Independent Pricing and Regulatory Tribunal

Regulatory tests of past and forecast capital expenditure

Review of approach used in determining allowances for return on assets and regulatory depreciation

Research — Final Report
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ISBN 978-1-921628-83-2 S9-60

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Contents

1 Executive summary

We have recently reviewed the processes, tests and information we use for the assessment of capital expenditure, to check that our approach is in line with regulatory best practice.

The purpose of this report is to explain our final decisions on our approach for assessing the efficiency and prudence of capital expenditure, and the reasons for these decisions.

1.1 What changes have we decided to make to our approach for assessing capital expenditure?

After considering PwC's findings and recommendations, and the responses we received from consultants and other stakeholders, we have decided to largely maintain our current approach to assessing capital expenditure, but to make the following improvements to this approach:

- Further clarify the processes, tests and information requirements for assessments of capital expenditure by summarising these in flow chart form. This flow chart will supplement the detailed requirements that we currently provide to the consultancy engaged to conduct the assessment.
- Enhance the 'strategic' review element by:
  - Explicitly including in our information requirements to agencies a request for longer term capital investment plans (ie, beyond the price determination period) along with the reasoning that underlies these plans. Our terms of reference for consultants will request that these plans and reasoning be reviewed.
  - Explicitly including asset management plans in our information requirements to regulated business, and specifying in our terms of reference for consultants that these plans be reviewed.
  - Requiring regulated businesses to obtain external assurance that the forecasts and supporting information provided for capex assessments accurately reflect their underlying information base, before they submit this information. However, small regulated businesses will be excepted from this requirement, as we agree with stakeholders that it would not be cost-effective for them to obtain external assurance. Instead, they will be required to submit details of the self-assurance process they have undertaken, and have their boards sign-off on their final submissions.
- Improve documentation of the 'detailed review element' and provide a good audit trail, by requiring consultants undertaking the assessment to provide a short summary of their findings on each capital project they review in detail.

- Continue to discuss the collection of reliable databases with other Australian regulators with a view to standardising the data available, which may make it possible for econometric benchmarking studies to be attempted.
- Continue to develop a suite of suitable output measures, in consultation with each business concerned. As part of this process, we intend to consider how the number of performance indicators that businesses are required to monitor and report on might be rationalised and/or aggregated to form higher-level indices of performance.

We decided not to adopt PwC's recommendation to include a review of regulated businesses' unit costs in the strategic review element of capex assessments, and benchmark these across time and across businesses. However, we will explore with the businesses concerned the extent to which useful standardised unit costs might be obtained for some specific activities and we will consider the extent to which these might be useful in benchmarking.

1.2 How is the rest of this report structured?

The following chapters discuss our review and decisions in more detail:

- Chapter 2 outlines the context for the review, including more information on our current approach to assessing capital expenditure and our review process
- Chapter 3 summarises PwC's findings and recommendations
- Chapter 4 discusses our considerations on each of PwC's recommendations and stakeholder comments on these recommendations, and explains our decisions.

2 Context for this review

As Chapter 1 indicated, this review relates to the approach we use to assess the regulated business' capital expenditure for the purpose of deciding how much of this expenditure should be recovered through prices for regulated services. We make this assessment when we use the building block approach to estimate the business' total efficient costs of providing these services. The assessment involves:

- reviewing the regulated business' actual capital expenditure over the current determination period (past capex), to establish the level that was prudent and efficient and thus should be included in the opening value of the regulatory asset base (RAB) at the start of the next regulatory period (for which prices are being set), and
- reviewing the business' forecast capital expenditure for the next regulatory period (forecast capex) to establish the level that is efficient and necessary for the provision of the regulated services and thus should be included when rolling forward the RAB to establish its value in each year of the regulatory period.

These opening and annual RAB values are key inputs to our calculations for the allowance for a return on assets and the allowance for a return of assets (regulatory depreciation). Figure 1 overleaf provides an overview of the building block method, and highlights where the assessment of capital expenditure fits into the overall scheme.

The sections below describe our current approach for assessing past and forecast capex, and the process we used in reviewing this approach.

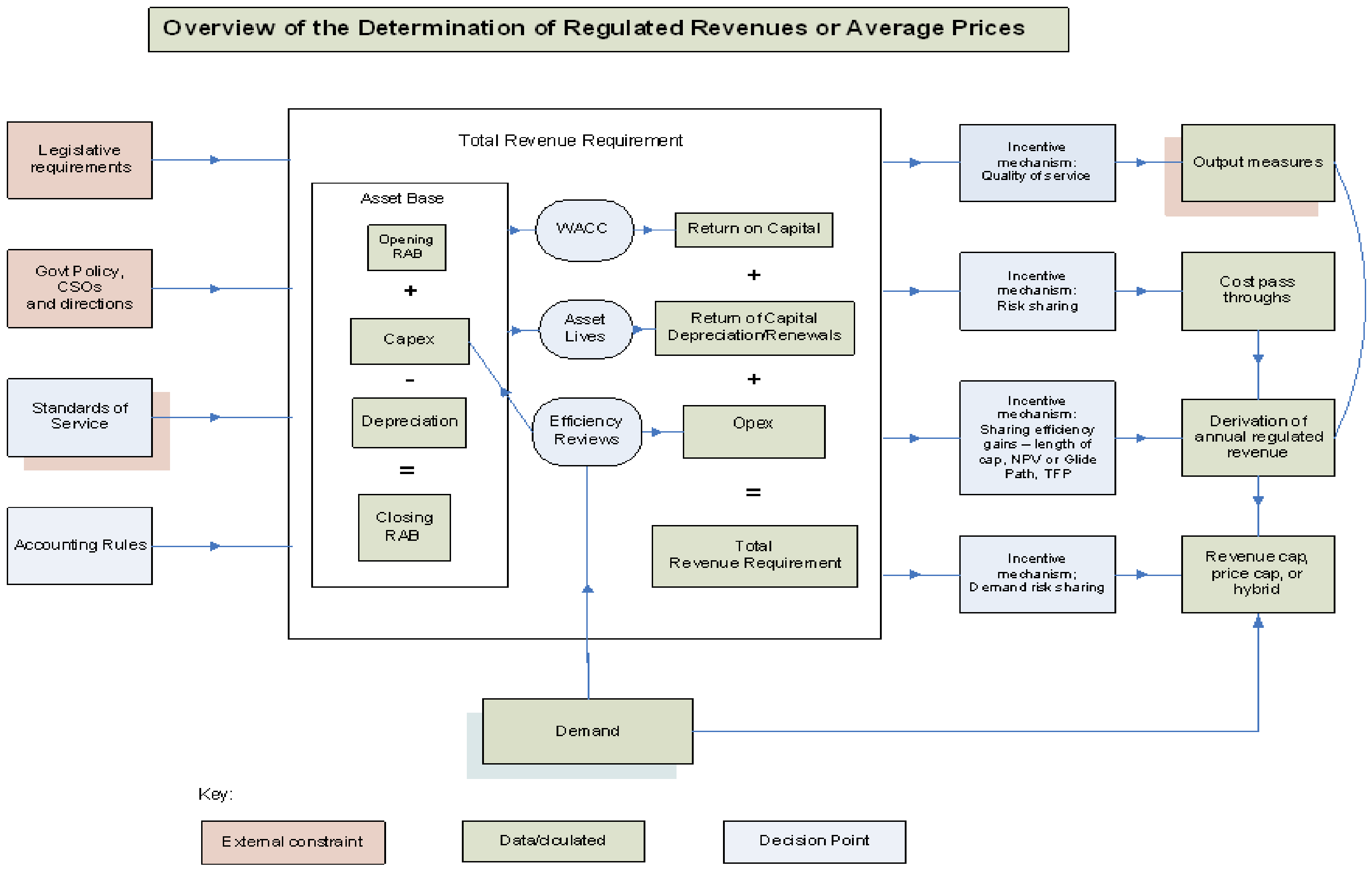
2.1 IPART's current approach to assessing capital expenditure

We usually engage a consulting firm – typically an engineering-based firm with specialist knowledge of the relevant sector – to undertake assessments of past and forecast capex on our behalf. As noted in Chapter 1, we provide detailed terms of reference for these assessments, which we usually provide to the regulated business concerned for comment prior to engaging the consultant.

The terms of reference indicate that the efficiency test should assess whether the business' past and forecast capex represents the best way of meeting the community's need for the relevant services. The prudence test should assess whether, in the circumstances existing at the time, the past decisions to invest in an asset were ones that a similar business, acting prudently, would be expected to make. In assessing prudence, the consultant should assess both **how the decision was made**, and **how the investment was executed**, having regard to the information available at the time.

We ask the regulated business concerned to provide the information the consultant needs to conduct this assessment. Appendix A provides an example - the terms of reference supplied to the consultant for the 2009 review of State Water Corporation's past and forecast capex.

Figure 1 The elements of the IPART building block approach to revenue or price regulation



2.2 IPART's review process

We engaged PricewaterhouseCoopers (PwC) to undertake the review of our approach to assessing capex on our behalf. We asked PwC to compare our current approach to those used by other regulators, including the various tests they currently apply, and to recommend any changes required to our approach to best-practice standard.

We received PwC's report on its findings and recommendations in August 2010.[1] After considering this report, we invited 4 consulting firms that have previously assisted us in assessing capex to provide us with informal comments on the recommendations. We also posted PwC's report on our website in September 2010, along with some introductory remarks,[2] and invited all interested parties to make submissions on the report.

We received 5 submissions, which we posted on our website from mid-October. The submitters were:

- Atkins Limited, a private consulting firm based in the UK
- the Australian Rail Track Corporation, (which is regulated by us via the NSW Rail Access Undertaking)
- Cardno Limited, a consulting firm listed on the Australian Stock Exchange
- the Sydney Water Corporation and the Hunter Water Corporation, the 2 largest metropolitan water agencies in NSW, both of which are regulated by IPART.

We thank these organisations for their contributions.

We considered PwC's findings and recommendations again, taking account of all the comments we received from consultants and other stakeholders, and made our final decisions on changes to our approach for assessing capital expenditure for price setting purposes.

1 PwC *Review of regulatory tests for capital expenditure - Final Report*, 10th August 2010.

2 IPART, *Introductory remarks on 'Regulatory Tests for Capital Expenditure' and an Invitation to Comment* at www.ipart.nsw.gov.au under the 'Research' icon button.

3 PWC's review, findings and recommendations

PwC undertook comparative analysis of the design, application and impact of regulatory tests for capital expenditure used by IPART and 5 other regulators (the Australian Energy Regulator, the California Public Utilities Commission in the United States, Ofwat and Ofgem in the United Kingdom, and the Commerce Commission in New Zealand). It considered:

- the nature of the test used (for example, efficiency, prudence, used and useful)
- the guidance provided or the precedents on the practical application of these tests
- whether the tests are applied to past capex, forecast capex, or both
- the magnitude and probability of disallowed expenditures in practice, and
- the impact on incentives for efficiency and investment risk, and the evidence as to actual impacts observed.

The sections below summarise PwC's findings and recommendations, and summarise stakeholders' general comments on the recommendations.

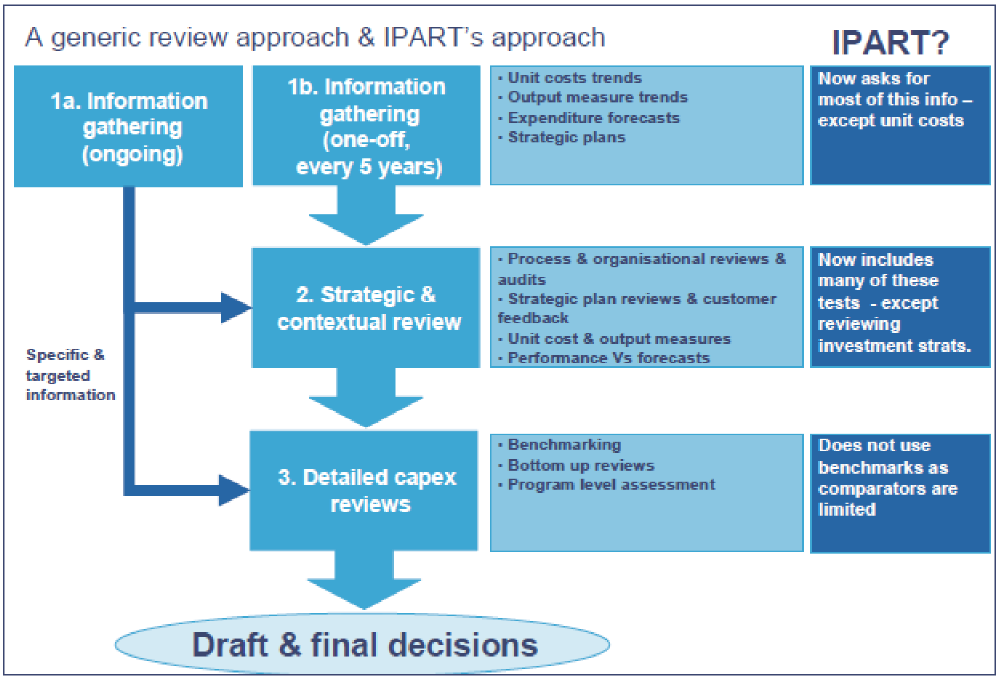
3.1 PwC's findings

PwC's findings suggested that the approach used by the UK regulators is the most relevant to the NSW context. PwC compared their approach to ours, in effect using the approach of the UK regulators as the best-practice yardstick. In PwC's view the UK approach is relatively structured and comprises a number of complementary measures. It involves:

- information gathering, which is specifically targeted to support the analysis the regulator intends to undertake or commission
- a strategic and contextual review of the regulated business that allows the potential areas for detailed analysis to be prioritised, and
- a detailed review of capex conducted by engineering consultants using a range of tools, including benchmarking analysis, bottom-up analysis and program-level assessments.

PwC developed a generic approach to capex assessments based on the UK regulators' approach. It then compared this to the approach we used for our most recent reviews of State Water and the NSW Office of Water in 2009 and 2010. It found that the current approach included most of the same information, tests and tools as used by the UK regulators (see Figure 2).

Figure 2 Stages in a generic pricing review compared to IPART's current approach



Source: PwC, *Review of regulatory tests for capital expenditure - Final Report*, 10th August 2010, p 13.

3.2 PwC's recommendations

Given this finding, PwC recommended only relatively minor enhancements to our current approach.[3] In particular, in Chapter 4 of its report it recommended that we:

1. Map out our processes, tests and information requirements for the capex assessment in a flow-chart format (similar to that used in Figure 2 above).
2. Enhance the 'strategic and contextual review' element of this assessment by:
   a) including a review of the business' unit cost trends
   b) reviewing the prudence and efficiency of the business' longer term strategic investment strategies
   c) considering including a review of the business' asset management processes and plans, and
   d) considering requiring the business to provide some level of independent or external assurance about the quality of the forecasts and supporting information provided for capex assessments.
3. Enhance the 'detailed capex review' element of the assessment by providing more detailed guidance to consultants on the approach, application and documentation of efficiency and prudence tests (ie, better scopes of work).

3 PwC *op cit*, p 13.

4. In the longer term:
   a) Continue to explore the potential for the wider use of econometric benchmarking techniques to complement the range of tools for assessing the efficiency of past or future expenditure. For example, it may be possible to use these techniques in comparing unit costs across businesses, or to use econometric models to predict the volumes of various classes of capital expenditure required in the future.
   b) Seek the cooperation of other Australian regulators, to facilitate the use of econometric benchmarking by ensuring the collection of a reliable database of financial and non-financial information from regulated water and passenger transport industries.
   c) Consider the development of more comprehensive measures of the outputs or serviceability of the assets that we regulate.

3.3 General comments from stakeholders

One of the regulated businesses that made a submission, the Australian Rail Track Corporation (ARTC) operates within a framework that has a thorough capex assessment process that involves stakeholder consultation and close scrutiny of its plans. ARTC's submission outlined how the process is conducted and the kind of information that informs the consultations. It concluded that:

> In the end, it is in ARTC's interests to provide a level of information to the capital expenditure consultation process that provides the industry with confidence that a strategy or project is prudent and delivery is efficient. This, in turn, gives ARTC greater certainty of recovery of the capital expenditure to the extent that risks associated with ex-post assessment of prudency or efficiency by IPART is largely mitigated.[4]

We agree with ARTC that its capex assessment process is thorough and we note that to date we have not excluded any capex from the regulatory asset base in the Hunter Valley coal rail network. As ARTC stated:

> The approach provided in the NSWRAU represents the most appropriate and efficient means by which efficient investment in the network can be delivered. ARTC recognises however that the approach cannot be applied across most other industries where the user base is different.[5]

The other regulated businesses, Hunter Water and Sydney Water, have experience with capex assessments made as part of price reviews under the IPART Act, which are the subject of this review. In general, these businesses and the 2 consulting firms that made submissions agreed that IPART's current approach is working well and that some of PwC's recommendations were practical and would further enhance the approach. However, both water businesses raised concerns about the additional

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4 ARTC, *Regulatory Tests for capital Expenditure: ARTC Response to IPART Introductory Remarks*, 14 October 2010, p 4.

5 *Ibid p 4*. NSWRAU refers to the NSW Rail Access Undertaking, which provides for third parties to obtain access to the NSW rail network.

information regulated businesses would be required to provide if some of the recommendations were implemented.

In particular, Sydney Water argued that PwC appeared not to have considered water businesses' operating licence conditions in forming its recommendations. It noted that the operating licence reporting manual contains 81 performance indicators on community and customer requirements and 131 that comprise the National Water Indicators. It requested that we rationalise our existing requirements if we decide to require businesses to report on additional performance or output measures and other matters.

4 IPART's considerations and decisions

We carefully considered PwC's report and recommendations, and the comments provided by our selected consultants and the stakeholders that made submissions.

The sections below discuss each of PwC's recommendations, stakeholders' specific comments about these recommendations and our decisions on whether or not to adopt the recommendations. The final section discusses the issue of licence requirements and output measures raised by Sydney Water, and how we bring these together when considering the overall efficiency and prudency of past and forecast capex.

4.1 Recommendation 1: Map out processes, tests and information requirements in flow chart format

PwC recommended that we map out the processes, tests and information requirements for our capex assessments in flow chart format, using the format shown in Figure 2 above as a guide. It noted that this will help ensure clear alignment between the information we require from regulated businesses and the tests we apply. It would also improve the likelihood that the processes used for these assessments are efficient, repeatable and consistent.

We have decided to adopt this recommendation. We consider that this kind of 'map' will help ensure that consultants, regulated businesses and us all share a clear, consistent understanding of our approach for capex assessments. We note that the consultants and other stakeholders who provided comments also generally agreed that such a map would enhance our current approach.

For example, Sydney Water commented that in its experience, different consultants tend to take different approaches to testing the efficiency of capex and had somewhat different information requirements. Therefore, it agreed with PwC's recommendation that IPART could establish clearer processes, tests and information requirements.[6]

In addition, Atkins noted that developing such mapping would involve only minor changes to the most recent the terms of reference we provided to it for its review of State Water's capex in 2009.[7] However, Cardno suggested that such mapping should be at a broad level because detailed application of the processes and tests would vary from review to review and should not be prescribed in advance.

4.2 Recommendation 2: Enhance the 'strategic review' element

PwC recommended 4 potential actions for enhancing the 'strategic' review' element of the capex assessment:

1. include a review of the business' unit cost trends
2. include a review of the business' longer term capital investment strategies
3. consider including a review of the business' asset management processes and plans, and
4. consider requiring the business to provide independent or external assurance about the quality of the forecasts and supporting information it provides for capex assessments.

4.2.1 Include a review of the business' unit cost trends

PwC recommended we expand our information request template to require businesses to submit a set of standard unit costs for both past and forecast capex. In addition, we should require businesses to provide reasons for wide differences in unit costs for comparable projects, and to document trends in these costs over time. The consultant would review the unit cost data, and benchmark them against other businesses (if possible) and over time. This would help it identify potential areas for detailed review and ensure that the businesses can explain their cost trends.

We decided not to adopt this recommendation at this stage. While we agree with PwC that regulated businesses should be able to explain their cost trends, we do not consider it meaningful (because it is not practical) to review or benchmark their unit cost data at this stage. In particular, we note Atkins and Cardno's concerns about the use of unit cost data in capex assessments, discussed below. However, we will

6 Sydney Water, *Sydney Water's comments on Regulatory Tests for Capital Expenditure*, 12 October 2010, p 1.

7 Atkins, *Comments on The Review of Regulatory Tests for Capital Expenditure*, 6 October 2010, p 2.

explore with the businesses concerned the extent to which useful standardised unit costs might be obtained for some specific activities in the future.

We note that costs are only one of several drivers of regulated businesses' capital expenditure. Other important drivers include:

- the standards set by legislation
- the decisions on the level of services to be provided over and above any statutory minimums
- the planning processes through which the business determines the infrastructure to be provided, and
- the business' efficiency in building/installing this infrastructure.

In our view, unit cost benchmarking would help in assessing the business' efficiency in building the infrastructure. But it would not help with the other drivers of capex which would have to be assessed as prudent and efficient on other grounds.

While Atkins had no difficulty in principle with benchmarking, it considered that the uncertainties and practical difficulties surrounding meaningful benchmarking might be insurmountable. It noted that in reviews it has done for us in the past, it was difficult to use unit cost benchmarking data for efficiency assessments because the data were not sufficiently robust and the findings were easy to challenge. It noted that:

> …the approach works in England and Wales because there are some 20 companies with similar operating environments under one regulator following stringent reporting requirements which are independently audited in some detail. Applying a similar methodology to Australian agencies is more difficult because of uncertainties in definitions, accounting practice, operating environments and clarity of data.[8]

Atkins suggested that trends in unit costs for a few common assets and activities such as water mains and sewers (where activities that are similar and homogeneous) might be helpful in identifying outliers. However, assets that are heterogeneous, such as service reservoirs and sewage treatment works, are not amenable to straightforward unit cost comparisons.

Cardno also foresaw significant difficulties with any attempt to adopt unit cost benchmarking, particularly for water and wastewater treatment works assets, and provided some illustrative examples of measurement problems. It put the view that, even if measurement problems could be overcome, reviewing unit costs could be misleading, as these costs can change due to changes in the economic circumstances of the regulated business, which may have nothing to do with the efficiency of its capital expenditure practices. It suggested that it would be better to ask for activities and total costs rather than unit cost data because the consultants can always calculate unit costs themselves.

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8 *ibid* p 1.

Sydney Water expressed severe reservations about unit cost benchmarking against other water businesses because of the major differences in market conditions, geography and environmental matters. Hunter Water expressed a similar view. It noted, as an example, that infiltration is a significant issue for both it and Sydney Water, but is not for Melbourne water businesses. It put the view that the right question on efficient capex should be "does the proposed investment add value to the business' customers?" rather than how does its cost performance compare on a league table.

4.2.2 Review the prudence and efficiency of the business' longer term capital investment strategies

PwC recommended we require businesses to submit longer term investment strategies (eg, at least 10 years). These would then be reviewed for prudence (are they appropriate in the circumstances?) and for efficiency (has the business considered the most efficient way of providing services in the longer term?).

We have decided to adopt this recommendation, and also require the businesses to submit the reasoning or rationale for these longer term strategies. We consider that indicative long-term plans and the reasoning behind them will help us appreciate better the place of agencies' immediate capex plans in better, ie, long-term, context. We also note it was widely supported by the consultants who provided comments.

For example, Atkins agreed that it was appropriate to assess a business' past and forecast capex in the context of its longer term strategies. Cardno observed that the usefulness of the longer term view was related to a feature often found in agency capex plans:

> As we have found that in many instances capital expenditure is planned to be much higher in the first two years of a typical four to five year program, this extended [longer term] focus may encourage better planning and reduce 'lumpiness', front loaded, or peaked expenditure profiles in the capital expenditure program for the price path under review.[9]

Sydney Water also accepted that it was reasonable to consider proposed capex in the context of a longer term investment plan.

[9] Op cit, p 2.

4.2.3 Consider including a review of the business' asset management processes and plans

PwC recommended we consider asking regulated businesses to submit their asset management plans for detailed review by an expert technical consultant. It indicated that the consultant should compare the following aspects of the asset management processes and plans against good industry practice:

- demand forecasting
- clarity of accountability
- asset condition and risk assessment processes
- asset information and reporting systems
- asset management skills and training, and
- appropriate internal reporting and executive oversight.

It noted that this requirement might seem to overlap with operating licence requirements that businesses comply with NSW Total Asset Management standards. However, in its view, current licence condition requirements do not consider asset management in the level of detail that would allow a consultant to assess whether processes contribute to efficient service delivery.

We decided to adopt this recommendation. We will explicitly include asset management plans in our information requirements to regulated business, and specify a review of these plans in our terms of reference to consultants. In making this decision we note that both consultants indicated that they had found asset management plans particularly valuable in conducting past capex assessments, and supported the recommendation.

Atkins also noted that it was important that the assumptions and risks related to a business' capex program be exposed via the assessment process. It suggested that requiring the businesses to provide their asset management plans would enable the consultant to do this, and identify any short-comings in these plans compared to best practice.

Cardno noted that IPART (as regulator) would need to take care that we were not too prescriptive about what the plans should contain. The consultant would want to focus on whether the capital planning process was robust and consistent with best practice, and the criteria used to assess this would vary across operating environments and over time.

4.2.4 Consider requiring the business to provide independent or external assurance about the quality of its capex forecasts and supporting information

PwC recommended that we consider requiring the businesses to ensure a high level of rigour around the forecasts and submissions they provide for capex assessments. It noted that while we currently require a business' executive to sign-off on the submission, the level of quality assurance could be enhanced by requiring it to have key elements of it audited prior to submission. It also noted that both the Australian Energy Regulator and the UK regulators require this, as does the Commonwealth Government for grant funding applications.

We decided to adopt this recommendation, by requiring businesses to obtain external assurance that their pricing proposals in general and key elements of the capex submissions in particular are an accurate reflection of their underlying information base, before making their submissions. This will provide an additional level of quality assurance. However, we have also decided to make an exception to this requirement for small regulated businesses, where we consider it would not be cost effective for them to obtain such external assurance. Instead these businesses would be required to submit details of the self-assurance process they have undertaken and have their final submissions signed off at Board level. At this stage, we have not attempted to define a 'small' business.

In reaching this decision, we agreed with Cardno that sign-off at Board level is sufficient for small regulated businesses. We also agree with Sydney Water and Hunter Water's general view that the level of detail they are currently required to provide is adequate.

For example, Hunter Water commented in relation to this recommendation (and recommendation 2 in general) that various consultants have recommended improvements to the capex assessment process in the past several reviews, which it has been implementing. In its view, these previous recommendations covered much of what PwC recommended for enhancing the strategic review element, and the current capex assessment process is already quite rigorous. For example, it commented that there had been recent improvements in the annual information return and that these had addressed some of PwC's concerns regarding the quality of the data collected. It asked that "additional review/audit" functions only be incorporated into this approach if they add further net value to it.

4.3 Recommendation 3: Enhance the 'detailed capex review' element

PwC recommended that we enhance the 'detailed capex review' element of our approach for capex assessments by providing more detailed guidance to consultants on the approach, application and documentation of efficiency and prudence tests (ie, better scopes of work). It suggested a framework for this guidance, similar to the one used by Ofgem. It noted that more detailed guidance would help to standardise the detailed review element and create more certainty for the businesses, reduce the risk that our prudence and efficiency tests would be interpreted and applied inconsistently, and encourage more discipline among the businesses about documenting their investments.

We do not think that further detail to our guidance would achieve all these aims. Instead, having regard to the responses summarised below, **we decided not to adopt this recommendation.**

Both water corporations expressed the general view that the regulatory requirements were already highly detailed.

Atkins put the view that the current approach was preferable to the recommended approach. It noted that the recommended approach required the consultant to consider whether any of its findings suggest that individual investments (or the program of investments) are not efficient or prudent. It commented that it would be reluctant to commit to saying that an individual capex program was efficient or not.

Cardno supported the current approach that requires consultants to thoroughly examine a representative sample of capital projects as the means of assessing the efficiency of entire investment programs. Cardno noted, however, that:

> …it may be beneficial to formalise the linkages between the findings from the review of a sample of projects and the application to the entire investment program.[10]

Atkins commented that it uses short project summary sheets that provide a good audit trail of what it found for each project reviewed. It suggested that these sheets could meet the intent of the recommendation if they were used to highlight:

> …any inconsistencies in the application of the business planning process which might indicate some inefficiency. For example, inappropriate levels of cost contingency, the basis of the costs, the approach to procurement, program slippage etc. All these factors built up to an overall view of the management of the investment program as proposed in the submission.[11]

We consider there is merit in this suggestion by Atkins, which stops short of requiring consultants to make the formal linkages mentioned by Cardno, and since no stakeholders raised objections to it[12]**, we have decided to require our consultants to provide a short summary for each capex project examined.**

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10 Cardno, *Comment on Recommendations, Regulatory Tests for Capital Expenditure*, p 3.

11 Op cit, p 4.

12 Atkins' comment was included in our *Introductory Remarks* to stakeholders.

4.4 Recommendation 4: Continue to explore econometric benchmarking, seek improvements to data collection, and develop more comprehensive output measures

PwC recommended, in the longer term, that we:

a) Continue to explore the potential for the wider use of econometric benchmarking techniques to complement the range of tools for assessing the efficiency of past or future expenditure.

b) Seek the cooperation of other Australian regulators on the collection of a reliable database of financial and non-financial information from regulated water and passenger transport industries.

c) Consider developing more comprehensive measures of the outputs or serviceability of the assets that we regulate.

4.4.1 Continue to explore potential use of econometric benchmarking and seek the cooperation of other Australian regulators to improve data collection

In the short term, PwC recommended we review businesses' unit costs and benchmark them across time and across businesses (recommendation 2(a), discussed on pages 7 and 10 above). It also recommended that over time, we explore using econometric benchmarking techniques to enhance the review of unit costs across businesses. It noted that these techniques have a useful role to play in narrowing down the situations where more detailed analyses of forecast capex may be required.

However, it noted that currently the greater use of econometric benchmarking is limited by the quality of available data. Therefore, it recommended we seek the cooperation of other Australian regulators to ensure the collection of a reliable database of financial and non-financial information from regulated water and passenger transport industries.

We did not make a specific decision on the recommendation to explore the use of econometric benchmarking techniques. However, **we will continue to discuss the collection of reliable databases with other Australian regulators with a view to standardising the data available, which may make it possible for econometric benchmarking studies to be attempted.**

In relation to both unit costing and benchmarking more generally, we consider that regulators need to seek to standardise and improve their datasets in order to explore the usefulness of benchmarks in their various possible forms. We note that in its review of total factor productivity (TFP) as a pricing tool, the Australian Energy Market Commission (AEMC) supported data development as the first step in a general data improvement process.

The AEMC proposed that the initial focus should be on establishing a better, more consistent data set, noting that such data would improve regulatory practice in 3 ways:

1. By addressing the considerable information asymmetry problem that regulators face under the building block approach.
2. By facilitating greater use of benchmarking techniques.
3. By helping measure the effectiveness of the current regime in delivering outcomes for consumers.

While we do not intend to explore the use of TFP for price-setting purposes, we believe the AEMC's comments have wider application: better data are an important first step in improving regulatory practice. Hence we propose to discuss with the businesses we regulate and other regulators the options for the collection of better, more reliable and standardised data.

In relation to econometric benchmarking in particular, we note that Cardno indicated it did not support this approach because it has found that qualitative parameters were often crucial in assessing the efficiency of capital costs. It also pointed out that Ofwat has moved away from econometric modelling for capex in the UK water industry.

4.4.2 Consider developing more comprehensive output measures

PwC recommended that we consider developing more comprehensive measures of the outputs or serviceability of the assets we regulate. It noted that these measures would provide several benefits. They would:

- enable regulators to observe whether reduced actual capex compared to forecast capex was associated with a decline in output (such as a reduction in the condition of the assets, or increased utilisation and thus increased risk of asset failure)
- make it possible to strengthen businesses' financial incentives to minimise their capital costs without reducing their outputs
- provide greater transparency about the quality of the services being provided, and
- help in developing econometric benchmarking techniques to predict prudent and efficient levels of past and forecast capex.

We have decided that we will continue to develop a suite of suitable output measures, in consultation with each business concerned. As part of this process, we intend to consider how the number of performance indicators that businesses are required to monitor and report on might be rationalised and/or aggregated to form higher-level indices of performance.

This decision reflects stakeholders' general acceptance of the usefulness of output measures. For example, in its submission, Atkins strongly supported the further development of output measures because it saw these as central to assessing performance. Cardno also supported the recommendation, noting that regulated businesses were unlikely to interpret more comprehensive output measures as an attempt by IPART to micro-manage them as long as the required outputs were transparent, and we clearly established how we would respond if the business failed to deliver the outputs, or exceeded the outputs.

Our decision also takes account of regulated businesses' concern that the number of output measures (and other reporting requirements on them) not be increased without also considering rationalisation (or consolidation) of a large number of existing performance indicators. This issue is discussed further in section 4.5 below.

4.5 Licence conditions and output measures

We agree with PWC and the submitters that sound overall output measures are an important part of the review of capex, and the setting of prices more generally. While we currently do have regard to various output measures, we will work with stakeholders to review those measures and the way in which output measures are incorporated into the regulatory framework. This will be done on a sector-by-sector basis.

For example, Sydney Water and Hunter Water already have a range of output measures specified in their operating licences against which they report annually. These include measures of:

- quality (eg, performance against water quality and pressure)
- reliability (eg, frequency of service interruptions), and
- adequacy of capacity (eg, planning requirements).

As a result of this review, we will examine the extent to which these outputs drive capex requirements to better inform future capex reviews.

Output measures are also important because, in setting prices, we would like to match the prices to the overall level of service expected to be provided and monitor performance against those expectations. Typically customers are concerned about the quality and reliability of the services provided. For network businesses, this will be underpinned by the adequacy and serviceability of the network infrastructure.

However, it is difficult to make an overall assessment when looking at the current diverse range of measures. Hence, we also wish to review the existing performance measures and the scope to build up more aggregate measures of performance from these components. This may highlight that some measures are less useful and it may identify gaps within the existing suite of measures. Sydney and Hunter Water are rightly concerned about the risk of a proliferation of output measures. We will carefully consider the costs and benefits of any additional requirements and of maintaining existing requirements.

A Extract from terms of reference for review of capex in regards to IPART's review of State Water (2009)

Detailed review of operating and capital expenditure

IPART examines operating and capital expenditure from two perspectives – since the last determination and for the next determination period.

To assist IPART in this task the consultants are required to assess the adequacy, appropriateness and efficiency of State Water's past and proposed levels of operating and capital expenditure. In conducting this assessment the consultants must examine the total level of expenditure, in addition to assessing expenditure on an individual activity/project basis. IPART expects that a broader, high-level assessment of expenditure will have regard to the impact on State Water's business, its customers and its prices.

The consultants must assess:

a. the *efficiency* of operating expenditure for the period from 1 July 2006 to 30 June 2010, to the extent necessary to assess the efficiency of the proposed operating expenditure

b. the *efficiency* of proposed operating expenditure for the period from 1 July 2010 to 30 June 2015

c. the *efficiency and prudence* of capital expenditure for the period from 1 July 2006 to 30 June 2009

d. the *efficiency and prudence* of proposed capital expenditure for the period from 1 July 2009 to 30 June 2015

e. State Water's past performance against its current output measures and review and recommend output measures for the next determination period, taking into account any proposals made by State Water in its submission to IPART.

Explanations of the *efficiency* and *prudence* tests that the consultants are required to undertake are provided below.

Efficiency test

In reviewing forecast expenditure, the *efficiency test* is used to determine how much of State Water's proposed operating and capital expenditure for the upcoming determination period will go into IPART's determination of State Water's revenue requirement. The efficiency test should examine whether State Water's proposed expenditure represents the best way of meeting the community's need for the relevant services.

Prudence test

The *prudence test* is used to determine how much of State Water's:

- actual capital expenditure in the current determination period (2006/07 to 2009/10) should be rolled into State Water's regulatory asset base for the start of the upcoming determination period, for the purposes of calculating allowances for return on and return of capital
- forecast capital expenditure in the upcoming determination period (2010/11 to 2014/15) should be rolled into State Water's regulatory asset base over the course of the upcoming determination period, for the purposes of calculating allowances for return on and return of capital.

The prudence test assesses whether, in the circumstances existing at the time, the decision to invest in an asset is one that State Water, acting prudently, would be expected to make. It should assess both the prudence of *how the decision* was made to invest and also the prudence of *how the investment was executed* where the asset has been built (ie, the construction or delivery and operation of the asset), having regard to information available at the time.[13]

Detailed lists of the tasks that the consultants are required to undertake to review State Water's operating and capital expenditure are outlined below.

Capital Expenditure

The consultants are required to recommend prudent and efficient levels of capital expenditure for the next determination period. The consultants are to review and comment on the capital expenditure assigned to each asset category.

In undertaking the review of capital expenditure the consultants must investigate and assess the projects that make up the capital program (including the cost and timing of projects). The consultants are required to consider the capital expenditure across all areas of State Water's business to prioritise and rank projects. The consultants' prioritisation and ranking of projects should include consideration and comment on:

- State Water's assessment of customers' willingness and capacity to pay, particularly in regard to discretionary capital expenditure proposals

13 The World Bank suggests that application of the prudence test: "…utilizes the information only available at the time of investment or outlay decisions, including expectations about the future. However, the test does assess what managers should have known and should have considered when they made the decision in question." PPIAF, World Bank and PURC, *Glossary for the Body of Knowledge on the Regulation of Utility Infrastructure and Services*, 30 June 2005 (Revised 27 August 2007) p 64. Concha and McKenzie concur suggesting the test should, "…appraise how the company takes the decision to invest and how the company executes the project, in the light of available information and conditions at the time." Concha, R. and McKenzie, I., 'OFGEM Proposes New Treatment of Capex Overspend', *NERA Energy Regulation Insights*, Issue No. 21, August 2004, p 3.

- an assessment of State Water's evaluation or justification for the project (eg, the robustness of its business case, cost benefit analysis or cost effectiveness analysis), including its consideration of alternative options and the implications of not proceeding with the project over 2006/07 to 2009/10.

For the review of State Water's capital expenditure the consultants are specifically required to:

1. Identify, describe, cost and assess State Water's capital works programs from 2006/07 to 2014/15 by function,[14] separately identifying projects which satisfy a materiality threshold of $1 million individually, as well as taking an aggregate overview to assess how the total capital program will impact on State Water's customers and its prices.
2. Undertake a detailed investigation into the project planning and actual outcomes for at least 10 per cent of State Water's capital projects above the $1 million threshold (the 10 per cent is to be achieved by number and by total value of State Water's capital program). The output from this task must incorporate a one-page summary for each project to be incorporated within the consultants' report as an appendix. The one-page summaries should include the following:
   - the planned project budget, program and outputs
   - the actual project, budget, program and outputs (appropriate to the stage in the project)
   - reasons for variations between actual and forecast expenditures
   - additional information that identifies any proactive planning by the agency for change of project scope or process development as a result of the project
   - assessment of the project outcomes and contribution to State Water's capital program drivers.
3. Comment on any particular concerns or issues relating to the process for determining and prioritising future infrastructure expenditures for State Water.
4. Comment on the prudence and efficiency of State Water's capital expenditure for the period from 2006/2007 to 2009/2010 and nominate a value for any capital expenditure considered imprudent or inefficient. Prudence and efficiency should be assessed against users' willingness and capacity to pay, identified drivers and variations from capital expenditure proposals and output measures identified in the 2006 Determination should be examined and detailed within the consultants' report. The outputs from this task must include:

14 State Water will submit an information return which allocates capital expenditure to a number of functions including asset management planning, routine maintenance, dam safety compliance, renewal & replacement, structural and other enhancement, corporate systems, fish passage works, cold water impact mitigation, salt interception schemes, flood operations, office accommodation capital projects, information management projects, river channel protection works. Costs by valley and year will be given for each function.

- A detailed review of progress against the output measures identified at the 2006 Determination. IPART considers that an assessment of State Water's performance against its 2006 output measures forms a useful indicator of its capital expenditure efficiency and prudency.
- Historical capital expenditure values (by program) for each year of the past determination period (2006/07 – 2009/10).

5. Provide an opinion on the efficiency and prudency of State Water's capital expenditure program for the period from 2010/2011 to 2014/15 and provide for each year reasoned estimates (by program) of the level of capital expenditure that the consultant considers efficient and prudent in order for State Water to undertake its functions. The outputs from this task must include forecast capital expenditure values (by program) for each year of the forthcoming determination period (2010/11 – 2014/15).
6. Identify the potential for efficiency savings to be achieved by State Water within the capital expenditure program over the period 2010/11 to 2014/15 and provide evidence and reasoning to support the proposals.