).<br><br>The specific circumstances under which clause 4.4.2 clause may be applied are:<br><br>● *"the application of clause 3.1.1 means that the return of capital derived using a straight-line depreciation methodology is not capable of being recovered in the applicable Financial Year"* (clause 4.4.2(a)); or<br>● *"the alternative depreciation methodology is reasonably likely to reduce the variance in the expected annual percentage changes in the level of Prescribed Services Tariffs through to the end of the Port Lease"* (clause 4.4.2(b)).<br><br>Clause 4.4.2(a) only applies during the Tariffs Adjustment Limit (TAL) period as determined under clause 3.3, and is presently set by the operation of clause 3.3.5, to cease in 2037. |

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| | Clause 4.4.2(a) is unusual in that a pricing constraint such as that applied by the TAL would, under generally accepted principles of corporate finance, first impact the return on capital, rather than the return of capital. It is, however, clear that the return of capital is the relevant factor in this case.<br><br>We understand clause 4.4.2(b) to be available at any time – either during the TAL period, or after the conclusion of the TAL in 2037 through to the end of the Port Lease.<br><br>Clause 4.4.2(b) requires that the alternative depreciation methodology be *"reasonably likely to reduce the variance in the expected annual percentage changes in the level of Prescribed Services Tariffs"*.<br><br>This assessment period is not clearly specified. In our view it is reasonable to consider the term *"through to the end of the Port Lease"* to cover the period commencing prior to the transition from the pre-existing methodology to the new methodology.<br><br>Clause 4.4.3 requires that the return of capital allowance in any Financial Year must not be below zero.<br><br>Similar to clause 4.4.2, such a clause is unusual in economic regulatory regimes. For example, the process of "normalisation", used in the past by the ACCC to establish price paths to promote the efficient growth of services and the efficient use of regulated assets, can present negative depreciation charges, particularly in early years. |

## 2.3. The Port of Melbourne's Approach

### 2.3.1. Basis for adopting an alternative approach to depreciation

The Port of Melbourne approach to depreciation in respect to the pricing of Prescribed Services regulated under the Pricing Order is described in its various TCSs and other supporting documentation.

Because our review has been requested as part of the ESC's inquiry under section 49I of the Act into the Port's compliance with the Pricing Order – to be conducted in relation to the five years from the initial application of the Order – our assessment covers the period to the end of 2020-2021. Accordingly, the information we have considered is contained in the Port's TCSs up to and including the 2020-2021 TCS.

We have applied a particular focus to the 2020-2021 TCS given that material in that statement contains information for the prior years, and that matters raised by the ESC in respect of earlier TCS's appear to have been addressed by the Port by the time of the 2020-2021 statement.

Issues raised by the ESC in the past have included particular matters regarding complexity and presentation in the Port's regulatory model. In its *Interim commentary, Port of Melbourne tariff compliance statement 2019-20*, 16 December 2019 (Interim Commentary 2019), for instance, the ESC comments as follows:

> *In response to our feedback, the port submitted a revised, simpler and more transparent regulatory model and user guide. The revised structure of the model clearly distinguishes inputs, calculations and outputs with common formatting, and includes explanatory notes in each of the tabs. Further, the model covers the full 50-year port lease period, which gives greater transparency in its calculation of how asset values might change when the tariff adjustment limit (TAL) does not apply and the impact of deferred depreciation on the capital asset base in the post-tariff adjustment limit period. The port has reduced the complexity of the calculation of asset values in its model.*[6]

The model version supporting the 2020-2021 TCS embodies the same structure and processes as the 2019-2020 version commented by the ESC above and can be considered to present the clearest perspective of the operation of the Port's approach to depreciation for the specific period covered by the ESC's current inquiry.

The 2020-2021 Tariff Compliance Statement General Statement 31 May 2020 describes the Port's general approach to depreciation as follows;

> *… as per the 2019-20 TCS PoM has adopted an alternative to straight-line depreciation, by setting depreciation to zero. This approach has been adopted on the basis that Prescribed Services revenue is currently not sufficient to recover straight-line depreciation, in accordance with the Pricing Order.*[7]
>
> *PoM has determined the forecast rolled forward values of its capital base … by:*
>
> *….*
>
> - *deducting depreciation (i.e. the return of capital allowance). However, because in 2017-18, 2018-19, 2019-20 and 2020-21 PoM's Prescribed Services revenue (subject to the TAL) plus revenue from legacy contracts is below the ARR …., PoM has used an alternative depreciation*

[6] Interim commentary, Port of Melbourne tariff compliance statement 2019-20, ESC, 16 December 2019, page 32
[7] 2020-2021 Tariff Compliance Statement General Statement, Port of Melbourne, 31 May 2020, page 7

*methodology, which involves setting the return of capital to zero and deferring recovery of depreciation to future years.* [8]

*Importantly, the unrecovered depreciation balance sits within the capital base. That is, the capital base for a given year includes any unrecovered straight-line depreciation from prior years. 'Unrecovered depreciation' is simply another way of presenting a portion of the remaining value of the asset base, which remains within the capital base until it is recovered through the return of capital component of the ARR.* [9]

The approach to depreciation to which the comments from the General Statement above relate is contained in the *PoM Regulatory Model 2020-2021* (which forms Appendix B of the 2020-2021 General Statement).

Our analysis of this model sought to establish whether the general procedures applied by the Port in relation to depreciation and the return of capital comply with the requirements of the Pricing Order. Our analysis did not constitute a full model review or involve verification of model inputs, outputs and calculations generally. The procedures we analysed in the model are only those that have bearing on the calculation and application of depreciation and the return on capital within the economic regulatory context of the Pricing Order.

### 2.3.2. Overview of the Port's regulatory model and ARR calculations

The Port's regulatory model calculates straight line nominal depreciation for each Financial Year to the end of the applicable Depreciation Period by class of asset.

In general terms, as presented in the TCS General Statement, the model applies a zero value for depreciation in place of the annual straight line depreciation charge otherwise determined. In the model, zero depreciation is applied, until 2033.

The capital base value on which the return on capital allowance is determined is rolled forward, adjusted for capital expenditure and indexation, but the calculated straight line depreciation charges are not deducted from the capital base values.

In 2017 to 2032, the calculated annual straight line depreciation charges are sent to an unrecovered depreciation balance, which is maintained in nominal terms.

This balance of rolled-forward, accumulated and inflated depreciation values is a mirror of the depreciation charges that are notionally retained in the capital base, until 2033.

At 2033, the accumulated nominal unrecovered depreciation balance is shown to be recovered as a lump sum amount, along with straight line depreciation for that year. From 2034, straight line year-to-year depreciation charges are applied in a regular manner. The capital base accordingly commences to depreciate, through to the end of the Port Lease.

#### *Capital Base*

The model processes are reflective of clause 4.2.1 in relation to a CCA capital base roll forward. The return of capital allowance (clause 4.2.1(d)) is not deducted – at least not until 2033, according to the information contained in the model.

[8] 2020-2021 Tariff Compliance Statement General Statement, Port of Melbourne, 31 May 2020, page 36
[9] 2020-2021 Tariff Compliance Statement General Statement, Port of Melbourne, 31 May 2020, page 48

### *Return on Capital*

Weighted average cost of capital values applied in the model are identified as pre tax nominal values in the TCS General Statements (clause 4.3.2).

### *Return of Capital*

Depreciation charges determined in the model are calculated using a straight line methodology over relevant Depreciation Periods, in accordance with clauses 4.4.1(a) and (b).

The depreciation charges incorporate the effect of indexation, a factor relevant to consideration of compliance with clause 4.4.1(c).

The port's 'trigger' for the application of clause 4.4.2(a), in relation to the application of an alternative to the straight line depreciation methodology, appears to be the calculations made in section 7.04 of the Required Revenue worksheet of the model, as discussed below. Clause 4.4.2(b) has not been relied on by the Port as a basis for its alternative depreciation methodology, and interpretation or application of this clause is not covered in this report.

The information in the model suggests capital values do not commence to be returned to the Port until 2033.

### *Accrual Building Blocks*

Section 7.03 of the Required Revenue worksheet of the model, *Aggregate Revenue Requirement (ARR)*, adopts a general building block format depicting the Required Revenue by Financial Year on a basis that is broadly similar to the structure of clause 4.1.1.

In section 7.03, the sum of depreciation charges shown for a particular Financial Year, within the relevant review period, represents the entire amount that would need to be recovered in that year in order to discharge all accumulated depreciation to that point in time.

***Table 2: PoM - Regulatory Model 2020-21 TCS - Table 7.03, Aggregate Revenue Requirement (ARR)[10]***

| **ARR Component ($ million)** | **2017** | **2018** | **2019** | **2020** | **2021** |
|---|---|---|---|---|---|
| Return on Capital | 481.9 | 495.3 | 511.3 | 481.7 | 425.1 |
| (+) Return of Capital | 295.7 | 208.8 | 117.1 | 123.8 | 130.5 |
| (+) Recovery of Previously Unrecovered Depreciation | - | 302.0 | 520.5 | 646.1 | 786.8 |
| (+) Forecast Operating Expenses | 134.0 | 126.4 | 124.5 | 128.6 | 133.9 |
| (-) Indexation Allowance | (54.8) | (91.3) | (84.4) | (61.4) | (104.3) |
| **Aggregate Revenue Requirement** | **856.9** | **1,041.3** | **1,189.0** | **1,318.8** | **1,372.0** |
| (-) Forecast Revenue | (333.1) | (364.1) | (362.8) | (389.7) | (365.3) |
| **Under-recovery of Aggregate Revenue Requirement** | **523.8** | **677.2** | **826.2** | **929.1** | **1,006.7** |

[10] Appendix B - PoM - Regulatory Model - 2020-21 TCS - PUBLIC v2.xlsx, Required Revenue worksheet

Section 7.04 of the Required Revenue worksheet, *Alternative ARR Presentation*, is an adaptation of the table in section 7.03. Essentially, it is the same as the table in 7.03, except that in the period covered by the ESC's inquiry, the table in section 7.04 excludes depreciation/return of capital values and accordingly arrives at different Aggregate Revenue Requirement values.

The total value determined in section 7.04 is the reference total revenue calculation used to determine any Under-recovery of the Aggregate Revenue Requirement, for the purposes of clause 4.4.2(a).

***Table 3: PoM - Regulatory Model 2020-21 TCS - Table 7.04, Alternative ARR Presentation*** [11]

| ARR Component ($ million) | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|
| Return on Capital | 481.9 | 495.3 | 511.3 | 481.7 | 425.1 |
| (+) Return of Capital | - | - | - | - | - |
| (+) Forecast Operating Expenses | 134.0 | 126.4 | 124.5 | 128.6 | 133.9 |
| (-) Indexation Allowance | (54.8) | (91.3) | (84.4) | (61.4) | (104.3) |
| **Aggregate Revenue Requirement (excluding unrecovered depreciation)** | **561.1** | **530.5** | **551.4** | **548.9** | **454.7** |
| (-) Forecast Revenue | (333.1) | (364.1) | (362.8) | (389.7) | (365.3) |
| **Unrecoverable Aggregate Revenue Requirement (not available for future recovery)** | **228.1** | **166.4** | **188.6** | **159.2** | **89.4** |

The values contained in Tables 2 and 3, the labelling of data rows, and the general presentational format is taken from the 2020-21 Port model. We do not express a view about the model values shown.

In section 4 of the report we comment on the ESC's finding in 2019 that the presentational format used in Table 7.03 had the effect of materially misrepresenting the port's revenue requirement, and that this issue had been addressed by the Port adopting the format as used in Table 7.04. Table 7.04 in the 2020-2021 Port model embodies a clear presentation in terms of the matters commented on by the ESC in 2019 and depicts the Port's stated approach of setting depreciation/return of capital values to zero in place of the straight line depreciation charges otherwise determined over the first five years of the application of the Pricing Order.

[11] Appendix B - PoM - Regulatory Model - 2020-21 TCS - PUBLIC v2.xlsx, Required Revenue worksheet

# 3. Conceptual foundations

## 3.1. Different contextual settings for depreciation

Depreciation measures the decline in service potential of an asset as a result of wear and tear, ageing or obsolescence. In a financial sense, depreciation is that amount allocated during the current period to amortise the cost of acquiring assets over their useful life.

Depreciation is an imputed cost, introduced to take account of the fact that the economic life of capital assets is limited, and to distribute their decline in value, which is a genuine cost of production, over their economic life so as to allow for cost recoupment from customers.[12]

Depreciation is often linked to the concept of asset consumption, which closely resembles the concept of economic depreciation described above. Asset consumption refers to the idea that providing services "uses up" service potential in a capital asset that otherwise could be allocated to future users, and therefore "consumes" a portion of the value of the asset.

To understand depreciation further requires an understanding of the different contexts in which it might be applied or referenced:

- accounting depreciation (or depreciation for financial reporting purposes) is based on the systematic allocation of an asset's carrying value, less the amount expected to be recovered at the end of its useful life, over its estimated remaining useful life
- economic depreciation, measures the change in economic value of an asset over a defined period, reflecting the change in the value of the remaining service potential of that asset
- regulatory depreciation, represents the change in regulatory asset valuations between two points in time, and also forms a core element of the contemporary "building block" approach to monopoly regulation and pricing
- tax depreciation, or that amount of non-cash expense permitted by tax statutes to be offset against earnings to lower "taxable" income and which, through mechanisms such as accelerated amortisation, can be used to shift taxable income from one period to another and influence the timing of tax payments.

When we use the term "conventional depreciation", we mean asset consumption costs estimated using an approach methodologically similar to that used to estimate depreciation for accounting/reporting purposes. There is a deal of complementarity and use of terminology similar to that used from an accounting/financial reporting perspective. For this reason, we have included a discussion of depreciation issues from an accounting/financial reporting perspective at Appendix A.

Conventional approaches to depreciation are fundamentally about cost allocation. That is, they primarily rely on a process for allocating costs (whether historic/actual acquisition costs, current replacement costs or even some measure of fair value) over an accounting period using a particular formula.

The progressive "using up" of an asset, as reflected by the prorating of its cost/value, along with other expenses, is matched against the revenue the asset earns in each accounting period. The objective is to

[12] Kahn, A. E. (1990), *The economics of regulation – principles and institutions*, Massachusetts Institute of Technology, Third Printing

portray a more accurate picture of the financial position of the reporting entity, and seek to balance costs in each period – including non-cash depreciation costs – against revenue earned over the same period.

## 3.2. Application of conventional depreciation approaches

Conventional approaches have their genesis in financial reporting obligations, but more recently have also been used for other purposes, including for financial and economic performance monitoring and comparisons and for regulatory pricing determinations for monopoly utility businesses.

Conventional depreciation approaches comprise four key elements:

- what asset base (valuation) should be used to measure depreciation?
- over how long a time period?
- using what pattern of charges?
- to give what “residual” value at the end of the asset’s useful life?

***Table 4: Components of a conventional depreciation methodology***

| Depreciation component | Discussion |
|---|---|
| Depreciation base | Traditionally depreciation was calculated using historic or acquisition costs as the "depreciable amount". This reflected a view that businesses should be permitted to recover only those "dollars originally invested, no more and no less".[13]<br><br>More recently, and in combination with moves to reporting on a deprival value/current cost accounting, entities have adopted the current replacement cost of assets as a base for depreciation calculations. The advantage of using current cost valuations is that the asset consumption charge more closely reflects the opportunity cost of that consumption, or the cost of replacing that service potential now, which might be quite different from the historic costs of its acquisition. |
| Useful life | Under conventional depreciation methodologies the depreciable amount of an asset needs to be allocated across its estimated useful life. An asset's useful life is usually expressed in units of time (eg, a useful life of 50 years), though for some types of assets might more appropriately be measured by units of output (eg, number of operational hours for a pump, numbers of equivalent axle loads for a pavement etc) or some other metric.<br><br>The useful life for an asset is generally determined by four key influences:<br>● physical life – or the duration the asset is expected to last physically, assuming some level of maintenance (similar to its engineering life)<br>● technical life – the period of time the asset is expected to remain technologically efficient, or that amount of time until the asset is expected to be made redundant by a new, improved technology<br>● commercial or economic life – the period of time corresponding to the commercial sustainability of the outputs produced by the asset, such as where a water pipeline is used to supply a mine with a finite commercial life<br>● legal life – the period of time where an asset is legally able to be used, on account of access to certain (time-limited) rights or entitlements.<br><br>Estimating the useful life for infrastructure assets can be quite difficult. Various constructed assets can have engineering lives extending to more than 100 years, although for "active" assets such as mechanical/electrical components, the period to engineering obsolescence may be relatively short, perhaps only 10-15 years. Understating or overstating the useful life of an asset can have a large impact on the estimated annual asset consumption charge, and also on the estimated degree to which an asset has depreciated from its current value. |

[13] Kahn, A. E. (1990), *The economics of regulation – principles and institutions*, Massachusetts Institute of Technology, Third Printing

| | |
|---|---|
| Pattern of charges | Total depreciation over an asset's life should equate to the total change in value of the asset, from its original cost/value to scrap value. Yet there are a number of different ways in which depreciation charges might be allocated in each individual period, which still achieve this outcome. Common approaches to allocating depreciation across periods include:<br>● straight line - allocating the asset's value (less its estimated residual or salvage value) equally to each year of its remaining useful life<br>● diminishing value - using a constant fraction of the opening value (depreciable amount) in each year, thereby "front-loading" depreciation expense to the earlier years of operation, with the depreciation charge declining towards the end of the asset's life.<br>By far the most common approach adopted in the infrastructure sector is straight line depreciation. This approach also has been applied by the Port of Melbourne for statutory financial reporting purposes. |
| Residual value | Estimating the residual value of an asset at the end of its useful life can be quite difficult. It relies on present judgements about future market conditions, the rate of technological advancement, changes in consumer preferences and so on, in some cases requiring these judgements to be projected forward to a time perhaps 50 or more years into the future.<br>Given these difficulties, residual values are frequently either left out of depreciation calculations altogether, or included only as a "scrap" value, based on an estimate of today's salvage value for a similar asset at the end of its useful life or the cost savings equivalent to the future construction of a 'new' asset in a brownfields configuration.[14] |
| Accumulated depreciation | Depreciation measures not only the annual (or period to period) decline in service potential of an asset, but over time the amount of accumulated depreciation represents the degree to which an asset has depreciated from its "new" condition. The amount of accumulated depreciation therefore determines the carrying value or written down value for an entity's assets. Overstating or understating depreciation expenses in any one period will not only bias the estimate of total operating costs in that period, but also affect the allowable return on capital which, typically, is determined against the written down value of assets.<br>Tracking the balance of accumulated depreciation under conventional approaches is relatively straightforward, and complicated only where there is a revaluation of the underlying assets. In this case, the balance of accumulated depreciation commonly is re-estimated using the new estimate of current replacement cost, and estimates of engineering and remaining useful lives (assuming a straight line approach to depreciation allocation). |

[14] [redacted]

## 3.3. Application by economic regulators

### 3.3.1. Economic context to regulatory determinations of depreciation[15]

Prior to major Australian infrastructure regulatory reforms in the 1990's, which largely stemmed from the National Competition Policy Review Report (Hilmer Report) of August 1993 and related Council of Australian Governments initiatives, price regulation roles were most commonly performed by portfolio Ministers in relation to publicly owned significant infrastructure and service industries. Where cost information was submitted for consideration and approval, it generally incorporated straight line depreciation on a historical cost basis in accordance with relevant Government guidelines and then prevailing accounting standards.

The *Trade Practices Act 1974* and the *Prices Surveillance Act 1983* established important national regulatory frameworks and independent economic regulatory bodies. State-level frameworks and agencies were also established in the 1980s and 1990s. Economic regulatory bodies established played key roles in relation to infrastructure industry reform, and in related privatisations of Government-owned enterprises.

Most of the early regulatory pricing decisions made under the major regulatory frameworks established in the 1990's involved application of the building block cost of service approach to price regulation. Some significant industries, such as telecommunications, were initially subject to independent regulation under different frameworks (such as frameworks focussing on particular incentive mechanisms, or on incremental costing approaches). Over time however Australian economic regulatory pricing frameworks have, with a few exceptions, adopted various forms of building block approach.

Regulated Infrastructure industries such as telecommunications, electricity networks and railways are highly capital-intensive, and a significant proportion of costs are determined by the charge for depreciation. Depreciation, in combination with profit, provides the return to capital enjoyed by a business.

Depreciation is therefore linked directly to the business return on capital as:

- for regulated businesses, regulators almost universally have elected to calculate the return on capital against the written down value of assets (exclusive of accumulated depreciation), and
- the rate at which a business recovers its investment (return of) affects the perceived riskiness of the investment and hence the appropriate return on capital sought by the business.

### 3.3.2. Regulatory practice – initial predominance of straight line depreciation

Straight line depreciation continued to be the default depreciation methodology under economic regulatory regimes introduced in the 1990s.

An important step was taken by the parallel October 1998 determinations of the Office of the Regulator General, Victoria and the Australian Competition and Consumer Commission (ACCC) in relation to pricing of the distribution and transmission sectors of the Victorian Natural Gas Industry.

These decisions established important bases for applying current cost accounting, rather than historical cost accounting, to straight line depreciation calculations. They also adopted a pre tax approach to WACC, rather

[15] This section of the report comments on major decisions, instruments or regulatory regimes which, in our view, are relevant to the assessment of the Port's depreciation approaches. A list of the regulatory decisions and instruments we reviewed to inform this review is provided at Appendix B.

than a post tax WACC (the latter in effect requiring taxation to be included in cashflows). These decisions accordingly involved the combination of a real pre tax WACC and a CCA asset base roll-forward.

The ACCC's June 2000 decision on access arrangements for the Central West Pipeline (CWP) can be considered the first major building block decision to involve a material departure from the application of straight line depreciation.

From the starting point of total revenue determined based on straight line depreciation calculated from an inflation-adjusted asset base, the ACCC developed a "levelised" price path, with depreciation calculated as a residual. The form of depreciation applied in this case was characterised by the ACCC as economic depreciation:

> *AGLP's economic depreciation approach is intended to allow AGLP to subsequently recoup these under-recovered revenues and have the opportunity to earn a revenue stream that covers efficient costs over the life of the asset. The methodology results in negative depreciation during the first phase, which has the effect of increasing the asset value for regulatory purposes. The residual value at the end of the initial access arrangement period is greater than the initial capital base at the start of the period. Similarly, the initial capital base is greater than the actual cost of the assets as a result of negative economic depreciation in the first period of operation. This approach is considered reasonable for the CWP….* [16]

### 3.3.3. Post tax regulatory models

In October 2000, the ACCC released its Post Tax Revenue Model (PTRM), which provided a template building block approach for revenue and/or price regulation applicable to a 'range of Australian utilities'. The model incorporated general functionality that had underpinned the CWP final decision calculations.

In adapted forms, the PTRM continues to apply to major regulatory revenue and pricing decisions by the ACCC and the Australian Energy Regulator (AER), across a broad range of regulated industries.

The PTRM was instrumental in establishing the Australian regulatory practice of performing building block calculations on a post tax basis, in that the WACC value driving the return on assets building block is a form of post tax WACC (nominal vanilla WACC), with taxation a separately calculated cashflow.

The basic PTRM building block calculations apply straight line depreciation calculated from an inflation-adjusted asset base in accordance with CCA principles.

Total revenue and price smoothing applies to deal with matters such as operating cost and demand quantity variations within a regulatory period. The smoothing function does not affect depreciation charges.

The levelisation function, which is no longer a feature of current PTRMs, similar to the case of the CWP final decision, could apply a materially different depreciation profile than straight line depreciation.

Levelisation involves application of a sculptured revenue or price path that need not match costs on a year-to-year basis (but must exactly match costs over the life of the assets concerned, so that the tests of NPV=$0 and the "only once" condition are satisfied). As noted, depreciation charges under levelisation are back-solved from the chosen price/total revenue path.

In the initial PTRM, levelisation was applied to depreciation charges to address issues in relation to taxation cashflows. Potentially, this was in order to deal with issues at the time relating to new natural gas pipelines

[16] Final Decision, Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline, ACCC, 30 June 2000, page 53

becoming covered by regulation, changes in tax policy, combined with the transition to the new post tax regulatory framework:

- prior to the PTRM, a pre tax WACC was typically applied, with tax included in total revenue through the application of the pre tax WACC to capital base values.
- the PTRM established the convention of applying a post tax WACC to capital base values, with taxation included as a specific building block cashflow.
- where a new infrastructure facility becomes subject to the regulatory regime, given accelerated tax depreciation, the notional tax value calculated may be negative in early years and positive in later years. Levelisation applied in the initial PTRM allowed material smoothing to occur between years and potentially between regulatory periods.

Regulatory adoption of the PTRM and/or its basic procedures has meant that domestic regulators have tended to apply capital charges in building block calculations based on straight line depreciation (on an indexed, depreciating capital base) combined with a nominal return on capital. This results in relatively flat capital charges over the life of assets, unlike a straight line historical cost accounting method, which produces 'front-loaded' capital charges.

### 3.3.4. Sector-specific application

#### *Natural Gas*

The PTRM continues to apply to natural gas pipeline systems. The National Gas Rules require it to be used by full regulation pipelines in preparing price proposals to the AER. It should be noted however that a limited number of natural pipeline systems remain subject to full regulation. The natural gas version of the PTRM (involving separate revenue and capital base roll forward models) retains the straight line nominal depreciation basis.

Levelisation is not included in current natural gas and electricity PTRMs, but the models retain year-to-year revenue and price smoothing functions.

In the case of (full regulation) natural gas pipelines, there is potential to adopt levelisation but that involves a separate process outside the standard AER PTRM procedure. The AER would need to be satisfied that the non-standard application satisfies requirements in relation to the promoting efficient growth in the market for the reference services, and involve a deferral of a substantial proportion of the depreciation where:

- the present market for pipeline services is relatively immature; and
- the reference tariffs have been calculated on the assumption of significant market growth; and
- the pipeline has been designed and constructed so as to accommodate future growth in demand.

#### *Electricity*

In relation to the AER's current electricity industry PTRMs, levelisation is similarly a theoretical option outside of the standard model approach. In that case, the network service provider could pursue this option with the AER prior to lodging its PTRM revenue and price proposal. Such an initiative is required to satisfy relevant provisions of Chapter 6 and 6A of the National Electricity Rules.

In the AER's gas and electricity PTRMs, the procedure for calculating depreciation changes is essentially the same as in the initial version released in 2001, of straight line nominal depreciation (in both current PTRM forms discussed above, inflation on the regulatory asset base (RAB) is separately identified in roll forward calculations).

### *Telecommunications - MTAS*

The PTRM framework is applied to a range of Australian regulated industries, including telecommunications, rail networks and Australia Post notified services under Part VIIA of the CC Act.

A range of regulatory models have applied to the telecommunications industry in Australia. Models from the 1990s encompassed incentive-based mechanisms, incremental or avoidable costing approaches and building block models. Over time, the building block approach has become prevalent.

Since 2007, Mobile Terminating Access Service (MTAS) pricing determinations by the ACCC have applied a Total Service Long Run Incremental Cost (TSLRIC) approach incorporating tilted annuity depreciation.

In developing its 2007 MTAS Pricing Principles, the ACCC engaged Wik Consult GmbH (Wik Consult) to develop a cost model that estimates the efficient costs of supplying the MTAS by a hypothetical mobile network operator. The model extended the TSLRIC concept to TSLRIC+ by encompassing further, organisational-level, costs and incorporates a tilted annuity depreciation approach.

TSLRIC is a common approach in telecommunications rate setting. A number of overseas regulatory regimes apply TSLRIC in combination with tilted annuity depreciation (New Zealand, France, Ireland). In New Zealand, the building block approach now predominates in telecommunications Input Methodologies (IM), with default straight line depreciation, but with an ability to adopt an alternative depreciation methodology.

### *Telecommunications – Fixed line services*

TSLRIC had in the past been applied by the ACCC to regulate access pricing in respect of the PSTN and ULLS but a building block approach has replaced previous approaches for these services. The ACCC's Fixed Line Services Model (FLSM) is a 2010 adaptation of the AER's PTRM building block model. It incorporates the same basic principles and procedures as the PTRM, although costs are initially processed in the model in real terms, with inflation added at a later stage of model calculations.

The FLSM incorporates straight line depreciation and the ACCC expressly rejected application of a tilted annuity depreciation for this model. Tilted annuity had been proposed as a means of dealing with stranded asset risk, where with the NBN roll-out Telstra would under-recover depreciation on assets no longer used to provide the declared fixed services. The ACCC considered that this issue would be addressed contractually, rather than through access pricing determination.

The ACCC's November 2019 final access determinations in relation to the seven declared fixed line services involved access pricing determined by the ACCC's FLSM using straight line nominal depreciation.

The NBN is similarly regulated under a building block cost of service model incorporating nominal straight line depreciation. The NBN Co Special Access Undertaking (SAU) Long Term Revenue Constraint Methodology involves calculation of nominal regulatory depreciation as the difference between the nominal straight-line depreciation and the change in value of the nominal RAB due to inflation (and is accordingly consistent with the PTRM calculation of straight line depreciation). Depreciation on the SAU applies to the RAB and in tax calculations. The Initial Cost Recovery Account (ICRA) value is not subject to depreciation and is capitalised at a regulated rate of return.

### *Water industry*

In domestic regulatory jurisdictions in relation to the water industry, the building block cost of service approach incorporating straight line depreciation is the generally accepted basis to regulated water pricing. In some jurisdictions, specifically in relation to some rural water authorities, there has been application of a materially different approach, in the form of a renewals annuity. Such an approach is different from the prevailing approach because it is not based on the foundations of the building block cost of service model, as the annuity does not seek to recover the cost of initial capital but is instead calculated from the present value of future renewals expenditure.

Such an arrangement has been considered by some regulatory agencies as a form of capital charging appropriate for industries where assets are not replaced. It is formalised in the National Water Initiative (NWI), Pricing Principles of April 2010 issued by the Natural Resource Management Ministerial Council (only as a lower bound for pricing – upper bounds are to be set on the building block basis). Examples of this approach exist, but are confined to particular jurisdictions and authorities within the water industry and often, where it has applied, it has been subsequently replaced by the building block / straight line approach, as the more generally accepted standard regulatory practice.

### 3.3.5. Other regulatory mechanisms to shift the time profile for cost recovery

Regulators have adopted or allowed various mechanisms to shift the profile of revenue recovered over time. This can be engineered by adjusting different components of the building block revenue, including adjusting the recovery profile of depreciation, but more often this adjustment is at an aggregate level.

Commonly, regulators have adopted ‘smoothing’ or ‘true-up’ mechanisms which both smooth prices during a regulatory period and carry forward adjustments to the following regulatory period. Stable price paths are seen as offering benefits to customers, even though these invariably result in a profile of revenue which varies from the costs incurred in each relevant time period.

In some cases, regulators may apply a price path that smooths cost recovery over multiple regulatory periods. For instance, in its decision in relation to the Gladstone Area Water Board (GAWB) the Queensland Competition Authority (QCA) recommended a 20-year planning period with prices set to recover costs over this period (with a five year regulatory period to reset prices based on updated demand forecasts and other parameters). This methodology was adopted to avoid a significant step change in bulk water charges as a result of a capacity augmentation which was intended to service future demand. GAWB was permitted to roll forward any under- or over-recovery as an adjustment amount for the next regulatory period. This allowed any under- or over-recovery to be capitalised into future bulk water prices. Under this approach, it was anticipated that GAWB would under-recover in the early years against its revenue requirement, followed by a period of over-recovery, subject to demand projections being achieved.

The ACCC’s June 2000 Central West Pipeline decision (as previously discussed in section 3) also involved the application of a long term price path across regulatory periods, with a depreciation methodology selected specifically to support that price path. The pricing framework applied provided for the capitalisation of early losses incurred by the pipeline being recovered by higher revenues later in its economic life.

The Commerce Commission of New Zealand (CCNZ) also has adopted mechanisms to shift the profile of revenue recovered over time. In recent decisions on various industry input methodologies (used to set detailed price, quality and information disclosure requirements for regulated infrastructure providers) the CCNZ has

applied price paths, depreciation profiling and revenue cap ‘wash up’ processes. In its December 2016 decisions relating to electricity distribution networks, the CCNZ has in certain instances allowed:

- a depreciation profiling mechanism to address the risk of partial capital recovery (due to physical asset lives assumptions set out in the input methodologies). The CCNZ allows remaining asset lives to be shortened by electricity distribution businesses at their discretion on an NPV neutral basis. The adjustment is capped at a 15% reduction in remaining asset lives at the time of a regulatory reset.
- a revenue cap wash-up process to limit price shocks to customers. Where a business intentionally and voluntarily undercharges relative to the allowable revenue cap , the CCNZ allows businesses to delay the under recovery (subject to a cap) as part of its wash-up processes and price setting mechanism. The purpose of the wash-up process is to ensure that revenue is not under- or over-recovered over time.

# 4. Assessment of the Port of Melbourne's approach

## 4.1. Approach to assessment

This section presents results of our analysis of the Port's compliance with the Pricing Order in relation to depreciation as presented by its Tariff Compliance Statements relating to the five year review period. This assessment is based on our interpretation of the Pricing Order, and the scope and analytical limitations described in section 2 of this report.

Our analysis is largely based on information contained in the 2020-2021 TCS and, in particular, on information from its associated PoM Regulatory Model at Appendix B of the General Statement.

In addition to the 2020-2021 Financial Year, the model includes calculations in respect of the earlier years of the review period; it presents a refinement of approach in response to issues raised by the ESC over the term of the period under review; and it greater specifies the approach relative to the material in the General Statement.

### 4.1.1. Alignment of ARR construction with Pricing Order

***Capital Base***

Procedures in the model generally reflect clause 4.2.1 Pricing Order, relating to capital base roll forward, where an indexation allowance is added each Financial Year under a CCA roll forward approach. We make no comment on the efficiency or prudency of the capital expenditure included in the rolled forward capital base values.

Depreciation charges calculated in the Port's model are based on the straight line methodology, but each year, the model applies a zero value for depreciation in place of the annual straight line depreciation charge otherwise determined, until 2033.

The depreciation charges in effect remain in the capital base, and earn a return on capital, until that time. The model shows the entire accumulated unrecovered depreciation balance, in relation to the period 2017-2032, being charged in 2033, and regular straight line depreciation commencing from that time. From that point the capital base commences to depreciate, through to the end of the Port Lease.

Clause 4.2.1 requires that the value of the capital base must be defined, *at any particular time*, according to the steps in that clause, which include the requirement at clause 4.2.1(d) that an allowance for the return of capital be deducted.

The model shows that an allowance for the return of capital is not deducted at any time in the period 2017-2032, potentially implying that the Port's approach is inconsistent with the requirements of this clause.

This would, in our view, represent applying an overly narrow interpretation of clause 4.2.1(d). Clause 4.4.3 does not rule out the application of zero depreciation in a Financial Year. Also, the model does depict that a

depreciation charge calculated in respect to a Financial Year will be deducted, but for the period 2017-2032, not in the Financial Year to which the calculated depreciation charge relates.

### *Return on Capital*

Weighted cost of capital values applied in the model are identified as pre tax nominal values, from the TCS General Statements (clause 4.3.2).

The weighted cost of capital value is a related issue for our review of depreciation. The return on capital allowance presents the largest value of the four building block elements (the elements at clause 4.1.1 of the Pricing Order) which are contained in the "Alternative ARR Presentation" calculation used in the port model to determine whether the TAL constraint would cause the return on capital to be under-recovered. The level of pre tax nominal WACC values is the major driver of the return on capital, and therefore of the required revenue under the Alternative ARR Presentation. Should the ESC determine that a different, lower WACC should apply, this could impact whether the Port is able to rely on clause 4.4.2(a) as a basis for applying an alternative method for depreciation.

As noted, the return on capital allowance calculated for the purpose of clause 4.1.1(a) comprises a CCA roll forward of regulatory asset values in combination with a nominal rate of return value. The effect of indexation needs to be backed-out of such a calculation to ensure that it does 'double-count' inflation and thus over-recover initial asset values.

### *Return of Capital*

Depreciation charges determined in the model are calculated using a straight line methodology over relevant Depreciation Periods in accordance with clauses 4.4.1(a) and (b).

The depreciation charges incorporate the effect of indexation, through the calculations following the capital base roll forward procedure in clause 4.2.1 (subject to the issue at clause 4.2.1(d) as noted above).

The model includes calculations to the effect of illustrating that the underlying straight line approach to depreciation complies with clause 4.4.1(c) – in the Return of Capital worksheet under section row headings "Comparison ($July 2016)". This information indicates that assets are depreciated "only once" over relevant Depreciation Periods.

The illustration of this in the model involves the indexation allowance being backed-out of the summed values of depreciation charges. Such deflation from nominal to real values is not expressly provided for in the wording of clause 4.4.1(c).

While the combination of the negative indexation allowance adjustment at clause 4.1.1(d) and the return of capital allowance calculated under clause 4.4 is capable of arriving at depreciation charges over relevant Depreciation Periods that do not infringe the "only once" condition, such a combination represents the application of a building block calculation procedure that is not expressly provided for in the wording clauses 4.1.1 or 4.4.

We have, however, applied a conventional regulatory building block perspective to the application of these clauses and the relationship between them. When our application of the negative indexation allowance adjustment at clause 4.1.1(d) is applied to the summed nominal values of depreciation charges calculated in

accordance with clause 4.4.1(c), the sum of the resulting real depreciation charges will equate to initial values invested, satisfying the "only once" condition of clause 4.4.1(c).

In regulatory building block regimes of which we are familiar (particularly, those underpinned by the ACCC/AER PTRM), there are generally overarching objectives and tests for the efficacy of regulated revenue calculations. The objectives typically embody the requirement to seek efficient cost outcomes. Such an objective is specified in section 48 of the Act and is in part reflected in the principle in section 2.1.1(a) of the Pricing Order.

The "only once" requirement is one such fundamental test, but is almost universally applied alongside the related, more comprehensive test, that efficient capital costs are to be recovered over economic life when discounted at the opportunity cost capital (ie, the so-called NPV=$0 test). A more complete picture of costs, revenues and attendant forecasts, would be required than is given in the model (which provides complete data only to 2021) in order to perform this more fundamental test (acknowledging that it is not a requirement of the Pricing Order).

We note that in the Interim Commentary 2019, the ESC commented as follows in relation to the Port's 2019-2020 model:

> *In response to our feedback from last year, the port's regulatory model demonstrates that its methods for calculating deferred and straight-line depreciation only recover depreciation once over their economic lives.*[17]

The 2020-2021 model embodies the same procedures as the 2019-2020 model as commented on by the ESC. Our assessment of the Port's compliance in relation to clause 4.4.1(c) arrives at a similar conclusion.

Clause 4.4.2(b), in relation to adopting a methodology that is *"reasonably likely to reduce the variance in the expected annual percentage changes in … Tariffs through to the end of the Port Lease"* has not been utilised by the Port in relation to the period covered by the ESC's current inquiry.

Clause 4.4.3, specifying that the return of capital allowance should not be negative in any Financial Year, is a relevant matter for review, but the manner in which the model calculates return of capital values does not give rise to negative depreciation values in any Financial Year of the current review period.

### *Accrual Building Blocks*

Section 7.03, *Aggregate Revenue Requirement (ARR)*, of the Required Revenue worksheet of the model adopts a general building block cost of service similar to the structure of clause 4.1.1. In that section, the sum of depreciation charges shown for a particular Financial Year, within the relevant review period, represents the entire amount that would need to be recovered in that year in order to discharge all accumulated depreciation to that point in time.

Section 7.04, *Alternative ARR Presentation,* in that worksheet, is in effect, section 7.03 absent any depreciation values and arrives at different *Aggregate Revenue Requirement values than section 7.03*. The revenue requirement calculated by section 7.04 is the reference total revenue calculation used to determine whether there is under-recovery of the Aggregate Revenue Requirement, for the purposes of applying clause 4.4.2(a).

[17] Interim commentary, Port of Melbourne tariff compliance statement 2019-20, ESC, 16 December 2019, page 33

The *Alternative ARR Presentation* represents a response by the Port to issues raised by the ESC in its Interim Commentary in relation to the 2018-2019 TCS, of 26 October 2018. This matter was addressed by the Port in the 2019-2020 TCS, and the 2021-2022 TCS embodies the same approach. The ESC commented as follows:

> *We had previously noted in our 2018 interim commentary that the port had included depreciation in its revenue requirement even though the port was not seeking to recover depreciation in its revenues. We considered that this had the effect of materially misrepresenting the port's revenue requirement. The port has now resolved this by presenting the aggregate revenue requirement in two ways – one excluding unrecovered depreciation, the other including it.*[18]

The Port's reference total revenue calculation provided at section 7.04, *Alternative ARR Presentation*, of the Required Revenue worksheet in the 2020-2021 Port model demonstrates that in each Financial Year encompassed by the ESC's inquiry, the Port's calculated Aggregate Revenue Requirement exceeds the effective TAL revenue constraint, such that the Port's return of capital derived using a straight line depreciation methodology is not capable of being recovered in the applicable Financial Years. This outcome triggers the availability of clause 4.4.2(a) of the Pricing Order as a means of introducing an alternative depreciation methodology to the default straight line methodology specified in clause 4.4.1. This outcome is, however, dependent upon the values applied by the Port for the individual allowances for the building block components of Aggregate Required Revenue and the revenue forecasts, which are matters we have not reviewed.

During the period covered by the ESC's inquiry, the Port has consistently presented its alternative depreciation approach as one that has in effect been initiated under clause 4.4.2(a), not clause 4.4.2(b). The latter would require a case to be shown in relation to "variance", which has not been done.

As previously noted, clause 4.4.2(a) is available where, in a Financial Year, the Aggregate Revenue Requirement calculated based on application of the straight line depreciation methodology would exceed the Port's projected revenue for that year, calculated based on prior year prices escalated by CPI (the TAL constraint).

Clause 4.4.2(a) does not specify whether only a proportion of the annual return of capital needs to be impacted by the TAL constraint for the clause to be invoked, or that it is only invoked if the entire amount of the return of capital is not recoverable in the Financial Year.

If an intention of clause 4.4.2(a) is to preserve, as far as practicable, the Port's rate of return and capital recovery over the term of the Port lease, it would be consistent to enact this clause based on a partial under-recovery of the return of capital allowance in the particular Financial Year due to the effect of the TAL. The unusual nature of this clause, as noted in Table 1 in section 2.2 above in discussing clause 4.4.2(a), suggests that this is the likely intention of the clause.

As also noted above, in the 5 year review period, based on the particular values for the individual allowances for the building block components of Aggregate Required Revenue and the revenue forecasts, with all values as determined by the Port, the entire amount of the return of capital for each of the relevant Financial years is is not capable of being recovered in the applicable year, due to the effect of the TAL constraint on Aggregate Required Revenue. Different values applied for these allowances (such as the return on the capital base) and of forecast revenues could however present materially different results.

In the circumstance where the TAL constraint results in only a partial under-recovery of the return of capital in a particular Financial Year, this would raise the issue of whether the alternative depreciation methodology should

[18] Interim commentary, Port of Melbourne tariff compliance statement 2019-20, ESC, 16 December 2019, page 32

be defined by reference to the amount of the under-recovery. The wording of clause 4.4.2(a) does not provide guidance on this issue.

To the extent that an alternative methodology simply changes the time profile of recovery, but does not affect the amount to be recovered, one interpretation is that any alternative depreciation methodology that meets the "only once" condition in clause 4.4.1(c) could be considered to be compliant with the Pricing Order.

A narrower interpretation is that the alternative depreciation methodology should only be permitted to the extent, but not more, that it addresses the under-recovery of the return of capital due to the effect of the TAL. Such an interpretation would reflect that clause 4.4.2(a) is only operative where the TAL constraint applies and also the interpretation that it may be triggered by partial under-recovery.

We consider this to be a reasonable interpretation of the operation of clause 4.4.2(a) in cases of partial under-recovery of the return of capital in a Financial Year. Application of this interpretation could mean that the Port is provided with opportunity to recover deferred depreciation at the earliest feasible time (subject of course to the TAL), so that recovery of that amount is not unduly deferred. The longer that depreciation is deferred, there is potentially a greater likelihood and magnitude of rate shock once the TAL constraints cease (under current arrangements, at 2038 and not earlier than 2033). The earliest feasible recovery of this amount, subject to the TAL constraint, would address this issue at least to some degree.

Management of price rises and of rate shock appears to be a clear intention behind the Pricing Order – through the TAL provisions in clause 3.1.1, and importantly also through the other avenue for introducing an alternative depreciation methodology, at clause 4.4.2(b) – that the alternative would be reasonably likely to reduce the variance in the expected annual percentage changes in the level of tariffs through to the end of the Port Lease. Clause4.4.2(b) would appear to be available at any time that the Pricing Order is in force.

As noted, under the Port's reported values for the building block components of the Aggregate Revenue Requirement and its revenue forecasts in relation to the five year review period, a *partial* under-recovery of the return of capital in terms of clause 4.4.2(a) does not arise and therefore need not raise the issue discussed immediately above, although if different component values are applied in respect of that period, the issue may be relevant.

## 4.2. Assessment findings

### 4.2.1. Is the alternative depreciation methodology consistent with the Pricing Order?

***Has the Port, based on the information provided in its Tariff Compliance Statements during the period 1 July 2016 to 30 June 2021, demonstrated that its alternative depreciation methodology is consistent with the requirements of the Pricing Order?***

The Pricing Order envisages the default application of a particular form of pretax building block methodology, within which depreciation would be calculated using a straight-line approach over a period no shorter than the reasonable economic life of the relevant assets, and no longer than the remaining term of the Port Lease. The depreciable capital base is defined by initial capital values included in the Pricing Order (refer clause 4.7) and then a conventional roll-forward procedure (refer clause 4.2.1).

The Port may adopt an alternative depreciation methodology, but only where it meets certain conditions as set out at clause 4.4.2. Specifically, an alternative methodology may only be applied where:

- the calculated aggregate revenue requirement under clause 4.1.1 would exceed the cap applied by the TAL in clause 3.1.1 such that the return on capital (as derived using a straight line depreciation

methodology) is not capable of being recovered, the port licence holder may use an alternative to the straight line methodology for the purposes of clause 4.1.1 (refer clause 4.4.2(a)). The TAL requires the weighted average annual prescribed service price increase to not exceed CPI, for a period which currently extends to 2037; or

- it is reasonably likely to reduce the variance in the expected annual percentage changes in the level of Prescribed Service Tariffs through to the end of the Port Lease (refer clause 4.4.2(b)).

In each of its TCSs, from the initial Statement for 2017-18, the Port has raised the issue of the TAL acting as a constraint to the recovery of building block cost and described its application of an alternative approach to depreciation:

> *PoM has not applied straight line depreciation required under clause 4.4.1 of the Pricing Order, but rather used **the alternative methodology** provided under clause 4.4.2(a) of the Pricing Order. This is because the application of the TAL prevents PoM increasing prices to the level whereby PoM could recover its Aggregate Revenue Requirement calculated under the accrual building block methodology with the application of a straight line depreciation methodology.*[19] (emphasis added)

The Port has not relied on clause 4.4.2(b) as a basis for its alternative methodology for depreciation.

The alternative methodology comprises applying a zero value for depreciation. We note that clause 4.4.2(a) of the Pricing Order does not prescribe that "the alternative methodology" is a zero depreciation amount, nor does it prescribe any particular alternative methodology. Rather, that clause establishes that the Port "may only" use an alternative approach subject to certain conditions.

In subsequent TCSs, the Port has further described the application and general effect of this procedure, and its intention to adopt a different methodology at the end of the TAL period:

> *PoM will consult Port Users on options for recovering any deferred depreciation to minimise volatility in tariff levels through price smoothing closer to the end of the TAL period, if deferred depreciation is yet to be recovered at such time. PoM will continue to engage with Port Users on the key principles underpinning its approach to recovering deferred depreciation in the future, including its commitment to smooth prices.*[20]

The TCS General Statements, their associated papers and regulatory models have developed over the course of the five year review period. While we have analysed the General Statements in relation to this matter, we have not reviewed each regulatory model.

Regulatory model procedures were subject to material changes in 2019-2020, in response to feedback from the ESC on the Port's 2018-2019 regulatory model. The changes adopted in 2019-2020 were further refined in the 2020-2021 model, relating to the final year of the review period. Our assessment in relation to the model procedures regarding depreciation, or the return of capital, is in relation to the 2020-2021 model.

The General Statements, the 2020-2021 regulatory model and model guide, do not provide a step-by-step demonstration that the Port's approach to depreciation, or return of capital, is consistent with the requirements of the Pricing Order. Information is, however, provided in relation to compliance with some specific Pricing Order provisions contained in General Statements and more detailed, specific information is contained in the model.

The cost base pricing principles in the Order (clause 4.1.1) specify the adoption of an Accrual Building Block Methodology.

Because the building block methodology in the Pricing Order is predicated on a current cost accounting (inflated) approach to determining Capital Base values in each Financial Year (clause 4.2.1) which is combined

[19] 2017-2018 Tariff Compliance Statement (General Statement), Port of Melbourne, 31 May 2017, page 8
[20] 2018-2019 Tariff Compliance Statement General Statement, Port of Melbourne, 31 May 2018, page 24

with a nominal rate of return value (clause 4.3.2), there is a need, at consolidation of component costs into aggregate required revenue at clause 4.1.1, to adjust for potential double-counting of inflation. Adjusting to remove potential double-counting of inflation is performed by clause 4.1.1(d).

Depreciation charges are determined by the Port using a straight line methodology over relevant depreciation periods in accordance with clauses 4.4.1(a) and (b). Depreciation charges based on the rolled forward capital base values from clause 4.2.1 include the effect of inflation.

Due to the effect of inflation, the sum of such depreciation charges over the depreciation periods covered by the model will yield a value greater than the sum of initial asset values.

From a simple application of the condition in clause 4.4.1(c), which requires the sum of depreciation charges not to exceed the initial asset values, the Port's calculation of depreciation charges could be considered to be inconsistent with that clause.

A balanced application of that clause could take into account the fact that when the indexation adjustment is taken into account, at the later stage of aggregate revenue calculation in clause 4.1.1, the sum of depreciation charges in the model (now in real terms), would equate to the initial asset values. We consider such a balanced application of clause to be more relevant than a simple, narrow application of clause 4.4.1(c).

Depreciation is deducted from capital base values, and enters pricing calculations in an unusual manner. In the 2020-2021 model, for the period 2017-2032, the depreciation calculated for those years is not applied, but is accumulated, with the total accumulated value applied in 2033, along with straight line depreciation for that year. Depreciation charges calculated in respect of the years 2034-2066 are not shown to be deferred.

The Port has applied this particular depreciation approach as an alternative to the default straight line methodology because, in the Financial Years concerned, the Port's calculated aggregate revenue requirement under clause 4.1.1 would exceed the TAL constraint. This is shown by the Port's reference total revenue calculation in Section 7.04, *Alternative ARR Presentation*, of the Required Revenue worksheet of the 2020-2021 Port model.

Where the aggregate required revenue is constrained by the TAL such that the Port is unable to recover its return of capital (calculated using a straight line methodology), under clause 4.4.2(a), the Port may adopt an alternative to the straight line methodology.

The Port's 2020-2021 regulatory model demonstrates that straight line depreciation would not be recovered in any Financial Year of the five year review period, and that an alternative methodology may be applied in accordance with clause 4.4.2(a) of the Pricing Order. In making this observation, we make no comment on the appropriateness of the input values applied in the model or its specific output values.

The demonstration of the effect of the TAL limit, and the manner in which resulting constrained charges are presented, can be shown in different ways. The 2020-2021 model embodies a clear presentation of these matters based on the Port adopting procedures advised by the ESC under its review of 2018-2019 TCS.

The Act under which the Order is made provides for a form of economic regulation of the prescribed services. Economic regulation may accept a wide range of depreciation methodologies, as evidenced by our discussion in section 3, which comply with cost recovery principles and support revenue and price paths consistent with regulatory regime objectives. In this case, the price path and the regime is specified by the Pricing Order. That framework includes the principle that the Port licence holder be allowed reasonable opportunity to recover the efficient cost of providing the prescribed services by application of the building block methodology specified in

the Order. The Port's straight line deferred depreciation approach can be considered an alternative to the default straight line depreciation methodology in that particular regulatory context.

### 4.2.2. Does the alternative depreciation methodology recover the capital base more than once?

***Applying the alternative depreciation methodology, will the Port recover through depreciation charges an amount which is more than the value of the relevant assets at the time of their inclusion in the capital base?***

The Pricing Order at clause 4.4.1(c) provides that the Port may depreciate assets *"only once, meaning that the amount by which the asset or group of assets is depreciated over the Depreciation Period does not exceed the value of the asset or group of assets at the time of its or their inclusion in the capital base."*

The requirement that depreciation over the economic life of assets does not recover initial asset values more than once is typically a core principle of economic regulatory regimes. It affirms a key element of the financial capital maintenance foundations of regulatory required revenue calculations.

In our earlier commentary we note that depreciation is determined by the Port using a straight line methodology over relevant depreciation periods in accordance with clauses 4.4.1(a) and (b) of the Pricing Order.

The depreciation charges are derived from rolled forward Capital Base values calculated in accordance with clause 4.2.1, which include the effect of indexation in accordance with clause 4.6.

The model does not, however, deduct depreciation – the step at clause 4.2.1(d) of the Pricing Order. While depreciation is calculated in a regular straight line manner, for the period 2017-2032, depreciation is not applied to the capital base and depreciation is not included in the regulated price. The balance of the accumulated deferred depreciation charges is shown to be recovered at 2033. Depreciation charges calculated for each of the years 2034-2066 are not shown to be deferred.

In assessing the Port's approach in relation to this matter, we assume that future depreciation amounts are recovered in the way that they are presented in the model (the model does not show all component costs, and their consolidation into aggregate required revenue calculations, for the years following 2021).

Because depreciation charges include the effect of indexation, the (nominal) sum of the depreciation charges over the depreciation periods covered by the model would represent an amount greater than the values of assets when they were first included in the capital base. On one interpretation, this is inconsistent with the requirements of clause 4.4.1(c), where assets should be depreciated "only once". This conclusion is based on a straightforward interpretation of the text of this clause, but which does not consider the wider application of other components of the Pricing Order.

Separate building block cost calculations are consolidated by the process broadly defined at clause 4.1.1, which aggregates cost components to required revenue values. The process in that clause includes conversion of nominal component values to real values via the effect of clause 4.1.1(d), which removes the effect of indexation (inflation). We note this arrangement is similar to that in some other building block regimes that involve applying a nominal rate of return to inflated capital base values. In such regimes, the backing-out of inflation from the return *of* capital building block element, can result in the real value of the return of capital over economic life equaling the value of the assets when they first became regulated. This process is demonstrated in some of the checking formulas in the Port model. The process demonstrated is broadly consistent with processes in other building block models, although it is not clearly specified in the Pricing Order or included within the test set out within clause 4.4.1(c).

### 4.2.3. Consistency with regulatory, economic and accounting principles?

***Is the application of a zero depreciation amount consistent with commonly applied regulatory, economic and accounting depreciation principles, and does the Port's approach constitute a 'methodology' in the context of those commonly applied principles?***

Frameworks for economic regulation of revenues and/or prices commonly provide for efficient cost recovery and in Australian regulatory regimes efficient costs are almost universally determined under a building block approach.

The return of capital component within the building block calculation can be determined on the basis of a wide range of depreciation methodologies, provided that accumulated depreciation under the methodology applied does not exceed the initial agreed or specified capital value of the assets. For instance, in its Handbook released with the PTRM building block model, the ACCC states that **"***Apart from this requirement not to double count, the time path for depreciation can be viewed as arbitrary.***"**[21]

In practice, the choice of depreciation methodology will be framed, or prescribed by the regulatory regime concerned, either directly, or indirectly through the application of regime objectives to be applied in the price setting process.

The pattern of depreciation applied is one characteristic which determines the time profile of tariffs and for this reason some constraints on the depreciation path are desirable. A common objective is that regulated prices should mimic the properties of prices in competitive markets. Generally, this favours depreciation profiles that produce a level time profile of tariffs. However, there may be some circumstances where other depreciation profiles may be more appropriate. These circumstances could comprise the desire to promote efficient growth of services in a new market (eg back-ended depreciation where future growth is anticipated), or to deal with a future threat of bypass (which could be addressed by adopting accelerated depreciation).

In section 3 we highlight that different approaches to depreciation can be observed in regulatory, economic and accounting applications. Straight line depreciation is the dominant building block methodology, but in simple form, it can result in front-ended capital charges in the earlier years of asset life.

The current cost accounting form of straight line depreciation, which underpins major Australian regulatory regimes such as those to which the ACCC/AER PTRMs apply, is capable of producing a relatively flat profile of capital charges over the life of assets. This is the form of the default straight line depreciation methodology embodied in the Pricing Order.

Examples of deferred and levelised depreciation approaches exist in particular cases where regulated price paths may initially be constrained in early years of the life of specific regulated services, typically in order to promote the growth of services in new markets. While such methodologies are uncommon, they can be suited to particular industries, market conditions and regulatory regimes.

Overall, the particular depreciation methodologies adopted in regulatory settings are determined by the requirements of the regulatory regime concerned. Clause 4.4.2 of the Pricing Order presents. in our view, a unique regulatory mechanism and discretion on the part of the regulated entity in relation to depreciation charging.

[21] ACCC (2001), *Post tax revenue handbook*, October 2001, page 10

Accounting rules are the dominant form of regulating the practice of determining and applying depreciation charges and are embodied in standard business procedures and therefore provide a relevant perspective to the issue of 'methodology' (refer also Appendix A).

Rule 60 of AASB 116 provides that "The depreciation method used shall reflect the pattern in which the asset's future economic benefits are expected to be consumed by the entity". Assuming that the Port's approach constitutes a 'method', where the value of zero is applied as the depreciation charge over the inquiry period, this could be considered to be inconsistent with the pattern of economic benefits that the Port would be expected to consume from the use of the assets.

Rule 62 similarly provides that "... The entity selects the method that most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. ..."

Rule 62A states that "A depreciation method that is based on revenue that is generated by an activity that includes the use of an asset is not appropriate." The Port's approach to depreciation has however been adopted based on a specific revenue test, in relation to the recovery of the return of capital.

Regulatory and accounting approaches can differ on reasonable grounds. Regulatory regimes are typically designed to achieve outcomes based on those consistent with the operation of a theoretical efficient, competitive market, which may not be characteristic of the actual market being regulated. Depreciation methodologies adopted in regulatory models are established based on the requirements of the regulatory regime concerned. In this case, depreciation is applied under the regulatory regime specified in the Pricing Order, particularly through the application of the specific provisions of clause 4.4 as discussed.

Whether the approach applied can be considered a 'methodology' is a matter that can be assessed from a standard business practice perspective, which we have distilled into four questions below.

1. Is the approach based on the application of standard and replicable formulae
    a. The Port's approach of straight line depreciation, initially deferred then later recovered, is fundamentally based on a standard straight line nominal depreciation approach
    b. The trigger for applying the approach, the treatment of deferment and of later recovery, are simply addressed by model formulae. The overall calculation process is more complicated than standard straight line nominal depreciation, but not unduly so.

2. Is the approach clear in terms of its required inputs and its outputs
    a. The inputs are clear, in general, apart from a specified relationship between actual, capped revenue and the aggregate revenue requirement, the inputs are the same as standard straight line nominal depreciation
    b. The outputs are clear (subject to some presentational issues in relation to the aggregate revenue requirement discussed), although clarity in relation to pricing and associated actual recovery beyond review period is not provided (but need not be provided in the TCSs relevant to the period of the current inquiry).

3. Is the approach capable of objective application and not based on subjective judgement
    a. The approach has been invoked based on a specific defined relationship between capped revenue and the aggregate revenue requirement. This relationship has been defined to a significant degree during the period covered by the inquiry, based on the Port's responses to feedback provided by the ESC. The relationship, depicted in section 7.04 of the Required Revenue worksheet of the 2020-2021 Port model, reflects the text of the Pricing Order, at clause 4.4.2(a).

b. Depreciation input values are to a high degree prescribed by the Pricing Order. We otherwise make no comment on other input values relevant to revenue and pricing calculations.
c. The choice of the particular depreciation approach involves the exercise of judgement, and discretion of choice appears to be provided by clause 4.4.2(a) of the Pricing Order.

4. Is the approach auditable
    a. As noted, the approach is fundamentally based on a standard straight line nominal framework – the additional processes introduced by deferment of depreciation are simply defined.
    b. The approach would accordingly appear to be auditable. We have not conducted any audit in relation to the depreciation approach or the Port model more generally.

In the above context, and noting the comment from the ACCC above in relation to economic regulation that "the time path for depreciation can be viewed as arbitrary", the Port's alternative approach to depreciation during the the period covered by the ESC's inquiry can be considered a relevant depreciation methodology in the context of commonly applied general principles.

# Appendix A - Accounting depreciation

## 4.3. Introduction

Depreciation is defined in accounting literature as "the systematic allocation of the depreciable amount of an asset over its useful life" (AASB 116: Property, Plant and Equipment ('AASB 116')). The calculation of accounting depreciation therefore requires consideration of (1) useful life; (2) depreciable amount; and (3) systematic allocation. All three concepts are defined in the relevant accounting standard, with some judgement required by users to carefully apply the concepts to each specific set of circumstances.

### 4.3.1. Useful life

The useful life of an asset is defined as "(a) the period over which an asset is expected to be available for use by an entity, or (b) the number of production or similar units expected to be obtained from the asset by an entity" (AASB 16.6). The accounting policy applied by Port of Melbourne Accounting applies option (a), with the useful life determined as a period of time between 1-50 years, as illustrated by the financial statements extract below:

***(i) Depreciation***

Depreciation on assets is calculated using the straight-line method to allocate their cost or revalued amounts, net of their residual values, over their estimated useful lives (or, in the case of infrastructure and certain leased plant and equipment, the lease term if shorter) as follows:

| | Useful Life | Depreciation method |
|---|---|---|
| Channels (including right-of-use assets) | 1 - 50 years | Straight-line |
| Infrastructure | 1 - 48 years | Straight-line |
| Plant and equipment | 1 - 47 years | Straight-line |

*(Port of Melbourne Group financial statements, page 26)*

The useful life is applied from the period when the assets are available for use and therefore depreciation commences even if the asset has not yet been utilised. Depreciation of an asset ceases at the earlier date of (i) when the asset is made available for sale and (ii) when the asset is derecognised. Therefore, depreciation continues even if the asset becomes idle or is retired, unless the asset has been fully depreciated.

It is possible for users to change the 'useful life' judgement, however this is not common practice. Any change would be applied prospectively, impacting the depreciation charge from that time.

Under an alternative 'usage' depreciation method (see option (b) above), the depreciation charge could be zero for periods while there is no production. Examples of this application can be observed in the Oil and Gas and Mining industries where the output of an asset may be based on the amount it produces.

For context, Tables A1 and A2 provide a FY20 comparison of the Port of Melbourne accounting and regulatory asset bases (opening asset values as at 1 July 2019) by asset classes, the depreciation applied to each asset base and the implied remaining useful life (RUL).

*Table A1 - FY20 Port of Melbourne accounting asset base* [22] [redacted]

| Accounting asset base (PoMUT and LAPT) | Asset Value as at 1 Jul 2019 ($m) | Accounting depreciation ($m) | Implied RUL (years) |
|---|---|---|---|
| [redacted] | | | |

[22] The Port of Melbourne provided two accounting asset bases - Port of Melbourne Unit trust (PoMUT) and Lonsdale Asset Property Trust (LAPT) - which have simply been combined to present this comparative analysis.

[redacted]

*Table A2 - FY20 Port of Melbourne regulatory asset base* [24]

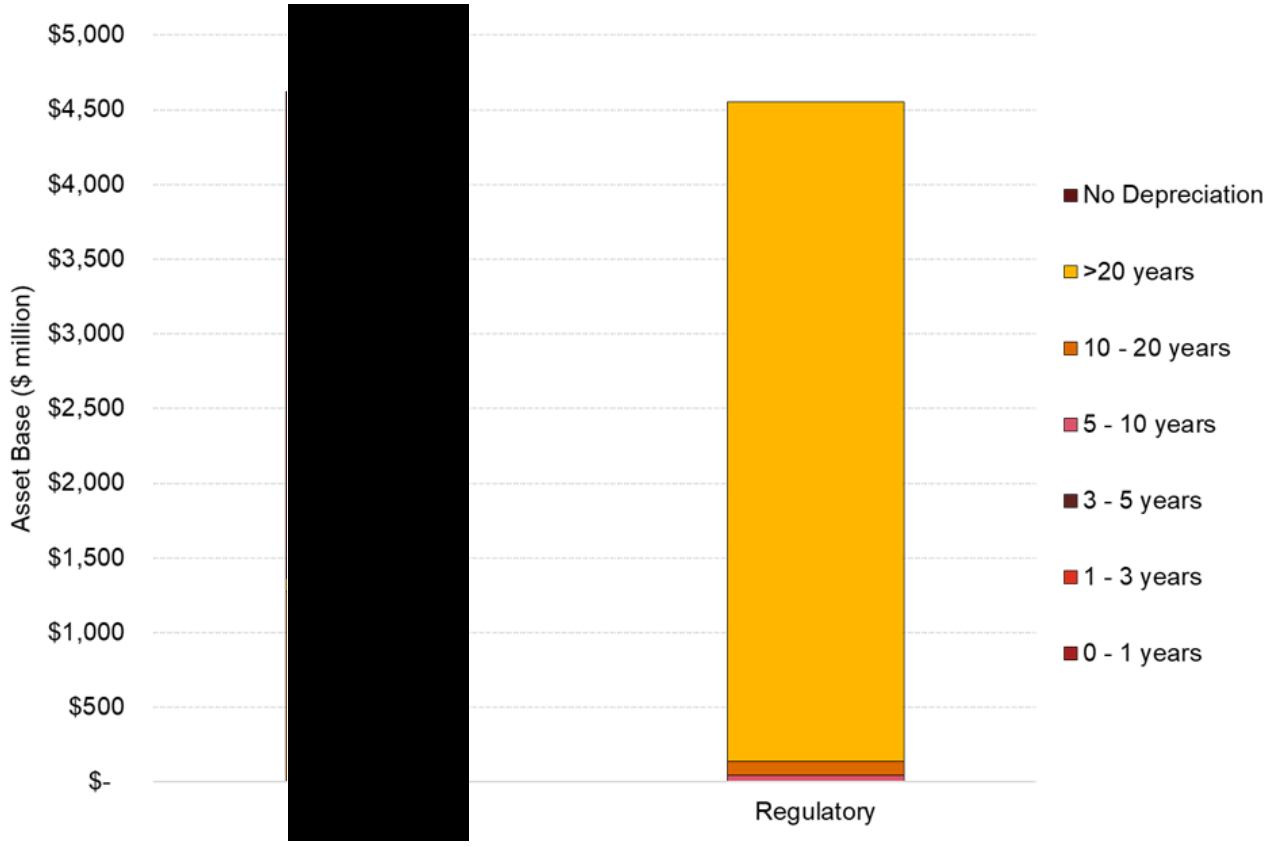
| Regulatory capital base by asset class | Asset Value as at 1 July 2019 ($m) | Regulatory depreciation ($m) | Implied RUL (years) |
|---|---|---|---|
| Shared Channel | $ 473 | $ 10 | 49.34 |
| Shared Channel Over-Dredge | $ 162 | $ 3 | 49.65 |
| Melbourne Channel | $ 2,019 | $ 41 | 49.16 |
| Melbourne Channel Over-Dredge | $ 157 | $ 5 | 30.05 |
| Channel Protection Assets | $ 65 | $ 3 | 22.70 |
| Channel Service Protection | $ 8 | $ 1 | 13.52 |
| Roads | $ 43 | $ 5 | 7.97 |
| Rail | $ 37 | $ 2 | 18.14 |
| Buildings | $ 5 | $ 0 | 21.37 |
| Wharves | $ 769 | $ 35 | 22.16 |
| Plant | $ 47 | $ 3 | 16.30 |
| Land | $ 43 | $ 1 | 49.34 |
| Port Capacity Project - Initial Capital Asset Value | $ 671 | $ 14 | 49.34 |
| Port Capacity Project - Wharves | $ 28 | $ 1 | 48.79 |
| Port Capacity Project - Civil | $ 19 | $ 1 | 29.61 |
| Navigational Aids | $ 2 | $ 0 | 22.20 |
| Utilities | -$ 0 | $ 0 | - 14.04 |
| Civil | $ 1 | $ 0 | 35.64 |
| Minor Capital Works | $ 3 | $ 0 | 19.32 |
| **TOTAL** | **$ 4,553** | **$ 124** | **36.76** |

These tables show the aggregate value of the Port of Melbourne accounting asset base and regulatory asset bases is broadly similar.[25] However the implied RUL for each asset base is [redacted], approximately [redacted] years for accounting purposes compared to approximately 37 years for regulatory depreciation purposes. Figure A1 below provides a further comparison of the Port of Melbourne accounting asset base and regulatory asset base values by implied RUL.

[24] Information drawn from *Appendix B - PoM - Regulatory Model - 2020-21 TCS - PUBLIC v2.xlsx*, available at https://www.esc.vic.gov.au/transport/port-melbourne/port-melbourne-compliance-pricing-regulations#toc--tariff-compliance-statement-2020-21.

[25] We have compared these asset bases at an aggregate level but do note the regulatory asset base relates to Prescribed Services only whereas the accounting asset base represents the combined PoMUT and LAPT assets.

*Figure A1 - FY20 Port of Melbourne accounting and regulatory asset base by implied RUL ($m)*




While it is not expected that the accounting and regulatory asset bases are identical there are some notable differences. Some key observations of the asset bases and implied RULs include

[redacted]

### 4.3.2. Depreciable amount

The depreciable amount is defined as “the cost of an asset, or other amount substituted for cost, less its residual value” (AASB 16.6). The cost is typically readily determinable, however judgement is required when estimating an asset’s residual value. The accounting literature notes that in practice, the residual value of an asset is often insignificant and therefore immaterial in the calculation of the depreciable amount.

The Port of Melbourne Group accounts do not disclose what, if any, residual values have been applied; however confirm in the accounting policy that depreciation is “net of their residual values” (see extract above).

### 4.3.3. Systematic allocation

The accounting literature allows for a variety of depreciation methods to be used to allocate the depreciable amount of an asset on a systematic basis over its useful life. These methods include:

(i) Straight line: results in a constant charge over the useful life if the asset's residual value does not change;

(ii) Diminishing balance: results in a decreasing charge over the useful life; and

(iii) Units of Production: results in a charge based on the expected use or output.

A user selects the method that most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. That method is applied consistently from period to period unless there is a change in the expected pattern of consumption of those future economic benefits. The method that has been applied by the Port of Melbourne Group is straight line.

The accounting literature explicitly prohibits a depreciation method that is based on revenue that is generated by an activity that includes the use of an asset.

# Appendix B - Summary of relevant regulatory decisions

*Table B1: Summary of Regulatory Depreciation Decisions and Determinations*

| Regulator | Decision | Industry/Sector | Depreciation approach | Classification | Commentary |
|---|---|---|---|---|---|
| ESC | Access Arrangements - MultiNet, Westar, Stratus, Final Decision, October 1998 | Natural Gas Distribution | Straight line depreciation on a current cost accounting (inflation indexed) asset base | Straight line | The Office set the approach to ensure that the capital base remained below initial value |
| ESC | Electricity Distribution Price Determination 2001-05, Volume 1, Statement of Purpose and Reasons, September 2000 | Electricity Distribution | Straight line nominal depreciation | Straight line | The Office held the view that regulatory depreciation should be determined on an economic basis as far as possible and encouraged distributors to submit alternative methodologies. Distributors chose to retain straight line depreciation |
| ACCC | Final Decision, Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline, 30 June 2000 | Natural Gas Distribution | Pure economic depreciation, as a tariff levelising mechanism | Economic | A price path adopted was to reflect an efficient level and structure of reference tariffs and promote the development of the market for the pipeline services concerned. Economic depreciation was characterised as measuring, in each period, the holding cost associated with using an asset in that period, with the cost determined as the change in the value of the asset in the period |
| ACCC | Post-Tax Revenue Model 25 October 2001 | Applied to a range of "Australian utilities" | Default straight line nominal depreciation | Straight line, ability to smooth & levelise | The nominal depreciation methodology based on current cost accounting (CCA) principles achieves a relatively flat revenue and/or price profile over a regulatory period |
| AER | Final Decision Electricity transmission and distribution network service providers Post-tax revenue models (version 5), April 2021 | Electricity Transmission and Distribution Networks | Straight line nominal depreciation, with inflation separately identified | Straight line, smoothing feature | National Electricity Rules require the AER to prepare and publish PTRMs for transmission and distribution network service providers. A provider's revenue proposal must be prepared using an AER PTRM |
| AER | Final decision Gas transmission service providers Post-tax revenue model handbook April 2020, Final Decision Gas distribution service providers Post-tax | Natural Gas Transmission and Distribution Pipelines | Straight line nominal depreciation, with inflation separately identified | straight line, smoothing feature | National Gas Rules permit the AER to prepare and publish revenue and capital base roll forward models, which must be used by the service providers in preparing proposal (only applicable to full regulation pipelines) |

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| | revenue model handbook April 2020 | | | | |
| AER | Final Distribution Determination for Aurora Energy Pty Ltd 2012–13 to 2016–17, Final Decision, April 2012 | Electricity Retail | Annuity | Annuity | This decision is applicable to public lighting. Metering services provided by Aurora are subject to a separate building block regulatory approach applied by the AER |
| ACCC | Preliminary View, Australia Post Pricing Proposal, September 2002 | Australia Post | Straight line nominal depreciation | Straight line | The initial full economic regulation model applied to Australia Post, based on the PTRM. Procedures in the model continue to apply to Australia Post notified services |
| ACCC | Statement of regulatory approach to assessing price notifications under Part VIIA of the Competition and Consumer Act 2010, 1 March 2017 | Notified Services | PTRM building blocks encompassing straight line depreciation | Straight line | The framework is used to assess price notifications in respect of notified services. These services comprise the Australia Post reserved services, regional air services provided by Sydney Airport, and Airservices Australia air traffic control and aviation fire-fighting and rescue services |
| ACCC | ACCC view on Australia Post's draft price notification, November 2019 | Australia Post | Straight line nominal depreciation | Straight line | The same basis as in the 2002 tariff case, and Post's cases in between |
| ACCC | Australian Rail Track Corporation Hunter Valley Coal Network Access Undertaking, approved 29 June 2011, version effective from 1 July 2021 | Rail | Straight line nominal depreciation | Straight line | Conventional building block approach incorporating straight line nominal depreciation |
| ACCC | Australian Rail Track Corporation Interstate Network Access Undertaking, approved 30 July 2008, effective from 30 June 2021 | Rail | Straight line nominal depreciation. | Straight line | Conventional building block approach incorporating straight line nominal depreciation |
| IPART | NSW Rail Access Undertaking Pursuant to Schedule 6AA of the Transport Administration Act | Rail | Straight line depreciation applied to original Depreciated Optimised Replacement Cost value | Straight line | Conventional building block approach incorporating straight line nominal depreciation |

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| ESCOSA | Tarcoola-Darwin Railway: 10-year review of revenues Final Report August 2015 | Rail | Straight line nominal depreciation consistent with the ACCC's PTRM and approach to ARTC access undertakings | Straight line | Conventional building block approach incorporating straight line nominal depreciation |
| WA Legislature | Western Australia Railways (Access) Code 2000 [WA subsidiary legislation] | Rail | Annuity | Annuity | The Code administered by ERA, provides for the application of an annuity in calculating the return on and of capital |
| ERA, WA | WestNet Rail's Floor and Ceiling Costs Review, 2010 | Rail | Annuity based capital charges (annuity due formula) | Annuity | Conventional building block approach incorporating a specific annuity basis for capital charging |
| ERA, WA | Amended Approved Costing Principles, The Pilbara Infrastructure Railways (Access) Code 2000 Costing Principles, May 2013 | Rail | Annuity based capital charges (annuity due formula) | Annuity | Conventional building block approach incorporating a specific annuity basis for capital charging |
| Commerce Commission NZ | Gas Transmission Services Input Methodologies Determination 2012, Consolidated 3 April 2018 | Natural Gas Transmission Pipelines | Default Price Quality Paths (DPP) based on straight line depreciation. Entities may propose a Customised Price Quality Path (CPP), incorporating an alternative depreciation method | Straight line, provider may propose alternative | The Commission must be satisfied the proposed alternative method would satisfy regime objectives to a greater extent than standard straight line depreciation. Under either method, asset carrying amounts cannot exceed initial values |
| Commerce Commission NZ | Transpower Input Methodologies Determination 2010, 29 January 2020 | Electricity Transmission Networks | Straight line depreciation, subject to an unallocated depreciation constraint where asset carrying amounts cannot exceed initial values | Straight line | |
| Commerce Commission NZ | Airport Services Input Methodologies Determination 2010, Consolidation 20 December 2016 | International Airports | International airports input methodologies incorporate standard straight line depreciation.Airports may disclose and apply a non-standard methodology. The regulatory regime is a monitoring regime only | Straight line, but provider may adopt alternative (monitoring regime) | A non-standard methodology may apply providing it is consistent with methodology and indexation approach used in calculating revenue. The depreciation method should apply for the entire regulatory period and asset carrying amounts cannot exceed initial values |

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| Commerce Commission NZ | Final summary and analysis report Christchurch International Airport Ltd (CIAL), 1 November 2018 | International Airports | Under the monitoring regime for international airports, CIAL applies a tilted annuity approach to deprecation | Tilted annuity (monitoring regime) | The Commission indicated that it was broadly satisfied that CIAL's tilted annuity approach was consistent with regime objectives. The tilted annuity method replaced a 20 year levelised method |
| Commerce Commission NZ | Electricity Distribution Services Input Methodologies Determination 2012, Consolidation 20 May 2020 | Electricity Distribution Networks | DPPs are based on straight line depreciation. Entities may propose a CPP incorporating an alternative depreciation method | Straight line, provider may propose alternative | The Commission must be satisfied the proposed alternative method would satisfy regime objectives to a greater extent than standard straight line depreciation. Under either method, asset carrying amounts cannot exceed initial values |
| Commerce Commission NZ | Powerco's customised price-quality path, Final decision, 28 March 2018 | Electricity Distribution Networks | The CPP incorporates straight line nominal depreciation | Straight line | The CPP incorporates revenue and price smoothing similar to the PTRM |
| Commerce Commission NZ | Fibre input methodologies: Main final decisions – reasons paper, 13 October 2020 | Telecommunications - Fibre Fixed Line Access Services (FFLAS) | The depreciation method should be consistent with the efficient profile of revenue and with accounting rules. A provider may apply an alternative depreciation method | Provider can propose (final determinations not made) | An alternative depreciation method is able to be applied where the Commission determines this better aligns with outcomes in a workably competitive market. The Commission has expressly rejected the straight-line depreciation method for FFLAS |
| Commerce Commission NZ | Final Determination for TSO Instrument for Local Residential Telephone Service for period between 1 July 2004 and 30 June 2005, 10 September 2008 | Telecommunications | Tilted annuity | Tilted annuity | Telecommunications Service Obligations (TSO) for local residential telephone services in the TSO deed between Telecom and the Crown dated December 2001 |
| ACCC | TSLRIC Pricing Methodology for the GSM Termination Service, Final Report, July 2001 | Telecommunications | Straight line depreciation | Straight line | The establishment of a long-run incremental cost pricing approach based on TSLRIC in order to promote the LTIE. The approach assumes a provider is facing effective competition and measures change in cost from not producing to producing |
| ACCC | MTAS Pricing Principles Determination, 1 July 2007 to 31 December 2008, Report, November 2007 | Telecommunications - Mobile Terminating Access Services (MTAS) | The ACCC's decision was informed by the WIK Mobile Network Cost Model (WIK model), a bottom-up cost model developed for the | Tilted annuity | The ACCC considered that using a tilted annuity approach was reasonable on the basis that growth in mobile services was likely to be steady |

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| | | | ACCC incorporating tilted annuity depreciation | | |
| ACCC | Domestic Mobile Terminating Access Service Pricing Principles Determination and indicative prices for the period, 1 January 2009 to 31 December 2011, March 2009 | Telecommunications - MTAS | Tilted annuity under TSLRIC+ | Tilted annuity | The ACCC confirmed that TSLRIC+ as applied by the WIK model remained the appropriate approach |
| ACCC | Public inquiry on the access determination for the Domestic Mobile Terminating Access Service, Final Report, October 2020 | Telecommunications - MTAS | Tilted annuity under TSLRIC+ | Tilted annuity | The ACCC concluded that a cost-based price consistent with the total service long run incremental cost plus organisational-level costs (TSLRIC+) pricing principles is the most appropriate pricing approach having regard to the LTIE |
| ACCC | Fixed Line Services Model (FLSM), 2011 | Telecommunications - Fixed Line Services | The FLSM is an adaptation of the AER's PTRM. Straight line nominal depreciation | Straight line | The ACCC did not consider that front-loading or back-loading of depreciation was warranted in place of the profile presented by straight line depreciation |
| ACCC | Inquiry into final access determinations for fixed line services, Final Decision, November 2019 | Telecommunications - Fixed Line Services | Straight line nominal depreciation, as applied by the ACCC's FLSM | Straight line | The ACCC's final access determinations for seven declared fixed line services (mainly on copper PSTN and DSL networks). Access prices are determined by the ACCC's FLSM. |
| ACCC | NBN Co Special Access Undertaking Long Term Revenue Constraint Methodology 2019-2020: Draft Determination and Price compliance reporting 2019-2020, 27 April 2021 | Telecommunications - NBN | Straight line nominal depreciation | Straight line | The SAU specifies that the nominal regulatory depreciation is the difference between the nominal straight-line depreciation and the change in value of the nominal RAB due to inflation (consistent with the PTRM calculation of straight line depreciation). Depreciation on the SAU applies to the RAB and to tax calculations. The Initial Cost Recovery Account (ICRA) value is not subject to depreciation and is capitalised at a regulated rate of return |
| ComReg (Ireland) | ComReg Decision 01/10 – LLU and SLU maximum monthly rental charges | Telecommunications - Local Loop Unbundled Service (LLU) | Tilted annuity under TSLRIC | Tilted annuity | The application of tilts to regulated LLU prices provides regulated entities with efficient incentives for the timing of their investments |
| ARCEP | ARCEP, Décision n°05-0834, | Telecommunications | Nominal CCA valuation, | Tilted annuity | ARCEP, Décision n°05-0834, 2005 |

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|---|---|---|---|---|---|
| (France) | 2005 | - LLU | converted to tilted annuity | | |
| Natural Resource Management Ministerial Council | National Water Initiative (NWI), Pricing Principles, April 2010 | Water National | Lower bound pricing may be set based on renewals annuity, upper bound pricing on a conventional building block basis | Renewals annuity option (lower bound prices) | To the extent that it is not practicable to charge on the basis of the building block approach, the NWI principles provide for charging, as a minimum, based on an annuity approach |
| QCA | SunWater Irrigation Price Review: 2012–17, Final Report Volume 1, May 2012 | Water, Qld | Rolling annual renewals annuity | Renewals annuity | Annuity based on the present value of forecast investment in assets, rather than on the recovery of an initial asset value (as in infrastructure, or capital annuity) |
| QCA | Seqwater Irrigation Price Review 2013–17, Final Report Volume 1, May 2013 | Water, Qld | Rolling annual renewals annuity | Renewals annuity | Annuity based on the present value of forecast investment in assets, rather than on the recovery of an initial asset value |
| QCA | Queensland Competition Authority, Final Decision, Dalrymple Bay Coal Terminal (DBCT) Management's 2015 draft access undertaking, November 2016 | Port Infrastructure, Qld | Straight line nominal depreciation allowance based on estimated asset lives. | Straight line | Calculated on a straight line basis applying the remaining useful life and where the underlying asset base is indexed. The annual revenue requirement is offset by the annual inflation amount.<br><br>The remaining useful life has been challenged and adjusted at regulatory reviews. |
| QCA | Queensland Competition Authority, Draft Decision, Aurizon Network's 2017 draft access undertaking, December 2017 | Rail, Qld | Straight line nominal annual depreciation allowance based on estimated asset lives. | Straight line (varying depreciation profile based on asset date) | Straight line nominal annual depreciation allowance based on a combination of estimated asset lives (capped at 50 years for original assets) and an accelerated depreciation profile appling a rolling 20-year life for new assets (rebased at each regulatory review) since the approval of the 2010 Undertaking. |
| QCA | Queensland Competition Authority, Final Report, Gladstone Area Water Board Price Monitoring 2020-25 May 2020 | Water, Qld | Straight line nominal annual depreciation allowance based on estimated asset lives | Straight line | Calculated on a straight line basis applying estimated asset lives and where the underlying asset base is indexed. The annual revenue requirement is offset by the annual inflation amount. |
| IPART | Independent Pricing and Regulatory Tribunal, Bulk Water Prices for State Water | Water, NSW | Renewals annuity | Renewals annuity | Since 2006 the building blocks approach has replaced the renewals annuity approach. Resumption of the building block approach has been justified by IPART on the basis |

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| | Corporation and Water Administration Ministerial Corporation from 1 October to 30 June 2010, September 2006 | | | | of economic efficiency and regulatory effectiveness |
| Goulburn–Murray Water | Goulburn–Murray Water, Goulburn-Murray Water Announces 2005/06 Prices, June 2005 | Water, Vic | Renewals annuity | Renewals annuity | Industry assets constructed since 1 July 2006 are regulated under a building block approach, although some regulated entities applied the annuity method for pre-1 July 2006 assets. Goulburn-Murray Water applied renewals annuity until 2005 (building blocks thereafter) |
| Southern Rural Water | Southern Rural Water, Water Plan 3—2013 to 2018, 2013 | Water, Vic | Renewals annuity | Renewals annuity | Southern Rural Water applied the renewals annuity approach until 2013 before adopting the building block approach |
| Water Services Regulation Authority (OFWAT) | 2009, Future Water and Sewerage Charges 2010–15, Final Determinations, 2009 | Water UK | Infrastructure renewals annuity (under-ground assets) | Renewals annuity (under-ground assets) | OFWAT's position involved under-ground assets charged on the basis of an infrastructure annuity, with above-ground charged on a building block basis |
| IPART | Review of pricing arrangements for recycled water and related services, Sydney Water, Hunter Water, Central Coast Council, Essential Energy, Final Report, July 2019 | Water, NSW | A Long Run Marginal Cost (LRMC) perspective that does not incorporate depreciation charges | LRMC, without depreciation charges | In calculating avoided and deferred costs under a ‘with vs without’ approach to costing, capital and operating expenditure are taken into account, but depreciation charges are ignored. |
| IPART | Prices for wholesale water and sewerage services, Sydney Water Corporation and Hunter Water Corporation Final Report, June 2017 | Water, NSW | Straight line | Straight line | Conventional building block approach incorporating straight line depreciation |
| IPART | Review of Prices for Sydney Water from 1 July 2020, Final Report, June 2020 | Water, NSW | Straight line | Straight line | Conventional building block approach incorporating straight line depreciation |
| IPART | Review of Prices for Hunter | Water, NSW | Straight line | Straight line | Conventional building block approach incorporating |

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|---|---|---|---|---|---|
| | Water Corporation from 1 July 2020, Final Report, June 2020 | | | | straight line depreciation |
| Federal Energy Regulation Commission (FERC) | PART 101 - Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act, October 2000 | Electricity US | Allocation over useful service life "in a systematic and rational manner" | Other | FERC had initially proposed that depreciation rates for accounting purposes should be based on the predominant straight line method, but after consultation, the instruction requires a method of depreciation that allocates costs over useful service life "in a systematic and rational manner" |

***Table B2: Regulatory examples of mechanisms to shift cost-recovery over time***

| Regulator | Decision | Industry/Sector | Mechanism | Commentary |
|---|---|---|---|---|
| ACCC | Final Decision, Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline, 30 June 2000 | Gas Distribution | Economic depreciation to achieve price path | ACCC's solved for an economic depreciation profile as part of a tariff levelising mechanism. Levelisation involves application of a sculptured revenue or price path that need not match costs on a year-to-year basis (but must exactly match costs over the life of the assets concerned, so that the tests of NPV=$0 and the "only once" condition are satisfied). Depreciation charges under levelisation are back-solved from the chosen price/revenue path. |
| QCA | Final Report<br>Gladstone Area Water Board: Investigation of Pricing Practices<br>March 2005 | Bulk Water | Price path and with under/over-recover y adjustment | In 2010 the QCA recommended a price cap methodology based on a 20-year planning period, with prices set to recover costs over this period. This involved five yearly regulatory period resets of the price path based on updated demand forecasts and other parameters - in order to avoid a significant step change in bulk water charges as a result of a capacity augmentation which was intended to service future demand. GAWB was permitted to roll forward any under- or over-recovery as an adjustment amount for the next regulatory period. |
| Commerce Commission (NZ) | Fibre input methodologies: Main final decisions – reasons paper<br>(13 October 2020) | Telecommunications | Depreciation | The depreciation method should be consistent with the efficient profile of revenue and should also be consistent with accounting rules. A provider may apply an alternative depreciation method, provided that the Commission is satisfied that this better aligns with outcomes in a workably competitive market. The Commission has expressly rejected the straight-line depreciation method for FFLAS and has not to date made a determination in relation to an alternative depreciation method in relation to this service |
| Commerce Commission (NZ) | Input methodologies review decisions<br>Topic paper 3: The future impact of emerging technologies in the energy sector (20 December 2016) | Electricity Distribution | Depreciation | To address the risk of partial capital recovery (due to physical asset life assumptions set out in the input methodologies), the Commission allows remaining asset lives to be shortened by electricity distribution businesses at their discretion on an NPV neutral basis. The adjustment is capped at a 15% reduction in remaining asset lives at the time of a regulatory reset. |
| Commerce Commission (NZ) | Input methodologies review decisions<br>Report on the IM review<br>(20 December 2016) | Electricity Distribution | Revenue cap wash-up process | Where a business intentionally and voluntarily undercharges relative to the allowable revenue cap (to limit price shocks to consumers), the Commission allows businesses to delay the under recovery (subject to a cap) as part of its wash-up processes and price setting mechanism. The purpose of the wash-up is to ensure that revenue is not under- or over-recovered over time. |

# Appendix C - Documentation provided by the ESC

Refer below for the full list of documentation provided to PwC by the ESC on 20 July 2021.

- 5.46 - 3 - P01668 - PoM 2020-21 Rebalancing Application - December 2020.pdf
- 5.47 - 1 - P01044 - 2021 Industry presentation.pdf
- 5.47 - 2 - P00762 - PoM 2021-22 TCS - General Statement_CONFIDENTIAL.pdf
- 5.47 - 3 - P01776 - Appendix R_Incenta options for structuring the return of capital for the Port of Melbourne.pdf

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