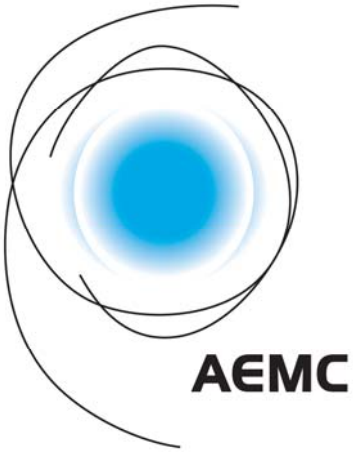

Assessment of Options: Cost Recovery Mechanisms for Mandated Smart Meter Roll-out Expenditure

Supplementary Paper to the Draft Report for the Request for Advice on Cost Recovery for Mandated Smart Metering Infrastructure

18 June 2010

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1. Adequacy of Current Chapter 6 Framework for Cost Recovery

We have identified two key problems with accommodating smart meter roll-out expenditure under the current distribution determination process:

- uncertainty regarding future costs and benefits may lead to a high conservative revenue allowance and a consequent increased risk that DNSPs will earn windfall gains over the five years under the current incentive mechanisms in the Rules;
- the current cost pass-through provisions are not adequate when applied to expenditure of the complexity of a smart meter roll-out.

This Paper considers options for amendments to the Chapter 6 framework to address each of these issues. The principle features of the options are described and assessed against the evaluation criteria set out Chapter 1 of the Draft Report. These criteria are:

1. Promotion of the efficient management of costs and provision of services.
2. Appropriate allocation of risk, having regard to what DNSPs can control.
3. Support for potential benefits being realised in practice.
4. Promotion of transparent, well informed and appropriate regulatory processes.
5. Robust to the necessary range of possible applications.
6. Consistency in treatment across different types of regulated distribution investments.

Prior to consideration of the options we first set out some key considerations in relation to the nature of the uncertainty associated with a smart meter roll-out and provide a summary of the existing incentive mechanisms in the Chapter 6 Rules.

2. The Nature of the Uncertainty

The key issue in considering the adequacy of the current Chapter 6 Framework for cost recovery associated with a Ministerial roll-out determination is the level of uncertainty that remains at the time at which the AER makes its distribution determination. 'Uncertainty' in relation to the costs associated with a Ministerial roll-out determination can be considered to fall into various categories:

- Uncertainty in relation to the speed with which the roll-out will be undertaken:
  - It is possible that a Ministerial roll-out could be prescriptive in relation to the numbers of meters that are required to be rolled-out in each year, as well as in relation to the required end-date by which the roll-out needs to be completed. However, the NEL amendments do not require the Ministerial determination to specify the timing of the roll-out to that level of detail.
  - Under the periodic distribution determination process in the Chapter 6 Rules, distribution businesses have an incentive to defer both capex and opex spending within a regulatory period.
- Uncertainty in relation to the efficient costs that will be incurred in complying with a roll-out determination. The extent of such uncertainty is likely to vary as a result of:
  - the type of expenditure required. The efficient costs of the smart meter itself and the costs of installation may be more easily assessed than the efficient costs of the required supporting IT and communications systems, as a result of better information and the potential to establish measurable benchmarks in relation to the former;
  - the ability to compare proposed expenditure with actual out-turn expenditure, either in a jurisdiction which has already begun its roll-out or from pilots and trials. The greater the availability of comparable information, the lower the level of uncertainty as to the level of efficient costs. This implies that, over time as more roll-outs are undertaken the remaining level of uncertainty for jurisdictions yet to complete their roll-out will fall; and
  - the difficulty of clearly identifying the scope of the expenditure required in order to comply with a Ministerial determination. For example, the IT systems required to support a roll-out could also be expanded to allow the distributor to undertake a wider range of functions, some of which may fall within the scope of regulated distribution services (i.e., activities related to the 'smart grid') and others which may be non-contestable services.
- Uncertainty in relation to the quantum of operational benefits that distributors are expected to achieve as a result of the roll-out. The implications of this uncertainty may depend on the specific nature of the operational benefit. As in the case of uncertainty relating to costs, the extent of uncertainty is likely to be greatest for the initial years of the roll-out, and for those jurisdictions who undertake a roll-out early. Over time, as information becomes available reflecting the actual experience of the roll-out, the level of uncertainty will fall.

The SMI roll-outs that are in prospect represent a rapid, large scale application of a relatively new technology. Under commercial conditions it is likely that there would be an emphasis on risk management through an extended developmental phase and/or incremental adoption. As the report of the Victorian Auditor-General indicates,[1] for projects of this scale and technical complexity the management of uncertainty both in the lead-up to and during implementation is a critical influence on the acceptability of outcomes.

The MCE has acknowledged the uncertainty present and allowed for a program of pilots and trials. The NSSC processes are also designed to reduce risks by providing a platform for sharing knowledge and experience.[2] It is currently unclear whether the MCE's processes, including the work of the NSSC, mean that at the time of a Ministerial roll-out determination the level of uncertainty will be manageable.

A critical source of uncertainty for cost recovery is the absence of clear boundaries around smart meter infrastructure and the associated costs and benefits. As technology expands the range of functions that can be provided, the meter becomes more closely integrated within the network, sharing infrastructure and providing 'upstream' benefits that, in turn, are shared with other network users. This presents challenges to any analysis that seeks to address SMI costs and benefits in isolation.

In addition to these types of cost and benefit uncertainty, critical decisions on the timing, pace and scope of the roll-out rest with the jurisdictional Minister as an issue of public policy. This type of 'policy dependent' uncertainty is perhaps inherent to the exercise of Ministerial discretion, and may be largely unavoidable.

Uncertainty will reduce with increasing experience and knowledge. It will be greater in the initial phases of a roll-out, and should reduce over time. There will be opportunities to gain information and experience from jurisdictions where the roll-out is more advanced, provided that appropriate reporting requirements are in place. Perhaps the most important potential source of knowledge and experience in this regard will be the Advanced Metering Infrastructure (AMI) program in Victoria. Again, whether this information contributes to improved regulatory outcomes will depend on the extent to which it is made available for use by the AER.

Given these differences in the sources of uncertainty, and the fact that the level of uncertainty is likely to vary depending on the timing and nature of the Ministerial determination, it is unlikely that a single regulatory approach will be sufficient to address the impact of uncertainty on the effectiveness of the current Chapter 6 Rules. It is also likely that the

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1 Victorian Auditor-General, *Towards a 'Smart grid' – the roll-out of Advanced Metering Infrastructure*, November 2009, 2009-10:3.

2 National Stakeholder Steering Committee. The NSSC is a formally structured body made up of representatives from industry and consumer groups and advises the MCE on regulatory, technical and economic matters in relation to the National Smart Metering Program. It has a TOR and work plan developed and agreed with the MCE SCO. Information on the NSSC, its terms of reference and its management of the NSMP can be found on the NSMP website, http://share.nemmco.com.au/smartmetering/default.aspx

effectiveness of the existing Chapter 6 Rules will change over time, as jurisdictional roll-outs proceed and the level of uncertainty diminishes.

3. Materiality of the Uncertainty

A mandated smart meter roll-out is a large scale project. For example, in NSW approximately 5.2 million customers would be involved, and in Queensland 3.3 million customers. Although the costs and benefits have been subject to an aggregate analysis, conducted at the national level, the MCE has recognised that considerable uncertainty regarding these estimates exists, and has proposed a process of pilots and trials to provide more reliable and detailed information.

3.1. MCE Uncertainty Concerns

In its June 2008 decision, the MCE commented on the variability and uncertainty in estimates of costs and benefits within and between jurisdictions and the possibility that in some jurisdictions benefits could be out-weighed by costs. The MCE noted that the roll-out of smart meters was already underway in Victoria through its AMI program, and that there would be benefits from having a lead jurisdiction. Nevertheless, in response to the level of cost and benefit uncertainty the MCE agreed to:

> further progress the smart meter roll-out by undertaking coordinated pilots and business-specific business case studies in most jurisdictions (not including South Australia and Tasmania). These pilots and business cases seek to confirm the findings of the cost-benefit analysis, reduce the range of uncertainty (particularly in jurisdictions with some risk of a net loss at the lower end of the range of benefits) to inform whether a roll-out should proceed, and also inform the development of roll-out implementation plans to maximise benefits.
>
> MCE agrees these pilots and business cases should be initiated as quickly as possible and coordinated though the National Stakeholder Steering Committee to share results, optimise learning and ensure all aspects of smart meters and associated systems, and their impact on network and market operation and customer responses are tested.

The role of the pilots and trials in reducing the level of uncertainty and providing a basis for future decisions by jurisdictions on the timing and nature of roll-outs has been emphasised by the MCE, and linked to a review of roll-out plans scheduled to take place prior to June 2012:

> MCE will review the progress of the pilots and business cases annually, starting in June 2009. A review of findings, including any resulting revision in the cost and benefits for each jurisdiction or specific businesses, will occur by June 2012, at which point MCE will further review jurisdictional deployment plans and any requirement for further analysis.

At the present time, a range of pilots and trials are underway in Queensland, NSW, the ACT, South Australia and Western Australia, although they vary substantially in scope. None of the pilots and trials currently underway has been initiated in response to a Ministerial pilot determination, although we understand that a Ministerial Determination is expected shortly in Queensland.

3.2. NEL Amendment and Ministerial Determinations

The obligation on DNSPs to roll-out smart meters is imposed by amendments to the NEL and given effect through a determination made by the jurisdictional Minister.

Through the determination the Minister has discretion over:

- the period of the mandate;
- the services that must be provided;[3]
- the areas and the customer groups covered by the roll-out; and
- the timing of the roll-out, which may be differentiated by the services provided, area and customer group.

From the information currently available, it appears that the work of the NSSC in detailing a minimum functionality for the meters and establishing technical standards for interoperability and communication, together with the knowledge and experience gained from the more advanced Victorian AMI program, will remove much of the specific technology risk associated with smart meter infrastructure. Nevertheless, significant discretion remains with the DNSP over the choice of equipment, the design of systems and the integration of smart meter infrastructure into the wider aspects of network operation. DNSPs may also opt to use technology which provides capabilities over and above the minimum specification.

The services that are able to be provided by smart meters are dependent upon the functionality that is specified for the metering equipment. The MCE has directed that a national minimum functionality should apply, and charged the NSSC with responsibility for developing a recommendation on the functions that should be included. Under current proposals, both smart metering services and minimum functionalities will be specified in the Rules.

3.3. Capital and operating costs

Table 3.1 presents a breakdown of the capital cost estimates adopted in the National Cost Benefit Analysis for Smart Meters, commissioned by the MCE in 2007, for distributors in NSW and Queensland.

[3] Provided that those services are specified as 'smart metering services' in the NER.

Table 3.1
National Cost Benefit Analysis - Distributor Capital Costs Scenario 1, $m

	NSW (3 DNSPs)		Qld (2 DNSPs)	
	Lower	**Upper**	**Lower**	**Upper**
Variable Costs	**671 (86%)**	**997 (79%)**	**410 (86%)**	**648 (79%)**
Meters	471 (61%)	656 (52%)	267 (56%)	370 (45%)
Installation	160 (21%)	293 (23%)	120 (25%)	248 (30%)
Comms	40 (5%)	48 (4%)	23 (5%)	30 (4%)
Fixed Costs	**107 (14%)**	**261 (21%)**	**69 (14%)**	**168 (21%)**
MDCM - NMS	8 (1%)	20 (2%)	5 (1%)	10 (1%)
MDCM - MDMS	27 (3%)	36 (3%)	18 (4%)	24 (3%)
Other system costs	43 (6%)	79 (6%)	29 (6%)	52 (6%)
SMI Roll-out Prog Mgt	28 (4%)	126 (10%)	17 (4%)	82 (10%)
Total	**777 (100%)**	**1258 (100%)**	**479 (100%)**	**816 (100%)**

Source: EMCa Workstream 1 Report.

The above table only reflects capital costs, and does not include operating costs, nor the costs associated with stranded accumulation meters.[4] From the table, the proportion of fixed costs compared to variable costs is 14-21% (depending on whether a low cost scenario or high cost scenario is assumed). To the extent that the level of uncertainty is expected to be greater in relation to these fixed costs (and in particular due to the difficulty of identifying the appropriate scope of the supporting systems, given the interaction between regulated and non-regulated services that could be provided by smart meters), the table indicates that, whilst important, these costs form the minority of the overall roll out costs associated with smart meters.

Table 3.2 sets out the AER approved revenue requirements for the Victorian distributors for the first budget period 2009 to 2011. This incorporates the expenditure forecast for 2010 and 2011 and so covers the first three years of the planned six year rollout. Table 3.3 shows the proportion of approved AMI revenue in comparison to each DNSPs' DUOS revenue requirement for that year.

[4] The operating cost estimates assumed in the National Cost Benefit Analysis (both those associated with the roll-out, and on-going operating costs (e.g., communications costs)) are not readily available from the public reports.

Table 3.2
AER Final Determination Revenue Requirement for Victorian DNSPs

	2009		2010		2011	
	($'000s, nominal)	% of Total Revenue	($'000s, nominal)	% of Total Revenue	($'000s, nominal)	% of Total Revenue
CitiPower						
Return on capital & Depreciation	6,925	34%	12,446	55%	18,282	63%
Operating & Maintenance costs	13,249	66%	10,271	45%	10,811	37%
TOTAL Revenue Required	*28,075*	-	*22,717*	-	*29,093*	-
Jemena						
Return on capital & Depreciation	13,443	77%	22,239	70%	27,426	65%
Operating & Maintenance costs	4,116	23%	9,408	30%	14,867	35%
TOTAL Revenue Required	*25,165*	-	*31,603*	-	*42,293*	-
Powercor						
Return on capital & Depreciation	12,965	32%	24,206	54%	38,664	62%
Operating & Maintenance costs	27,606	68%	20,799	46%	23,663	38%
TOTAL Revenue Required	*68,442*	-	*45,005*	-	*62,327*	-
SP Ausnet						
Return on capital & Depreciation	17,142	36%	29,091	49%	40,921	58%
Operating & Maintenance costs	30,757	64%	30,463	51%	29,655	42%
TOTAL Revenue Required	*41,762*	-	*59,554*	-	*70,576*	-
United Energy						
Return on capital & Depreciation	19,299	72%	30,605	68%	39,904	65%
Operating & Maintenance costs	14,533	28%	14,533	32%	21,842	35%
TOTAL Revenue Required	*20,996*	-	*45,138*	-	*61,746*	-

Notes: For 2009 the distributors all had an offset of costs and revenues for the previous period applied. As such, the 2009 total revenue required does not sum. The % of Total Revenue column represents the percentage of total revenue excluding the offset amount. This ensures that the distortionary effects from including the offset are avoided.

Source: AER, Final determination Victorian advanced metering infrastructure review 2009-11 AMI budget and charges applications, October 2009; and AER, Notice of Variation of the Final Determination: Victorian Advanced Metering Infrastructure Review: 2009-11 AMI Budget and Charges Applications by the Australian Competition Tribunal for Jemena Electricity Networks (VIC) Ltd and United Energy Distribution Pty Ltd.

From Table 3.2 it is clear that the opex and capex proportions of total revenue required vary significantly amongst the distributors, as well as across the years. For example, capital components of United Energy's revenue requirement in 2009 comprise 72% of their total revenue requirement, whilst for Citipower the proportion is only 34%. This implies that the impact of uncertainty of the effectiveness of the current Chapter 6 regulatory provisions needs to be considered in the context of both opex and capex expenditure. It also highlights that the DNSPs have flexibility in deciding how to incur expenditure in relation to a Ministerial roll-out determination, and differences in the treatment of capex and opex under the regulatory framework is likely to affect their decision in this regard.

Table 3.3
AER and ESC Final Determination Revenue Requirements for Victorian DNSPs

	2009	2010
	($'000s, nominal)	($'000s, nominal)
CitiPower		
Total Revenue Required (AMI)	28,075	22,717
Total revenue required (DUOS)	190,008	204,792
% of DUOS Revenue	*15%*	*11%*
Jemena		
Total Revenue Required (AMI)	25,165	31,603
Total revenue required (DUOS)	159,224	160,183
% of DUOS Revenue	*16%*	*20%*
Powercor		
Total Revenue Required (AMI)	68,442	45,005
Total revenue required (DUOS)	401,245	420,706
% of DUOS Revenue	*17%*	*11%*
SP Ausnet		
Total Revenue Required (AMI)	41,762	59,554
Total revenue required (DUOS)	341,212	371,865
% of DUOS Revenue	*12%*	*16%*
United Energy		
Total Revenue Required (AMI)	*20,996*	*45,138*
Total revenue required (DUOS)	287,193	278,294
% of DUOS Revenue	*7%*	*16%*

Note: The ESC's final determination on building block requirements for 2006-10 has been converted from real $2004 to nominal dollars.

Sources: AER, Final determination Victorian advanced metering infrastructure review 2009-11 AMI budget and charges applications, October 2009; Essential Services Commission, Electricity Distribution Price Review 2006-10 October 2005 Price Determination as amended in accordance with a decision of the Appeal Panel dated 17 February 2006 Final Decision Volume 1 Statement of Purpose and Reasons Final decision, October 2006; and AER, Notice of Variation of the Final Determination: Victorian Advanced Metering Infrastructure Review: 2009-11 AMI Budget and Charges Applications by the Australian Competition Tribunal for Jemena Electricity Networks (VIC) Ltd and United Energy Distribution Pty Ltd.

4. Current Incentive Mechanisms

Under the current distribution determination process, DNSPs are provided with incentives to achieve efficiencies in regard to both operating and capital expenditures.

4.1. Incentives for Operating Efficiencies

In relation to opex the incentives under the current regulatory framework stem from:

- the 5 year regulatory period plus no claw-back; and
- the efficiency benefit sharing scheme (EBSS).

The Rules currently provide for the development of one or more efficiency benefit sharing schemes (EBSS) by the AER.[5] An EBSS is required to cover operating expenditure and may (but need not) also cover capital expenditure. The AER issued its final decision in relation to the EBSS to be applied to electricity DNSPs in June 2008. There is currently a single EBSS which only covers a DNSP's operating expenditure.

The current EBSS is intended to increase the incentives on DNSPs to make efficiency gains over and above the forecast of operating expenditure that is included within the building block revenue requirement for standard control services, and to ensure that this incentive applies equally in each year of the regulatory period. It achieves this by allowing DNSPs to retain a portion of those gains for a period beyond the end of the regulatory period, rather then passing all of the gains through to customers at the time of the next regulatory review.[6] Under the current EBSS customers do not receive the benefit of any efficiency gain as quickly as they would if the EBSS was not in place, but the scheme is intended to provide a greater incentive for the DSNP to make efficiencies, resulting in customers receiving the benefit of a greater amount of efficiency gains eventually.

4.2. Incentives for Capital Efficiencies

In relation to capex, the incentives under the current regulatory framework stem from the basis on which expenditure is rolled into the regulatory asset base (RAB). There are two elements to the capex incentive:

1. Actual capex is rolled-in to the RAB at the time of the next review; there is no clawing back of the allowed return on capital over the period if actual capex is lower than forecast. Where the DNSP achieves capital efficiencies, it earns a return on the savings achieved until the end of the regulatory control period, and is allowed to retain the increased return.
2. In undertaking the roll forward of the RAB, depreciation is re-calculated based on actual expenditure. This means that an under- (over-) spend in relation to capital expenditure

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5 NER 6.5.8.

6 Specifically the EBSS allows the distributor to retain the operating efficiency gains made in any one year for five years following the year in which the efficiency gain was made, regardless of the year in which the gain was made.

will result in less (more) depreciation being deducted in rolling forward the RAB than the amount that was allowed for in regulated revenues during the previous period, resulting in a benefit (penalty) to the business.

Under the Chapter 6 Rules, it is a constituent determination for the AER whether to roll-forward on the basis of actual or forecast capex (NER 6.12.1(18)). As a result, the AER can determines whether it considers a stronger incentive for capex for distributors to be warranted (by including (2) above as well as (1)). For NSW, ACT, SA and Queensland the AER has determined that the stronger capex incentive will apply, and has stipulated that actual depreciation will be used in the roll-forward for the next regulatory period.

As noted above, the Rules provide the AER with the discretion to provide for an EBSS that also encompasses capex. Currently, the AER's determination is not to include capex within the scope of the EBSS.

5. Cost Recovery within the Distribution Determination Process

5.1. Uncertainty in Relation to Timing

In order to derive forecasts of annual capex and opex for the calculation of required revenues, a distribution determination that incorporates a roll-out of smart meters in response to a Ministerial roll-out determination will require a forecast of the number of meters installed and operational each year. Once the roll-out begins, differences between the forecast and actual number of meters installed will affect the timing of expenditures and leave the DNSP (and consumers) either better or worse off compared with the profile of allowed revenues.

Differences may arise for a number of reasons. If the rate at which the roll-out is to take place is set in a Ministerial roll-out determination, it may be either too ambitious or slower than the rate at which the DNSP minimises its overall costs. External factors may enforce a delay – if some of the meters prove faulty for example, or there is a shortage of labour for installation. A DNSP may also see an opportunity for increasing its return by delaying expenditures, compared with the forecast, given the incentives under the current Chapter 6 Rules.

We note that failure to achieve roll-out targets established by a Ministerial roll-out determination will be addressed by mechanisms outside the Rules. Failure to meet roll-out targets would be a breach of the NEL, and would be subject to the sanctions associated with such breaches.[7] The focus of the discussion in this paper is on cost recovery, rather than on incentives for the DNSP to comply with (or outperform) the roll-out targets set out in a Ministerial roll-out determination. However we note that the options discussed below could be modified in order to provide such incentives.

Given the incentives on DNSPs to delay expenditure under the incentive mechanisms in the rules, and the potential for external factor to enforce delays, we consider that timing uncertainty is present for all roll-out determinations. It will not lessen over time, or with more information. We have therefore considered whether it is appropriate to leave customers and DNSPs exposed to the financial effects of timing risk and, if not, the options for mitigating these effects. Timing incentives under the current distribution determination framework

Once an expenditure forecast is accepted by the AER and incorporated into allowed revenues, the DNSP faces an incentive to achieve reductions in actual expenditure, and to avoid over-spends. As described in section 4, specific incentive properties are built into the distribution determination framework to reward (penalise) under-spends (over-spends) in capex and opex. The relationship between outturn expenditure and the rate at which smart meters are rolled out will extend the influence of these incentives to the question of roll-out timing.

[7] AAR, 2010, Advice in response to MCE Request for Advice on Cost Recovery for Mandated Smart Metering Infrastructure, 18 June, p. 33.

The roll-out of smart meter infrastructure requires a DNSP to invest in new meters and network systems and potentially also leads to a number of operational savings. However, at least in the short term it is likely that the capital costs (i.e., the allowed return on investment and depreciation) will outweigh the operational savings associated with a SMI rollout. It is likely that:

- DNSPs will incur costs earlier than allowed for in the distribution determination if the roll-out is in advance of the forecast; in this case allowed revenues earlier in the period will be insufficient to cover the return on and of investment in those years;
- DNSPs will incur costs later than allowed for in the distribution determination if the roll-out lags the forecast; in this case allowed revenues earlier in the period will exceed the level required to cover the return on and of actual investment in those years.

Consequently, the incentive properties of the current regulatory regime are such that over a regulatory period a DNSP will be rewarded for delaying, or penalised for bringing forward, the roll-out out of smart meters.

5.1.1. Managing timing uncertainty for a mandated smart meter roll-out

The process by which the profile of a mandated roll-out is determined will form the critical first step in managing timing uncertainty. Where costs are recovered under a distribution determination, the forecast roll-out of smart meters incorporated in the determination will be derived from, potentially, three stages of planning, analysis and review:

- during the decision-making process on mandated roll-outs that the MCE has indicated will occur in 2012, which will include a review of updated information on costs and benefits specific to jurisdictions;
- during preparation of the jurisdictional Minister's draft Ministerial smart meter roll-out determination, and subsequent public consultation and finalisation; and
- during the preparation of the DNSP's initial regulatory proposal, its assessment by the AER and finalisation.

At each stage, before and during the distribution determination process, there is the opportunity to consider what reasonably may be achievable for the speed of the roll-out, and the appropriate balancing of risks.

The MCE has proposed that jurisdictions undertake pilots and trials to provide them with the necessary information for Minister's to make a decision on the mandated roll-out of smart meters in 2012. This provides an opportunity for the jurisdictions to include the question of how a roll-out might proceed in their specification of the information required from such pilots and trials. Where a decision to proceed with a roll-out is taken, the DNSPs (and any other parties) have the opportunity to respond to any specific timing targets proposed by the jurisdictional Minister. Indeed, if the Minister as a matter of public policy wishes to set such targets, it would appear sensible to first discuss these in some detail with the relevant DNSPs before settling on a final position.

Once the distribution determination process begins, there are further opportunities for all parties to consider what is achievable at reasonable cost. If the timing is set in detail by the Ministerial smart meter determination, the DNSP can consider the measures it would need to take to cover its timing risk, and build these into its regulatory proposal. The AER and other parties have the opportunity to review the proposals, but the AER is obliged to allow the DNSP's forecast of associated costs, unless it considers them not 'reasonably efficient'. It is arguable that, given these opportunities, any residual risk to the DNSP in relation to timing risk is already accounted for in the rate of return (WACC) it receives on its investment.

Our conclusion is that there will be valuable opportunities to reduce timing uncertainty and associated risks outside the distribution determination process. Addressing these uncertainties prior to the distribution determination will reduce the level of uncertainty at the time at which the AER makes its determination.

However, even where these aspects of timing uncertainty are addressed through the processes prior to the distribution determination process, DNSPs face incentives under the Chapter 6 regulatory regime to defer expenditure. Therefore the issue of timing risk will remain to be addressed as part of the distribution determination process, and this risk will be of more concern for the potential impact on customers. Delays to the roll-out will lead to allowed revenues for some years being above actual costs, and DNSPs will receive a financial benefit from a timing outcome that is unrelated to efficient operation, with some customers effectively paying for a service they have yet to receive. This suggests that additional measures aimed at neutralising the incentives on DNSPs to defer expenditures through delays to the roll-out may be warranted. Two options are considered – the inclusion of an M-factor within the price control formula, and a lagged adjustment to allowed revenues.

5.1.2. Option 1: M-factor

An M-factor was first proposed by the Essential Services Commission of Victoria (ESCV) as a volume incentive scheme to be applied to the roll-out of interval meters to residential and other small customers, in order to:

> "adjust the revenue requirement for prescribed metering services where more (or fewer) interval meters have been rolled out by a distributor than forecast."[8]

The intent of the M-factor was:

> "to ensure that distributors did not have an incentive to earn higher rates of return by rolling out fewer interval meters than forecast."[9]

The important features of the M-factor were that:

[8] ESC 2005 EDPR, p565.

[9] Ibid, p578.

- a distributor was neither worse nor better off as a consequence of faster or slower roll out of interval meters - this cost-neutrality was the principal objective of the M-factor mechanism;
- it was designed by reference to the ESCV's benchmark unit costs (both capital and operating unit costs) for installing meters, thereby preserving the rewards/penalties arising under the separate arrangement for operating and capital costs efficiency where a distributor achieve lower/higher costs per unit ; and
- a deadband was applied, so that the M-factor would not affect the total price cap or rebalancing constraint unless the actual number of meters rolled out varied from the forecast number by more than ± 2.0% .

The M-factor was ultimately not implemented, since the interval meter program was superseded by the rollout of AMI.

We note that the initial Order in Council in Victoria in relation to a smart meter roll-out required the development by the regulator of a similar volume-related adjustment:

> 4.2(s): "provide a mechanism that adjusts for the differences in costs in the event that actual rollover volumes are higher or lower than the rollout schedule included in the distributor's Pricing Proposal for the initial regulatory period as assumed by the Commission…"

However this provision was removed with the subsequent adoption of a different regulatory approach via the revised Order in Council.

Option 1 is a variant of such a volume-related adjustment, adopted in relation to a smart meter roll-out. Under this option the M-factor operates as an additional term in the CPI-X control formula, CPI-X + M, and forms part of the control mechanism applied to standard control services, established by the AER as part of its Framework and Approach paper prior to the distribution determination for each DNSP. It adjusts prices (or allowed revenues) within the regulatory period, to account for differences in the number of operational meters.

Because the objective is for the revenue adjustment to reflect the impact of timing on net costs, this option is slightly different to the ESCV M-factor proposal. Specifically, the revenue adjustment will need to take into account the distinction between the number of smart meters that are rolled-out and the number that are actually operational,[10] and the operational efficiencies associated with smart meters.

If this option is implemented, an amendment to the Rules will be required to provide guidance to the AER in developing the M-factor. This change in the Rules would be specific to SMI. However, it is comparable to the approach taken to other 'issue specific' price

[10] Since the communications infrastructure may be rolled-out in discrete 'blocks', enabling the operation of groups of installed meters at a time.

control factors incorporated in the Rules, for example, the D-factor in relation to demand management.

The principles for the application of an M-factor included in the Rules could reflect, for example:

- a condition stipulating that the DNSP should not be better or worse-off as a consequence of a faster or slower roll-out of smart meters compared to that assumed in the distribution determination (i.e., neutralising the incentive under the current Rules to defer expenditure);
- a requirement for the M-factor to be calculated by reference to benchmark capex and opex costs for provision and installation of meters, in order to preserve the existing incentives to achieve efficiencies; and
- a condition requiring the AER to ensure that any incentive scheme applied under the EBSS provisions must take into account the operation of the M-factor and the effect of differences in roll-out timing.

The M-factor would apply from the start of the next regulatory control period, i.e., 1 July 2014 in NSW and the ACT, 1 July 2015 in Queensland and South Australia.

5.1.3. Option 2: SMI Revenue Adjustment

An alternative option for eliminating the incentive (penalty) for DNSPs to delay (bring forward) expenditure in relation to a roll-out is to adjust future revenue to remove the reward (or penalty) received by the DNSP from delaying (or bringing forward) the actual rollout from that expected at the beginning of the regulatory period. That is, an *ex-post* recalculation difference between:

- the DNSP's revenues that were allowed at the beginning of the regulatory period, based on the expected rate of the SMI rollout; and
- the DNSP's revenues that should have been allowed at the beginning of the regulatory period, given the actual rate of the SMI rollout over the regulatory period.

This difference is then rolled forward to the end of the regulatory period and removed from (or added to, if negative) future regulated revenues.

To ensure that the DNSP continues to have an incentive to minimise the unit cost of the SMI rollout, recalculated revenues and prices could be based on the unit operating and capital costs originally forecast at the beginning of the regulatory period. In other words, the only change to the original revenue and pricing model would be the substitution of the forecast SMI roll out rate with the rollout rate actual observed over the regulatory period.

Table 5.1 presents a simplified example of how the SMI Revenue Adjustment would operate. In this example, the forecast unit operating and capital costs of a smart meter is assumed to be $50 per annum (over the life of the asset), and the DNSP is expected to roll out 1 million meters over the regulatory period. This results in the forecast revenue requirement for each year in the regulatory period rising from $2.5m in the first year to $50m in year 5.

Table 5.1
SMI Revenue Adjustment Example

	Year 1	Year 2	Year 3	Year 4	Year 5
Forecast roll-out					
Forecast % of total roll-out completed	5%	20%	50%	90%	100%
Expected Annual Revenue	$2.5m	$10.0m	$25.0m	$45.0m	$50.0m
Actual Rollout					
Actual % of total roll-out completed	5%	5%	20%	50%	90%
Recalculated Annual Revenue	$2.5m	$2.5m	$10.0m	$25.0m	$45.0m
Difference in Annual Revenue	-	-$7.5m	-$15.0m	-$20.0m	-$5.0m
NPV of difference at end of period (assuming 10% nominal WACC)					**$55.13m**

In this example, the actual rollout schedule from year 2 onwards is delayed by one year. As a result, the cumulative percentage of meters rolled-out is lower than forecast in each of years 2 to 5, and overall only 90% of meters are rolled-out over the period. In unadjusted terms, the DNSP's regulated revenues are $47.5 million higher over the period as a whole compared with the revenues that would have been justified given the actual roll-out rate (i.e., allowed revenues of $132.5m over the period minus actual expenditure of $85.0m).

If the DNSP is regulated by way of a revenue cap then the financial benefit received by the DNSP as a result of the delay in the roll-out schedule would be removed under the SMI Revenue Adjustment by escalating the difference between recalculated revenues and expected revenues in each year using the nominal WACC as the discount rate. For this example, assuming a nominal WACC of 10 per cent, the present value of the additional revenue received by the DNSP at the end of the current regulatory period is $55.13m.[11] This additional revenue would then be removed from the DNSPs regulated revenues in the following regulatory period.

[11] Note that for simplicity, this example assumes that outturn inflation is equal to that forecast at the beginning of current the regulatory period. If forecast inflation is different from that forecast at the beginning of the current regulatory period a nominal WACC (fixed real time varying) would be applied. The nominal WACC (fixed real time varying) would be identical to that calculate in the AER's current roll forward model.

An additional step is required where the regulatory control mechanism is either a weighted average price cap or a revenue yield cap. In these circumstances, using the DNSP's original revenue and pricing model, the SMI Revenue Adjustment is translated into a P_0 adjustment reflecting the change in year 1 prices (for the current regulatory period) sufficient to remove (in present value terms) the unspent revenue allowance received by the DNSP during the period (i.e., the P_0 adjustment that would have applied had the forecast in the regulatory determination been the same as the actual roll-out rate). The revenue adjustment in each year of the current regulatory period is then equal to the DNSP's actual revenue multiplied by the P_0 adjustment.[12] This difference in revenue is then rolled forward to the end of the regulatory period using the nominal WACC and removed from (or added to) the DNSP's future revenue requirement, as described above.

The SMI Revenue Adjustment mechanism could be implemented through changes to the Rules involving:

- an amendment to clause 6.4.3(a)(5) to allow for an explicit SMI adjustment to building block revenues; and
- a new clause specifying either the SMI Revenue Adjustment mechanism or requiring the AER to develop a mechanism consistent with a set of principles.

5.2. Evaluation of Options

To be effective, a quantitative mechanism such as the M-factor that directly links adjustments in a DNSP's price control to variances in the numbers of smart meters in operation compared with forecast requires a formula and parameter values that are both well-understood and broadly supported. In general, we consider the risk of unintended consequences associated with mechanisms of this kind to be high, especially when applied to price caps rather than revenue caps. If the relationships represented are relatively complex, the risk increases.

The design of an M-factor would need to address a number of factors, including:

- the variability in meter installation costs across a DNSPs customer base;
- the relationship between fixed smart meter infrastructure establishment costs and the number of meters in operation;
- the allocation of shared costs with other network functions; and
- the relationship between the number of meters in operation and the value of network operational efficiency benefits.

As was the case with the original Victorian proposal, an M-factor appears best suited to a distribution determination in which smart meter services are subject to a separate price control, and dealt with independently of other network services.

[12] This reflects the fact that under a price cap, actual revenues earned in any year will be affected by the level of demand.

An advantage of Option 2 (SMI Revenue Adjustment) is that it can be separately applied to each of the different variable and fixed cost elements of the SMI rollout, rather than requiring all SMI costs to be reflected in a $/meter value. For example, the fixed cost of back-end communication systems is likely to be independent of the rollout rate. The SMI Revenue Adjustment could explicitly re-calculate DNSP's revenues based on its actual investment in backend communications, thereby removing the incentive for a DNSP to defer these costs.

The SMI Revenue Adjustment could also be applied to differences in revenue both where roll-out costs are incurred as capex and also where they are incurred as opex. As can be seen from the earlier Table 3.2, there can be significant differences between DNSPs as to whether expenditure is treated as opex or capex.

A potential disadvantage of the SMI Revenue Adjustment compared to an M-factor type mechanism is that within period revenues do not adjust depending on the actual SMI rollout rate. As a result where the DNSP is able to accelerate the SMI rollout there will be detrimental cash flow implications. However, cash flow will only be a concern where the DNSP was able to substantially accelerate its SMI rollout (rather than the case where only incremental changes are made). Logistically, this may be less likely. Furthermore, where metering costs continue to be recovered through DUOS charges, the impact of any changes in the SMI rollout rate only will have a minimal impact on the total cash flows of the DNSP.

The SMI Revenue Adjustment may also have implications for the smoothing of tariff changes between regulatory periods, given that it will affect allowed revenues in subsequent regulatory periods. However, given that the most likely outcome is for the roll-out of SMI to be delayed within a period (due to external factors), this would be likely to offset price increases in the next regulatory period, rather than augment them.

Our comparative assessment of the options against the evaluation criteria is summarised in Table A5.2. Our conclusion is that, of the two options, the SMI Revenue Adjustment rates more highly across the range of criteria.

Table 5.2 Assessment of Options for Addressing Timing Uncertainty

	Option 1: M-factor	Option 2: SMI Revenue Adjustment
Promotion of efficiency	Yes, since adjustment undertaken on the basis of benchmark costs	Yes, since adjustment undertaken on the basis of benchmark costs
Appropriate allocation of risk	Yes, the DNSP is accountable	Yes, the DNSP is accountable
Support realisation of potential benefits	Yes, by reducing the incentive to delay the roll–out and incorporating operational efficiencies in the benchmark revenue adjustment	Yes, by reducing the incentive to delay the roll–out and incorporating operational efficiencies in the benchmark revenue adjustment
Promotion of transparency	No, because of concerns about the variance analysis	Yes, since the calculation is more straightforward
Robust to range of outcomes and proportionate	No, overly complex and of limited materiality	Yes, can be applied to both fixed and variable costs and to different cost types
Consistency with other expenditure	No, only applies to SMI	No, only applies to SMI

5.3. Uncertainty in Relation to Level of Expenditure

5.3.1. The effect of expenditure uncertainty on the recovery of efficient costs

Timing issues aside, if the quantum of roll-out costs and benefits are uncertain the DNSP will face the risk of incurring costs that are higher than expected and/or achieving operational benefits that are lower than expected. Once a distribution determination is made by the AER, the opportunities for a DNSP to seek a re-opening are limited, and do not include forecasting errors attributable to the DNSP itself.[13] Where there is an underestimation of costs or overestimation of operational savings by the DNSP compared to the expenditure estimates reflected in the determination, the DNSP is required to absorb the cost impact during the regulatory period within its allowed revenues.

It could be expected that in these circumstances the DNSP will seek to limit its risk by building into its forecasts of costs and benefits an increased allowance for contingencies. Other things being equal, the presence of uncertainty could therefore be expected to lead to an increase in the DNSP's cost forecasts.

In making its assessment of the DNSP's forecast costs, the AER is required by the Revenue and Pricing Principles in the NEL to ensure that the DNSP has a reasonable opportunity to recover its efficient costs. Further, under the Rules the AER can only reject a DNSP's forecasts if it is not satisfied that they reflect prudent and efficient costs. If there is acknowledged to be significant uncertainty then it is harder to meet this test. Even if the

[13] Under NER 6.13 the AER may only revoke a distribution determination for wrong information or error.

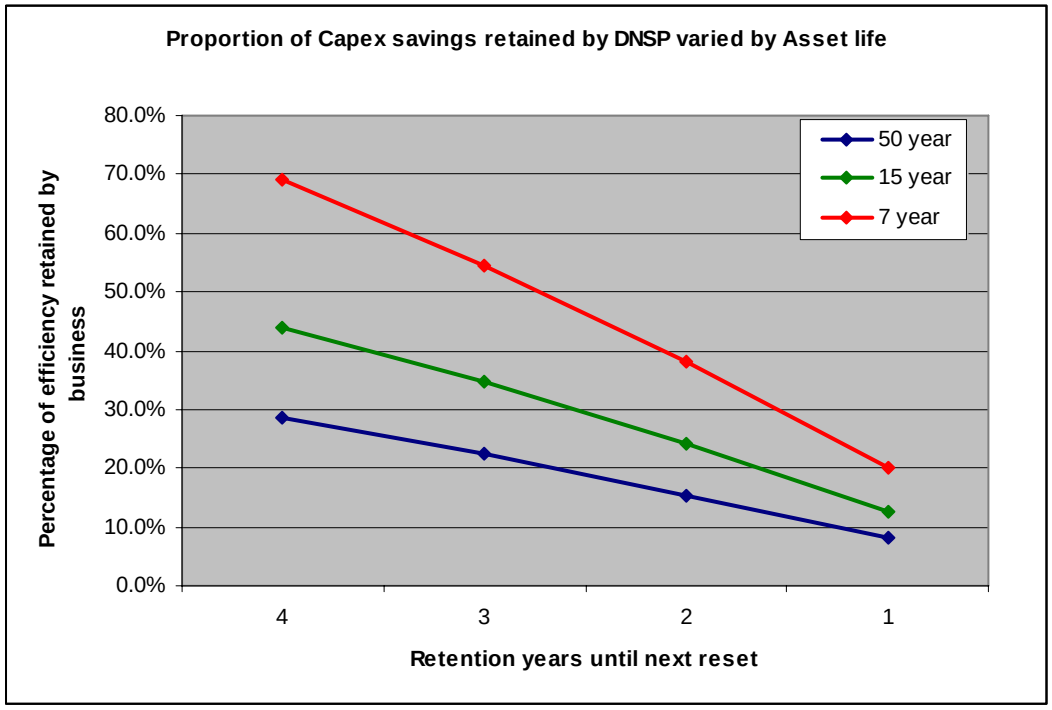
DNSP has access to reliable information, the AER may not, depending on how the information from the pilots and trials and other sources is disseminated. The presence of asymmetric information between service provider and regulator is a common feature of regulatory frameworks, and may restrict the ability of the regulator to identify 'reasonably efficient' costs.

The presence of uncertainty *by itself* therefore has implications for the level of prices determined under the Rules. Our assessment is that uncertainty in relation to the quantum of expenditure could be expected to lead to the AER's acceptance of higher cost forecasts (comprising both higher direct costs and lower off-setting cost benefits). As a result there is greater scope for variation between actual and forecast costs. If contingencies built into the forecasts are not called upon, actual costs will be lower than forecast costs by a larger margin. The variance will enter the opex and capex incentive mechanisms as savings. However, such variations may be considered to be 'windfall gains' to the DNSP, rather than real efficiencies that would not otherwise have been achieved in the absence of these incentive mechanisms.

For capex, the impact of actual costs being lower than forecast costs is represented by the additional return on capital and depreciation allowed during the regulatory control period, since only actual capex is rolled-in for the next period. The impact may be significant, depending on the proportion of expenditure connected with the roll-out represented by capex. This may vary considerably depending on whether the infrastructure is purchased as capital equipment by the DNSP or the required service is sourced from an external provider as an operating cost.

Because of the one-off nature of capital costs and the absence of claw back of any under-spend under the regulatory regime during the regulatory control period, the impact of over-estimating capital costs represents a permanent loss of value for consumers. Conversely, any over-spend in relation to capital would represent a permanent loss for the DNSP. Moreover, the relatively short asset lives of meters (around 15 years) and IT and communications assets (assumed to be 7 years in the national cost benefit analysis of SMI) has the effect of increasing the proportion of the gain retained by a DNSP as a result of actual capex being less than forecast (and, conversely, of increasing the loss as a result of an overspend). As Figure 5.1 illustrates, the proportion of a capex underspend gain retained by a DNSP is significantly higher for short-lived assets than longer-lived assets.

Figure 5.1
Proportion of Gain Kept by DNSP: 50 Year assets (network); 15 year assets (smart meters); 7 year assets (IT)



When short asset lives are combined with capex uncertainty the risk to efficient cost recovery is therefore magnified. As discussed in section 2, the extent of uncertainty in relation to the costs of short-lived IT assets may be greater than that in relation to the costs of the smart meters themselves.

Although the above discussion relates to the proportion of gains retained by a DNSP as a result of an under-spend in capex due to uncertainty, the reverse of the analysis applies where the DNSP spends more than the expenditure forecasts approved by the AER at the time of the distribution determination. That is, the DNSP bears a greater proportion of the over-spend in the case of short-lived fixed assets compared to longer-lived assets.

In relation to opex, the impact of higher forecast costs is represented by the increased margin between forecast and actual costs achieved during the period, and the proportion retained under the EBSS in the following period. Although this also represents a permanent loss of value for consumers, operating costs are recurring. The incentives on the distributor to achieve efficient costs allow those costs to be revealed and incorporated in future determinations, and therefore the overall impact of higher allowed costs in the first period is reduced. Under the current EBSS provisions, the proportion of any underspend retained by the DNSP in relation to operating costs is 30%.

The degree of uncertainty surrounding the expenditure associated with the roll-out of SMI highly dependent on the quality of the management, planning and analysis applied to the totality of roll-out decision-making and implementation, including:

- the pilots and trials that the MCE has indicated will provide the basis for jurisdictional roll-out decisions in 2012;
- the preparation and form of Ministerial smart meter roll-out determinations;
- the ability of the AER to access suitable roll-out benchmarking data; and
- the degree of clarity and certainty provided to DNSPs regarding their technical and regulatory obligations in relation to the roll-out.

In effect, a proportion of the uncertainty is 'policy dependent'. As we have noted in relation to the management of timing uncertainty, there are opportunities to address uncertainty in relation to mandated smart meter costs and benefits outside the Rules-based processes.

In addition, as roll-outs proceed both within and across jurisdictions, more information will become available to the AER to assist in reducing the level of uncertainty.

Whether a specific Rules-based mechanism is needed to address expenditure uncertainty is therefore likely to vary for each determination, based on differences in the information available at the time of the Ministerial determination and the timing of the determination. We therefore consider it appropriate for the Rules to provide for options to address the impact of uncertainty on the effectiveness of the Chapter 6 cost recovery process, but the leave the decision to the AER as to which mechanisms to adopt, as part of its Framework and Approach for each determination, taking into account the extent of uncertainty at the time of that determination.

5.3.2. Options for addressing expenditure uncertainty

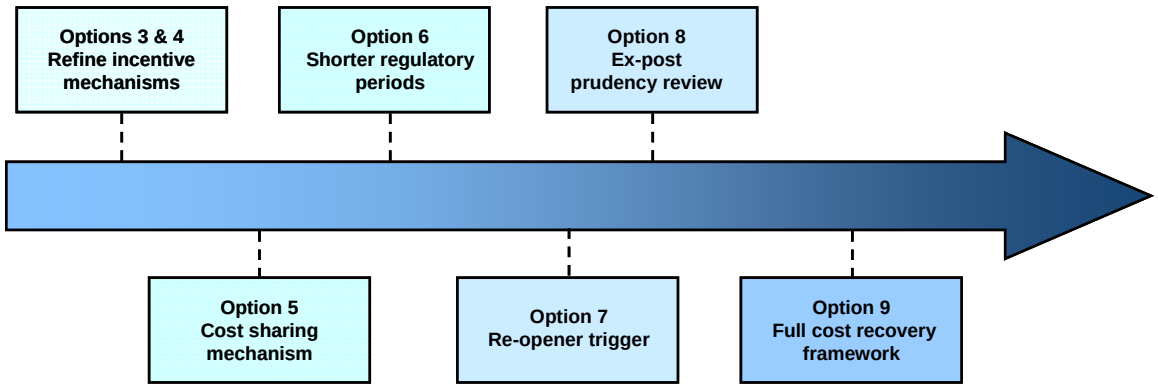
Under the current distribution determination process, the recovery of efficient costs where there is significant uncertainty regarding forecast costs and benefits will be constrained by the share of any windfall gains between the DNSP and customers, resulting from expenditure forecasts which include contingencies.

We have considered six options for addressing the impact of expenditure uncertainty. Arranged in increasing order of change to the existing arrangements, these are:

- Option 3: Lowering the power of the existing capex incentive mechanism;
- Option 4: Lowering the power of the existing opex incentive mechanism;
- Option 5: Replacing the incentive regime for smart meter expenditures with a smart meter cost-sharing mechanism;
- Option 6: Reducing the length of the regulatory control period;
- Option 7: Introducing a re-opener trigger for smart meter expenditures;
- Option 8: Subjecting smart meter expenditures to an ex-post review; and
- Option 9: Applying a full cost recovery mechanism to smart meter expenditures.

These options are depicted in Figure 5.2. Movement along the arrow indicates that the option involves more substantive changes to the current Rules.

Figure 5.2
Rule-based Options for Addressing Expenditure Uncertainty



At the lower end of the scale (i.e., to the left hand side), some options could be considered in combination. At the upper end, the options are essentially mutually exclusive.

We note that all of these options have the potential to address the concern that uncertainty at the time of a distribution determination as to the efficient level of SMI expenditure may result in higher approved forecasts, with the consequence that later outperformance against these forecasts reflects a windfall gain rather than a true efficiency. They address this concern by lowering the portion of any windfall gain that is retained by the business. None of the options considered are expected to directly impact the level of cost forecasts submitted by the DNSPs.

5.3.3. Option 3: Lowering the power of the existing capex incentive mechanism

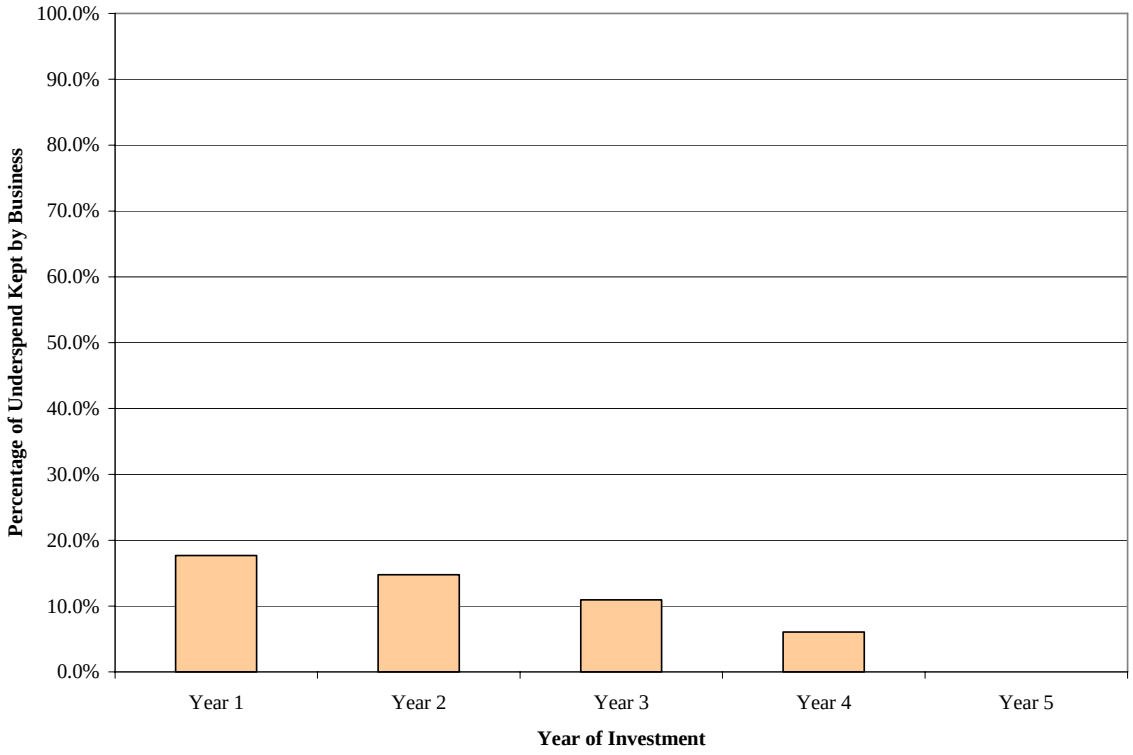
We have described in section 5.2.2 how the power of the capex incentive mechanism is greater for short-lived assets than long-lived assets. Where assets are short-lived, the DNSP faces a balance of risks and rewards that will favour building into its capex forecasts a higher margin for overspend error. This is the case for all types of short-lived assets. Where assets are short-lived and there is greater than normal uncertainty about future capital costs, the effect is magnified.

Figure 5.3 illustrates how the power of the capex incentive mechanism falls if the deprecation component is excluded from the incentive arrangements. If the roll-forward of the RAB is undertaken on the basis of forecast rather than actual capex, the power of the incentive mechanism for capex is the same for all assets, regardless of asset life. The proportion of gains retained by the DNSP in relation to capex cost savings in the first year of the regulatory period falls to around 18%, compared with close to 70% if depreciation is included in the incentive mechanism, for an asset with a 7 year life.

This is a general issue. Its importance is highlighted for SMI expenditure, given the potential high degree of uncertainty in relation to capital costs at the time of a regulatory

determination, which is likely to result in underspending in relation to forecasts reflecting windfall gains, rather than true cost efficiencies. However it also raises the question more generally of the appropriateness for any class of asset of an incentive mechanism that increases in power as standard life shortens. A stronger incentive for short-lived assets may be especially inappropriate for network businesses, whose focus should be on achieving efficiencies in relation to long-term assets, which form the bulk of the RAB.

Figure 5.3 Proportion of Gain Kept by DNSP if Depreciation Component Removed from Capex Incentive



One option for addressing the impact of uncertainty on the effectiveness of the Chapter 6 cost recovery arrangements is to de-power the incentive for short-lived assets by specifying the use of forecast depreciation in the roll-forward of the RAB. Specifically:

- for assets with standard lives of less than (say) 15 years, calculate the roll-forward of the RAB on the basis of forecast depreciation (i.e., remove the higher-powered incentives for these assets, but retain the low powered incentive);
- for assets with standard lives of (say)15 years or more, continue the use of actual depreciation (i.e., retain the higher-powered incentives for these assets)

Under the Rules the AER determines (through a constituent determination) the treatment of depreciation in the roll forward. This discretion could be retained, but the Rules amended

to enable (but not require) the AER to vary the method according to standard asset life. This would allow the AER to potentially vary its approach depending on the degree of uncertainty it perceives in relation to SMI expenditure at the time of the determination.

Alternatively, the Rules could be amended to specify the use of forecast depreciation for assets with standard lives less than a nominated length.

The above Rule changes could be considered for application to all distribution assets, or limited to the special case of SMI investment. Limiting the option to SMI investment is likely to add to complexity, involving arbitrary boundaries between assets that are classified as either SMI or non-SMI, and potentially creating incentives for swapping assets between categories. There is less scope for such distortion if the distinction in treatment is made on the basis of asset lives, as there is generally a high degree of transparency around assumptions in relation to standard asset lives.

Since the distorting effect of the current mechanism is a function of standard asset life rather than the purpose for which the assets are used, we consider that there are grounds for making the Rule change apply in general, rather than only to SMI investments. This would maintain consistency of treatment between roll-out and other expenditures.

5.3.4. Option 4: Lowering the power of existing opex incentive mechanism

Under this option direct SMI expenditure that is treated as opex is removed from the scope of the EBSS. The DNSP still receives a benefit (penalty) from an under-spend (over-spend) of opex (either as a result of efficiencies or as a windfall gain), as a result of the 'no claw-back' provisions. This incentive is higher at the start of the period, when uncertainty may be lower since more is known about expenditure in the most immediate periods.

Winding back the power of the opex incentive mechanism will reduce the impact on the DNSP and customers of opex under- or over-spends. This may be considered appropriate for smart meter opex, where forecasts are subject to a significantly greater degree of uncertainty, and the potential magnitude of windfall gains and losses is therefore higher. Where such expenditure is treated as opex, there would be an associated contract, and uncertainty about these costs may be less than in the case of capex. However, where this contract is with a related party, uncertainty in relation to the extent to which is reflects efficient costs may still remain.

Only direct SM opex savings are excluded from the EBSS. The EBSS would continue to apply to savings generated across other areas of a DNSP's network operations by the roll-out of smart meters.

A disadvantage of this option is that it introduces an arbitrary boundary by classifying opex as either SMI or non-SMI that may lead to 'cherry-picking' by a DNSP. Introducing differential incentives between classes of opex may lead to DNSPs seeking to 'transfer out' the under-spends to non-SM expenditure categories and 'transfer in' over-spends from other categories.

We note that the difference in incentives between expenditure classified as opex and capex is not addressed by this option, and so the potential for the difference to influence choices made by the DNSP in the management of the roll-out will remain. A DNSP may, for

example, prefer to convert some capital costs into operating costs by purchasing in a service rather than investing in the underlying asset.

No change to the Rules is required to implement this option, as the AER already has discretion on the form of the EBSS. The changes involved, therefore, do not appear disproportionate.

5.3.5. Option 5: SMI Cost Sharing Mechanism

Another potential alternative is to replace the current incentive regimes for SMI expenditure with an SMI Cost Sharing Mechanism. This targeted incentive mechanism features a fixed sharing ratio between the DNSP and network users of any SMI over- or under-spending, covering both capex and opex. This sharing ratio would be specified in advance by the AER, and could be set on the basis of the AER's view of the uncertainty prevailing at that time in relation to the forecast SMI expenditure.

The SMI cost sharing mechanism would operate in a similar manner to the SMI revenue adjustment (i.e., Option 2), in that the extent of under- or over- spend for SMI expenditure compared to forecast levels at the time of the AER's determination would be assessed at the end of the regulatory period and an adjustment made to revenues at the time of the subsequent determination to reflect the pre-determined 'share' of this underspend (or overspend) to be retained (borne) by the DNSP compared to that passed through to customers.

Under this option, DNSPs and network users would share the difference between forecast and actual costs due to differences in both variable and fixed SMI unit costs; and the level of SMI operational benefits. This approach could also be used to account for differences in the timing of the SMI roll-out (i.e., it could incorporate the SMI Revenue Adjustment (option 2) discussed earlier).

The sharing ratio between the DNSP and network users could vary depending on the level of variance between forecast and actual SMI costs. As the variance between forecast and actual SMI costs increase the share that borne (or received) by network users could increase. For example, if the level of variance between forecast and actual SMI costs is:

- ± 0-5%: network users receive (bear) 25% of the cost of the variance;
- ± 5-15%: network users receive (bear) 50% of the cost of the variance;
- ± 15+%: network users receive (bear) 75% of the cost of the variance.

The rationale for this approach is that expenditure differences at the more extreme end of the scale are more likely to indicate the presence of windfall gains or losses, and so the share borne by the DNSP in these cases should be lower in order to appropriately allocate risk between consumers and the business.

The main advantage of this option 5 is that allows the extent of any windfall gain (or loss) borne by the DNSP in relation to SMI expenditure to be targeted depending on the extent of uncertainty that the AER considers applies at the time of its determination. It also allows the

same sharing ratio to be applied across both capex and opex, and therefore addresses concerns with the provision of differential incentives, both under the current Chapter 6 arrangements and also Options 3 and 4 discussed above.

However, we note that the SMI Cost Sharing Mechanism would need to be specified carefully in order to avoid a number of potential disadvantages. This option may not provide uniform incentives for efficient behaviour. For example where costs have escalated for some categories of the SMI rollout, the SMI Cost Sharing Mechanism reduces the incentive for a DNSP to achieve cost efficiencies in other areas associated with the roll-out. It may also lead to perverse incentives at the boundaries between different sharing ratios, i.e., in situations where there is an over-spend, in order to trigger a lower sharing of this over-spend the DNSP may have an incentive to actually spend more in order to reach the next sharing bracket. This problem could be overcome if the change in the sharing ratio was expressed as a function, rather than discrete bands.

We note that this option does not maintain consistent treatment between SMI roll-out and other expenditure, although the differences are limited to the benefit sharing ratios, and in all other respects consistency is maintained.

5.3.6. Option 6: Shorter regulatory period

A reduction in the regulatory period to, say, 3 years, will provide benefits in the management of uncertainty by reducing the power of the incentive mechanisms for both capex and opex, and providing for more frequent resetting of forecast costs based on updated information.

If metering is unbundled, a separate regulatory review and determination could be applied to smart metering services by the AER. If metering is not unbundled, the entire distribution determination process would need to operate on a shortened timetable. This appears to be an impractical and disproportionate response, since SMI expenditure is in the order of 10% or less of overall expenditure. If applied generally, a shorter regulatory period will lessen the efficiency incentives for a DNSP across all categories of expenditure and, by increasing the frequency of determinations, significantly increase regulatory costs for all parties.

A separate shortened determination process that applies only to smart metering services will create incentives for the DNSP to swap expenditures between the two determination processes to optimise its financial result, as well as adding significantly to overall regulatory costs. While transparency is improved, shortening the regulatory period represents a substantial change to the current approach, and does not appear to be proportionate to the issue.

5.3.7. Option 7: Re-opener trigger

Under this option a re-opening of the distribution determination is triggered if the difference in outturn roll-out expenditure compared with forecast is more than a pre-specified percentage. It provides a mechanism for limiting the risk of DNSPs that is directly linked to the materiality of the variance. The option may take several forms:

- where metering is unbundled, the re-opening could be limited to smart meter expenditure; however, this would represent an inappropriate sharing of risk between categories of expenditure, since gains (losses) in other areas are not taken into account;

- where metering is not unbundled, the entire determination may need to be re-opened, unless smart metering expenditure can be adequately separated out and made the subject of a limited re-opening. This would again represent a difference sharing of risk between different categories of expenditure.

Re-opener triggers suffer generally from the disadvantage of being asymmetric; DNSPs have an incentive to react quickly in the case an over-spend, but not for an under-spend. Where an under-spend trigger is included, it relies on external supervision and is subject to significant data lags, reducing its effectiveness. In the context of uncertainty in relation to SMI expenditure, this is a major disadvantage, given that the primary concern is the potential for windfall gains.

Where the whole determination is re-opened, there may be perverse incentives. DNSPs may use the trigger where they also stand to gain as a result of other changes (unexpected increases in demand, for example). The potential for a general re-opening will also reduce the power of the incentive mechanisms that are built into the current fixed term regulatory control periods.

Cost will depend on the extent of the re-opening that is triggered. Where a full re-opening is required, the costs will be substantial; less if the re-opening is limited to expenditure associated with the roll-out.

A re-opener trigger for smart meter expenditure does not maintain consistency with other forms of expenditure. It represents a substantial departure from current regulatory practice, and does not appear proportionate to the issue it addresses.

5.3.8. Option 8: *Ex-post* review

The disadvantages of using expenditure forecasts in a distribution determination where there is greater than normal uncertainty are offset in this option by applying an *ex post* review to outturn expenditure at the end of the regulatory period.

The existing *ex ante* provisions of Chapter 6 remain under this option. DNSPs submit a regulatory proposal including forecast expenditure, which is assessed by the AER who makes a determination in relation to allowed revenues and X-factors for the regulatory period, as per the current Chapter 6 arrangements.

At the end of the regulatory period the AER makes an additional constituent determination on whether outturn expenditure associated with the roll-out of smart meters is prudent and efficient. The determination applies to all expenditure associated with the roll-out, to avoid the DNSP 'cherry-picking' items of over-spend only, and could extend to include operational efficiencies associated with the roll-out. Expenditures that are otherwise not associated with the roll-out are excluded from the scope of the review.

The review would be undertaken in accordance with additional principles set out in the Rules. Schedule 6.2.2 in the current Rules contains some principles in relation to the *ex-post* review of expenditure, which may be applicable in this regard. These include requiring the AER to have regard to:

- the need to provide a reasonable opportunity for the relevant DNSP to recover the efficient costs of complying with all applicable regulatory obligations or requirements associated with the provision of standard control services;
- the need to provide effective incentives to the DNSP to promote economic efficiency in the provision of standard control services;
- whether the DNSP undertook the expenditure in a manner consistent with good business practice and so as to practicably achieve the lowest sustainable cost of delivering the standard control services to be provided as a consequence of that capital expenditure;
- the desirability of minimising investment uncertainty for the DNSP; and
- the need to provide incentives to the provider to avoid undertaking inefficient capital expenditure.

In addition the Rules would need to incorporate a 'no hind-sight' principle, similar to that included in Schedule 6.2.2:

- in determining the prudency and efficiency of expenditure the AER must only take into account information and analysis that the provider could reasonably be expected to have considered or undertaken at the time that it undertook the relevant capital expenditure.

An *ex post* review allows the AER to assess whether the DNSP acted prudently and efficiently, given the information available to the DNSP at the time. Where substantial contingencies have been built into a DNSPs forecast expenditures to accommodate uncertainty, and the level of uncertainty reduces during the regulatory period, it may be possible to separate out the effect of the reduction in uncertainty, and, in effect, 'claw-back' the windfall gain to the DNSP.

However, we note that *ex post* review mechanisms present a number of practical difficulties, and there has been a general movement away from *ex post* review in regulatory policy and the Rules, and a greater emphasis on *ex ante* incentive arrangements. Under an *ex post* approach, DNSPs are exposed to the risk of an uncertain future regulatory determination. Where costs are more than normally uncertain, the risk associated with an *ex post* review may be greater, particularly given the difficulty faced by the regulator in applying the 'no hindsight' principle and distinguishing between internal (controllable) and external influences on cost outcomes. The risk of regulatory error in this regard may weaken the incentive for the DNSP to seek additional efficiencies.

The assumption implicit in an *ex post* review mechanism – that an assessment can be made after the fact of what it would have been reasonable to consider as prudent and efficient before the fact – may also be questionable in the specific case of SMI expenditure. The relevance of the distribution determination process is also brought into question. If the *ex*

ante review is time constrained, then an *ex post* review could allow for a more considered assessment. This is not the case for this option, which presupposes a conventional distribution determination process, including a full *ex ante* review. If the *ex post* review is to make a contribution to improved outcomes, it raises the question of what additional allowable information is available that was not available during the *ex ante* review.

The additional layer of regulation involved in an *ex post* review will add to the costs of the DNSP and the AER. It represents a substantial move away from the current basis of regulatory policy and method, and does not appear proportionate to the issue it seeks to address.

5.3.9. Option 9: Separate cost recovery mechanism

The approach to AMI cost recovery currently applied in Victoria under the Order in Council (OIC) provides an example of a mechanism tailored specifically to the mandated roll-out of smart meters.[14] During the term of the mandated roll-out, costs are recovered through a mechanism that operates independently of the distribution determination process. This option effectively replaces the current Chapter 6 framework for expenditure associated with a Ministerial roll-out determination.

The revised OIC provides for a cost pass through model under which budgets for the roll-out are established at the beginning of each budget period, with annual charges then being determined based on actual expenditure.

There are two regulatory periods set out in the revised OIC: the first budget period from 1 January 2009 to 31 December 2011 (which is the subject of the recent determination[15]); and the second budget period 1 January 2012 to 31 December 2015. From 2016, the determination of prices will be by the AER in accordance with Chapter 6 of the NER in relation to standard and alternative control services. There will be a 'true-up' of revenue and actual expenditure in 2015 with the anticipated difference in revenue and actual expenditure from 2009 to 2015 to be calculated and carried through to prices in 2016.

In the first two regulatory periods, DNSPs provide an initial budget to the AER which it must approve unless it can establish that the expenditure is for activities that are out of scope (with scope of activities set out in the November 2008 and January 2009 OICs) or is not prudent. Expenditure is not prudent if in relation to contract costs the contract was not issued in a competitive tender process, and in relation to other expenditure the AER considers that the expenditure will not be incurred or will be substantially different to commercially standard expenditure.

Prices are then set by the AER on the basis of the approved budgets and are adjusted on an annual basis based on the actual expenditure incurred. Actual expenditure is used where it

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[14] Advanced Metering Infrastructure Order in Council 2009, 25 November 2008.

[15] AER, Final determination Victorian advanced metering infrastructure review 2009-11 AMI budget and charges applications, October 2009.

is within scope, certified in an audit report and no more than 120 per cent of the first budget, and no more than 110 per cent of the second budget.[16] When actual expenditure is outside these ranges the AER must investigate further. The AER cannot allow costs outside this range to be recovered if it considers that such costs are not prudent or not within scope.

The focus of this approach is on limiting the exposure of DNSPs by establishing actual expenditure as the basis for cost recovery. Both DNSPs and customers benefit from greater certainty, but protections for customers from inefficient expenditures undertaken by DNSPs are relatively weak. Essentially there is a trade-off between stronger incentive properties and lower risk for DNSPs in favour of the latter. Off-setting operational benefits are not taken into account in this mechanism, with the implication being that these can be included in the next full distribution determination.[17] By itself the mechanism does not support potential operational benefits being realised.

This approach treats SMI expenditures differently to other forms of expenditure. Consistency and proportionality are not maintained, which may result in pressure to adopt tailored approaches for other major DNSP expenditure.

5.4. Expenditure Uncertainty – Evaluation and Preferred Approach

5.4.1. Evaluation of Options

We have considered a range of options that could be adopted to address the various aspects of uncertainty associated with a smart meter roll-out determination. The options discussed above range from incremental change to the structure of capex incentives that can be applied generally within the current Chapter 6 Rules, to the replacement of the Rules with alternative cost recovery arrangements, solely applied to expenditure associated with a smart meter determination. The options are not all mutually exclusive. Options 3 and 4 could be implemented either separately or concurrently with all other options except 5 (which is a substitute for 3 and 4) and 9 (which represents a fundamentally different change in approach). There are grounds for applying Option 3 across all assets, independently of the approach taken for smart meters.

Options 3 and 4 (which involve an amendment to the current incentive arrangements) represent a relatively small change to the existing Chapter 6 arrangements, and so are proportionate. They support the promotion of transparent, well-informed and appropriate processes. Together with Option 5, the changes to incentive levels result in a more balanced risk-reward trade-off where there is uncertainty. However, the efficiency incentive is reduced. The key issues in relation to 4 and 5 are their workability in practice. Option 5 is more complex, less proportionate and may have significant boundary issues where the level of incentive reduces as the degree of any cost over- or under-spend increases.

Options 6 and 7 maintain a focus on the interaction between uncertainty and the level of incentives in relation to under- and over-spends. Incentives are retained but moderated by

[16] AER, Final determination Victorian advanced metering infrastructure review 2009-11 AMI budget and charges applications, October 2009, p. 4.

[17] The AER has confirmed that at the next distribution determination it intends to include operational benefits from the AMI roll-out in the scope of its review of DNSP costs.

less direct means – shortening the regulatory period and conditional re-opening of the determination. Again, this results in a reduction to the efficiency incentive. Both require complex and substantial amendments to the Rules, and are not proportionate. Both options are impractical and distorting in the absence of full unbundling of services provided by SMI. With unbundling, significant boundary issues for SMI and related network assets subject to either differently timed determination process or limited re-opening will remain. A separately timed SMI determination under Option 6 will potentially improve transparency, but transparency is unlikely to be a source of benefit under Option 7. This option suffers from asymmetric risk, and its effectiveness in reacting to under-spends is limited by data lag.

As an alternative to modifying the interaction between uncertainty and the incentive properties of the distribution determination process, Options 8 and 9 address uncertainty directly by focussing on actual expenditures. Both options represent substantial changes to current regulatory policy, applied exclusively to SMI, and are neither consistent in their treatment of SMI expenditures nor proportional in their response to the cost recovery issues raised by the roll-out.

The incentives for efficient expenditure are weakened under both options. *Ex post* review exposes efficiency gains made by the DNSP to additional regulatory risk, while the effect of Option 9 is to replace the forward-looking nature of the current determination process with a lightly supervised pass through of actual expenditures. Transparency and well-informed process are not supported by either option. Robustness is lacking in Option 8. Under both options the realisation of benefits is left as an issue to be pursued under a subsequent distribution determination.

Table 5.3 provides a summary of the options as assessed against our evaluation criteria.

Table 5.3

Assessment of Options for Addressing Expenditure Uncertainty

	Option 3: Reduced capex incentive	**Option 4: Reduced incentive for opex**	**Option 5: Cost sharing mechanism**	**Option 6: Shorter regulatory period**	**Option 7: Re-opener trigger**	**Option 8: *Ex-post* review**	**Option 9: Full cost recovery mechanism**
Promotion of efficiency	Weaker for capex, but potentially more balanced	Weaker for opex, but potentially more balanced	Weaker, but potentially more balanced	No, incentives weaker and potentially affects all operations	Weaker, incentives asymmetric	No, incentives weakened by regulatory risk	No, incentives significantly weaker
Appropriate allocation of risk	Improved for capex	Improved for opex	Improved	Improved for SM only	Weaker, risks asymmetric	Increased regulatory risk	No, customer bears most risk
Support realisation of potential benefits	Yes – no change	Yes – no change	Yes – no change	No, weaker incentives	No, weaker incentives	No, weaker incentives	No, weaker incentives
Promotion of transparency	Transparent change to current arrangements	Transparent change to current arrangements	Improved for SM expenditure	Improved, more frequent review	Potentially improved, but at DNSP's discretion	No, increased regulatory discretion	Unlikely, depends on prudency tests
Robust to range of outcomes and proportionate	Yes, if applied generally	Yes, if limited to SMI opex	May be boundary issues; question whether proportionate	No, affects all operations and has significant costs	No, potentially affects all operations and has significant costs	No, has significant costs	Robust, but not proportionate
Consistency with other expenditure	Yes, if applied generally	No, only SM opex	No, limited to SMI	No, if applied separately	No, trigger limited to SMI	No, limited to SMI	No, limited to SMI

5.4.2. Summary and Preferred Approach

The presence of significant expenditure uncertainty is a key determinant of the effectiveness of the current Chapter 6 arrangements in facilitating the recovery of the efficient costs of a mandated smart meter roll-out. Uncertainty will cause the DNSPs to build into contingencies into their expenditure forecasts, and will reduce the capacity of the AER to challenge these forecasts. Once a distribution determination is in place, the incentive properties of the current Chapter 6 arrangements will allow DNSPs to retain a disproportionate share of any contingencies built into the forecasts that are not called upon.

The greater the extent of uncertainty, the more the concerns raised with the operation of the current regime. However, we also note that the extent of uncertainty is likely to vary, both between jurisdictions (where processes vary or more comprehensive pilot and trial results are available) and over time (as information from the roll-out in Victoria and potentially other jurisdictions becomes available). As a result, the level of uncertainty, and therefore the appropriate responses, may well be different between jurisdictions and over time.

Given that the level of uncertainty at the time of a Ministerial determination is not currently foreseeable, one approach that has been suggested in submissions[18] is to provide a degree of flexibility for the regulatory framework to be adapted as appropriate at the time of a regulatory determination.

We support an approach that allows the AER reasonable discretion within a framework underpinned by clear principles in the Rules. In summary:

- The Commission encourages jurisdictional Ministers to reduce 'policy dependent' uncertainty associated with the roll-out of smart meters as much as reasonably possible;

- The Commission supports, in principle, the AER having flexibility to respond to the circumstances that apply at the time of a distribution review, including the flexibility to apply different cost recovery mechanisms selected from an expanded range provided for in the Rules, where these are underpinned by clear principles;

- The Commission would support the AER modifying its approach to capex and opex incentives for expenditure on short-lived assets and where there is significant uncertainty in relation to forecast expenditure; the AER already has discretion over these matters, although Rule changes would be required in order to allow the AER to make different decisions on the roll-forward approach for assets depending on their asset lives;

- The case for expanding the mechanisms for cost recovery in the Rules to include *ex post* review and full cost recovery would need to be made on the basis of a broadly-based assessment that the current arrangements are inadequate for addressing the uncertainties associated with future network expenditures; and

[18] NSSC, Submission on Draft Statement of Approach, February 2010.

- At this stage there does not appear to be evidence to suggest that uncertainty associated with future network expenditures is emerging as a problem for the Rules.

We consider that Options 3 and 4 have merit in that they focus on the interaction between uncertainty and the incentive properties of the distribution determination process in a manner that is consistent with the regulatory principles underlying the Rules.

6. Cost Recovery outside of the Distribution Determination Process

The current regulatory framework set out in Chapter 6 of the NER includes a 'cost pass through mechanism' to allow for the recovery of costs which are either unforeseen or highly uncertain at the time of the distribution determination and which therefore are not able to be incorporated in the expenditure forecasts for the next regulatory control period.

Current distribution determinations allow for the cost pass-through provisions to be triggered for a Ministerial roll-out determination in NSW, ACT, SA and Queensland. However, our assessment (set out in Chapter 3 of the Draft Report) is that the current cost pass-through provisions in the Chapter 6 Rules are not sufficient to accommodate efficient cost recovery associated with a Ministerial smart meter roll-out determination. Specifically:

- The timeframes set out in the current cost pass through provisions are unlikely to be adequate, and there is no flexibility to extend the timeframe in relation to the period for the AER's decision;
- The requirement to take account of off-setting operational benefits is not clearly specified in the Rules;
- The criteria against which expenditure is assessed is not clearly specified in the Rules; and
- The Rules may preclude a cost pass-through application in relation to a Ministerial roll-out determination that occurs during the period between the lodgement of a regulatory proposal and the start of the next regulatory control period (the 'dead-zone').

We have therefore considered the feasibility of alternative 'mid-period' mechanisms to enable costs associated with a Ministerial roll-out determination which occurs subsequent to a distribution determination to be recovered via an adjustment to prices during the regulatory period. It is important that any such mid-period mechanism not only facilitates appropriate cost recovery (where expenditure associated with a roll-out needs to be incurred by the DNSP prior to the start of the next regulatory period), but also addresses the difficulties raised by the potential uncertainty associated with roll-out expenditure (as discussed in section 5 of this Paper).

A mid-period cost recovery mechanism will operate where a DNSP is required by a Ministerial smart meter roll-out determination to incur expenditure before there is an opportunity to include the expenditure within a distribution determination. This would arise where there is a timing mismatch between the processes triggered by a Ministerial smart meter roll-out determination and the next distribution determination. We first consider whether such a timing mismatch is avoidable.

6.1. Is a Timing Mismatch Avoidable?

Figure 6.1 sets out key dates in the announced timelines in relation to the MCE processes leading up to possible Ministerial determinations in relation to smart meter roll-outs, and

compares these with the timeframes for key activities associated with the next distribution determinations in NSW and the ACT.

Under the MCE process, current and proposed pilots and trials are expected to inform a decision in June 2012 by individual Ministers as to whether to make a roll-out determination.

Figure 6.1
Timeframe for MCE SMI Process and Next NSW and ACT Distribution Determinations

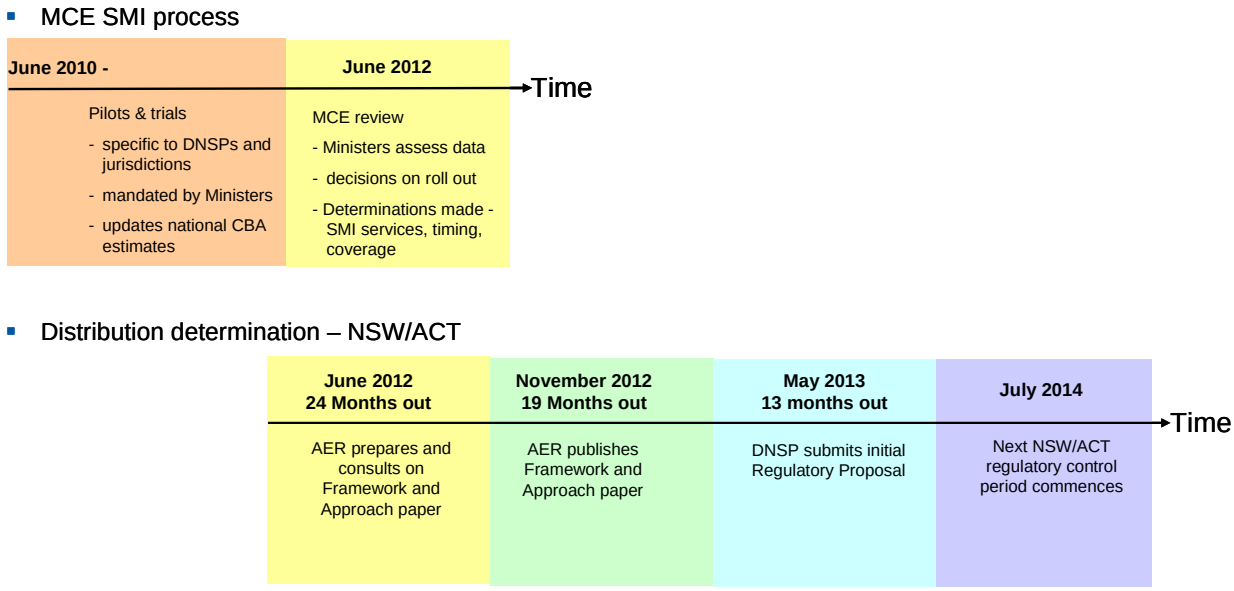

Figure 6.1 also presents the timing of the key activities under Chapter 6 in relation to the distribution determination process, for NSW and the ACT. The next regulatory period for these jurisdictions will begin in July 2014. Under the NER, the AER is required to prepare and consult on its Framework and Approach for that regulatory period at least 24 months prior to the start of the regulatory period, i.e., June 2012. Where there is a Ministerial roll-out determination, the AER's Framework and Approach paper would be expected to canvas changes in the application of the regulatory framework to accommodate such a roll-out (e.g., the implementation of options to deal with uncertainty in relation to the timing of the roll-out and the quantum of expenditure, as discussed in section 5). In addition, the DNSPs will require sufficient time following a roll-out determination to prepare their expenditure forecasts. Under the timeframes depicted in Figure 6.1 the DNSPs in either NSW or the ACT would have 11 months between the announcement of a Ministerial determination, assuming that this following the MCE June 2012 meeting, and the time at which they need to submit their expenditure forecasts to the AER for the 2014/15 regulatory period.

Figure 6.1 highlights that the expected timing of the planned MCE decision-point in relation to smart meter roll-outs fits well with the timing of the next regulatory review period for NSW and the ACT, on the assumption that a Ministerial roll-out determination made subsequent to the June 2012 MCE review does not require the roll-out to begin prior to July 2014. A two-year lead-time between a Ministerial determination and the required start of

any roll-out does not appear unrealistic once the interactions of the regulatory design, project planning and regulatory review procedures are considered. Indeed, Figure 6.1 suggests that the alignment of the timeframes would support an orderly process for policy decision-making and implementation, and allow effective coordination with the development of the next distribution determinations in NSW and the ACT (i.e., the 2014/15-2018/19 distribution period).

For Queensland and South Australia, the start of the next regulatory review period is 12 months later than for NSW and the ACT (i.e., the next regulatory period starts in July 2015). If Queensland and South Australia decided to proceed with a roll-out, this difference in timing would provide an opportunity for the implementation of roll-outs across the NEM jurisdictions to take place progressively, allowing for improved regulation and project planning as experience is gained, and the management of potential resource bottlenecks. An additional 12 months lead-time for the start of a roll-out in order to enable cost recovery to be accommodated under the existing distribution determination process does not appear to be a substantial delay, particularly if it resulted in a more efficient and effective delivery of benefits to consumers.

6.1.1. Advantages of all cost recovery falling under the distribution determination process

We consider that a 'first best' option is to ensure that the roll-out timeframes set out in a Ministerial determination require expenditure only at the start of the next regulatory period for that jurisdiction. This would enable the roll-out expenditure to be recovered under the same distribution determination process and considerations as applied to all other types of DNSP expenditure.[19]

There are several advantages of the cost recovery process for expenditure associated with all smart meter roll-outs being undertaken as part of the existing distribution determination process, rather than via a separate and different mechanism:

- the distribution determination process is comprehensive, and allows SMI expenditure to be assessed at the same time as all other expenditure. This is important where it is difficult to separate out SMI expenditure from other expenditure necessary to meet DNSPs' obligations (e.g., IT and communications systems). It also allows for the more straight-forward consideration of off-setting operational efficiencies, since expenditure requirements across all of a DNSP's activities are being considered at the same time;
- it allows the AER a relatively long timeframe (13 months) to assess the SMI expenditure;
- it lowers regulatory costs, since the cost recovery for roll-out expenditure would not require a separate regulatory process. Such cost savings could be expected to be significant;

[19] As discussed in section 5, we have identified certain aspects of the current Chapter 6 approach relating to the distribution determination process that are likely to require modification to ensure that the approach remains effective in the light of the potential uncertainty associated with expenditure relating to a smart meter roll-out.

- it removes any potential 'gaming' incentives to cherry-pick between different cost recovery mechanisms, which may result in pressure on Ministers in relation to the timing set out in any roll-out determination;
- it would result in a single and consistent process applying to DNSPs across all jurisdictions (which the exception of Victoria); and
- it would enable the AER to also consider the wider issue of appropriate service classification.

We note that the lead-time between the announcement of a Ministerial roll-out determination and the time at which the first smart meters are to be installed is not prescribed and is a matter for the Minister's determination. It will be necessary in any event to provide sufficient lead-time following the determination for the DNSPs to undertake the detailed planning associated with delivering such a large investment. The AER will also require lead time to prepare its response to the regulatory obligations placed upon it in relation to the roll-out. In Victoria DNSPs were provided with a one-year lead-time under the Order in Council before commencing installation, and in this context we note the comments of the Victorian Auditor-General in regard to the difficulties that have subsequently been encountered. In these circumstances, allowing for a lead-time of 2 years (in the case of NSW and the ACT) or 3 years (in the case of Queensland and South Australia) in order to gain the benefits of aligning the roll-out with the distribution determination process and achieving an orderly roll-out across jurisdictions, does not seem an undue delay.

Where the Ministerial determination provides sufficient lead-time for roll-out expenditure to be recovered as part of the next distribution determination process, the up-front planning costs incurred by DNSPs between the making of the Ministerial determination and the start of the distribution determination period will need to be recovered via the cost pass-through mechanism (as a 'regulatory change event'). However, given the much lower magnitude of these costs and their different nature compared to the costs of undertaking the roll-out itself, the existing Chapter 6 cost pass-through provisions (as modified as suggested in Chapter 4 of the Draft Report) are expected to be able to accommodate such cost recovery.

6.2. Options for a Mid-period Mechanism

As noted above, it is important that any mid-period cost recovery mechanism not only facilitates appropriate cost recovery where expenditure associated with a roll-out needs to be incurred prior to the start of the next regulatory period, but also addresses the difficulties raised by the potential uncertainty associated with roll-out expenditure (as discussed in section 5).

Key issues in considering the options for a mid-period mechanism are:

- the form of the mechanism;
- the timeframes within which DNSPs are required to submit expenditure estimates to the AER and then for the AER to undertake its assessment and make its determination; and
- the nature of the AER's determination, and whether there is any later re-visiting of the AER's decision.

Options for the form of mechanism will depend on the extent to which SMI expenditure is able to be practically 'separated out' and considered in isolation from other DNSP expenditure. As discussed previously, in some cases it is expected to be difficult to determine the precise scope of SMI expenditure (e.g., in relation to IT and communication systems, which may also facilitate other activities of the DNSP). In addition, the mechanism should enable consideration of the off-setting operational efficiencies expected as a result of the roll-out.

We consider it desirable that any mid-period mechanism should reflect as closely as possible the same approach to cost recovery as that embodied in the distribution determination approach. Alternative approaches will result in the DNSP facing different incentives for efficiency depending on whether the roll-out is occurring at the start of the regulatory period or mid-period, and may result in distortions in the timing of expenditure by DNSPs. For example, where a mid-period mechanism provides a guarantee of cost recovery, this may incentivise the DNSP to bring-forward expenditure associated with the roll-out, in order to gain more favourable treatment than if that expenditure was considered as part of a later distribution determination process.

The Commission has considered the following potential options for a mid-period mechanism:

- **Option 10**: 'Stop-gap' full cost recovery, no later review;
- **Option 11:** Mid-period adjustment to existing cost allowances (a variant of the 'contingent project' mechanism applying to electricity transmission businesses);
- **Option 12:** Separate determination for smart meter expenditure; and
- **Option 13a**: No mid-period adjustment; expenditure considered at the next distribution determination (with an *ex post* review);
- **Option 13b**: 'Stop-gap' mid-period adjustment, expenditure considered at the next distribution determination (with an *ex post* review).

These options are each described briefly below.

6.2.1. Option 10: 'Stop-gap' full cost recovery, no later review

Under Option 10, the DNSP submits to the AER its forecast of the additional expenditures required to comply with the Ministerial roll-out determination for each remaining year of the current regulatory period (i.e., the 'stop-gap' revenue). The AER is required to approve these forecasts, subject to a high level 'light handed' review to ensure that they are not obviously out of line with efficient expenditure. The AER's determination adjusts the price control for the DNSP within the regulatory period in order to allow for the recovery of the 'stop-gap' revenue.

The DNSP is required to submit its roll-out expenditure forecasts for the next regulatory period to the AER in line with the timetable set out in the Chapter 6 Rules (i.e., 13 months before the end of the regulatory period) and the AER then reviews this forecast together with the DNSP's other expenditures at the time of the next regulatory determination, in line

with the Chapter 6 provisions. There is no *ex post* review or adjustment of the 'stop-gap' revenue adjustment under this approach.

This 'stop-gap' approach facilitates cost-recovery by the DNSPs of expenditure incurred in the current regulatory period. By reducing the AER's review role to a minimum, the timeframe required for review under such an approach is reduced.

However under this approach there is no incentive for the DNSP to ensure that its expenditure is efficient. Indeed, the option is likely to result in incentives for DNSPs to bring forward roll-out expenditure, where possible, so as to avoid regulatory review at the time of the next determination. Also, under this option SMI expenditure is treated differently to all other DNSP expenditure.

6.2.2. Option 11: Adjustment to existing cost allowances

Option 11 is a full mid-period review of the DNSP's roll-out expenditure proposal. The review extends to increases in expenditure due to a roll-out and also operational efficiencies directly associated with the roll-out. The operational efficiencies are taken into account without opening up all of the DNSPs' expenditure for review, by explicitly netting off these expected efficiencies as part of the assessment of the direct expenditure required, for those categories of operational efficiencies which are more easily identified (e.g., the reduction in meter reading costs). The Commission notes that this option has many similarities with the 'contingent project' mechanism applying to transmission investment under Chapter 6A.[20]

Following a mid-period Ministerial roll-out determination the DNSP submits its forecast of the total expenditure associated with the roll-out, and the proportion of such expenditure that it expects to incur in each of the remaining years of the regulatory period, together with off-setting operational benefits. The AER then makes a determination in relation to the change in the revenue requirement required for the DNSP to recover this expenditure and the resulting change in the X-factors that are applicable for the remainder of the regulatory period.

The AER's determination is made in accordance with the principles and criteria applied during a distribution determination process (e.g., using the capital and operating expenditure criteria set out in 6.5.6(c) and 6.5.7(c) and the capital and operating expenditure factors sect out in 6.5.6(e) and 6.5.7(e)). This directly addresses one of the shortcomings with applying the current cost pass-through provisions in Chapter 6 to a Ministerial roll-out determination (i.e., that the criteria for the assessment of expenditure are not clear).

Under Option 11, the AER's mid-period determination would not extend into the next regulatory period. That is, the revenue adjustment applies only for the remainder of the current regulatory determination, and does not have any implications for the AER's determination for the following regulatory period. As part of the next determination, the AER considers the DNSP's forecasts of expenditure for completing the roll-out at the same time and on the same basis as it considers all other aspects of the DNSP's expenditure forecasts. There is no 'carry-over' from the mid-period expenditure forecasts.

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[20] The contingent project regime for transmission businesses is set out in clause 6A.8 of the NER.

We note that in this respect the option varies from the contingent project mechanism for transmission, which does require a carry-over of the mid-period expenditure forecasts into the next regulatory period. The rationale for the carry-over is to preserve the same incentive to make efficiency gains for transmission investment under the contingent project mechanism as for expenditure included in the distribution determination. In the context of SMI expenditure, we recognise that the incentives for efficiency would be lower under Option 11 (because any efficiency gains will only be retained to the end of the regulatory period, rather than also beyond), than if they were carried over in the distribution determination. we consider that the additional complexity of 'carrying over' any efficiency gains, combined with the potential uncertainty in relation to the quantum of roll-out expenditure, means that providing a lower-powered incentive under a mid-period mechanism is an appropriate trade-off.

In terms of the timeframes required under Option 11:

- the AER is required to develop a 'framework and approach' for the mid-period review covering, for example, how differences in the timing of expenditures are to be taken into account;[21]
- the DNSP needs time following the Ministerial roll-out determination to develop its expenditure forecasts; and
- following the submission of the DNSP's forecasts, the AER needs sufficient time to review the forecasts. The AER has suggested that it would need at least the eight month period it was allowed in Victoria in order to undertake such a review.[22]

Accommodating the above timing requirements means that where a Ministerial roll-out determination is made at or shortly following the MCE June 2012 target date, requiring expenditure prior to the start of the next period, the regulatory processes required to enable cost recovery of this expenditure under Option 11 will overlap with the activities required for the next distribution determination. This is particularly the case for NSW and the ACT, but there will also be a degree of over-lap for Queensland and South Australia. Such an approach will therefore increase overall regulatory costs. Estimates of the cost of the distribution determination process for a single DNSP are in the region of $3m.[23]

6.2.3. Option 12: Separate determination for smart meter expenditure

Option 12 applies a separate regulatory determination to smart metering services, timed according to the requirements of the Ministerial roll-out determination (and therefore differently to the timing of the distribution determination for other DUOS services).

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[21] We note that in relation to the timing of expenditure, an M-factor (option 1) would become more complex to apply via a mid-period mechanism.

[22] AER, Submission to the Draft Statement of Approach, 2 February 2010.

[23] EnergyAustralia, Regulatory Proposal, June 2008, p. 133.

Implicit in this option is the unbundling of smart metering services from other DUOS services. Ideally, the unbundling of existing metering services would be coordinated with the smart meter roll-out. However, it would be impractical to unbundle existing metering services within a regulatory period, and it is also inconsistent with the current Rules. As a result, the effectiveness of this option as a mid-period mechanism is reduced, since operational efficiencies relating to the DNSP's wider activities and even its existing metering activities will not be able to be directly taken into account. As in the case of Option 11, an adjustment could potentially be made to the direct expenditure associated with a roll-out in order to take into account these efficiencies, where they can be easily identified.

In terms of the timeframes required, Option 12 raises similar issues to Option 11. Separating out smart metering services will not avoid the need for the AER to develop a 'framework and approach'; for the DNSP to develop its expenditure forecasts; and for the AER to have sufficient time to review the expenditure forecasts. As for Option 11, accommodating the above timing needs means that where a roll-out determination is made at or shortly following the MCE June 2012 target date, requiring expenditure prior to the start of the next period, the regulatory processes required to enable cost recovery of this expenditure prior to the next period (even via a separate price control) will overlap with the activities required for the next distribution determination, thereby increasing overall regulatory costs.

6.2.4. Option 13a: No mid-period adjustment; expenditure considered in next distribution determination

Given the timeframes associated with the MCE decision-making process and the next distribution determinations, a fourth option is to defer the recovery of roll-out expenditures made during the current regulatory period to the next regulatory period.

Under this approach there is no adjustment to revenues during the current regulatory period. At the time of the next distribution determination an *ex post* review of the expenditure incurred is undertaken and an adjustment is made to future allowed revenues to take into account of the time value of money associated with this expenditure.

An advantage of this option is that it allows the AER to consider roll-out expenditure at the same time as all other expenditure, and so does not require expenditure to be identified as relating solely to a smart meter roll-out. Since it does not require a parallel process to be undertaken, it will have lower regulatory costs than the other options.

However, as this approach includes an *ex post* review of some expenditures, it will increase the regulatory risk faced by DNSPs. In order to at least partially address this risk there will be a need to set out in the Rules the principles relating to the factors that the AER is required to have regard to in undertaking its *ex post* review. As noted above in the discussion of Option 8 in section 5, Schedule 6.2.2 in the current Rules contains some principles in relation to the *ex-post* review of expenditure. These include requiring the AER to have regard to:

- the need to provide a reasonable opportunity for the relevant DNSP to recover the efficient costs of complying with all applicable regulatory obligations or requirements associated with the provision of standard control services;

- the need to provide effective incentives to the DNSP to promote economic efficiency in the provision of standard control services;

- whether the DNSP undertook the expenditure in a manner consistent with good business practice and so as to practicable achieve the lowest sustainable cost of delivering the standard control services to be provided as a consequence of that capital expenditure;

- the desirability of minimising investment uncertainty for the DNSP; and

- the need to provide incentives to the provider to avoid undertaking inefficient capital expenditure.

In addition the Rules would need to incorporate a 'no hind-sight' principle, similar to that included in Schedule 6.2.2:

- in determining the prudency and efficiency of expenditure the AER must only take into account information and analysis that the provider could reasonably be expected to have considered or undertaken at the time that it undertook the relevant capital expenditure.

The effectiveness of this option in providing incentives for efficiency while also addressing the risks perceived by the DNSP in relation to cost recovery will depend critically on the principles applied and the method followed in undertaking the *ex post* review. If the AER's *ex post* review includes consideration of off-setting operational benefits, this may undermine the DNSP's incentive to achieve such benefits, as it may result in a 'clawing back' of gains made during the regulatory period. The risks perceived by businesses in relation to an *ex post* review under this option may be greater than where an *ex post* review is applied subsequent to a full distribution determination (as in Option 8, described in section 5.2.8), since there is no AER approval of an *ex ante* expenditure forecast. There would therefore be little prior indication for the DNSP of what the AER may consider to be efficient expenditure at the time of its later *ex post* review. However we note that the DNSP would have the right of appeal of an ex post assessment to the National Electricity Tribunal, as it would form part of the AER's regulatory determination.

One potential concern with Option 13a is whether this approach would expose the DNSP to significant cash flow risk during the time it is required to fund the unrecovered expenditures. We consider that cash flow implications are not likely to be substantial, given that SMI expenditure is likely to form only a small proportion of expenditure compared with DNSPs' annual DUOS revenues (as indicated in Table 3.3). Nevertheless this is an important factor to consider. In addition, by deferring any revenue recovery until the following regulatory period, this may have implications for tariff smoothing between periods.

6.2.5. Option 13b: 'Stop-gap' mid-period adjustment; expenditure considered in next distribution determination

The second variant of Option 13 would operates as above, except that the AER would be allowed to make a 'stop-gap' mid period revenue adjustment. As part of the later *ex post* review process, the additional revenue allowed under this stop-gap approach would be compared with actual expenditure, and an adjustment made as part of the subsequent distribution determination (which would take into account the time value of money).

The ability for the AER to make a revenue adjustment mid-period addresses the potential concerns noted above with Option 13a, in that it may impose an unacceptable cash flow risk and may result in substantive tariff increases at the time of the next regulatory review.

A 'stop-gap' adjustment to revenues within the current regulatory period could be based on external benchmarks, such as the costs and benefits underpinning the Ministerial roll-out determination. Alternatively it could be based on DNSP's own forecasts (similar to Option 10).[24] Under either approach, the time required by the AER to approve the mid-period revenue adjustment will be short, since the AER's review role at the time at which the DNSP lodges its mid-period application is limited.

6.3. Evaluation and Preferred Approach

6.3.1. Evaluation of options

The 'Stop gap' option 10 has the advantage of low cost and relative ease of implementation, but the disadvantage of poor incentive properties and risk allocation. It lacks transparency and results in the inconsistent treatment of SMI expenditure compared to other types of expenditure.

As a full mid-period review, Option 11, scores well on robustness, transparency, consistency and, to a lesser extent, efficiency and risk allocation, but is costly and, due to its timing requirements, largely impractical. Option 12 has the same strengths and weaknesses. The timing requirements mean that both options would run up against the next round of distribution determinations, and largely defeat their purpose of providing a mid-period solution.

Option 13a is low cost and easily implemented. However it may expose the DNSPs to regulatory risk associated with the ex post review of expenditure. It may expose the DNSP to additional cash flow risk, which could be addressed by adopting Option 13b as a variant.

Table A6.1 sets out our evaluation of each of the above five options for a mid-period recovery mechanism against the criteria adopted for this review.

[24] The difference between this option and Option 10 is that an ex post review of expenditure compared to this forecast would be undertaken as part of the next distribution determination.

Table 6.1
Assessment of Options for Mid-Period Cost Recovery

	Option 10: **'Stop-Gap' – full cost recovery**	**Option 11:** **Mid-period revenue adjustment**	**Option 12:** **Separate metering price control**	**Option 13a:** **No mid-period mechanism; *ex post* review**	**Option 13b:** **'Stop-Gap' revenue adjustment – *ex post* review**
Promotion of efficiency	No efficiency incentives	Yes, although weaker than under distribution determination	Yes	Incentives weakened by regulatory risk	Incentives weakened by regulatory risk
Appropriate allocation of risk	No, customer bears most risk	Yes	Yes	Increased regulatory risk	Increased regulatory risk
Support realisation of potential benefits	No, weaker incentives	Yes, operational efficiencies explicitly considered	No, where operational efficiencies not part of separate control	No, weaker incentives	No, weaker incentives
Promotion of transparency	No	Yes, similar transparency to distribution determination	Yes, similar transparency to distribution determination	Depends on conduct of ex post review	Depends on conduct of ex post review
Robust to range of outcomes and proportionate	Robust, but not proportionate	Robust but not proportionate. Significantly higher regulatory costs	Robust but not proportionate. Significantly higher regulatory costs	Yes	Yes
Consistency with other expenditure	No	Yes, same approach taken.	Yes	No, *ex post* limited to SMI	No, *ex post* limited to SMI

6.3.2. Summary and Preferred Approach

We noted above that the 'first best' option to address the 'timing mismatch' issue is to ensure that the roll-out timeframes set out in a Ministerial Determination require expenditure only from the start of the next regulatory period. This will enable the roll-out expenditure to be recovered under the same distribution determination process applied to all other types of DNSP expenditure, with the following advantages:

- the distribution determination process is comprehensive, and allows SMI expenditure to be assessed at the same time as all other expenditure; this is important where it is difficult to separate out SMI expenditure from other expenditure necessary to meet DNSPs' obligations (e.g., IT systems);
- it allows the AER a relatively long timeframe (13 months) to assess the SMI expenditure;
- it has lower regulatory costs, since the roll-out cost recovery does not require a separate regulatory process;
- it removes any potential 'gaming' incentives to cherry-pick between different cost recovery mechanisms, which may result in pressure on Ministers in relation to the timing included in any roll-out Determination;
- it provides a single process applying in all jurisdictions (with the exception of Victoria); and
- it would enable the AER to also consider the wider issue of appropriate service classification.

We have considered the timeframes set out for the MCE process for making roll-out determinations and the activities needing to be undertaken prior to the next distribution determination in NSW, ACT, South Australia and Queensland. It appears that these timeframes could co-ordinate relatively easily, to allow roll-out expenditure to fall within the distribution determination process.

We have considered alternative mid-period mechanisms in the event that a Ministerial roll-out determination requires expenditure prior to the start of the next regulatory control period. None of these mechanisms are without substantive disadvantages. In particular, in order to accommodate a comprehensive assessment of smart meter expenditure it would be necessary to duplicate many of the activities that will need to be undertaken in any event as part of the next distribution determination process. We consider that this outcome would be inefficient and would also impose unnecessary regulatory costs and stretch the resources of the AER.

As a consequence, of the options considered above, we consider that Option 13a is the preferred approach, in the event that the timing of a ministerial determination requires expenditure prior to the start of the next regulatory determination. This option avoids the duplication of regulatory processes, and therefore avoids additional regulatory costs. The Commission notes that Option 13s incorporates an *ex post* review element, which may have undesirable incentive properties and which we consider would not be an appropriate approach to be applied to roll-out expenditure as part of the distribution determination process. However, in the case of a mid-period mechanism, there is likely to be insufficient time for the AER to undertake a full review (i.e., to implement Option 11) and doing so would impose significant additional regulatory costs.

7. Smart Meter Cost Recovery - Summary and Conclusions

The primary mechanism for cost recovery under the Chapter 6 Rules is the periodic five year distribution determination. Once a determination is in place, the pass through of additional costs is allowed provided they meet specified criteria.

A distribution determination allows all of a DNSPs costs to be assessed at the same time and on a consistent basis. By encompassing the full scope of the DNSP's operations, the effect of inter-relationships, scale and scope on cost outcomes can be addressed. This is of particular importance to the assessment of smart meter costs and benefits, which have significant linkages across other DNSP activities that are not easily isolated.

The timing of a mandated smart meter roll-out, which is a decision of the jurisdictional Minister, will determine whether the associated costs are recovered through the distribution determination process, or whether a mid-period cost pass through will also be required. Both mechanisms have shortcomings:

- given the incentive properties in the current regulatory regime, uncertainty regarding future costs and benefits may lead to a high conservative revenue allowance and an increased risk that DNSPs will earn windfall gains over the five years; and
- the current cost pass-through provisions are not adequate when applied to expenditure of the complexity of a smart meter roll-out.

The distribution determination is a far superior mechanism, compared with mid-period alternatives, all of which have significant problems. The Commission considers that the coordination of a roll-out with a distribution determination is highly desirable. It also appears feasible, given that the timing of the next distribution reviews in both NSW/ACT and Qld/SA fits well with the roll-out decision-making process set out by the MCE. If it seems unavoidable that some level of expenditure associated with the roll-out will be incurred prior to the next regulatory period, we recommend the use of a minimalist mid-period mechanism (i.e., Option 13a of 13b) that allows for an *ex post* review to be included within the next distribution determination.

Of the uncertainty associated with roll-out costs and benefits, we note that a significant proportion is essentially 'policy dependent' rather than inherent to smart meters. The Commission encourages jurisdictional Ministers and the MCE to take all reasonable steps to minimise uncertainty of this type.

However, it is likely that a degree of uncertainty will remain and potentially reduce the effectiveness of the distribution determination process in recovering efficient smart meter roll-out costs. Our analysis is that the problem is largely caused by an imbalance in the incentives faced by the DNSP in relation to smart meter timing and expenditures. A proportionate and cost effective remedy is to 'de-power' the incentives faced by the DNSP in relation to SMI expenditure. This is our preferred approach, which, could be reflected in the Rules, or, alternatively, for the expenditure incentives (i.e., Options 3 and 4), left as a matter for the AER to determine, given that it has this discretion under the Rules as they stand.

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