



**Forecast Expenditure Summary**  
**Customer Initiated**  
**Capital Works**  
**2015 to 2020**



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## 1. About this summary document

This section explains the purpose and structure of this summary document.

### 1.1 Purpose

The purpose of this summary document is to explain and justify Ergon Energy's forecast Customer Initiated Capital Works (CICW) expenditure for its Standard Control Services (SCS) and Alternative Control Services (ACS) for the next regulatory control period (1 July 2015 to 30 June 2020).

It aims to provide the reader with a full understanding of Ergon Energy's CICW capital expenditure forecasts. However, because it is a summary document, it necessarily addresses some matters at a relatively high level and refers out to other documents for further detail.

This summary document provides details of actual, estimated and forecast CICW capital expenditure for the previous (1 July 2005 to 20 June 2010), current (1 July 2010 to 30 June 2015) and next regulatory control periods. All capital expenditure presented in this document is in real 2014-15 dollars, except where stated otherwise.

Importantly, this summary document only explains and justifies Ergon Energy's direct costs for its CICW capital expenditure. Ergon Energy applies real cost escalations and shared costs (overheads) to these direct costs to determine its total CICW capital expenditure. Ergon Energy has prepared, and provided to the Australian Energy Regulator (AER), separate documents that explain and justify – for all of its capital expenditure categories – how it applies these real cost escalations and shared costs (overheads).

Readers should take care in examining the (un-escalated) direct costs in this overview document to ensure that they do not confuse them with either Ergon Energy's:

- Direct costs, inclusive of real cost escalations or
- Total costs, inclusive of direct costs, real cost escalations and shared costs (overheads).

### 1.2 Structure

The remainder of this summary document is structured as follows:

- Section 2 details Ergon Energy's CICW capital expenditure for the previous, current and next regulatory control periods. This is intended to provide the reader, at the outset, with a clear view of the profile of Ergon Energy's actual, estimated, and forecast CICW capital expenditure that will be explained and justified in the remainder of this summary document.
- Section 3 describes the conceptual nature of Ergon Energy's CICW capital expenditure. It explains why it is necessary, including having regard for customer expectations and Ergon Energy's legislative and regulatory obligations. It also describes the nature of Ergon Energy's different CICW categories, including what is categorised for regulatory purposes as SCS and ACS.
- Section 4 examines why Ergon Energy's CICW capital expenditure in the current regulatory control period differed from the forecasts that it presented to the AER in its regulatory proposal (and revised regulatory proposal), as well as the AER's own capital expenditure allowance in its distribution determination. It also explains how Ergon Energy has incorporated learnings about these differences into its capital expenditure forecasts for the next period.
- Section 5 explains Ergon Energy's expenditure forecasting methodology for its CICW capital expenditure for the next regulatory control period for both its SCS and ACS.

- Section 6 details Ergon Energy's forecasts for its CICW capital expenditure for SCS and ACS for the next regulatory control period.
- Section 7 draws on the material in the previous sections to explain and justify Ergon Energy's forecast CICW capital expenditure for its SCS against the capital expenditure objectives and criteria in clause 6.5.7 of the National Electricity Rules (NER). It therefore outlines why the AER should approve this capital expenditure forecast as part of its distribution determination for Ergon Energy's next regulatory control period. Clause 6.5.7 does not apply to Ergon Energy's forecast CICW capital expenditure for its ACS.

### **1.3 Customer engagement**

Ergon Energy has engaged its stakeholders to ensure that its Regulatory Proposal is aligned with the long-term interests of its customers and communities. This has included engagement through its Real Estate Developer Reference Group and customers more generally, on service improvement plans and anticipated demand in the new connections area.

Through listening to customers, Ergon Energy refreshed its service commitments, developed a 'New Connections for Developers Charter', and built on its understanding of the potential future demand on its network. This is publically available of Ergon Energy's website - [www.ergon.com.au](http://www.ergon.com.au).

Ergon Energy is committed to playing its part in powering the Queensland economy by making it easier to connect to the network and to delivering service for the best possible price. This is achieved through the alignment with its legislative and regulatory obligations and supported by the expenditure forecasts outlined in this summary document.

## **2. Expenditure profile**

This section details Ergon Energy's CICW capital expenditure for the previous, current and forthcoming regulatory control periods. This is intended to provide the reader with a clear, up-front view of the profile of Ergon Energy's actual, estimated, and forecast CICW capital expenditure that will be explained and justified in the remainder of this overview document.

Importantly, this section distinguishes between direct and total costs for CICW capital expenditure for both SCS and ACS.

## 2.1 Direct costs

Table 1: CICW capital expenditure – Standard Control Services (Direct costs, \$ million real 2014-15<sup>1</sup>)

Regulatory Review Process	2005-06	2006-07	2007-08	2008-09	2009-10	Total	2010-11	2011-12	2012-13	2013-14	2014-15	Total	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Regulatory Proposal	131	132	138	141	140	<b>682</b>	274	295	264	278	311	<b>1,422<sup>2</sup></b>	82	83	83	83	83	<b>414<sup>6</sup></b>
Revised Regulatory Proposal	126	123	125	127	125	<b>626</b>	298	327	286	302	337	<b>1,551<sup>3</sup></b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>
QCA/AER Determination	117	128	140	140	140	<b>664</b>	223	220	220	228	234	<b>1,125<sup>4</sup></b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>
Actual/Estimate	182	253	228	221	207	<b>1,091</b>	139 <sup>5</sup>	133 <sup>5</sup>	142 <sup>5</sup>	140 <sup>5</sup>	135 <sup>6</sup>	<b>689</b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>
Variance – Actual v Determination	<b>56%</b>	<b>98%</b>	<b>63%</b>	<b>58%</b>	<b>48%</b>	<b>64%</b>	<b>-38%</b>	<b>-40%</b>	<b>-35%</b>	<b>-39%</b>	<b>-42%</b>	<b>-39%</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>

Table 2: CICW capital expenditure – Alternative Control Services (Direct costs, \$ million real 2014-15)

Regulatory Review Process	2005-06	2006-07	2007-08	2008-09	2009-10	Total	2010-11	2011-12	2012-13	2013-14	2014-15	Total	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Regulatory Proposal	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	46	47	48	49	49	<b>239<sup>6</sup></b>
Actual/Estimate	n/a	n/a	n/a	n/a	n/a	n/a	4	9	19	23	17 <sup>6</sup>	72	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>

<sup>1</sup> Indexation based on Australian Bureau of Statistics (ABS) Series 6401.0 Consumer Price Index Weighted Average of Eight Capital Cities, All Groups CPI

<sup>2</sup> Regulatory Proposal to AER – Distribution Services for period – 1 July 2010 to 30 June 2015 – 1 July 2009, Page 31, Table 6 – converted into direct costs

<sup>3</sup> Revised Regulatory Proposal to AER – Distribution Services for period – 1 July 2010 to 30th June 2015 – 14th Jan 2010, Page 11, Table 1-1 – converted into direct costs

<sup>4</sup> AER Final decision, Queensland distribution determination 2010-11 to 2014-15, Page xxxiii, Table 12 – allocated by Ergon Energy into the capex categories, converted into direct costs

<sup>5</sup> 2010-11 to 2013-14 Ergon Energy Annual Performance RINs, Table 2.4 (2010-11 to 2011-12), Table 1 (2012-13 to 2013-14) – converted into direct costs

<sup>6</sup> Ergon Energy CICW & Network Capital Expenditure Forecast Model – for Ergon Energy 2015-20 regulatory proposal, escalated for CPI only to 2014-15 dollars and excludes non-CPI input price escalations and overhead as per the Cost Allocation Method (CAM)

Table 1 details Ergon Energy's CICW capital expenditure for its SCS only, in direct costs, for the previous, current, and forthcoming regulatory control periods. Specifically, it details:

- the CICW capital expenditure forecast that Ergon Energy:
  - presented in its regulatory proposals, and revised regulatory proposals to the Queensland Competition Authority (QCA) for the previous regulatory control period and to the AER for the current regulatory control period
  - is now presenting in its regulatory proposal to the AER for the next regulatory control period.
- the QCA's and the AER's CICW capital expenditure allowance for the previous and current regulatory control periods respectively
- Ergon Energy's actual and estimated CICW capital expenditure for the previous and current regulatory control periods.

Table 1 also shows that over the 2005-10 regulatory control period Ergon Energy overspent its allowance for CICW capital expenditure by \$427 million, or 64%. The main drivers for this increase were:

- increased internal labour costs associated with Ergon Energy's Enterprise Bargaining Agreements – this increase was around 25% from 2004-05 to 2008-09
- increased material costs due to rises in commodity prices over the period
- increased external and internal standards for delivery of customer connection works (e.g. reduced CICW cycle times)
- an increase in the average size (and cost) of commercial and industrial projects during the resources boom
- significant demand growth in 2005-06. This used up excess network capacity and resulted in an increased requirement for shared network augmentation and extension compared to previous years.

Table 1 shows that, for the current regulatory control period, the AER's allowance for CICW capital expenditure increased by \$461 million from the previous period. This was based on the recommendations of the AER's consultants, Parsons Brinckerhoff, who developed an alternative forecasting model. This model was based on average historical numbers and costs of customer connections, escalated for anticipated growth in total customer numbers.

Expenditure for large customer connections (greater than 1 MW) was classified as SCS during the 2005-10 regulatory control period was re-classified as ACS for the 2010-15 regulatory control period. As a result, expenditure relating to the design and construction of large customer connection assets was excluded from the AER proposed forecasting of CICW capital expenditure forecast for SCS.

Table 1 shows that for the period 2010-11 to 2013-14, Ergon Energy underspent its allowance by \$337 million, or 38%. Ergon Energy estimates that for the remainder of the regulatory control period (2014-15) it will underspend its allowance by a further \$99 million, or 42%. The underspend in this period has been caused by:

- the AER basing the growth in customer connections on the expected annual population growth rate, whereas Ergon Energy's analysis indicates that connection numbers are driven by employment, housing and residential building approvals (housing and non-housing).
- reduced new customer connections due to the impact of the Global Financial Crisis (GFC) on Queensland. This reduced new customer connections, including subdivisions, and delayed mining activity, was later and flatter than previously expected by both industry, government and the AER.



Table 1 shows that Ergon Energy has forecast its CICW capital expenditure for the forthcoming regulatory control period to be \$414 million. This is \$711 million (or 63%) less than the AER's allowance for the current regulatory control period. Section 4 and 6 of this document detail the reasons for the trend in Ergon Energy's CICW capital expenditure in the current and next regulatory control periods respectively. Table 2 details, for Ergon Energy's ACS only, in direct costs:

- the actual and estimated CICW capital expenditure for current regulatory control period
- the proposed CICW capital expenditure for the forthcoming regulatory control period.

## **2.2 Total costs**

Table 3 and Table 4 provides the same information as is in Table 1 and Table 2 above but, instead of presenting the CICW capital expenditure in direct costs, they present it in total costs (i.e. inclusive of real cost escalations and shared costs (overheads)).

This total cost information is provided for comparative purposes only should the reader be seeking to compare Ergon Energy's total costs with other documents. As discussed in Section 1, the remainder of this document explains and justifies Ergon Energy's direct costs only (i.e. the costs in Table 1 and Table 2).

**Table 3: CICW capital expenditure – Standard Control Services (Total costs, \$ million real 2014-15<sup>7</sup>)**

Regulatory Review Process	2005 -06	2006 -07	2007 -08	2008 -09	2009 -10	Total	2010 -11	2011 -12	2012 -13	2013 -14	2014 -15	Total	2015 -16	2016 -17	2017 -18	2018 -19	2019 -20	Total
Regulatory Proposal	196	200	202	209	215	<b>1,023</b>	380	401	357	372	407	<b>1,916<sup>8</sup></b>	120	122	128	132	135	<b>637<sup>12</sup></b>
Revised Regulatory Proposal	190	187	182	188	192	<b>939</b>	411	446	386	404	440	<b>2,087<sup>9</sup></b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>
QCA/AER Determination	183	200	219	225	229	<b>1,056</b>	316	313	310	318	320	<b>1,578<sup>10</sup></b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>
Actual/Estimate	253	352	340	324	306	<b>1,575</b>	204 <sup>11</sup>	196 <sup>11</sup>	201 <sup>11</sup>	180 <sup>11</sup>	195 <sup>12</sup>	<b>975</b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>
Variance – Actual v Determination	<b>38%</b>	<b>76%</b>	<b>55%</b>	<b>44%</b>	<b>34%</b>	<b>49%</b>	<b>-35%</b>	<b>-37%</b>	<b>-35%</b>	<b>-43%</b>	<b>-39%</b>	<b>-38%</b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>

**Table 4: CICW capital expenditure – Alternative Control Services (Total costs, \$ million real 2014-15)**

Regulatory Review Process	2005 -06	2006 -07	2007 -08	2008 -09	2009 -10	Total	2010 -11	2011 -12	2012 -13	2013 -14	2014 -15	Total	2015 -16	2016 -17	2017 -18	2018 -19	2019 -20	Total
Regulatory Proposal	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>	68	70	74	77	80	<b>369<sup>12</sup></b>
Actual/Estimate	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>	7 <sup>11</sup>	14 <sup>11</sup>	24 <sup>11</sup>	29 <sup>11</sup>	25 <sup>12</sup>	<b>98</b>	n/a	n/a	n/a	n/a	n/a	<b>n/a</b>

<sup>7</sup> Indexation based on Australian Bureau of Statistics (ABS) Series 6401.0 Consumer Price Index Weighted Average of Eight Capital Cities, All Groups CPI

<sup>8</sup> Regulatory Proposal to AER – *Distribution Services for period – 1st July 2010 to 30th June 2015* – 1st July 2009, Page 31, Table 6

<sup>9</sup> Revised Regulatory Proposal to AER – *Distribution Services for period - 1st July 2010 to 30th June 2015* - (14th Jan 2010) page 11 Table 1-1

<sup>10</sup> AER Final decision Queensland distribution determination 2010-11 to 2014-15, Page xxxiii, Table 12 – allocated by Ergon Energy into the capex categories

<sup>11</sup> 2010-11 to 2013-14 Ergon Energy Annual Performance RINs, table 2.4 (2010-11 to 2011-12), Table 1 (2012-13 to 2013-14)

<sup>12</sup> Network Capital Expenditure Forecast Model escalated for Ergon Energy 2015-20 regulatory proposal in accordance with Ergon Energy Forecasting Methodology, i.e. applying CPI indexation to 2014-15 dollars, non-CPI input price escalations, overhead as per Ergon Energy CAM

### 3. Nature of expenditure

CICW capital expenditure is for works to service new or upgraded customer connections that are requested by Ergon Energy's customers.

This section describes Ergon Energy's obligation to connection customers, the different customer type and/or activity that are relevant to its CICW capital expenditure and how they are treated for regulatory purposes in the current and forthcoming regulatory control period.

#### 3.1 Ergon Energy's obligation to connect customers

Ergon Energy has a legislative obligation to operate, maintain and protect its supply network in a manner that ensures adequate, economic, reliable and safe connection and supply of electricity to its customers.<sup>13</sup> It is also obliged, as far as is technically and economically practicable, to connect customers to its distribution network<sup>14</sup> and has a legislative monopoly to undertake the final connection of new connections.<sup>15</sup>

#### 3.2 Types of works relevant to CICW

Ergon Energy's CICW capital expenditure is required to build assets in response to new or upgraded customer connections. Specifically, it is required for:

- designing and constructing shared network assets that are directly relevant to customer connections
- designing and constructing connection assets
- commissioning and energizing connection assets
- installing assets as part of a real estate development
- installing assets to remove a network constraint for an embedded generator
- providing and installing metering assets
- providing and constructing public lighting.

#### 3.3 Distinction between Corporation Initiated Augmentation and CICW expenditure

Both of Ergon Energy's Corporation Initiated Augmentation (CIA) and CICW capital expenditure categories may result in the design and construction of shared network assets.

The distinction between the two expenditure categories is that shared network assets are included in:

- CICW only where they relate directly to a dedicated customer connection/request. It will typically involve new connection assets and depending on existing network capacity augmentation of shared assets to ensure a connection is supplied..
- CIA where they are not dedicated to a particular customer connection but rather relate to meeting the future needs of customers generally. CIA expenditure is solely related to the augmentation of

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<sup>13</sup> Refer section 42 of the *Queensland Electricity Act*

<sup>14</sup> Refer clause 5.3 of the National Electricity Rules (NER), section 43(1) of the *Queensland Electricity Act* and clause 5.1 of the Standard Connection Contract under the *Queensland Electricity Industry Code*

<sup>15</sup> Refer clauses 230 and 232 of the *Queensland Electricity Act* and clause 5.3 of the Standard Connection Contract

shared assets so where customer block loads (driven from customer requests) have been included in the demand forecast then the expenditure remains as CIA.

### **3.4 Different ways CICW can be undertaken**

Not all CICW works are undertaken by Ergon Energy. Depending on the type of work, services can be undertaken by one of three parties:

- Ergon Energy
- someone acting on Ergon Energy's behalf (i.e. a contractor to Ergon Energy)
- real estate developers or other service providers (acting on behalf of customers), where the assets are subsequently gifted to Ergon Energy.

As a consequence, depending on the nature of the work being undertaken, CICW can be funded by:

- Ergon Energy, where it, or someone acting on its behalf, undertakes the works
- a customer or real estate developer paying a cash capital contribution to Ergon Energy, where Ergon Energy, or someone acting on its behalf, undertakes the works
- a real estate developer or another service provider, where after the assets that they build are 'gifted' to Ergon Energy and are accounted for by Ergon Energy as a capital contribution.

The way in which CICW is undertaken affects how the cost of the works are recovered and from whom they are recovered. This is explained in more detail in the following sections.

### **3.5 Contestability of customer connection works**

Local government authorities in Ergon Energy's service area generally require the electricity infrastructure for subdivisions to be underground reticulation. Real estate developers can use contractors from either Ergon Energy's approved suppliers register or service providers who have been accredited by Ergon Energy to design and construct electrical reticulation for:

- urban residential subdivisions
- rural residential subdivisions
- commercial and industrial subdivisions
- commercial developments within a residential subdivision
- public lighting.

'Ergon Energy's Underground Distribution Construction (UDC) Developers Handbook – Developer Design and Construct' details the basis on which these contestable works must be undertaken. Works relating to large customer connections are also contestable and can be undertaken by accredited third party service providers. Where a third party builds an asset, it is gifted to Ergon Energy and accounted by Ergon Energy as a capital contribution. Section 3.6 describes how this capital contribution is determined and regulated.

Importantly, contestable works do not include network connection works, such as:

- the design and construction of a required extension to the distribution network outside the development that is required to provide the connection (except as agreed by Ergon Energy)
- augmentation works to the distribution network outside the project required to provide connection
- the final connection of the high voltage electrical works to the Ergon Energy distribution network
- the final connection of the low voltage electrical works to the Ergon Energy distribution network (except as agreed with Ergon Energy)
- Ergon Energy's compliance checks and audits of design and construction works

- testing and commissioning of the electrical works (except as defined in Ergon Energy's publically available document 'Specification for Underground Distribution Construction (UDC) Electrical Testing').

### **3.6 Regulatory treatment of capital contributions**

Ergon Energy has a 'Capital Contributions Policy' that details the circumstances in which a customer must contribute towards the cost of its connection and how it is to be treated for regulatory purposes. Generally, a capital contribution is required when the project costs, for a customer's connection including any upstream shared network costs, exceed the revenue that Ergon Energy expects to earn from the customer.

Ergon Energy's current 'Capital Contributions Policy' was approved by the QCA in April 2005. It applies in the current regulatory control by virtue of the transitional rules in clause 11.16.3 of the NER.

Ergon Energy is submitting a proposed new 'Capital Contributions Policy' to the AER for the next regulatory control period that will replace the April 2005 version. This is required because the transitional rules will no longer apply in this next period and clause 6.21 of the NER requires Ergon Energy to have a capital contributions policy that complies with the rules.

Ergon Energy will also change the way in which it treats capital contribution for regulatory purposes in the next regulatory control period:

- In the current regulatory control period, Ergon Energy includes assets funded through capital contributions in its regulatory asset base. It earns a return on, and of, these assets for the purposes of determining its Annual Revenue Requirement. It then deducts the value of capital contributions from the Annual Revenue Requirement for each regulatory year.
- In the next regulatory control period, Ergon Energy will not include assets funded through capital contributions in its Regulatory Asset Base. Rather, it will be able to charge capital contributions over and above its Annual Revenue Requirement and include these assets in its Regulatory Asset Base at zero value.

### **3.7 Form of regulation for SCS and ACS**

Chapter 6 of the NER specifies that:

- Ergon Energy's annual revenue requirement for its SCS must be regulated under a building blocks approach
- Ergon Energy must submit a Regulatory Proposal to the AER that must include a Building Blocks Proposal for its SCS
- the Building Blocks Proposal must include a forecast of Ergon Energy's capital expenditure for its SCS for each year of the next regulatory control period.

The AER notes in its 'Expenditure Forecast Assessment Guidelines'<sup>16</sup> that one element of a Distribution Network Service Provider's (DNSP), such as Ergon Energy's, forecast capital expenditure relates to its 'connections and customer-initiated works capital expenditure that typically relates to the cost of connecting customers to the network and other customer-related works'. This is what Ergon Energy calls its CICW capital expenditure.

The NER do not specify how Ergon Energy's ACS will be regulated. The 'AER's Final Framework and Approach' paper states that 'Through the distribution determination process, we will confirm the basis of the control mechanism for ACS. That is, we will confirm whether we will set prices using a building block approach or another method'.<sup>17</sup>

Ergon Energy's Regulatory Proposal must include CICW capital expenditure forecasts for all new or upgraded customer connections inside of the National Electricity Market, distinguished by SCS and ACS.

The regulatory treatment of CICW capital expenditure depends on:

- the type of customer connection
- the type of service.

Ergon Energy has the following types of customer types or what can be described as customer connection activity:

- small customers broken down into two subcategories:
  - Domestic and Rural
  - Commercial and Industrial
- subdivisions (i.e. made by real estate developers)
- large customer connections
- public lighting
- metering
- services.

In addition to the types of customer connections CICW works are undertaken in two ways:

- Ergon Energy's work – this comprises:
  - design and construct connection assets
  - design, construct and augment shared network
  - commission and energise connection assets.
- Work undertaken by other parties – this comprises:
  - cash contributions
  - gifted assets.

Table 5 details how Ergon Energy proposes to treat these different types of customer connection activities for regulatory purposes.

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<sup>16</sup> AER, Expenditure Forecast Assessment Guideline for Electricity Distribution

<sup>17</sup> AER, Final Framework and approach for Ergon Energy Regulatory control period commencing 1 July 2015, April 2014, p. 65.

**Table 5: Forecasting categories of CICW**

	Small Customer Connections (SACs)		Real Estate Developer (Subdivisions)	Large Customer Connections (ICC, CAC & EGs)	Remove network constraint for generator > 30KvA	Public lighting	Metering
	Domestic & Rural (SAC)	Commercial & Industrial (SAC)					
<b>EECL work</b>							
Design and construct connection assets	Activity Code – Domestic and Rural, SCS, SCS Metering [SCS → DUOS]	Activity Code – Commercial and Industrial [SCS → DUOS]	Activity Code – Subdivisions [ACS → ACS charge]	Activity Code – Large Customer Connection [ACS → ACS charge]	Not applicable	Activity Code – Public Lighting [ACS → ACS charge]	Activity Code - ACS Services, ACS Metering [ACS → ACS charge]
Design, construct and augment shared network			Activity Code – Subdivisions [SCS → DUOS, if within planning horizon and no advancement ACS → ACS charge, if outside planning horizon or requires advancement]	Activity Code – Large Customer Connection <sup>18</sup> [SCS → DUOS]	Activity Code – % Large Customer Connection [ACS → ACS charge]		
Commission and energise connection assets			Activity Code – Subdivisions [ACS → ACS charge]	Activity Code – Large Customer Connection [ACS → ACS charge]	Not applicable		
<b>Capital contributions</b>							
Cash contributions (to cost of EECL work)	Activity Code – Domestic & Rural, Services [SCS → cash cons]	Activity Code – Commercial & Industrial [SCS → cash cons/gifted assets]	Not applicable	Not applicable	Not applicable	Activity Code – Public Lighting [ACS→ cash cons]	Not applicable
Gifted assets	Not applicable		Activity Code – Subdivisions [ACS → gifted assets]	Activity Code – Large Customer Connection [ACS → gifted assets]	Not applicable	Activity Code – Public Lighting [ACS → gifted assets]	Activity Code – ACS Services, ACS Metering [ACS → gifted assets]

<sup>18</sup> Excludes expenditure related to augmentation works on the shared network.

### 3.7.1 Small customer connections

Ergon Energy's small customer connections are classified as Standard Asset Customers (SAC) for pricing purposes. They do not relate to works conducted for real estate developers, Individually Calculated Customers (ICC), Connection Asset Customers (CAC) or Embedded Generators.

Ergon Energy's forecasts of CICW capital expenditure for small customer connections comprise two sub-categories, being 'Domestic and Rural' customers and 'Commercial and Industrial' customers.

#### Domestic and rural customer connections

This sub-category is for all customer requested capital works for connections of domestic properties in urban and rural areas. This includes costs for works conducted at a customer's meter box. It excludes the metering expenditure that will be classified as ACS in the next regulatory control period.

The unit costs for this sub-category relate to four activities, being:

- new rural customer
- new urban customer
- new metering works not classed as ACS for the next regulatory control period – such as load control receivers
- new metering services works not classed as ACS for the next regulatory control period.

The volume forecast for this sub-category is discussed further in Section 6 of this document.

Revenue for this sub-category is recovered through DUOS charges and from upfront (cash) capital contributions from the connecting customer, determined in accordance with Ergon Energy's 'Capital Contribution Policy'.

#### Commercial and industrial customer connections

This sub-category is for all customer requested capital works for connections of commercial and industrial customers in urban and rural areas. This includes connection to pumping / irrigation loads and other industries. It excludes the metering expenditure that will be classified as ACS in the next regulatory control period.

The unit costs developed for this sub-category relate to two activities, being:

- new rural customer
- new urban customer.

The volumes relating to the forecast are discussed further in Section 6 of this document.

Revenue for this sub-category is recovered through DUOS charges and from upfront (cash) capital contributions from the connecting customer, determined in accordance with Ergon Energy's 'Capital Contribution Policy'.



### 3.7.2 Real estate developer (subdivisions)

Ergon Energy's subdivision connections relate to all residential and commercial subdivisions where construction is performed for a developer of a number of allotments. They do not relate to ICC, CAC or EG.

The unit costs developed for this sub-category relate to two activities, being:

- new overhead subdivision connection
- new underground subdivision connection.

The unit cost excludes any work in relation to small customer connections.

The volumes relating to the forecast is discussed further in Section 6 of this document.

During the current regulatory control period, the costs of:

- the provision of the connection asset (i.e. excluding works required on the shared assets) are recovered through an ACS charge payable by the developer
- the provision of works required on the shared network is recovered through SCS DUOS charges levied on end customers.

However, in the forthcoming regulatory control period, the cost of works required on the shared network will transition from SCS to ACS and be recovered through DUOS charges. The exception to this is where the developer requires Ergon Energy to augment the shared network outside of the current planning horizon by bringing work forward, in which case an ACS charge would still be levied on the developer.

Real estate developers gift to Ergon Energy the assets that they build.

### 3.7.3 Large customer connections (ICC, CAC and EG)

Ergon Energy's large customer connections are classified as ICC, CAC or EG for pricing purposes.

Generically, these connections are new block loads that exceed 1,500kVA or 1.5MVA or where power usage is typically above four gigawatt hours per annum at a single site. It also includes connections for generators that are above 10 kilowatts on one-phase, or above 30 kilowatts on three phases but excludes expenditure related to augmentation of shared assets as this is discussed in the next section.

During the current regulatory control period Ergon Energy has been transitioning to a new regime where the customer has two options:

- Firstly, the customer can request Ergon Energy to undertake the required works, in which case the customer is charged DUOS charges to recover the costs of shared network assets and an ACS charge to recover the remaining costs of the new connection.
- Secondly, the customer can arrange for the required works to be undertaken by a third party and then gift the resultant asset to Ergon Energy.

In development of Ergon Energy's forecast the breakdown of work in Table 5 for this category takes account of when Ergon Energy performs 'design, construct and augment shared network' works. This only relates to the design and construction of works required to facilitate the connection such as modification of Ergon assets to connect the customer funded connection. This is done to systematically exclude all related augmentation works from the CICW capital expenditure forecasts, as Ergon Energy's network planning systems includes potential block loads for large customer connections. This avoids double counting of augmentation expenditure for shared network assets in the CICW forecast.

The exception to this is for works required to remove a network constraint for generators at a customer's request as this will be classified as an ACS service in the next regulatory control period. All costs relating to both ACS services and gifted assets have been excluded from Ergon Energy's SCS forecast. Additionally all costs relating to the augmentation of the shared network are only included under the Corporation Initiated Augmentation capital expenditure forecasts and are excluded from the CICW forecasts.

### **3.7.4 Remove network constraint for generator > 30KvA**

As stated above Ergon Energy's large customer connections are classified as ICC, CAC or EG for pricing purposes. In accordance with the 'AER's Framework and Approach paper'<sup>19</sup>, Ergon Energy has developed a sub category relating to augmentation of shared assets for connections of generators that are above 30KVA.

Generically, this category caters for circumstances where generators request Ergon Energy's network to be enhanced to allow generators to export more electricity into the shared network. It applies to embedded generators (>30KVA) being treated as an ACS service in the next regulatory control period.

In preparation of Ergon Energy forecasts for this category, analysis was conducted into a sample of historical projects to determine the percentage of works relating to this activity within the large customer connection category for the current period and applies this percentage to determine the forecasted ACS component.

### **3.7.5 Public lighting**

This category is for all customer requested capital works for the connection of new and upgrade of existing public lighting assets in urban and rural areas. Ergon Energy's public lighting connections for the current regulatory control period are classified as an alternative control service for pricing purposes.

The unit cost developed for this sub-category relate to two activities, being:

- new public light connection
- upgrade public light connection.

The volumes relating to the forecast are discussed further in Section 6 of this document.

Revenue for this sub-category is recovered via:

- an ACS charge for new public lights and upgraded connections where Ergon Energy performs the work
- a cash contribution made by a third party where Ergon Energy performs the work
- as a gifted asset where a third party performs the work and the asset ownership is transferred to Ergon Energy to operate and maintain into the future.

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<sup>19</sup>AER, Final Framework and approach for Energex and Ergon Energy Regulatory control period commencing 1 July 2015, April 2014

### 3.7.6 Metering

This category is for all customer requested capital works relating to the installation and provision of new, replaced (failed in service) alterations and additions for connections for standard Type 5 and 6 meters. This includes works in relation to meters and associated service connection in both urban and rural areas. It excludes the metering expenditure that will be classified as SCS in the next regulatory control period.

The unit costs for this sub-category relate to two activities, being:

- new meters (ACS classified works only)
- new meter services (ACS classified works only).

The volume forecast for this sub-category is discussed further in Section 6 of this document.

In the past, metering services have been classified as SCS and recovered via the associated DUOS charge. In the next regulatory control period, metering services (other than Type 7 meters) will be reclassified as ACS. As a consequence, there will be a new ACS metering charge applied, which will be separate to the DUOS SCS charge.

## 4. Current period outcomes at a category level

This section examines why Ergon Energy's actual CICW capital expenditure in the current regulatory control period differed from:

- the forecasts that it presented to the AER in its regulatory proposal (and revised regulatory proposal)
- the AER's own capital expenditure allowance in its distribution determination.

It also explains how Ergon Energy has incorporated learnings about these differences into its capital expenditure forecasts for the next period, which are explained in Sections 5 and 6.

This section includes an estimate of expected connection requests and expenditure for 2014-15.

### 4.1 Ergon Energy's regulatory proposal and AER's distribution determination

Ergon Energy's regulatory proposal for the current regulatory control period set out its approach for forecasting its CICW capital expenditure, which involved:

- taking its 2007-08 CICW expenditure as the starting point
- adjusting its CICW price book to reflect current costs
- escalating its small CICW expenditure for forecast changes in dwelling stock and its large CICW expenditure for forecast changes in gross regional product.

In its Draft Distribution Determination, the AER rejected Ergon Energy's approach and instead adopted a model prepared by its consultant, Parsons Brinckerhoff. This model forecast the CICW capital expenditure by:

- averaging the number of new customers over the previous regulatory control period and increasing this average by Ergon Energy's assessment of the expected annual population growth rate (i.e. 1.6% per annum)
- applying regression analysis to Ergon Energy's historical costs of new connection to determine an average unit rate per connection.

This resulted in the AER's Draft Distribution Determination reducing Ergon Energy's total CICW forecast of \$1,787 million by \$259 million to \$1,528 million (total costs).

In its Revised Regulatory Proposal, Ergon Energy changed its approach to forecasting CICW capital expenditure. It used dwelling stock growth as the forecast driver for both small and large customer CICW capital expenditure. This resulted in its total CICW forecast increasing to \$2,108 million (total costs).

The AER also rejected Ergon Energy's revised approach in its Final Distribution Determination on the basis that Ergon Energy had not effectively demonstrated a causal relationship between dwelling stock growth and either small commercial and industrial connections or large commercial and industrial connections. Instead, the AER applied a modified version of the Parsons Brinckerhoff developed model that it used in its Draft Distribution Determination – the modifications involved using data over a longer period to determine the average cost of customer connections. This resulted in the AER reducing Ergon Energy's total CICW expenditure forecast by \$514 million to \$1,594 million (total costs). This amount has been reflected into Ergon Energy's regulatory asset base for the current regulatory control period and therefore into its annual revenue requirements, revenue caps and distribution charges.

To allow the comparison of Ergon Energy's performance in the next section, Table 6 details Ergon Energy's CICW forecast in its regulatory proposal and revised regulatory proposal and the AER's allowance in its distribution determination for the current regulatory control period, noting that these are direct costs only (not total costs as discussed immediately above).

**Table 6: AER and Ergon Energy's CICW capital expenditure forecast (Direct costs, \$ million real 2014-15)**

Regulatory Review Process	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Regulatory Proposal	274	295	264	278	311	<b>1,422</b>
Revised Regulatory Proposal	298	327	286	302	337	<b>1,551</b>
AER Determination	223	220	220	228	234	<b>1,125</b>

## 4.2 Performance against the AER's CICW allowance

Table 7 compares Ergon Energy's actual and estimated CICW capital expenditure for the current regulatory control period with the AER's CICW capital expenditure forecast.

**Table 7: Ergon Energy's actual, and the AER's forecast, CICW forecast (Direct costs, \$ million real 2014-15)**

	2010-11	2011-12	2012-13	2013-14	2014-15	Total
AER Determination	223	220	220	228	234	<b>1,125</b>
Actual / Estimate	139	133	142	140	135	<b>689</b>
Variance – Actual v Determination	-38%	-40%	-35%	-39%	-42%	<b>-39%</b>

Ergon Energy expects that it will underspend its allowance from the AER for CICW capital expenditure by \$436 million, or 39%, during the current regulatory control period. The key reasons for this underspend are:

- The AER based its forecast growth in customer connections on the expected annual population growth rate, whereas Ergon Energy's analysis indicates that the number of connection requests are driven by employment, housing and residential building approvals (housing and non-housing).
- The effect of the Global Financial Crisis saw reduced new-customer connections, including subdivisions, and delayed mining activity, which was later and flatter than previously expected by both industry and government.

The impact of subdued economic growth was felt across most CICW categories, including a:

- 51.0% reduction in the growth of domestic and rural connection requests by the end of the regulatory control period
- 16.6% reduction in the growth of commercial and industrial connection requests by the end of the regulatory control period
- 11.3% reduction in the growth of subdivision new lots recorded for work requests.

A comparison of the average total number of new connections for 2006-10 years to the actual number of new connection requests per year during the current period, are provided in Table 8.

**Table 8: Total number of connection requests during the current regulatory control period**

High level activity	2006-10 average	2010-11	2011-12	2012-13	2013-14 <sup>20</sup>	2014-15
Domestic and rural connection	1,025	594	633	537	495	543
Commercial and industrial connection	772	717	617	652	607	697
Subdivision connection	6,597	5,178	6,127	6,972	5,685	6,306
Large customer connection	4	9	14	3	2	4
Public lighting	106	219	297	279	165	190
Metering	- <sup>21</sup>	- <sup>21</sup>	56,705	68,648	62,984	66,379
Services	- <sup>21</sup>	12,174	12,858	13,852	13,665	13,574

### 4.3 How Ergon Energy backcast its CICW capital expenditure

As discussed above, Ergon Energy's CICW capital expenditure is driven by customers wanting to connect, or upgrade their connection, to the distribution system. In this sense, customers, rather than Ergon Energy, dictate the timing and quantum of CICW capital expenditure.

Connection requests have significantly declined during the current regulatory control period, in line with movements in economic drivers. Ergon Energy undertook a backcasting exercise to determine whether a relationship can be drawn between these drivers, and CICW capital expenditure.

Once Ergon Energy established that its model could explain its actual historical CICW capital expenditure, it applied the model to forecast its new or upgraded customer connections.

Ergon Energy undertook this backcasting in several steps, which are detailed briefly below.

Step 1 involved calculating monthly historical CICW capital expenditure for 2006-12 based on:

- CICW project start dates
- CICW project costs
- a standardised monthly profile of how expenditure is incurred on individual projects.

Step 2 involved using 2010-11 data to calculate – for Ergon Energy's customer type/activity – the standardised average:

- total costs for CICW projects
- monthly expenditure profile for CICW projects.

<sup>20</sup> Source of the forecasted data for 2013-14 & 2014-15 is the pre-scaled volume from the Ergon Energy CICW model

<sup>21</sup> Data not available owing to no applicable activity code to identify in Ergon Energy's Enterprise Resource Planning (ERP) System - Ellipse

Step 3 involved using an econometric model to backcast the historical volumes of CICW projects for each customer type/activity. Ergon Energy found that the following state macroeconomic variables had the strongest estimating power:

- employment
- housing building approvals
- non-housing (residential) building approvals.

Step 4 involved calculating the backcast CICW capital expenditure for the customer type/activity by calendar month by applying the outcomes of Steps 2 and 3.

Step 5 involved Ergon Energy comparing the backcast values from Step 4 with the actual historic CICW capital expenditure from Step 1 to ensure that the model is producing consistent results.

The following sub-sections outline the sources of historical employment and building approvals data for the period 1 July 2006 to 31 December 2013.

#### **4.3.1 Residential and non-residential building approvals**

Data for residential and non-residential building approvals are collected at the regional level from monthly Australian Bureau of Statistics (ABS) publications (Catalogue No. 8731.0).<sup>22</sup> Definitions of the collected variables are:

- total number of residential building approvals – house residential building, new, Pprivate ownership
- total number of residential building approvals – other residential building, new, private ownership.

Building approvals data from 2006 to January 2014 could not be used in its current format, as the data was in the old Australian Standard Geographical Classification (ASGC). An exercise was undertaken to realign this data to the latest data in the new ASGC codes through the correspondence table.

Ergon Energy is interested in presenting the results in geographical regions that are relevant to the provision of services. Consequently, it is necessary to map data that is publically released by the ABS to Ergon Energy's CICW regions. The detailed mapping and updating procedure is provided in Table 9.

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<sup>22</sup> For further details refer to <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8731.0December%202012?OpenDocument>.

**Table 9: Mapping of ABS geographic regions to Ergon Energy's CICW regions**

Ergon CICW region	ABS Statistical Area (SA3)	Ergon CICW region	ABS Statistical Area (SA3)
Burdekin	Bowen Basin – North Charters Towers – Ayr – Ingham	Maranoa	Darling Downs (West) – Maranoa Outback – South
Cairns	Cairns – North Cairns – South Tablelands (East) – Kuranda	North West	Outback – North
Callide Curtis	Gladstone – Biloela	Tablelands	Port Douglas – Daintree Far North Outback – North
Central coast	Rockhampton Central Highlands (Qld)	Toowoomba	Toowoomba
Darling Downs	Darling Downs – East Granite Belt	Townsville	Townsville
Hinchinbrook	Innisfail – Cassowary Coast	Wide Bay North	Bundaberg
Mackay	Mackay Whitsunday	Wide Bay South	Burnett Hervey Bay and Maryborough

Where there is more than one statistical area/region mapping to an Ergon Energy CICW region then they are totalled. For example, Wide Bay South (an Ergon Energy CICW region) is calculated by totalling the number of building approvals for Burnett, Hervey Bay and Maryborough.

Where there is a statistical area/region mapping to two Ergon Energy CICW regions, the number of building approvals is split evenly between the two regions. For example, Outback North (SA3 level) maps to Ergon Energy CICW regions North West and Tablelands. Half of the building approvals for Outback North are attributed to North West, and half to Tablelands.

### 4.3.2 Employment data

Based on the same methodology applied for the compilation of building approvals data, the ABS's definition of statistical area were mapped with Ergon Energy's regions to get employment level data for the five broad regions (Tablelands, Cairns, Hinchinbrook, North West and Burdekin).<sup>23</sup>

This used the share data derived from the 2011 Census data to obtain employment level data for sub-regions within each of the five broad regions (so each of Ergon Energy's 15 regions has a unique dataset for the level of employment).

Employment series collected and used in the econometric models are the number of persons employed. That is, there is no distinction between full time and part time employment.

<sup>23</sup> Data was collected from the ABS Catalogue No. 6291.0.55.001 – The Labour Force, Australia, Detailed – Electronic Delivery (which is released monthly) <http://www.abs.gov.au/ausstats/abs@.nsf/mf/6291.0.55.003>



## 4.4 Reasons for variance from AER's CICW allowance

The reasons for the variances between Ergon Energy's actual/estimated CICW capital expenditure and the forecasts in its regulatory proposal, revised regulatory proposal and the AER's allowance in its distribution determination can be explained by the differences between what:

- Ergon Energy has established as the key drivers of its actual expenditure through its backcasting model
- Ergon Energy and the AER respectively assumed at the time of the last reset (outlined in Section 4.1).

During the current regulatory control period, it became evident that total connection requests were heavily driven by underlying macroeconomic variables, including:

- employment
- housing building approvals
- non-housing (residential) building approvals.

Table 10 illustrates the difference in the adopted approach.

**Table 10: Differences between CICW capital expenditure assumptions**

	Ergon Energy's Regulatory Proposal forecast	Ergon Energy's Revised Regulatory Proposal forecast	AER's Distribution Determination forecast	Ergon Energy's backcast modelling
Assumed base year	2007-08	2007-08	Average of five years	2010-11
Annual growth factors	Small customers – dwelling stock Large customers – gross regional product	Small and large customers - dwelling stock	Population growth	Employment Housing building approvals Non-housing (residential) building approvals

Overall residential connections can be well explained by new residential buildings while commercial and industrial connections can be explained by overall regional economic activity variables such as employment. Expenditure for the sub-divisions, public lighting, services and metering categories are consequential requirements of new residential/commercial buildings.

Thus, the residential building approvals are leading indicators of new connections for residential building related CICW capital expenditure categories. Additionally employment is as a leading indicator of commercial and industrial projects related CICW capital expenditure.

At the regional level, the employment and residential building approval data are only variables that are reliably available on a monthly basis for a substantial historical period.

However, large customer connections are inherently difficult to forecast as they are typically low volumes, large variation in cost and are often not directly related to local economic activities.

Thus, the backcasting exercise outlined in Section 4.3 established a strong relationship between these economic variables and the CICW capital expenditure for most of the customer connection

activities. The results of the regression analysis satisfied various econometric diagnostic tests and the assumed sign conditions.<sup>24</sup>

The following section summarises at a high level, the results of the backcasting exercise for each high level customer type/activity, and demonstrates the strength of the relationship between the economic variables and connection activities. It should be noted that the values below cannot be added together to obtain total connection/customer numbers as they relate to different units, some are connection request by volume, work requests for metering/services and others are new lots for subdivisions.

#### 4.4.1 Domestic and rural connection

During the analysis period, Ergon Energy had 4,718 actual new domestic and rural connection requests, or an average of 786 new connections per annum. For the same period, the backcasting analysis estimated 4,858 connection requests, or an average of 810 per annum.

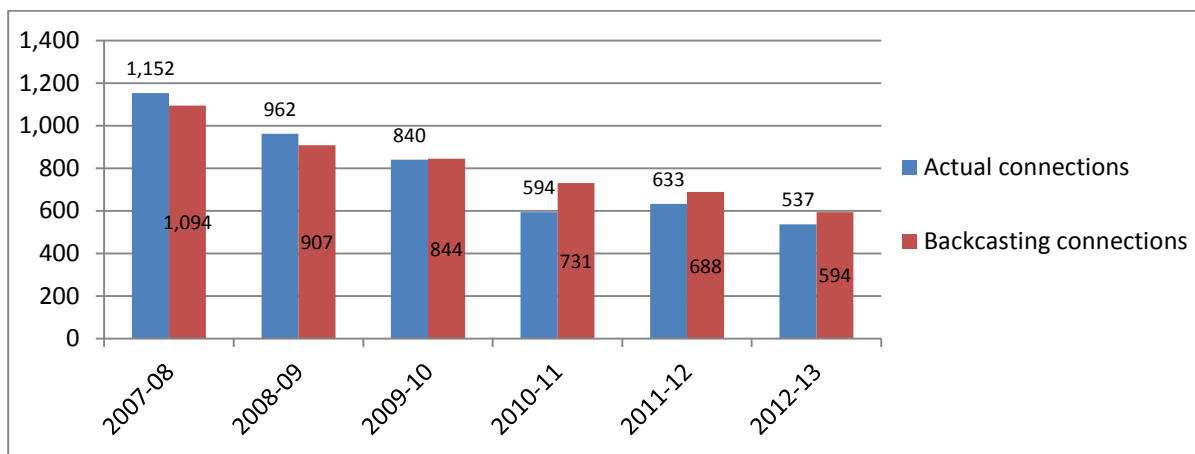


Figure 1: Domestic and rural connection – comparison of actual vs backcasting results

24. Generally, the coefficients of each driver should have the positive sign unless there are complicated dynamic impacts. This implies that any positive (negative) changes in the underlying drivers should lead to an increase (decrease) in the volume series.

### 4.4.2 Commercial and industrial connection

During the analysis period, Ergon Energy had 4,356 actual new commercial and industrial connection requests, or an average of 726 new connection requests per annum. For the same period, the backcasting analysis estimated the same number of connection requests, and the same annual average number of connection requests.

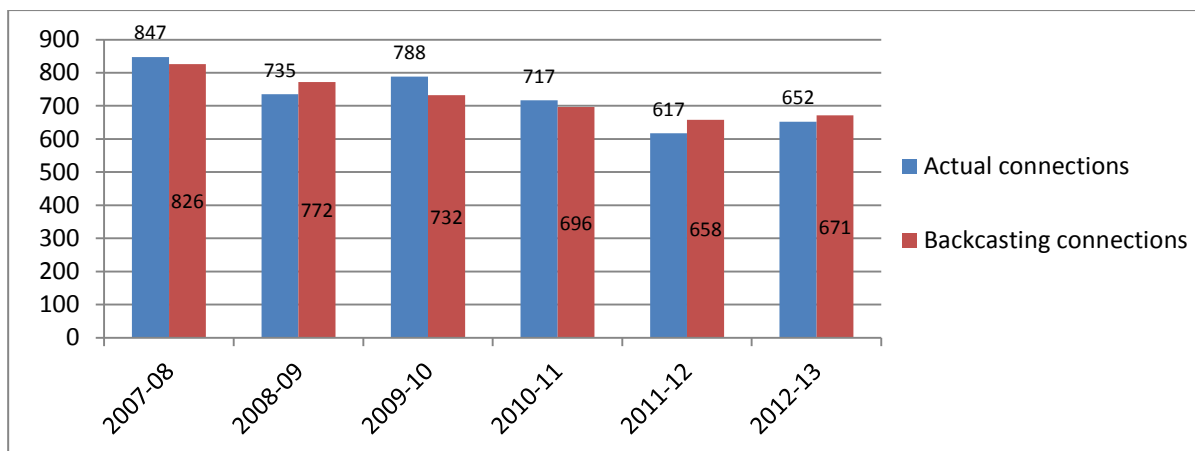


Figure 2: Commercial and industrial connection – comparison of actual vs backcasting results

### 4.4.3 Subdivision connection (new lots)

During the analysis period, Ergon Energy had 37,150 new lots recorded for work requests, or an average of 6,192 new work requests per annum. For the same period, the backcasting analysis estimated 37,689 work requests, or an average of 6,282 work requests per annum.

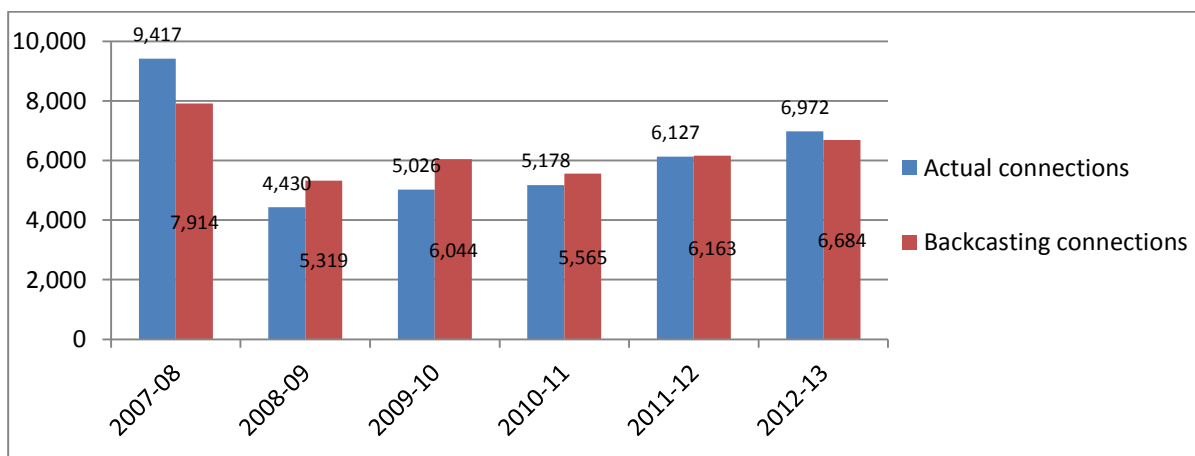


Figure 3: Subdivision connection – comparison of actual vs backcasting results

#### 4.4.4 Public lighting

During the analysis period, Ergon Energy had 1,135 new public lighting work requests or an average of 189 new work requests per annum. For the same period, the backcasting analysis estimated 1,112 new public lighting work requests or an average of 185 work requests per annum.

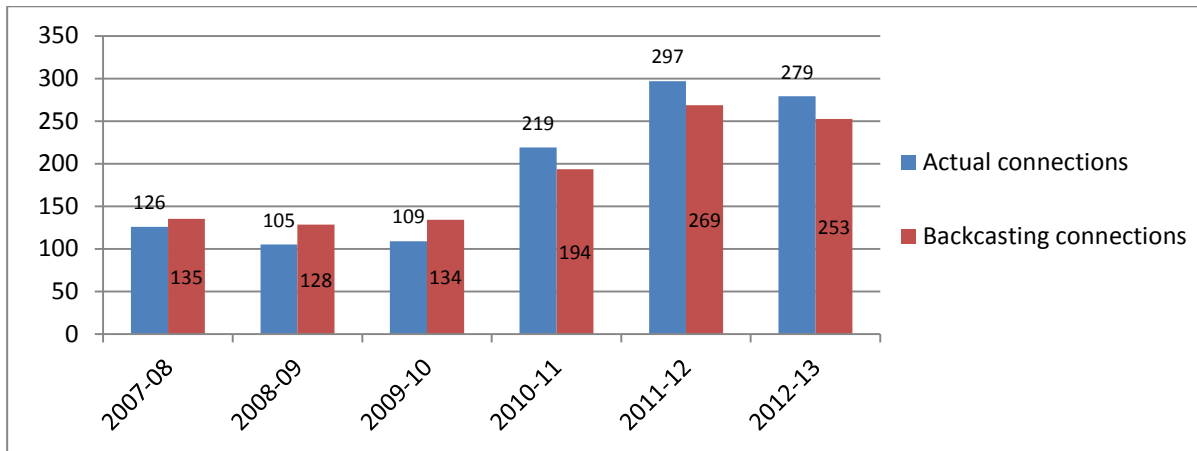


Figure 4: Public lighting – comparison of actual vs backcasting results

#### 4.4.5 Metering

During the analysis period, Ergon Energy had 119,547 new metering work requests, or an average of 59,774 new work requests per annum. For the same period, the backcasting analysis estimated 118,269 new metering work requests, or an average of 59,134 work requests per annum.

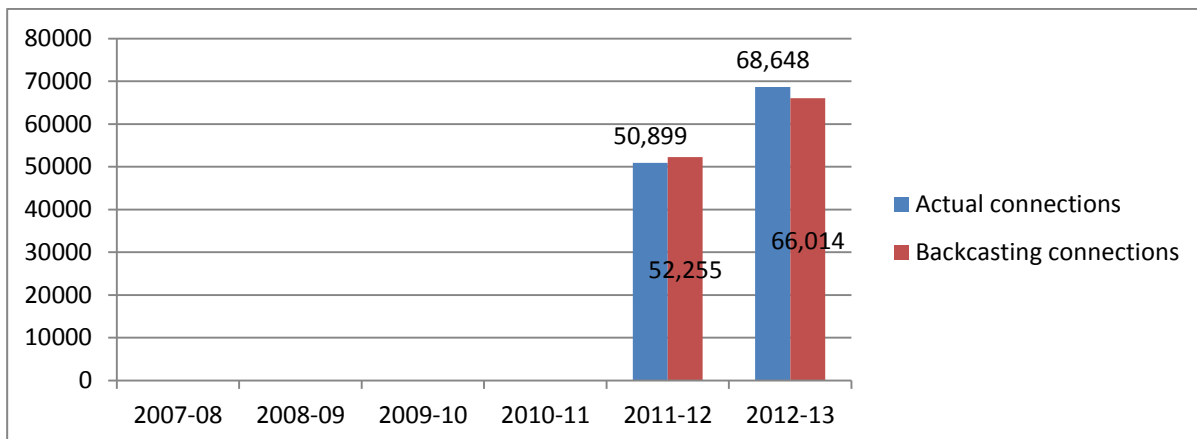


Figure 5: Metering – comparison of actual vs backcasting results

#### 4.4.6 Services

During the analysis period, Ergon Energy had 22,803 new work requests associated with each work request, or an average of 11,402 work requests per annum. For the same period, the backcasting exercise estimated 22,536 new work requests, or an average of 11,268 work requests per annum.

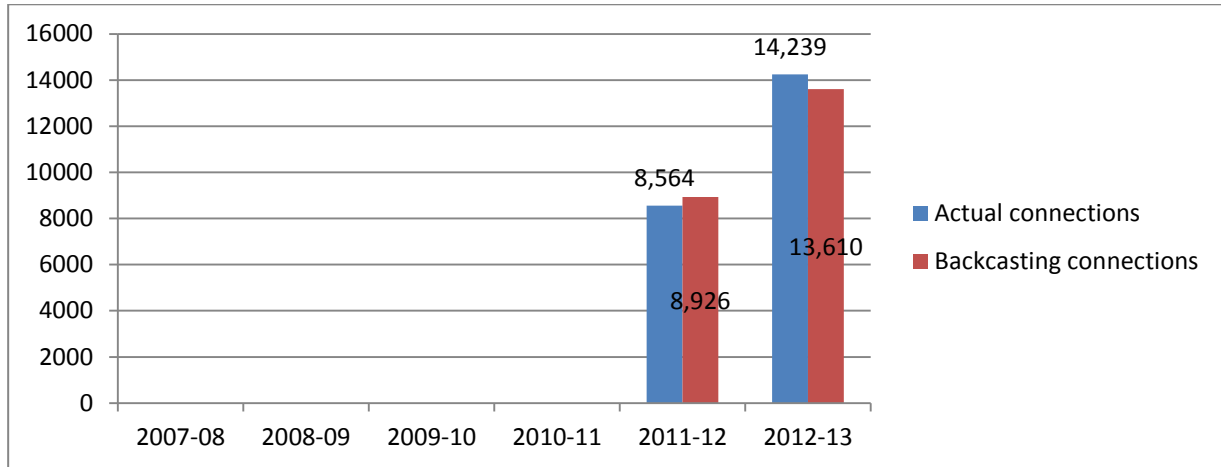


Figure 6: Services – comparison of actual vs backcasting results

#### 4.4.7 Large customer connection

It must be noted that the AER substituted its forecast for the current regulatory period it did not provide a forecast of expenditure for this large customer connection category. Additionally the large customer connection category has been transitioned during the current period from SCS to ACS. This category is inherently difficult to predict. Customer activity can generate large scale projects, which are often not directly related to local economic activities. The annual volume of activity can fluctuate year to year, however is typically quite low in the order of less than 10 connection requests. It is for these reasons that it is not possible to provide a backcast of volumes of this category.

## 5. Expenditure forecasting method

This section explains and justifies the method that Ergon Energy has used to forecast its CICW capital expenditure for the next regulatory control period.

### 5.1 Objectives of CICW capital expenditure forecasts

Ergon Energy's objective is to produce robust and well supported forecasts of its CICW capital expenditure for the next regulatory control period.

Ergon Energy recognises that the quality of its CICW capital expenditure forecasts critically depends on the appropriateness or validity of the engineering, economic, econometric and statistical forecasting approaches that are used to produce them. Forecasting approaches are more valid if:

- they reflect the nature of the CICW expenditure
- they take into account historical movements in CICW expenditure
- relevant data is available about potential underlying expenditure drivers that can be used in the forecasting approaches.

Accordingly, CICW capital expenditure forecasts are disaggregated into distinct customer type/activity that exhibit different engineering, economic or statistical characteristics or properties.

### 5.2 Conceptual nature of expenditure forecasting method

Ergon Energy prepared its CICW capital expenditure forecasts for the following customer type/activity:

- small customers:
  - domestic and rural
  - commercial and industrial.
- subdivisions (i.e. made by real estate developers)
- large customer connections
- public lighting
- services
- metering.

Ergon Energy in preparing its forecasts take account of:

- works that it undertakes itself (i.e. Ergon Energy works)
- cash contributions and gifted assets.

### 5.2.1 Ergon Energy works

Ergon Energy has developed unit costs for all customer type/activity except for the large customer connections category. These unit costs are 'compatible units' that represent the requirements to deliver a single unit of work (i.e. a customer connection). They are based on historical labour, materials, contractors, equipment, and other costs for the period 2010-11 to 2012-13.

Ergon Energy used these compatible units to determine:

- A capital expenditure estimate:
  - where the volumes were based on Ergon Energy's historical CICW volumes for the period 2010-11 to 2013-14
- A capital expenditure forecast:
  - where the volumes were forecast using an economic forecasting model that used the following state macroeconomic variables:
    - employment
    - housing building approvals
    - non-housing (residential) building approvals.

The choice of macroeconomic variables is described in section 5.3 below.

Ergon Energy then developed a 'scaling factor' to equate the capital expenditure estimate and forecast for 2013-14.

Ergon Energy then re-based the volumes from the econometric forecasting model by applying the scaling factor to them. It then applied the CICW unit costs to these new volumes to determine the annual expenditure forecast for 2015-20, again for each customer type/activity.

Large customer connections forecast are basically a 5 year average of historical expenditure for this activity.

Ergon Energy then determined the proportion of capital expenditure for each customer type/activity that is attributable to SCS and ACS based on historical averages.

### 5.2.2 Cash contributions and gifted assets

Ergon Energy determined the historical capital expenditure for each customer type/activity.

It then determined the proportion of historical capital expenditure that comprised cash contributions and gifted assets relevant for each customer type/activity based on the averaged over the last five years. In this way, Ergon Energy determined different proportions for each.

Ergon Energy then applied the proportions to the expenditure forecast for Ergon Energy works by customer type/activity to determine the annual forecast expenditure for cash contributions and gifted assets.

### 5.3 Choice of macroeconomic variables

Ergon Energy used the following process to choose the macroeconomic variables that are applied in the CICW expenditure forecasting model to forecast the customer connections volumes for the next regulatory control period:

- Starting from a sample of 8 or 9 potential economic drivers, Ergon Energy chose employment and residential and non-residential housing building approvals as the proposed economic drivers because:
  - Conceptually Ergon Energy expected that they would be strongly related to new customer connections – specifically, Ergon Energy expected:
    - Employment to be closely reflective of new connection activity; and
    - Building approvals to be closely related to new buildings requiring new connections.
  - Historical data was available for these economic drivers broken down by Ergon Energy’s geographic areas. While other variables (i.e. that were not selected) could be used for the entire Ergon Energy service area on a quarterly or yearly basis, it was difficult to disaggregate the state-level variables to Ergon Energy’s geographic areas with a monthly frequency as we required for the forecast; and
  - Ergon Energy considered that differences in customer connection growth across Ergon Energy’s geographic areas could be well explained by the three selected variables.
- Ergon Energy undertook analysis to test the statistical significance of the relationship between its historical customer connections and the selected economic drivers. Importantly, this involved statistical and econometric testing of:
  - The economic variables; and
  - Various periods of lags between the economic variables and the historical connection numbers.

Ergon Energy’s analysis found that there were strong monthly relationships between the chosen economic drivers and the connection numbers over the historical periods from January 2006;

On the basis of this analysis, Ergon Energy determined estimation coefficients for each sub-category of its customer connections. In effect, these coefficients reflect the relationships between the economic drivers and the customer connection sub-categories. The lagged connection requests are also used to determine the current connection requests given that the typical work duration is generally longer than a month;

Ergon Energy then developed forecasts of the economic drivers for the next regulatory control period using KPMG’s macroeconomic model and KPMG construction sector forecasting model; and

Ergon Energy then applied the estimation coefficients to the forecasts of the economic drivers in order to forecast the customer connections volumes for the next regulatory control period.

### 5.4 Further detail about forecasting method

For the complete details please see the Ergon Energy’s forecasting model, complete with explanatory documentation to assist with the AER review of this forecasting approach. These key references are:

- Ergon Energy CICW Forecast Model – Excel spreadsheet
- ‘Model Documentation Ergon Energy CICW Forecasting Model’ – Word document/PDF



Additionally the following listed appendices are a summary of key aspects of the forecasting approach:

- Appendix A describes Ergon Energy's CICW capital expenditure forecasting method in greater detail.
- Appendix B describes the CICW unit cost estimates for Ergon Energy's SCS
- Appendix C describes the CICW Large customer connection forecast method in greater detail

## **5.5 Justification of expenditure forecasting method**

Ergon Energy's forecasting approach is broadly similar to that which the AER used to determine Ergon Energy's CICW capital expenditure allowance in its Distribution Determination for the current period. In short, it involves applying a growth factor to a base level of expenditure.

This forecasting approach is also consistent with the assessment approach that the AER indicated in its Expenditure Forecast Assessment Guideline Explanatory Statement that it will use, where it stated: 'We will continue our approach of using trend analysis in setting expenditure allowances for the DNSPs' provision of customer-initiated services'.

Ergon Energy has used its actual 2013-14 CICW capital expenditure as its base expenditure. This ensures that the forecast is grounded in the most recent actual capital expenditure that Ergon Energy has delivered. Ergon Energy considers that this provides the best available information about customers' demand to connect to the distribution system. Importantly, CICW connections are driven entirely by customers' preferences, not by any decisions of Ergon Energy.

Ergon Energy then applied a scaling factor to ensure the correct relativities are maintained between its customer type/activity. Ergon Energy then forecast the annual change in its capital expenditure using an economic forecasting model. This model used three state macroeconomic variables – employment, housing building approvals, and non-housing (residential) building approvals. Ergon Energy chose three variables because they had the strongest explanatory power. Ergon Energy established this was the case by using its model – incorporating these variables – to backcast its CICW capital expenditure as explained in Appendix B. It checked that its backcast capital expenditure was comparable to its actual capital expenditure.

Ergon Energy is therefore confident that its capital expenditure forecasts are prudent and efficient because they:

- are based on its most recent actual capital expenditure, which provides the best available information about customers' demand to connect to the distribution system
- categorise the capital expenditure into its chart of account categories for forecasting purposes
- use an economic model to forecast annual changes in its CICW, which incorporates state macroeconomic variables that have demonstrated explanatory power.

## 6. Expenditure forecasts and outcomes for next period

This section details Ergon Energy's forecasts for its CICW capital expenditure for the next regulatory control period.

### 6.1 Expenditure forecasts for next regulatory control period

Table 11 details the split of Ergon Energy's CICW capital expenditure forecasts between SCS and ACS for the next regulatory control period, expressed in direct costs<sup>25</sup>.

**Table 11: CICW capital expenditure forecast (Direct costs, \$ million real 2014-15)**

Regulatory Review Process	2015-16	2016-17	2017-18	2018-19	2019-20	Total
CICW capital expenditure – SCS	82	83	83	83	83	<b>414</b>
CICW capital expenditure – ACS	46	47	48	49	49	<b>239</b>

Direct CICW capital expenditure for SCS is forecast to reduce by \$275 million to \$414 million, when compared to the estimated expenditure for the current regulatory control period.

It must be noted that the primary component of this reduction is the forecasted ACS expenditure of \$239 million.

Table 12 details the split of Ergon Energy's CICW capital expenditure forecasts between SCS and ACS for the next regulatory control period, expressed in total costs.

**Table 12: CICW capital expenditure forecast (Total costs, \$ million real 2014-15)**

Regulatory Review Process	2015-16	2016-17	2017-18	2018-19	2019-20	Total
CICW capital expenditure – SCS	120	122	128	132	135	<b>637</b>
CICW capital expenditure – ACS	72	74	78	80	81	<b>385</b>

Total CICW capital expenditure for SCS is forecast to reduce by \$338 million to \$637 million, when compared to the estimated expenditure for the current regulatory control period.

Again, it must be noted that the primary component of this reduction is the forecasted ACS expenditure of \$385 million.

### 6.2 Economic driver forecasts for next regulatory control period

In order to forecast employment and building approvals relative to Ergon Energy's regions for the period 1 January 2014 to 31 December 2021, monthly forecasts are derived using the following variables at the Queensland level:

- quarterly Queensland total employment forecast
- quarterly Queensland total nominal value of housing and non-housing approval.

<sup>25</sup> Escalated for CPI only and excludes input price escalations and overhead as per the CAM

Both quarterly Queensland forecast series are generated from the KPMG proprietary macro econometric model. The monthly forecasts are summarised below.

### 6.2.1 Employment forecasting

Total employment growth has been forecast for each of Ergon Energy's 15 regions by undertaking a regression analysis of the trend of movement in historical shares for each region compared to Queensland's total.

Forecast monthly shares are aggregated into quarterly shares and applied to quarterly forecasts of total Queensland employment to forecast Ergon Energy's regional employment levels. These quarterly regional employment forecasts are converted to a monthly series using the trends of the monthly forecast shares.

Figure 7 shows the forecast of total employment across Ergon Energy's service area.

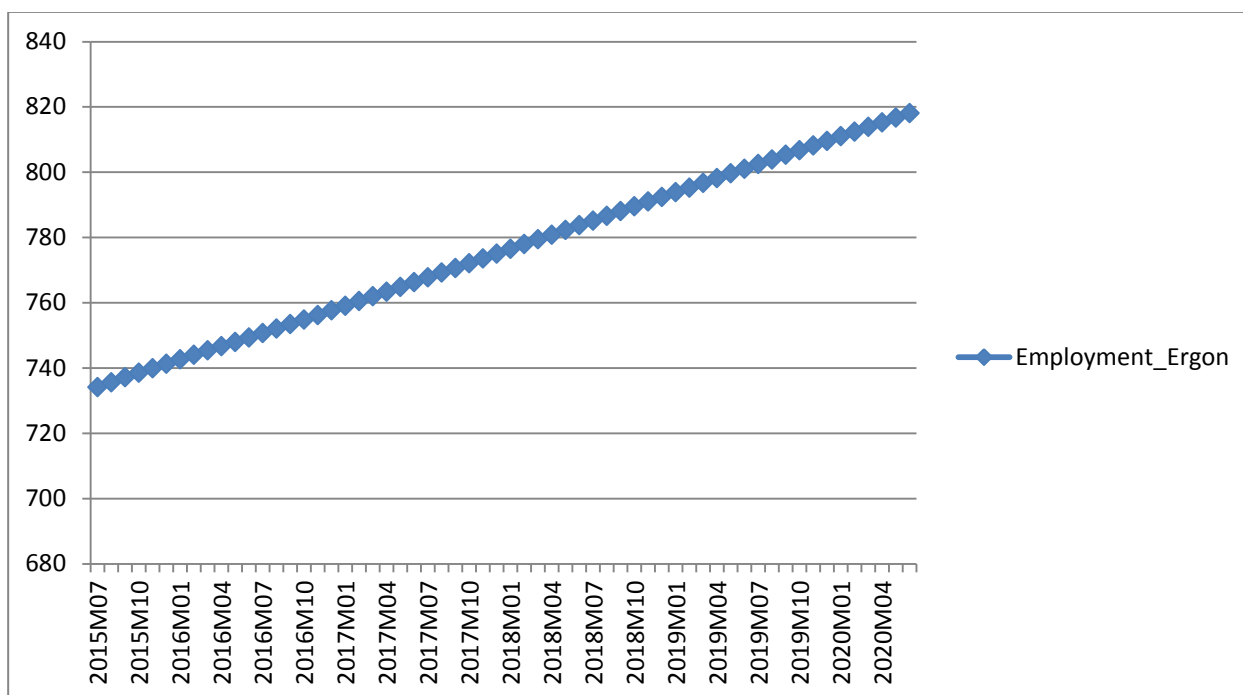


Figure 7: Ergon Energy forecast of employment ('000)

Employment numbers are forecast to steadily grow by, on average, 2.2% per annum, from approximately 733,000 at 1 July 2015, to 818,000 by 30 June 2020. Table 13 shows, as at 1 July in each year, the growth in employment numbers at an aggregate level.

Table 13: Ergon Energy forecast employment levels at 1 July during the next regulatory control period ('000)

Employment	2015	2016	2017	2018	2019	2020
Ergon Energy	733	749	766	784	801	818

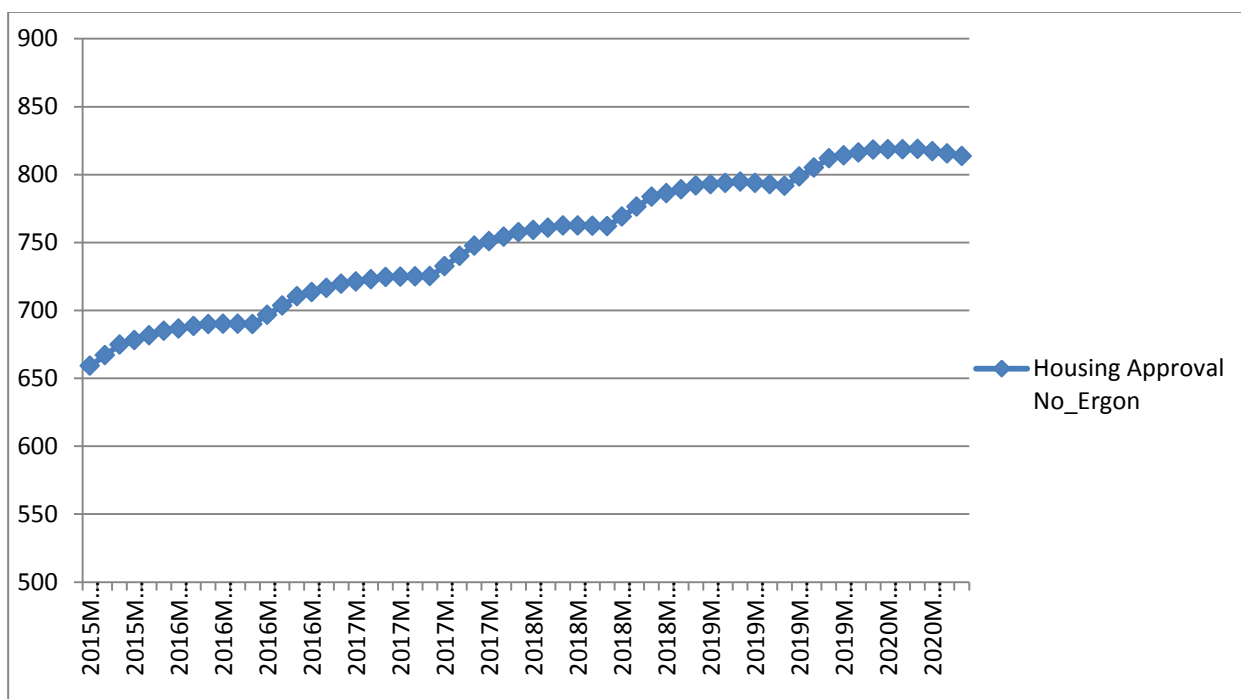
Employment within the Ergon Energy region is forecast to grow by 85,000 during the next regulatory control period, or 11.6%. This is higher than forecast employment growth for the current regulatory control period by 327%, which is tracking at 26,000 by the end of the 2014-15 financial year.

## 6.2.2 Building approvals forecasting

Similar to employment forecasting, forecast shares of housing and non-housing building approvals are undertaken through a regression analysis of the trend of the movement in historical shares for each region compared to Queensland's total housing and non-housing building approvals numbers. Forecast nominal quarterly building approval values are available for Queensland from KPMG's macro-economic model, and converted into real dollars by applying the forecast consumer price index (CPI). These forecast real values of building approvals are used to derive the forecast building approval numbers. This quarterly data is converted into a monthly series.

The forecast monthly numbers of housing and non-housing building approvals are derived by applying the above forecast shares to the forecast monthly Queensland building approval numbers.

Figure 8 shows the forecast of housing approval numbers within Ergon Energy's service area.



**Figure 8: Ergon Energy forecast of housing approval numbers**

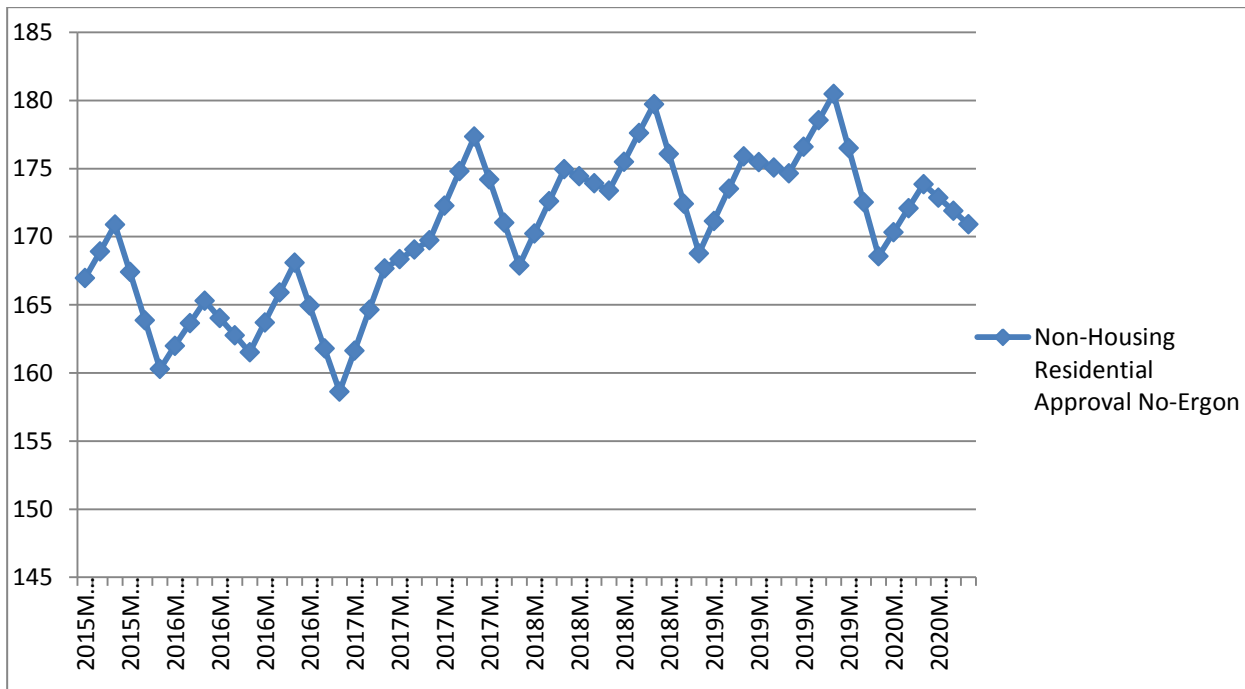
Housing approval numbers are forecast to grow, at a declining annual rate of 6.8% in 2015 to 3.3% by 2020. At an aggregate level, housing approval numbers are forecast to grow from 8,179 per annum in 2015-16 to 9,765 in 2019-20. Table 14 shows the total forecast housing approval numbers for each financial year.

**Table 14: Total Ergon Energy forecast housing approval numbers per annum**

Employment	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy	8,179	8,602	9,051	9,455	9,765

Total housing approval numbers during the next regulatory control period are forecast to be 45,052. This is higher than forecast housing approval numbers for the current regulatory control period by 21%, which is tracking at 37,196 by the end of the 2014-15 financial year.

Figure 9 shows the forecast of non-housing residential approval numbers within Ergon Energy's service area.



**Figure 9: Ergon Energy forecast of non-housing residential approval numbers**

Total annual non-housing residential approval numbers are forecast to reduce by 0.5% to 1,978 in 2015-16, and then grow by approximately 2% per annum to 2,096 in 2018-19, and then fall by 0.5% to 2,085 in 2019-20. Table 15 shows the total forecast non-housing residential approval numbers for each financial year.

**Table 15: Ergon Energy forecast non-housing residential approval numbers per annum**

Employment	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy	1,978	1,984	2,077	2,096	2,085

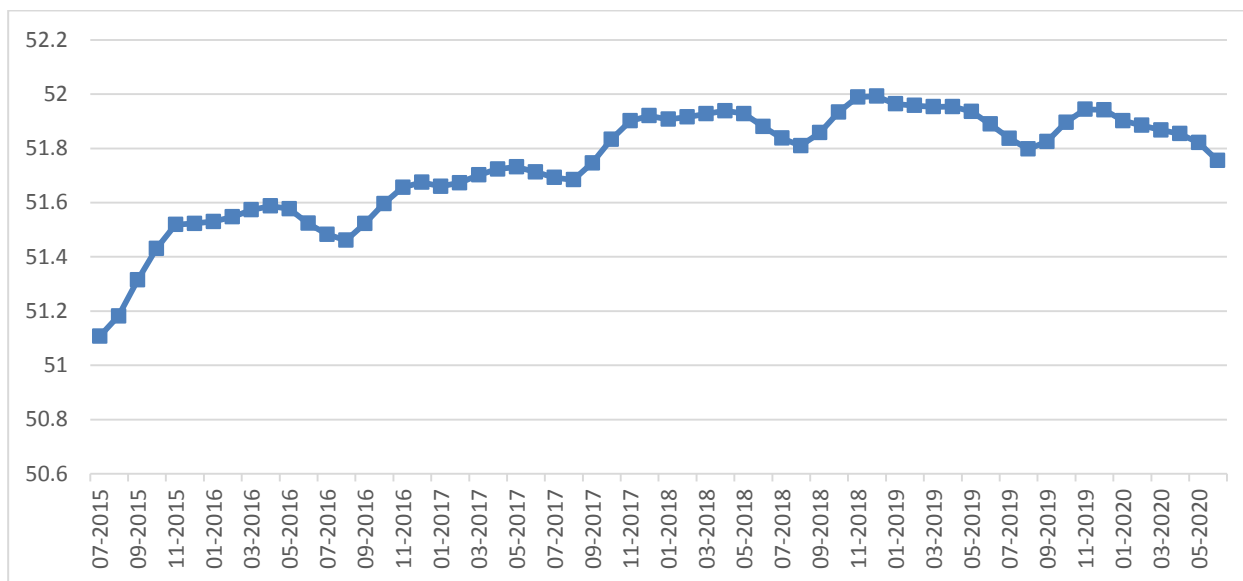
Total non-housing residential approval numbers during the next regulatory control period are forecast to be 10,220. This is higher than forecast non-housing residential approval numbers for the current regulatory control period by 3.9%, which is tracking at 9,836 by the end of the 2014-15 financial year.

### 6.3 Volume forecasts for next regulatory control period

The following section outlines Ergon Energy’s volumetric forecasts for each of its customer type/activity. It must be noted, that the volumes below are scaled in accordance with modelling technique discussed in Appendix A. The technique establishes a base year of expenditure being 2013-14 for the growth factors assigned to each customer type/activity. The 2013-14 year was chosen as this was the most recent expenditure experienced. Other adjustments were owing to a review of certain unit costs to compensate for these adjustment to unit costs results in an offset to volumetric trends. As such some volumes appear less that actuals when compared however expenditure trending aligns with growth factors.

### 6.3.1 Domestic and rural connection

Figure 10 shows the forecast of domestic and rural connection work requests for the next regulatory control period within Ergon Energy’s region.



**Figure 10: Forecast domestic and rural connection work requests for the next regulatory control period**

Total annual domestic and rural connection work requests are forecast to remain relatively steady, and slightly grow, from 602 in 2014-15, to 623 in 2019-20. Table 16 shows the total forecast domestic and rural connection work requests for each financial year of the next regulatory control period.

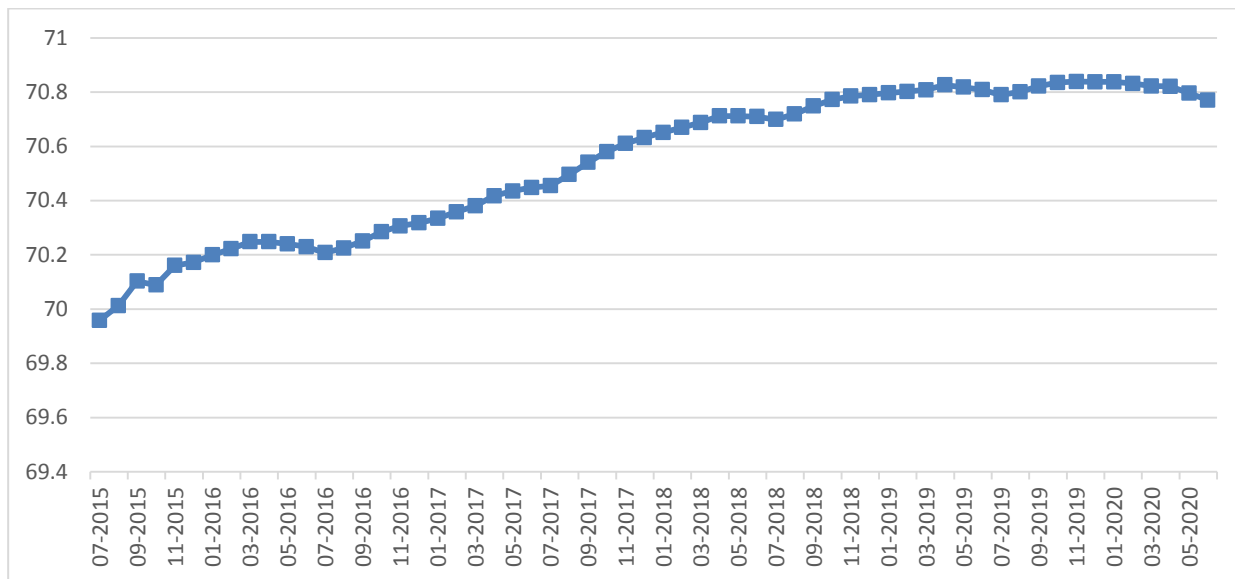
**Table 16: Ergon Energy forecast domestic and rural connection work requests per annum**

Domestic and rural connection work requests	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy	618	620	622	623	623

Total domestic and rural connection work requests during the next regulatory control period are forecast to be 3,106. This is higher than domestic and rural connection work requests forecast for the current regulatory control period by 4.9%, which is tracking at 2,960 by the end of the 2014-15 financial year.

### 6.3.2 Commercial and industrial connection

Figure 11 shows the forecast of commercial and industrial connection work requests for the next regulatory control period within Ergon Energy’s service area.



**Figure 11: Forecast commercial and industrial connection work requests for the next regulatory control period**

Total annual commercial and industrial connection work requests are forecast to remain relatively steady, and slightly grow, from 838 in 2014-15, to 850 in 2019-20. Table 17 shows the total forecast commercial and industrial connection work requests for each financial year of the next regulatory control period.

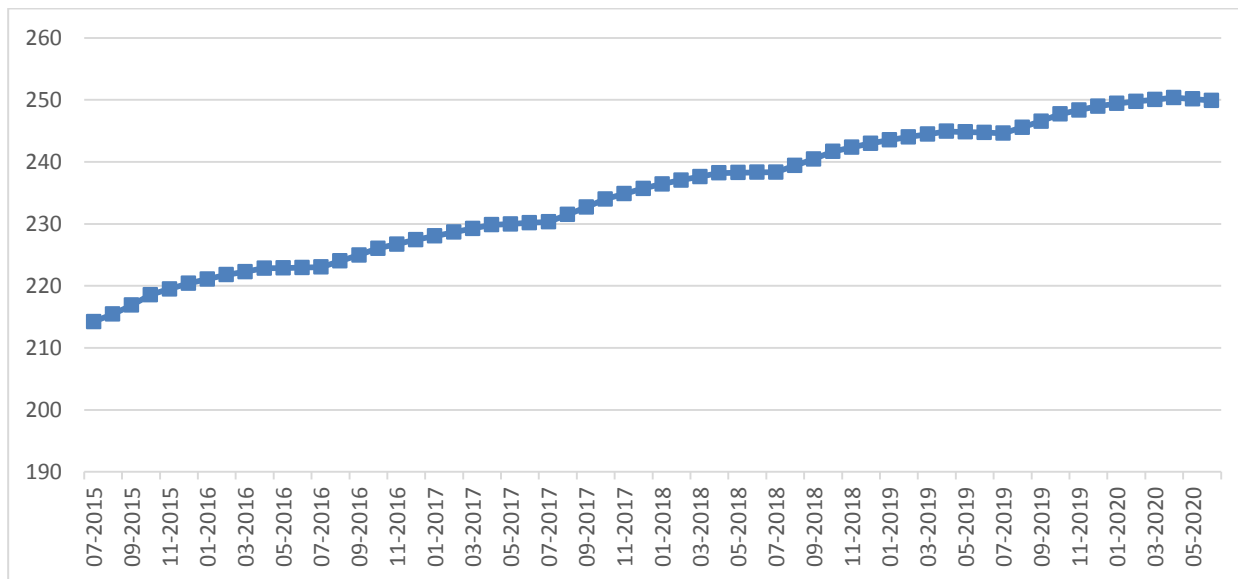
**Table 17: Ergon Energy forecast commercial and industrial connection work requests per annum**

Commercial and industrial connection work requests	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy	842	844	848	850	850

Total commercial and industrial connection work requests during the next regulatory control period are forecast to be 4,234. This is 17% higher than commercial and industrial connection work requests forecast for the current regulatory control period, which is tracking at 3,613 by the end of the 2014-15 financial year.

### 6.3.3 Subdivision connection

Figure 12 shows the forecast of new lots recorded for work requests for the next regulatory control period within Ergon Energy’s service area.



**Figure 12: Forecast new lots recorded for work requests for the next regulatory control period**

Total annual new lots recorded for work requests are forecast to grow by 15.6% in the next regulatory control period, from 2,580 in 2014-15, to 2,982 in 2019-20. Table 18 shows the total forecast new lots recorded for work requests for each financial year of the next regulatory control period.

**Table 18: Ergon Energy forecast new lots recorded for work requests per annum**

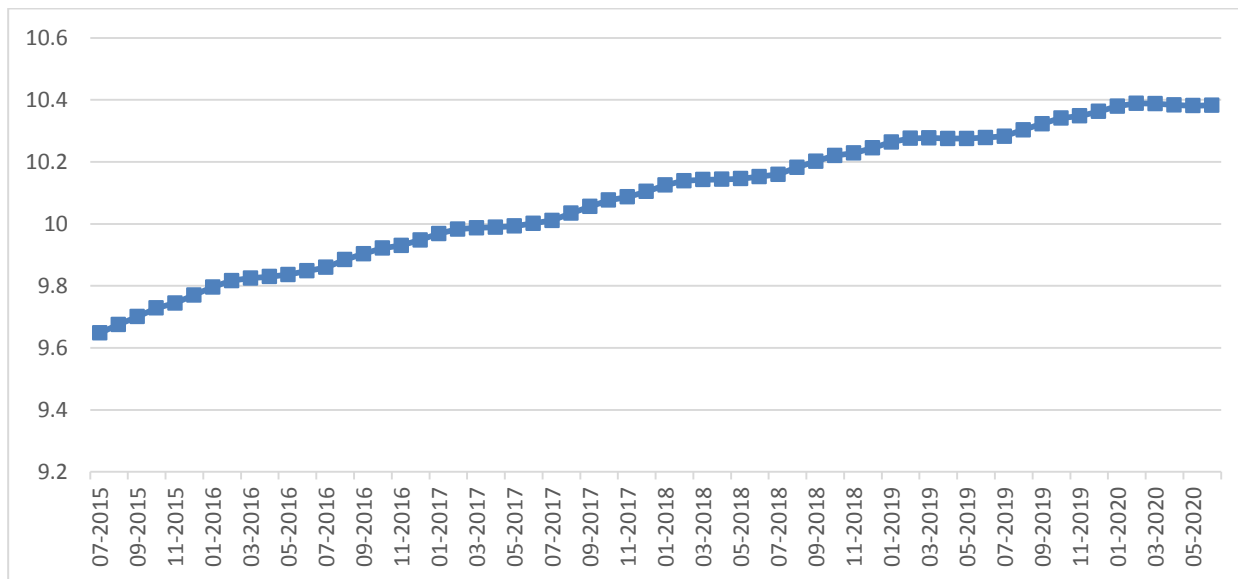
New lots recorded for work requests	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy	2,639	2,728	2,824	2,912	2,982

Total new lots recorded for work requests during the next regulatory control period are forecast to be 14,085. This is 38.7% less than forecast new lots recorded for work requests for the current regulatory control period, which is tracking at 23,349 by the end of the 2014-15 financial year.



### 6.3.4 Public Lighting

Figure 13 shows the forecast of new public lighting work requests for the next regulatory control period within Ergon Energy’s service area.



**Figure 13: Forecast new work requests for the next regulatory control period**

Total annual new public lighting work requests are forecast to grow by approximately 9% in the next regulatory control period, from 114 in 2014-15, to 124 in 2019-20. Table 19 shows the total forecast new work requests for each financial year of the next regulatory control period.

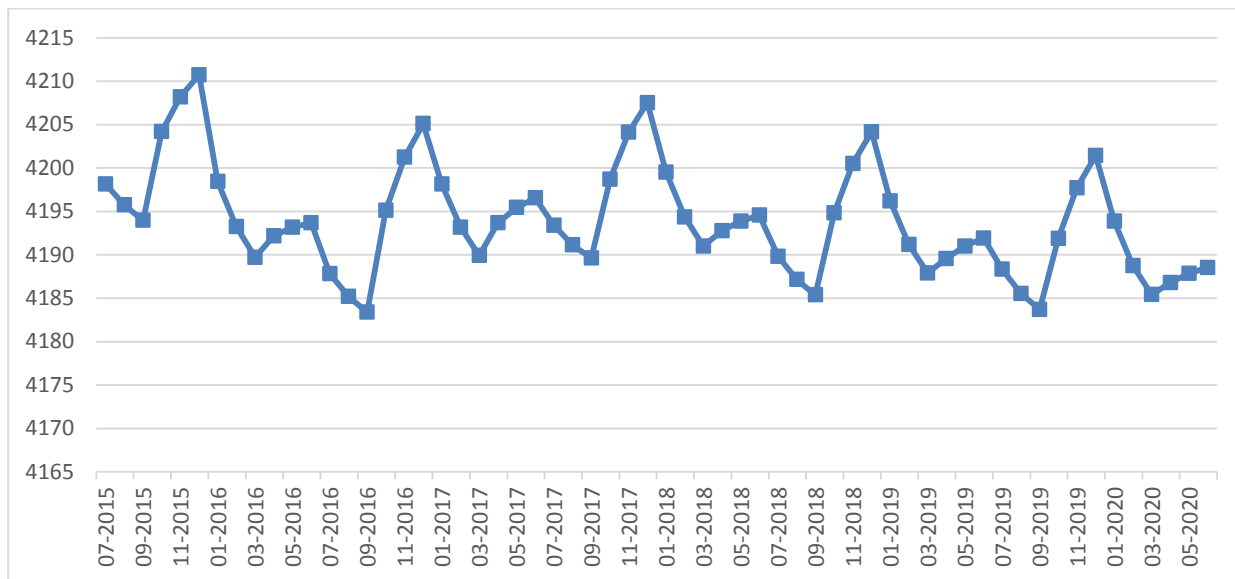
**Table 19: Ergon Energy forecast new work requests per annum**

New work requests	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy	117	119	121	123	124

Total new work requests during the next regulatory control period are forecast to be 604. This is lower than forecast work requests for the current regulatory control period by 40.7%, which is tracking at 1,019 by the end of the 2014-15 financial year.

### 6.3.5 Metering

Figure 14 shows the forecast of new metering work requests for the next regulatory control period within Ergon Energy’s service area.



**Figure 14: Forecast new metering work requests for the next regulatory control period**

Total annual new metering work requests are forecast to marginally decrease in the next regulatory control period, from 50,311 in 2014-15, to 50,280 in 2019-20. Table 20 shows the total forecast new metering work requests for each financial year of the next regulatory control period.

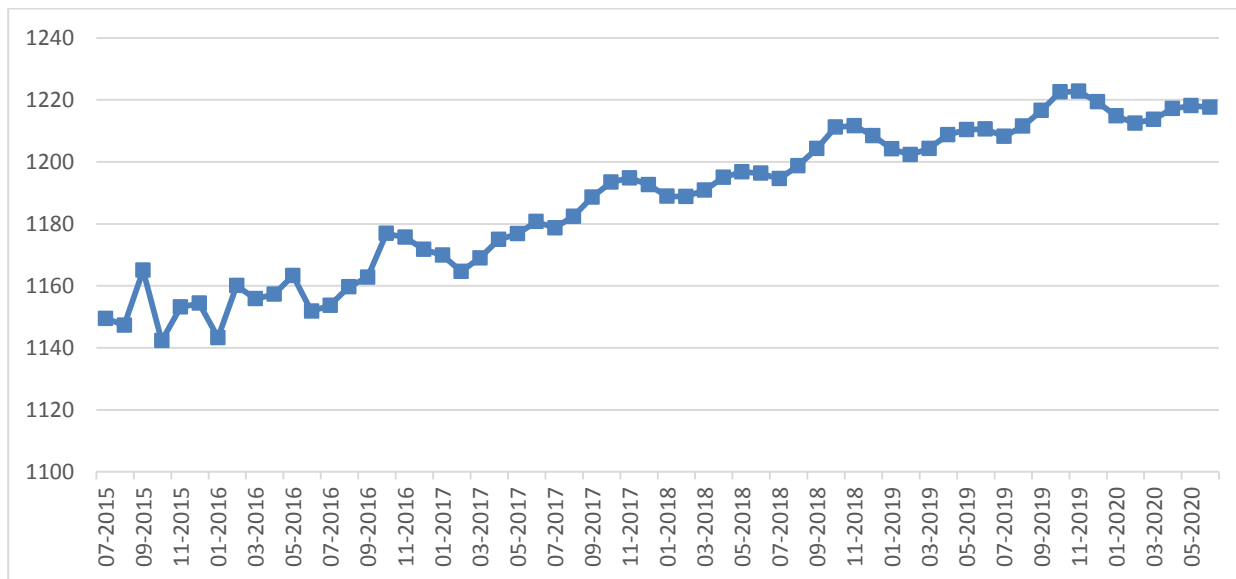
**Table 20: Ergon Energy forecast new metering work requests per annum**

New metering work requests	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy	50,371	50,325	50,351	50,310	50,280

Total new metering work requests during the next regulatory control period are forecast to be 251,637, or an average of 50,327 per annum. This is 11.4% less than the average annual work requests of 56,828 requests for the 2011-15 financial years (actual and forecast).

### 6.3.6 Services

Figure 15 shows the forecast of new work requests associated with each work request for the next regulatory control period within Ergon Energy’s service area.



**Figure 15: Forecast new work requests associated with each work request for the next regulatory control period**

Total annual new work request are forecast to increase in the next regulatory control period, from 13,574 in 2014-15, to 14,595 in 2019-20. Table 21 shows the total forecast new work request for each financial year of the next regulatory control period.

**Table 21: Ergon Energy forecast new work request per annum**

New work request	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy	13,843	14,036	14,287	14,469	14,595

Total new work request during the next regulatory control period are forecast to be 71,230, or an average of 14,246 per annum. This is higher than average annual actual work requests of 2,361 for the 2011-12 & 2012-13 financial years.

## 6.4 Unit cost forecasts for next regulatory control period

Table 22 shows the unit costs for CICW capital expenditure (excluding large customer connections). All costs shown are total direct costs (exclusive of overheads and other indirect costs).

The product of these estimates and the corresponding forecast volumes produce the total expenditure in direct costs for each customer activity/type.

**Table 22: Direct unit costs for CICW capital expenditure**

	Ellipse Estimate Code	Investment Description	Direct unit cost (\$ real 2014-15)
1	MIP1161	New Meters/Receivers - SCS	15
2	MIP1162	New Meter Services - SCS	339
3	MIP1271	New Meters/Receivers - ACS	158
4	MIP1272	New Meter Services - ACS	54
5	PCAASPLN	Public Lighting: D-Public Lighting – New	54,045
6	PCAASPLU	Public Lighting: D-P Lighting-Upgrade/Replace	10,757
7	PCCCCRCN	Commercial and Industrial: D-Rural Customer New	51,642
8	PCCCCUCN	Commercial and Industrial: D-Urban Customer New	70,968
9	PCCCDRCN	Domestic and Rural: D-Rural Customer New	28,362
10	PCCCDUCN	Domestic and Rural: D-Urban Customer New	21,159
11	PCCSDSON	Subdivision: D-Subdivision Overhead – New	9,708
12	PCCSDSUN	Subdivision: D-Subdivision Underground – New	6,392

See Appendix A for details of how each forecasted customer category is scaled and apportioned into the relevant SCS and ACS splits.

## 7. Meeting Rules' requirements

This section draws on the material in the previous sections to explain and justify Ergon Energy's CICW capital expenditure forecast against the capital expenditure objectives and criteria in clause 6.5.7 of the NER.

It therefore outlines why the AER should approve this capital expenditure forecast as part of its distribution determination for Ergon Energy's next regulatory control period.

### 7.1 The capital expenditure objectives

The NER set out the objectives that Ergon Energy must satisfy for its proposed capital expenditure for the next regulatory control period. Clause 6.5.7(a) states:

*A building block proposal must include the total forecast capital expenditure for the relevant regulatory control period which the Distribution Network Service Provider considers is required in order to achieve each of the following (the capital expenditure objectives):*

- (1) meet or manage the expected demand for standard control services over that period;*
- (2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;*
- (3) to the extent that there is no applicable regulatory obligation or requirement in relation to:
  - (i) the quality, reliability or security of supply of standard control services; or*
  - (ii) the reliability or security of the distribution system through the supply of standard control services,*to the relevant extent:
  - (iii) maintain the quality, reliability and security of supply of standard control services; and*
  - (iv) maintain the reliability and security of the distribution system through the supply of standard control services; and**
- (4) maintain the safety of the distribution system through the supply of standard control services.*

Standard Control Services is the name given to those services that Ergon Energy provides by means of, or in connection with, its distribution system, and for which the costs incurred by Ergon Energy in doing so are generally recovered through distribution use of service tariffs paid by all, or most, customers. Standard Control Services are grouped into five categories: network services, connection services, metering services, ancillary network services and public lighting services. The SCS that Ergon Energy provides to customers are set out in the 'AER's Framework and Approach – Ergon and Energex 2015-2020' paper.<sup>26</sup>

The proposed CICW expenditure relates to connection services, metering services and street lighting services. For regulatory purposes, Ergon Energy's CICW expenditure forecast for connection services is further separated into SCS and ACS in accordance with the 'AER's Framework and Approach – Ergon and Energex 2015-2020'<sup>27</sup> paper. How each of Ergon Energy's CICW activities is classified as ACS or SCS is set out in Table 5 in Section 3.7 of this document. However services that are regulated as ACS are not subject to the requirements of section 6.5.7.

<sup>26</sup> AER, Framework and Approach – Ergon and Energex 2015-2020, April 2014, p 51.

<sup>27</sup> AER, Framework and Approach – Ergon and Energex 2015-2020, April 2014

Ergon Energy believes that its proposed capital expenditure for CICW in the next regulatory control period, relating to SCS, achieves the objectives as follows:

- Meeting and managing expected demand for SCS, as required by clause 6.5.7(a)(1), is the predominant objective of Ergon Energy's proposed CICW expenditure, the nature of which is described in Section 3 of this document. Ergon Energy's CICW connections are driven entirely by customers' request to connect and not by any decisions of Ergon Energy. CICW expenditure is proposed to satisfy demand for connection services by using underlying macroeconomic variables that have the greatest explanatory power to the volume of customer requests experienced in the current period. Ergon Energy forecasts CICW expenditure by forecasting volumes and unit costs - volumes are predominantly determined using an economic forecasting model that draws on state macroeconomic variables.<sup>28</sup> The reason for this is discussed in Section 5.4 of this document and the methodology is described in Appendix A.
- This is consistent with the AER Expenditure Forecast Assessment Guideline Explanatory Statement: 'We will continue our approach of using trend analysis in setting expenditure allowances for the DNSPs' provision of customer-initiated services'. Following Ergon Energy's analysis into the variance experienced from the AER's CICW allowance assumed at the time of the last reset (outlined in Section 4.1), it became evident that connection requests were driven by underlying macroeconomic variables: employment, housing building approvals and non-housing (residential) building approvals. The resulting forecast that Ergon Energy proposes is intended to meet the demand for SCS.
- It follows that without Ergon Energy's proposed CICW expenditure, Ergon Energy would not be able to meet the expected demand for SCS over the 2015-20 regulatory control period.
- The CICW capital expenditure that Ergon Energy proposes is necessary to comply with all applicable regulatory obligations or requirements associated with the provision of SCS, as required by clause 6.5.7(a)(2).
- As described in Section 3.1 Ergon energy has an obligation to connect customers under the Electricity Act 1994(Qld), National Electricity Rules and the Queensland Electricity Industry Code. These obligations form the basis for Ergon Energy's connection policies, processes and practices which underpins Ergon Energy's CICW forecasting methodology.
- As a distribution network service provider, Ergon Energy has an obligation to connect customers to its distribution network, as far as is technically and economically practicable, within timeframes mandated by legislation, and subject to various technical, financial, economic, procedural and other requirements. These obligations are set out in section 43(1) of the Electricity Act 1994 (Qld), Chapters 5 and 5A of the National Electricity Rules and in Ergon Energy's Distribution Authority which is issued to it by the Queensland Government Department of Energy and Water Supply. To enable Ergon Energy to meet these requirements, Ergon Energy has adopted a 'Connections Policy' – previously the Capital Contributions Policy, 'Major Customer Connections Manual (2014)' and a 'Developers Handbook', which are designed to ensure that Ergon Energy satisfies its regulatory obligations. Ergon Energy's CICW expenditure in the 2010-15 regulatory control period has been incurred in accordance with these policies and procedures and, using these incurred costs as a basis for its forecast expenditure, its forecast CICW expenditure is necessary to discharge its regulatory obligations in the 2015-20 regulatory control period.<sup>29</sup>

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<sup>28</sup> Except for capital contributions (and gifted assets). How these are treated is described in Appendix A.

<sup>29</sup> Subject to potential changes to Ergon Energy's policies for the contestability of works, capital contributions and other changes to applicable regulations.

- The CICW expenditure that Ergon Energy proposes is necessary to maintain the quality, reliability and security of supply of SCS, and hence the reliability and security of the distribution system, as required by clause 6.5.7(a)(3).
- Maintaining the quality, reliability and security of supply of SCS as required by clause 6.5.7(a)(3), are objectives of Ergon Energy's proposed CICW expenditure. New (or upgraded) customer connections can lead to adverse impacts on quality, reliability and security of supply because they increase the load on the network, which if left unchecked would cause the network to exceed its technical limits. Ergon Energy's customer connection and network planning policies and procedures combine to maintain the quality, reliability and security of supply of the network.
- The CICW expenditure Ergon Energy proposes for the 2015-20 regulatory control period is designed to allow customers to connect to the distribution network while maintaining the network's functional performance thus ensuring any new or existing customer does not adversely affect the quality, reliability or security of supply of other customers. It does this by proposing expenditure, based on costs incurred during the current period, which demonstrated no adverse impact on the quality, reliability and/or security of supply requirements of Ergon Energy's network.
- The CICW expenditure that Ergon Energy proposes is required to maintain the safety of the distribution system through the supply of SCS, in accordance with clause 6.5.7(a)(4). Ergon Energy has obligations under the *Electrical Safety Act 2002* (Qld) to ensure that its works are electrically safe and are operated in a way that is electrically safe. Under the *Work Health and Safety Act 2011* (Qld), Ergon Energy must ensure, so far as is reasonably practicable, that the fixtures, fittings and plant are without risks to the health and safety of any person. Additionally, Ergon Energy is subject to enforceable orders issued by the Queensland Electrical Safety Office in response to identified safety risks.
- To discharge these obligations, Ergon Energy has established connection standards, policies and procedures that ensure connection works maintain the safety of the distribution system. All connection works plans are signed off by engineers with Registered Professional Engineers Queensland accreditation to ensure that CICW works are designed in accordance with professional and legislative safety requirements. Upon completion of the construction phase of a CICW activity, a rigorous testing and commissioning regime is enforced to provide assurance that the resulting works do maintain the safety of the distribution system. The CICW expenditure that Ergon Energy proposes is in accordance with Ergon Energy's connection standards, policies and procedures and is therefore necessary to maintain the safety of the distribution system.

## 7.2 Capital expenditure criteria

The NER set out the expenditure criteria that Ergon Energy must satisfy for its proposed capital expenditure for the next regulatory control period. Clause 6.5.7(c) states:

*The AER must accept the forecast of required capital expenditure of a Distribution Network Service Provider that is included in a building block proposal if the AER is satisfied that the total of the forecast capital expenditure for the regulatory control period reasonably reflects each of the following (the capital expenditure criteria):*

- (1) *the efficient costs of achieving the capital expenditure objectives;*
- (2) *the costs that a prudent operator would require to achieve the capital expenditure objectives; and*
- (3) *a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.*

Clause 6.5.7(e) goes on to state:

*In deciding whether or not the AER is satisfied as referred to in paragraph (c), the AER must have regard to the following (the capital expenditure factors):*

- (1) – (3) [Deleted]*
- (4) the most recent annual benchmarking report that has been published under rule 6.27 and the benchmark capital expenditure that would be incurred by an efficient Distribution Network Service Provider over the relevant regulatory control period;*
- (5) the actual and expected capital expenditure of the Distribution Network Service Provider during any preceding regulatory control periods;*
- (5A) the extent to which the capital expenditure forecast includes expenditure to address the concerns of electricity consumers as identified by the Distribution Network Service Provider in the course of its engagement with electricity consumers;*
- (6) the relative prices of operating and capital inputs;*
- (7) the substitution possibilities between operating and capital expenditure;*
- (8) whether the capital expenditure forecast is consistent with any incentive scheme or schemes that apply to the Distribution Network Service Provider under clauses 6.5.8A or 6.6.2 to 6.6.4;*
- (9) the extent the capital expenditure forecast is referable to arrangements with a person other than the Distribution Network Service Provider that, in the opinion of the AER, do not reflect arm's length terms;*
- (9A) whether the capital expenditure forecast includes an amount relating to a project that should more appropriately be included as a contingent project under clause 6.6A.1(b);*
- (10) the extent the Distribution Network Service Provider has considered, and made provision for, efficient and prudent non-network alternatives; and*
- (11) any relevant final project assessment report (as defined in clause 5.10.2) published under clause 5.17.4(o), (p) or (s);*
- (12) any other factor the AER considers relevant and which the AER has notified the Distribution Network Service Provider in writing, prior to the submission of its revised regulatory proposal under clause 6.10.3, is a capital expenditure factor.*

Therefore, Ergon Energy must demonstrate that its proposed capital expenditure reasonably reflects the criteria in clause 6.5.7(c) by reference to the factors in clause 6.5.7(e).

### **7.2.1 How Ergon Energy's capital expenditure reasonably reflects the criteria**

The capital expenditure that Ergon Energy proposes to meet the objectives, in accordance with clause 6.5.7(a), reasonably reflects the criteria set out in clause 6.5.7(c) as follows.

#### **The efficient and prudent costs of achieving the objectives**

Ergon Energy has had regard for the AER's interpretation of prudence and efficiency in assessing whether Ergon Energy's capital expenditure reasonably reflects sub clauses (1) and (2) in this Summary. In the Explanatory Statement to the Expenditure Forecast Assessment Guidelines the AER stated that:

*"We consider that efficient costs complement the costs that a prudent operator would require to achieve the expenditure objectives. Prudent expenditure is that which reflects the best course of action, considering available alternatives. Efficient expenditure results in the lowest cost to consumers over the long term. That is, prudent and efficient expenditure reflects the*



*lowest long term cost to consumers for the most appropriate investment or activity required to achieve the expenditure objectives.*

*“We will continue our approach of using trend analysis in setting expenditure allowances for the DNSPs' provision of customer-initiated services.”<sup>30</sup>*

Ergon Energy's approach to forecasting CICW expenditure is based on such a trend analysis, and is described in Section 5.4 and Appendix A of this document. Trend analysis is a prudent basis on which to forecast future volumes of work because CICW connections are driven entirely by customers' preferences, not by any decisions of Ergon Energy. Ergon Energy's forecasted volumes of connections are based on three state macroeconomic variables: employment, housing building approvals, and non-housing (residential) building approvals. Ergon Energy has selected these three variables because they had the strongest explanatory power during the current period and are supported by extensive econometric analysis. This approach represents the actions of a prudent operator.

To develop an efficient cost base Ergon Energy has adopted a robust methodology to estimate the unit costs of projects and programs of works, based on a combination of historic and estimated costs. These costs, and how they are developed, are described in Appendix C of this Summary and the document titled 'Capital Expenditure Forecast Unit Costs Methodologies'. For connection services Ergon Energy applies a unit cost per customer type to the forecasted volumes that are based historical direct costs for projects completed during financial periods 2010-11, 2011-12 and 2012-13. These costs are actual direct costs (including mobilisation and contractors) for the finalised projects where actual data is available. These costs represent the most efficient bottom up cost basis which takes into account the significant improvements made in Ergon Energy's standards and delivery processes and practices during the current period.

Ergon Energy considers its capital expenditure to be prudent and efficient because not only are its unit costs efficient, Ergon Energy applies those efficient costs to the prudent actions it proposes to undertake so that its total CICW expenditure is both prudent and efficient.

## **A realistic expectation of the demand forecast and cost inputs required to achieve the objectives**

To ensure that its forecast volumes of CICW activity are realistic, Ergon Energy backcast connection expenditure per customer type and compared these values with actual historical CICW capital expenditure identified in Stage 2 to ensure the model produced realistic results. Additionally, Ergon Energy developed a 'scaling factor' to baseline forecasts to actual CICW expenditure for 2013-14 to ensure that the forecast is consistent with the most recent experience. This process is described in Stage 4 of Appendix A.

Ergon Energy adopts a realistic expectation of the cost inputs required to achieve the objectives by developing unit costs that are based on a reasonable and robust estimation methodology. Unit costs are developed based on historical average costs of like-for-like activities that Ergon Energy has undertaken in the past and current regulatory control periods as described in Stage 1 of Appendix A. The specific time periods from which historical costs are taken have been chosen to exclude the effect of one-off or non-representative costs and hence reflect the most realistic cost of each CICW activity in the 2015-20 regulatory control period. This methodology excludes inefficient costs when evident, includes only those costs to do the task in establishing direct costs. For further details see the 'Capital Expenditure Forecast Unit Cost Methodologies' paper.

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<sup>30</sup> Australian Energy Regulator (AER), Expenditure Forecast Assessment Guideline for Electricity Distribution, November 2013, p 12.

## Having regard for the factors

Ergon Energy's proposed capital expenditure reasonably reflects the prudent and efficient costs of achieving the objectives by having regard for the factors in clause 6.5.7(e) as follows:

- In relation to sub clause (4), in September 2014 the AER decided to delay the release of its first benchmarking report under clause 6.27 until late November 2014, one month after the submission of this Regulatory Proposal. As a result Ergon Energy has not been able to use it to inform its capital expenditure forecasts. Nevertheless, using the same publicly-available information that will be used to develop the AER's benchmarking report, Ergon Energy commissioned an independent report to enable it to compare its performance and other network service providers, having regard for the unique qualities of Ergon Energy's network. This is prudent because Ergon Energy has quite unique cost drivers which should be considered when benchmarking performance. For further details refer to the 'How Ergon Compares' document.
- In relation to sub clause (5), Ergon Energy has set out, in Tables 1 and Table 2 of this Summary, its actual capital expenditure during the previous regulatory control period (2005-10) and actual and expected capital expenditure in the current regulatory control period (2010-15). To accompany this information, in Section 2.1, Ergon Energy has explained the actual and expected capital expenditure by reference to the allowance approved by the AER (and, for the 2005-10 regulatory control period, the QCA) and the endogenous and exogenous factors that have contributed to any variance from the AER's allowance.
- Where its current period expenditure has deviated from the AER's allowance, Ergon Energy has explained this by reference to drivers and circumstances that support the prudence and efficiency of the level of capital expenditure that was actually incurred. This demonstrates the robustness of Ergon Energy's system of investment review controls, which ensures that Ergon Energy's capital expenditure is continuously assessed for prudence and efficiency.
- In relation to sub clause (5A), Ergon Energy has conducted a comprehensive program of customer engagement to identify the concerns of customers wishing to connect to Ergon Energy's network and ensure that its proposed capital expenditure addresses those concerns. The results of Ergon Energy's engagement, and how they have informed its proposed capital expenditure, are set out in Section 1.3 of this summary document and in the document 'Supporting Our Plans, Our Engagement Program'.
- For real estate developers undertaking their own 'developer design and construct' projects (for residential, rural, commercial and industrial subdivisions), Ergon Energy's service promises are being outlined in a dedicated 'New Connections for Developers Charter' which supports Ergon Energy's proposed Real Estate Developer CICW expenditure forecast. Additionally, to support its obligations to connect Major Customers to its distribution network and to undertake the final connection to its network of new Major Customer connections, Ergon Energy has a dedicated Major Customer Connections group to manage the experience of Major Customers and to maintain long term relationships with these customers. This close engagement with Major Customers has informed the development of the Large Customer Connections CICW expenditure forecast.
- In relation to sub clauses (6) and (7), the nature of CICW presents little opportunity to consider the relative prices and substitution possibilities of operating and capital expenditure. As its name suggests CICW expenditure is necessarily delivered through capital rather than operating expenditure. This is because new connections or upgrades to existing connections are typically only technically achievable through the delivery of capital works. CICW expenditure may also involve augmentation or modifications of the shared network to address any adverse impact on the reliability, quality and security of supply of the distribution network that is attributable to the

customer's new or upgraded connection. In some instances operating expenditure in the form of demand management may be a prudent and efficient substitute for capital expenditure to address this type of shared network need. How demand management options are taken into consideration in CICW expenditure forecasting and delivery is described in relation to sub clause (10) below.

- In relation to sub clause (8), Ergon Energy notes that none of the schemes set out in clauses 6.5.8A or 6.6.2 to 6.6.4 of the NER is applicable in the context of its proposed CICW expenditure for the 2015-20 regulatory control period.
- In relation to sub clause (9), Ergon Energy has robust procurement governance processes in place to ensure that contractual arrangements at all times reflect arm's length terms. These processes are described in detail in the 'Network Deliverability Plan'. It is noted, that Ergon Energy's only subsidiary Sparq Solutions does not provide network services for CICW that would constitute 'direct' costs and which would thus form part of the expenditure proposed in Section 6.1.
- In relation to sub clause (10), as required by clause 5.17.4 of the NER, Ergon Energy must apply the Regulatory Investment Test (RIT-D) (previously the Regulatory Test) for CICW augmentation projects greater than \$5 million or large CICW projects where there is an augmentation component greater than \$5 million. As part of this test, Ergon Energy must consider adopting non-network solutions where it is prudent and efficient to do so. Within Ergon Energy, this is achieved through close engagement between the Major Customer Connection team and the Demand Management team to identify prudent and efficient demand management solutions or non-network alternatives. Where the RIT-D process is enlivened, non-network alternatives will be considered as required by the relevant provisions of the NER in this way. For the purposes of the 2015-20 expenditure forecast, given the limited emergence of demand management options to meet CICW needs to date, proposed capital expenditure is currently based on efficient historical costs incurred as described in the 'Capital Expenditure Forecast Unit Cost Methodologies Summary 2015 to 2020'.
- In relation to sub clause (11), Ergon Energy is required to develop a final project assessment report under 5.17.4(o), (p) or (s) as part of the Regulatory Investment Test for Distribution (RIT-D). Ergon Energy will apply the RIT-D to applicable projects in the 2015-20 period as required by the NER. Ergon Energy notes that no capital expenditure projects have been subjected to the RIT-D to date and hence there are no relevant final project assessment reports for Ergon Energy to have regard to in proposing its CICW expenditure for the 2015-20 period.
- In relation to sub clause (12), Ergon Energy has not been notified of any other factor the AER considers relevant and has notified Ergon Energy is a capital expenditure factor.

## 8. Appendices

### Appendix A. CICW capital expenditure forecasting method

This appendix explains the key stages of Ergon Energy’s CICW capital expenditure forecasting method that was discussed at a high level in Section 5.2 above.

There is a distinction in the approaches that were applied to forecast the CICW capital expenditure for:

- Ergon Energy works
- capital contributions.

#### 1. Ergon Energy works

Ergon Energy has applied a five-stage process to forecast the CICW capital expenditure for works that it undertakes itself. This process is illustrated in Figure 16 and explained below.

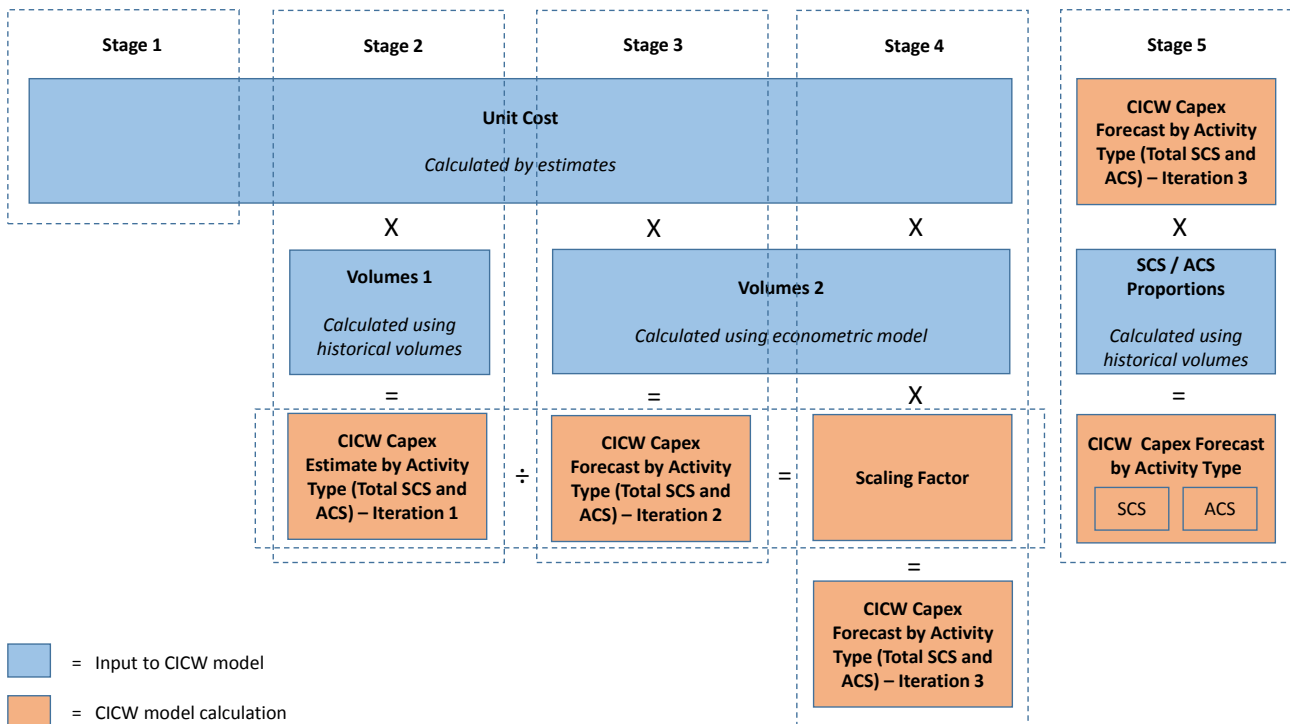


Figure 16: Process for forecasting CICW capital expenditure undertaken through Ergon Energy works

#### Stage 1: Determine unit costs

In this stage, Ergon Energy determined the average unit costs for its CICW capital expenditure forecasts.

Ergon Energy sourced data from its Ellipse ERP System, about the historical costs of its CICW projects for a three-year period from 2010-11 to 2012-13.

Ergon Energy then broke these historical costs into unit rates for labour, materials, contractors, equipment and other. It then developed ‘compatible units’ for its customer type/activity (where a ‘compatible unit’ represents the requirements to deliver a unit of work).

## **Stage 2: CICW Capital Expenditure Estimate by Customer Type/Activity – Iteration 1**

In this stage, Ergon Energy used a two-step process to determine the first iteration of its CICW capital expenditure forecast:

- In Step 1, Ergon Energy sourced data from Ellipse about the historical volumes of its CICW projects for the period 2010-11 to 2012-13. These volumes represented the count of work requests recorded in Ellipse except for subdivisions, which were based on a count of lots.
- In Step 2, Ergon Energy calculated its monthly expenditure estimate for the customer type/activity by multiplying the unit costs from Stage 1 and the volumes from Step 1 (of this Stage 2). It then summed the monthly expenditure forecast to determine annual expenditure for 2012-13 and an estimate for 2013-14, again by the customer type/activity.

## **Stage 3: CICW Capital Expenditure Forecast by Customer Type/Activity – Iteration 2**

In this stage, Ergon Energy used a two-step process to determine its CICW capital expenditure forecast.

In Step 1, Ergon Energy determined monthly CICW volumes for the period 2015-20 using an economic forecasting model that used the following state macroeconomic variables: employment, housing building approvals and non-housing (residential) building approvals. These volumes were again forecast in the customer type/activity.

In Step 2, Ergon Energy calculated its monthly expenditure forecast by customer type/activity by multiplying the unit costs from Stage 1 and the volumes from Step 1 (of this Stage 3). It then summed the monthly expenditure forecast to determine annual expenditure forecast for 2015-20, again using the customer type/activity.

The difference between the capital expenditure estimate in Stage 2 and the forecast in Stage 3 was that the Stage 2 estimate was based on historical volumes, whereas the Stage 3 forecast was based on the econometric forecasting model.

## **Stage 4: CICW Capital expenditure Forecast by Customer Type/Activity – Iteration 3**

In this stage, Ergon Energy determined the third (and final) iteration of its CICW capital expenditure forecast using a three-step process. This became Ergon Energy's CICW capital expenditure forecast that is explained and justified in this document and is reflected into its regulatory proposal to the AER.

In Step 1, Ergon Energy developed a 'scaling factor' to equate the capital expenditure forecast for 2013-14 that was developed in Stage 3 (using the volume forecasts from the econometric forecasting model) to the capital expenditure estimate developed in Stage 2 (using Ergon Energy's historic volumes).

In Step 2, Ergon Energy applied the 'scaling factor' to the monthly CICW volumes for the period 2015-20 that were determined using the econometric forecasting model (that were used in Stage 3). This resulted in new monthly volumes (adjusted volumes) for each customer type/activity.

In Step 3, Ergon Energy calculated its monthly expenditure forecast for each customer type/activity by multiplying the unit costs in Stage 1 and the adjusted volumes from Step 2 (of this Stage 4). It then summed the monthly expenditure forecast to determine annual expenditure forecast for 2015-20, again for each customer type/activity.

This approach therefore involved:

- applying the CICW unit costs from Stage 1
- forecasting CICW volumes by:
  - re-basing the volumes from the econometric forecasting model using the CICW capital expenditure forecasts that were calculating using the actual historic volumes and costs from Stage 2
  - applying the annual volume changes that are forecast using the econometric forecasting model.

### Stage 5: CICW Capital expenditure Forecast by Customer Type/Activity by SCS and ACS shares

Ergon Energy then determined the proportion of capital expenditure for each customer type/activity that is attributable to SCS and ACS based on historical averages over five years.

For large customer connections, Ergon Energy undertook additional checks to validate the results of the above approach using a sample of large customer connection projects. This also involved checking that none of the projects included any shared network augmentation expenditure – this helped to confirm that the CICW capital expenditure forecast did not include any expenditure that is included in the Corporation Initiated Augmentation expenditure.

## 2. Cash contributions and gifted assets

Ergon Energy has applied a three-stage process to forecast the CICW capital expenditure for its capital contributions. This process is illustrated and explained in Figure 17 below.

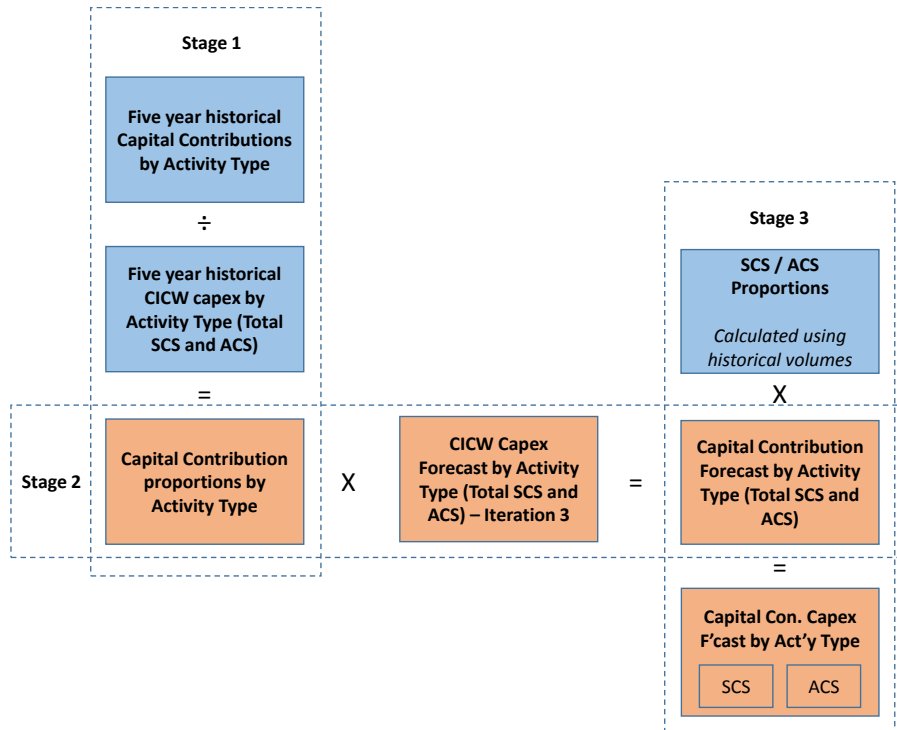


Figure 17: Process for forecasting CICW capital expenditure undertaken through capital contributions

### **Stage 1: Determine Capital Contribution proportions by Customer Type/Activity**

Ergon Energy determined for each customer type/activity the average proportional relationship over the last five years between its capital contributions – split between cash contributions and gifted assets – and the CICW capital expenditure that Ergon Energy has undertaken itself.

### **Stage 2: Determine Capital Contribution forecast by Customer Type/Activity**

In order to determine the capital contribution forecast by customer type/activity, split between cash contributions and gifted assets, Ergon Energy applied:

- the average capital contribution proportions from stage 1
- the CICW Capital expenditure forecast by customer type/activity for Ergon Energy's Works from Stage 4 above.

### **Stage 3: Determine Capital Contribution forecast by Customer Type/Activity**

Ergon Energy then determined the proportions of capital contributions for each customer type/activity that is attributable to SCS and ACS based on historical averages over five years.

It then applied these proportions to the Capital Contribution forecast by customer type/activity from Stage 2 above, to determine the capital contribution forecast by customer type/activity, split between cash contributions and gifted assets for both SCS and ACS.

## **3. Total CICW capital expenditure forecast**

Ergon Energy's total CICW capital expenditure forecast for the next regulatory control period is a summation of forecasts for:

- Ergon Energy works, as determined in Section 1 above
- cash contributions from Section 2 above.

## Appendix B. CICW unit cost estimates for its SCS

This section is an extract of the information reported in the “Capital Expenditure Forecast Unit Cost Methodologies 2015 to 2020” document. It is repeated here to assist the reader with a complete understanding of the CICW forecasting approach. Appendix B summarises the approach taken to forecasting unit costs for all customer types/activity except for the large customer connections as this is addressed in Appendix C.

Cost estimate summary Table 23 summarises cost estimation for Customer Initiated Capital Works.

**Table 23: Customer Initiated Capital Works cost estimation**

Sub-program	Unit of measure	Description of unit	Approach to costing the sub-program	Cost elements
Commercial & Industrial Domestic & Rural Street Lighting	Work requests	Top-down estimate of costs based on historical expenditures and quantities  These costs include mobilisation and contractor costs	Product estimates applied to each work type and applied to forecast volumes	Labour Materials Equipment Other Contractor
Subdivision	Lot numbers			
Services Metering	Customer numbers	Top-down estimate of costs based on historical expenditures and quantities  These costs include mobilisation and contractor costs	Product estimates applied to each work type and applied to forecast volumes	Labour Materials Contractor Equipment Other

### 4. Units of measure

The volumes are based on total numbers of work requests, lot numbers, customer numbers for the respective categories shown above.

### 5. Approach to costing

Unit cost or program estimates for all categories, with the exception of services and metering, are based on historical direct costs recorded for units of work completed during financial periods 2010-11, 2011-12 and 2012-13. These costs include mobilisation and contractors use for the finalised tasks where actual data is available.

The data source is the Ellipse ERP System, using recorded historic costs of CICW works, and to determine an average unit cost, uses a three-year period from 2010-11 to 2012-13. This period provides a representative sample, which includes improvements and efficiencies implemented to current equipment standards and work practices, thereby reflecting an efficient cost of the forecasted activity.

Unit costs or program estimates for services and metering are based on historical direct costs recorded for each customer service during the financial period 2008-09 to 2013-14 as the developed costs from the 2010-11 to 2012-13 period was considered to have a negative bias. To cater for this abnormality a sample size covering the historical period from 2008-09 to 2013-14 was used. It is assumed that the use of a larger sample size represents a unit cost that is comparable to the bottom up cost estimate. These costs include mobilisation and contractors use for the finalised tasks where actual data is available.



It is assumed that the historical costs are indicative of future costs as:

- the nature of the works is not forecasted to change significantly during the 2015-20 regulatory control period
- the standards and specifications are not forecasted to change significantly during the 2015-20 regulatory control period
- the currency of the data reflects the cost of delivery of the works in the current market.

To ensure an efficient unit cost, the following manual checking for validity of the data was applied in establishment of the unit cost:

- removal of all projects marked 'unsuccessful'
- removal of any project with a cost less than or equal to \$0
- verification of the activity code; removal of five line items where the code did not match
- separation of contestable and non-contestable works.

## Appendix C. CICW Large Customer Connection Forecast

### 1. Approach to forecasting large customers connections

Owing to the large customer connection works being transitioned during the current period from SCS to ACS, new categories have been developed in the Ellipse ERP system. Table 24 below shows direct costs associated with Ergon Energy's large customer connection activity from the relevant financial categories being Commercial and Industrial, Large Customers Connection Constructed and Large Customer Connections Gifted, from 2008/09 to 2013/14.

**Table 24: Commercial and Industrial and Large Customer Expenditure (\$000 Direct Nominal Costs)**

Description	Activity Code	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Commercial & Industrial Customer Requested Works	C2070	105,319	74,839	67,046	64,010	58,692	50,061
Large Customer Connections Constructed	C2110	-	-	-	1,368	5,676	3,445
Large Customer Connections Gifted	C2210	-	-	-	-	-	11,350

As can be seen above, historical expenditure is relatively volatile between each year owing to:

- The classification change to the service of design and construction of connection assets for Large Customers commenced in July 2010
- Costs for Large Customers that existed prior to July 2010 are historically allocated to the Commercial and Industrial activity code, even if constructed after this date
- the relatively small number of large customers and the wide ranging expenditure that may be incurred between different large customers in varying industries, locations and energy requirements.

For the above reasons, Ergon Energy believes it is not prudent to forecast Large Customer expenditure according to via volume by unit cost approach and an alternative approach was developed.

## 2. Large customer expenditure forecast

The methodology to forecast Large Customers expenditure involved:

- examining all of the Commercial and Industrial customers for the period 2006-07 to 2013-14 and determining which are Large Customers connections, which identified 73 customers; and
- summing the total annual direct costs for these 73 customers and calculating the annual average costs for various time periods, seen in Table 25.

**Table 25: Large Customer Expenditure (2012-13 Direct Real \$000)**

Period	Average of Last (years)	Average Cost
2006-07 to 2013-14	8	36,914
2007-08 to 2013-14	7	20,735
2008-09 to 2013-14	6	19,134
2009-10 to 2013-14	5	14,686
2010-11 to 2013-14	4	11,812
2011-12 to 2013-14	3	12,334
2012-13 to 2013-14	2	10,372
2013-14 to 2013-14	1	5,963

It is considered that a period of less than three years would not be reflective of annual costs for Large Customers and the average Large Customers cost ranges from \$11.8m to 36.9m based on the last four to eight years. It is considered that a five year average was appropriate based on the below validation exercise and thus the base year forecast is \$14.7m.

### 3. Validation

To validate the forecast of annual Large Customer expenditure of \$14.7 million, a separate analysis was undertaken. This involved assessing potential large customer connections from 2014-15 to 2019-20 and applied Ergon Energy's:

- Major Customer relationship management system (Salesforce) which tracks the progress of projects from pre-feasibility through to commissioning, providing data known (for those with committed customer payments) and possible future capital expenditure;
- Ergon Energy's Project Assessment Tool which was developed to produce robust and well-supported information about the likely probability, timing and load of new or upgraded major customer connections to Ergon Energy's electricity network. The tool calculates the probability based on the customer's project achieving milestones (such as announcement of maiden Joint Ore Reserves Committee, issuing and approval of an Environmental Impact Statement etc.). Data sourced from the tool's output included the probability of 42 Large Customer projects that were identified as proceeding from 2014-15 to 2019-20.
- Discussions with each Large Customer Project Sponsor who facilitated the connection process for individual customers from enquiry to commissioning

The combination of the above resulted in an average of seven potential new projects per year with an average probability of proceeding of 0.7 and an average cost of \$18.1 million. This separate analysis supports the base year Large Customer annual cost of \$14.7 million M being conservative.

## 4. Large Customer Gifted Assets Forecast

As explained previously recorded historical activity code data for the gifted assets from Large Customers is limited and not considered a good reflection of future gifted assets that Ergon Energy is forecast to receive. Therefore forecasts for Large Customer Gifted is based on the above mentioned 42 Large Customer projects that were identified as proceeding from 2014-15 to 2019-20 as well as one specific customers project for which Ergon Energy received a gift of \$10.6 million in 2013-14. Of the 43 Large Customers, nine customers provided and are predicted to provide gifted assets from 2013-14 to 2016-17<sup>31</sup>, as shown in Table 25.

**Table 25: Gifted Asset forecasts 2012-13 Real \$'000**

Name	Work Request #	Gift	2013-14	2014-15	2015-16	2016-17
Customer 1	663688	132kVABS, 1 pole, 2 spans 132kV, secondary systems, SCADA, metering	-	1,242	-	-
Customer 2	637229	132kV/22kV substation, 2x 22kV feeders	-	-	-	8,189
Customer 3	672003	132kV dual circuit feed, 4 bay 132kV switch yard	-	12,756	-	-
Customer 4	796698	11kV switchboard and control building	-	4,664	-	-
Customer 5	511835	66kV switching station	-	-	-	2,855
Customer 6	878110	66kV lines	-	952	-	-
Customer 7	495241	300mtrs of 33kV line, switching and circuit breakers to support	-	238	-	-
Customer 8	364136	132/22kV substation including land, 132kV easement, additional block of land for future use	10,582	-	-	-
Customer 9	672964	3 switch RMU and feeder cables	118	-	-	-
<b>Total</b>			<b>10,700</b>	<b>19,852</b>	<b>0</b>	<b>11,045</b>

The average annual gift of the four years is \$10.4 million and this is used as the average annual gift. As a validation check, this average is not too dissimilar to the \$10.6 million Large Customer gift that was received by Ergon Energy in 2013-14.

To forecast gifted, the proportion of historical capital expenditure that comprised gifted assets was averaged over the last five years. This proportion was then applied to the expenditure forecast for works for Large Customer Connection activity to determine the annual forecast expenditure of gifted assets. The same method was applied for cash contributions forecast using cash contribution proportions.

<sup>31</sup> A forecast gift beyond 2017-18 is not considered reliable and is therefore excluded from this table.

In compliance with the 'Final Framework and Approach paper'<sup>32</sup> the forecast is split for SCS and ACS. Table 26 below shows the cost allocations. This split was based on reviews of historical large customer connection project design, planning and financial information.<sup>33</sup>

**Table 26: SCS and ACS Breakdown**

Item	% of Large Customer Cost	Annual Large Customer Forecast in \$000
Major customer (excl. Generator) ACS	71.0%	10,427
Major customer (excl. Generator) SCS	22.5%	3,305
Test and Commission (excl. Generator) (ACS)	3.5%	513
Large Customer Generation ACS	1.5%	227
Remove generator constraint ACS new rules	1.3%	186
Large Customer Generator SCS	0.1%	11
Large Customer Generator T&C - ACS	0.1%	16
<b>Total</b>	<b>100%</b>	<b>14,686</b>

<sup>32</sup> AER, Final Framework and approach for Energex and Ergon Energy, Regulatory control period commencing 1 July 2015, April 2014

<sup>33</sup> See briefing note: Review of ACS, SCS and Test/Commission splits for Major Customer Projects, 19/8/14

## Appendix D. Definitions, acronyms and abbreviations

The following abbreviations and acronyms appear in this summary document.

Abbreviation or acronym	Definition
ABS	Australian Bureau of Statistics
ACS	Alternative Control Services
AER	Australian Energy Regulator
ASGC	Australian Standard Geographical Classification
CAC	Connection Asset Customers
CAM	Cost Allocation Methodology
CIA	Corporation Initiated Augmentation
CICW	Customer connection initiated capital works
CPI	Consumer Price Index
DNSP	Distribution Network Service Provider
EG	Embedded Generators
ERP	Enterprise Resource Planning
ICC	Individually Calculated Customers
kV	Kilovolt
NER	National Electricity Rules
QCA	Queensland Competition Authority
SAC	Standard Asset Customers
SCS	Standard Control Services

## Appendix E. References

### 1. Compliance Documentation

Name	Description
Electrical Safety Regulation 2013	The Electrical Safety Regulation 2013 identifies specific ways to meet electrical safety duties under the Electrical Safety Act 2002 and establishes requirements for electrical work; licensing; installations; equipment; supply; safety management systems; cathodic protection systems; and incident notification and reporting.
Electrical Safety Act 2002 (Qld)	The Electrical Safety Act 2002 is the legislative framework for electrical safety in Queensland. The purpose of this Act is to prevent people from being killed or injured and property from being destroyed or damaged by electricity
Electricity Act 1994 (Qld)	State legislation governing the supply, distribution, sale and use of electricity in Queensland.
National Electricity Rules (NER)	Statutory instrument made under the National Electricity (South Australia) Act 1996 governing the National Electricity Market and the regulation of market participants including Ergon Energy.
Work Health and Safety Act 2011 (Qld)	State Legislation governing the provision of a balanced and nationally consistent framework to secure the health and safety of workers and workplaces.

### 2. Supporting documentation

Name	Description
Capital Expenditure Forecast Unit Cost Methodologies Summary 2015 to 2020	The purpose of this summary document is to explain and justify the methodologies applied by Ergon Energy to develop unit cost estimates for its Standard Control Services (SCS) and Alternative Control Services (ACS) for the next regulatory control period, 1 July 2015 to 30 June 2020. The cost estimates provide the building blocks for the network capital expenditure forecast and specifically apply to the following capital expenditure categories: <ul style="list-style-type: none"><li>• Customer Initiated Capital Works</li><li>• Augmentation Expenditure</li><li>• Renewal Expenditure</li><li>• Reliability and Power Quality Expenditure</li><li>• Other System and Enabling Technology Expenditure</li></ul>
Connections Policy – previously the Capital Contributions Policy	This policy document outlines the circumstances in which Capital Contributions would be required. The existing Capital Contributions Policy is publically available off Ergon Energy’s website - <a href="http://www.ergon.com.au">www.ergon.com.au</a> .
Ergon Energy’s Underground Distribution Construction (UDC) Developers Handbook – Developer Design and Construct	The intent of this Handbook is to provide information to prospective Developers for Underground Distribution Construction (UDC) on the policies and processes Ergon Energy will use to progress the connection of a Project. This publically available off Ergon Energy’s website - <a href="http://www.ergon.com.au">www.ergon.com.au</a> .



Name	Description
How Ergon Compares	This document discusses benchmarking approaches across distribution networks and whether the cost to develop, operate and maintain the Ergon network can easily be compared and contrasted with the industry average and peers. The document provides an appreciation of the way that the design and operation of Ergon network has been shaped, over time, in direct response to both the needs of our customers and the challenges of our network area. Specifically, this documents seeks to highlight those significant drivers of cost that affect Ergon Energy more (or in a different way when compared to) other DNSPs.
Major Customer Connection Manual (2014)	This Manual is intended to form a useful reference for such Connection Applicants and to assist them in negotiating and entering into relevant agreements with Ergon Energy to facilitate the new or modified connection. This publically available off Ergon Energy's website - <a href="http://www.ergon.com.au">www.ergon.com.au</a> .
New Connections for Developers Charter	The New Connections for Developers' Charter is a formal commitment to the development industry across regional Queensland. This publically available off Ergon Energy's website - <a href="http://www.ergon.com.au">www.ergon.com.au</a> .
Specification for UDC Electrical Testing	This Specification details Ergon Energy's requirements for electrical testing to be undertaken by the Developer under the conditions of Developer Design and Construct Works associated with installation works in Underground Distribution Construction (UDC) Developments. This publically available off Ergon Energy's website - <a href="http://www.ergon.com.au">www.ergon.com.au</a> .

### 3. Models

Name	Description
Ergon Energy CICW Forecasting Model - Excel	Excel spreadsheet used to forecast SCS and ACS expenditure for the next regulatory control period.
Model Documentation Ergon Energy CICW Forecasting Model	Supporting document provided to assist the AER review of the above listed CICW model. The purpose of the document is to provide an understanding of the workings of the model.