

Barriers to Energy Efficient Street Lighting

Equipment Energy
Efficiency Committee

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1 Executive Summary

PwC has been asked by the South Australian Department for Transport, Energy and Infrastructure to provide advice on regulatory barriers to improved energy efficiency of street lights. We have also been asked to provide advice on possible mechanisms to overcome any barriers that are identified.

Whether the regulatory framework provides city councils with a financial incentive to upgrade to energy efficient street lighting turns on two questions, which are:

- Would councils expect to receive a benefit equal to the reduction in network and energy costs that is caused by the reduction in energy use?
- Would the additional charges that city councils would bear from upgrading to energy efficient street lighting reflect the economic costs caused by that decision?

If the benefits and costs to city councils from upgrading to energy efficient street lighting correspond to the true benefits and costs caused, then councils would have an incentive to upgrade where it is efficient to do so.

We have found that, on the whole, the regulatory framework should encourage councils to upgrade where it is efficient to do so. While the approach to network pricing differs across jurisdictions, and there is some concern about whether charges are set efficiently, the framework for setting network prices in the Rules is sufficiently robust for efficient prices to be set. The framework provides pricing principles, and incentives, for distributors to set prices so they reflect costs. To the extent there are any concerns about the efficiency of these tariffs this can be addressed through the Australian Energy Regulator's (AER) annual pricing approval process.

Councils would be expected to be exposed to the incremental cost of an upgrade to street lights. Where the provision of new street lights is contestable the pressure provided by competition should allow efficient costs to be signalled to councils. If the AER is required to make a determination on the costs of street lighting assets the framework is appropriately focused towards ensuring that councils are charged only the efficient costs of provision, and that the charges to councils signal the incremental cost caused by the retrofitting of streetlights.

We note in this regard that the AER has permitted distributors to recover the unrecovered cost of the existing streetlights after the retrofitting has occurred, with the result that councils would pay for the old and new lights for a period (decisions on the recovery of residual costs have been made in Victoria and New South Wales). However, while this may appear to be a barrier to the uptake of energy efficient street lighting, this charging scheme is in fact required to ensure that councils are exposed to the full incremental cost of the upgrade.

However, we consider there are factors which could improve the ability for councils to make this decision. One of the features of the AER's decisions on the residual costs associated with existing street lighting assets is that councils would bear the full cost of upgrading their streetlights upfront in return for a flow of benefits over time. If councils were to face financing constraints, efficient options may not be undertaken even when the total benefits (received over time) exceed the upfront costs.

Accordingly, we consider there may be benefits in aligning the recovery of these costs with the benefits that can be achieved through energy efficient street lights. This can be achieved by allowing for the recovery of residual costs over the life of new installed assets. However, the option of different timing for the recovery of residual costs should be permitted for those councils which are able to pay residual costs upfront or within a shorter timeframe.

Options to mandate a roll out

We were asked to specifically consider two options to mandate a roll out of energy efficient street lights, either:

- Through a National Electricity Rule (Rule) change proposal submitted to the Australian Energy Market Commission (AEMC), or
- By amending relevant legislation.

With respect to the AEMC Rule change process we make the following observations:

- A rule obligation could only be placed on distributors as councils are not subject to Rule obligations
- The costs of a mandate would need to fall on councils, and not the broader customer base given the costs and prices for street lighting are controlled separately to the costs and prices for other network services
- Given an economic test in the form of the National Electricity Objective (NEO) applies to AEMC assessments of Rule changes the benefits of a mandate would need to exceed the costs before the AEMC could make a Rule. In addition, given the NEO is focused on those who consume, produce and transport electricity, it does not facilitate the consideration of broader benefits such as environmental benefits unless these fall upon the market participants (for example, under a carbon tax or cap and trade system). It would be expected that a detailed cost-benefit analysis would be required to demonstrate that this condition is met.
- In addition to being technically able to be approved as a rule, the AEMC would want to be convinced that mandating the retrofitting of energy efficient street lights is the best mechanism for meeting the NEO. In our view, given previous assessments by the AEMCF under the NEO it may have the view that councils are best placed to make a decision about the merits of a roll out of energy efficient street lights if the financial incentives are appropriate, and so convincing the AEMC otherwise would need a compelling case.

With respect to a legislative approach, if a mandate was to be pursued, this would have a number of benefits over seeking to impose an obligation through the Rules. As implied above, there is no certainty that the AEMC would approve such a Rule change, and pursuing a separate legislative obligation would provide the ability to consider broader costs and benefits in decision making. However, we note that irrespective of how the obligation is placed on distributors, the costs of the upgrade would fall on councils and the charging rules the AER has approved to date (which include the recovery of the residual costs of the current streetlight) would not be changed. We note that depending on how street lighting charges are regulated across jurisdictions, to the extent that a retrofit did not align with a revenue determination, there may be some concerns with ensuring cost recovery for distributors.

2 Background and scope

The purpose of this chapter is to provide some relevant background to the issues that are the focus of this report. It describes the scope of work we have been asked to undertake, some discussion of why it is relevant to improve the energy efficiency of street lights, and how street lights are currently regulated in Australia.

Scope of assignment

South Australia (SA) has been assigned policy leadership for measure 4.1.4 of the National Strategy on Energy Efficiency (NSEE). Measure 4.1.4 relates to the barriers and opportunities for energy efficient street lighting technologies and operational practices. This includes the consideration of both mandatory requirements as well as incentives for distribution businesses.

As indicated in the Request for Quotation (RFQ), an opportunity exists for a 'step change' improvement in street lighting energy efficiency. This step change can be achieved through the accelerated phasing out of inefficient product classes across existing public lighting networks in Australia. On that basis, you have asked PwC to provide advice on any National Electricity Market (NEM) (and Western Australian, South West Interconnected System (SWIS)) regulatory barriers to improved energy efficiency of street lights. You are also seeking advice on possible mechanisms to overcome any barriers that are identified.

More specifically, you have asked PwC to provide advice on in the following areas:

- The interaction between the NEM and SWIS framework and street lighting
- Cost recovery issues associated with new and existing street lights
- Incentives and barriers in the economic regulation framework to energy efficient street lighting, and
- Framework measures to improve street lighting energy efficiency.

Benefits of Energy Efficiency

The NSEE and initiatives such as improving the energy efficiency of street lights can deliver broad economic and environmental benefits. The benefits of promoting energy efficiency can include:

- Economic benefits – The economic benefits of energy efficiency are two-fold. In the first instance, customers that improve energy efficiency will have lower energy bills. Secondly, lower energy use at peak times will lead to a reduced need for energy infrastructure to be built to meet that peak demand. This then lowers the overall cost of supplying energy, which can improve the spending capacity of households and the competitiveness of commercial businesses.
- Environmental benefits – The stationary energy sector is one of the largest emitters of carbon in the economy. Efforts to improve energy efficiency can have a flow on effect on the amount of carbon that generators emit.
- Increases in energy security – customers place a high value on having access to a secure and reliable energy supply. Increasing demand can put a strain on energy security at the natural resources level or at the energy infrastructure level. Energy efficiency can, by reducing demand, play a role in increasing the security and stability of energy supply.
- Incentivise energy efficiency research and development – As more and more consumers and producers seek energy efficient outcomes, their demand will incentivise research and development into energy efficient products and

services. This can not only reduce the cost of energy efficient measures, but may make them more effective or easier to implement.

Regulatory Framework for Street Lighting

The ownership of street lighting assets, and the approach to their regulation differs between jurisdictions.

Street lighting assets can either be owned by the customer, a distributor, or some other third party. The ownership of the street lighting assets will influence the approach to their regulation. There are a number of approaches that can be applied for the regulation of street lighting services. The approach taken will depend primarily on the likelihood of the service provider taking advantage of any market power they may hold. Where there is a considerable scope to take advantage of market power the form of regulation will tend to be more intrusive. However, where there is the prospect of effective competition the need for regulation is significantly reduced, to the extent that regulation may be removed entirely in some instances.

The Australian Energy Regulator (AER) makes the decision on the form of regulation that will apply to street lighting services in the NEM. When deciding on the form of regulation that applies to street lighting, the AER is to have regard to the form of regulation factors in the NEL. The form of regulation factors direct the AER to consider the extent of barriers to entry, network externalities, countervailing market power, the presence of substitutes and the extent of information available to facilitate effective negotiation.¹ Taking these factors into consideration the AER has a number of options for the form of regulation, these include:

- Regulating street lighting services in combination with all other monopoly services provided by distributors. This approach will be taken if there is a view that there will be no, or very limited scope, for contestability in providing services (Standard Control Services)
- Regulating street lighting services separately from other monopoly services so that its arrangements are ring-fenced from other services and prices. When this approach is taken additional transparency is afforded to the service such that there is scope for it to eventually be provided through a contestable market (Alternative Control Services)
- Applying a negotiating framework to negotiations between parties. This is a relatively lighter handed form of regulation. This approach leaves it to the distributor and customer to agree to prices and terms and conditions in the first instance. Only when parties cannot reach agreement does the regulator get involved (Negotiated Services), and
- No regulation may be applied where it is deemed that an effective competitive market already exists for the provision of street lighting services. In this instance it is considered that the pressure applied by competition will ensure efficient outcomes are achieved (Non-Regulated Services)

The table below outlines the different ownership and regulatory approaches by jurisdiction.

¹ Clause 2F of the National Electricity Law.

Table 1: Jurisdictional Street Lighting Regulatory Arrangements

State	Service provision		Form of regulation		
	Contestable	Not contestable	Alternative control services	Negotiated services	Unregulated
ACT		✓			✓ • Maintenance
NSW	✓ New public lighting works that are fully funded by the customer	✓ Distributors own the majority of public lighting assets and are responsible for the maintenance and capital works	• Construction • Maintenance		
NT		✓			
Qld	✓ ²		• Provision • Construction • Maintenance		
SA	✓ ³			• Provision • Operation • Maintenance • Energy only	
Tas		✓ Aurora operates and maintains the public lighting system Aurora provides the majority of public lighting services for new housing developments	• Provision • Repair • Replacement ⁴ • Maintenance	• New public lighting technologies	
Vic	✓ ⁵		• Operation • Maintenance • Repair • Replacement	• Alteration & relocation of distributor's public lighting assets • New public lighting assets ⁶	

² Options for customers to arrange street lighting:

- The distributor to provide, install and maintain the street lights
- A party other than the distributor provides and installs the street light, but the assets are then handed over to the distributor
- A party other than the distributor provides, installs and maintains the street lights

³ Options for customers to arrange street lighting:

- Street lighting use of system service - ETSA owns, operates and maintains public lighting assets
- Customer lighting equipment rate services - Customers retain ownership of their assets and are responsible for maintenance aside from lamp replacement
- Energy only services- Customers retain ownership of the assets and are responsible for maintenance, including lamp replacement. ETSA maintains a database relating to street lights and recording and informing customers of street light faults reported to ETSA utilities

⁴ Public services (except new public lighting technology services) are subject to change to alternative control services in the next regulatory period (Commencing 1 July 2012) according to the AER's Framework and Approach Paper. New public lighting technology services will likely be classified as negotiated distribution services

⁵ New public lighting assets are generally built by third parties and then vested to Victorian distributors to operate, maintain, repair and replace these assets under the Public Lighting Code otherwise the service responsibilities remain with the third party

⁶ New public lighting assets that didn't exist at the time of the distributor's regulatory proposal or the AER's final determination

WA	✓ New public lighting assets	✓ Western Power owns the majority of public lighting assets and is responsible for the maintenance and capital works.			
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As indicated in the table above, no street lighting services are regulated as a standard control service. This means that in all instances they are separated from the standard monopoly services provided by distributors. There are a number of reasons for separating the regulation of street lighting, including:

- There is scope for contestability of street lighting services to limit market power, as demonstrated by the non-exclusive provision in states such as Queensland. Where street lighting services are contestable it is expected that competitive pressures will encourage potential providers to make offers to councils that reflect the costs of provision. Where this occurs there are no additional benefits that can be obtained from regulation, so oversight by a regulator is unnecessary.
- Street lighting customers, in the form of councils, can be easily identified and separated from the general customer base. This means it is simple to allocate costs to particular parties and avoids the need to spread costs across other parties.
- Street lighting customers are generally well resourced parties that are familiar with negotiating large contracts. This can act as a counterbalance to any perceived market power that a distributor may have with respect to street lighting provision.

Given street lights services are regulated separately to general network services it also means that costs are specifically allocated to these services and specific prices are charged to street lighting customers to reflect these costs. There are important reasons for this approach. First, it ensures that those who are able to influence the costs incurred pay for those costs. For instance, councils determine how many street lights are in their area, when they operate, and the technology they use (i.e. the decision on whether energy efficient bulbs are used). Given it is councils that influence the size of the costs incurred for street lighting it is appropriate that they are allocated these costs. Second, it avoids cross-subsidies. If cross-subsidies existed it would mean that street lighting customers would not receive a signal about the true cost of their decisions. Where cross-subsidies exist, street lighting customers may seek to install more or less street lights than would otherwise be efficient. Further discussion on the efficient allocation of costs is provided in the next chapter.

The Rules framework includes provisions to ensure costs are allocated appropriately and that cross-subsidies do not exist. For instance, the cost allocation principles in the Rules require that costs must be directly attributable to the provision of those services to which they are allocated.⁸ In addition, where the service is determined to be a negotiated distribution service the Rules require that the price for the service should be based on the costs incurred in providing that service, in accordance with the cost allocation method.

⁷ Options for customers to arrange street lighting:
- Customer owned and operated
- Customer designed and constructed
- Western Power designed and constructed

⁸ Clause 6.15.2(3)(i) of the Rules.

3 Framework for Efficient Decision Making on Energy Efficient Street Lighting

Before making a decision about whether to change technologies to achieve energy efficiency it is necessary to accurately assess the net benefits of doing so. That is, is sufficient reward provided for undertaking energy efficiency given the costs incurred? Whether the regulatory framework provides city councils with a financial incentive to upgrade to energy efficient street lighting turns on two questions, which are:

- Would councils expect to receive a benefit equal to the reduction in network and energy costs that is caused by the reduction in energy use?
- Would the additional charges that city councils bear from upgrading to energy efficient street lighting reflect the economic costs caused by that decision?

Capacity to obtain benefits

The benefits from energy efficiency result from reducing total energy consumption and therefore avoiding, or reducing, some of the costs associated with purchasing electricity. There are two potential areas where savings can be made in this respect for electricity:

- Savings on the cost of purchasing electricity generated in the wholesale market, and
- Savings on the costs of transporting electricity to the load through network infrastructure.

The way charges are set for these aspects will impact on the extent that street lighting customers have the incentive to undertake energy efficiency options and also the extent that the resultant energy efficiency will be beneficial to society. For both wholesale and network aspects, an efficient price should reflect the efficient costs of providing the service. When this occurs, the benefits, or savings, to private consumers will be the same as the benefits to society. That is, the decision maker will be able to obtain the full social benefit associated with their decision. This is because a reduction in price will also reflect a reduction in costs. From the perspective of overall efficiency, this is the correct outcome.

Efficient cost signals

While it is important that customers are able to achieve benefits associated with energy efficiency, it is equally important that they receive an efficient signal about the costs associated with undertaking energy efficiency options.

In many instances, the costs associated with energy efficiency solutions are low. This is because actions may simply include turning an electricity consuming device off more frequently, or for longer periods than previously. However, in other instances, some costs are incurred to achieve energy efficiency. This is particularly the case where old technology is replaced with more energy efficient technology.

For costs of energy efficiency to be properly signalled to customers, it is the costs associated with installing new equipment, and any relevant administration costs, that need to be factored into decision making. This is because, when making decisions, it is the incremental costs of a decision that matter. That is, absent new energy efficient technology, a business will simply continue incurring business as usual costs. Therefore, a decision maker will want to

identify how costs will change from business as usual if they undertake certain energy efficiency initiatives.

With respect to the consideration of which costs should influence decision making it is worth noting that often electricity involves significant sunk assets (that is, it is infeasible to remove those assets to an alternative use). Given the size of the investments required the costs of these sunk assets tend to be recovered over an extended period time. Typically, sunk costs should be ignored in decision making. This is because behaviours and actions taken today or in the future cannot affect these decisions that have already been made. However, this does not mean that should a new technology or investment be undertaken that the recovery of sunk costs should be totally ignored.

There are two reasons why sunk costs should not be completely ignored. In the first instance, if these costs are not paid customers would not face the actual incremental costs of their decision. That is, absent new energy efficient investments there would be an ongoing need to recover sunk costs. Therefore, the extent that sunk costs are not recovered would represent a subsidy to the customer as they would no longer continue to pay for costs they have incurred. It is equally important, however, that any payments for residual costs are not higher than the amounts that would be paid had the status quo continued. This is because this would represent a windfall gain to the network business and the signal to customers would be above efficient incremental costs.

The second reason that it is important that sunk costs be recovered is because a regulator's decision over sunk assets would be expected to colour expectations about how future regulatory judgements would be exercised. That is, if a regulator disallowed the recovery of residual (sunk) costs simply because a more efficient technology was available that decision has the potential to dissuade otherwise efficient future investment. This is because businesses would be concerned that they would also be unable to recover the costs of future investment.

4 Assessment of Regulatory Barriers to Energy Efficient Street Lighting Decision Making

The objective of this chapter is to identify whether the regulatory framework provides the correct incentives for councils to make efficient decisions about the introduction of energy efficient street lights.

There are three charges that will affect the uptake of energy efficient street lights, namely:

- The mechanism by which councils pay for the energy consumed by street lights
- The charging regime for the use of the network, and
- The charging regime for the street light assets.

Capture of benefits

As noted in the previous chapter, there are two areas where councils can make savings from energy efficient street lights, these are wholesale energy costs and network use costs. The form and structure of the prices for these aspects will influence the extent that councils benefit from reducing energy consumption from implementing energy efficiency options.

It is important to note at the outset that it is generally not possible to set a truly accurate price for street lights. This is because energy use from the majority of street lights is not metered. Absent a meter it is not possible to provide a direct link between actual consumption and prices. Therefore, alternative mechanisms are needed to approximate the energy use from unmetered loads such as street lights.

The methodology for the calculation of energy volumes for unmetered supplies is set out in the NEM Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons⁹, Registered Participants and other relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated.

Wholesale energy

Street lighting customers, through an energy retailer, pay for electricity that is purchased from the wholesale market.

⁹ Clause 7.2.1(a) of the Rules defines the responsible person as the person responsible for in accordance with Chapter 7, the metrology procedure and procedures authorised under the Rules, the provision, installation and maintenance of a metering installation, and the collection of metering data from each metering installation for which it is responsible, the processing of that data and the delivery of processed data to the metering database and to parties entitled to that data under rule 7.7(a), except as otherwise specified in clause 7.2.1A(a).

In the NEM wholesale prices are set in a spot market every five minutes to achieve an average price for settlement every 30 minutes. This price is based on generator's offers of how much electricity they are willing to supply to the market at a given price. The price in the wholesale pool, once all offers are made, is intended to reflect the short-run marginal cost of meeting total energy demand for a particular 30 minute interval. Electricity retailers tend to contract with generators for wholesale electricity in order to avoid the potential volatility of being exposed to the 30 minute price of wholesale electricity.

The efficiency of wholesale electricity prices to end-use customers will depend on the extent that the price they face reflects the price paid for electricity in the wholesale market. The most efficient price signal for customers would be for retailers to directly pass through the 30 minute spot price to customers. However, this signal will only be effective where customers are aware of the actual price at a particular point in time.

In reality, it is very rare for customers to be exposed to the wholesale spot price. However, even without this sharp signal from the wholesale market customers can still be provided with signals for efficient electricity use. This can be achieved by structuring tariffs so that they change depending on the expected total system demand at a particular time of the day or the year. Given the costs of supplying electricity are highest at peak times, if prices can seek to mirror these peak times as much as possible customers can be provided with better signals for efficient electricity use.

The prices that councils pay for wholesale electricity through retailers is not regulated. This is because the total consumption is above the threshold for regulated tariffs (160Mwh). This means that councils negotiate with retailers about the form of prices and the applicable rate. Given this, it is incumbent upon councils to agree to a tariff that allows them to benefit from energy efficient decision they may make. As a consequence, the regulatory framework does not provide a barrier to councils obtaining an efficient price for the energy associated with street lights.

However, it is worth noting that it is not only the rate that will determine whether retailers are able to benefit from energy efficiency. As noted above, the consumption associated with different street lighting options is determined via a load table. Therefore, should councils move towards more efficient street lights the extent they benefit can be influenced by the responsiveness of distributors to update inventory tables so that councils are only charged for lamps they are using. In Victoria, the Public Lighting Code requires distributors to use their best endeavours to ensure the accuracy of inventory tables.¹⁰ While we are not aware of similar requirements relating to the updating of inventory tables in other jurisdictions, we note that it appears that councils are able to access their relevant inventory tables at any time in order to confirm their accuracy. We consider that the ability for councils to confirm the accuracy of inventory tables should ensure that where a retrofit occurs the tables are updated accordingly.

Network use signals

Street lighting customers pay charges for the use of the network. That is, the transportation of electricity from generators to the load.

While an efficient wholesale electricity price will reflect the short-run marginal costs of supply, the form of marginal cost pricing that is typically preferred for network infrastructure is the long-run marginal cost of supply. This is because these prices encourage efficient long term consumption decisions (such as where to locate and production or appliance choices). These long term consumption

¹⁰ Section 2.1 of the Victorian Public Lighting Code

decisions are considered more important with respect to network costs given the need for sufficient network infrastructure needs to be constructed in advance to ensure peak demand can be met. Therefore, when setting prices it is the cost of augmenting the network to meet peak demand that is often signalled to customers.

In the majority of circumstances we understand the size of the charge for an unmetered connection point is determined by an algorithm that takes into account the number of lights, the light bulb wattage, and the consumption load. Street lights are fitted with photovoltaic cells that allow them to turn on at a predetermined level of natural light. As a consequence, there are seasonal variations in consumption given days are shorter in winter compared to summer. We understand that this variation in consumption is taken into account for the purposes of determining the amount of electricity use for street lights.

The process and framework for setting prices in the NEM is determined under Chapter 6 of the Rules. The AER must approve a pricing proposal if it is satisfied that it complies with the Rules. The Rules, in this respect, include a number of pricing principles.¹¹ The effect of the pricing principles in the Rules is to guide the setting of prices so that:

- Prices generate revenue that sits between the upper and lower bound of costs,
- Prices reflect long-run marginal costs, and
- Any residual costs are recovered in the least distortionary manner.

In addition to these pricing principles, distributors face a number of financial incentives that encourage them to set prices that reflect efficient costs. That is, under the regulatory framework, where prices are not linked properly to costs the network business may be exposed to a loss of profit.

Given the guidance for efficient price setting in the Rules, and the effect of financial incentives, we consider that the framework in the Rules for pricing does not provide a barrier and should be expected to encourage distributors to set efficient prices for network use.

Under the framework distributors can decide to charge street lighting customers fixed charges, variable charges, or a mixture of both. Fixed charges do not vary depending on the amount of energy used or the timing of consumption. Variable charges are influenced by levels of consumption. In this respect there are a number of options available to distributors, including:

- A flat charge that prices on the basis of total energy consumed.
- An inclining block charge that changes based on the amount of electricity consumed. For instance, as more electricity is consumed the relative price of electricity increases.
- Time of use charges that change on the basis of when electricity is consumed. These charges tend to seek to set higher prices at times of peak demand.
- Capacity charges that reflect the amount of network capacity required to meet a customers demand needs at peak times.

Of these options time of use tariffs and capacity charges, when set properly, tend to be considered the more efficient options from society's perspective. This is because these charges are typically better able to signal the cost of using electricity at peak times. However, given the certainty and predictability of the load from street lights it is possible to set a flat charge that reflects efficient

¹¹ The pricing principles are contained in clause 6.18.5 of the Rules.

costs. That is, an assessment can be made about the timing and level of consumption from street lights in advance, and a price set so that the impact this consumption has on costs is signalled to street lighting customers.

The table below identifies the form and structure of street lighting charges across distributors in Australia.

Table 2: Form and structure of distribution street lighting charges

Distributor	Form of charge	Form of variable charge			
		Flat rate	Inclining block	Time of use	
				Peak/Off-peak	Other
SP Ausnet	Variable		✓		
Powercor	Variable			✓	
CitiPower	Variable			✓	
Jemena	Variable			✓	
United Energy	Variable				Peak (Summer & Non-Summer) / Off peak
Aurora	Fixed				
AusGrid	Variable	✓			
Endeavour	Variable	✓			
Energex	Variable	✓			
Ergon	Fixed and variable	✓			
Essential Energy	Fixed and variable	✓			
	Variable				Peak/shoulder/Off-peak
ETSA	Variable	✓			
PAWA	Fixed and variable	✓			
Western Power	Fixed and variable	✓			

As is evident in the table, the majority of distributors charge only a variable charge for network use. In addition, in the majority of instances this charge is a simple flat rate. This means that the rate does not change depending on the time of day or the season.

Street lights typically turn on at dusk and operate through the night. In summer, when dusk occurs relatively late, demand for electricity is likely to be low when street lights are operating. When demand for electricity is low, the marginal costs associated with supply are very low. Alternatively, in winter, when it gets dark earlier, there is an increased likelihood that street lights will be operating at

times of peak demand. This is because people generally arrive home and switch on appliances such as a space heater at this time.

An efficient flat tariff for street lights would need to take into consideration the potential for them to operate during peak periods depending on the season. However, we note that with flat tariffs this may be difficult to achieve accurately do so there is a potential that prices may not properly reflect the costs of providing network services for street lights at different times of the day. Where prices do not accommodate changes in the interactions with peak demand it is possible that prices are too high at off-peak times and too low at peak times.

Charges based on time of use can be more transparent regarding their interaction with peak and off-peak times than peak tariffs. This is because different rates will be set depending on the time of day. Such transparency may assist in identifying whether a shift to energy efficient lighting is likely to be efficient.

We note that Aurora charges a demand based charge. This charge is set on the basis of each lamp. As a consequence, the more lamps a customer has the higher the total amount paid by the customer. As noted above, setting a charge in this way can enable customer charges to reflect the impact of their total maximum demand on the long-run marginal costs of supply. That is, more lamps imply greater maximum energy use, and hence a larger total amount paid. However, given the marginal costs of electricity are very low at off-peak times, additional lamps at this time are unlikely to have an influence on the long-run marginal costs of supply. Therefore, increased total charges for street lights based on the amount of lamps used should only be justified to the extent this influences peak demand and costs overall.

The demand charge set by Aurora's does not appear to be disaggregated by council or lamp type. As a consequence, the ability for individual councils to influence the size of the charge by choosing energy efficient lamps is limited. That is, it appears an energy efficient lamp would be charged the same rate as a standard lamp, even though the energy efficient lamp would cause a relative reduction in maximum demand. When faced with this charge there is no incentive for councils to undertake energy efficiency on the basis of network costs.

In conclusion, while we note that in practice the approach to network pricing for street lights differs across jurisdictions, this of itself does not imply inefficient outcomes. This is because there are a number of alternative approaches to pricing that are accommodated under the Rules. Instead, it is more important that the approach in each instance properly reflects the costs incurred through consumption. To the extent there are concerns in this area we consider this has to do with application of the framework rather than the framework itself. To that extent, there may be a role for the AER to provide more focus on the efficiency of individual charges when it undertakes its annual pricing approval process.

Avoided street lighting costs

A benefit may also be obtained by councils with respect to their street lighting service charges. When a retrofit is undertaken existing assets will be replaced early with new assets. These new assets are likely to have a longer life than the existing assets. That is, these new assets could be in service for a longer period than what the existing assets would have been. When this occurs distributors may avoid some costs associated with replacing the existing assets sometime in the future (noting that the new assets will also need to be replaced at some point, but at a later date). The extent this reduces costs for the distributor should be counted as a benefit from undertaking a retrofit and as a consequence should be passed onto street lighting customers.

We consider the benefits of avoided street lighting costs below as part of the discussion on the AER's decision on the roll out of energy efficient street lights in Victoria. In this instance the AER allowed for the recovery of these additional costs. However, it is not yet clear whether this would be the case in all circumstances.

Efficient cost signals

As identified in the previous chapter, it is the incremental costs that are relevant for efficient decision making. However, as was also indicated, to ensure that future efficient investment is not dissuaded, and that customers are not provided with a subsidy to the true incremental costs of investment, investors should also be able to recover the efficient costs of previous investments, even when those costs are sunk. Therefore, this section considers the efficiency of the incremental costs of undertaking a retrofit for energy efficient street lighting as well as the setting and recovery of any residual costs associated with existing assets.

New energy efficient street lights

The new energy efficient street lights, and associated installation costs, represent the incremental costs of seeking to improve the energy efficiency of street lighting. Where these costs are signalled properly to street lighting customers they will be well placed to make informed decisions about the costs and benefits of undertaking a retrofit of existing street lights.

The efficiency of charges for new energy efficient street lights will depend on the extent charges accurately reflect the costs incurred. We consider that the regulatory framework provides sufficient safeguards to ensure the costs associated with new energy efficient street lights reflect the efficient costs of their provision.

Where charges for new energy efficient street lights are regulated the AER will make an assessment about the efficiency of costs and the form and structure of prices. For standard network services the Rules set out a prudency test for the AER's assessment of efficient capital and operating expenditure.¹² The test requires the AER to consider expenditure against a set of objectives having regard to a number of evidentiary factors. While it is not an express requirement to do so, the AER have undertaken a similar level of assessment for street lighting costs. That is, the AER has been concerned to ensure that costs are efficient. It could generally be considered, therefore, that this framework and the approach taken by the AER is sufficiently robust to ensure that the prices for new energy efficient street lights are efficient.

In circumstances where new energy efficient street lights fall under the Rules based negotiating framework other disciplines will influence the efficiency of charges.¹³ In the first instance, distributors are required to undertake negotiations in accordance with an AER approved negotiating framework. This framework is focused towards ensuring costs and resulting prices are efficient. Should a customer remain concerned that prices are not efficient they have the option of referring a decision to the AER. When this occurs the AER will then undertake a detailed assessment of the efficient costs of providing the service. This is similar to a process that occurred in Victoria with respect to energy efficient street lights, which is discussed further below.

It is also relevant to note that the Rules require a distributor to provide all such commercial information a service applicant may reasonably require to enable it to engage in effective negotiation with the distributor.¹⁴ In addition, the distributor is also required to demonstrate that the charges for providing the

¹² Clause 6.5.7 of the Rules sets out the prudency test for capital expenditure.

¹³ Part D of Chapter 6 of the Rules sets out the arrangements for negotiated distribution services.

¹⁴ Clause 6.7.5(C)(2) of the Rules.

service reflect the costs.¹⁵ As a consequence, this should provide councils with confidence that they will be provided with sufficient information to undertake effective negotiation with distributors.

Given the robustness of the AER's assessment framework, and the protections available when more light handed forms of regulation are applied, we consider that the cost signals for new energy efficient street lights are likely to be efficient from the perspective of both councils and society as a whole.

Existing street lights

The costs associated with existing street lights may be considered as sunk by a regulator where it is infeasible to remove those assets to an alternative use. Therefore, from an economics perspective, these costs can be ignored when considering whether to undertake any future investments. However, councils should still pay charges for existing street lighting assets to reflect the residual value they have in the regulatory asset base (RAB). This residual value exists because distributors have sought to recover the costs associated with the investment in street lighting over an extended period of time.

As mentioned above, it is appropriate for distributors to be properly compensated for the costs they have incurred, even where costs are sunk. This means that councils should be required to compensate distributors for any residual costs even when they install new energy efficient street lights. It is also important that the recovery of residual costs mirrors existing charges. This is so that councils are not provided with a subsidy from incremental cost where they pay less than existing charges and so that distributors are not provided with a windfall gain should charges be more than existing charges. On this basis, we have considered whether the approach to determining the residual value of existing assets, and the approach to allocating these costs to customers should a retrofit occur is reasonable.

Value of existing street light assets

The value of existing street lights is determined by the RAB associated with the assets used to provide street lighting services. The AER has been required to consider the RAB associated with street light assets for various distributors due to changes made to the form of regulation. This has seen assets removed from the general RAB that is associated with the majority of distribution services to a specific RAB that relates only to street lighting assets.

The AER has relied upon actual costs to determine the RAB for street lighting assets. The RAB is then increased or decreased over time to reflect any new capital expenditure undertaken and to make an allowance for depreciation. This is referred to as rolling forward the asset base. The AER has applied the roll-forward model that applies to majority of distribution services provided to general customers in this respect. This approach is illustrated in the AER's draft decision with respect to the street lighting RAB for the Queensland distributors. With respect to Energex the AER stated:¹⁶

"The AER notes that Energex's proposed valuation of its street lighting assets was based on the existing asset valuations and has been adjusted for actual capex, depreciation and indexation, during the current regulatory control period.

¹⁵ Clause 6.7.5(C)(3)(ii) of the Rules.

¹⁶ AER, Draft Decision, Queensland distribution determination 2010-11 to 2014-15, 20 November 2009, p. 381.

In chapter 5 of this draft decision the AER reviewed Energex's proposed opening RAB adjustments and the cost inputs to the roll forward model (RFM) for the current regulatory control period and on the basis of its review the AER is satisfied that Energex's opening asset value for street lighting assets has been derived in accordance with the requirements of the RFM."

The approach undertaken by the AER to determine the RAB for street lighting assets reflects the standard approach undertaken in regulation. It is also consistent with the treatment of the RAB for other distribution services. Therefore, the value of the RAB for street lighting is likely to reflect the fair and reasonable value of existing street lighting assets.

Approach to charging for written down values

Given it is appropriate that councils are required to pay for the outstanding costs associated with existing street lighting assets, it is relevant to consider the whether the manner in which these values are determined and the approach to charging this cost to councils is appropriate or whether it would distort otherwise efficient decisions. This is relevant because councils should not pay any more or any less than they would have paid if they had of continued using the existing assets. Where charges for residual costs differ from what councils are paying now they would not pay the efficient incremental costs of a retrofit.

The AER has made a number of decisions related to an approach for charging street lighting customers the costs associated with the written down values of redundant street lighting assets following a retrofit. We consider that the approach the AER has taken to allowing residual costs to be recovered, as well as its approach to the amounts to be recovered has been generally appropriate, noting some constraints to determining accurate costs in Victoria. This is because the approach undertaken by the AER seeks to ensure that street lighting customers are exposed to the full costs of upgrading their street lights. However, we consider there may be some issues associated with the timing of payments which we elaborate on in the following section.

AER Decision on Victorian Energy Efficient Public Lighting Charges

In February 2009 the AER published a Final Decision on Energy Efficient Public Lighting Charges in Victoria.¹⁷ The AER decision was the finalisation of a process commenced by the Essential Services Commission of Victoria (ESCV). The decision was made in accordance with the Public Lighting Code for Victoria (the Code), which required that in the first instance charges for the ongoing operation, maintenance and replacement of street lighting assets be negotiated between the parties. However, where agreement cannot be reached the option is available under the Code for parties to seek recourse to the ESCV/AER to assess the proposed charges. It is on this basis that the ESCV review commenced and the AER decision was made.

As part of the decision the AER considered that where distributors are requested by councils to remove existing luminaires and replace them with energy efficient options, distributors will be entitled to recoup the written down value of the existing assets. In Victoria there were a number of issues that influenced the regulator's decision:

- There were no records of the respective average age of lights for different councils
- Common costs were allocated evenly across councils, and

¹⁷ AER, Energy Efficient Public Lighting Charges – Victoria, Final Decision, February 2009.

- The distributor's RAB's for street lighting assets consisted of capital expenditure undertaken on all lights within a distribution area, rather than for each council.

These issues had a number of implications for the AER's decision making. In the first instance, a decision needed to be made on the remaining economic life of luminaires. In this instance, the AER relied upon a previous ESCV decision of the economic life of luminaires and determined a 20 year economic life. It was also assumed that existing assets were approximately half way through their 20 year economic life. However, while this approach ignored that some assets would have been subject to spot replacements over the years, given the constraints on the information available to the AER the approach is likely to be appropriate. Some caution should also be applied in extrapolating this approach to other jurisdictions. This is because the approach taken by the AER was based on the existing framework of the ESCV rather than the Rules.

Secondly, the AER made a decision on the timing of the recovery of the written down costs of existing assets. The AER found that allowing councils to pay the written down value of retired assets over time provided an incentive for councils not to roll out energy efficient luminaires, stating:¹⁸

"The AER also recognises that a fixed written down value (WDV) could provide councils with an incentive to delay the retrofitting of TF luminaires as early adopters would cross-subsidise later adopters. This effect can be removed if councils pay the WDV to distributors upfront when replacing MV80 luminaires with T5 luminaires.

Therefore, the AER's final decision is made on the basis that the MV80 WDV is paid upfront by the council to the distributor at the time a T5 is retrofitted. This will limit cross subsidisation among councils."

In doing so, the AER indicated that this should not prevent a council from having a separate instalment plan with their distributor to pay off the written down value over time. It is not clear however, should the prospect of cross-subsidisation exist, how the approach taken by the AER would affect councils undertaking retrofits at different times. That is, a single residual value for all councils would only be relevant where they all undertake a retrofit at the same time.

It is relevant to note that it was identified that undertaking a retrofit also avoided some costs. These avoided costs were future costs, such as labour, associated with the replacement of assets, particularly the lamps. The AER determined that this amounts should be paid to councils through an upfront payment by distributors.

Energy Australia Decision on Alternative Control (public lighting) services

On 13 April 2010 the AER made a final decision with respect to EnergyAustralia's (EA) public lighting charges.¹⁹ The decision was made in accordance with the directions of the Australian Competition Tribunal which directed the AER to replace its April 2009 decision on the matter. The final decision addressed three considerations. The first two related to the value of the RAB and the AER's assessment of efficient maintenance costs. The third decision, and the one related most to the issues of this report, was the treatment of the residual value of assets replaced early at the request of a customer.

¹⁸ AER, Energy Efficient Public Lighting Charges – Victoria, Final Decision, February 2009, p.46.

¹⁹ AER, Final decision, EnergyAustralia's distribution determination 2009-10 to 2013-14, Alternative control (public lighting) services, 13 April 2010.

The AER made a decision on the treatment of the residual value of assets replaced early at EA's request. EA sought clarification from the AER on the control mechanism and the timing of charges arising from early replacement of assets at a customer's request and the adjustment to the RAB for residual asset values.

In its final decision the AER determined that the control mechanism for the early replacement of an asset installed before 1 July 2009 at the customer's request will be represented by a formula for each public lighting asset component. The formula for determining residual value is:

$$\text{Residual Value} = \text{Annual depreciation} \times \text{remaining life}_t \times \text{No. of assets replaced}_t \times (1 + \Delta \text{CPI}^{\text{forecast}})$$

We consider that this approach is likely to enable an accurate reflection of the residual costs of existing assets. In addition, it appears that, unlike the case in Victoria, the residual costs for each council are able to be accurately determined. This is because the final decision sets out a formula for each asset type held by EA. This formula sets an amount based on the residual value multiplied by the quantity of assets, multiplied by the remaining life. As a consequence, this approach should be able to properly signal the residual cost of existing assets to individual street lighting customers by applying this formula to each council's inventory of street lighting assets.

The Final Decision on street lighting by the AER is not clear on the timing of this payment. However, in its Final Decision for EA's revenue determination it stated that the charge for pre 1 July 2009 assets is to be paid upfront. While in the Draft Determination the AER proposed to allow either an annuity approach or an upfront payment, it decided that only an upfront payment should be allowed as this avoided complexities associated with multiple charges for street lighting services.²⁰

For post 30 June 2009 assets replaced early at the request of a customer the AER noted that a new charge would apply for the new asset in addition to the existing annuity payment for the replaced asset. The AER also noted that, alternatively, the customer could negotiate to make an upfront payment of the remaining value of that replaced asset.

Conclusion on incentives for efficient decision making

Based on the information above, we consider that there are limited barriers to providing incentives for efficient decision making with respect.

With respect to obtaining benefits, we consider the framework allows the benefits to reflect the cost savings that would be provided through improved energy efficiency. To the extent there are concerns about the efficiency of network prices, for instance in the case of Aurora's prices, this is not a result of the regulatory framework as it provides pricing principles, and incentives, for distributors to set prices that reflect costs. Given the AER approve prices annually, should the need arise, price structures can be easily changed to better reflect costs subject to the proposed charges being compliant with the Rules.

With respect to facing efficient costs we consider that the present regulatory framework is sufficiently robust to enable councils to receive an efficient price for new street lighting assets. This is because either the AER will undertake an

²⁰ AER, Final decision, New South Wales distribution determination 2009-10 to 2013-14, 28 April 2009, p.389.

assessment based on robust economic criteria, or the pressure afforded by competition will enable councils to receive an efficient price. We also consider that the approach taken by the AER with respect to the residual costs of existing assets enables the full costs of existing assets to be paid by councils.

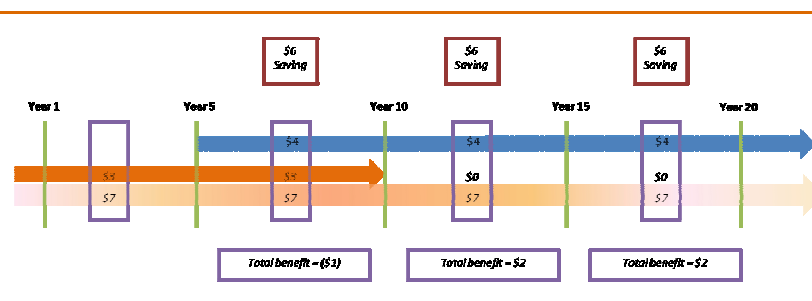
One factor with respect to costs that may influence the decision of councils is the timing for paying the residual costs of existing assets. There are three options in this respect, two of which have been identified by the AER, the options are

- Require councils to pay for any residual costs of existing assets upfront when the retrofit occurs,
- Maintain the existing charges and recovery profile for existing assets so that these costs continue to be recovered once the energy efficient street lights are installed, and
- Spread the cost recovery of the residual costs of existing assets over the life of the new energy efficient assets.

We consider that requiring the residual costs of existing assets to be paid upfront may dissuade councils from making otherwise efficient decisions. This is because, even where the costs outweigh the benefits, the capital raising constraints of councils may prevent them from undertaking a retrofit.

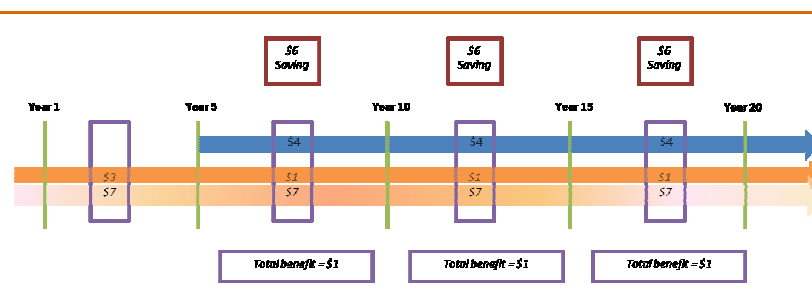
Allowing residual costs to be recovered over time can overcome the capital constraint issues for councils. In this respect, the third option may be preferred. This is because, where the benefits outweigh the costs, councils will be able to obtain a benefit in each year over the life of the new assets. The figure below illustrates the status quo situation. As can be noted, councils will have some losses in the early period as they are required to fund both the new assets and existing assets.

Figure 1: Standard recovery of existing asset costs



In figure 2 below, by smoothing the recovery of the costs of existing assets over the life of the new assets councils are able to obtain a benefit in each year. As a consequence, the case for undertaking the retrofit may be stronger in this second example, even though the total costs and benefits will remain the same.

Figure 2: Extended recovery of existing asset costs



We consider that councils should have a choice with respect to how they pay for the costs associated with existing assets. Any avoided costs associated with the retrofit should ideally be paid in a similar manner to the recovery of residual costs.

Given the AER has discretion on this matter there may be benefits in providing certainty to councils that they will be able to decide which cost recovery arrangements apply to residual costs (rather than having a cost recovery schedule imposed upon them). This could be achieved through a Rule change to AEMC that required the AER to allow multiple approaches for the recovery of residual costs associated with the roll out of energy efficient street lights. The Rule change would be made to Chapter 6 of the Rules as this directs the AER's approach to distribution regulation. To the extent that differing approaches to cost recovery create an administrative burden for distributors this may need to be factored into the total amount paid.

We consider a Rule change relating to the recovery of residual costs is likely to have some merit under the NEO. While the AER has previously required cost recovery upfront so to avoid a cross-subsidy issue in Victoria, and to avoid tariff complexity in NSW, it is not clear that there is indeed significant justification for this approach into the future. For instance, so long as the approach to calculating the residual amount is correct, as has been the case in the decisions above, we do not consider that cross-subsidy concerns will arise. This is because councils will continue to pay street lighting charges for existing assets until a retrofit occurs and this amount can be reduced from the residual value of existing street lights. In addition, to the extent that there are additional administration costs associated with tariff setting, these costs could be factored into prices.

Given it is not clear there is sufficient justification for a requirement for an upfront payment, we are of the view that there is a reasonable prospect a Rule change request relating to the recovery of residual costs would be considered favourably under the NEO. This assessment would be based on improved certainty and transparency for relevant parties and the consequent impact this has on encouraging more efficient investment in street lighting assets.

5 Approaches to mandating energy efficient street lighting

In the previous section we identified that the regulatory framework, on the whole, should encourage councils to make efficient decisions about the retrofit of street lights. However, we have also been asked to consider the options for mandating a roll out of energy efficient street lights. This chapter describes two possible paths for undertaking a mandate:

- Through the AEMC as a Rule change, or
- By placing a requirement in legislation.

AEMC Rule making path

The AEMC is the Rule making body in the NEM and as such has the authority to make changes to the Rules when proposed by other parties.²¹ Any person can propose a change to the Rules, including a Government. The process the AEMC is required to follow to assess and make changes to the Rules is set out in the National Electricity Law (NEL). Relevant aspects for a possible Rule change proposal relating to energy efficiency street lighting include:

- Whether the Rule is within the AEMC's power to make
- Whether the Rule change proposal is misconceived or lacking in substance, and
- The assessment framework applied by the AEMC when deciding whether to make a Rule or not.

Power to make the Rule change

The AEMC is only allowed to make changes to the Rules where the proposal relates to the subject matter of the Rules. Section 34 and Schedule 1 of the NEL specify the subject matter of the Rules. The AEMC, has summarised the aspects of section 34 of the NEL as follows:²²

- Regulating the operation of the national electricity market
- Regulating the operation of the national electricity system for the purposes of safety, security and reliability of that system
- Regulating the activities of persons (including Registered Participants) participating in the national electricity market or involved in the operation of the national electricity system, and
- Any matter or thing contemplated by the NEL, or is necessary or expedient for the purposes of the NEL.

Given these requirements in Schedule 34 of the NEL we consider that a Rule proposal relating to energy efficient street lights could be made on distributors given this would have the effect of regulating the activity of persons participating in the national electricity market. However, we consider a Rule could not be

²¹ The AEMC is allowed to be the proponent of a Rule change only where it is to correct a minor error in the Rules or it considers the Rule involves a non-material change.

²² AEMC, National Electricity Rules – Guidelines, Guidelines for proponents: Preparing a Rule change proposal, June 2009, p.2.

made on city councils directly, i.e. street lighting customers. This is because distributors, and not the councils, are relevant participants for the purposes of the Rules. Indeed, the AEMC has previously made a decision to not commence with the Rule making process on the basis that it considered the Rule related to persons who are not legally able to assume the full range of roles under the Rules.²³ The implication, as identified by the AEMC, was that because the Rule proposal related to persons not subject to the Rules those persons would not be subject to enforcement proceedings should there be any breach of the Rules.

Schedule 1 of the NEL includes a number of specific provisions relating to the wholesale market, the operation of the system, the economic regulation of networks, metrology and disputes. With respect to the operation of the system, Item 12 may have some relevance to a possible Rule to mandate a roll out of energy efficient street lights. This is because this Item relates to the augmentation of transmission systems and distribution systems. However, there is considerable uncertainty about whether street lighting would meet the definition of a distribution system in this respect.

There may also be two relevant provisions within the Items related to the regulation and pricing of distribution systems. These are Item 26B which relates to the assessment and treatment of investment in distribution systems, and Item 26E which relates to the RAB and proposed new assets to form part of a distribution system. However, given these provisions relate more specifically to pricing, rather than specific investments, there is a risk that these would not be considered as relevant items for the purposes of a proposed Rule mandating energy efficient street lighting. That is, the AEMC may consider these items relate more to the treatment of investment once it has been made rather than to what specific investments should be undertaken.

Misconceived or lacking in substance

The AEMC has the option of not progressing with an assessment of a Rule change proposal if it deems that the proposal is misconceived or lacking in substance.²⁴ Whether a proposal is misconceived or lacking in substance is left to the AEMC's discretion. The requirement for a Rule change request to not be misconceived or lacking in substance is a relatively low threshold. Therefore, this initial assessment requirement appears focused towards ensuring that frivolous Rule change requests, or those that are clearly not appropriate for a Rule are not considered further.

Given the relatively low threshold of the test for whether a proposal is misconceived or lacking in substance we consider that a Rule change request related to the mandating of energy efficient street lights would likely pass this test.

AEMC assessment framework

Should the AEMC deem that a proposed Rule passes the initial assessment requirements the formal Rule making process will commence. This process involves initial consultation with stakeholders, a draft decision and Rule, a further round of consultation and then a final decision and Rule.

Under section 88(1) of the NEL, the AEMC may only make a Rule if it is satisfied that it will, or is likely to, contribute to the achievement of the National

²³ See: <http://www.aemc.gov.au/Electricity/Rule-changes/Completed/Responsible-Person-Contestability.html>

²⁴ Section 94(1(a)(ii) of the NEL.

Electricity Objective (NEO). The NEO is set out in section 7 of the NEL as follows:

“The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

- (a) price, quality, safety, reliability and security of supply of electricity; and
- (b) the reliability, safety and security of the national electricity system.”

The AEMC has indicated in numerous publications that it considers the NEO is founded on the concept of economic efficiency. In that respect, the AEMC has considered productive, allocative, and dynamic efficiency when assessing Rule change proposals against the NEO. In addition, the AEMC has identified that the objective can be achieved by following the principles of good regulatory design and ensuring predictability, transparency, and where appropriate, flexibility in the regulatory framework.²⁵

It is relevant to note that the NEO is focused only on the electricity system and those who produce, transport and consume electricity. This means that broader considerations, including environmental and social costs and benefits are not factored into decision making unless these fall upon market participants (for example, under a carbon tax or cap and trade system). While this approach is likely to be appropriate for making decisions with respect to the NEM, given the consideration broader benefits would introduce considerable uncertainty into decision making, it does mean that the identification of environmental benefits will not affect the AEMC’s decision making with respect to a Rule change request.

In addition to the NEO, the NEL identifies a number of other factors that the AEMC is required to have regard to in deciding whether to accept a Rule change proposal or not. For instance, section 33 of the NEL requires that the AEMC, in applying this test, is also to have regard to any relevant MCE Statement of Policy Principles.

Section 88B of the NEL requires that the AEMC must take into account the form of regulation factors in making or revoking a Rule that specifies, or confers a function or power of the AER to specify, an electricity network service as a direct control or negotiated network service. The form of regulation factors require the AEMC to have regard to:

- The presence and extent of barriers to entry
- The presence of network externalities in the provision of services
- The extent that market power may be mitigated by countervailing market power
- The presence and extent of substitutes, and the elasticity of demand for an electricity network service or in the market for electricity, and
- The extent to which there is information available to a network service user, or prospective user, to enable negotiation on an informed basis with a network service provider.

It is possible that the form of regulation factors may apply to a Rule change proposal related to mandating energy efficient street lights. This is because there may be a requirement for the form of regulation or price control for a roll out to be defined in either the Rules or a revenue determination. This is consistent

²⁵ AEMC, Review of Demand-Side Participation in the National Electricity Market, Stage 2: Issues Paper, 16 May 2008, p.7.

with the AER making a determination on the form of regulation and price control for existing street lighting arrangements across jurisdictions.

Under section 88B of the NEL, the AEMC must also take into account the revenue and principle principles in making a Rule for, or with respect to, any matter or thing specified in items 15 to 24 and 25 to 26J in Schedule 1 of the NEL. The revenue and pricing principles, which are set out fully in Appendix A, include:

- Providing a network service provider with a reasonable opportunity to recover efficient costs
- Providing network service providers with effective incentives in order to promote economic efficiency, including efficient investment, provision of services and use of the transmission or distribution system
- Having appropriate regard to a RAB set in a previous determination
- Prices or charges should allow for a return commensurate with the regulatory and commercial risks involved in providing the service to which the charge relates
- Regard should be had to the economic costs and risks of the potential for under investment by network service providers, and
- Regard should be had to the potential for under or over utilisation of the distribution or transmission system

Given our initial view that a Rule change proposal relating to the mandatory roll out of energy efficient street lights may fall under the subject matter of Schedule 1, and specifically, Items 26B and 26E, it is possible that the AEMC would need to take into account the revenue and pricing principles when undertaking its assessment.

Our analysis of possible AEMC assessment

Based on the above, a Rule to mandate the roll out of energy efficient street lights would need to be an obligation for distribution businesses. In addition, the costs of such a roll out would need to remain with street lighting customers and could not be recovered from the broader customer base. The requirement that costs remain with street lighting customers exists because these charges are regulated separately to those for the broader customer base. As previously identified, there are specific Rules to ensure that costs are appropriately allocated and cross-subsidisation is avoided. This implies an express requirement in the Rules that distributors retrofit energy efficient street lights with a charging framework specified for prices paid by councils.

We note that a similar issue has come before the AEMC previously. On 21 November 2007 the AEMC received a Rule change proposal from the Victorian Government seeking a jurisdictional derogation to implement the rollout of Advanced Metering Infrastructure (AMI).²⁶ The derogation proposal sought to establish the local distributor as the exclusive responsible party for small customer metrology, and in particular, for the roll out of AMI. This was in support of the Victorian Government's policy that smart meters be rolled out to all small electricity customers in Victoria within an accelerated timeframe.

²⁶ AEMC, Victorian Jurisdictional Derogation, Advanced Metering Infrastructure Roll Out, Rule Determination, 29 January 2009.

The AEMC accepted the Rule change proposal and subsequently made the Rule. In accepting the Rule the AEMC stated:²⁷

“The Commission is of the view that the Rule (reflective of the Government’s proposal) meets the NEO in that it provides for a certain, predictable and accelerated rollout of AMO, thereby meeting the Victorian Government’s policy. An accelerated rollout of AMI would enable a number of efficiency benefits to be realised. These benefits would not be available to the same extent and as rapidly under a retailer mandated or contestable rollout of AMI. The Commission considered the propositions from stakeholders to promote metering contestability during the period of the derogation where stakeholders suggested a number of exclusions from the derogation. The Commission is of the view that any exclusions would potentially only provide benefits to an incremental number of consumers and metering contestability, while negatively impacting on the cost and operational effectiveness of the rollout.”

We note, in addition, that the AEMC’s assessment with respect to this Rule change request was also guided by a Ministerial Council on Energy (MCE) Statement of Policy Principles in relation to the roll out of AMI. This statement included that distribution businesses will be legislatively obliged to roll out smart meters to some or all residential and other small customers in those jurisdictions where a roll out will take place and they should also have exclusive responsibility over meter provision and metering data provision.²⁸ While the AEMC cited an economic basis for its decision on this Rule change, it is possible that the MCE Statement of Policy Principles had a significant influence over the AEMC’s final decision. In addition, it is also important to note that this decision did not mandate distributors to undertake specific investments, instead it addressed the arrangements for investments that distributors were required to undertake under Victorian legislation.

More recently the AEMC has expressed its preference for allowing market outcomes to drive efficient investment rather than relying on centrally planned decisions. A Rule change from the MCE titled Scale Efficient Network Extensions (SENEs), which was the result of an AEMC review on the impact of climate change policies on the NEM, seeks to introduce a centrally planned approach to enabling scale efficient network connections for remote generation investment. The proposal seeks to require customers to underwrite stranded asset risks, on the basis that they are the ultimate beneficiaries from network scale efficiencies, until generators are able to connect and pay for network assets related to their connection.

In its draft determination on the SENE’s Rule the AEMC has effectively rejected the approach in the proposed Rule and proposed to make a more preferable Rule.²⁹ The Rule put forward by the AEMC would see investment in SENEs driven by market requirements, rather than on the basis of central planners and regulators, and customers will not be required to underwrite any part of the investment. In making this decision the AEMC stated:³⁰

²⁷ Ibid, p.vii.

²⁸ See: <http://www.aemc.gov.au/Media/docs/MCE%20Statement%20of%20Policy%20Principles-8fd446e2-e28f-4927-92a8-cd412fabd701-o.pdf>

²⁹ Section 91A of the NEL allows the AEMC to make a Rule that is different (including materially different) from a market initiated proposed Rule if the AEMC is satisfied that, having regard to the issue or issues that were raised that a more preferable Rule will or is likely to better contribute to the achievement of the NEO.

³⁰ AEMC, Scale Efficient Network Extensions, Draft Rule Determination, 10 March 2011, p.55

“The Commission considers this market based approach will promote efficient decision making given that participants that face market signals typically have greater incentives to ensure their investment decisions are well-informed and balanced against any associated risks.

In making this decision the AEMC also identified advantages in promoting competition for the funding of the required network investments. The AEMC considered that this outcome would lead to more SENEs being built at lower costs, while ensuring that consumers do not face the risk of those decisions.

Based on the above, we consider a Rule change proposal that direct the specific investment decision of network businesses is likely to have a better chance of success when:

- There is a clear benefit over the costs imposed, and
- Those who are best placed to manage the costs and risks with the investment make the decision about whether the investment proceeds.

This has a number of implications for a possible Rule change proposal to mandate the roll out of energy efficient street lights.

In the first instance, if the AEMC were to make a decision to expressly include a requirement for investment in energy efficient street lights we expect it would want to be sure that the costs outweighed the benefits. We note in respect of the Victorian AMI roll out that numerous, and detailed, studies produced over several years were provided in support of the roll out. This included a number of consultancies engaged by the AEMC. Therefore, a similar level of evidence would likely be required for the AEMC's consideration of a roll out of energy efficient street lights.

We note that the costs and benefits of a street lighting retrofit may not be the same in each jurisdiction, or even for each street lighting customer. This reflects that there are likely to be differences in the age and types of assets installed in each region. Therefore, when assessed against the NEO, the case may need to be made about the costs outweigh the benefits in each jurisdiction before a mandated national roll out occurs. This may require that a roll out only occur on a case-by-case basis where a detailed cost benefit analysis has been undertaken.

Given street lighting customers would pay the costs of a retrofit, and, as indicated in Chapter 2, are best placed to make a decision on the costs and benefits of an energy efficient upgrade, it may be perceived that the NEO is best met by requiring that councils be the ones to make a decision on the merits of a roll out rather than distributors.³¹ This would bring into question the benefits of a mandate given such an approach would effectively represent the status quo. That is, a Rule change would not change the decision making framework from what exists today.

Statutory obligations path

An alternative to a Rule change approach is to mandate the roll out of energy efficient street lights through another legal instrument such as state based legislation / regulation or licence obligations. The outcome of this approach would be a specific obligation on either councils or distributors to retrofit street lights within a specified timeframe. It may also specify aspects such as the type of luminaire that is to be installed. Again, councils would be obliged to pay for

³¹ It is relevant to note that the general customer base has no capacity to influence the decision about whether energy efficient street lights are rolled out and would therefore not be a relevant decision maker from the perspective of the AEMC.

the costs of a roll out given the economic regulation of street lighting services would remain separate from other distribution services.³²

We note that the Draft Street Lighting Strategy Paper identified two legislative options for achieving energy efficient street lights. The first was a minimum energy performance standard referenced to the relevant Australia Standard. The second was to mandate as a condition of distribution licences that they abate a given amount of greenhouse gases through a suite of defined measures.

The passing of new legislation across multiple jurisdictions would be a large undertaking. Therefore, it is necessary to consider whether this approach is able to effectively achieve the desired goals. It is also relevant to consider how a legislative approach would interact with the regulatory framework.

There are a number of benefits associated with undertaking a mandated roll out through legislation:

- The obligation can be placed on any party, including the local councils or distributors
- Governments would have increased control over specific aspects of the roll out as compared to a Rule change option where the AEMC may make changes to the proposed Rule (as was the case in the SENEs Rule change), and
- Broader social policy goals and objectives can be factored into decision making (as compared to the more narrow focus of the NEO)

The benefits of this approach need, however, to be weighed against the potential difficulty of negotiating consistent legislation across jurisdictions and any associated issues with having the legislation pass through parliament.

It is worth noting that for the roll out of AMI in Victoria the Government implemented a legislative approach to the mandate. In this jurisdiction the Government placed an obligation in the Electricity Industry Act (VIC) 2000. The obligation was to deem a requirement within distribution licences related to the roll out of AMI. We note, however, that an associated jurisdictional derogation to the Rules was still necessary to implement the roll out. This is because the obligation placed responsibilities onto distributors that may have been inconsistent with the existing Rules.

Interaction with regulatory framework

A legislative requirement to retrofit to energy efficient street lights will cause a change in the price councils pay for non-transport street lighting charges. This is to reflect the cost of the new assets. Therefore it is relevant to identify whether the economic regulation framework can accommodate a change in costs, and therefore, charges for street lighting in this circumstance.

Increase through present price controls

The simplest ways to accommodate a change in street lighting costs from a retrofit is to align the decision with a regulatory determination. Where this occurs the AER can factor the associated costs into its determination. However, it is also relevant to consider the circumstances should a roll out not align with a distribution determination.

Where new street lighting charges are negotiated between parties and are not regulated directly by the AER (SA, Tasmania³³, Victoria) distributors will have

³² This assumes that the existing legislative framework that regards street lighting services as distribution services is maintained.

sufficient flexibility to agree to a change in charges based on the additional costs of a retrofit. For instance, one charge could be set for new assets while customers pay the existing charges for old assets. Therefore, this section focuses on the circumstances where the AER directly regulates the charges for street lighting services (ACT, NSW, QLD.).

As noted above, the AER maintains discretion with the form of regulation and form of price control that applies to street lighting. The decision on each of these matters is made via a distribution determination for each distributor. In addition, the Rules require that the mechanism for controlling prices must have a basis stated in the distribution determination.³⁴ This means that the services regulated, and the form of price control must be set out in a distribution determination. The implication of this is that if additional costs, or different forms of regulation or price control are not accommodated in the distribution determination there is no flexibility for the AER to divert from this approach through the regulatory period.

In a number of jurisdictions the AER has set prices for regulated street light services on the basis of a price cap. This means that the AER's determination approves a maximum price that can be charged for each street lighting service in each regulatory year of the control period. Where this is the case, should costs increase so that charges need to increase above the maximum price set in a determination, distributors may not be able to recover these costs through street lighting charges.

Cost pass through mechanism

Where prices cannot be simply altered to reflect a change in costs an alternative option is to use a pass through mechanism to allow for costs to be recovered from street lighting customers. We consider that the Rules are sufficient to accommodate a mandatory requirement to retrofit street lights. However, there may be a case to improve the certainty of this arrangement.

Clause 6.6.1 of the Rules sets out the cost pass through process for regulated services. We consider these cost pass through arrangements associated with standard regulated services are likely to be appropriate in allowing distributors to recover the costs of a street lighting retrofit. The cost pass through arrangements in the Rules allow costs to be passed through for certain events. Relevant events in the context of a street lighting retrofit include a service standard event or regulatory change event. A service standard event is an event that alters the nature or scope of services provided by a distributor, or imposes minimum standards. A regulatory change event is an event that substantially affects the manner which a distributor provides services. Given a roll out of energy efficient street lights would be a new regulatory requirements that affects the manner which a distributor provides services, including by altering the nature or scope of services provided, it is likely that these events would provide a suitable mechanism for a pass through event.

While it is possible, and potentially likely, that the AER could use the cost pass through events identified above, additional certainty could be provided by explicitly specifying a street lighting retrofit as a pass through event in a distribution determination. In this way businesses would have certainty that costs associated with a retrofit could be treated as a cost pass through rather than having to rely on the assessment of the AER under the existing pass through definitions. We note however, that the AER has previously rejected this

³³ We note that the AER has not yet made a revenue determination for Tasmania so it's decision on the form of regulation for new energy efficient street lighting. Therefore, there is scope for the AER's final position to diverge from its consideration in its Framework and Approach paper.

³⁴ Clause 6.2.6(b)

idea where there was uncertainty about a mandated retrofit occurring. In Queensland the distribution businesses sought a specific inclusion of a energy efficient lighting event to accommodate a potential Queensland Government requirement for the roll out of certain types of street lighting fittings. In the first instance, the AER considered that the event was uncertain and may not be appropriate as a pass through event:³⁵

“The AER notes that it remains uncertain whether the Queensland Government will mandate an energy efficient street lighting rollout or when the QLD DNSPs would be required to commence any such rollout. At this time, Ergon Energy is not required to replace existing luminaires with energy efficient luminaires. Further, the trial is in part to determine the appropriate luminaire technology for particular environmental conditions. The AER notes that it is not possible to accurately forecast the costs associated with the potential rollout as there is considerable uncertainty regarding the specific luminaire technology to be included in the rollout. Therefore, the AER considers that the cost of the rollout cannot realistically be identified.”

The AER went on to say that such a roll out could be managed through other means:³⁶

“The AER also considers that an energy efficient lighting initiative of the Queensland Government that requires Ergon Energy to roll out certain types of street light fittings may constitute a general pass through event or a regulatory change event.”

The general pass through event referred to by the AER was a specific event added to the regulatory determination and is not a defined pass through event in the Rules.³⁷ The AER defined this event as an uncontrollable and unexpected event during the regulatory control period, the effect of which could not have been prevented or mitigated by prudent operation risk management. A regulatory change event is as described above.

While the AER did not consider that a specific energy efficient lighting pass through should be defined in the regulatory determination, it did consider that should a mandate occur, it would likely be covered by the existing provisions. Therefore, its preliminary view appeared to be that should a mandate occur a pass through of costs would be appropriate. It is relevant to note that irrespective of which pass through mechanism is used, the pass through of costs would be to street lighting customers, i.e. councils, rather than the general customer base. This is because street lighting in Queensland, as is the case in all other jurisdictions, is regulated separately to other network services.

A materiality threshold applies to both a service standard event and a regulatory change event. This threshold is determined at the discretion of the AER. The AER has provided guidance on materiality thresholds for pass through events in its distribution determinations. For instance, in its decision for the NSW distributors the AER indicated that it will generally consider a pass through event as material based on the following:³⁸

³⁵ AER, Draft Decision, Queensland distribution determination 2010-11 to 2014-15, 20 November 2009, p.386.

³⁶ AER, Final decision, Queensland distribution determination 2010-11 to 2014-15, May 2010, p.306.

³⁷ Due to a general pass through event not being defined in the Rules, it does not apply to other distributors unless the AER specifies this pass through event in the relevant distribution determination.

³⁸ AER, Final decision, New South Wales distribution determination 2009-10 to 2013-14, 28 April 2009, p.280.

“The AER will generally consider that a pass through event will have a material impact if the costs associated with the event would exceed 1 per cent of the smoothed forecast revenue specified in the final decision in the years of the regulatory control period that the costs are incurred.”

If this materiality threshold is not met for a street lighting retrofit the cost pass through arrangements could not be applied. We note that the AER does have discretion regarding how it applies the materiality threshold, however, it has indicated that its preference is to not divert from its policy on this matter.

The materiality threshold for Ausgrid, the largest distributor in NSW, would be, for instance, \$15.7 million if a roll out were to occur in year 2011-12 (based on a revenue requirement of. Given estimates of changeover costs for energy efficient street lights based on distributor estimates range between \$340-\$450 per light³⁹, AusGrid would need to change over approximately 40,000 street lights in 2011-12 to meet the threshold.

We consider that the framework is likely to be sufficiently robust to accommodate a roll out of energy efficient street lights. However, we note that some uncertainty about the treatment of new costs that may arise within a regulatory determination remains. Therefore, there may be some benefit in proposing a Rule change to provide additional certainty to councils and distributors. A Rule change could do one of two things. It could require the AER to include sufficient flexibility in its determination on the form of control for street lighting services to accommodate a potential price change from a roll out of energy efficient street lights. Alternatively, a Rule change could prescribe that an energy efficient street lighting roll out is a cost pass through event and that the materiality threshold is deemed to be met should the event occur.

We consider the second option, prescribing an energy efficient street lighting roll out as a cost pass through event, is likely to provide improved certainty to distributors and councils compared to the alternative option. A Rule change proposal could, therefore, seek to achieve the following outcomes:

- Identify a new type of cost pass through, ‘an energy efficient street lighting roll out event’, in the definition of a pass through event in Chapter 10 of the Rules
- Define an energy efficient street lighting roll out event in Chapter 10 of the Rules as: a requirement to roll out energy efficient street lighting within a distribution network where the roll out is instigated by either a regulation, a change in legislation, or a request from a street lighting customer. This means the pass through event would be triggered by a requirement for a distributor to roll out energy efficient street lights
- Require that the AER is to deem that the materiality threshold is met when an energy efficient street lighting event occurs.

In addition, there may also be a need to define what an energy efficient street light is and who a street lighting customer is. An energy efficient street light could be defined as either a specific technology type or at a more general level, for instance, as specified in the relevant regulation or legislation for a roll-out. A street lighting customer can be defined as the party required to pay for street lighting services.

We consider that such a Rule change would have some merit with respect to its assessment against the NEO. This is because it allows distributors to recover the efficient costs of activities they are required to undertake. In addition, it

³⁹ Victorian Department of Sustainability and Environment, Report from Public Lighting Taskforce, March 2009, p.9

provides certainty and transparency to relevant parties. We note, however, that the AEMC may perceive that the existing pass through event provisions are sufficient to accommodate an energy efficient street lighting roll out and additional certainty is not warranted.

Appendices

Appendix A Subject Matter of the Rules

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Appendix A Subject Matter of the Rules

There are two areas of the NEL where the subject matter of the Rules is set out, these are section 34 and Schedule 1.

Section 34 Rule making power

Division 2—Rule making functions and powers of the AEMC

34—Rule making powers

(1) Subject to this Division, the AEMC, in accordance with this Law and the Regulations, may make Rules, to be known, collectively, as the "National Electricity Rules", for or with respect to—

- (a) regulating—
 - (i) the operation of the national electricity market;
 - (ii) the operation of the national electricity system for the purposes of the safety, security and reliability of that system;
 - (iii) the activities of persons (including Registered participants) participating in the national electricity market or involved in the operation of the national electricity system;
- (b) any matter or thing contemplated by this Law, or is necessary or expedient for the purposes of this Law.

Note—

The procedure for the making of a Rule by the AEMC is set out in Division 3 of Part 7.

(2) Without limiting subsection (1), the AEMC, in accordance with this Law and the Regulations, may make Rules for or with respect to any matter or thing specified in Schedule 1 to this Law.

(3) Rules made by the AEMC in accordance with this Law and the Regulations may—

- (a) be of general or limited application;
- (b) vary according to the persons, times, places or circumstances to which they are expressed to apply;
- (c) confer functions or powers on, or leave any matter or thing to be decided or determined by—
 - (i) the AER, the AEMC, AEMO or a jurisdictional regulator; or
 - (ii) the Reliability Panel or any other panel or committee established by the AEMC; or
 - (iii) any other body established, or person appointed, in accordance with the Rules;
- (d) confer rights or impose obligations on any person or a class of person (other than the AER, the AEMC or a jurisdictional regulator);
- (e) confer a function on the AER, the AEMC, AEMO or a jurisdictional regulator to make, prepare, develop or issue guidelines, tests, standards, procedures or any other document (however described) in accordance with the Rules, including guidelines, tests, standards, procedures or any other document (however described) that leave any

matter or thing to be determined by the AER, the AEMC, AEMO or jurisdictional regulator;

(f) empower or require any person (other than a person referred to in paragraph (e)) or body to make or issue guidelines, tests, standards, procedures or any other document (however described) in accordance with the Rules;

(g) apply, adopt or incorporate wholly or partially, or as amended by the Rules, the provisions of any standard, rule, specification, method or document (however described) formulated, issued, prescribed or published by any person, authority or body whether—

(i) as formulated, issued, prescribed or published at the time the Rules are made or at any time before the Rules are made; or

(ii) as amended from time to time;

(h) confer a power of direction on the AER, the AEMC, AEMO or a jurisdictional regulator to require a person conferred a right or on whom an obligation is imposed under the Rules (including a Registered participant) to comply with—

(i) a guideline, test, standard, procedure or other document (however described) referred to in paragraph (e) or (f); or

(ii) a standard, rule, specification, method or document (however described) referred to in paragraph (g);

(i) if this section authorises or requires Rules that regulate any matter or thing, prohibit that matter or thing or any aspect of that matter of thing;

(j) provide for the review of, or a right of appeal against, a decision or determination made under the Rules and for that purpose, confer jurisdiction on the Court;

(k) require a form prescribed by or under the Rules, or information or documents included in, attached to or given with the form, to be verified by statutory declaration;

(l) in a specified case or class of case, exempt—

(i) AEMO; or

(ii) a Registered participant or class of Registered participant; or

(iii) any other person or body performing or exercising a function or power, or conferred a right, or on whom an obligation is imposed, under the Rules or a class of any such person or body, from complying with a provision, or a part of a provision, of the Rules;

(m) provide for the modification or variation of a provision of the Rules (with or without substitution of a provision of the Rules or a part of a provision of the Rules) as it applies to—

(i) AEMO; or

(ii) a Registered participant or class of Registered participant; or

(iii) any other person or body performing or exercising a function or power, or conferred a right, or on whom an obligation is imposed, under the Rules or a class of any such person or body;

(n) confer an immunity on, or limit the liability of, any person or body performing or exercising a function or power, or conferred a right, or on whom an obligation is imposed, under the Rules;

(o) require a person or body performing or exercising a function or power, or conferred a right, or on whom an obligation is imposed, under the Rules to indemnify another such person or body;

- (p) contain provisions of a savings or transitional nature consequent on the amendment or revocation of a Rule.

Schedule 1 of the NEL

Distribution system revenue and pricing

25 The regulation of revenues earned or that may be earned by owners, controllers or operators of distribution systems from the provision by them of services that are the subject of a distribution determination.

26 The regulation of prices (including tariffs and classes of tariffs) charged or that may be charged by owners, controllers or operators of distribution systems for the provision by them of services that are the subject of a distribution determination

26A Principles to be applied, and procedures to be followed, by the AER in exercising or performing an AER economic regulatory function or power relating to the making of a distribution determination

26B The assessment, or treatment, by the AER, of investment in distribution systems for the purposes of making a distribution determination.

26C The economic framework, mechanisms or methodologies to be applied by the AER for the purposes of item 26B.

26D The economic framework, mechanisms or methodologies to be applied or determined by the AER for the purposes of items 25 and 26 including (without limitation) the economic framework, mechanism or methodologies to be applied or determined by the AER for the derivation of the revenue (whether maximum allowed revenue or otherwise) or prices to be applied by the AER in making a distribution determination.

26E The regulatory asset base, for the purposes of making a distribution determination, of assets forming part of the distribution system owned, controlled or operated by a regulated distribution system operator, and of proposed new assets to form part of a distribution system owned, controlled or operated by a regulated distribution system operator, that are, or are to be, used in the provision of services that are the subject of a distribution determination.

26F The determination by the AER, for the purpose of making a distribution determination with respect to services that are the subject of such a determination, of allowances for-

- (a) Depreciation; and
- (b) Operating costs of a regulated distribution system operator; and
- (c) If the regulated distribution system operator is a corporation or other body corporate-
 - i. The income tax payable by corporations, or
 - ii. Amounts payable under a law of this jurisdiction or otherwise that are equivalent to income tax that would be payable by the operator if that operator were liable to pay income tax; and
- (d) A rate of return on assets forming part of a distribution system owned, controlled or operated by a regulated distribution system operator.

26G Incentives for regulated distribution system operators to make efficient operating and investment decisions including, where applicable, service performance incentive schemes.

26H The procedure for the making of a distribution determination by the AER, including-

- (a) The submission by the AER, by a regulated distribution system operator, of a proposal relating to the revenues or prices to be regulated by a distribution determination applying to the operator; and
- (b) The publication of notices by the AER; and
- (c) The making of submissions, including by the regulated distribution system operator to whom the distribution determination will apply; and
- (d) The publication of draft and final determinations and the giving of reasons; and
- (e) The holding of pre-determination conferences.

