Regulatory arrangements for electricity network pricing

A REPORT PREPARED FOR NSW DEPARTMENT OF PREMIER AND CABINET

October 2014

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1 Overview

Electricity networks are an essential part of the electricity supply chain. The high voltage **transmission network** transports electricity from large power stations to 'load centres' where customers are located. The most recognisable parts of the transmission network are the overhead lines supported by large steel lattice towers. The low voltage **distribution network** transports electricity from the transmission network to customers' premises. The most recognisable parts of the distribution network are the overhead lines on wooden power poles that run down most streets in Australia.

The transmission network in New South Wales is owned and operated by Transgrid. On most measures, Transgrid is the largest transmission network in Australia: it transmits the most electricity of any transmission network business in Australia and – along with PowerLink in Queensland – has the longest network of transmission lines.

There are three distribution networks in New South Wales, each operating in different areas of the state:

- **Ausgrid** –supplies electricity to around 1,600,000 households and businesses in Sydney, on the Central Coast and in the Hunter region.
- **Endeavour Energy** –supplies electricity to around 900,000 households and businesses in Sydney, the Blue Mountains and Lithgow area, the Southern Highlands and the Illawarra region.
- **Essential Energy** –supplies electricity to around 800,000 households and businesses in regional and rural New South Wales.

Reflecting the central part that electricity networks play in the electricity supply chain, network tariffs – the prices that transmission networks and distribution networks charge for the use of their services – make up the largest part of the electricity bills that most residential customers pay to their retailer. Network pricing outcomes, therefore, are a major determinant of changes in electricity bills for customers.

Arrangements for setting network tariffs

Electricity networks are natural monopolies – this means that it is only cost-effective to have one electricity network operating in a particular area. Because electricity networks are natural monopolies, the prices that electricity network businesses can charge their customers are regulated: since natural monopolies cannot be exposed to competition, price regulation is necessary to ensure that customers do not face monopoly prices.

The framework for regulating the prices that electricity network businesses can charge their customers is designed to achieve prices for customers that reflect the

efficient costs of providing network services. In other words, the framework is designed to achieve the prices that would be achieved if network business could be exposed to competition.

This framework for regulating prices is based on a detailed set of governance arrangements that apply to all electricity network businesses, regardless of ownership. This regulatory framework is established in legislation and is administered by an independent national regulator. There is an established process for making changes to this regulatory framework, which is administered by an independent national commission.

The regulatory framework applies in the same way to all network businesses, regardless of which state they operate in and regardless of who owns them.

Network tariff outcomes and the effect of ownership

The regulatory framework for setting electricity network tariffs applies in the same way to network businesses that are government owned and privately owned. Therefore, the outcomes of the regulatory process – including network prices – should not vary as a result of the ownership of a business.

Furthermore, the available evidence on regulatory outcomes supports the view that private ownership has resulted in similar or lower network tariffs for customers. Specifically, the evidence suggests that outcomes for customers have been comparable, or better, in those jurisdictions in which network businesses are privately owned:

- The evidence suggests that capital expenditure by private businesses has not been higher, and may have been lower, than capital expenditure by government-owned businesses.
- The evidence suggests that lower capital expenditure by private businesses has not been at the expense of reliability or quality of service provided to customers.
- The evidence suggests that *network* prices have increased at the same rate, or more slowly, in states with privately owned network businesses.
- The evidence suggests that *retail* prices paid by customers have increased at the same rate, or more slowly, in states with privately owned network businesses.
- The evidence suggests that while network tariffs have been increasing in all jurisdictions, it is apparent that the network tariffs for a typical residential customer are lowest in Victoria, where the network businesses are privately owned.

2 Overview of the electricity industry

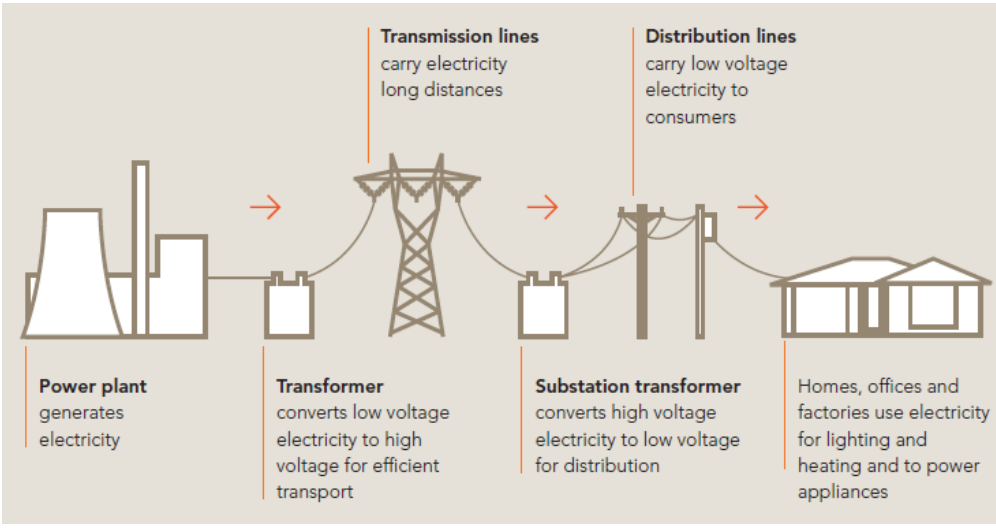
2.1 Structure of the electricity industry

Different sectors of the electricity supply industry are involved in the generation of electricity, the conveyance of electricity and the retail sale of electricity:

- For the most part, electricity is generated by large power stations. Most power stations in Australia generate electricity by burning fossil fuels: coal, natural gas and oil. Renewable energy – generated by hydro-electric power stations, wind turbines or solar photovoltaic panels – is also becoming an increasingly important source of electricity in Australia.
- Most power stations are located a long way from where customers use electricity. To ensure that electricity is transported efficiently from power stations to 'load centres' (where customers are), high voltage transmission lines are used. The most recognisable parts of this transmission network are the overhead lines supported by large steel lattice towers.
- When electricity has been transported from power stations to load centres, the high voltage transmission network connects with the low voltage distribution network. A substation transformer converts high voltage electricity to low voltage electricity suitable for use in customers' appliances. The distribution network carries this electricity to customers' premises. The most recognisable parts of the distribution network are the overhead lines on wooden power poles that run down most streets in Australia.

The physical supply chain for electricity is illustrated in Figure 1.

Figure 1: Supply chain for electricity



Source: AEMO

Most retail customers will have little or no interaction with the businesses that own and operate generation, transmission and distribution assets. Instead, the principal relationship of retail customers is with an electricity retailer. Electricity retailers bundle together the various services required to provide electricity to their customers – including the wholesale purchase of electricity and the transmission and distribution services required for that electricity to be delivered to customers – in order to supply electricity to retail customers at their premises.

Generation

Most electricity generated in Australia is generated by large power stations. Figure 2 shows the location of the major power stations in eastern Australia, and the technology that they use.

In New South Wales, the major power stations are coal-fired power stations located on the Central Coast, in the Hunter Valley and in the Central West (around Lithgow). New South Wales also has a number of hydro-electric power stations (mostly those associated with the Snowy Mountains Hydro-electric Scheme), a couple of gas-fired power stations and a small number of wind farms.

The electricity generated by major power stations is sold to electricity retailers and very large customers (such as large industrial plant) through the wholesale electricity market, which is administered by the Australian Energy Market Operator. These major power stations have no direct commercial relationship with retail electricity customers.

Patterns of ownership of generation plant are summarised in Box 1.

Box 1: Power station ownership in the NEM

Historically, the major power stations in eastern Australia were built and owned by state governments, or corporations owned by state governments. More recently, however, most government-owned power stations have been privatised and most new power stations have been built by the private sector. The key exceptions to this are:

- Two major fossil-fuel power stations in New South Wales – Vales Point and Colongra – which remain owned by the New South Wales Government.
- A number of major power stations in Queensland, which remain owned by the Queensland Government.
- The Snowy Mountains Hydro-electricity Scheme, which is jointly owned by the Commonwealth Government, the New South Wales and Victorian Governments.
- The hydro-electric power stations in Tasmania, which are owned by the Tasmanian government.

Transmission

The transmission network in eastern Australia provides for the interconnection of electricity supply in Queensland, New South Wales and the Australian Capital Territory, Victoria, Tasmania and South Australia. This interconnected electricity market is known as the National Electricity Market (NEM).

The transmission network in the NEM is made up of:

- **Intra-regional transmission networks** – which transport electricity within each of the five states in the NEM.[1]
- **Inter-regional interconnectors** – which transport electricity from one state to another.

Figure 2 shows the transmission lines in the NEM connecting major power stations with load centres, and Figure 3 illustrates which of these form part of the transmission network and which are inter-regional interconnectors. There is a single transmission network in each NEM region: Powerlink in Queensland, Transgrid in New South Wales, SP AusNet in Victoria, ElectraNet in South Australia and Tasmanian Networks in Tasmania.

On most measures, Transgrid – the transmission network in New South Wales – is the largest transmission network in Australia. Transgrid transmits the most electricity of any network business in Australia and – along with PowerLink in Queensland – has the longest network of transmission lines.

The electricity transmission networks have commercial relationships with the businesses that use their networks, including major power stations, electricity distribution networks and very large customers (such as very large industrial plant). The electricity transmission networks have no direct commercial relationship with retail electricity customers.

Patterns of ownership of transmission networks are summarised in Box 2.

Box 2: Transmission network ownership in the NEM

Historically, the transmission networks in eastern Australia were built and owned by state governments, or corporations owned by state governments. More recently, some of these networks have been privatised, meaning that the transmission networks in the NEM are now a mix of government owned and privately owned businesses:

- The transmission networks in Victoria and South Australia are **privately owned**.
- The transmission networks in New South Wales, Queensland and Tasmania are **government owned**.

1 The Australian Capital Territory forms part of the New South Wales region in the NEM.

Distribution

There are 13 distribution networks in the NEM, which together provide for the delivery of electricity to the premises of retail customers in the NEM. New South Wales, Queensland and Victoria each have a number of individual distribution networks, while the Australian Capital Territory, Tasmania and South Australia each have a single distribution network. In New South Wales, the three distribution businesses are:

- **Ausgrid** – which supplies electricity to around 1,600,000 households and businesses in Sydney, on the Central Coast and in the Hunter region.
- **Endeavour Energy** – which supplies electricity to around 900,000 households and businesses in Sydney, the Blue Mountains, the Southern Highlands and the Illawarra region.
- **Essential Energy** – which supplies electricity to around 800,000 households and businesses in regional and rural New South Wales.

Figure 3 shows the location and geographic coverage of the distribution networks in the NEM.

The distribution networks provide each of their customers with a connection to the electricity network. For that reason, the distribution networks do have obligations to their customers. However, retail customers do not receive bills from the electricity distribution network that supplies their electricity: rather, the electricity distribution network will charge retailers for the services used by the retailers' customers, and the retailers will pass-on these network charges as part of the retail electricity price.

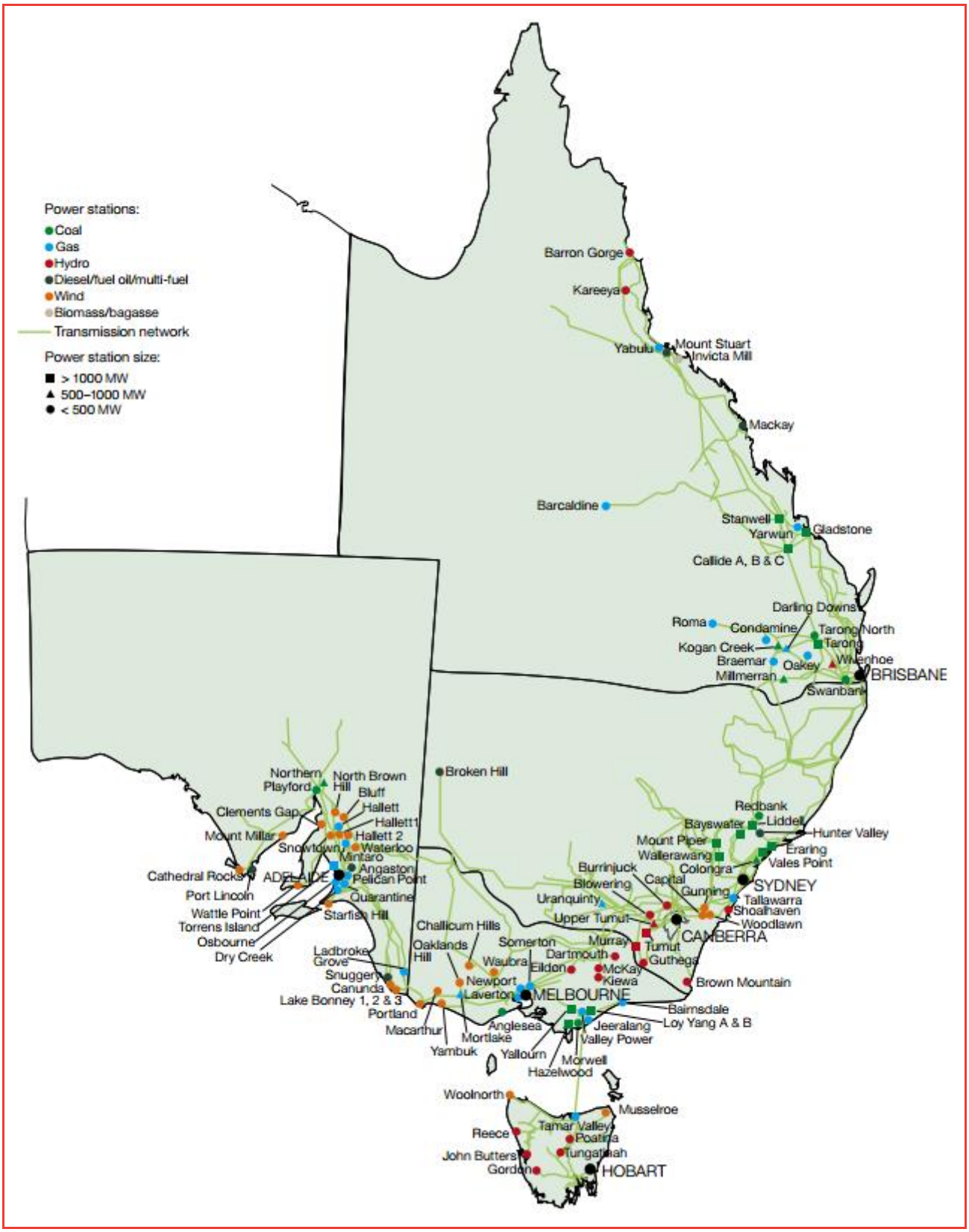
Patterns of ownership of distribution networks are summarised in Box 3.

Box 3: Distribution network ownership in the NEM

Each of the 13 distribution networks in the NEM is a monopoly in the region in which it operates. As with transmission networks, distribution networks were originally built and owned by state governments, or corporations owned by state governments, but have since been privatised in some jurisdictions. This means that the distribution networks in the NEM are a mix of government owned and privately owned businesses:

- The distribution networks in Victoria and South Australia are **privately owned**.
- The distribution networks in New South Wales, Queensland and Tasmania are **government owned**.
- The distribution network in the Australian Capital Territory is part government owned and part private owned.

Figure 2: Major power stations in eastern Australia



Source: AER; AEMO.

Figure 3: Electricity networks in eastern Australia

Source: AER

Retail

Electricity retailers buy electricity in the wholesale electricity market (from power stations) and package that electricity with transmission and distribution network services for sale to customers. The retailers also meet obligations under specified green schemes, including the Renewable Energy Target (RET).

The retailing of electricity throughout the NEM has been gradually opened to competition among retailers. All jurisdictions in the NEM now allow electricity customers to choose their electricity retailer. One of the consequences of this is that in most jurisdictions in the NEM there are now a number of retailers competing to supply retail customers. In New South Wales, there are more than 10 retailers who are active in the market.

Electricity retailers are the key point of contact between retail electricity customers and the electricity industry. Electricity retailers market directly to customers, bundle together wholesale electricity and network services, meet green scheme obligations and bill electricity customers to cover the total cost of supplying electricity and network services to those customers.

Patterns of ownership of retail businesses are summarised in Box 4.

Box 4: Retail ownership in the NEM

Retail businesses in the NEM were initially government owned. More recently, most state governments have privatised their retail electricity businesses, and a number of new privately owned retail electricity businesses have entered the market. As a result, almost all of the retailers that are active in the NEM are privately owned. The only exceptions are:

- **Aurora Energy** – which retails in Tasmania and is owned by the Tasmanian Government.
- **Momentum Energy** – which retails in a number of NEM jurisdictions and is owned by HydroTasmania, which is owned by the Tasmanian Government.
- **Ergon Energy** – which retails in regional and rural areas of Queensland and is owned by the Queensland Government.
- **ActewAGL Retail** – which retails in the Australian Capital Territory and is part owned by the Australian Capital Territory Government.
- **Red Energy** – which retails in a number of NEM jurisdictions and is owned by Snowy Hydro (which is in turn owned by the Commonwealth Government and the Governments of New South Wales and Victoria).

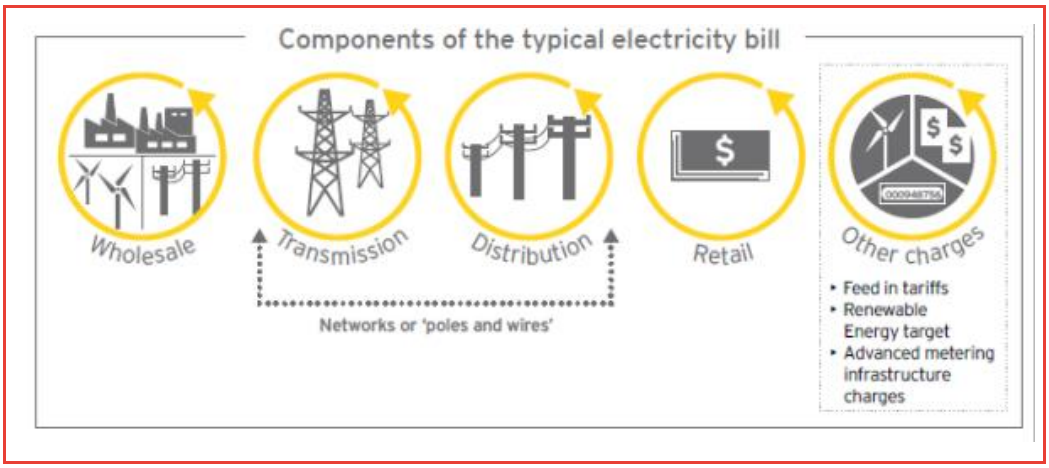
2.2 Overview of pricing in the electricity industry

There are a number of different prices in the electricity sector that are important to the bills that retail electricity customers face:

- **Wholesale electricity spot prices** – are the prices for the supply of electricity from generators to retailers and very large customers. There is a wholesale electricity spot price in each region, which all generators in a region receive and all retailers in a region pay. The electricity spot price is determined by the market forces of demand for and supply of electricity. The price is determined for every half hour and can vary significantly, even over short periods of time. On infrequent occasions, the half hour spot price can be very high.
- **Wholesale electricity contract prices** – are the prices for financial (derivative) contracts that generators and retailers use to manage the risk associated with volatile wholesale electricity spot prices. The prices of these financial contracts are determined by the market forces of demand for and supply of financial contracts.
- **Network tariffs** – are the prices that transmission networks and distribution networks charge for the use of their services. Retailers and very large customers pay network tariffs to the transmission networks and distribution networks. Network tariffs are not determined by market forces: because each network is a monopoly and so market forces cannot be relied upon to provide efficient prices. Instead these prices are set by the Australian Energy Regulator.
- **Green scheme certificate prices –** are the prices that retail businesses face in buying the certificates to meet green scheme obligations. For example, retailers need to purchase a certain number of renewable energy certificates to meet their obligations under the RET. In New South Wales, retailers need to purchase Energy Savings Certificates to meet their obligations under the Energy Saving Scheme.
- **Retail prices** – are the prices that retail businesses charge their customers for the retail supply of electricity. Because retailers are responsible for purchasing wholesale electricity and network services for their customers, retail prices will incorporate these costs. Retail prices are determined in the competitive retail market, with retailers making competing offers available to customers.

The components of a typical electricity bill are illustrated in Figure 4.

Figure 4: Components of an electricity retail bill



Source: NSW Government, Rebuilding NSW, Discussion Paper, August 2014.

3 Governance arrangements

Key messages

The National Electricity Market (NEM) incorporates a detailed set of governance arrangements that apply to all electricity network businesses, regardless of ownership.

These governance arrangements include a framework for regulating the prices that electricity network businesses can charge their customers. This regulatory framework is established in legislation and is administered by an independent regulator. There is an established process for making changes to this regulatory framework, which is administered by an independent commission.

The regulatory framework applies in the same way to all network businesses in the NEM, regardless of which state they operate in and regardless of who owns them.

New South Wales is one of the jurisdictions that form part of the NEM, along with Queensland, Victoria, Tasmania, South Australia and the Australian Capital Territory. There is a regulatory framework and a set of institutional arrangements for the NEM. This framework and these institutional arrangements apply to the network businesses in New South Wales.

In addition to the NEM-wide regulatory framework, a number of regulatory functions remain the responsibility of individual jurisdictions. For this reason, the New South Wales State Government also plays a role in the regulation of certain functions of the network businesses in New South Wales.

This Section 3 provides an overview of the legislative and regulatory framework for the NEM, and the institutions that play a role in administering this framework. The focus is on the governance arrangements that are relevant to the regulation of electricity network businesses.

3.1 Legislative and regulatory framework

Australian electricity network businesses are subject to economic regulation by the Australian Energy Regulator (AER) under the provisions of the National Electricity Law[2] (NEL) and the National Electricity Rules (NER).

2 *National Electricity (South Australia) Act* 1996, Schedule – National Electricity Law.

National Electricity Law (NEL)

The overarching legal framework for the NEM is provided by the NEL. The NEL establishes the functions of the Australian Energy Market Commission (AEMC) and the AER, and provides for the making of the NER. Section 7 of the NEL contains the National Electricity Objective (NEO):

> 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.

Both the AEMC and the AER are obliged to abide by the NEO:

- The AEMC must have regard to the NEO in performing any power or function under the NEL or the NER.[3] In particular, the AEMC may only make a change to the NER if it is satisfied that the change will or is likely to contribute to the achievement of the NEO.[4]
- The AER must exercise its economic regulatory powers and functions in a manner that will or is likely to contribute to the achievement of the NEO.[5]

The NEL has been adopted by New South Wales, all other States (apart from Western Australia), the Australian Capital Territory and the Commonwealth of Australia (together, 'the participating jurisdictions').

It is important to note that changes to the NEL can only be made if all the energy Ministers of all the participating jurisdictions agree to make the change.[6]

National Electricity Rules (NER)

The NER were made under the NEL, and remain subject to the NEL. The NER govern the operation of the NEM, setting out arrangements for key elements of the market, as summarised in Table 1.

3 NEL section 32.

4 NEL section 88.

5 NEL section 16.

6 See *Australian Energy Market Agreement*, 30 June 2004 (as amended), clause 6.6.

Table 1: Overview of the NER

Chapter	Subject
Chapter 2	The registration of electricity generators, networks and retailers.
Chapter 2A and 3	The physical operation, pricing and settlement of the wholesale spot market.
Chapter 4	The maintenance of overall power system security and reliability.
Chapter 5 and 5A	The process and technical standards for connecting to an electricity network and the procedures for network planning.
Chapter 6 and 6A	The process and methodology for setting electricity networks' price levels and structures.
Chapter 6B	The financial relationships between electricity retailers and networks.
Chapter 7	The metering of customers' electricity usage and generators' electricity output.
Chapter 8 and 9	Specific participants and jurisdictions.
Chapter 11	Transitional arrangements.

The NER are central to the economic regulation of electricity networks. Chapter 6 of the NER sets out the rules for the economic regulation of distribution networks and Chapter 6A sets out the rules for the economic regulation of transmission networks. As discussed in more detail below, the AER is responsible for giving effect to these rules.

Changes to the NER can be made by the AEMC in accordance with a process set out in the NEL, which is discussed further below.[7]

3.2 Institutions

There are a number of institutions that play a role in the governance and/or operation of the arrangements that make up the NEM. This Section 3.2 focuses on the institutions that play a role in the regulation of electricity network businesses.

COAG Energy Council

The Council of Australian Governments (COAG) is the peak inter-governmental forum in Australia. Its role is to promote policy reforms that are of national significance.

7 NEL section 34.

The COAG Energy Council is one of eight COAG councils established to deal with priority areas. Its role includes:

- facilitating national oversight and coordination of governance and policy development,
- providing national leadership on key strategic issues, and
- enhancing national consistency between regulatory frameworks.

In doing so, the COAG Energy Council seeks to ensure the safe, prudent and competitive development of Australia's energy markets to benefit the community. One of the important ways that the COAG Energy Council promotes these objectives in the electricity network sector is by referring reviews, or proposing rule changes, to the Australian Energy Market Commission.

The members of the COAG Energy Council are the Commonwealth and State and Territory ministers with responsibility for energy. For New South Wales, the Minister for Resources and Energy sits on the COAG Energy Council.

Australian Energy Market Commission (AEMC)

The AEMC is an independent national body established by COAG to oversee Australia's main energy markets. The role of the AEMC is to make rules which govern the electricity and natural gas markets in Australia, and to support the development of these markets by providing advice to the COAG Energy Council.

Any proposal to change the rules for the economic regulation of electricity networks – which are set out in Chapter 6 and Chapter 6A of the NER – will need to be considered by the AEMC. As noted above, the AEMC may only make a rule if it is satisfied that the rule will, or is likely to, contribute to the achievement of the NEO. Before making a decision about whether to change the rules, the AEMC undertakes a detailed review, including public consultation. This process is set out in more detail in Appendix 2.

Australian Energy Regulator (AER)

The AER is an independent national statutory authority, located within the Australian Competition and Consumer Commission (ACCC). The role of the AER is to regulate energy markets and networks under the NEL and the NER. The AER sets prices for electricity and gas networks, monitors wholesale electricity and gas markets and regulates retail energy markets in a number of jurisdictions, including New South Wales.

With regard to electricity networks, the AER's principal task is the economic regulation of all distribution networks and transmission networks in the NEM. The regulatory framework under which the AER operates is set out in the NEL and the NER. Under these arrangements – which are set out in Chapter 6 and

Chapter 6A of the NER – the AER is tasked with determining the revenue required by a network business and setting an appropriate ceiling on the business's revenues or prices. The network businesses must periodically (typically every 5 years) apply to the AER to assess their revenue requirements. In assessing the revenue requirements of the network business, the AER must consider the efficient costs of the network business, and set a ceiling on the revenues that the network business can earn, or the prices that the network business can charge, for the following 5 year period.

More information about the regulatory process managed by the AER is provided in Section 5.

Australian Competition Tribunal

The Australian Competition Tribunal is responsible for adjudicating on appeals of the AER's determinations.

More information about this appeal process is provided in Section 5.1.

New South Wales Government

Currently, the reliability standards that network businesses are required to meet are determined individually by the jurisdictions. This means that the reliability standards in New South Wales are not the same as those that apply in other states.

As well as having responsibility for setting reliability standards for the network businesses, the New South Wales Government has a number of other roles that are relevant to network businesses:

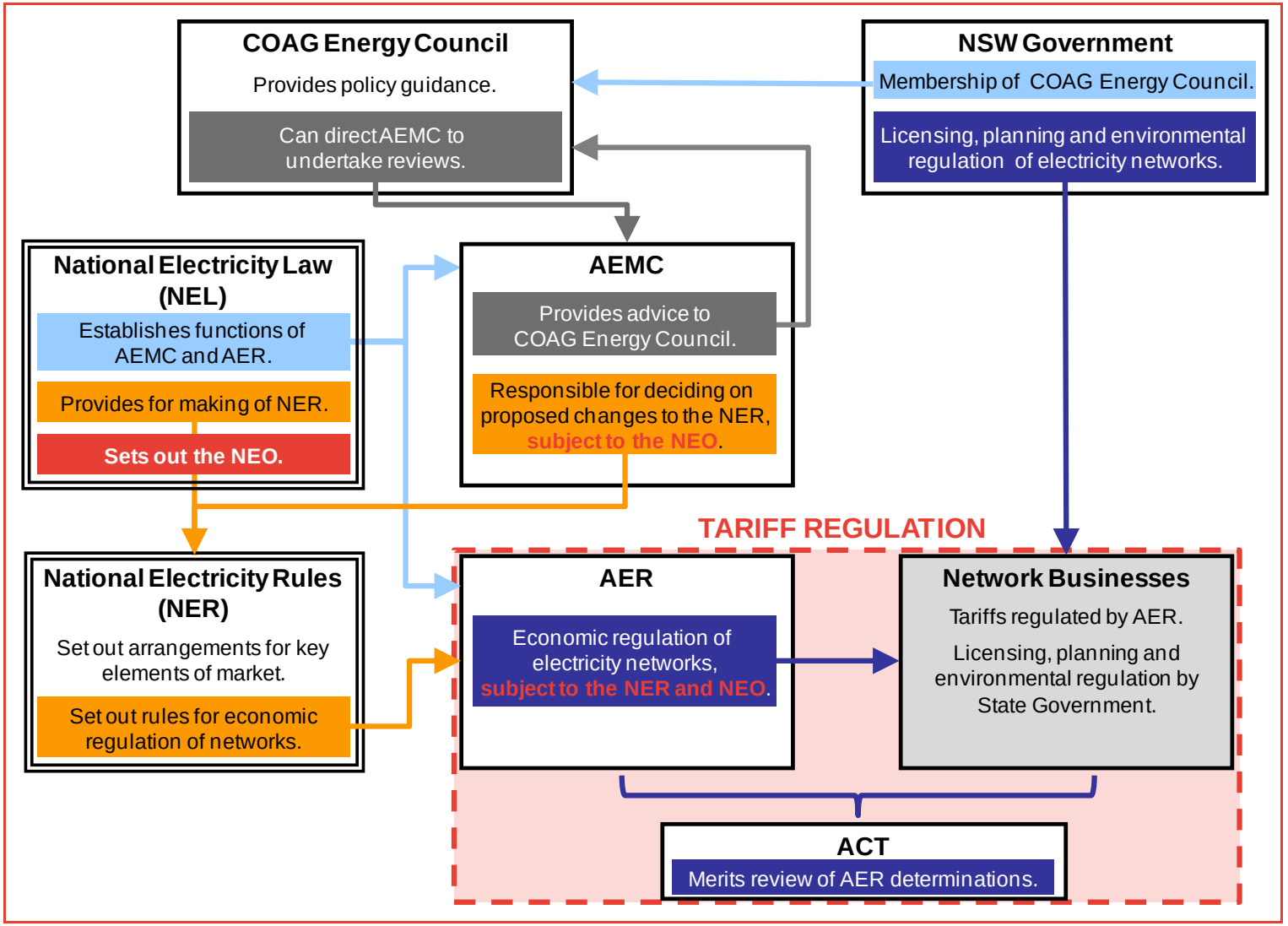
- Licensing – the Minister for Resources and Energy issues licences for the distribution of electricity. These licences are subject to standard conditions covering matters such as consumer protection and network reliability.
- Planning approvals for network assets.
- Certain environmental regulations that apply to network assets.

3.3 Relevance of ownership

Figure 5 provides a schematic overview of the key legislative and institutional arrangements that govern the regulation of electricity network tariffs.

These legislative and institutional arrangements apply in the same way for network businesses that are government owned and network businesses that are privately owned. As far as the New South Wales network businesses are concerned, therefore, these arrangements will apply in the same way regardless of whether a share of their ownership is transferred to private owners.

Figure 5: Legislative and institutional arrangements for network tariff regulation



Source: Frontier Economics

4 Consumer protections

Key messages

The prices that electricity network businesses can charge their customers are regulated because these businesses are natural monopolies. Since natural monopolies cannot be exposed to competition, price regulation is necessary to ensure that customers do not face monopoly prices.

The framework for regulating the prices that electricity network businesses can charge their customers in the NEM is designed to achieve prices for customers that reflect the efficient costs of providing network services. In other words, the framework is designed to achieve the prices that would be achieved if network business could be exposed to competition.

There are regulatory arrangements at all levels of the electricity supply chain that are intended to promote the long-term interests of electricity consumers. Briefly, these arrangements include:

- **Electricity wholesale markets** – the AER is responsible for monitoring, investigating and enforcing compliance by generators in the NEM with the NEL and the NER.
- **Electricity networks** – the AER is responsible for price regulation of network businesses in the NEM and individual jurisdictions are responsible for imposing, monitoring and enforcing licence conditions related to matters such as consumer protection and network reliability.
- **Electricity retail markets** – in jurisdictions in which retail price regulation remains in place, the state-based regulator is responsible for price regulation. In most jurisdictions (including New South Wales) the AER is responsible for monitoring and enforcing compliance by retailers with their obligations under retail laws and regulations.

This report does not deal in any detail with arrangements in electricity wholesale markets or electricity retail markets. Rather, this report deals with the regulatory regime that applies to electricity networks in the NEM, with a particular focus on the pricing aspects of this regulatory regime. These aspects are summarised in this Section 5.

4.1 Economic regulation of network businesses

Economic regulation refers to regulation that limits the revenues that businesses can earn and/or the prices they can charge for the services they provide. In the case of electricity networks, the principal regulated service is the conveyance of

power from generators to retail customers using the transmission and distribution systems.

The need for economic regulation

Without economic regulation, electricity networks would be able to charge very high prices for the use of their networks. This is because customers have little choice as to which electricity networks to use. A typical customer in a certain location will be connected to a particular distribution network, which itself will be connected to a particular transmission network; electricity generators in the same region of the NEM are also typically connected to the same transmission network. Customers cannot opt to connect to a different network unless they move premises. The reason that there is only one transmission network and one distribution network in each geographic area is that these networks are what are known by economists as 'natural monopolies'. This means that it would be too expensive to build a duplicate network (see Box 5).

In Australia, the prices of goods or services provided by natural monopolies (which include things like electricity, gas and water networks, certain transport infrastructure and certain telecommunications infrastructure) tend to be set by regulation. Since competition cannot be relied upon to drive natural monopolies to set prices to their customers that are efficient, prices are set by regulation.

Box 5: Electricity networks are natural monopolies

The reason that electricity networks face little competition in a given area – and hence why they will remain regulated for the foreseeable future – lies in their physical and technical qualities. Because of these physical and technical qualities, electricity networks are widely acknowledged by economists and policy-makers as exhibiting strong natural monopoly characteristics. This means it is cost-efficient to have a single network business operating in a particular area.

Natural monopolies arise due to strong economies of scale. Economies of scale mean that it is cheaper to provide a service 'in bulk' than it is to provide a small quantity of the service. Distribution businesses experience economies of scale: the total cost to supply ten customers in a street is not much higher than the cost of supplying one customer because once the businesses has built its network out to that street, extending the network slightly to supply more customers in the same street does not greatly increase its costs. Therefore, the average per-customer cost of supply tends to fall.

Where the average per-customer cost of supply continues to fall as a business supplies more customers, it can be cheapest for one firm to supply the whole market. This is true of most electricity distribution networks: a firm will only be able to capture the full extent of scale economies by being the sole network in that area. In other words, it would be inefficient to have two sets of poles and wires in the same area.

The form of economic regulation

The form of economic regulation applied to electricity network businesses in Australia is broadly known as 'building block incentive-based' regulation:

- **Building block** – means that the amount of revenue that a network business is allowed to earn from the provision of regulated services is determined by adding up estimates of the various cost components the business needs to incur to provide those services efficiently. The purpose of the building block approach is to ensure that businesses can earn what they need to provide regulated services, and no more. Generally, building block regulation is applied over a fixed regulatory control period (RCP), which is currently five years for most electricity network businesses. The amount of revenue that the network businesses can earn over the RCP is based on a forecast of efficient costs the business would incur over this period.
- **Incentive-based** – means that the amount of regulated revenue that network businesses are allowed to earn from customers over a RCP is fixed in advance. Therefore, if a network business can reduce its costs below the costs included in its building block allowance, the business can 'keep the difference' for a period of time. Conversely, if the network business incurs higher costs than its building block allowance, it will bear the difference for a period of time. This attribute – known as 'benefit-sharing' – is designed to encourage network businesses to minimise their costs while continuing to meet or exceed stipulated reliability or performance targets.

At the end of every RCP, each network's building block allowance is reset for the next RCP. The new allowance takes into account any efficient cost overruns or savings the business made over the previous RCP. In this way, the benefits of cost savings (or the losses of cost overruns) made by a network business in response to the incentives they face are gradually passed-on to customers through lower (or higher) regulated revenues and prices.

4.2 Other regulatory obligations of network businesses

The economic regulatory regime applicable to electricity networks in the NEM operates subject to a range of government-mandated reliability, safety and environmental obligations. These obligations are typically imposed under legislation, regulations or subordinate instruments such as licence conditions. First and foremost, network businesses are expected to satisfy these obligations. The incentives arising from the economic regulatory regime are designed to encourage networks to reduce costs while continuing to meet these other obligations. Sub-section 7A(2) of the NEL supports the primacy of these non-cost-related obligations, by providing that electricity networks *should be provided*

with a reasonable opportunity to recover at least the efficient costs incurred in providing regulated services or in meeting a regulatory obligation.

4.3 Relevance of ownership

The network businesses in New South Wales are natural monopolies, in the same way as the network businesses in other states. For this reason, the network businesses in New South Wales are subject to the same building block incentive-based regulation as the network businesses in other jurisdictions. And this will continue regardless of ownership changes.

5 Current approach to network regulation

Key messages

The framework for regulating the prices that electricity network businesses can charge their customers is detailed and prescriptive.

The regulatory framework is administered by an independent regulator. The process that the independent regulator has to follow in regulating prices is set out in the National Electricity Rules. This process requires the independent regulator to invite stakeholder submissions. The independent regulator is also assisted in the regulatory process by a Consumer Challenge Panel, which offers a consumer perspective.

The National Electricity Rules also establishes the principles to be applied in determining the prices that electricity network businesses can charge their customers.

This regulatory process, and the principles to be applied in determining prices, are the same for all network businesses in the NEM, regardless of which state they operate in and regardless of who owns them.

As noted above, electricity distribution and transmission network businesses are regulated by the AER under the provisions of Chapter 6 and Chapter 6A of the NER, respectively. Both chapters deal with the processes for regulating networks' revenues and the methodology for establishing allowed building block revenues. Section 5 provides an overview of these processes and methodologies.[8]

5.1 The regulatory process

Part E of Chapter 6 and Chapter 6A sets out the procedures for the making of regulatory determinations by the AER for distribution and transmission networks, respectively. Both processes stretch over approximately 30 months, with the AER's final regulatory determination due to be published two months before the determination formally takes effect at the start of the new RCP.

In broad terms, the regulatory process going forward will involve the following key steps:

8 As discussed in Appendix 5, the approach to network regulation has changed in recent years pursuant to changes made to the NER in 2012. The regulatory determinations for NSW network businesses being undertaken currently by the AER (which will span the period from July 2015 to June 2019) are governed by slightly different terms than those that will apply in the future (starting with the determinations for the period from July 2019 to June 2024). This Section 5 focuses on the approach to network regulation that will be applicable for future determinations.

1. The AER is required to publish a 'framework and approach' paper 23 months before the end of the network business's current RCP, setting out the AER's proposed approach to the business's next regulatory determination.
2. The network business must submit a detailed regulatory proposal to the AER at least 17 months prior to the end of its current RCP. The regulatory proposal must set out the business's proposed regulated revenues for the following RCP, based on the various building block cost components.
3. The AER must publish:
   - the network business's regulatory proposal and related documents
   - an issues paper the AER has prepared seeking written submissions from stakeholders, allowing at least 30 or 45 business days for stakeholders to respond
   - an invitation to stakeholders to attend a public forum on its issues paper, well before stakeholder submissions are due to be submitted.
4. The AER must then publish, 9 months before the RCP ends:
   - a draft determination setting out where it refuses to approve any aspect of the network business's regulatory proposal
   - notice of a predetermination conference
   - an invitation for stakeholders to make written submissions.
5. The AER must ultimately publish, at least 2 months prior before the RCP ends, a final determination setting out:
   - where it has not accepted elements of a network business's regulatory proposal,
   - reasons why it has not accepted those elements of the proposal
   - its decision in substitution of those elements of the regulatory proposal it has not accepted.

A detailed summary of the regulatory process is shown in Appendix 3.

Customer engagement and the Consumer Challenge Panel

The regulatory process offers numerous opportunities for interested parties to comment on network businesses' proposals and the AER's assessments of them. The key opportunities for consumer input arise in response to:

- the AER's Issues Paper on the network business's regulatory proposal, and
- the AER's Draft Determination on the business's regulatory proposal.

Also, as part of the AER's recent 'Better Regulation' reforms (discussed further in Appendix 5), the AER established the Consumer Challenge Panel (CCP). The CCP assists the AER to make better regulatory determinations by providing input on issues of importance to consumers. Regulatory determinations are technical and complex processes which can make it difficult for ordinary consumers to participate. The expert members of the CCP bring consumer perspectives to the AER to better balance the range of views considered as part of the AER's decisions.

The roles of CCP members include:

- Advising the AER on whether a network business's proposal is justified in terms of the services to be delivered to customers; whether those services are acceptable to, and valued by, customers; and whether the proposal is in the long term interests of consumers.
- Advising the AER on the effectiveness of a network business's engagement with their customers and how this engagement has informed, and been reflected in, the development of its proposal.

Scope for merits review

Following a final determination by the AER, an interested party may apply to the Australian Competition Tribunal for a review of the merits of the determination.

To have a decision amended, the applicant must demonstrate to the Tribunal that the AER:

- made an error of fact that was material to its decision
- incorrectly exercised its discretion, having regard to all the circumstances, or
- made an unreasonable decision, having regard to all the circumstances.

If the Tribunal finds the AER erred, it can substitute its own decision or remit the matter back to the AER for consideration.

The Tribunal may only change the AER's decision if this would lead to a materially preferable decision in relation to the achievement of the NEO. This represents a change from the previous criteria for merits reviews (discussed further in Appendix 5).

5.2 How the regulator sets network prices

As noted above, the form of economic regulation applicable to electricity networks in the NEM is known as building block incentive-based regulation.

The legal foundation for this approach is the revenue and pricing principles contained in Section 7A of the NEL (see Box 6), which requires that a network

business should have a reasonable opportunity to recover its efficient costs and should be provided with incentives to promote efficiency.

Box 6: Section 7A of the NEL

(2) A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in—

  (1) providing direct control network services; and

  (2) complying with a regulatory obligation or requirement or making a regulatory payment.

(3) A regulated network service provider should be provided with effective incentives in order to promote economic efficiency with respect to direct control network services the operator provides. The economic efficiency that should be promoted includes—

  (a) efficient investment in a distribution system or transmission system with which the operator provides direct control network services; and

  (b) the efficient provision of electricity network services; and

  (c) the efficient use of the distribution system or transmission system with which the operator provides direct control network services.

Schedule 1 of the NEL also provides for the NER to address the development of building block regulatory methodologies and incentive schemes for network operators.

Regulated revenues – building block components and incentive mechanisms

The building block components (which together 'build up' the revenue that networks are allowed to earn from the provision of regulated services) are intended to reflect the costs to the network business of providing the regulated services. These costs include a return on capital and a return of capital, operating and maintenance expenditure, tax and revenues related to various incentive schemes. More detail on these components is set out in Appendix 4.

The regulatory arrangements applicable to electricity networks in the NEM seek to provide networks with a range of incentives to reduce costs and improve their performance, subject to meeting their other regulatory obligations. The key incentive schemes currently or soon to be applicable to transmission and distribution networks in the NEM are set out in Appendix 4.[9]

9 See also AER, *Overview of the Better Regulation reform package*, April 2014.

Derivation of network tariffs

Once a network business's allowed regulated revenue for a RCP has been established, this is used to set the business's regulated revenues for each year within the RCP. At this stage, the network business needs to derive prices for its customers that seek to recover its annual regulated revenue.

The pricing proposals developed by network businesses must comply with a set of pricing principles set out in Clause 6.18.5 of the NER (see Box 7). These principles seek to relate tariffs to the underlying costs that distribution network businesses face.

Box 7: Clause 6.18.5 of the NER

(a) For each tariff class, the revenue expected to be recovered should lie on or between:

  (1) an upper bound representing the stand alone cost of serving the retail customers who belong to that class; and

  (2) a lower bound representing the avoidable cost of not serving those retail customers.

(b) A tariff, and if it consists of 2 or more charging parameters, each charging parameter for a tariff class:

  (1) must take into account the long run marginal cost for the service or, in the case of a charging parameter, for the element of the service to which the charging parameter relates; and

  (2) must be determined having regard to:

    (i) transaction costs associated with the tariff or each charging parameter; and

    (ii) whether retail customers of the relevant tariff class are able or likely to respond to price signals.

(c) If, however, as a result of the operation of paragraph (b), the Distribution Network Service Provider may not recover the expected revenue, the provider must adjust its tariffs so as to ensure recovery of expected revenue with minimum distortion to efficient patterns of consumption.

There are two broad ways – known as 'forms of price control' – in which regulated businesses can set and vary the level of their prices from year to year:

- **Revenue cap** – in which the business can raise or lower its prices from year to year if it under-recovers or over-recovers, respectively, its regulated revenue for a particular year.

- **Price cap** – in which prices do not vary from year to year in response to previous over-recovery or under-recovery of annual revenues.[10]

Broadly speaking, the main difference between these two forms of control is that the regulator must forecast future demand in order to determine capped prices, but is not required to do so in order to cap revenues. To the extent that demand forecasts are susceptible to error, network businesses bear demand risk under price cap regulation, but do not under revenue cap regulation. Therefore, network businesses are subject to more revenue risk under a price cap form of control than under a revenue cap form of control.

The extent to which network tariffs can change over time is partly a function of the form of price control. All transmission networks in the NEM are subject to revenue caps.[11] This means that they have a reasonable degree of freedom to vary the level of their prices from year to year as long as the aggregate revenue recovered over a RCP matches the allowed regulated revenue for that RCP. The NER requirements for distribution networks in the NEM are more flexible.[12]

5.3 How network tariffs affect retail tariffs

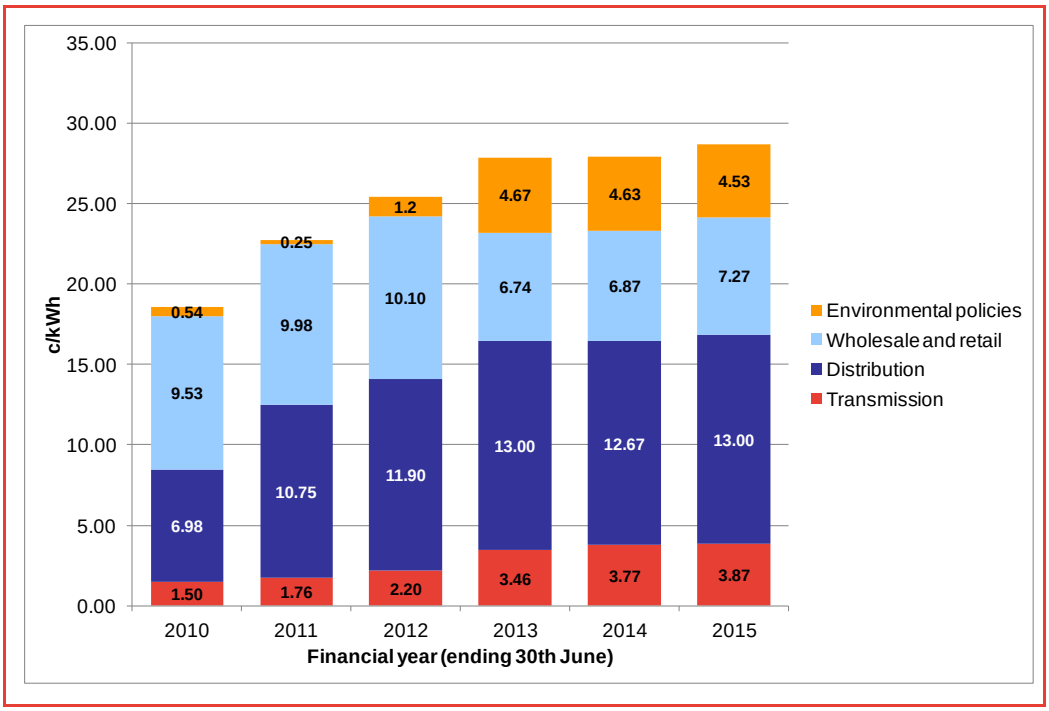
Electricity network tariffs are the main input to the retail tariffs offered by energy retailers. In most NEM jurisdictions, network tariffs comprise about half retail tariffs. The remainder of retail tariffs reflect the wholesale cost of power, retailer costs and margins and miscellaneous other costs (such as the costs of complying with green schemes). An estimate of the components of retail prices for a typical New South Wales customer is shown in Figure 6. It is clear from Figure 6 that network costs are the largest component of retail prices, and that increases in network costs since 2010 are the primary cause of increases in retail prices.

10 Under a price cap, if prices are set based on forecast volumes that prove to be higher than actual volumes, this means that the prices will tend to be relatively low and hence under-recover regulated revenues over a RCP. Conversely, if forecast volumes prove to be lower than actual volumes, this means that the prices will tend to be relatively high and hence over-recover regulated revenues over a RCP.

11 NER, 6A.4.2(a)(1).

12 NER, 6.2.5.

Figure 6: Components of retail prices for a typical NSW customer



Source: AEMC

5.4 Relevance of ownership

The process and methodology used to set regulated revenues and prices for electricity network businesses in the NEM are the same regardless of network ownership. This means that the network tariffs customers face do not depend on whether the network is owned by a jurisdictional government or a private or institutional investor.

State governments have – and will retain – an ongoing role in setting reliability standards for both transmission and distribution networks.[13] As networks are legally obliged to meet jurisdictional reliability standards, and the economic regulatory framework allows networks to recover the cost of any capital and operating expenditure needed to efficiently meet such standards, government policy decisions regarding the appropriate level of reliability have a substantial impact on regulated network revenues and tariffs. However, this role and influence exists irrespective of whether governments own network businesses.

13 See AEMC, *Final Report, Review of the national framework for distribution reliability*, 27 September 2013, p.4.

6 Comparative network pricing outcomes

Key messages

In the last few years, there have been a number of significant amendments to the framework for regulating the prices that electricity network businesses can charge their customers. In large part these amendments have been a response to the substantial increases in network tariffs over recent years and these amendments are intended to ensure that future changes to the network tariffs that customers face are consistent with the National Electricity Objective.

This amended regulatory framework for setting electricity network tariffs applies in the same way to network businesses that are government owned and privately owned. Therefore, the outcomes of the regulatory process – including network prices – should not vary as a result of the ownership of a business.

The evidence on regulatory outcomes, including the evidence on regulated network prices, supports the view that private ownership does not result in higher network tariffs for customers.

As noted above, network pricing outcomes are derived from the AER's regulated revenue determinations for the relevant network business. Regulated revenues, in turn, are derived from the building block components outlined in Section 5.2 and discussed in detail in Appendix 4. An analysis of regulated revenues and network pricing outcomes supports the view that the private ownership of network businesses in Victoria and South Australia has not resulted in worse outcomes for customers.

First, this Section 6 presents information on two key drivers of network businesses' building block revenues:

- **Capital expenditures** – feed in to the determination of the network businesses' RAB, which helps determine the return on capital and return of capital. Capital expenditure is the cost of purchasing and installing assets like poles and wires.
- **Operating expenditures** – are a building block element in their own right. Operating expenditure is the cost of running the electricity network and include labour costs, fuel costs and the cost of other consumables.

This section highlights trends in network businesses' capital expenditure and operating expenditure across jurisdictions.

Second, this Section 6 presents information on network prices across jurisdictions.

In considering the data in this section, it is important to note that these measures of expenditures and prices do not adjust for network customer density, geographic terrain or other key factors influencing network costs and network

reliability. Because the data cannot be directly compared on a like-for-like basis, definitive conclusions about the drivers of network outcomes cannot be formed.

6.1 Capital expenditure

Capital expenditure is a major driver of network pricing outcomes. Significant increases in capital expenditure by network businesses over their recent RCPs have, therefore, contributed to significant increases in network tariffs.

Figure 7 shows the level of capital expenditure by transmission and distribution network business in the NEM over the current RCP (the blue bars) and the previous RCP (the green bars). The dark blue dots signify the value of the business's RAB at the start of the current RCP. This means that the RABs do not incorporate the very large levels of capital investment occurring in the current RCP.

Network investment over the current five year RCP cycle is forecast at over $7 billion for transmission networks and $36 billion for distribution networks. These forecasts represent an increase on investment in the previous regulatory periods of around 16 per cent in transmission and 60 per cent in distribution (in real terms).[14]

The AER noted that much of the increase in allowed and actual capital expenditures reflected increased capital needs to replace ageing assets, meet higher reliability and new bushfire (safety) standards, and respond to forecasts made at the time of rising peak demand.[15] However, forecast increases in peak demand have not materialised in all cases. For instance, the AER notes:

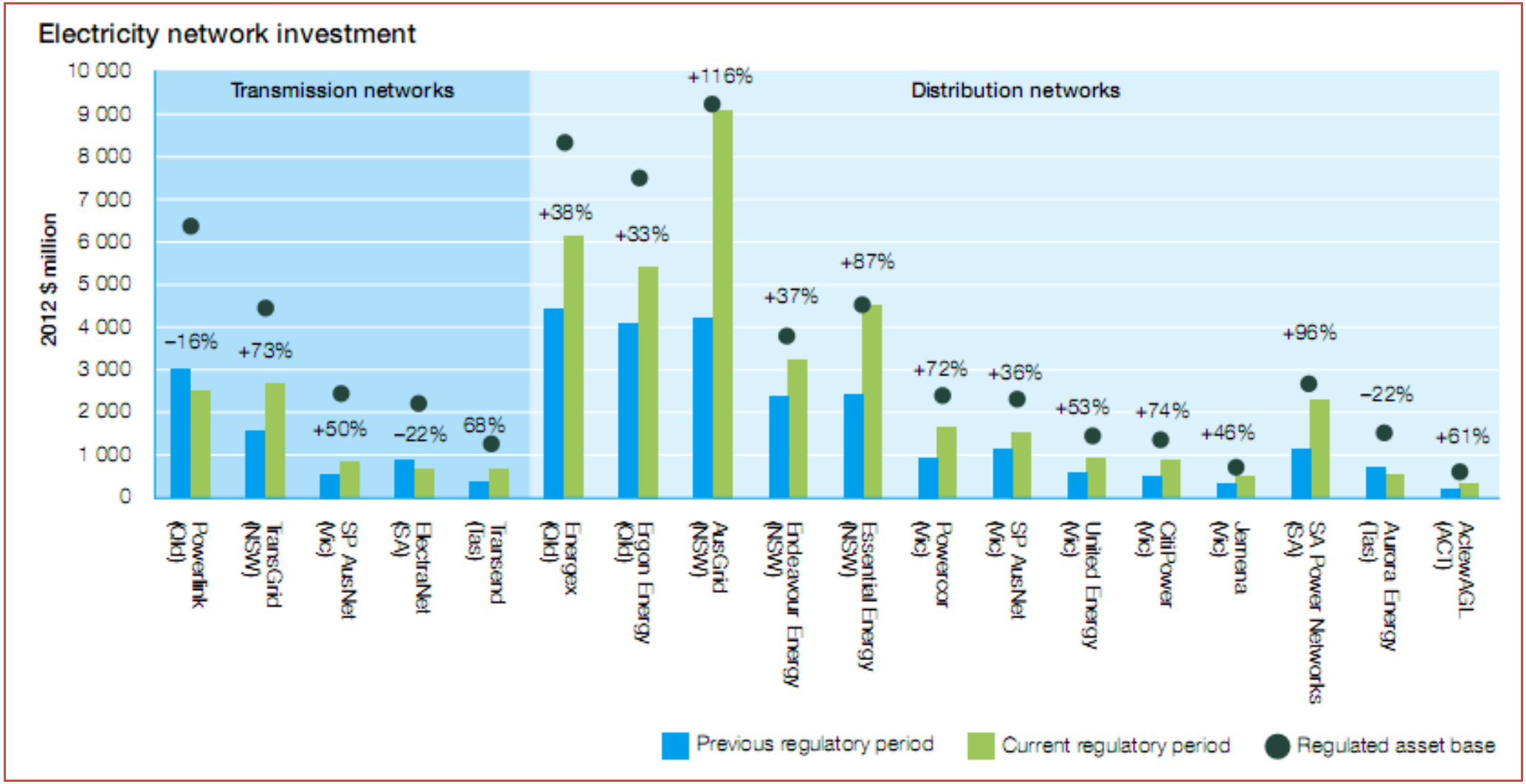
> The determination for the AusGrid distribution network in New South Wales for 2009–14, for example, provided for capital investment to meet an expected increase in peak demand from 5500 to 6700 megawatts over the period. But these forecasts proved optimistic; actual peak demand over the first four years of the period did not surpass 6000 megawatts, and the forecast for 2013–14 is below this level.[16]

14 AER, *State of the Energy Market 2013*, p.72.

15 AER, *State of the Energy Market 2013*, p.72.

16 AER, *State of the Energy Market 2013*, p.72.

Figure 7: Electricity capital expenditures and previous RAB values



Source: AER State of the Energy Market 2013, *Figure 2.6, p.73.*

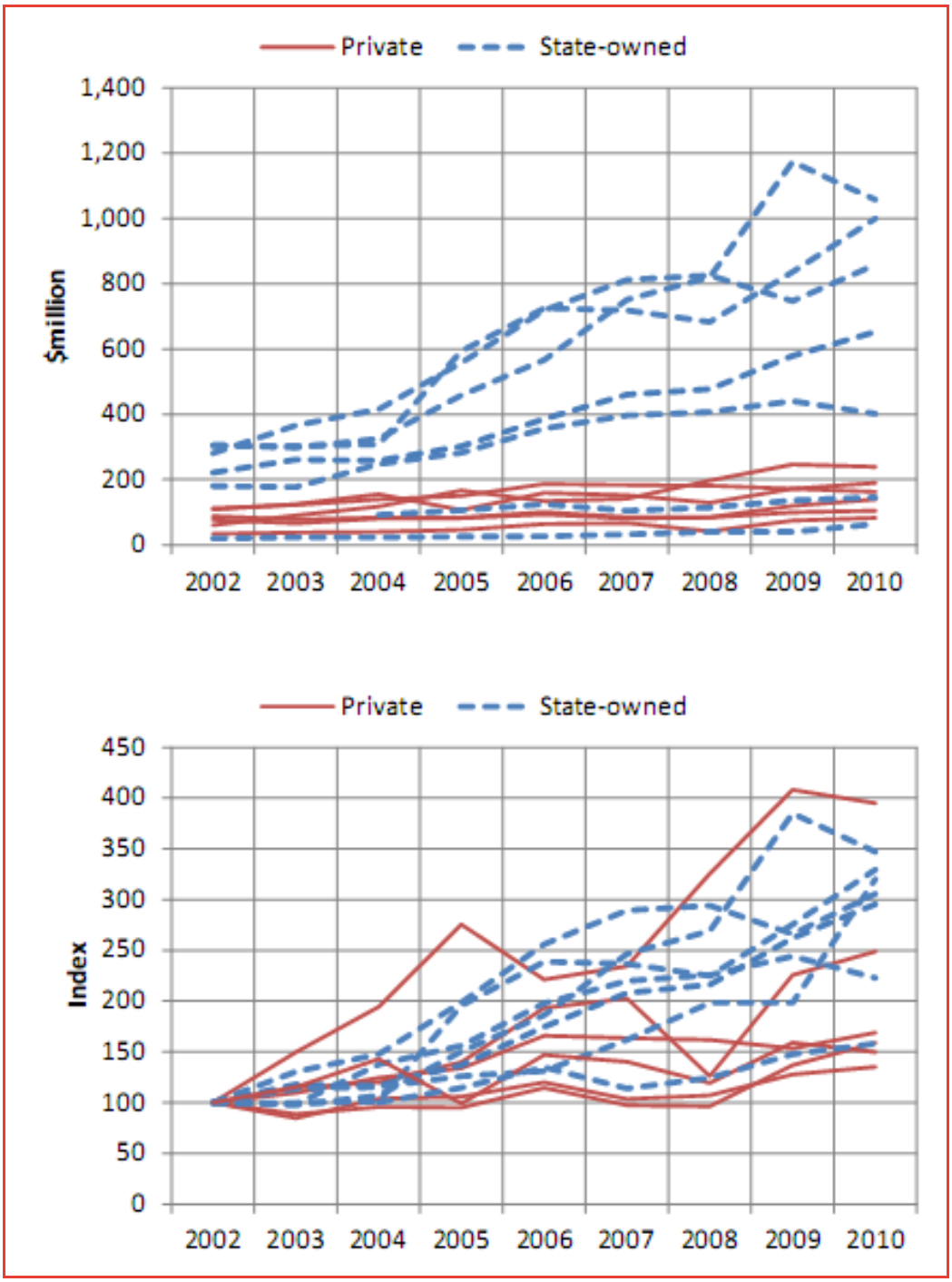
The information on capital expenditure presented in Figure 7 does not support the view that capital expenditure has been increasing at a faster rate for privately owned network businesses. Furthermore, analysis over a longer period by the Productivity Commission supports the view that private ownership does not result in higher capital expenditure (leading to higher prices). In its 2013 report on electricity network regulatory frameworks, the Productivity Commission tabled some empirical analysis on capital expenditures by network business ownership. It found that distribution network capital expenditures were *much higher* in absolute terms and *generally higher* in relative terms for government-owned networks than for privately-owned networks. The results of the Productivity Commission's analysis are reproduced in Figure 8.[17]

Further, we note that the average age of the privatised Victorian distribution networks does not appear to be higher – if anything, is lower – than New South Wales distribution networks.[18] This suggests that the notion that Victorian networks will soon need to embark on a large-scale wave of capital expenditure, as New South Wales networks have done over the last decade, is unlikely to be the case.

17 Productivity Commission, *Electricity Networks Regulatory Frameworks, Inquiry Report, Volume 1*, No.62, 9 April 2013, p.241.

18 CSIRO, *Modelling the Future Grid Forum Scenarios*, Figure 16, p.44.

Figure 8: Distribution network business capital expenditure by ownership type



Source: Productivity Commission, Electricity Networks Regulatory Frameworks Inquiry Report, *Figure 6.3, p.241.*

6.2 Operating expenditure

Operating expenditure is also a significant driver of network pricing outcomes. Significant increases in operating expenditure by network businesses over their recent RCPs have, therefore, contributed to significant increases in network tariffs.

Figure 9 shows the level of operating expenditure by transmission and distribution network business in the NEM over the current RCP (the blue bars) and the previous RCP (the green bars).

In its 2013 State of the Energy Market report, the AER noted:

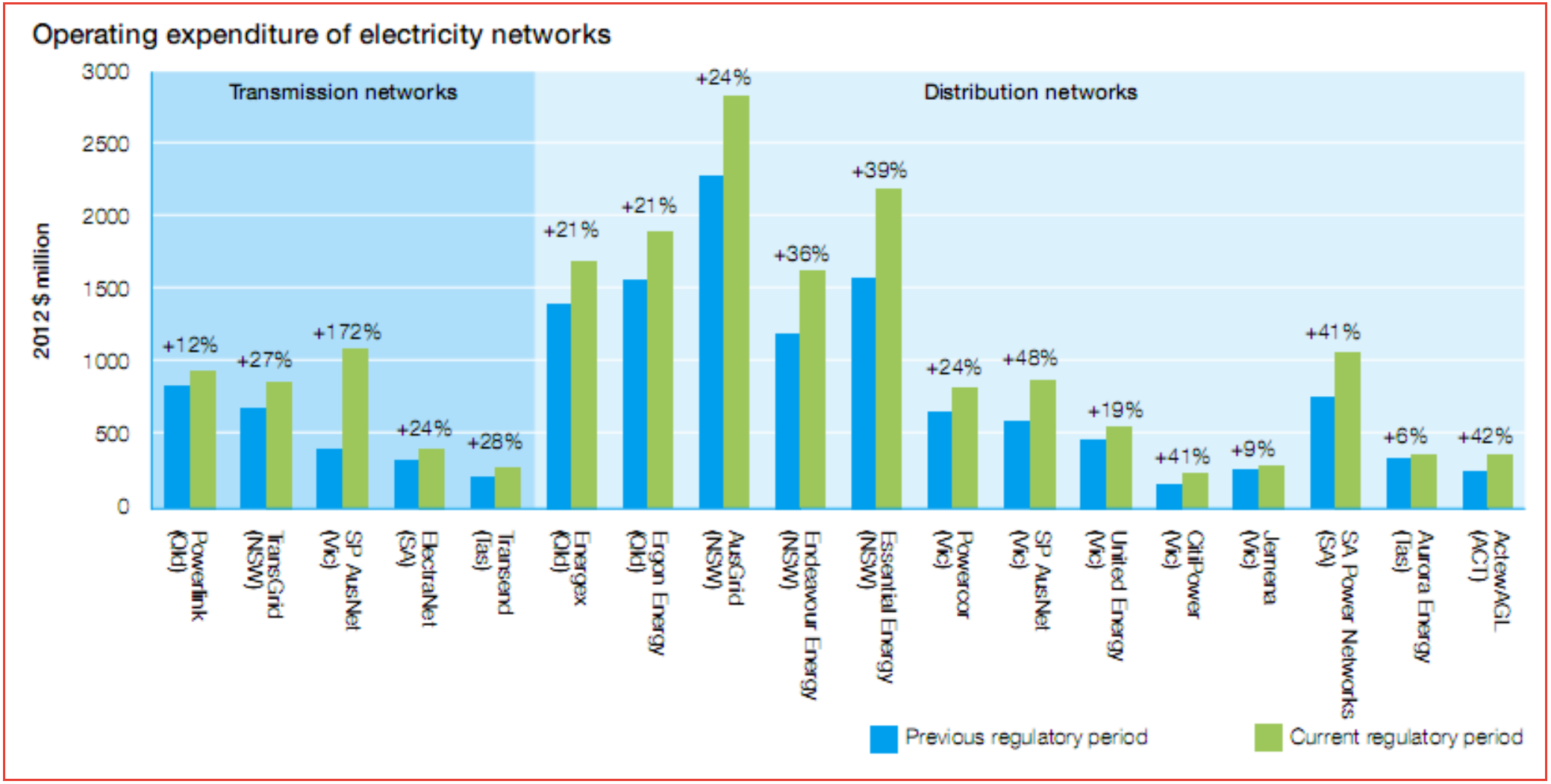
> In the current cycle, transmission businesses in the NEM are forecast to spend $3.6 billion on operating and maintenance costs. Distribution businesses are forecast to spend almost $15 billion. Differences in the networks' operating environments result in significant variations in expenditure allowances. On average, costs are forecast to rise by 45 per cent in transmission and 28 per cent in distribution for the current regulatory periods, compared with previous regulatory periods.[19]

The information on operating expenditure presented in Figure 9 does not support the view that operating expenditure has been increasing at a faster rate for privately owned network businesses. The one apparent exception to this is the Victorian network operator – SP AusNet – which, on the AER's analysis, has seen a 172 per cent increase in operating expenditures. However, a review of the regulatory determinations for SP AusNet[20] reveals that a very substantial part of this increase was due to a decision by the Victorian Government to extend land tax to electricity transmission easements in Victoria. This resulted in a very significant increase in operating costs for SP AusNet, but one that was outside the control of the business.

19 AER, State of the Energy Market 2013, p.73.

20 SP Ausnet, *Electricity Transmission Revised Proposal*, 2008/09 to 2013/14.

Figure 9: Electricity operating expenditures



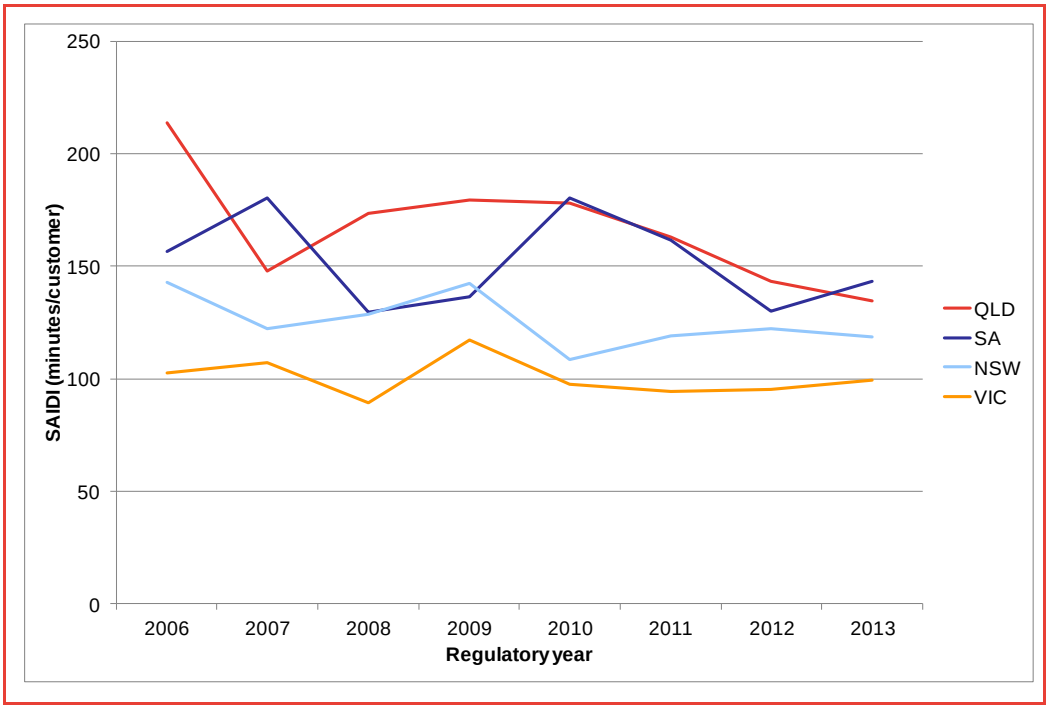
Source: AER State of the Energy Market 2013, *Figure 2.7, p.74.*

6.3 Network service quality and reliability

Importantly, it does not appear that lower capital and operating expenditures in Victoria and South Australia compared with Queensland and New South Wales have been at the expense of the reliability or quality of service.

For example, two key measures of distribution network service quality – System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) – appear to be no worse, and are frequently better, amongst the privately-owned Victorian distribution businesses than amongst the government-owned New South Wales and Queensland network businesses. This is shown by the comparison of SAIDI and SAIFI for New South Wales, Victoria, Queensland and South Australia in Figure 10 and Figure 11.

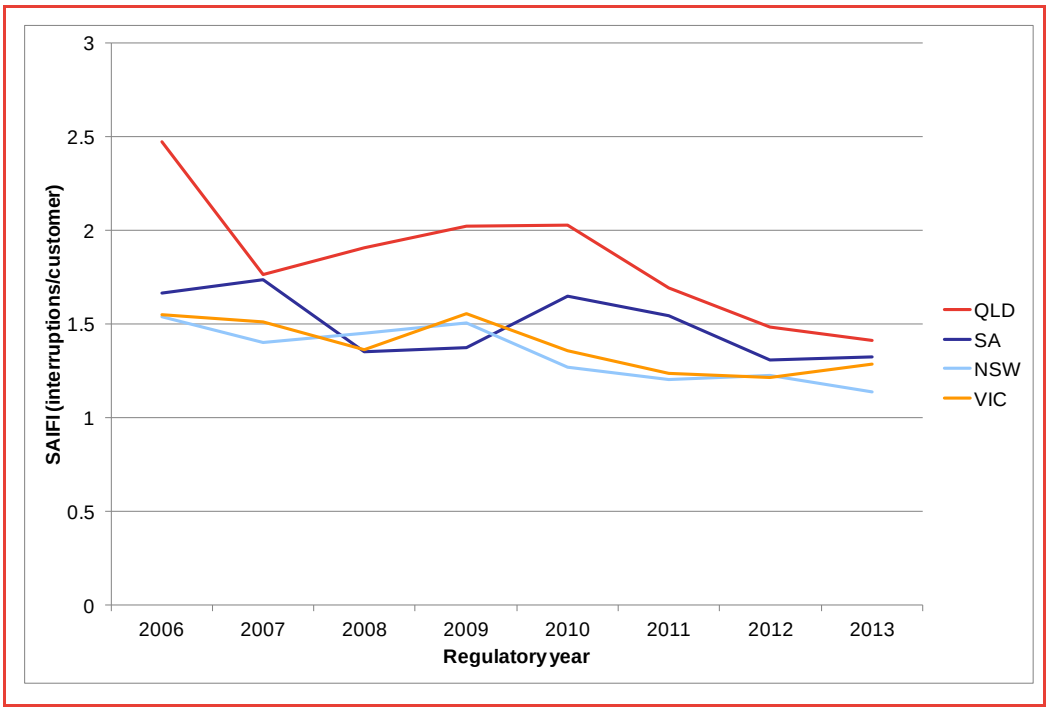
Figure 10: Distribution network measures of reliability - SAIDI



Source: AER, Regulatory Information Notices (RIN) Responses. Available from the AER's website.

Note - results for New South Wales, Queensland and Victoria represent the customer number weighted average of outcomes for the individual distribution networks is each state.

Figure 11: Distribution network measures of reliability - SAIFI



Source: AER, Regulatory Information Notices (RIN) Responses. Available from the AER's website.

Note - results for New South Wales, Queensland and Victoria represent the customer number weighted average of outcomes for the individual distribution networks is each state.

6.4 Network pricing

As discussed in Section 5.2, the prices that network businesses can charge for their services are regulated by the AER. In regulating network prices, the AER has regard, among other things, to the capital expenditure and operating expenditure requirements of the network businesses. As these expenditure requirements have increased, so have the network tariffs that customers face (and by extension, so have the retail prices that customers face).

The AEMC publishes a report in December each year that summarises current and expected future retail electricity prices for a typical residential customer in each jurisdictions in the NEM (as well as in Western Australia and the Northern Territory). As part of this report, the AEMC splits out the various components of the retail electricity price for a typical residential customer, including the cost of transmission and distribution services. This information is summarised for the four largest NEM jurisdictions in Figure 12, which compares average tariffs for a

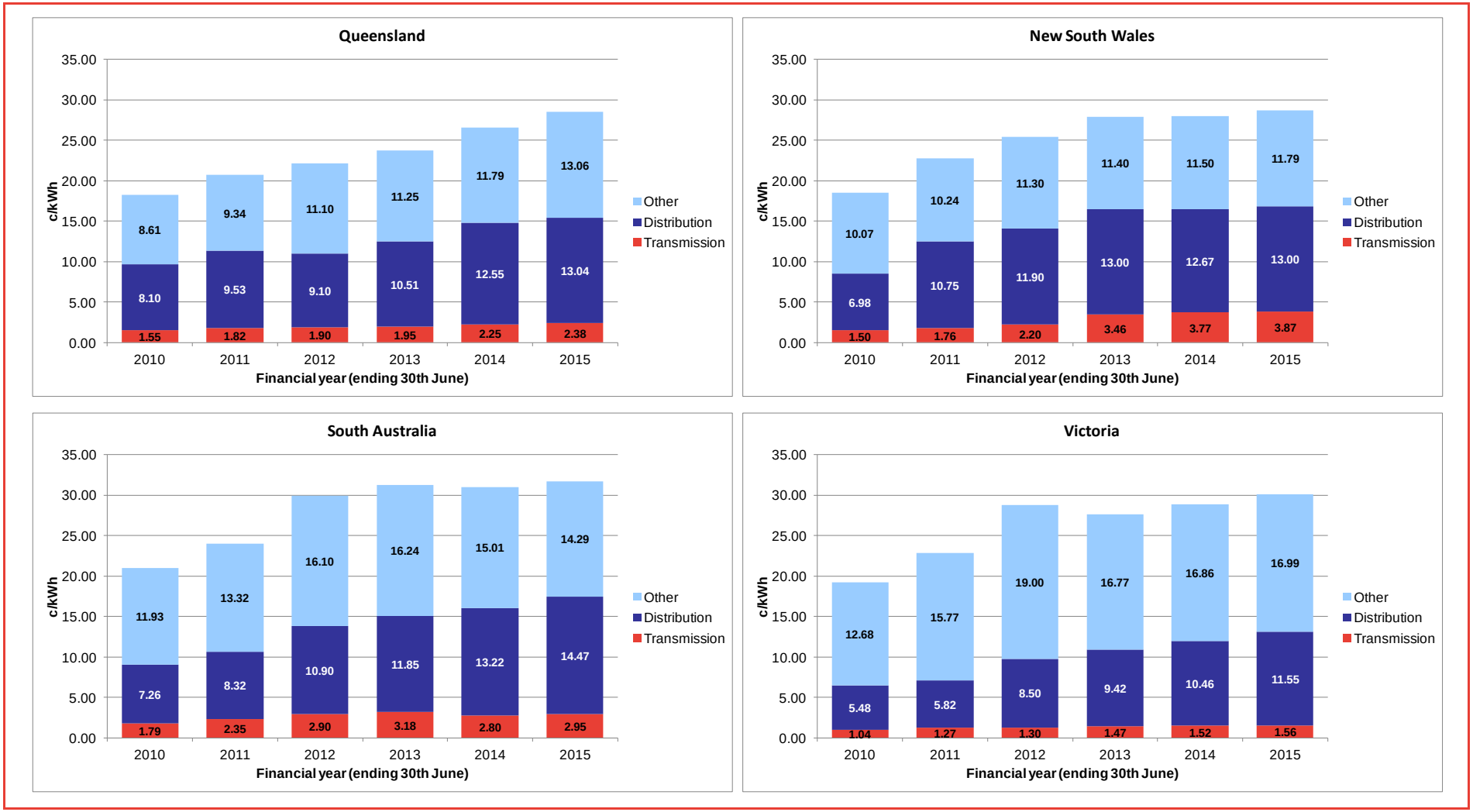
typical residential customer in each jurisdiction, and Figure 13, which compares total electricity bills for a typical residential customer in each jurisdiction.[21]

Of course there are a number of important determinants of network prices, including network customer density, the age of network assets and the service standards that networks are required to meet. This makes it very difficult to draw firm conclusions about the causes of differences in network prices. What can be said, however, is that the information on average tariffs that is summarised in Figure 12 does not support the view that network prices will be higher because of private ownership. While network tariffs have been increasing in all jurisdictions, and have been the principal cause of increasing retail prices over this time, it is apparent that the network tariffs for a typical residential customer are lowest in Victoria, where the network businesses are privately owned.

A comparison of the information on total annual bills that is summarised in Figure 13 suggests something similar: the network component of total electricity bills is lower, or similar in jurisdictions with privately-owned network businesses. Indeed, if anything, the information that is summarised in Figure 13 suggests that Victoria customers face significantly lower network costs than customers in other jurisdictions. It should be noted, however, that this is not just due to a difference in network prices: it is also due to the fact that typical residential customers in Victoria use less electricity than typical residential customers in other jurisdictions (this is due, in part, to the fact that gas is used more commonly in Victoria than in other jurisdictions).

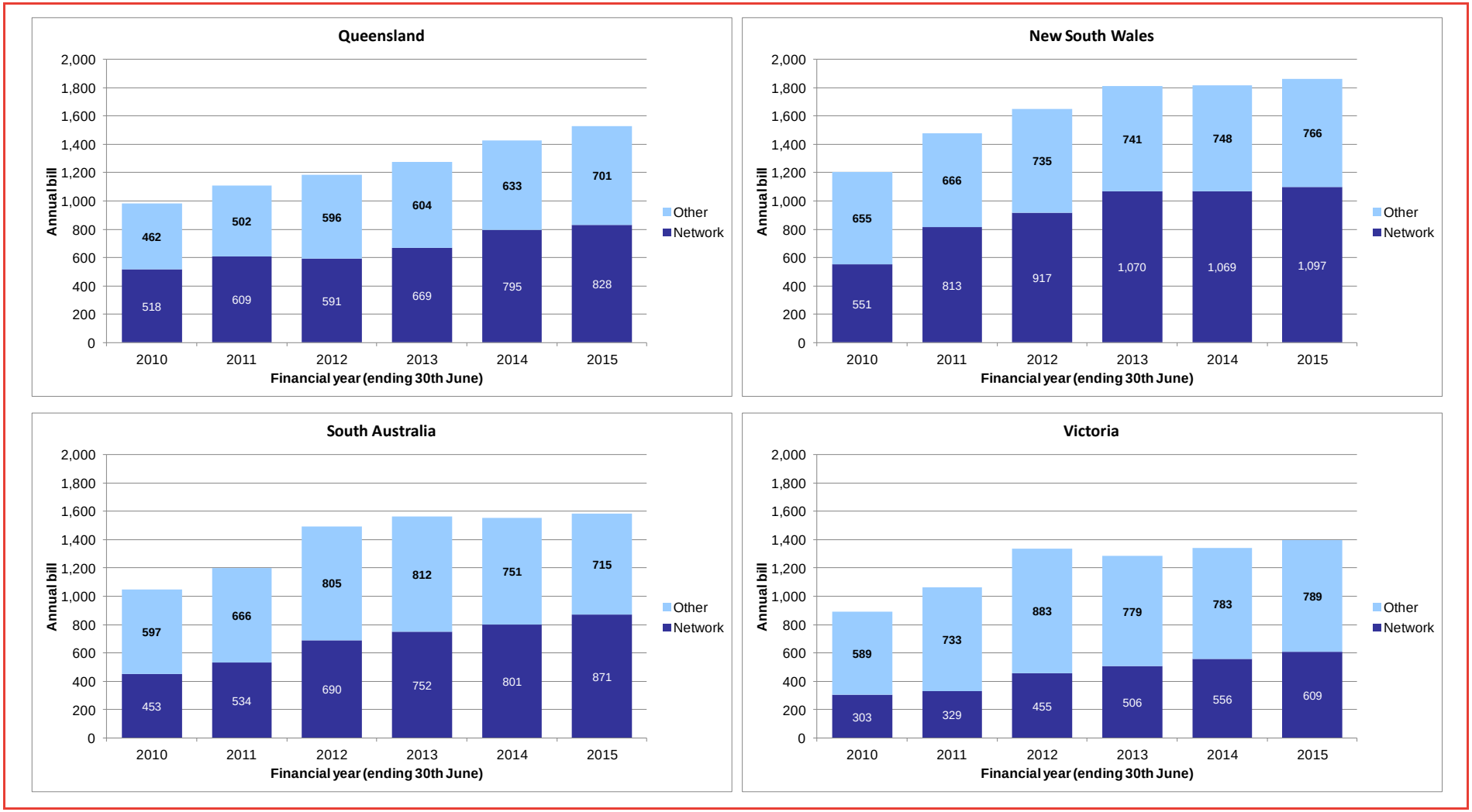
21 For small retail customers, the prices that network businesses charge for their services generally consist of different pricing components, such as a fixed annual fee and one or more tariffs for the electricity supplied to the customer. The implication of this is that the average price that a small retail customer pays for electricity will depend on how much electricity they use. The data in Figure 12 and Figure 13 is based on the estimates of typical usage patterns in each jurisdiction that were used by the AEMC.

Figure 12: Retail prices for typical residential customers



Source: AEMC

Figure 13: Retail bills for typical residential customers ($/annum)

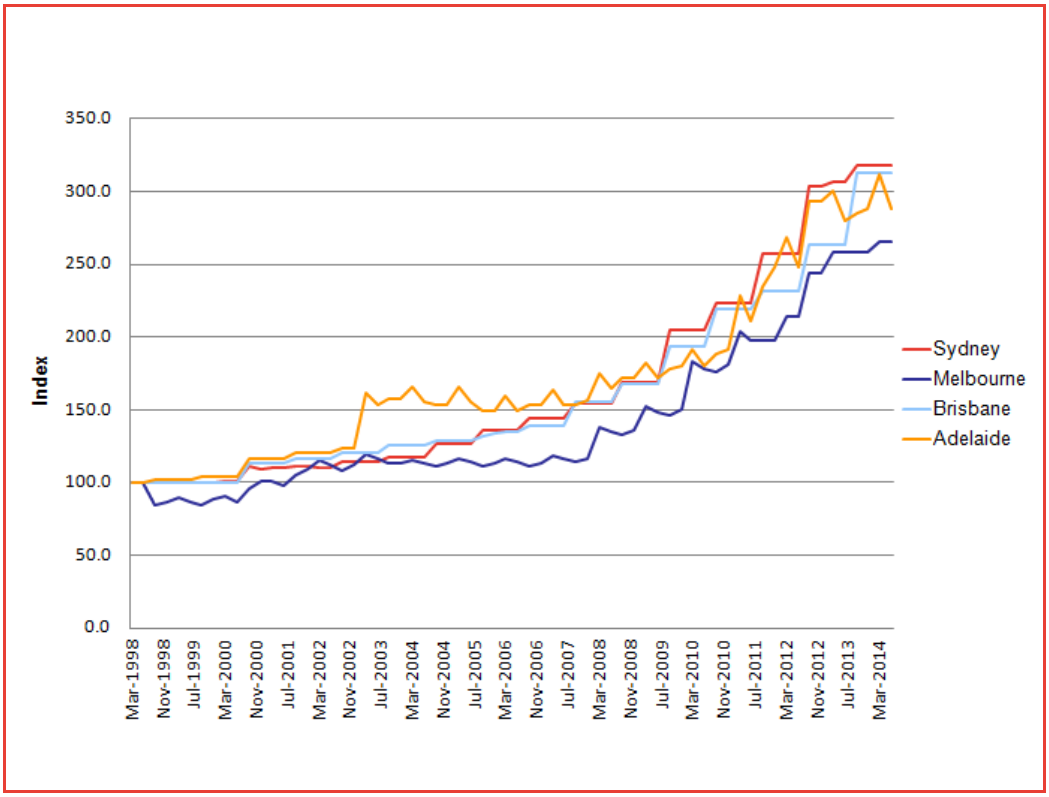


Source: AEMC

Note: retail bills based on average annual consumption in each state. Average annual consumption varies by state.

The results of the AEMC's retail price estimates, summarised in Figure 12 and Figure 13, does not support the view that network prices will be higher because of private ownership. However, the AEMC's retail price estimates only cover the period since 2010. Given that privatisation in Victoria and South Australia occurred in the late 1990's, the AEMC's retail price estimates cannot be used to assess relative price movements over the full period since privatisation. However, analysis over a longer time period also indicates that customers in jurisdictions in which network businesses have been privatised experienced lower, or similar increases in electricity prices. The Australian Bureau of Statistics (ABS) collects data on electricity retail prices faced by consumers in each capital city of Australia. This information is set out, for the capital cities of the four largest NEM jurisdictions, in Figure 14. While the information recorded by the ABS does not separate out the network component of electricity prices, it does at least suggest that customers in jurisdictions in which network businesses have been privatised – Victoria and South Australia – have not been exposed to larger increases in their retail electricity prices.

Figure 14: Consumer retail price index - capital cities



Source: ABS

These findings are consistent with what was suggested by our overview of the regulatory arrangements for network pricing.

Appendix 1 – Abbreviations

ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CCP	Consumer Challenge Panel
CESS	Capital Expenditure Sharing Scheme
COAG	Council of Australian Governments
DMEGCIS	Demand Management and Embedded Generation Connection Incentive Scheme
EBSS	Efficiency Benefit Sharing Scheme
IPART	Independent Pricing and Regulatory Tribunal
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
NSP	Network Service Provider
RAB	Regulatory Asset Base
RCP	Regulatory control period
RET	Renewable Energy Target
RIT-D	Regulatory Investment Test for Distribution
RIT-T	Regulatory Investment Test for Transmission
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
STPIS	Service Target Performance Incentive Scheme

Appendix 2 – Rule change process

Summary of the AEMC's review process for rule change proposals

Stage 1: Initial consideration of a rule change request

Anyone can request a change to the NER.

There are certain requirements that a rule change request must meet, including information that must be provided as part of a rule change request.

When the AEMC receives a rule change request, the AEMC may decide not to proceed with the request in the event that the rule change request does not meet the relevant requirements. If the AEMC decides not to proceed with the request, the AEMC will inform the person requesting the change and provide its reasons for not proceeding.

Stage 2: Consultation

If the AEMC proceeds with a rule change request, it will publish notice of the rule change request. The notice will include an invitation for any person to make written submissions to the AEMC.

The AEMC may also hold a public hearing on the proposed rule change.

Stage 3: Draft rule determination

Following the consultation stage, the AEMC will publish a draft rule determination. The draft rule determination will contain the AEMC's reasons as to whether it should make the proposed rule change.

When publishing the draft rule determination the AEMC will publish a notice including an invitation for any person to make written submissions to the AEMC on the draft rule determination.

The AEMC may also hold a public hearing on the draft rule determination.

Stage 4: Final rule determination

Following consultation on the draft rule determination, the AEMC will publish a final rule determination. The final rule determination will contain the AEMC's reasons as to whether it should make the proposed rule change.

If the AEMC determines to make the proposed rule change it will publish notice in the South Australian Government Gazette and publish the rule on its website.

Appendix 3 – Regulatory determination process

Summary of the new process for the AER's regulatory determinations for electricity networks

	Milestone	Deadline
Framework and Approach (F&A)		
1	DNSP notifies AER on the value of dual function assets	32 months before the end of the current RCP
2	Network service provider (NSP) notifies AER on need for F&A stage	32 months before the end of the current RCP
3	AER consults on need for F&A stage for component not triggered by NSP	31 months before the end of the current RCP
4	AER issues notice on need for F&A process	30 months before the end of the current RCP
5	AER publishes position paper on F&A	Publication date has no set deadline
6	AER publishes F&A paper	23 months before the end of the current RCP
Regulatory Proposal (RP)		
7	NSPs inform the AER of the proposed methodology for forecasting expenditure	24 months before the end of the current RCP
8	NSPs submit RP to the AER (Transmission NSP also required to submit pricing methodology and negotiating framework)	17 months before the end of the current RCP
9	AER publishes issues paper on the RP	40 business days after the submission of the RP
10	AER holds public forum on the issues paper and RP	Not more than 10 business days after publication of issues paper
11	Submission on RP and issues paper	Not earlier than 30 business days after publication of issues paper
Draft Decision (DD)		
12	AER publishes DD	Publication date has no set deadline
13	AER holds predetermination conference	Date not specified
Final Decision (FD)		
14	NSP submits revised regulatory proposal (RRP)	Not earlier than 45 business days after DD
15	Submissions on DD and RRP	Not earlier than 45 business days after DD
16	Cross-submissions (AER may invite further submission on the RRP) - optional	Not earlier than 15 business days after invitation for cross- submission
17	AER publishes FD	2 months before the start of the next RCP
	New stage under the National Electricity Rules. The F&A approach stage is new for the transmission determination process.	

Source: AER website

Appendix 4 – Building block components and incentive mechanisms

Overview of building block components

Return on capital

Network businesses are allowed to earn a risk-adjusted commercial rate of return on the assets they use to provide regulated services.

The regulated rate of return is based on a mix of debt and equity capital, on the assumption that network owners – whether government or private – will use a mix of funding sources.

The value of an electricity network's assets upon which its return is calculated is known as its regulatory asset base (RAB). The RAB is adjusted over time to take account of:

- *Inflation* – assuming positive inflation, the nominal value of the RAB will rise over time.
- *Depreciation* – depreciation will reduce the value of the RAB over time.
- *New investment in network assets that is required to achieve the capital expenditure objectives in the NER* – new investment will increase the RAB unless it is disallowed by the AER through an ex post review (see below).
- *Any asset disposals or removals of specific non-contributing transmission assets* – asset disposals or removals will reduce the RAB.

As with the determination of the forecast operating expenditure component (see below), the determination of forecast capital expenditure is a critical and often controversial part of determining the overall building block revenue allowance.

If a network business incurs lower (or higher) capital expenditures than those allowed by the AER, the business can enjoy some of the savings (incur some of the overruns) during the RCP, because the business's return on capital is determined on the basis of the accepted forecast of capital expenditure. However, at the start of the new RCP, the network business's actual capital expenditure is 'rolled in' to the business's RAB and the reward or penalty is curtailed, unless new investment is disallowed through an ex post review (see below).

Return of capital

Network businesses are allowed to earn an amount to compensate the network for depreciation on their assets. As electricity network assets tend to be fairly long-lived, most network assets are depreciated on a straight-line basis over 40-50 years. This means that approximately 2% of the original cost of network assets is recovered through this component of the building block each year. As with the return on capital, a network business gains by reducing depreciation below what was forecast and suffers if it faces higher expenditures.

Operating and maintenance expenditure

Network businesses are allowed to recover forecast operating expenditure that is required to achieve the operating expenditure objectives in the NER. The AER's approach to forecasting operating expenditure for a new RCP is to take the network business's actual operating expenditure in a nominated 'base year' of the current RCP and – if that expenditure is found to be efficient – project that level of expenditure forward for the next RCP. As with capital expenditure, the business gains by reducing operating expenditure below what was forecast and suffers if it incurs higher expenditures than forecast.

Tax

Network businesses are allowed to earn an amount to reflect the corporate income tax they are obliged to pay.

Increments or decrements relating to incentive schemes

Network businesses in the NEM are subject to a number of specific incentive schemes designed to encourage them to minimise costs, improve service quality and promote various other objectives. These schemes are briefly described below.

Overview of incentive mechanisms

Capital expenditure incentives

This is comprised of two elements:

- *Capital Expenditure Sharing Scheme (CESS)*: The CESS exposes network businesses to approximately 30% of the benefits or costs associated with under-spending or over-spending their allowed capital expenditure for the 5-year RCP.
- *Ex post review*: If a network business over-spends its allowed capital expenditure, the AER will examine the nature of the over-spend. If the AER considers that the over-spend was not prudent, the AER may not allow it to be added to the RAB at the end of the RCP. This would reduce the building block regulated revenue allowance for the following RCP.

Operating expenditure incentives
(aka the Efficiency Benefit Sharing Scheme (EBSS))

The EBSS exposes network businesses to the benefits or costs of 6 years of the value of any under-spending or over-spending. Combined with the 'base year' approach to forecasting operating expenditure, this means that network businesses are exposed to approximately 30% of the benefits or costs of under-spend or over-spend. This promotes symmetry between the CESS and EBSS so that network businesses do not have an inappropriate incentive to substitute capital expenditure for operating expenditure or vice versa.

Service Target Performance Incentive Scheme (STPIS)

The STPIS provides network businesses with rewards for good service and penalties for poor service relative to benchmarks set at the time of a regulatory reset. The STPIS helps ensure that network businesses do not have incentives to benefit (via the CESS or EBSS) by reducing costs at the expense of the quality of service they provide to customers. For transmission network businesses, the maximum value of the incentive is an increment or decrement of between 1% and 5% of a transmission network business's regulated revenue for a given year. Going forward, distribution network businesses will also be subject to a STPIS but the value of the incentive as a percentage of each distribution network business's regulated revenue is yet to be determined.

Demand Management and Embedded Generation Connection Incentive Scheme (DMEGCIS)
(not applicable to transmission networks)

Distribution network businesses in the NEM are currently subject to demand management incentive schemes. These schemes are intended to encourage networks to utilise demand management options as an alternative to network augmentation. Without such schemes, distribution networks would face incentives to invest in a network augmentation option, as this would provide an addition to their RAB. Going forward, these schemes will be expanded to provide incentives to connect embedded generators.

Small scale incentive scheme

The NER provides for the AER to develop and trial additional small-scale incentive schemes.

Appendix 5 – Recent changes to the regulation of network businesses

Over the last few years there have been a number of reviews and reform programs that have aimed to improve the processes and methodology for regulation of network businesses. This Appendix provides an overview of these reviews and reform programs.

AEMC's 2012 changes to Chapters 6 and 6A of the NER

In September 2011 the AER submitted proposals to the AEMC seeking changes to Chapters 6 and 6A of the NER to better meet the NEO.

The AER's rule change proposal came at a time when network prices had been increasing significantly. While recognising the fundamental drivers of higher network costs from rising peak demand and higher reliability standards, the AER considered some provisions of the NER that were drafted in 2006 – a time of policy concern about the adequacy of network investment – were causing consumers to pay more than necessary for energy services. In particular, the AER argued:[22]

- The provisions of the NER constrained the extent to which the AER could make holistic and independent assessments of a network business's proposed expenditure needs.
- The automatic roll-in of all capital expenditure to a network business's regulatory asset base (RAB) – including amounts above the AER's allowances – created incentives for overinvestment.
- Inconsistent approaches to setting the cost of capital for electricity and gas network businesses, along with constraints on the AER in setting costs that reflect current commercial practices, led to inflated cost estimates.
- The consultation arrangements hindered effective stakeholder engagement.

Following detailed consultation, the AEMC published its final determination of the rule change proposal in November 2012. There were a number of changes to the NER, including to:

- Create a common approach to setting the cost of capital across electricity and gas network businesses. Under this common approach, the AER makes a best possible estimate of the cost for a benchmark efficient service provider at the time a regulatory determination is made.

22 See AER, *State of the Energy Market 2012*, pp.12-13.

- Require the AER to undertake a full public review at least every three years on its approach to setting the cost of capital, completing the first review by November 2013.
- Clarify the AER's power to assess and amend network revenue proposals. Additionally, the AER will publish annual benchmarking reports on the relative efficiency of the businesses. The first of these annual benchmarking reports is due towards the end of 2014.
- Enhance the incentives for efficient investment by enabling the AER to review the actual capital expenditure of network businesses to ensure it is prudent and efficient. Expenditure in excess of regulatory approvals may be removed from the RAB if the AER finds it is not prudent or efficient.
- Require the commencement of the electricity regulatory process four months earlier, to allow more effective consultation with stakeholders. More information will now be made available early in the regulatory process to strengthen consumer engagement.

Better Regulation reform program

As part of the changes to Chapters 6 and 6A of the NER made in 2012, the AEMC imposed an obligation on the AER to make a range of guidelines to inform network businesses and other stakeholders how it would undertake its regulatory resets and broader economic regulation role in the future. This work program became known as the 'Better Regulation' reform package.[23]

The NER explains that most of the guidelines developed as part of the Better Regulation reforms are not intended to be binding on either the AER or the network business. However, the AER must provide its reasons if it has chosen to depart from the guidelines.[24]

The guidelines produced as part of the reform package were finalised in late 2013. These are:

- **Expenditure forecast assessment guidelines** – describe the process, techniques and associated data requirements for the AER's approach to setting efficient expenditure allowances for network businesses. These were prepared separately for electricity transmission and distribution businesses.
- **Expenditure incentives guidelines** – seek to create the right incentives to encourage efficient spending by businesses and share the benefits of efficiencies with consumers. These were prepared separately for capital expenditures (CESS) and operating expenditures (EBSS).

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23 See AER, *Overview of the Better Regulation reform package*, April 2014.

24 See NER 6.2.8 and 6A.2.3. The key exception is the confidentiality guideline(s).

- **Rate of return guideline** – sets out how the AER determines the return that electricity and gas network businesses can earn on their investments.
- **Consumer engagement guideline** – sets out a framework for electricity and gas network businesses to better engage with consumers. It aims to help network businesses develop strategies to engage systematically, consistently and strategically with consumers on issues that are significant to both parties.
- **Shared assets guideline** – outlines how consumers will benefit from the other services electricity network businesses may provide using the assets for which consumers pay.
- **Confidentiality guideline** – sets out how energy network businesses must make confidentiality claims over information they submit to the AER. This guideline balances protecting genuinely confidential information with ensuring that stakeholders can access sufficient information on issues affecting their interests.

Appendix 6 sets out the AER's description of the rationale and effect of the key elements of the Better Regulation reforms.

In addition, the Better Regulation work program included the development of the Regulatory Investment Test for Distribution (RIT-D) and RIT-D Application Guidelines. These were prepared pursuant to the AEMC's Power of Choice Review in 2012. The RIT-D and associated guidelines seek to establish consistent, clear and efficient planning processes for distribution network investments in the NEM. A Regulatory Investment Test for Transmission (RIT-T) and RIT-T Application Guidelines were published in 2010 and apply to augmentations proposed by transmission network businesses.

Changes to Limited Merits Review

As noted in Section 5.1, the NEL allows network businesses to apply to the Australian Competition Tribunal for a limited review of an AER determination. The criteria for merits reviews were changed in 2013 following a review of the operation of the former regime.

Between June 2008 and June 2013, network businesses sought review of 18 AER determinations on electricity networks – three reviews in transmission and 15 in distribution.[25] The Tribunal's decisions increased allowable electricity network revenues by around $3.2 billion, with substantial impacts on retail energy charges. The two most significant contributors to this increase in allowable revenues were:

- The Tribunal decision on the averaging period for the risk free rate (an input into the weighted average cost of capital). This was reviewed for five networks, with a combined revenue impact of $2 billion.

25 AER, *State of the Energy Market 2013*, pp.67-69.

- The Tribunal decision on the value adopted for tax imputation credits (gamma), which affects the estimated cost of corporate income tax. This was reviewed for eight networks, with a combined revenue impact of over $900 million.

In 2012, an independent review of the limited merits review regime found the regime has not operated as intended. It found that the regime did not sufficiently consider the NEO, which focuses on the long term interests of consumers, and did not sufficiently consider the overall balance of a determination.

In response, in September 2013 the predecessor of the COAG Energy Council agreed to amendments to the NEL. The key changes were the following:

- A requirement that a network business demonstrate that the AER erred in its determination and that addressing the grounds of appeal would lead to a materially preferable outcome in the long term interests of consumers.
- A requirement that the Tribunal consider any matters interlinked with the grounds of the appeal, and consult with relevant users and consumers.

Legislation to implement these changes was passed in November 2013. A further review of the regime will commence in 2016.

Distribution Network Pricing Arrangements rule change

The AEMC is presently considering changes to the NER in relation to distribution network pricing that have been independently submitted by New South Wales' Independent Pricing and Regulatory Tribunal (IPART) and the predecessor of the COAG Energy Council.

The rule change proposal is largely based on the AEMC's findings and recommendations from its Power of Choice Review.[26] This review recommended a package of reforms designed to increase the responsiveness of the demand side (ie electricity consumers) to evolving market and technological developments and changing future consumer interests. The AEMC concluded that efficient and flexible pricing options are important tools to help consumers to adapt their consumption patterns and hence manage their electricity bills.

At present, each distribution network business's annual network tariffs must be submitted to the AER as a pricing proposal and approved before they can take effect. Distribution network businesses' pricing proposals set out the proposed tariff classes for the upcoming regulatory year and the proposed tariffs and charging parameters that correspond to each of these tariff classes. As discussed in Section 5.2 of this report, pricing proposals must comply with a set of pricing principles set out in Clause 6.18.5 of the NER.

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26 See AEMC, *Consultation Paper, National Electricity Amendment (Distribution Network Pricing Arrangements) Rule 2014*, 14 November 2013 (AEMC Distribution Pricing Consultation Paper).

The current annual network pricing process does not require distribution network businesses or the AER to consult with stakeholders on the way prices are structured. Nor do distribution network businesses have any obligation to consult with retailers or consumers on the development of the structure of their network tariffs or the level of prices. The NER also does not require the AER to consult with stakeholders on its decision on whether or not to approve the distribution network businesses pricing proposals (as distinct from their revenue proposals).

The proposed Rule change seeks to:[27]

- Oblige distribution network businesses to consult on proposed network tariff structures and to provide more detailed network pricing information earlier in the tariff change process.
- Require distribution network businesses to set network tariffs that are structured to reflect their network costs.
- Require distribution network businesses to take into account consumer impacts in designing efficient network tariffs.
- Allow the recovery of residual network costs in a manner that is efficient and does not distort or undermine flexible pricing.
- Amend the tariff class provisions to promote clarity and certainty in how distribution network businesses should group customers into different tariff classes.
- Extend the operation of side constraints on annual network price changes.

The AEMC has published a consultation paper on the rule change proposal and a draft determination was released on 28 August 2014.

27 AEMC Distribution Pricing Consultation Paper, p.11.

Appendix 6 – Overview of Better Regulation changes

Overview of Better Regulation changes

Reform	What has changed?	Purpose	AER activity
Greater stakeholder involvement in regulatory reviews	Creation of a Consumer Challenge Panel to assess whether: • regulatory proposals are in the long term interests of consumers • network businesses are engaging effectively with customers. The review process has been extended by four months and the AER and network businesses must provide more information to stakeholders at an early stage. The AER may consider how a business has engaged with its customers when setting expenditure allowances. Clearer guidelines on types of information submitted by network businesses that may be treated as confidential.	Strengthen accountability that regulatory reviews meet the NEO to promote the long term interests of consumers. Address concerns that confidentiality provisions have allowed network businesses to strategically withhold or limit scrutiny of key information.	Consumer Challenge Panel established 1 July 2013. Consumer engagement guideline published October 2013. Confidentiality guideline published November 2013.
Stronger powers for the AER to assess and amend network spending proposals	The AER can apply new tools and techniques to better forecast how much network businesses need to spend. It is no longer limited to a narrow assessment of a network business's proposal. The new tools include benchmarking and trend techniques to test expenditure proposals and compare the relative performance of each network business.	Under the old rules the AER was required to assess expenditure forecasts on the basis of the network business's proposal, usually requiring a detailed bottom-up assessment. The AER was limited to amending forecasts only to the extent necessary for compliance with the rules; this created an upward bias in revenue allowances.	Expenditure assessment guideline published November 2013.

Reform	What has changed?	Purpose	AER activity
New approach to setting rates of return for network businesses	A common approach now applies for setting the cost of capital across all electricity and gas network businesses, based on the costs for a benchmark efficient service provider. The AER's assessment can account for a wider range of information than previously, and allows for decisions that better reflect conditions in capital markets. The AER must undertake a full public review of its approach at least every three years.	The old rules provided separate rate of return frameworks for electricity distribution, electricity transmission, and gas pipelines. The AER was locked into a parameter-by-parameter assessment of the rate of return, with limited scope to consider the appropriateness of the overall allowance.	Rate of return guideline published December 2013.
New incentives for efficient investment	A new incentive scheme ensures efficiency benefits are shared between consumers and network businesses. The AER can assess overspends in capital expenditure allowances, and can exclude inefficient overspends from the regulated asset base.	Under the old rules an efficiency benefit sharing scheme applied to operating expenditure but not capital expenditure. All capital expenditure was automatically rolled into the regulated asset base, creating an incentive to overspend.	Expenditure incentives guideline published November 2013.
Fairer arrangements for distribution of revenue from shared assets	Revenue earned by network businesses from third party use of regulated assets will be shared with customers, for example by reducing regulated revenue allowances.	Under the old rules revenues earned from third party use of network assets were not shared with consumers, despite consumers being required to wholly fund the assets.	Shared assets guideline published November 2013.

Source: AER, State of the Energy Market 2013, *Table 2.3, pp.66-67.*

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