

Report from Department of Climate Change and Energy Efficiency

Addressing Market and Regulatory Failures for New and Upgraded Connection Assets



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Executive Summary

With this report the Commonwealth Department of Climate Change and Energy Efficiency (DCCEE) is responding to the AER Consultation Paper: *Issues and AER's preliminary positions - connection charge guidelines for accessing the electricity distribution network*, 10 June 2011.

This paper argues that current charging arrangements for connection to electricity distribution networks fail to promote the most economically efficient investment choices with regard to street lighting and distribution transformers.

The National Electricity Objective, as stated in the National Electricity Law is¹:

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 –

- 1. price, quality, safety, reliability, and security of supply of electricity;*
and
- 2. the reliability, safety and security of the national electricity system.*

Current connection charging arrangements for street lighting and distribution transformers fail to support this Objective because:

- **Separation between the parties bearing the cost (the Electricity Distribution Network Service Provider (DNSP) and/or a developer) and the beneficiaries (the user and/or the retailer) can obstruct the achievement of an economically optimal outcome.**
- **Equity issues are created by the different funding/ownership models. This conflicts with the “long term interests of consumers of electricity”.**

This situation creates the following problems:

For street lighting, the initial procurement decision and subsequent upgrade path is often limited by the DNSP. The costs and complexities of implementing replacement programs act as a disincentive for DNSPs to replace street lights with more energy efficient technologies. This is a significant barrier to the adoption of technologies that could provide economic and energy savings.

For transformers, the separation of purchaser, owner, and user tends to encourage procurement of least capital cost assets over lowest lifetime cost assets. This separation discourages investment in technologies that exceed the minimum energy efficiency requirements (MEPS).

Another concern expressed in this submission is that the proposed guidelines for electricity connection charges might not adequately address existing equity issues and imbalances, and could create additional issues by taking an overly prescriptive approach. Recommendations are provided as to an appropriate approach to developing the AER guidelines.

¹<http://www.aemc.gov.au/Electricity/Electricity-Market.html>

A well-considered national approach to connection regulation could address inequities and improve economic efficiency on a 'whole of life' economic basis, consistent with the National Electricity Objective.

Light-handed regulatory intervention is recommended to create a better informed market by requiring DNSPs to:

- inform their connecting customers of the funding/ownership models available to them and the rights and obligations pertaining to each. This should include reaching an agreement about the appropriate connection point i.e. the point that divides the assets that belong to the user from those that belong to the utility. This agreement would enable each customer to give explicit informed consent to its preferred connection arrangement;
- provide sufficiently detailed calculations and assumptions on the regulatory parameters that underpin the charges to enable the connection arrangement to be adjusted on reasonable terms at some future date, in response to technology innovation;
- support the distribution transformer purchaser to make investment decisions based on economically rational 'whole of life' cost considerations, including investments in technologies that exceed the minimum energy performance standards (MEPS) and to replace street lighting with more efficient technologies when this is the economically rational option.

1. Introduction

This report is prompted by the recent AER Consultation Paper, *Issues and AER's preliminary positions - connection charge guidelines for accessing the electricity distribution network*, 10 June 2011.

It outlines DCCEE's concerns about the proposed connection charge guidelines and the problematic issues around current charging arrangements for street lighting and distribution transformers. Specific requests for comment raised in the AER Consultation Paper are addressed, and analysis and recommendations are provided.

The reorganization of DNSP regulation under common Federal oversight of the Australian Energy Regulator presents an opportunity to correct market and/or regulatory failures in this area.

1.1 Background

The information in this report has been provided by *Exigency*, a specialist, independent energy and carbon advisory firm.

In 2003, *Exigency* undertook a study: "Whose Line is it Anyway? A review of the connection arrangements for large customers throughout the National Electricity Market"². That study identified substantial differences between jurisdictions in the National Electricity Market (NEM), both in terms of process and the determination of connection charges. More recent research undertaken by *Exigency* in 2011 confirms that many of these differences remain, raising potential equity issues within and between jurisdictions. In other words, "who pays and how much?" and "who benefits and how much?" is a function both of the geographic location and the connection process followed.

To limit the scope of this report to street lights and transformers, issues raised in the AER consultation that are pertinent to shared network and augmentation costs have not been addressed in this report.

1.2 The National Electricity Objective

The National Electricity Objective, as stated in the National Electricity Law is³:

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 –

- 1. price, quality, safety, reliability, and security of supply of electricity;*
- and*
- 2. the reliability, safety and security of the national electricity system.*

²http://www.ret.gov.au/Documents/mce/_documents/ExigencyPanelreportfinal20041221170107.pdf

³<http://www.aemc.gov.au/Electricity/Electricity-Market.html>

This paper argues that current connection charging arrangements for street lighting and distribution transformers fail to support this Objective because:

- Separation between the parties bearing the cost (the Electricity Distribution Network Service Provider (DNSP) and/or a developer) and the beneficiaries (the user and/or the retailer) can obstruct the achievement of an economically optimal outcome.
- Equity issues are created by the different funding/ownership models. This conflicts with the “long term interests of consumers of electricity”.

2. Funding/ownership arrangements for street lighting and distribution transformers

In funding/ownership arrangements for street lighting and distribution transformers, the separation between the parties bearing the cost (the DNSP and/or a developer) and the beneficiaries (the user and/or the retailer) complicates the achievement of an economically optimal outcome.

The electricity supply chain is made up of generators, grid operators, DNSPs and retailers. On the customer side, there is usually separation of ownership between the original applicant (e.g. the developer), and the ultimate owner of the facility. In turn, the owner (say a pension fund or property investment trust) might be different from the users, who may be residential, commercial or industrial lease-holding tenants. The involvement of a retailer in the provision of bundled network and energy supply services further disaggregates the supply chain.

The purchase decision for a long-lived asset would normally involve weighing the initial expenditure against the costs and benefits over the life of the asset. However, in the case of distribution transformers and street lighting, the party responsible for the upfront costs is often different from the party responsible for ongoing costs.

A connection involving the construction and energisation of new connection assets is typically instigated by an application from a network customer, such as a developer or Local Government Authority (LGA). The application often follows a process laid down by the DNSP and the design and configuration may be required to conform to installation rules monitored by the DNSP.

There appear to be 3 funding/ownership models for connection assets such as street lights and distribution transformers:

1. The developer/user funds the assets and gifts them to the Distribution Network Service Provider (DNSP). The DNSP provides connection services and levies ongoing Distribution Use of System (DUoS) charges to the user.
2. The DNSP funds and owns the connection asset. The developer/user makes a capital contribution. The DNSP provides connection services and levies ongoing DUoS charges at the published tariff.
3. Developer/user funds and retains ownership of the asset. DNSP provides connection services. DNSP charges DUoS revenue based on a connection point upstream of the user's assets. The connection point is the point that divides the assets that belong to the user from those that belong to the utility.

Depending on the type of connection asset, one or more models may be available. However, in practice, there is a tendency towards a “default” model in each jurisdiction, which may not necessarily be the optimal model for the particular circumstance.

3. Street lighting

3.1 Connection arrangements often involve information/bargaining imbalances

As discussed above, depending on the jurisdiction, street lighting may be funded by the customer (developer or LGA) and gifted to the DNSP, or purchased by the DNSP, with a capital contribution from the customer.

Either way, maintenance is in most cases subsequently undertaken by the DNSP. Within the NEM, the energy is usually supplied by a licensed retailer, who bills the user for energy and network charges. These charges may be recovered by the LGA through its rates.

In setting the network charge, account is taken of the life of the asset and the expected maintenance cost. However, the charge is usually aggregated across a number of different streetlight types with limited ability to add new configurations.

Cost and Greenhouse Gas considerations have led some Local LGAs to seek to migrate to smart lighting systems and new more efficient luminaire technologies, requiring replacement programmes.

This has raised a number of commercial issues which can create considerable complexities which have essentially been discouraging change. Sometimes the replacement programme may lead to costs that were not factored into the original connection charges.

Further, particular difficulties can arise when trying to calculate new connection charges under the existing rules when:

- there is insufficient documentation on whether the original asset was gifted or funded through capital contribution
- the original data supporting the connection application is insufficient to recalculate a new connection charge
- the proposed changes lead to changed inventory costs
- the proposed changes lead to changes to the original incremental cost/incremental revenue calculation for capital contributions
- there are information gaps about expected life of the replacement population

Problems can also arise over a whole range of areas such as:

- stranded assets, and potentially stranded costs
- changes in supply variables (such as power factor) which can add to network costs
- issues about refining the pricing structure for different street light configurations

- measuring the changed performance or the more sophisticated operation of the luminaire

In practice, this has meant that the LGAs that have been seeking change have been doing so in an environment where the commercial drivers on DNSPs and retailers actually encourage the status quo and discourage investment in more efficient street lighting technologies.

Chapter 5 of The National Electricity Rules describes rights and obligations of DNSPs and Customers (among others) in relation to network connection. DNSPs also document the application process to various levels of detail and “user friendliness”.

Whilst this affords some level of protection for applicants, in practice, there is considerable effort required to become informed as to the options and rights afforded to the customer. The decision to challenge a connection offer has to be balanced against the achievement of time-critical project delivery, for which the connection application is a small but critical component of the overall programme of works.

For the applicant, a connection application is generally a “one-off” transaction, by a relatively uninformed buyer. Unsurprisingly, applicants tend not to “rock the boat”, even if they have concerns about the reasonableness of the connection transaction.

Therefore, for street lighting, the initial procurement decision and subsequent upgrade path is often limited by the DNSP in ways that fail to support the National Electricity Objective.

3.2 Upgrade of existing street lighting

The proposed connection charging guidelines should address the current inertia experienced by some LGAs to upgrading street lighting to new technologies, by including provisions to enable the unbundling of existing network charges within a regulatory period.

Specifically, regulations should allow for changes to reflect expected increases in maintenance cost projections together with a reasonable allowance for recovery of stranded costs.

Lack of DNSP experience with new assets should not be considered a legitimate reason to defer upgrade decisions, but on the other hand, it may be appropriate for the DNSP to require a form of performance bond from the customer to cover variations from expected maintenance costs during a suitable proving period.

Where the DNSP is unable to produce documentation on the original charging assumptions and parameters, the regulator should be granted the power to determine an appropriate set of parameters that should have applied, in order to remove the risk of charging an unreasonable or inappropriate stranded asset cost.

4. Distribution transformers

4.1 Minimising capital cost tends to be prioritised over ‘whole of life’ costs and benefits

Recent research undertaken by *Exigency* into private transformer purchases identified specific areas of potential market/regulatory failure:

- Between 1 MVA and 5MVA, transformers tend to be purchased at the lowest capital outlay that satisfies the minimum energy performance standards (MEPS), where MEPS apply.
- The vast majority (approx 90%) of these purchases are gifted to the DNSP.
- The separation of purchaser and owner means that better performing assets (i.e. lowest ‘whole of life’ costs and benefits) may be ignored in favour of lowest capital cost options.
- The regulatory framework places incentives on the DNSP to minimise its capital and short-run operating costs, without due consideration of energy losses.

The separation of purchaser, owner, and user encourages procurement of least capital cost assets over lowest lifetime cost assets. By discouraging investment in technologies that exceed the minimum energy efficiency requirements (MEPS), this works to the detriment of overall economic efficiency.

4.2 Selection of distribution transformers above the minimum energy performance standard (MEPS)

Where a ‘whole of life’ economic analysis justifies purchasing a distribution transformer in excess of the minimum energy performance standard (MEPS), then this should be encouraged within the regulatory arrangements.

In particular, in cases where an asset is justified on ‘whole of life’ economic considerations for the benefit of all network users but is in excess of the minimum capital cost for a product that meets the basic regulatory requirements for energy efficiency (MEPS: minimum energy performance standards), then the regulator should accept the capital difference within the regulated asset base.

Similarly, where a developer wishes to avail itself of the long-term benefits of assets exceeding the minimum standard, the DNSP should assist the customer to make an informed decision on funding/ownership that best meets this objective.

5. Comments on the AER regulatory approach

The AER has proposed connection charging guidelines that could fail to address equity issues between existing funding/ownership models – and could unintentionally raise new ones by taking an overly prescriptive approach.

Currently, a fundamental equity issue arises in relation to connection charges. Simply:

- A connection asset funded through a partial capital contribution can take into account incremental costs and forecast network revenues from the customer.
- A connection asset funded by the customer and gifted to the DNSP may not.

With a few notable exceptions (for example, cost reflective network pricing in Queensland and, optional cost reflective pricing for large capacity connections in NSW), the same Distribution Use of System (DUOS) charging structure applies irrespective of the funding/ownership model.

Therefore, while charging arrangements correctly account for contributed capital and gifted assets from the DNSP's point of view, the range of different funding/ownership models create equity issues from a customer's perspective. The AER proposal fails to address these issues.

DCCEE is of the view that:

1. If the market was better informed and/or the bargaining powers were more balanced this situation would not arise.
2. Any connection charging regime should address this inequity.

The proposed AER charging guidelines take a capital contribution-oriented perspective, which does not take into account other valid funding/ownership models.

Connection charges should be based on a cost-revenue-test. If the cost to connect a new customer exceeds the distribution network tariff revenue collected over the pre-determined time period from this customer, the customer should pay for the shortfall⁴.

It is our position that connections assets that are gifted also involve connection charges, and so should be addressed in the national regulation of connection charges.

The consultation paper argues that:

A connecting customer's costs will be recovered as a combination of ongoing DUoS payments and upfront capital contribution, if required. Each jurisdiction currently has its own method of apportioning a

⁴ Summary, page vi

customer's connection costs as either upfront capital contributions or ongoing DUoS payments. Changing the jurisdictional balance between DUoS and capital contributions would create equity issues between new and existing customers.⁵

It is normal for equity issues to exist between new and existing customers in competitive markets and avoiding equity issues is not a compelling reason for maintaining the status quo.

It is important to recognise that equity issues might arise if the connection arrangement, made at a point in time, burdened future generations with unnecessarily high costs of service. An overly prescriptive regulatory approach could create further equity issues, by attempting to corral the current diversity of connection charging arrangements towards a single set of charging parameters.

The Consultation paper raised several issues in this area, which we have addressed in turn:

The AER seeks comments on its design criteria for the connection charge guideline.

DCCEE considers that the following key design criteria should be added to the AER guidelines:

1. The charging framework should strive for equity between the funding/ownership models available to the customer.
2. The DNSP should be required to provide sufficient information to enable the customer to make an explicit informed decision on the optimal connection arrangements over the life of the asset.
3. The regulatory guidelines should ensure that incentives remain for economically rational investment decisions in technologies that exceed the minimum regulatory requirements for energy efficiency performance.

The AER seeks comments on its preliminary position to apply a cost-revenue-test of the form $CC = ICCS + ICSN - IR(n=X)$.

Ideally, the customer's incurred costs should be taken into account in deriving the capital contribution. If this proves to be impractical, then as a fall-back, this should be made explicit to the customer to assist in making an informed decision on the ownership/funding model.

The AER requests comments on the appropriate assumptions regarding the connection period for new connections

and

The AER requests comments on how much flexibility DNSPs, or new business customers, should have to alter these default assumptions.

The DCCEE position is that the actual period deployed varies according to the type of connection asset and the primary business to be undertaken at the connection point. Existing jurisdictional guidelines vary and are provided as a guide that may be deviated from.

⁵ Consultation Paper 5.3 AER Considerations

For example, the WA Electricity Network Access Code 2004 refers to a “reasonable period” for calculating “anticipated incremental revenue”, leaving it to the DNSP to propose specifics as part of its Access Arrangement. This contrasts with Victoria, wherein the DNSP must justify a departure from a period of 15 years in the case of business customer.

In our view, and as a first step, an equitable approach would require the DNSP to disclose and justify the connection period underpinning its calculation of connection charges. Flexibility should be retained so that the DNSP and customer can best arrive at the appropriate arrangement for the particular circumstance.

For connections that are a composite of assets having different asset lives, the periods pertaining to each component should be explicitly set out, so that the cost and charging implications of future upgrades can be known and planned for in advance.

A well-considered national approach to connection regulation could address the issues discussed above and improve economic efficiency on a ‘whole of life’ economic basis, consistent with the National Electricity Objective.

In supporting the achievement of the National Electricity Objective through light-handed regulation there is a requirement for a flexible approach that is reflective of the different starting points within each jurisdiction and the potential equity issues of moving too quickly to a “one-size fits” all national approach.

6. Recommendations

A new national approach to connection charging is required to address equity issues between different funding/ownership models and to better support the National Electricity Objective. Regulators must lead this process, in light of observed market failures.

The AER's proposed connection charging guidelines could fail to address existing equity issues - and could unintentionally raise new ones - by taking an overly prescriptive approach. This report provides recommendations for a flexible approach to regulation that would recognise the current diversity of connection charging arrangements throughout the NEM.

Our recommended regulatory approach is based on DNSP disclosure. Economic efficiency could be achieved through fully-informed customers selecting funding/ownership models and charging arrangements that are optimal over the life of the connection asset, and that anticipate further technological change. This approach would require the DNSP to:

- inform the connecting customer as to the funding/ownership models available to it and the rights and obligations pertaining to each. This should include reaching an agreement about the appropriate connection point i.e. the point that divides the assets that belong to the user from those that belong to the utility. This agreement would enable the customer to give explicit informed consent to its preferred connection arrangement;
- provide sufficiently detailed calculations and assumptions on the regulatory parameters that underpin the charges to enable the connection arrangement to be adjusted on reasonable terms at some future date, in light of technology innovation;
- support the distribution transformer purchaser in investment decisions based on economically rational 'whole of life' cost considerations, including investments in technologies that exceed the minimum energy performance standards (MEPS). The DNSP should also be supportive of economically rational decisions to replace street lighting with more efficient technologies, as outlined in this report.

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