Motivating efficient expenditure and service outcomes for water businesses

IPART

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1. Introduction

IPART has asked Incenta Economic Consulting (Incenta) to assist with its strategic review of the regulatory framework for water utilities. This report is focused on the issues that arise when looking at reforms to enhance incentives for efficient expenditure and service performance. At the commencement of the engagement IPART presented us with a proposed model for regulatory reform. Therefore, we have sought to frame our advice within the context of this proposed model with the aim of informing the next stage of its development.

Specifically, this report considers the purpose and implementation of incentives with respect to:

- expenditure forecasting
- within period capital and operating expenditure, and
- service performance.

In addition, while we have not been asked to provide a comprehensive review of IPART's proposed model for reform of water utility regulation, where appropriate, we provide some commentary on the merits of certain aspects of the model.

1.1 Summary of 3Cs reform model

The 3Cs is a proposed reform to the regulatory arrangements that we understand has been developed by IPART staff. The 3Cs represents the focus of the proposed approach, namely: 'customers, costs and credibility'. We understand the key features of the model are as follows:

- Grading of expenditure proposals having regard to three focus areas: 'customers, costs and credibility'
- A 'standard' ranking will provide a firm with only a limited range of incentives and a simpler framework.
- 'Ambitious' or 'leading' proposals will permit a broader range of mechanisms, specifically:
  - An upfront efficiency dividend payment
  - More incentive based schemes (expenditure sharing mechanism, possibility of Totex, service performance and option for a customer service scheme)
  - Options for greater pricing flexibility
  - Increased scope for material cost pass through
  - Potential acceptance of negotiated outcomes on parts of the expenditure proposal with customer groups, along with less burdensome and more targeted efficiency reviews
- Firms to identify 5-10 customer outcome targets, advanced or leading proposals need to assign delivery targets to each and place revenue at risk, eg 10-30% of the annual dividend

The framework has some similarities to the PREMO framework adopted by the Essential Services Commission in Victoria (ESCV) but with a key enhancement. That enhancement is the inclusion of within period incentives in addition to an efficiency dividend for 'good' proposals.

Given IPART's proposal for reform we have sought to frame our advice within the context of the proposed model. However, we note that our advice would also apply to other models where there is an aim to enhance the incentives within the framework and so is not constrained to the 3Cs model.

1.2 Summary of our advice

The objective of incentives in economic regulation is to align the commercial interests of businesses with the interests of their customers. Financial incentives are achieved by aligning the regulated business' financial rewards or penalties with certain outcomes with the benefits and costs those outcomes create for customers. Reputational incentives can be achieved by exposing the performance outcomes of firms to customers, including through 'competition by comparison'. The primary focus of our analysis is on financial incentives.

The principal aims of financial incentives in economic regulation are to motivate:

- the delivery of the service quality desired by customers at its lowest sustainable costs, and
- investment and service improvement where the value customers place on that service improvement is greater than the cost.

While financial incentives are designed under the assumption that firms are financially motivated to improve profits, they can also be effective for more financially conservative firms. Financial incentives can motivate improved outcomes for financially conservative firms in the following ways:

- Motivating behaviours to avoid losses, recognising that financial incentives typically include penalties as well as rewards, such that behaving efficiently can avoid a penalty under an incentive scheme.
- Financial incentives would be expected to be taken into account when management and boards consider internal business cases for new expenditure, so that the payoffs that financial incentives deliver may "unblock" innovative projects that would not pass normal business plan hurdles in the absence of financial incentives.
- It would not be unusual for the KPIs for key management even in a financially conservative firm to be linked to outcomes in the regulatory framework, including incentive based outcomes. An example being that there may be a target to achieve, or retain, a certain ranking for a regulatory proposal, or a target to avoid penalties associated with certain service performance metrics.[1]

[1] We note a feature of the regime is to permit firms to self-select how ambitious they are with respect to identifying and implementing efficiency improvements. A natural consequence of this is that some businesses may prefer 'the simple life' and so be satisfied with minimal financial incentive being imposed. For smaller entities with lower levels of sophistication this may be an appropriate position. In this case reputational incentives – through exposing performance outcomes – may play a greater role in avoiding poor efficiency outcomes.

While financial incentives are typically considered a lower cost form of delivering desirable outcomes compared to alternatives such as central planning or administrative arrangements, getting the design and calibration of the incentives right so that the incentives are clear – and the risk of perverse responses is avoided – will require some upfront investment. Key factors to have regard to when designing incentive schemes include:

- the choice of the objective, which should be something customers care about
- how to measure gains and losses under the scheme so that they match the societal gains and losses
- deciding on the power of the incentive, that is, the share of the benefits or losses that are retained by the business,[2] and
- deciding how risk should be managed in the scheme, including whether exclusions from the scheme are needed so that risk is maintained to tolerable levels.

Incentives to propose efficient target revenue

An important aspect of the 3Cs model as summarised above is to provide encouragement for the businesses to advance more robust and better-articulated proposals during regulatory reviews, which we understand is viewed as not being provided sufficient priority at present by the businesses (which is a stark contrast to the situation of privatised firms). This aspect of the 3Cs model has, in our view, clear merit because the receipt of better articulated proposals should improve regulatory outcomes (even if more work is created to understand and respond to the proposals), and we also think that when businesses provide more thoughtful and better-articulated proposals that they will naturally bear more responsibility for the outcomes of the regulatory process.

However, a further key feature of the proposed 3Cs model that has been put forward by IPART staff is the ranking and subsequent rewarding of the expenditure proposals of the businesses in order to provide an incentive for businesses to provide forecasts that are efficient. This aspect of the model is clearly a greater challenge and would amount to an advance on the standard model of regulation that is applied to the largely privatised sectors (i.e., the energy networks). However, if this aspect of the model can be made to work, there would be substantial benefits. Under the standard application of the building block approach with prices fixed for a period of time, firms have a natural financial incentive to 'talk up' expenditure requirements, and the information asymmetry between the regulator and the regulated business makes it a challenging process for the regulator to overcome this asymmetry. Therefore, there is merit in exploring whether it is possible to provide an incentive for firms to reveal the efficient forecast in advance. The concept would be that a business would perceive itself as better off by offering their true opinion of the efficient forecast of expenditure at the outset rather than from being rewarded during the period, whilst also ensuring that any upfront efficiency reward is only retained if the promised benefits are delivered. Such an incentive scheme would naturally provide an

[2] Many of the incentive schemes implemented in Australia have been designed to provide a benefit to be retained for a pre-determined period, so that the incentive rate would depend on the length of that retention period (which in turn has normally been aligned with the length of the regulatory period) and the prevailing cost of capital. However, these incentive schemes can be respecified as an NPV form of calculation, so that any incentive rate can be provided. As an example, the AER's expenditure incentive schemes include a retention period model for opex and NPV model for capex (although why the AER has chosen a different calculation framework for the difference cost streams is not at all clear).

incentive for businesses to submit well-argued justifications for the proposal, including a clear demonstration that forecast projects meet the needs of customers, as they would bear the burden of demonstrating the efficiency of the proposals, whilst also reducing the susceptibility of the regulator to the asymmetric information concerns noted earlier.

Where an incentive is offered to promote efficient expenditure proposals, implementation issues that emerge include:

- How to give transparency and predictability to the raking that a particular proposal would achieve. Firms should know that if they submit a proposal with certain features that it is likely the regulator will rank it in a certain way.[3] This will give firms the confidence to do the work required to achieve a certain ranking.

  – It is unlikely that IPART can impose a highly objective target for determining the ranking as occurs in the United Kingdom. In the United Kingdom the regulator's best view of the required benchmark expenditure can be used to rank proposals because the number and characteristics of the regulated firms makes benchmarking far more feasible than in NSW. While some form of baseline will be required to rank businesses, creating this might involve additional qualitative analysis. Establishing a robust baseline will be a key to ensuring that any that regulated businesses are only rewarded for promising efficiency gains that exceed what would have been set under a standard regulatory review of expenditure and service level proposals.

- There is a need to consider the relationship between the assessment of proposals and the potential provision (and magnitude) of financial rewards, including:

  – Balancing any upfront efficiency dividend reward with the within-period incentives, with the key issue being to ensure that the business cannot be made materially worse off from identifying efficiency improvements in advance, given this prospect might discourage revealing efficient or ambitious forecasts, whilst also providing sufficient incentive to reveal efficiencies upfront so that these can be passed onto consumers sooner. This will be a function of both the total payoff available between various rankings of proposals and also the balance between upfront rewards and within period rewards.

  – Aligning the expenditure assessment approach with the design of within period financial incentives for efficient expenditure, including so that permanent gains in operating expenditure efficiency are properly rewarded.

It is also our view that IPART should continue on its path to move from input focused output measures to a focus on the outcomes that are actually delivered by regulated businesses. We consider, however, that not all outcomes should be proposed by the businesses themselves and instead IPART should establish a core list of outcomes that are consistent across all regulated water utilities. This

[3] Delivering a model that is predictable and transparent is likely to require that IPART establish some sort of baseline that permits ranking against that baseline. Establishing this baseline might require a combination of quantitative and qualitative assessment. Developing the baseline, and associated criteria, is a complex task with many factors to take into account, and so is beyond the scope of this paper. We consider that developing this framework is a key task for the next phase in developing the 3Cs model.

ensures the most important outcomes are captured and permits consistency and comparison between businesses.

Incentives to incur efficient expenditure

A known problem with merely fixing prices for a period of time is that the power of the incentive to incur efficient expenditure declines over the regulatory control period. The consequence is that businesses may have an incentive to delay expenditure until late in the regulatory period, even when customers would benefit from that expenditure being incurred earlier. Further, in the context of the proposed 3Cs model, within period financial incentives will have a role of holding firms accountable to the claims in their regulatory proposal, such that any efficiency dividend payment is returned to customers where projected efficiency improvements are not achieved.

Given the problem with just fixing prices for a period of time, expenditure incentives focus on providing an incentive to continuously find ways to lower overall input costs. This is done by supplementing end of period incentives so that the business has an equal incentive to minimise expenditure in each year of the regulatory control period.

Implementation issues that emerge in the context of within period financial incentives include:

- How to set the power of the incentive, with the considerations for this decision including:
  - What level of confidence is available that expected outcomes can be achieved? For this question the 3Cs model is expected to play an important role in motivating well argued proposals supported by customer preferences. The general approach being that a higher degree of confidence in the expenditure forecast can warrant a higher powered incentive, and vice versa.
  - How difficult is it to achieve efficiency improvements? Recognising that additional efficiency improvements will be more challenging for more ambitious regulatory proposals, such that higher powered incentives may be warranted in this case.
  - The payoffs that might be available in other incentive mechanisms. This includes the interaction within any efficiency dividend under the 3Cs model, as well as rewards and penalties available under service performance schemes.
  - Whether the scheme should provide symmetric or asymmetric payoffs, with an influence on this decision being whether gains may be harder to achieve than losses where efficiencies have already been revealed in an expenditure proposal.
- There are several issues that need to be addressed specifically in the context of the application of a capital expenditure EBSS, with four of the more prominent issues being:
  - The rewards for shifting projects between regulatory periods. Here the main concern is that businesses would be over-rewarded (under-rewarded) where projects are deferred (or advanced) between periods, unless an adjustment is made.
  - Where actual demand varies from what was forecast for the purpose of setting the forecast expenditure allowance there is the potential for windfall gains or losses to occur. This is

because the change in the need for expenditure to be incurred, and so the reward or penalty earned under a scheme, is dependant on an exogenous factor rather than the behaviour of the business. For instance, demand driven augmentations may no longer be required if demand falls from what was forecast.[4] To the extent this is an issue, adjustments can be made to the scheme to account for exogenous drivers, or projects that are triggered by exogenous drivers can be excluded from the scheme.

  - Whether depreciation is included in the scheme or not. The key issue here being whether the lifetime effect of a deferral of expenditure is taken into account.[5] However, including depreciation is not straightforward, especially because the standard approach to depreciation is unlikely to deliver the correct incentive outcome. In Australia, given the challenges associated with this issue, the more common approach has been to exclude depreciation from the schemes if some form of carry-over of benefits is provided (this is given effect by adjusting the RAB for forecast depreciation).

  - Implications from changes in capitalisation policies and other 'recurrent' capital expenditure changes, for instance, where substantial reductions are made to the capital expenditure overhead costs (a recurrent expenditure). This issue arises because capital expenditure schemes assume all capital expenditure is comprised of 'one-off' projects and there is no recurrent element to this expenditure, while operating expenditure is assumed to be recurrent with rewards or penalties occurring in perpetuity.

- There is a relationship between the approach to setting forecast operating expenditure and the scheme for operating expenditure incentives because the latter assumes implicitly that any reduction in expenditure is permanent. Specifically, it requires that the regulator rely on the revealed actual operating cost incurred in the base year in setting its forecast. If firms reveal efficiency improvements as part of their proposals, the efficiency dividend payment will have a role in ensuring that firms are not worse-off financially from revealing these efficiency gains in advance of making them.

We note that in recent times there has been attention given to combining capital and operating expenditure into one 'bucket' with a key aim being to address perceived bias towards capital expenditure. It is our view, however, that in the Australian context that separating capital expenditure and operating expenditure is preferrable and necessary. The main reason for this is that combining capital and operating expenditure into a single 'Totex' category requires expenditure forecasts to be set using exogenous forecasts rather than business specific costs. We do not consider it is feasible to benchmark operating expenditure with sufficient confidence for this purpose in NSW given the limited number of regulated firms and the variance in their size.[6]

Incentives to achieve service performance outcomes

As the incentive to minimise costs increases it can increase the incentive to avoid expenditure at the expense of service quality. Service incentives act as a counterbalance to cost efficiency incentives by

4 This need not imply that the forecasts were 'bad' from the outset. There are many legitimate reasons why actual demand can be materially different to forecast, not least for the water sector due to drought.

5 That is that the deferral of a renewal project at one point also implicitly defers the subsequent renewal.

6 We note, however, that there might be a case for adopting Totex for certain categories of expenditure where both operating and capital expenditure can be forecast using exogenous forecasts. A possible example of this is IT expenditure.

providing a reward to businesses achieving a socially desirable standard of performance and penalties for under-performance. The two primary means of imposing service performance incentives are:

- A scheme that delivers rewards or penalties based on the extent that a business achieves certain performance targets or output measures (i.e., s-factor schemes), and

- Penalty-only schemes that compensate individual customers where performance levels fall below certain pre-defined levels (i.e., redress payments).

The choice between these forms of incentive should depend on what drives customer value – i.e., do customers care about service increases or reductions equally, do they only care about service reductions, or do they care about both, but not equally?

Implementation issues that arise in the context of service performance incentive schemes include:

- Ensuring that the target for the scheme provides rewards for *improvements* in performance. This means that the target set for an incentive scheme need not be, and ideally should not be, the same as the minimum target set in a regulatory instrument.

- The choice of performance measures is a critical element of a well-designed service performance incentive framework. While there is merit in having the businesses propose measures for which they will be held financially accountable, we consider that IPART should establish a core set of performance measures and attach performance standards to these. At a minimum this ensures that the most important service performance measures are included in the incentives. It also allows consistent definitions and measurement across businesses.

- A decision needs to be made on the structure and level of a performance target. For instance, is the target focused on the frequency of service interruptions, their duration, or both? Further, is the target based on average performance, and if so, over what time horizon? On this matter we note that the first application of the scheme might bring a different treatment to the ongoing application of the scheme to avoid windfall gains that would arise if businesses were rewarded for performance improvements that occurred before the incentive was in place.

- How to have the incentive reward align with the social costs and benefits of particular outcomes for customers. Here, willingness to pay studies are likely to be required, recognising that these are not a perfect tool but are often better than alternatives such as the marginal cost of service improvements.

- Exposure to risk needs to be managed given there will be certain events over which businesses have no control or are unable to mitigate the impact of. The solution here is to exclude those events from the scheme.

Recommendations

In the table below we present our recommendations for IPART with respect to the reform of its approach to economic regulation. Given the focus of our report, these recommendations are focused mostly on the 'next steps' when deciding how to develop further and then implement the preferred reform approach.

Box 1: List of recommendations

Expenditure forecasting

- We think there is a strong case for using financial and reputation incentives to encourage businesses to submit more robust and better-articulated proposals with respect to expenditure requirements and service levels, based upon comparisons of one business's proposals against its peers as well as the promise of greater regulatory flexibility. The specific proposal for firms to be rewarded and ranked based on their proposal, and for differences in the flexibility/complexity of the regulatory regime to flow from this, has merit in the context of multiple regulated businesses of materially different size and characteristics. We also think that there is a good case for considering further the potential to provide financial incentives for businesses to volunteer material efficiency improvements, and so address the natural incentive for regulated firms to overstate their revenue requirements.

- We recommend the following implementation matters be considered when further developing the model:

  – Additional analysis is required on the method that is used to rank proposals based, amongst other things, on the relative efficiency of the forecasts. A focus for this analysis should be on ensuring appropriate transparency and predictability for regulator decision making. As part of this, IPART needs to consider if it is able to develop a sufficiently robust baseline of its best view for future expenditure needs that proposals can be ranked against. If a formal incentive scheme for rewarding upfront proposals of efficiency gains is developed, establishing an efficient baseline will be critical to ensuring that businesses are rewarded only for gains in excess of the efficiencies that IPART would have factored into prices under its current approach to regulation.

  – A detailed analysis is required of how the incentive schemes should be structured to encourage the most ambitious expenditure and service level, and to ensure that those proposals are delivered (or that any upfront reward is reduced to the extent that outcomes fall short of the promise), and indeed that an incentive for further improvement is provided. We assume that this scheme would comprise a mix of an upfront incentive reward that is linked to the ambition of the proposal, and then for rewards or penalties to operate based on how actual performance during the regulatory period compared to the promise. The levers in this scheme would be the target share of efficiency gains that is offered (which we assume would be linked to the degree of ambition), as well as how the sharing factors applied in the different components of the scheme inter-relate. Scenario analysis should be undertaken to establish a structure for the scheme that will deliver a combination of incentives for the business that is expected to encourage the intended behaviour, whilst not resulting in a scheme of undue complexity. The objective being to ensure that firms are appropriately motivated to reveal expected efficiency gains in upfront, but also deliver on the forecast within the period.

  – There needs to be a consistency between how IPART forecasts expenditure, and the assumptions applied when calculating the efficiency benefits that are generated by a business. By way of example, the AER's EBSS (the operating expenditure scheme) assumes implicitly that any change in operating expenditure is permanent, and consistency

requires operating expenditure to be forecast on this assumption too (the AER's correctly applies the 'base+step+trend' approach in a very rigid manner for this reason).

Expenditure incentives

- There is an economic case for IPART to consider strengthening the financial incentives to incur efficient expenditure, and the scope to do this would be advanced by the measures for improving the standard of regulatory proposals discussed under the previous point. This reflects that the current incentives for NSW water business to incur efficient expenditure is relatively weak and declines over the regulatory period. The approach should focus on achieving an equal incentive to incur efficient expenditure in each year and a reasonable balance between the incentives to minimise operating expenditure and capital expenditure.

- We recommend the following implementation matters be considered when further developing within-period financial incentives to incur efficient expenditure:

  – Further consideration should be given to what incentive rate is needed to sufficiently motivate firms to identify and implement expenditure efficiency improvements without 'over-rewarding' those efficiency improvements. Here, there may be a case for the power of the incentive to be more modest at the commencement of the schemes given the potential for 'low hanging fruit'.

  – There is merit in adopting an 'NPV' form of scheme versus the standard 'carry-over' form of incentive schemes given the flexibility over the power of the incentive that is offered by the NPV form.

  – Specific measures should be included to address the perverse incentives that can arise with respect to capital expenditure incentive schemes.

- We do not recommend that a general 'totex' approach is used to balance incentives between capital and operating expenditure, recognising that there may be merit in the approach in limited circumstances, such as IT expenditure.

Service incentive

- Where expenditure incentives are strengthened, we recommend that service incentives are also strengthened to counterbalance the incentive to reduce expenditure at the expense of service performance outcomes.

- We recommend consideration be given to both 's-factor' type schemes and also redress payments, noting that there is an economic case for these to be applied in combination.

- We recommend the following implementation matters be considered when further developing service incentive schemes:

  – The target for schemes should reward improvements in performance, not the achievement of minimum requirements.

  – IPART should establish a core set of performance targets, but permit regulated businesses to propose additional targets.

- IPART should be actively involved in the development of 'willingness to pay' studies to identify the costs and benefits of service improvements. This might also include supporting sector-wide collaboration to undertake the studies.
- There will be a need to manage exposure to risk under service incentive schemes, including by ensuring that businesses are not unduly exposed to events which they are unable to control.

1.3 Structure of this report

The remainder of this report is structured as follows:

- Chapter 2 provides an overview of the purpose of incentives in economic regulation as well as a discussion of the key considerations for the design of incentives in order to inform the discussion in the subsequent chapters
- Chapter 3 considers the role and implementation of incentives to promote efficient expenditure forecasts
- Chapter 4 addresses financial incentives to promote efficient expenditure within a regulatory control period, and
- Chapter 5 considers the role and implementation of incentives to promote efficient service performance.

2. Incentives in economic regulation

2.1 Introduction

The purpose of this chapter is to provide an overview of the aim of incentives in economic regulation. This includes what incentives are focused on and what they are seeking to achieve. The chapter also sets out some of the key considerations for deriving incentives. These considerations inform the discussion around the design and implementation of specific incentives in the following chapters.

2.2 Purpose of incentives in regulation

Incentive regulation seeks to provide a financial or reputational incentive for regulated businesses to act in a manner, or deliver outcomes, that are desirable from the perspective of society.

- Financial incentives are achieved by aligning the regulated business' financial rewards or penalties from certain outcomes with the benefits and costs those outcomes create for customers. This alignment can occur by exposing the regulated business to a share of the gains or losses that may be experienced by customers through the actions of the business.

- Reputational incentives are achieved by exposing the performance outcomes of firms to consumers. The most used form of this type of incentive is 'competition by comparison'. This is where the regulator reports on the performance of the regulated businesses and compares, or ranks, that performance relative to other regulated businesses. The incentive here is for firms to not be seen as poor performing, or ranked low, compared to other firms. The use of reputational incentives is not dependent on the capacity to compare firms. Another form of reputational incentive is to score a regulated business against criteria that the regulator has pre-determined. The incentive here is that the firm will not want to be viewed as a low scoring firm.

The primary focus for the remainder of this report is on financial incentives, however, where relevant comment is also made on the role for reputational incentives.

With respect to financial incentives, by aligning the financial gains and losses for a regulated business with that experienced by customers it means that a business is not penalised for making decisions that are in the interests of customers. If there is a bias towards either capital or operating expenditure, or there is no additional revenue stream related to discretionary, but welfare improving service improvements, businesses may make decisions that are in their own interests but that are not in the interests of customers. Financial incentives can work to ensure neutrality in expenditure decisions and also provide a revenue stream so that welfare improving service improvements are self-funding. Further to this, by putting in place well-functioning incentive arrangements the task of regulation is simplified. This is achieved because businesses respond to the incentives and thereby reveal information about the outcomes that are efficient.

There are two primary targets for financial incentives in regulatory frameworks, these are:

- **cost efficiency** – this means that businesses are motivated to deliver the level of service quality desired by customers at its lowest sustainable cost, this includes innovative practices to achieve this outcome. The obvious advantage for customers is the impact that cost efficiency has on

average prices. The most basic cost efficiency incentives are created by fixing prices independently of cost for a defined period.

- **service performance efficiency** – this means that the business is motivated to undertake investment and innovate to achieve service improvement where the value that customers place on that service is greater than the cost.

2.2.1 Role for financial incentives with financially conservative firms

One concern that is often raised is whether financial incentives have a role where firms are financially conservative. The most cited example of this is with respect to government owned businesses. However, even if a business is financially conservative financial incentives can play an important role in motivating efficient behaviour, or at a minimum, discouraging obvious inefficiency. Reasons that financial incentives can support efficient outcomes in this circumstance include:

- Even where firms are not strongly motivated to increase profits, they are usually motivated to avoid losses. It is typical for financial incentives to include penalties as well as rewards. Avoiding a penalty means that firms need to identify ways to ensure they reduce cost and achieve service performance outcomes.

- Financial incentives will necessarily form part of any internal business case for a new investment even for financially conservative firms. That is, the payoffs from financial incentives will need to be reflected in the business case. When properly calibrated, financial incentives should mean that the more efficient solutions produce a better business case than alternatives. A particularly relevant example might be where there is a choice between an operating expenditure solution and a capital expenditure solution.

- It would also not be unusual, even in firms that are financially conservative, for the KPIs of key management to be linked to incentives within the regime. In this instance there may particularly be a role for reputational incentives. For instance, key management may have a target of achieving a certain ranking from the regulator for their regulatory proposal. Within the period, management may have KPIs that relate to delivering on the regulatory proposal and avoiding any penalties associated with financial incentives.

2.2.2 Comparison to other tools

Incentives are not the only tool available to regulators to see certain outcomes are delivered for customers. Alternatives can include centralised decision making or administrative requirements imposed on the businesses. Centralised decision making sees a party other than the regulated business make decisions on when to invest and what to invest in. Administrative arrangements explicitly set out what service and price outcomes are required to be achieved by the regulated entities.

While these other tools have a place in certain circumstances, their major drawback with them is that they cannot overcome information asymmetry. That is, the party making the decision with respect to planning or investment does not have the same operational knowledge as the regulated business possess. This substantially increases the prospects that performance targets are set above or below efficient levels, or that less efficient means of delivery are implemented than the business would be able to implement with its detailed operational knowledge. Conversely, one of the primary benefits of

financial incentives is that the private information of businesses can be harnessed for the benefit of consumers.

The fact that incentives allow the regulator to step back from detailed operational matters of the business also has the potential to reduce the overall costs of regulation. Resources and time needs to be devoted by regulators, or other external bodies, where they are required to make operational decisions on behalf of businesses. Therefore, the use of incentives can mean that regulators can devote their resources to tasks that they are better suited to, such as the design of regulatory frameworks and incentives.

2.3 Key considerations for deriving incentives

While financial incentives usually lead to superior outcomes than might otherwise be the case, they are not always straightforward to implement and so require some upfront work to get the settings right. As such, it is necessary to be aware of the challenges associated with their implementation. It is worth noting that while challenges in implementation will always exist, perfection is not necessary. What is necessary is that outcomes are superior to what would have been the case absent the financial incentive. This may mean that the incentive, with its imperfections, nevertheless sufficiently motivates the business to undertake actions that are welfare improving from the perspective of customers. Further, it is also worth emphasising that while some work may be required to ensure that incentive mechanisms work well, that the outcome should be to reduce the burden on regulation overall where the incentives do the heavy lifting in terms of revealing the efficient cost of supply and service performance.

The remainder of this section summarises the key considerations for deriving incentives at a general level. The following chapters then consider these issues with respect to implementing specific incentive mechanisms.

2.3.1 Choosing the objective

One of the most important aspects to designing financial incentives is to ensure that an appropriate objective is selected. The objective of an incentive scheme is the outcome that we are attempting to achieve. First and foremost the outcome should be something that is sufficiently important to customers. For instance, there are many dimensions of service that are provided by a water business, however, some of these are likely to be more important to customers than others. If incentives are focused on outcomes that are of low value to consumers there is a risk that the costs of implementing and operating the scheme outweigh the benefits the scheme delivers to customers. It may also mean that other higher value objectives are missed.

It is common when designing incentive schemes that proxy measures are needed in place of the actual thing that is important to customers. This is because an objective measure is required in order to measure improvements or detriments in performance. However, some outcomes are not easily measurable. For instance, customers value good customer service but customer service can mean different things to different customers. Also, good customer service is not something that is easily reflected in a measurable number for which a performance target can be assigned. Therefore, proxy measures, such as call response times, can be used to motivate businesses to undertake actions that are generally known to improve customer service outcomes.

Further, in the case of something like an efficient proposal of forecast cost, it is not possible for the regulator to know with certainty what is an efficient forecast of cost. Therefore, it will be difficult for a regulator to set a completely objective measure for the outcome. In this case some subjective principles or criteria are largely unavoidable.

2.3.2 Measurement of gains and losses

Once an objective for a scheme is chosen, the next most important consideration is how efficiency will be measured in practice. As noted above, a key objective of financial incentives is to align the incentives of businesses with the social benefits and costs from certain behaviours. Therefore, when measuring gains and losses it is necessary to determine what are the societal gains and losses that arise when performance targets are exceeded or failed. This may be in the form of dollars saved or spent or in terms of the value that customers place on changes in service performance.

As with identifying an objective for a scheme it may not always be the case that gains and losses can be measured precisely. While there are techniques available to measure the value customers place on the achievement of certain outcomes, these techniques will rarely fully reflect the willingness of customers to pay for that outcome being achieved. Again, however, perfection is not a necessity. What is necessary is that gains and losses can measured in a sufficiently robust way to limit the prospects of businesses inefficiently under or over-investing to achieve certain outcomes.

2.3.3 Share of efficiency gains and losses

The share of the efficiency gain or loss retained by a business – i.e. the power of the incentive - will directly impact on its motivation to identify efficiency improvements. While this share needs to be large enough so that there is sufficient motivation to act, it is also necessary to ensure that it is not so large as to expose businesses or customers to a level of risk that is unsustainable.

There are a number of considerations that guide the share of efficiency gains or losses that should be retained by the business. The overarching objective with respect to these considerations, however, is that the share should be the one that maximises consumer welfare. This is the level that just motivates the desired behavioural change. To provide a greater share to businesses would see customers 'over-paying' for efficiency improvements.

It is also necessary in this context to consider whether the scheme should provide symmetric or asymmetric payoffs. A scheme can provide both rewards and penalties, reward only or penalty only. This decision may be influenced by the extent that gains or losses are possible under a scheme. That is, there may be measures where the prospects of increases in performance outcomes are limited while there is considerable scope for losses in performance. In this instance a penalty only scheme may be more appropriate. It may also be influenced by the types of behaviour that the regulator is seeking to motivate. For instance, if the regulator is looking to motivate speculative investments that might deliver benefits for customers, a reward only scheme may be preferred. Reward only schemes may also be preferred for dimensions of service where no action from the business does not degrade service performance, or where the risks associated with a penalty element may be particularly high. We note that if the scheme is asymmetric in the form of a penalty only scheme consideration also needs to be given to what other arrangements need to be in place so that businesses are appropriately compensated for any liability they face under the scheme.

2.3.4 Risk management

Any financial incentive scheme will expose the business to risk. Indeed, this is a big part of what motivates behaviour under an incentive scheme. The risks for a business from an incentive scheme will primarily depend on its ability to control outcomes associated with the scheme. Where a business has only limited control over outcomes there is an increased risk associated with the scheme.

One means to manage the size of the risk faced by businesses is to exclude those factors that are outside of the control of the business.[7] This, therefore, limits the exposure the business has to those factors within their control. Doing so, however, also limits the scope of the scheme. Therefore, it is necessary to ensure that the scope is not so narrow to make the implementation of the scheme meaningless.

Another means of limiting risk is to limit the share of the benefit or loss that a business is exposed to. This can be achieved through the sharing ratio or by placing caps on the amount of revenue that businesses can earn or lose under a scheme.

[7] For instance, by excluding certain events from service performance schemes, or with respect to expenditure incentives, relying on uncertainty mechanisms like pass-through arrangements or 'contingent projects' schemes.

3. Incentives to propose efficient target revenue

3.1 Introduction

A key feature of the proposed 3C's model is the ranking and rewarding of the expenditure proposals that are put forward by the businesses. The revenue proposal, and the regulator's assessment of this, is a key element of the regulatory framework. It establishes the expected revenue that the business will earn over the regulatory period and so also the prices that customers are charged. In this chapter we consider the incentive issues associated with expenditure forecasting, and assessing those forecasts, including what role incentives might have to promote efficient forecasts as well as certain implementation issues. We also consider whether the proposal, and the assessment of that proposal, should focus on outputs or outcomes.

Box 2: Summary of recommendations

- We think there is a strong case for using financial and reputation incentives to encourage businesses to submit more robust and better-articulated proposals with respect to expenditure requirements and service levels, based upon comparisons of one business's proposals against its peers as well as the promise of greater regulatory flexibility. The specific proposal for firms to be rewarded and ranked based on their proposal, and for differences in the flexibility/complexity of the regulatory regime to flow from this, has merit in the context of multiple regulated businesses of materially different size and characteristics. We also think that there is a good case for considering further the potential to provide financial incentives for businesses to volunteer material efficiency improvements, and so address the natural incentive for regulated firms to overstate their revenue requirements.

- We recommend the following implementation matters be considered when further developing the model:

  – Additional analysis is required on the method that is used to rank proposals based, amongst other things, on the relative efficiency of the forecasts. A focus for this analysis should be on ensuring appropriate transparency and predictability for regulator decision making. As part of this, IPART needs to consider if it is able to develop a sufficiently robust baseline of its best view for future expenditure needs that proposals can be ranked against. If a formal incentive scheme for rewarding upfront proposals of efficiency gains is developed, establishing an efficient baseline will be critical to ensuring that businesses are rewarded only for gains in excess of the efficiencies that IPART would have factored into prices under its current approach to regulation.

  – A detailed analysis is required of how the incentive schemes should be structured to encourage the most ambitious expenditure and service level, and to ensure that those proposals are delivered (or that any upfront reward is reduced to the extent that outcomes fall short of the promise), and indeed that an incentive for further improvement is provided. We assume that this scheme would comprise a mix of an upfront incentive reward that is linked to the ambition of the proposal, and then for rewards or penalties to operate based on how actual performance during the regulatory period compared to the promise. The levers in this scheme would be the target share of efficiency gains that is offered (which we assume would be linked to the degree of ambition), as well as how the sharing factors applied in the different components of the scheme inter-relate. Scenario analysis should be undertaken to establish a structure for the scheme that will deliver a combination of incentives for the business that is expected to encourage the intended behaviour, whilst not

resulting in a scheme of undue complexity. The objective being to ensure that firms are appropriately motivated to reveal expected efficiency gains in upfront, but also deliver on the forecast within the period.

– There needs to be a consistency between how IPART forecasts expenditure, and the assumptions applied when calculating the efficiency benefits that are generated by a business. By way of example, the AER's EBSS (the operating expenditure scheme) assumes implicitly that any change in operating expenditure is permanent, and consistency requires operating expenditure to be forecast on this assumption too (the AER's correctly applies the 'base+step+trend' approach in a very rigid manner for this reason).

3.2 Issue to be addressed

Under a standard application of the building block approach with prices fixed for a period of time regulated firms have a financial incentive to 'talk-up' expenditure requirements. There are several reasons why this can be a low cost option for a business:

- Information asymmetry between the business and the regulator means that there is a natural incentive to propose the highest credible forecast possible and put the evidentiary burden on the regulator to prove the forecast is not prudent or efficient.

- The cost to the business is generally low from making an initial ambit claim. This is because making a regulatory determination is a process that permits further opportunities for the firm to influence the regulator. For instance, the business can make a low evidence ambit claim initially, and then respond to the draft determination with robust evidence.

- Regulators may also be reluctant to cut too deeply into the proposed expenditure amount in recognition of the asymmetric consequences of providing insufficient revenue allowances compared to an allowance that is too high.[8]

Capital expenditure is perhaps the component of expenditure where there are the most challenges in determining what is an efficient forecast of cost. The reasons for this include:

- the need for costs to be incurred can be based on factors that are difficult to observe, or audit in a robust way, such as asset condition and asset performance.

- trend analysis is only partially useful for capital expenditure given much of it tends to be discrete one-off expenditure

- the costs of large capital expenditure projects can be significant and so the margin for error when forecasting expected cost may also be high, and

[8] This is that it is expected that there is an asymmetric impact between having greater or lesser capital investment. The asymmetry arising through an expectation that there is a larger detrimental impact from too little investment, for instance lack of water supply or public health issues, compared to the cost to customers from more expenditure on capital infrastructure. For this reason regulators have tended to err in favour of permitting higher allowances when assessing revenue proposals.

- within-period financial incentives can only encourage an efficient starting RAB and so past expenditure, even where financial incentives are applied, is not a good guide for future expenditure.[9]

For operating expenditure, as will be discussed in the following chapter, within-period incentive schemes can reveal the efficient starting point for setting future operating expenditure amounts. However, even here, there remains a requirement for the regulator to take a view on any proposed step-changes to costs and also what the trend of expenditure will be over the period.

Absent incentives for service performance it is necessary for the regulator to decide in advance which service related projects will be welfare enhancing and so provide an amount for these in the revenue allowance. This is necessary because if this is not done any additional expenditure above what has been approved for above minimum standard service performance will not be rewarded and will instead reduce profitability for the business. The implication being that firms will not undertake service improvement projects that have not been accommodated in the revenue allowance. This, in turn, places a high burden on the regulator to assess if proposed projects are likely to be welfare enhancing or not.

In addition to this, we understand a particular issue with respect to NSW water businesses is a view that there the businesses are not putting sufficient priority on providing the regulator with robust and well-articulated proposals. This can hamper the regulator outcomes as it makes the task of identifying the efficient forecast of expenditure more challenging.

3.3 Role for incentives to promote high quality proposals

The primary aim of providing incentives to regulated businesses to submit high quality and well evidenced regulatory proposals is to limit the capacity for firms to be better off by withholding information and their true opinion of the efficient forecast of expenditure from the outset. In addition, incentives can have a role in encouraging firms to be more ambitious in the efficiencies they identify at the commencement of a regulatory control period.

Various mechanisms have been adopted in order to encourage better regulatory proposals from businesses. For the regimes we are aware of, features that have been used to motivate high quality proposals include:[10]

- Menu regulation – where firms maximise their benefits (or minimise their losses) by making an honest forecast of expenditure, where honesty is judged by the extent the forecast reflects the regulator's best view of forecast expenditure.

9 We note that for some types of capital expenditure that past expenditure could provide useful information on future expenditure. For instance, routine maintenance capital expenditure.

10 We note that in the energy sector for Australia the focus has been more on empowering the regulator to critically assess proposals. This is by ensuring it has access to significant data and also with respect to its capacity to substitute forecasts. A key focus for energy regulation in Australia has also been on increasing the involvement of customers and their representatives in the regulatory process. In the energy sector the businesses demonstrated a capacity to provide extensive evidence to the regulator to make the case for their expenditure requirements.

- Up-front efficiency dividend payments in circumstances where the proposal is found to either be suitably ambitious or reflect the regulator's best view of efficient expenditure – this is the approach adopted in Victoria under their PREMO model for water businesses.

- Ranking or scoring of proposals in order to provide a reputational incentive for a high quality submission.

- Access to higher powered incentives where forecasts propose cost savings over and above what the regulator has considered achievable.

- Capacity for regulator to substitute its own forecast where the proposal is deemed as unreasonable.

In each instance the primary aim of the incentive is to have the business reveal themselves the expected efficient forecast for expenditure and provide the evidence to support this. So, for instance, a firm may undertake its own comparative benchmarking analysis to demonstrate to the regulator that its proposal is efficient. In addition, businesses should have an incentive to engage with customers to demonstrate that the service levels targeted by the proposal represents what is desired by customers. This, in turn, reduces the burden on the regulator when assessing regulatory proposals. Further, as additional evidence is put forward by businesses to support their proposals it reduces the information asymmetry between the regulator and the regulated business.

3.4 Implementation issues

3.4.1 Setting the target

As indicated above, a challenge with ranking, or scoring, businesses based on their proposals will be determining how ranks are allocated. That is, what is required for a proposal to be classed as leading, versus standard. Obviously the 3Cs of 'customers, costs, and credibility' will factor into the ranking of proposals. Therefore, the task is to give those words sufficient meaning to the businesses.

A key focus for setting the target should be to achieve transparency and predictability. That is, firms should know that if they submit a proposal with certain features that it is likely that the regulator will rank it in a certain way. This predictability will give businesses confidence to do the work required to achieve certain rankings. Noting it is likely they would seek to avoid revealing information to the regulator without that also bringing a commensurate reward in the form of ranking provided. This is akin to the businesses knowing the 'rules to the game' before they play the game.[11]

We note that in the United Kingdom the assessment of proposals is highly objective. It has used both 'menu regulation' as well as relative score against the regulator's best estimate of the required expenditure as means of scoring businesses and setting the power of incentives. While this approach has the positive of being an objective measure, its key problem in the context of water in NSW is that it requires the regulator to develop a baseline expenditure forecast in order to construct the menu or the targets for firms. This is more difficult in NSW given it does not have many similar firms as exists in the United Kingdom to undertake benchmarking analysis to derive baseline expenditure. As a

[11] Knowing the 'rules to the game' might also raise concern that firms take advantage of those rules to the detriment of customers. However, to the extent this is a problem it is not an issue with predictability and certainty, but instead the rules themselves.

consequence, it would be incumbent on the regulator to rely on the regulated business for information and data to inform the baseline expenditure amount. This would in-turn create pressure for the business to promote a higher expenditure forecast again.

Establishing a robust baseline will be a key to ensuring that any that regulated businesses are only rewarded for promising efficiency gains that exceed what would have been set under a standard regulatory review of expenditure and service level proposals. Therefore, establishing a method to developing this baseline will be an important aspect of the framework. However, unlike in the United Kingdom this is likely to require a combination of more traditional assessment tools, and so quantitative and qualitative assessment. What baseline can be set, and what specific criteria are adopted, for the ranking of business is a complex matter that depends on the tools available to the regulator and also the nature of the businesses being regulated. We note also that the robustness of any baseline and criteria will also influence how highly powered the incentive for a high quality proposals might be, where a high degree of confidence in the baseline making a higher powered incentive rate more feasible.

Another issue related to setting the target will be how challenging that target is to achieve. For instance, the target for a leading or advanced proposal needs to be sufficiently high that firms cannot just marginally improve from BAU to achieve it. If this were the case it could mean that the rewards and performance incentives offered to the business over-reward it. Conversely, if the target is so high that no firms can achieve it then it also makes the new framework somewhat redundant given it may not lead to a meaningful difference to the status quo.

3.4.2 Relationship to financial incentives

The assessment of expenditure proposals will be linked with financial incentives in a number of ways. Two issues that need to be considered with respect to the design of the 3Cs model are:

- balancing the efficiency dividend reward with within period financial incentives, and
- aligning the assessment approach with the approach to the design of the within period expenditure incentives.

The second of these issues is addressed in detail in the following chapter, with the focus on ensuring that the approach to setting operating expenditure permits firms to be fully rewarded (or penalised) for permanent changes in efficiency.

In terms of balancing the upfront efficiency dividend reward with the within period incentives, the key issue here is to ensure that there is sufficient incentive for businesses to identify efficiency improvements in advance, while also ensuring that they are not materially worse off from doing so compared to if they merely responded to within period incentives. This will be a function of both the total payoff available between various rankings of proposals, as well as the balance between the upfront reward and the within period reward. As an example, if businesses believe the rewards for within period savings are significantly higher than what could be achieved through an upfront reward they will not reveal these in advance and instead undertake them through the period. Even though they will still benefit from the efficiency improvement being achieved, the consequence for customers in this instance is that prices for the regulatory period are higher than they need to be.

It is our view that IPART should undertake scenario analysis to identify a preferred incentive design between the upfront reward and within period rewards. Our expectation is that the scheme would include an upfront reward for offering expenditure forecasts that exceed the baseline, and where the incentive rate would be related to (i.e., increase with) the degree of ambition, and further that the incentive rate applied to improvements / back-sliding against the proposal would attract a (slightly) higher incentive rate. However, a detailed analysis – and possibly structured around a series of "what if" scenarios would be required to establish the relativity between the upfront incentive rates and the margin between the upfront and within-period incentives to ensure that the incentive for honesty in forecasting is established and that obvious perverse (i.e., gaming) incentives are avoided.[12]

3.5 Inputs versus outcomes

3.5.1 Issue to be addressed

In the past the approach for regulation of water in NSW has focused on inputs rather than outcomes. For instance, proposed revenue, and so the revenue allowance, was to be in part based on output measures and for businesses to report annually on its progress against these measures. Examples of output measures for Sydney Water in recent determinations includes:

- Capital expenditure on discretionary and drought-related projects
- Km of renewal of critical water mains
- Number of water pumping station renewals, and
- Number of renewals of customer water meters.

In its recent determination for Sydney Water IPART identified that focusing on inputs used to deliver a capital program may send the wrong signal to stakeholders about the need to complete a certain quantum of renewals. As a consequence, possible consequences of the approach are that:

- It potentially creates a bias towards capital expenditure solutions, and
- There is a risk that a focus on delivering specific works stifles innovation.

In each case this would increase the costs to customers for service delivery more than what might otherwise be the case.

[12] We have done some simple simulations that suggests it may be possible to create a reasonably simple incentive compatible scheme comprising of an upfront reward that reflects the difference between the proposed expenditure and the baseline, and with an incentive rate that increases with the degree of ambition, and then for a higher within-period incentive to then apply. The higher within-period incentive would dissuade a business from providing forecasts that are unduly optimistic (i.e., as they would lose at a rate that was higher than they received upfront). Similarly, the fact that the upfront incentive rate increases with the degree of ambition, as well as the fact that if the firm performs above its proposal it would earn a higher incentive rate only for the marginal improvement, provides a natural incentive against being too pessimistic. However, our simple simulations also show that care is required to align the relativities of the incentive rates to ensure the scheme is incentive compatible.

3.5.2 Implementation of an outcomes focused approach

We understand that IPART is considering on expanding on the approach it has taken in its recent determinations to focus even more on an outcomes approach to regulation. In particular, it is expected that businesses focus on a customer outcomes approach.

An outcomes approach to regulation focuses on higher level objectives that a business' actions, activities and achievements are intended to deliver. Outcomes are intended to represent what customers and society value, rather than the works that deliver that value. Under an outcomes based approach the regulator is instead focused more on the inputs required to achieve the outcomes.

When the focus is on outcomes and the inputs required in achieving these outcomes, the expectation is that the business has more flexibility about how to deliver on what customers really value. In turn, the business is not as focused on meeting targets of capital expenditure projects. As a consequence, it may be motivated to identify more innovative solutions for delivery.

Choosing the outcomes

The key step in implementing an outcomes focused approach is for the businesses and IPART to agree to the outcomes that the businesses will be accountable for delivering against. These outcomes should be those attributes that customers clearly value from the water and wastewater service. We expect that this will involve water businesses engaging with customers in a variety of ways to identify these outputs. For instance, surveys, customer focus groups, calls for submissions, and public meetings and discussions. A key task for the regulator in this context will be ensuring that this engagement is sufficiently robust that there is confidence that the chosen outputs are what is actually desired by customers.

In the United Kingdom, where Ofwat has moved to an outcomes focused framework, businesses have proposed different outcomes depending on what their customer's value. Some examples of outputs that have been used in the UK include:

- Clean, safe and reliable supply of drinking water
- Available and sufficient water resources
- Resilience in extreme conditions
- Responsiveness to customers
- Protecting the environment, and
- Fair charging.

Consistent with our views expressed below with respect to service performance incentives, we consider that there is merit in IPART establishing some core and mandatory outcomes that businesses are required to target. This approach then permits consistency across time and also comparison between businesses, where feasible. It would then be open to businesses to propose additional outcomes should the wish to do so as a demonstration of ambition.

Scheme design

We consider that the approach taken by Ofwat to implement an outcomes based approach appears reasonable. This requires the regulator and the business to agree to three distinct elements, namely:

- a set of outcomes
- Performance commitments, which set out in detail the levels of performance that companies commit to achieve, and
- outcome delivery incentives, which set out what happens if the company over or under deliver against committed performance levels.

We consider that this model fits well within the move towards increased use of financial incentives that is suggested in this report. We note, in addition, that in the United Kingdom framework businesses have been able to propose that a reputational incentive apply in some instances. This effectively requires the business to report publicly on outcomes. The number of comparable businesses in the United Kingdom also facilitates competition by comparison through this reporting process. While competition by comparison is not particularly amenable to NSW water utilities, for those performance commitments that are not suitable for financial incentives we consider that public reporting is likely to be appropriate.

Ongoing requirement for output information

While a shift to an outcomes focused regime has merit, there will nevertheless remain a requirement for businesses to report on the outputs that have been delivered and those it plans to deliver. This requirement, however, would be substantially less than is the case under the current framework. The requirement arises due to the need to track deferrals between regulatory periods for the purposes of the capital expenditure EBSS.[13] In moving to an outcomes regime, however, it may be appropriate for IPART to move away from the terminology of outputs and instead refer to 'capital program assumptions'. Doing so will ensure that there is less confusion under a new approach and also better reflect the intended use of the data.

[13] See section 4.4.2 of this report for more detail on the issue of deferrals.

4. Incentives to incur efficient expenditure

4.1 Introduction

A key element of the 3Cs framework is the use of within-period financial incentives for water businesses. We understand that the intent of the within period financial incentive is to ensure that businesses are held accountable to the claims made in their expenditure proposal. This chapter focuses on the key issues for implementation of cost efficiency incentives. The four main objectives that incentives for cost efficiency are focused on motivating are:

- to encourage firms to identify and implement cost efficiencies so that outcomes are delivered at least sustainable cost
- to make efficient trade-offs between capital and operating expenditure
- for project specific expenditure, ensure that the most efficient project is selected and is delivered at the most efficient time, and
- to consider the trade-offs between costs against consumer benefits when considering service improvements.

Where a scheme successfully motivates these outcomes being achieved customers will benefit through cost reductions that would not otherwise have been achieved. This in turn will result in lower prices than otherwise would have occurred. In addition, cost efficiency incentives assist in ensuring that service improvements are undertaken only where their value exceeds the cost.

Box 3: Summary of recommendations

- There is an economic case for IPART to consider strengthening the financial incentives to incur efficient expenditure, and the scope to do this would be advanced by the measures for improving the standard of regulatory proposals discussed under the previous point. This reflects that the current incentives for NSW water business to incur efficient expenditure is relatively weak and declines over the regulatory period. The approach should focus on achieving an equal incentive to incur efficient expenditure in each year and a reasonable balance between the incentives to minimise operating expenditure and capital expenditure.
- We recommend the following implementation matters be considered when further developing within-period financial incentives to incur efficient expenditure:
  - Further consideration should be given to what incentive rate is needed to sufficiently motivate firms to identify and implement expenditure efficiency improvements without 'over-rewarding' those efficiency improvements. Here, there may be a case for the power of the incentive to be more modest at the commencement of the schemes given the potential for 'low hanging fruit'.
  - There is merit in adopting an 'NPV' form of scheme versus the standard 'carry-over' form of incentive schemes given the flexibility over the power of the incentive that is offered by the NPV form.

  - Specific measures should be included to address the perverse incentives that can arise with respect to capital expenditure incentive schemes.

- We do not recommend that a general 'totex' approach is used to balance incentives between capital and operating expenditure, recognising that there may be merit in the approach in limited circumstances, such as IT expenditure.

4.2 Issue to be addressed

As indicated above, the basic form of cost efficiency incentive fixes prices independently of cost for a defined period of time. Due to businesses retaining any differences between forecasts and actual cost, from the perspective of the business, it is penalised for each dollar it spends during the regulatory control period. At the end of the period revenues are reset in line with costs such that cost savings are passed onto customers.

A known problem with the most basic form of incentive regulation, and consequently the approach that presently applies to water in NSW, is that the power of the incentive declines over the regulatory control period. This is because a firm that spends early in the regulatory period incurs the penalty for that spending for a longer period of time compared to if that expenditure had been undertaken later in the period. Said another way, the incentive to find and implement cost efficiency improvements is much weaker at the end of the period than it is at the start. This declining incentive arises because the business would anticipate that it would be unable to retain efficiency savings achieved at the end of the period for as long given the likelihood that cost reductions would be passed through to customers in the form of lower prices.

The consequence of the declining incentive power under the basic form of incentive regulation is that businesses may have incentives to behave in ways that are not in the best interests of consumers. The most obvious way that this might be revealed is by the business delaying expenditure until later in the regulatory control period, even where customers would benefit from that expenditure being incurred earlier. The business will behave this way because the implied penalty from incurring an additional dollar at the end of the period is lower than at the start.

An additional incentive issue arises in the context of proposed 3Cs model. Under this model we understand that firms that are ranked highly due to ambitious expenditure proposals will be rewarded with an upfront efficiency dividend. This efficiency payment is effectively pre-paying the businesses for revealing efficiency gains they will make during the regulatory period. However, if the business earns an efficiency dividend based on projected efficiency improvements but does not achieve these improvements then it will receive a windfall gain from the dividend payment.

4.3 Role for incentives to promote efficient expenditure

In order for it to be said that a business has an efficient incentive to achieve desired service levels at their lowest cost it is necessary for it to have an incentive to continuously find ways to lower overall input costs. Therefore, it is necessary to supplement end of period incentives so that the business has an equal incentive to minimise expenditure in each year of the regulatory control period. Faced with an equal incentive in each year of the regulatory control period the business should be indifferent to

the year in which cost efficiencies are achieved. When this is the case the business can instead focus on which outcomes maximise benefits for consumers.

There are several ways to implement an equal incentive for each year of a regulatory control period. However, each approach seeks to achieve the same outcome only with different mechanisms. The mechanism used to supplement end of period incentives in the energy sector in Australia, which is based on the approach that was applied to energy and water sectors in the United Kingdom, is referred to as the Efficiency Benefits Sharing Scheme (EBSS) by the Australian Energy Regulator (AER) or the Capital Expenditure Sharing Scheme (CESS) in the context of capital expenditure.[14] It has also been referred to in the Australian context as the Efficiency Carry-over Mechanism (ECM). We note that particularly in the case of operating expenditure, this form of incentive has been adopted in the energy sector for an extended period of time, suggesting a degree of confidence in the design of the schemes and their capacity to drive efficiency improvements. While there was initially some hesitancy from the AER to apply this form of incentive to capital expenditure due to concerns about overcoming some perverse incentives it can create, it now adopts the CESS for both transmission and distribution businesses.[15]

The EBSS that applies in Australia operates in the form of a rolling carry-over mechanism. Under this approach businesses retain the full efficiency gain or loss that is earned for a set period of time. This is typically at least the duration of a regulatory control period (e.g., at least 4 years in the case of NSW water). At the end of the holding period the benefit is then passed onto customers in full. Retaining the benefit of an efficiency saving for this period is the benefit that is provided to the business for making that saving.

The fact that under the scheme the business only retains benefits for a limited period of time means that they do not retain 100 per cent of the total efficiency gain created. Under the traditional form of the EBSS the sharing ratio between the business and customers, or the 'power of the incentive' is a function of the duration of the holding period and the discount rate. Therefore, a longer holding period will lead to a higher -powered incentive and vice versa. When interest rates reflect long-term trends, a five year holding period results in approximately a 30:70 sharing ratio, while a 10 year holding period would result in approximately a 50:50 sharing ratio.

The CESS that operates in Australia, and also expenditure incentive schemes that currently apply in the United Kingdom, rely on an NPV form of calculation to provide the incentive. Here the first step is to calculate the efficiency gain achieved in the relevant period and the share of this intended for the business. Then it is necessary to calculate the efficiency benefit that has already been retained by the business within the period, with an amount then applied in the next period (positive or negative) to account for any difference between the actual gain made and the intended gain. An advantage of this approach is it permits more flexibility in the sharing ratio applied as it is not tied to the duration of the regulatory period.

It is important to note that the EBSS is typically applied symmetrically. That means that gains and penalties are equally rewarded or penalised. Where a business is spending in excess of its allowance this means that it also shares this overspend with customers.

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14 For the sake of simplicity, unless a specific reference to the CESS is required, we refer to an EBSS in the context of both operating expenditure and capital expenditure.

15 We set out those perverse incentives, and how they can be addressed, below.

Further, applying an EBSS to both capital and operating expenditure means that in the majority of cases where trade-offs between capital and operating expenditure are possible the business will be indifferent to which form of expenditure is used. This is achieved where the business is able to retain the same proportion of the total savings achieved for each different type of expenditure.[16]

In the context of the 3Cs model financial incentives for efficient expenditure have an additional function. That is, where a firm fails to achieve the targets that it set for itself in its proposal, and for which it has already earned a dividend payment, it will effectively return that benefit to customers in the form of a penalty under the incentive scheme. This is because for each dollar spent above the forecast the firm will earn a penalty. As such, financial incentives play a role in holding firms to account for their commitments.

4.4 Implementation issues

4.4.1 Power of the incentive

The 3Cs proposal that IPART is presently considering includes an option for the incentive rate to vary depending on how the business is ranked by the regulator. We consider that this proposal for varying incentive rates has merit. The primary reason for this view is that additional efficiencies are likely to be harder to identify for firms that have submitted ambitious proposals, and also the extent of 'penalty' a firm receives for failing to achieve its commitments needs to be balanced with the size of up-front reward it may have already earned so that customers are not worse off.

The incentive rate, or power of the incentive, is an important element when implementing incentive schemes. This is because it will directly impact on the motivation for firms to identify efficiency improvements. Therefore, while it needs to be large enough so that there is sufficient motivation to act, it is also necessary to ensure that it is not so large as to expose businesses or customers to a level of risk that is unsustainable.

There are a number of considerations that guide the share of efficiency gains or losses that should be retained by businesses. The overarching objective with respect to these considerations, however, is that the share should be the one that maximises consumer welfare. This is the level that just motivates the desired behavioural change. To provide a greater share to businesses would see customers 'over-paying' for efficiency improvements. The considerations that are necessary for the achievement of this objective include:

- What level of confidence is available that expected outcomes can be achieved? This is an element where the 3Cs framework is expected to play an important role. This is because in the context of a regulated business it means how confident the regulator is that the forecast of expenditure matches what is required. Where there is less confidence about expected outcomes a higher incentive rate for businesses may create greater scope for windfall gains or losses to be earned.
  - The 3Cs framework is intended to strengthen the confidence the forecast of expenditure is what is required because the business has an incentive to reveal this information, and provide robust support for its claims, as part of the proposal process. The point being that the regulator

[16] As will be discussed below, it is important to recognise that the differences in the nature of capital expenditure and operating expenditure, and the impact this has on how each is forecast for expenditure setting purposes, means that differences in the application of an EBSS to each is necessary.

should be able to impose higher powered incentives on well-argued revenue proposals with more confidence.

- How difficult is it to achieve efficiency improvements? As efficiency improvements become harder to identify and implement businesses will require a greater share of the efficiency of the efficiency gains in order to be motivated to take action.
  - This implies that where a business has been ambitious in its proposal, and so identified efficiency improvements upfront, that additional efficiency improvements might be expected to be more challenging to achieve. As such, it is reasonable that a higher powered incentive apply to motivate further efficiency improvements being identified and implemented.
  - We note that when the scheme is first implemented that there may be a degree of 'low hanging fruit' available in terms of potential efficiency gains. That is, efficiency gains are relatively easy to identify and implement. The existence of potential 'low hanging fruit' means that it may be feasible for a lower powered incentive to be imposed in the early iterations of the incentive scheme.
- The payoffs that might be available through other incentive mechanisms. An incentive scheme will not operate in isolation, therefore, it should not encourage businesses to manage their assets to maximise returns under a scheme at the expense of achieving desired outcomes of another incentive scheme or the overall service levels.
  - The most obvious interaction in terms of the 3Cs model, other than service performance, is where financial rewards are made available for high quality proposals. In this case, as previously stated, the upfront reward and the within period reward need to be balanced so that there is not a perverse incentive to either over-promise in the proposal, or hide known efficiency opportunities upfront.

It is also necessary to consider if the scheme should provide symmetric or asymmetric payoffs. A scheme can provide both rewards and penalties, reward only or penalty only. Further, the power of the incentive between reward and penalty can differ between each. This decision may be influenced by the extent that gains or losses are possible under a scheme. For instance, the gains that might be possible when efficiencies have been identified in advance may be considerably less than the scope for losses in performance. In this instance a greater penalty on underperformance may be warranted, in particular where an upfront reward has already been offered for forecast efficiency gains.

The discussion above implies that some flexibility in the choice of incentive power is beneficial. This in turn raises the question of how to give effect to that flexibility, in particular where different incentive rates might apply to different businesses. As indicated above, the power of the incentive under the standard form of the EBSS is impacted by the length of the regulatory period, given this influences how long benefits are retained. Conversely, the NPV approach adopted for the CESS removes this limitation and permits a highly flexible approach to be taken to the power of the incentive. Given the intended approach to the regulatory reform, in this case we would expect the NPV approach to implementing the EBSS would have significant merit.

4.4.2 Specific capital expenditure issues

There are several issues that need to be addressed specifically in the context of the application of a capital expenditure EBSS, three of the more prominent issues are:

- the rewards for shifting projects between regulatory periods,
- windfall gains and losses from exogenous projects,
- whether depreciation is included or not, and
- implications from changes in capitalisation policies and other 'recurrent' capital expenditure changes.

Deferral of projects between regulatory periods

One of the legitimate concerns of regulators when applying an EBSS to capital expenditure is that unless adjustments are made to the rewards received for projects deferred between regulatory periods, even efficient deferral, rewards can be higher than they should be. Under the standard design of a capital expenditure EBSS a change in the timing of a project is treated as if the project cost less than was forecast, or was completely avoided altogether. Without an adjustment to the capital expenditure EBSS there is the potential that deferrals in projects create windfall gains for the business.[17]

The prospects of windfall gains arises because the rewards assumed under the scheme would be higher than the social gains of the deferral where the firm is able to include the deferred project in the revenue allowance for the next regulatory control period. This can provide an incentive for firms to inefficiently alter the timing of projects into the next regulatory control period in order to maximise their rewards under the scheme.

It is important to recognise that the incentive problem created through the scheme only applies where businesses have substantial discretion over the timing of investment. In the context of water businesses we would expect that this would largely be in relation to renewal expenditure. Conversely, for that expenditure which businesses have little or no discretion, for instance growth driven expenditure, there is no incentive issue.

In addressing this issue it is important to bear in mind that what is required is an improvement, rather than perfection. We consider that in the context of NSW water it is likely to be sufficient for the regulator to simply focus on large projects to identify if they have been deferred between periods or not. We note that it is our understanding that for electricity transmission businesses in the United Kingdom that Ofgem monitors investment plans to identify whether duplicate expenditure is being provided. We consider that given an ex-post assessment approach exists for NSW water that such an assessment is highly feasible.

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17 We note that a symmetrical issue arises in the context of advancements of projects between regulatory periods, however, this has typically been less of a concern for regulators. If there was a desire to address this issue it would require the regulator to be assured that a future project was indeed planned for a later time, such as through long term planning reports, and that the need to bring it forward was appropriate.

If a material deferral is identified an adjustment to the calculation of efficiency gains is required to ensure that the efficiency gain is measured correctly. The simplest approach is to adjust the carry-over amount to reflect the actual, or expected, deferral of the capital expenditure, and to adjust the measured efficiency gain accordingly. An alternative to adjusting the carry-over amount would be to adjust the capital expenditure forecast that is allowed in the subsequent regulatory period, with the carry-over remaining unadjusted. This would be an equivalent adjustment, however, it would mean that forecast capital expenditure would not include all of the expenditure that is actually required for the period ahead.

We note that there is also the potential that businesses are penalised where they bring forward expenditure between periods. This is typically less of a focus for regulators given it is a less common practice given there is no natural incentive for firms to bring forward projects unless there is an objective need to do so. However, where this occurred it would be necessary to also make an adjustment to take account of the project being brought forward so that the firm is not penalised for doing so. The main thing the regulator would look for in this instance is an assurance that the project was actually planned for the next period. This could be identified through long term plans that have been undertaken by the business. The regulator may also want to convince itself that there was actually a need to bring forward the project.

Windfall gains and losses from exogenous factors

It is inevitable that actual demand will vary from what was forecast for the purpose of setting the expenditure allowance for a business. This has the potential to create windfall gains or losses that are not driven by the behaviour of management. The potential windfall gain or losses arise as a result of the reduction or increase in expenditure that has to be incurred if demand is higher or lower than forecast. The extent that this is an issue depends largely on how much of capital expenditure is likely to be driven explicitly by demand factors. We note that the existence of this issue is not necessarily linked to the robustness of the initial forecasts given variations can occur for a number of legitimate reasons, for instance, drought or economic shocks that impact on the demand for new developments.

There are variety of approaches available to address the risks associated with windfalls from exogenous drivers for the need to incur capital expenditure. For instance, where demand is a clear cost driver, and adjustment can be made at the end of the regulatory control period for the impact these have on revenue requirements. That is, to assess the efficiency gain or loss based on what the revenue requirement would have been had demand been forecast equal to actual demand.

Another measure that can be used to manage the consequences of external drivers on incentive rewards or penalties is to exclude certain projects from the scheme at the outset. For instance, if a project is triggered only where an exogenous event occurs, this project can be excluded from the efficiency scheme so that consumers and water utilities are not exposed to the potential windfall gains and losses that can arise if the timing or scope of the project differs to what was forecast.

Whether depreciation is included or not

In principle, the capital expenditure efficiency improvement from deferring a project is the saving from:

- deferring the project in question, and

- from the deferring of the eventual renewal of the project, and the renewal of that project and so on.

Including depreciation in the incentive scheme acts as a proxy for the lifetime effect of deferral of expenditure. However, including depreciation in the scheme is not straightforward, not least because applying straight-line depreciation would almost certainly deliver the wrong outcome given the correct reward depends on asset lives, the relationship between maintenance cost to asset age, and the growth in the cost of replacement assets. Conversely, ignoring depreciation altogether implicitly assumes that all assets are infinitely lived, which is also not correct.

The most common approach in Australia has been to exclude depreciation, and this approach is likely to be prudent for IPART also. This is because the added complexity that would be introduced to the scheme would be unlikely to deliver a correspondingly large benefit.

Need to monitor capitalisation policy

When a reward is placed on capital expenditure it is necessary to monitor the classification of expenditure between operating and capital expenditure, and consider adjustments to the application of the scheme where necessary. The weak point of capital expenditure incentive schemes described here is that they assume all capital expenditure is comprised of 'one-off' projects and that there is no recurrent element to this expenditure. In contrast, operating expenditure is assumed to be recurrent and is forecast on this basis with the calculation of rewards and penalties assuming that savings or cost over-runs occur in perpetuity. This gives rise to the following implications:

- A regulated business will get an inappropriate gain if it reclassifies expenditure from operating expenditure to capital expenditure. Thus, the classification of expenditure needs to be held constant and monitored.

- A regulated business will be under-rewarded where it is able to achieve a recurrent gain to capital expenditure given the capital expenditure scheme does not reward efficiency improvements in perpetuity like the operating expenditure scheme does. In addition, if a gain to recurrent expenditure requires operating expenditure to implement, then a regulated business may be financially penalised for something that is clearly efficiency improving.[18] The potential for recurrent gains to be treated inappropriately can be minimised by classifying this as operating expenditure to the extent possible (i.e., minimising the overhead component of capital expenditure). However, an *ad hoc* adjustment may be required in some cases.[19]

4.4.3 Relationship between operating expenditure incentive and expenditure forecast

Operating expenditure incentives tend to be recurrent in nature. As a consequence, the standard design of an EBSS for operating expenditure rewards operating expenditure efficiencies as if they are achieved in perpetuity. This approach has an important implication for how operating expenditure should be set in the subsequent regulatory period. Specifically, it requires that the regulator rely on the

[18] An example of this is where substantial reductions are made to the capital expenditure overhead costs (a recurrent expenditure), and the cost of redundancies shows up as an operating expense.

[19] Providing a proper reward for some recurrent capital expenditure efficiency gains is quite difficult and is not treated well in any incentive schemes that we have seen, including in the UK Totex schemes.

revealed actual operating cost incurred in the base year in setting its forecast. To this revealed cost the regulator can then add any step changes in costs, for example, new government obligations, as well as any exogenous changes in the trend for operating expenditure. We note that the AER in the energy sector has been quite effective at relying on the revealed cost approach and so has been quite strict in terms of its approval of step changes. That is, firms should expect that the forthcoming operating expenditure allowance is based on revealed cost, plus an adjustment for the trend, with step changes only permitted in limited circumstances where these can be justified in a robust way.

It is important that any adjustments that are made to the forecast are indeed exogenous to the business. This ensures that the business is able to retain the full value of any management induced productivity improvements that it is able to create. Conversely, to apply endogenous productivity changes would impinge on the integrity and credibility of the scheme.

The 3Cs model may see something other than revealed cost be used to set an expenditure allowance. This is because the business may propose efficiency savings in advance that will then be reflected in its expenditure allowance, rather than the revealed cost that it incurred in the previous period. This scenario highlights the importance of an upfront reward for forecast efficiency savings. If the standard EBSS was applied while also revising down the expenditure forecast from revealed costs would provide, it would mean that the business is forgoing rewards that it would otherwise earn in the subsequent regulatory control period. It is here that the up-front dividend payment has a role in ensuring that businesses are not worse-off where they reveal efficiency savings in advance of making them.

4.5 Thoughts on totex

A perennial issue when considering the design of regulatory frameworks is how best to ensure that there is a balance between incentives for the use of either capital or operating expenditure. In recent times there has been an increasing focus on the pros and cons of treating operating and capital separately or combining them so there is simply one ‘bucket’ of expenditure, referred to as total expenditure, or Totex.

In summary, it is our view that in the Australian context, at least for the majority of expenditure types, separating capital and operating expenditure is preferable and necessary. The main reason for this is that the use of Totex requires that expenditure forecasts be established based on exogenous forecasts rather than business specific costs. This is because deriving a Totex allowance cannot be dependent on past expenditure. This means, for instance, that the revealed cost approach could not be used to derive the allowance given this method is not exogenous to the business. For operating expenditure this means that very good benchmarking is needed, which we believe is not currently feasible given the number of water businesses in NSW and the variation in their size. In addition, divorcing operating expenditure from past expenditure also means that firms may be under-rewarded for operating expenditure efficiency gains they make under the EBSS. This is because it would not properly value permanent reductions in expenditure.[20]

Despite the general view of a Totex allowance expressed here, we note that such an arrangement may be amendable to certain categories of projects, such as IT expenditure. IT expenditure, as an example,

[20] Under a Totex model the EBSS would need to be designed in the same way as a capital expenditure EBSS, such that efficiency gains are treated as one-off savings rather than savings that occur in perpetuity.

might be suitable because both operating and capital expenditure are amendable to being forecast on the same basis, being either a bottom-up approach or benchmarking approach. As such, the forecasts are exogenous to previous expenditure incurred by the business. The question to be addressed is if expenditure of this type is of sufficient materiality to justify a different approach to be taken.

TOTEX approach as applied in the United Kingdom

The utilities regulators in the United Kingdom have shifted towards a TOTEX approach to assessing, and applying incentives, to expenditure. The basic model is for an allowance to be set for TOTEX, and for a fixed percentage (the incentive rate or sharing factor) of any variance between actual and allowed TOTEX to be borne by the business. The percentage is set individually for each business through the IQI mechanism identified above.

The proportion of costs that is borne by customers is allocated into one of two cost recovery 'buckets'. These buckets align, in broad terms, to (a) current and (b) future customers. The allocation to current customers is called "fast money" and adjusts revenue in full in the year the adjustment is made. For the energy sector this is two years after the cost variation occurs. The "slow money" bucket adjusts through adjustments to the Regulatory Asset Base (RAB). The split between fast and slow money is proposed by each business in its plan, and is fixed ex-ante for the duration of the regulatory control period.

It is our understanding that the initial rationale for having a Totex scheme for electricity networks in the United Kingdom was that it is the only way that Ofgem's approach to menu regulation, the IQI, can work without creating perverse incentives between capital and operating expenditure. That is, under menu regulation an incentive rate needs to be set for all expenditure so to avoid shifting from one form of expenditure to the other so to maximise benefits under the approach. As a consequence, all expenditure also needs to be forecast in the same manner so that the approach to forecasting does not lead to perpetual rewards being delivered for lumpy capital expenditure and vice versa.

As identified above, the prospect of using Totex for the electricity or water businesses in the United Kingdom, and hence the menu of regulatory outcomes, is far more feasible given there is less need to rely on business specific costs to forecast expenditure. It is our view, however, that the limited ability to forecast the recurrent portion of expenditure on a purely benchmarked basis means that this approach is not feasible for NSW water businesses at a general level. To apply a Totex approach without the ability to rely on benchmarked data would create different incentive rates depending on whether a change in expenditure is a one-off change or a recurring change. This outcome is avoided, however, with different approaches to the EBSS where different approaches to forecasting are applied.

5. Incentives to achieve service performance outcomes

5.1 Introduction

The purpose of this chapter is to examine the purpose and application of service performance incentives, and in particular an s-factor scheme and redress payments, in the context of water businesses in NSW. In this chapter we first consider why service incentives are needed, we then set out what types of incentives are available. We then consider some of the detailed implementation issues that need to be addressed should IPART wish to impose strengthened service incentives as part of its 3Cs model.

Box 4: Summary of recommendations

- Where expenditure incentives are strengthened, we recommend that service incentives are also strengthened to counterbalance the incentive to reduce expenditure at the expense of service performance outcomes.
- We recommend consideration be given to both 's-factor' type schemes and also redress payments, noting that there is an economic case for these to be applied in combination.
- We recommend the following implementation matters be considered when further developing service incentive schemes:
  - The target for schemes should reward improvements in performance, not the achievement of minimum requirements.
  - IPART should establish a core set of performance targets, but permit regulated businesses to propose additional targets.
  - IPART should be actively involved in the development of 'willingness to pay' studies to identify the costs and benefits of service improvements. This might also include supporting sector-wide collaboration to undertake the studies.

There will be a need to manage exposure to risk under service incentive schemes, including by ensuring that businesses are not unduly exposed to events which they are unable to control.

5.2 Issue to be addressed

There is a direct relationship between incentives to minimise costs and incentives related to service performance. As the incentive to minimise costs increases it can increase the incentive to avoid expenditure at the expense of service quality. This is because higher powered expenditure incentives increase the marginal cost to the business of service improvements.

Service incentives act as a counterbalance to cost efficiency incentives. The primary objective of service performance incentives is to provide a financial reward to businesses for achieving a socially desirable standard of performance and financial penalties for under-performance. In the context of the proposed 3Cs model, absent a service incentive firms would have an incentive to forecast large

expenditure efficiency improvements at the expense of service performance outcomes, or allow service performance to suffer in order to achieve expenditure efficiency improvements that they had forecast to achieve.

The desirable consequence of well-designed service incentive schemes is that businesses are not penalised for undertaking service improvements that cost less than the social benefits that are created by those improvements. Indeed, a service performance incentive scheme can be seen as providing a revenue stream to fund welfare improving investments. That is, where improvements are not funded through the revenue allowance, rewards through a service performance scheme can act as a cost-recovery mechanism for those service improvements.

Further, when service incentive schemes are in balance with cost efficiency incentives it can also mean that businesses are motivated to let service performance deteriorate from current levels, or remain stagnant, where customers place a greater value on the expenditure saving than the increase in performance outcomes, recognising that the service performance would need to remain above minimum service requirements Letting service performance deteriorate or remain stagnant in this circumstance is actually welfare improving from the perspective of customers given what they have revealed about their willingness to pay for service improvements.

5.3 Role for incentives

There are two primary means of imposing service performance incentives on a business, these are:

- A scheme that delivers rewards or penalties based on the extent that a business achieves certain performance targets or output measures. These are referred to here as an s-factor scheme, and

- Penalty-only schemes that require businesses to compensate individual customers where performance levels fall below certain pre-defined thresholds. In the context of water, this form of incentive already applies and is referred to as redress payments.[21]

The key feature to each approach that motivates welfare improving service improvements is to expose firms to a portion of the social benefit or detriment caused through improvements or detriments in service performance. When this occurs it will be in the financial interests of the business to incur expenditure on service improvements where the costs are less than the social benefit created by the improvement or the value of the social cost avoided. This is also what is required for these service improvements to be efficient from the perspective of society.

We note that both s-factor schemes and redress payment schemes have operated in the energy sector in Australia for some time, in particular with respect to Victorian distribution businesses and also transmission businesses across the national market for electricity. Analysis undertaken by Energy Networks Australia (ENA) suggests that these schemes have driven material efficiency improvements over time. For instance, between 2006 and 2018 the ENA state there has been a 24 per cent improvement in the average minutes off supply and a 37 per cent improvement in the average number of power interruptions per customer.[22]

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21 In the context of the Australian energy sector these schemes are called Guaranteed Service Level (GSL) schemes

22 Energy Networks Australia, 'Rewarding Performance, How customers benefit from incentive-based regulation', July 2019, p.12.

The remainder of this section discusses separately how the s-factor scheme and redress payments scheme works.

5.3.1 How an s-factor scheme works

As indicated above, an s-factor scheme is an incentive scheme that delivers revenue rewards or penalties based on the extent that service performance targets are surpassed or missed. The targets that apply to the s-factor scheme are based on past performance.[23] As such, the financial incentive provides a reward for a business where it is able to improve performance compared to past performance. Conversely, a financial penalty is imposed where performance deteriorates relative to the previous performance. If service levels are simply maintained against the average or actual past performance the business receives neither a reward nor a penalty.

Relying on the average performance over the previous regulatory control period or on outturn performance five years previously has two main benefits. First, this approach ensures that the targets set are actually achievable for the business. This is self-evident given the target is based on previous actual performance achievements. Secondly, each of these approaches allows for the retention period for service performance improvements to be kept for the same period as the EBSS.

As with the operating expenditure EBSS, businesses are rewarded for incremental improvements in performance. This has the same advantage as its application under the EBSS in that a 'penalty' that may be earned through a one-off degradation in service performance will be offset by a 'reward' when service performance returns to normal and vice versa. As such, businesses are not under or over rewarded or penalised due to one-off variations in service performance outcomes.

The rate that rewards or penalties are assigned to a business is commonly based on the social costs and benefits of changes in dimensions of service performance. Therefore, it is necessary to identify the costs that poor performance imposes on customers, and therefore, their willingness to pay to avoid these costs. The economic implications of this approach is that it creates an incentive for the business to make improvements to service performance up to the point where the marginal cost of a service performance increase equals the social benefit that the performance increase derives for customers. It is relevant to note, however, that estimating the social costs and benefits of service performance outcomes is a non-trivial task.

5.3.2 How a redress payments scheme works

The s-factor scheme outlined above provides the same reward or penalty to improve service performance for all customers. However, those customers that receive much poorer service levels are likely to have a higher willingness to pay for service improvements relative to the average customer. This reflects the strong likelihood that as customers experience more frequent or longer service interruptions or failures they are likely to incur additional costs. As a consequence, these customers are likely to be willing to pay a higher amount than the average customer is to avoid an additional service interruption or failure.

[23] In the Australian energy schemes the average of performance achieved over the previous regulatory control period is used. However, an alternative and predominantly equivalent method is to set targets based on outturn performance five years previously to the current year.

The redress payments scheme operates by directly targeting those customers that receive a poorer service than the average. This is achieved by making individual payments to those customers that experience service performance outcomes that are below a pre-defined level. This may be either a frequency or total duration of events over a 12 month period.

The economic role of the redress payments is to align the incentive rate with the additional value that the worst served customers place on improved service performance. This is achieved through the payment made to those poorly served customers. The total value that these customers place on service performance is signalled through a combination of the penalty the business will face under the s-factor scheme plus the penalty that is imposed via the redress payments. The consequence of the scheme being a payment to customers is that it is a penalty only scheme. As such, the incentive for the business is to improve performance to these poorly served customers so to avoid incurring the penalty.

5.4 Implementation issues

5.4.1 Incentive targets versus minimum regulatory requirements

The target set for an incentive scheme need not be, and ideally should not be, the same as the minimum target set in a regulatory instrument. This reflects that each target has a different purpose.

When financial incentives are in place, obligations to meet certain standards of performance should be focused more on providing a safety net to customers that a certain level of performance will not be breached. That is, these standards protect against particularly poor outcomes. This is reflected in the consequences associated with a failure to achieve these standard which might include, for instance, a loss of licence or some form of legal action. Notably, if minimum performance standards were set at the same level as the standard in an incentive scheme it might imply that the business is exposed to a loss of its licence simply due to a failure to achieve the average of its past performance. This would clearly lead to a penalty that would significantly outweigh the consequences of that outcome.

On the other hand, the target set for a financial incentive scheme is intended to reflect the notion that the scheme is designed to provide rewards for *improvements* in performance.[24] In this case, the revenue allowance does not provide for the business making these improvements, instead, they are funded through the rewards under the scheme. As such, for improvements in performance to be rewarded it is necessary to base targets on what the business has already been able to achieve.

5.4.2 Choice of performance measures

The choice of performance measures is a critical element of a well-designed service performance incentive framework. There are three relevant questions that can guide the choice made, these are:

- Which aspects of service performance are of most importance to customers?

[24] As noted above, a service scheme, in combination with an expenditure incentive scheme, may also motivate an efficient shift lower performance levels from the average where customers value a lower price higher than the impact of the change in performance outcomes. Notably, this is a trade-off that could not be made if the incentive target was also the minimum standard in the Operating Licence.

- Which aspects of service performance are measurable proxy values available?
- Who chooses the service performance measures?

In terms of the third question raised here, while there is merit in having businesses propose measures for which they will be held financially accountable for during a regulatory control period as part of the 3Cs model, we consider that IPART should establish a set of core performance measures. The reasons for this include:

- ensuring the most important service performance measures are addressed by businesses
- enabling a consistent definition of the service performance proxy measures across businesses, and
- it permits consistency in the measurement of outcomes over time so that actual performance improvements can be identified.

It would then remain open to firms to propose any additional measures for which they are wish to be held accountable to in terms of either financial or reputational incentives. With respect to those core performance measures we consider that there is merit in requiring all businesses to record data with respect to these, irrespective of whether financial incentives apply. In the first instance this will permit reputational incentives to exist, however, collecting data from the start will also assist in applying the scheme to businesses should their ranking or ambition improve in the future under the 3Cs model.

S-factor performance measures

As indicated previously, the choice for an objective of an incentive scheme should be that it is something that is sufficiently important to customers. This means that not every dimension of service performance requires that it have a financial incentive scheme attached. A reasonable starting point for identifying what are likely to be appropriate service performance objectives would be the Operating Licence. This is because it can be expected that if a service standard is contained within the Operating Licence it is because it is something that is of value to customers. Another way to identify what aspects of service are important to customers is through survey work. This could either be done by IPART or the businesses themselves.

Redress payment scheme service performance measures

We understand that the redress payments can be given effect through the Operating Licence requirements in NSW where certain thresholds of performance are not met. For instance, the standard contract contained in Sydney Water's Operating Licence imposes redress payments for certain performance outcomes. Even where an s-factor type scheme is imposed it is likely to be reasonable that the current redress payment arrangements are maintained. As stated above, redress payments work in addition to the s-factor scheme to address the service performance for the worse served customers.

5.4.3 Measuring target performance

Once measures have been chosen as appropriate for either the s-factor scheme or the redress payments scheme a decision needs to be made on what targets businesses should be required to achieve. There are two matters to address in this context:

- What is the structure of the target?
- What is the level of the target?

Structure of the target

The structure of the target refers to the form that a target should take. We understand the Operating Licence for Syndey Water sets minimum standards based on a threshold of poor performance that should not be breached. For instance, the performance threshold for continuity of supply is that no more than a certain amount of properties experience unplanned water interruptions exceeding a certain duration of time in a financial year, and no more than a certain amount of properties experience multiple numbers of unplanned water interruptions of a certain duration of time in a financial year. The structure of this standard combines two elements:

- a frequency component, in terms of the number of properties impacted and the reference to properties that experience multiple interruptions in a year, and
- a duration component given the outages need to exceed a certain number of hours depending on if it is a single instance or multiple instances.

We consider that at the commence of the schemes, and as an interim measure, that it would be preferrable to maintain the current structure of performance standards. This is because these standards are well established, so there is good data available on past performance, and the businesses have experience with how to respond to them.

However, we consider it may be feasible to consider whether the scheme should be more ambitious than current standards. For instance, customers may be willing to pay more to reduce the duration or frequency of service events. Further, once the duration of an event passes the threshold, for instance 5-hours of interruption, the business has no incentive to minimise the duration of the interruption as the penalty has already occurred. Given these incentive issues, consideration should be given to whether there are advantages in implementing a simple average customer minutes off supply event measure and also a frequency of supply events measure. This could either be established by IPART or proposed by businesses under the 3Cs framework.

Level of the target

The level of the target refers to the specific value upon which business's performance will be assessed against. For the s-factor scheme different approaches may be needed for determining this value for the first application of the scheme compared to its ongoing application. For the redress scheme existing targets can likely be maintained.

Ordinarily we would recommend that targets for an s-factor scheme be based on actual outturn performance that was achieved 5 years previous to the prevailing regulatory year. This means that the benchmarks will be based on what the businesses are actually able to achieve. Further, the approach permits a retention period for rewards and penalties that aligns with the standard EBSS. However, in the first period we recommend that consideration be given to using an alternative to outturn performance from 5 years previous.

The reason for adopting a different approach to the target when an s-factor scheme is first applied is to avoid windfall gains being provided to the businesses. That is, regulated businesses would obtain a reward under the scheme for performance improvements that occurred prior to the scheme being in place. In order to ensure that only new service improvements are rewarded it is preferrable that the initial target be set using the performance in the preceding year. Doing so means that water businesses will be rewarded for service improvements that occur only from this point forward. An instance where this approach may not be appropriate is if there were legitimate reasons why the preceding year was an outlier of performance. In this case a different year could be chosen if that better reflects a stead state or an average of a shorter period of years.

5.4.4 Incentive reward

The reward that businesses receive for a one unit change in service performance should align with the social costs and benefits of particular outcomes for customers. Therefore, it is necessary to measure the social costs and benefits of particular outcomes for customers.

For measures such as infrastructure service performance and customer service performance the best measure for determining the social costs and benefits of changes in performance is the customer willingness to pay for service improvements. Focusing on the willingness to pay means that businesses should be encouraged to improve service performance up to the point where the marginal cost of improving performance equals the reward for doing so. The consequence being that all service improvements that occur in this circumstance improve economic welfare.

Implementing a willingness to pay incentive rate requires customer surveys be undertaken to estimate this value. Ideally this is something that is done jointly between IPART and the businesses. This can ensure that the surveys are sufficiently robust. Survey design can also draw on those that have been undertaken in the United Kingdom water sector for the same purpose. While we recognise that undertaking such studies could be seen as a large financial burden for smaller entities, it is reasonable to expect that willingness to pay would be reasonably consistent across customers for different water utilities such that the results for one utility might be applicable for another. This, in turn, raises the prospect that businesses may decide to jointly fund such studies.

We note that experience in the electricity sector suggests that there can be large variations in the outcomes of willingness to pay studies. These variations have turned on differences in the method used by the party undertaking the analysis as well as the jurisdiction being analysed. This reflects that the analysis is not an exact science. For instance, customer willingness to pay is likely to be higher just after a customer has experienced a failure of supply compared to just prior. Nevertheless, this analysis will still provide the best information upon which to base the incentive and should not be viewed as a major barrier to the implementation of a scheme.

An alternative to the willingness to pay approach that has been implemented in the past is to set the size of the reward or penalty based on the (annualised) marginal cost of service improvements for the business. The advantage of this approach is that if the amount is lower than the customer willingness to pay it imposes less risk while still motivating the business to improve service where it is able to do so at lower cost. However, this approach is not recommended generally because it may mean that a business does not strive for a level of service performance that is welfare improving.

For a measure such as water leakage, however, the cost to customers is the additional bulk water that needs to be purchased to replace water that has escaped through leakage. Therefore, in this case the price of bulk water is the best value for the incentive rate for an incentive focused on water leakage.

5.4.5 Managing exposure to risk

A general principle of service incentive schemes is that businesses should not bear risks associated with certain events over which they have no control or are unable to mitigate the impact of. To reward or penalise businesses in this circumstance would expose them to the potential for considerable risk. As a consequence, the outcomes of the scheme would be asymmetric in that the businesses would be exposed to ore downside events than upside events; given there are no 'events' that improve performance. Therefore, it is prudent to remove those events that are outside the control of the business that would have asymmetric consequences on the scheme.

Examples of events that might be excluded from a service performance scheme include extreme weather or catastrophic events, or disruptions that occur upstream from the water utility that impact on water supply.

The other way to manage risk in service incentive schemes is to limit the overall revenue at risk for the businesses. For instance, in electricity revenue at risk is capped at plus or minus 1 per cent.