Power and Water Corporation

Expenditure Forecasting Methods for Electricity Distribution Services

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Version history and date of issue

Version	Issue Date	Description of Changes
1.0	May 2017	N/A – initial version submitted to the AER.

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1 Introduction

Power and Water Corporation (**PWC**) is a NT Government Owned Corporation that is responsible for the provision of electricity, water and sewerage services across the Northern Territory, an area of more than 1.3 million square kilometres. In this document, reference to PWC is a reference to PWC in its capacity as the monopoly provider of distribution services licensed by the Utilities Commission under the Electricity Reform Act.

As the Network Service Provider for the local distribution systems in the NT,[1] PWC has responsibility for planning, building and maintaining reliable electricity networks to transport electricity between electricity generators and electricity consumers. PWC's mission is to operate its networks in a safe, reliable, efficient and environmentally sustainable manner.

As a matter of jurisdictional policy, the economic regulation of PWC's operations on the regulated networks will transfer from local to national jurisdiction on 1 July 2019. The regulation will be administered by the Australian Energy Regulator (**AER**) under the framework created by the National Electricity Law and the National Electricity Rules (**NER**). The first regulatory control period under the new regime will commence on 1 July 2019 and end on 30 June 2024.

By 1 July 2017,[2] PWC must submit to the AER for approval a document to:[3]

> *… inform the AER of the methodology it proposes to use to prepare the forecasts of operating expenditure and capital expenditure that form part of its regulatory proposal.*

This document is produced to fulfil these regulatory obligations.

PWC may refine its expenditure forecasting methods in the course of preparing its expenditure forecasts for inclusion in its Regulatory Proposal.

PWC will provide more detailed information about its expenditure forecasting methods in its Regulatory Proposal, and supporting documents, which it will submit to the AER by 31 January 2018.

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1 *National Electricity (NT)(National Uniform Legislation) Act 2015* (as in force at 2 July 2015).

2 NER, clause 6.8.1A(c).

3 NER, clause 6.8.1A(a).

2 Capital Expenditure Forecasting Methods

This section describes the methods that we propose to use to forecast capital expenditure (**capex**) for the provision of regulated distribution services during the next regulatory control period. Much of the capex will relate to Standard Control Services although some, such as Metering capex, will relate to Alternative Control Services.

2.1 Overview

We propose to use four general approaches to forecast capex. These are described in Table 1.

Table 1 – General capex forecasting approaches

Approach	Application
Scoped capex	Capex will be forecast by scoping and costing individual projects.
Programmed capex	Capex will be forecast based on programs of work for different asset classes. Forecasts will be based on a build-up of volumes and unit costs. We will use a variety of techniques to forecast both volumes and unit costs, depending on the asset class.
Pooled capex	Capex will be forecast at an aggregate level, typically based on either a single historical year or a historical trend. We may use this approach where we cannot readily prepare scoped or programmed capex forecasts. For example, the capex: • may cover multiple types of works or activities; or • cannot be forecast based on individual projects or programs.
Benchmarked capex	Capex will be benchmarked by applying the AER's Repex and Augex models as a check against our own Replacement and Augmentation capex forecasts.

We use multiple approaches to forecast the various categories of capex:

- because it is not feasible or appropriate to use a single approach to forecast all elements of a capex category; and
- in the case of Replacement and Augmentation capex, to benchmark our forecasts using the AER's "Repex" and "Augex" models.

The forecasting approaches that we propose to use for our capex categories are presented in Table 2.

In the remainder of this section 2 we discuss how we propose to apply the alternative forecasting approaches to our capex categories.

Table 2 – Proposed forecasting approaches by capex category

Expenditure Type	Scoped	Programmed	Pooled	Benchmarked
1. Replacement	✓	✓	✓	✓
2. Augmentation	✓		✓	✓
3. Connections			✓	
4. Metering		✓	✓	
5. Network - Other		✓	✓	
6. Non-network IT	✓	✓	✓	
7. Non-network other				
a. Buildings / Property	✓	✓	✓	
b. Fleet		✓	✓	
c. Tools and Equipment			✓	

2.2 Replacement Capex

Replacement capex applies to our distribution services that are expected to be classified as Direct Control, Standard Control Services by the AER. Replacement capex is to replace or refurbish our existing assets to maintain their service performance so that we can meet our reliability, safety and other compliance obligations.

We propose using four approaches to forecast our replacement capex, depending on the asset category.

2.2.1 Approach 1 – Scoped Capex

We propose forecasting some of our replacement capex on an individual project basis. This will only be for any large, discrete projects that we can scope and cost on a discrete basis. Projects will be designed to meet jurisdictional planning criteria and other regulatory obligations.

2.2.2 Approach 2 – Programmed Capex

We propose forecasting some of our replacement capex based on a build-up of volumes and unit costs.

Volume forecasts may be based on:

- assets reaching the end of their technical life, having regard for their age and condition;
- asset obsolescence;
- prescribing a set number of units for replacement each year (for example, to address a low-consequence risk that requires mitigation but does not warrant the immediate replacement of the entire asset family); or
- historical asset replacement volumes.

Unit rates may be based on:

- our historical costs;
- costing models; or
- cost estimates from external independent consultants or service providers.

2.2.3 Approach 3 – Pooled Capex

For some asset categories, it is not feasible to base forecast replacement capex on volumes and unit costs. For example, it may not be possible to forecast accurately the volume of faults for a given asset class, or the cost of replacing failed assets due to the different types of assets in the class, but the annual cost of replacements may be relatively stable.

In these cases, we propose forecasting our required capex based on our historical capex expenditure.

2.2.4 Approach 4 – Benchmarked Capex

We propose to use the AER's repex model to benchmark replacement capex forecasts prepared using the above two methods.

2.3 Augmentation Capex

Augmentation capex applies to our distribution services that are expected to be classified as Direct Control, Standard Control Services by the AER. Augmentation capex is to manage capacity constraints in our distribution system due to growth in maximum demand.

Our augmentation capex is forecast to allow us to maintain our asset utilisation rates at appropriate levels, and so that we can meet our safety, reliability, security of supply and other compliance obligations.

We propose to use three approaches to forecast our augmentation capex.

2.3.1 Approach 1 – Scoped Capex

We propose to forecast some of our augmentation capex on an individual project basis. This will only be for any large, discrete projects that we can scope and cost on a discrete basis. Projects will be designed to meet jurisdictional planning criteria and other regulatory obligations.

2.3.2 Approach 2 – Pooled Capex

For some asset categories it is not feasible to base forecast augmentation capex using scoped projects. In these cases, we propose to forecast our required capex based on our historical capex expenditure.

2.3.3 Approach 3 – Benchmarked Capex

We propose to use the AER's augex model to benchmark augmentation capex forecasts prepared using the above two methods.

2.4 Connections Capex

Connections capex applies to our distribution services that are expected to be classified as Direct Control, Standard Control Services by the AER. Connections capex is to service new, altered or upgraded connections for our residential, commercial and industrial customers. This comprises capex that we directly incur ourselves, and contributions that we receive from our customers to cover some or all of the cost of the work.[4]

Unlike for our other capex categories, our customers determine the nature, quantum and timing of our connections capex.

We propose to base our Connections capex forecast on our historical expenditure.

We will prepare a separate forecast for customer contributions using the same approach.

2.5 Metering Capex

Metering capex is for the provision of services classified as Direct Control, Alternative Control, Metering Services.

We propose using three approaches to forecast our Metering capex.

2.5.1 Approach 1 – Scoped Capex

We propose to forecast some of our metering capex on an individual project basis. This will only be for any large, discrete projects that we can scope and cost on a discrete basis. Projects will be designed to meet regulatory obligations.

[4] Contributions will be collected according to the PWC Connection Policy, which will be submitted to the AER with the regulatory proposal.

2.5.2 Approach 2 – Programmed Capex

We propose forecasting some metering capex using a build-up of volumes and unit costs.

Volume forecasts may be based on:

- assets reaching the end of their technical life, having regard for their age and condition;
- asset obsolescence;
- prescribing a set number of units for replacement each year;
- families of meters to be replaced due to failure under asset testing consistent with Metering Asset Management Plans and the relevant regulatory obligations; or
- historical asset replacement volumes.

Unit rates may be based on:

- our historical costs;
- costing models; or
- cost estimates from external independent consultants or service providers.

2.5.3 Approach 3 – Pooled Capex

It is not feasible to base forecasts of some metering capex on volumes and unit costs. For example, it may not be possible to forecast accurately the volume of meter replacements to accommodate changed customer needs, or the cost of replacing failed metering equipment due to the different types of assets in the class, but the annual cost of replacements may be relatively stable.

In these cases, we propose forecasting our required capex based on our historical capex expenditure.

2.6 Network-Other Capex

Network-other capex applies to our distribution services that are expected to be classified as Direct Control, Standard Control Services by the AER. This capex is for the provision of network services that are not covered by replacement expenditure, augmentation expenditure or customer connections expenditure.

We propose to use three approaches to forecast our network-other capex.

2.6.1 Approach 1 – Scoped Capex

We propose to forecast some of our network-other capex on an individual project basis. This will only be for any large, discrete projects that we can scope and cost on a discrete basis. Projects will be designed to meet jurisdictional planning criteria and other regulatory obligations.

2.6.2 Approach 2 – Programmed Capex

We propose to forecast some network-other capex based on a build-up of volumes and unit costs.

Volume forecasts may be based on:

- assets reaching the end of their technical life, having regard for their age and condition;
- asset obsolescence;
- prescribing a set number units for replacement each year (for example, to address a low-consequence risk that requires mitigation but does not warrant the immediate replacement of the entire asset family); or
- historical asset replacement volumes.

Unit rates may be based on:

- our historical costs;
- costing models; or
- cost estimates from external independent consultants or service providers.

2.6.3 Approach 3 – Pooled Capex

For some asset categories it is not feasible to forecast network-other capex using scoped projects. In these cases, we propose to forecast our required capex based on our historical capex expenditure.

2.7 Non-Network IT Capex

Non-network IT capex applies to our distribution services that are expected to be classified as Direct Control, Standard Control Services by the AER. Our Non-network IT capex:

- includes (amongst other things) capex for corporate applications, asset management, network management and geospatial applications, LNSP-related applications,[5] and IT infrastructure; and
- excludes IT-related capex on our SCADA, network control systems and metering.

We propose to use three approaches to forecast our Non-Network IT capex.

2.7.1 Approach 1 – Scoped Capex

We propose to forecast some of our non-network IT capex on an individual project basis. This will only be for any large, discrete projects that we can scope and cost on a discrete basis. Projects will be designed to meet operational requirements and regulatory obligations.

[5] Jurisdictional functions equivalent to the "Local Network Service Provider" functions under the NER, as per jurisdictional requirements.

2.7.2 Approach 2 – Programmed Capex

We propose to forecast some non-network IT capex based on a build-up of volumes and unit costs.

Volume forecasts may be based on:

- assets and applications reaching the end of their technical life, having regard for their age and condition;
- asset obsolescence and vendor support;
- prescribing a set number of units for replacement each year (for example, to address a low-consequence risk that requires mitigation but does not warrant the immediate replacement of the entire asset family); or
- historical asset replacement volumes.

Unit rates may be based on:

- our historical costs;
- costing models; or
- cost estimates from external independent consultants or service providers.

2.7.3 Approach 3 – Pooled Capex

For some asset categories it is not feasible to forecast non-network IT capex using scoped projects or programmed capex. In these cases, we propose to forecast our required capex based on our historical capex expenditure.

2.8 Non-network – Other Capex

Non-network - other capex applies to our distribution services that are expected to be classified as Direct Control, Standard Control Services by the AER. Our Non-network other capex includes expenditure on:

- buildings and property;
- fleet; and
- tools and equipment.

We propose to use three approaches to forecast our Non-network other capex.

2.8.1 Approach 1 – Scoped capex

We propose to forecast some of our non-network other capex on an individual project basis. This will only be for any large, discrete projects that we can scope and cost on a discrete basis. Projects will be designed to meet operational requirements and regulatory obligations.

2.8.2 Approach 2 – Programmed capex

We propose to forecast some non-network other capex based on a build-up of volumes and unit costs.

Volume forecasts may be based on:

- assets and applications reaching the end of their technical life, having regard for their age and condition;
- asset obsolescence and vendor support;
- prescribing a set number of units for replacement each year (for example, to address a low-consequence risk that requires mitigation but does not warrant the immediate replacement of the entire asset family); or
- historical asset replacement volumes.

Unit rates may be based on:

- our historical costs;
- costing models; or
- cost estimates from external independent consultants or service providers.

2.8.3 Approach 3 – Pooled capex

For some asset categories it is not feasible to forecast non-network other capex using scoped projects or programmed capex. In these cases, we propose to forecast our required capex based on our historical capex expenditure.

3 Operating and Maintenance Expenditure Forecasting Methods

This section describes the methods that we intend to use to forecast operating and maintenance expenditure (**opex**) for the provision of regulated distribution services during the next regulatory control period. Much of the opex will relate to Standard Control Services although some, such as Metering opex, will relate to Alternative Control Services. We intend using similar methodologies for both types of services.

We intend to use a base-step-trend (BST) approach to forecast most of our opex. The AER's Expenditure Forecast Assessment Guideline indicates that this is its preferred approach for forecasting opex.

We intend using alternative forecasting approaches to forecast certain other costs, such as our Guaranteed Service Level (GSL) payments and debt raising costs.

We explain these approaches below.

3.1 BST Approach

The BST approach involves forecasting opex in aggregate, rather than separately forecasting individual opex categories.

The BST approach comprises the following components:

- nominating a base year;
- adjusting the base year for matters such as:
    - changes in service classification between the current and next regulatory control periods;
    - efficient incremental opex in the final year(s) of the current regulatory control period (i.e. between the base year and the end of the period);
    - one-off, or other non-recurrent, costs;
    - movements in provisions; and
    - changes in cost allocation;
- adding or subtracting any step changes;
- adding or subtracting rate of change adjustments.[6]

[6] We note that the AER's Expenditure Forecast Assessment Guideline discusses potential adjustments for: output growth, such as for customer numbers, network circuit length and ratcheted maximum demand; real price growth; and productivity growth.

3.2 Other Forecasting Approaches

We intend to use alternative forecasting approaches for other components of our opex, where it is not suitable to apply the BST approach, for example:

- for GSL payments, we intend to base our forecast on historical payment levels (recognising changes in payment values) and applying an escalation for forecast changes in customer numbers;
- for debt raising costs, we intend to apply a benchmark debt raising unit rate to the regulatory value of debt.