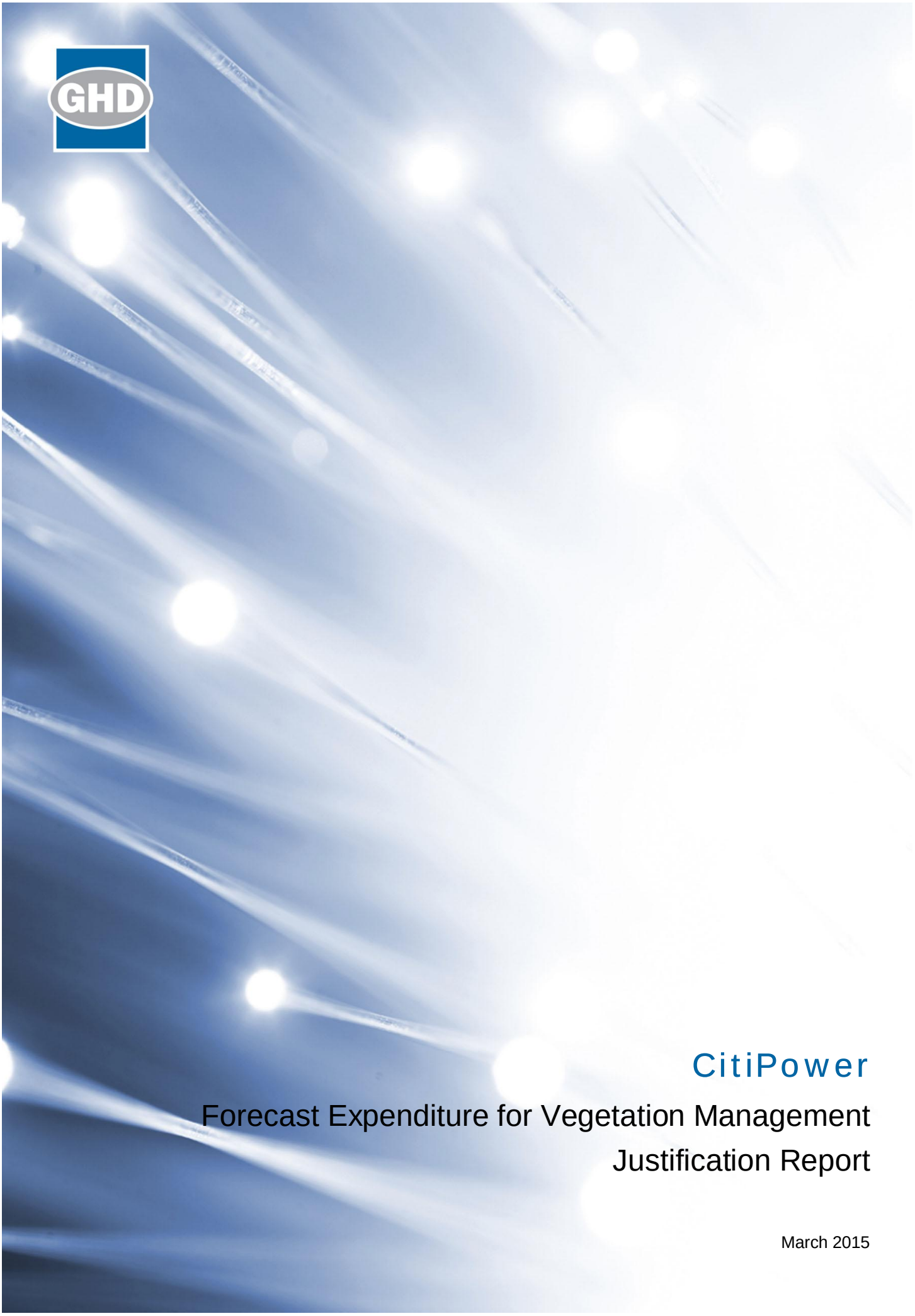

CitiPower

Forecast Expenditure for Vegetation Management Justification Report

March 2015

Table of contents

Table index

Figure index

Appendices

1. Introduction

CitiPower Pty (CitiPower) owns and manages a 157 square kilometre electricity distribution network. It provides power for more than 340,000 customers in Melbourne's CBD and inner suburbs.

CitiPower's network consists of nearly 60,000 poles carrying approximately 4500km of overhead high and low voltage lines, within low bushfire (LBRA) areas.

The Australian Energy Regulator (AER) regulates electricity distributors in the National Electricity Market (NEM) under the National Electricity Law and the National Electricity Rules. The AER is required to make distribution determinations for distributors, including CitiPower, under the National Electricity Rules. In making a distribution determination a principal task of the AER is to determine the efficient and prudent expenditure required by CitiPower during the relevant regulatory control period to achieve certain objectives including, in particular, compliance with regulatory obligations or requirements associated with the provision of standard control services. One of the components of a distributor's annual revenue allowance is forecast operating expenditure, and vegetation management expenditure is a component of CitiPower's forecast operating expenditure.

While the AER provides economic regulation, vegetation management is regulated under State based legislation rather than a national framework. CitiPower has a regulatory obligation to "create and maintain the required clearance space around a powerline"[1]. The *Electricity Safety (Electric Line Clearance) Regulations 2010* (2010 Regulations) specify the clearance spaces required to be maintained around powerlines.

The 2010 Regulations also require that distributors (as responsible persons) prepare and have approved by Energy Safe Victoria (ESV), a Management Plan that describes, among other requirements, the objectives of the plan and the means by which the Code will be adopted and complied with.

To meet these obligations, CitiPower has outlined in their Vegetation Management Plan a series of programs that they have in place to manage vegetation near powerlines (refer section 3.3).

1.1 Purpose of this report

CitiPower engaged GHD Pty Ltd (GHD) to provide an independent forecast of CitiPower's prudent and efficient vegetation management expenditure for the 2016-2020 regulatory control period (RCP). This report and the model prepared by GHD has been developed to be transparent and to break down the costs used in the forecast to demonstrate to the AER the prudency and efficiency of the forecast, while maintaining risk to an acceptable level.

The purpose of this report is to describe the analysis and modelling that has been undertaken by GHD in order to prepare forecast vegetation management costs for the 2016-2020 RCP.

This report must be read in conjunction with the Excel Model CP_Cost Model.

1.2 Report Authors

This report has been prepared on behalf of GHD by Peter Keys, Senior Consultant. For the purpose of preparing this report the author has been provided with a copy of the Federal Court of Australia Practice Note CM7 Expert Witnesses in Proceedings in the Federal Court of

[1] Electricity Safety (Electric Line Clearance) Regulations 2010 (VIC)

Australia. In preparing this report the author has read, understood and complied with that Practice Note.

A list of the materials considered in preparing the report and model is contained in Appendix A. In preparing this report the author has been assisted by Jennie Gater and Paul de Mar. A copy of the author's and assistants' curricula vitae are contained in Appendix B. Where opinions are expressed in this report, unless otherwise stated, those opinions are based on the experience and knowledge of the author and assistants as set out in those curricula vitae. A copy of the instructions from CitiPower's lawyers, DLA Piper, for the preparation of the expert report is contained in Appendix C.

1.3 Scope and limitations

This report: has been prepared by GHD for CitiPower Pty and may only be used and relied on by CitiPower Pty for the purpose agreed between GHD and CitiPower Pty as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than CitiPower Pty arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by CitiPower Pty and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

GHD has not been involved in the preparation of the submission to the AER and has had no contribution to, or review of the submission to the AER other than in this document. GHD shall not be liable to any person for any error in, omission from, or false or misleading statement in, any other part of the submission to the AER.

The Cost Estimate has been prepared for the purpose of informing the submission to the Australian Energy Regulator and must not be used for any other purpose.

This cost forecast has not been developed on a detailed specification and as such could vary by +/- 10%.

1.4 Qualifications and Assumptions

- The data provided by CitiPower is true and accurate and reflects the current understanding of the situation. GHD has not conducted any audit work to verify the data or the compliance status of the network.
- As at 31 December 2014, the network is fully compliant with the 2010 Regulations in line with the 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan (Vegetation Management Plan) as approved by ESV.
- For the purposes of clarification, this report refers to Hazardous Bushfire Risk Areas (HBRA) and Low Bushfire Risk Areas (LBRA), in accordance with Victorian legislation. This is not the same as rural and urban feeders for AER purposes.

Due to the commercial in confidence nature of the vegetation management industry, GHD is not able to reproduce in this report all of the research GHD conducted as part of this assignment.

1.5 Abbreviations

ABC	Aerial Bundled Cable
AER	Australian Energy Regulator
DNSP	Distribution Network Service Provider
ESV	Energy Safe Victoria
EWP	Elevated Work Platform
HBRA	High Bushfire Risk Area (also referred to as Hazardous)
LBRA	Low Bushfire Risk Area
LLC	Live Line Clearance
NCR	No Code Required
NEM	National Electricity Market
NSP	Network Service Provider
NVS	Non Vegetated Spans
OPEX	Operational Expenditure
ORP	Other Responsible Persons
POEL	Private Overhead Electricity Line
RCP	Regulatory Control Period
RIN	Regulatory Information Notice
VDB	Vegetation Database
VS	Vegetated Spans

2. Background

This background is provided to inform the reader on the regulatory and operating context of, and basis for, the forecast model and this report.

2.1 Regulatory Obligations

CitiPower has a regulatory obligation to maintain and comply with the specified clearance distances at all times.

The *Electricity Safety Act 1998* (Electricity Safety Act) requires distribution companies to keep the whole or any part of a tree clear of an electric line within its distribution area, unless another person is responsible for the maintenance of the line or keeping of the whole or any part of a tree clear of the line (s84). Other persons who may be responsible for the maintenance of the line, or keeping the whole or any part of the tree clear of the line, are set out in s84A to s84D of the Electricity Safety Act and include, in particular circumstances, councils or occupiers of land.

The 2010 Regulations prescribe the Code of Practice for Electric Line Clearance and provide for other matters authorised under the Electricity Safety Act relating to electric line clearance.

2.1.1 Current Requirements – Electricity Safety (Electric Line Clearance) Regulations 2010

The 2010 Regulations prescribes a Code of Practice for Electric Line Clearance (the Code). This Code prescribes the clearance spaces for vegetation in the vicinity of a powerline that must be maintained at all times.

Generally, the required clearance space around a powerline is the smallest space such that if a tree were cut or removed from that space, the tree would not grow into the minimum clearance space around that powerline between cutting times.

Critical elements in the determination of the size of the clearance space required by the Code in respect of a given powerline are:

- Voltage at which the power is transferred along the relevant powerline,
- The type of the powerline (insulated cable, bare conductor),
- The span length and distance of the vegetation from the poles at either end of the powerline, and
- The bushfire risk classification of the area through which the powerline traverses (LBRA or HBRA).

Examples of clearance space around a powerline can be seen in Figure 1 and Figure 2 below.

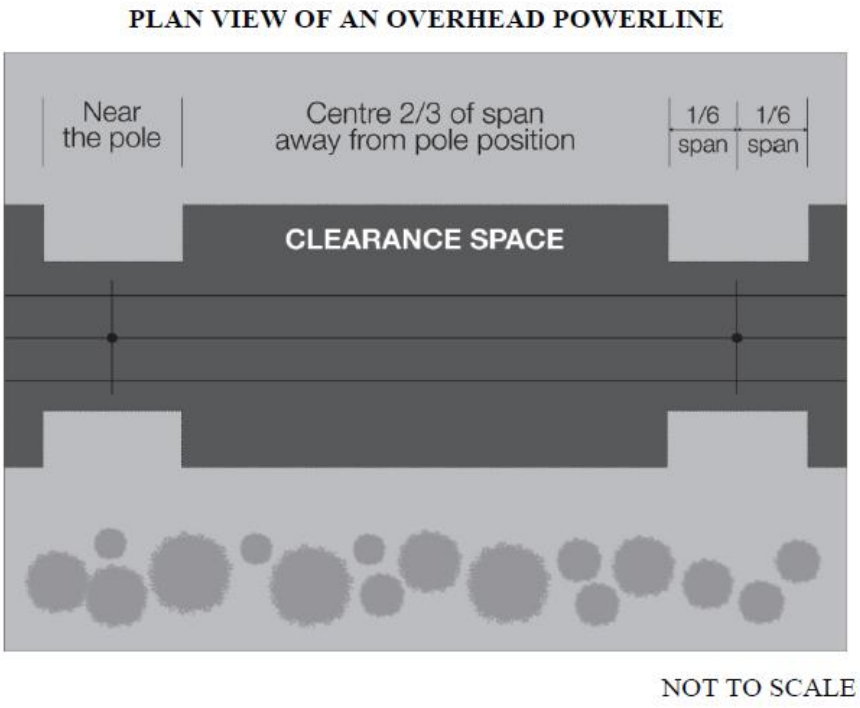

Figure 1 Example of Clearance Space – Plan View (Figure 1 in the Schedule to the 2010 Code)

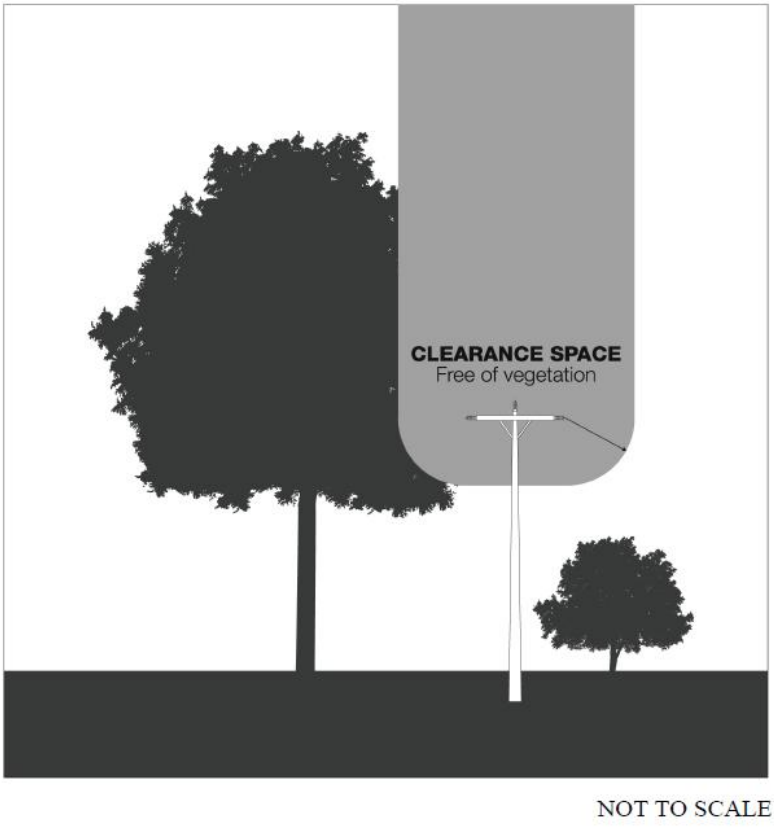

Figure 2 Example of Clearance Space - Elevation View (Figure 5 in the Schedule to the 2010 Code)

The 2010 Regulations also require that distributors (as responsible persons) prepare and have approved by ESV, a Management Plan that describes, among other requirements, the objectives of the plan and the means by which the Code will be adopted and complied with.

ESV provided exemptions to CitiPower from some of the requirements of the 2010 Regulations, being:

- an exemption dated January 2011 from the requirement to maintain a clearance space in accordance with tables 1, 2 and 3 of Schedule to the Code;
- an updated exemption dated September 2013 from the requirement to maintain a clearance space in accordance with tables 1, 2 and 3 of the Schedule to the Code; and

The updated exemption dated September 2013 essentially required CitiPower to be compliant with the 2010 Regulations by the end of 2014. CitiPower's Vegetation Management Plan, which was approved by ESV, modified some of the clearance space requirements in the 2010 Regulations.

The impact of this exemption and the approved Vegetation Management Plan was to require CitiPower to transition vegetated spans to the clearance spaces specified by the 2010 Regulations in line with the Vegetation Management Plan.

This transition has resulted in more vegetation from trees needing to be cut which were already infringing into the clearance zone, in some cases additional trees needing to be cut, as well as greater or more frequent cutting of trees to ensure ongoing compliance. The transition also resulted in year to year specific volumes determined by the priorities agreed with ESV to achieve agreed compliance.

2.1.2 Proposed Requirements – Electricity Safety (Electric Line Clearance) Regulations 2015

The *Electricity Safety Act 1998* requires that the Regulations prescribing the Code of Practice for Electric Line Clearance be remade every 5 years by virtue of a sunset provision. At the time of this report, a Regulatory Impact Statement had been issued for comment on the proposed *Electric Safety (Electric Line Clearance) Regulations 2015* and the associated Code and the changes effected by the proposed Regulations and Code to the 2010 Regulations and Code.

At the time of preparing this report, the 2015 Regulations have not been finalised. The model has therefore been prepared on the basis that the network will maintain compliance over the 2016-2020 RCP with the 2010 Regulations in line with the Vegetation Management Plan approved by ESV.

3. Vegetation Clearance Program

3.1 CitiPower Vegetation Management Plan

As mentioned in Section 2, CitiPower is required to prepare a Vegetation Management Plan to address the items required under the Regulations.

The Mission of CitiPower's Vegetation Management Plan is:

"To ensure that the vegetation clearance space is maintained in accordance with the Code for the period of the cutting cycle.

At all times these activities will be carried out with attention to:

- Minimising the risk of fire starts,
- Ensuring public safety,
- Ensuring private property security,
- Ensuring continuity of supply,
- Delivery of quality service,
- Responsible Environmental Management,
- Commitment to work place safety,
- Minimising of community cost,
- Consultation/Notification,
- Moving to a 3 year cutting cycle in areas where practical, and
- Reduction in number of inappropriate species of vegetation near powerlines"[2].

To achieve this mission and meet its obligations under the Act, CitiPower has engaged Vemco under a full management contract to undertake clearance and associated activities.

3.2 Current Contract

The current vegetation management contract is based on a full management contract. The contractor, Vemco, is responsible for:

- Vegetation inspection and clearance for all programs, including:
  - Cyclic program
  - CitiPower High Voltage Annual Inspection Program
- Inspection (and notification to customers if non-compliant) of Insulated Powerlines and Service Cables,
- Inspection (and notification to customers if non-compliant) of Private Overhead Electricity Lines (POEL),
- Identification and recording of Hazardous Vegetation,
- Recording of any observed CitiPower powerline hazards, and
- Any special inspections required.

[2] CitiPower, 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan, 31 July 2014.

3.3 Programs

CitiPower's current programs are described below.

Cyclic Program

The aim of CitiPower's current cyclic program is to ensure that vegetation does not grow into the clearance space at any time.

In addition to this program, the minor programs described below also form part of the vegetation management contract.

Hazard Trees

Hazardous vegetation includes:

- Dead and dangerous limbs,
- Physical defects in trees,
- Environmental conditions, and
- Other trees or limbs that may be unstable and could fall on the powerline under the range of weather conditions that can be reasonably expected to prevail in the locality.

An appropriately qualified Arborist may be required to evaluate hazardous vegetation to determine the structural integrity of the vegetation and whether removal of the tree is necessary.

The current contractor (Vemco) maintains a register of "Trees of Interest" that are monitored for any changes that would require them to be removed as a Hazard Tree.

Tree Removals

There is no current specified program for tree removals although Vemco have been reporting on tree removals during their contract term.

While tree removal in urban areas is not a real volume reduction strategy, GHD believes that it is efficient and prudent to have a program in place to allow for removal of contentious trees (eg cycle breakers, or trees which the owner would rather have removed than cut every year) where appropriate.

3.4 Summary

GHD is of the opinion that all programs contained within CitiPower's existing vegetation management program are efficient and prudent components of a vegetation management plan and are common tasks across Australian NSPs (including NSPs not in the NEM).

4. Cost Driver Analysis

GHD has undertaken some analysis of the cost drivers related to vegetation management to provide a high level review of the vegetation growth factors that affect different NSPs across the country and determine what, if any, relevant comparisons can be drawn. For the reasons set out in this section, GHD considers that forecasting vegetation management expenditure requires the development of a model to reflect the specific requirements of CitiPower.

4.1 Regulatory Requirements

Vegetation management is regulated under State based legislation rather than a National Framework. A summary of the requirements for each State is provided in Table 1 below. This information was obtained through a search of relevant legislation for each jurisdiction, and where no legislation could be found, (i.e. in WA) through the relevant NSP's websites.

Table 1 Summary of Vegetation Management Frameworks

	Vic	SA	Tas	NSW	QLD	ACT	WA
NSP responsibility	Yes	Yes	Yes	Yes	Yes	No	No
Legislation prescribed Clearance Zone	Yes	Yes	Yes	No	No	Yes	No
Legislation prescribed Buffer Zone	No	Yes	No	No	No	No	No
Legislation prescribed maximum clearance cycle	No	Yes	No	No	No	No	No
Other specified Clearance Zone	N/A	N/A	N/A	Yes	Yes	No	No
Other specified Buffer Zone	No	N/A	No	No	Yes	No	No
Other specified clearance cycle	N/A	N/A	Yes	No	No	No	Yes
Tree removal allowed	Yes	No	Yes	Yes	Yes	Yes	Yes

The legislation drives the required programs for each NSP and therefore will impact the cost of vegetation management.

4.2 Environmental Factors Affecting Vegetation Growth

There is a wide range of interacting factors which affect vegetation growth. Major factors include climate (particularly rainfall patterns and the limiting effects of temperature ranges), soil properties (such as type, depth, texture, chemistry), and natural and human-induced processes that consume or suppress vegetation (such as fire, grazing, and other forms of land management). In the absence of human intervention to alter one or more of these factors, the natural distribution patterns of native vegetation generally reflect the factors affecting growth.

Figure 3 below shows that there is a high degree of vegetation variability in Victoria.

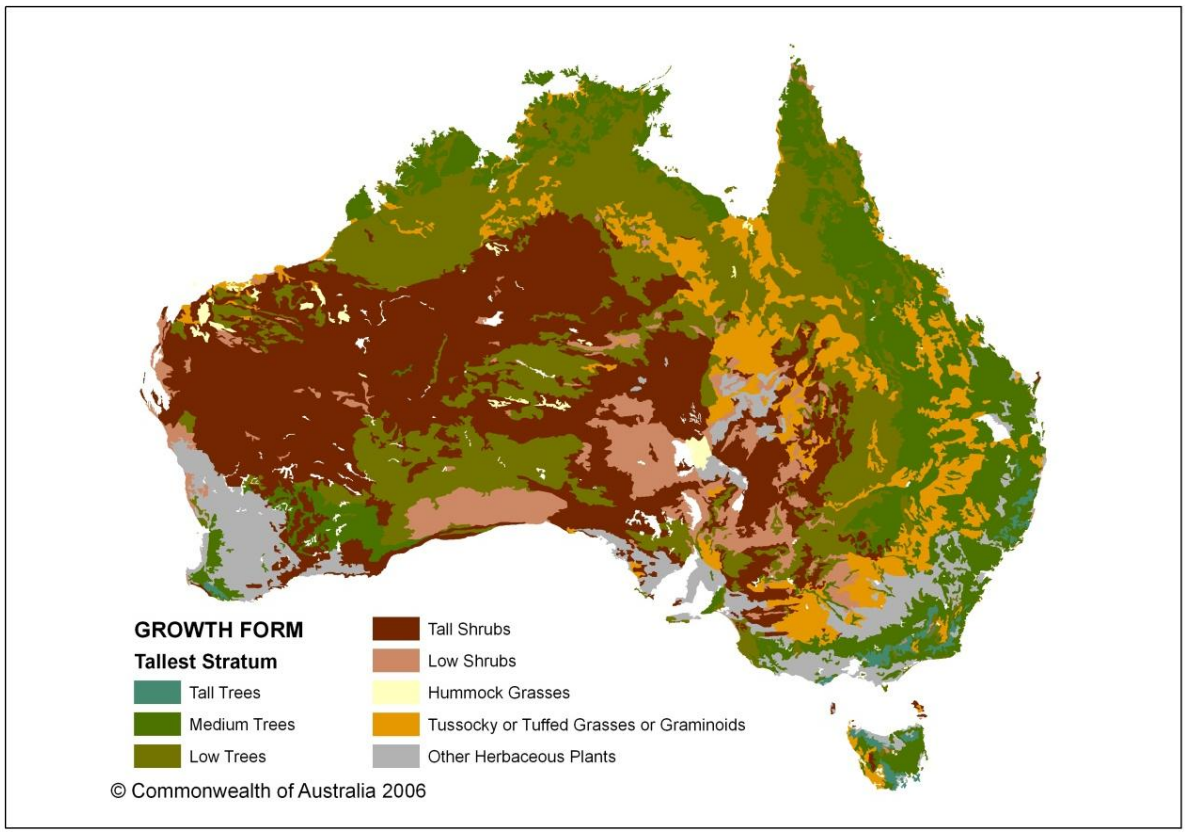

Figure 3 Vegetation Growth Form

In addition to the natural environmental factors affecting vegetation growth and management dynamics, a range of factors influenced by human activity also affect vegetation management dynamics. These include:

- Agriculture,
- Changes to road verge management practice,
- NSP vegetation management program scoping,
- Vegetation density and condition in spans,
- Contractor cutting practices, and
- Street, property boundary and windbreak tree planting selection.

The Economic Benchmarking and Category Analysis RIN data that was supplied by all DNSPs to the AER included statistics for the average number of trees per vegetation maintenance span for both rural and urban/CBD areas.

Analysis of these figures shows that CitiPower is slightly below average for the number of trees per vegetation maintenance span in designated Urban areas. While this number is lower than some other DNSPs, other operating environment factors need to be considered, including the higher consultation and traffic management requirements within CBD areas. This would transfer to a higher cost of clearance per span based on workload requirements.

This analysis can be seen in Figure 4 below.

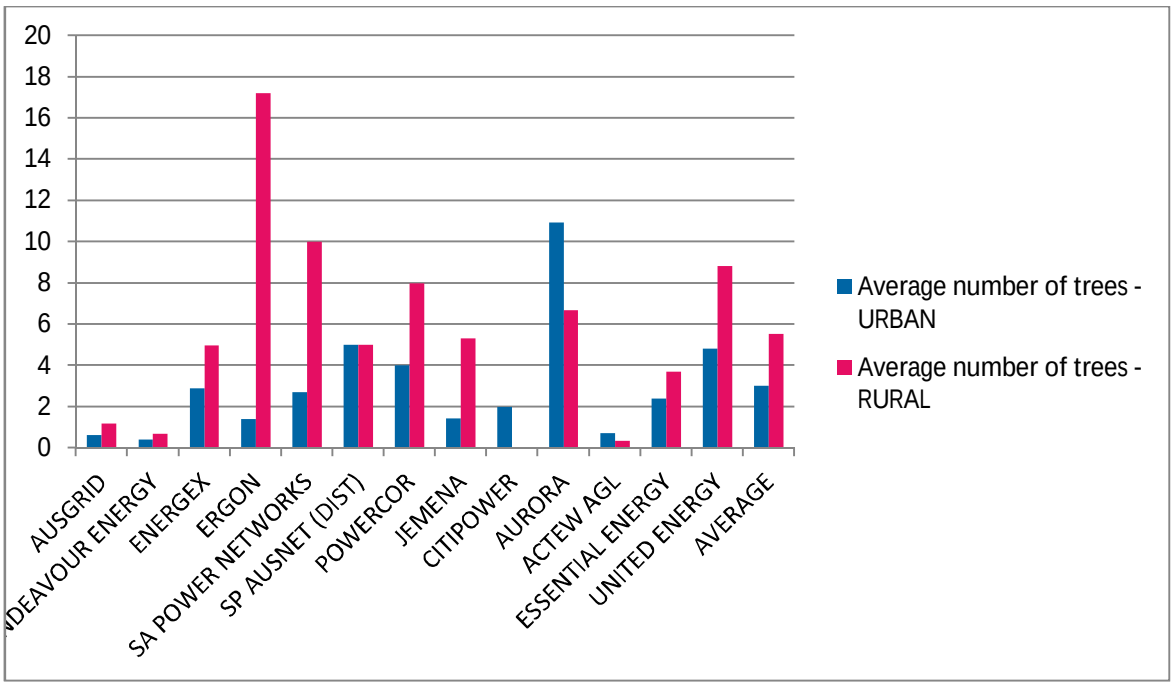

Figure 4 Average Numbers of Trees per Span by DNSP

4.3 Summary

In attempting any form of comparative analysis of vegetation management outcomes, contextual information applying to the areas is vital. The following contextual information is important:

- Any differences in legislation between areas being compared,
- Quantitative information on the proportion of spans that require recurrent treatment, and at least some qualitative information (using coarse classification systems) of the density and attributes of vegetation in spans,
- Qualitative information about vegetation growth characteristics and volumes (based at least on annual rainfall and soils),
- Qualitative information about antecedent seasonal climate conditions as a proxy of growth rates (or a more direct measure),
- Details of the vegetation management work specifications being applied during the treatments, and
- Qualitative information in relation to access/site difficulty in relation to applying treatment.

As set out in this section, limitations for comparing vegetation management data exist due to the differences in climate, legislation and operating environments. These differences reduce the confidence with which any comparison of rates per service across NSPs can be undertaken. The level of confidence in this information is further reduced where an NSP has not implemented a consistent vegetation management program over at least a 3 year period (for example, due to transitioning to compliance with new obligations during that period).

Given the limitations in being able to compare rates per service across NSPs with any level of confidence, forecasting vegetation management expenditure therefore requires the development of a model to reflect the specific requirements of CitiPower.

5. Modelling Approach

The previous sections of this report describe the background, regulatory requirements and environmental conditions that impact on CitiPower's vegetation management program.

From this information, the key observations and considerations that GHD has made in the development of the model are consolidated and repeated here for clarity.

- As at 31 December 2014, the network is fully compliant with the 2010 Regulations in line with the Vegetation Management Plan as approved by ESV.
- At the time of preparing this report, the 2015 Regulations have not been finalised. The model has therefore been prepared on the basis that the network will maintain compliance over the 2016-2020 RCP with the 2010 Regulations in line with the Vegetation Management Plan as approved by ESV.
- All programs contained within CitiPower's vegetation management program are efficient and prudent components of a vegetation management plan and are common tasks across NSPs.
- The vegetation management data volumes for the last 2 years (being 2013 and 2014) are indicative of the transition cycle required to achieve compliance and are not representative of a maintenance cycle.[3] It is therefore not possible to draw any correlation between the volume data and the climate conditions.
- Given the limitations in being able to compare rates per service across NSPs with any level of confidence, forecasting vegetation management expenditure requires the development of a model to reflect the requirements specific to CitiPower.

Together with these observations, we have applied our knowledge of the vegetation management industry and practices, and the vegetation management programs across a range of NSPs, to the preparation of this report and the associated model.

[3] The actual cutting volumes in 2013 and 2014 reflect work completed in the relevant years to achieve transition program. The volume of maintenance cutting required is driven by the actual years of clearance that were able to be achieved during the transition as represented by the code data in the Vegetation Management Database (see section 6.2). The former are indicative of the transition cycle, while the latter indicates cutting volumes going forward.

6. Modelling

GHD has developed a model to demonstrate the build-up of forecast efficient and prudent vegetation management volume and costs for CitiPower's network for each of the regulatory years of the 2016-20 RCP.

6.1 Model Inputs

Key inputs were identified based on previous sections of this report that are required to develop a bottom-up forecast of expenditure.

The key inputs in the model are:

- Scoping – volumes and rates,
- Cutting - volumes and rates,
- Service line cutting volumes and rates,
- Tree removal volumes and rates,
- Hazard trees volumes and rates,
- Liaison and Negotiation with Other Responsible Persons (ORP), and
- Internal costs.

These inputs are described below.

6.2 Volumes

CitiPower retains a Vegetation Management Database (VDB) that is updated by the current contractor with the latest information at the end of each month. This database contains information at a span level. Information recorded includes (but is not limited to):

- Equipment number to identify each span,
- The fire area (to distinguish between HBRA and LBRA), and
- Code (to identify whether or not the span is vegetated, and if so, the year that the vegetation is expected to grow into the clearance zone).

This VDB is considered to be the "single source of truth" in regard to vegetation management data. CitiPower has advised that it has a reasonable level of confidence in the quality of the data having undertaken audits of the information populated.

The data from the 2014 VDB, as provided to GHD, forms the basis of our assessment and forecasting of the volumes used for the model.

6.2.1 Scoping

Scoping is required to identify the spans that require vegetation management clearance work to be undertaken. Scoping must occur at least on the same minimum cycle, if not more frequently, than the cutting cycles in order to ensure compliance of the network.

Spans are currently scoped on a 3 yearly cycle. Ideally an annual cycle should be adopted to ensure that compliance is maintained at all times; however, due to the lower risk of bushfire incidents, we consider it efficient and prudent to scope on a 2 year cycle. Where there are identified spans that fall outside the 2 year cycle these can be categorised as managed spans in the VDB. Therefore the volume of spans is equal to one half of all spans within CitiPower's

network. (Managed Spans are those spans that have been identified as required to be inspected and/or cut prior to the next programmed cycle.)

Scoping includes all notification and consultation as required where vegetation management is the responsibility of CitiPower (excludes ORP's).

6.2.2 Cutting

GHD has used the data in the 2014 VDB provided by CitiPower as a basis for deriving the volumes required to be cut in the years 2016 to 2020. Where data was not available (e.g. for 108 spans, no previous cut date exists), we have assumed a cycle of 2 years based on the cycle provided in the 2013 Category Analysis RIN.

During scoping, all spans are allocated a code to indicate the year in which any vegetation is likely to encroach into the clearance zone. This data is recorded in the 2014 VDB.

The practice adopted by CitiPower to minimise the likelihood of vegetation growing into the clearance zone (i.e. maintaining clearances at all times), requires spans that are coded for the current year and the following year to be cut. For example, in 2016 all spans coded 2017 will be cut, in addition to any spans coded 2016 that are found or have been carried over, and also any code 55 spans (vegetation touching the powerline) and 56 spans (vegetation within the clearance space) that are found. Given the environmental variables and subjective nature of vegetation growth scoping this is considered to be a prudent approach.

CitiPower has undertaken some predictive modelling using the 2014 VDB to estimate volumes requiring cutting in the years 2016 to 2020. GHD has validated the modelling techniques applied by CitiPower and has adopted these in part.

In the 2014 VDB there are a total of 59,108 spans of which 37,734 (64%) are coded as:

- Non Vegetated Spans (NVS) – 25,146 (43%) where there is no potential for any vegetation to ever enter into the clearance space.
- No Code Required (NCR) – 7,620 (13%) where a pole asset has no overhead powerline connection attached and therefore no vegetation clearance requirement.
- Vegetated Spans (VS) – 4,968 (8%) where vegetation will most likely not enter clearance space until at least 2022 (in accordance with the CitiPower definition).

Spans in the above three categories have been assumed to have no vegetation clearance requirement for the RCP 2016 to 2020.

Of the remaining 21,374 spans, there are 18,766 spans (32%) where historic data shows regular cycles of 1 to 4 years which will result in all spans requiring at least one cut, with some spans being cut multiple times during the RCP (depending on the cycle and last cut date). There are a further 2,608 spans (4%) which historic data shows cycles of 5 to 10 years; our assumption is that these spans will require clearance only once during the 2016-2020 RCP (based on the last cut date). Table 2 shows the summary of the calculations performed by GHD using data in the 2014 VDB.

Table 2 Vegetation Database Modelling Calculation Summary

2016-2020	TOTAL
Spans 1 to 4 year Cycle	18,762
Average Volume PA (for 2016-2020)	8,174
Spans > 4 year cycle	2,612
Average Volume PA (for 2016-2020)	522
Total Average Volume PA	8,696

Table 3 below shows the actual data for 2013 and 2014, during which time the focus of these years was to transition to literal compliance.

Table 3 Span Clearance Rates (2013-2014 Actual)

Year	TOTAL
2013	3,432
2014	4,516
2 Year Average Volume	3,974

From this data, we can see that the predicted volumes are greater than prior years (2013 / 2014); however GHD is of the opinion that more frequent cutting will be required in order to maintain literal compliance. Table 4 below shows the volumes and cycle rates forecast by GHD for the 2016 to 2020 RCP based on the codes recorded in the 2014 VDB for when spans are to be cut. In urban areas it is often impractical to achieve the required clearances whilst achieving visual amenity and therefore a significant increase in cutting frequency is required.

As shown in Table 4 the volumes forecast using the data in the 2014 VDB yield a per annum span clearance rate of 14.7% over the whole network or 40.7% of the vegetated spans.

Table 4 Span Clearance Rates (VDB 2016-2020 Model)

Area	Cycle	Average Volume per year	All spans	Clearance Rate	Vegetated spans	Clearance Rate
Total	2.5	8,696	59,108	15%	21,374	41%

Whilst this is the information derived from the 2014 VDB, GHD is of the opinion that these predicted cycles are too low and should be increased in order to maintain compliance, tree health and visual amenity. In urban areas, spans are generally shorter and lower and thus tree health and amenity are significantly impacted by vegetation clearance practices. Our view is that a cycle of 2 years should be adopted, and this produces the volumes shown in Table 5 below.

Table 5 Span Clearance Rates (GHD 2016-2020 Model)

Area	Cycle	Average Volume per year	All spans	Clearance Rate	Vegetated spans	Clearance Rate
Total	2	10,687	59,108	18.1%	21,374	50%

6.2.3 Service Lines Scoping

Service lines are the insulated supply lines from a pole to a customer premises. We have allowed for scoping of service lines to be the same as for general spans (as described in section 6.2.1), as for efficiency of resources they are a contiguous part of the network. That is, all service lines are forecast to be scoped on a 2 year cycle.

6.2.4 Service Line Cutting

All service lines within CitiPower's network are in areas declared under section 81 of the Electricity Safety Act.[4]

Historic information provided in a previous regulatory submission for the percentage of service lines requiring cutting each year suggested that vegetation around 10% of service lines may need to be cut each year.[5] The actual volumes of service lines cut each year are not captured or recorded by CitiPower, so in the absence of any other data, GHD is of the opinion that this percentage seems high, and our recommendation would be to allow for 5% of service lines to be cut each year. Accordingly, to determine the volume of service lines requiring cutting each year GHD applied this percentage to the number of services lines in CitiPower's network.

The volumes do not represent a material cost differential should they differ from the volumes used.

6.2.5 Minor Programs

Hazard trees

CitiPower maintains a register of 'Trees of Interest' that are monitored for changes in their nature. CitiPower and councils are required to identify and report on hazard trees. The number will vary from year to year based on this identification.

Based on 2014 data (in which there were 5 hazard trees removed) we have allowed for 2 hazard trees to be removed each year. This program reflects efficient and prudent vegetation management practice.

Tree Removal

While tree removal volumes are reported on by the current contractor, CitiPower does not currently specify targets or criteria.

While tree removal in urban areas is not a real volume reduction strategy, GHD believes that it is efficient and prudent to have a program in place to allow for removal of contentious trees (eg cycle breakers, or trees which the owner would rather have removed than cut every year) where appropriate.

The volumes of tree removals reported by the contractor may be reflective of the transition, where they may have removed trees rather than increase the cutting volume. Therefore the data reported by the contractor is not necessarily an accurate reflection of the volume going forward.

Tree removals should be assessed on a business case basis looking at alternate solutions (e.g. reconstruction, ABC, undergrounding). While this cost may not necessarily be part of a lump sum contract, an allowance for this cost should be made. Based on the contractor reported schedule of tree removals classified as 'heavy' in 2013/14, we have assumed a notional provision of 5 trees to be removed in any one year. This represents a nominal reasonable target reflecting the urban environment CitiPower operates in.

[4] Since all of the public land in the CitiPower network has been declared under section 81 of the Electricity Safety Act, CitiPower is not responsible for clearing vegetation within the clearance space of service lines where vegetation is on public land. However, CitiPower is responsible for clearing vegetation within the clearance space of service lines where the vegetation is located on an adjacent property to that to which the service line supplies power. The service lines that CitiPower is responsible for are those that cross over the boundary of another property. Accordingly, the vegetation for which CitiPower is responsible is located in the adjacent property owner's front yard.
[5] Statement of Matthew Thomas Joyce dated 30 August 2010, para137.

6.3 Unit Rates

As discussed in Section 4 above, there are limitations in being able to compare rates per service for vegetation practices across NSPs due to the number of variables. Simplistic comparisons provide meaningless assistance when comparing the NSPs. The variables associated with each task (scoping, cutting, removals, easements, consultation, market factors and profit) that ultimately build up the pricing structure for any contractor can differ significantly due to environmental, physical, legislative, program maturity, contract type, use of technology and risk factors.

To determine the unit rates, we have considered the specific tasks and programs required in order for CitiPower to meet its regulatory obligations, together with our experience and knowledge of vegetation practices in other jurisdictions.

All unit rates have been stated in $2014 and are inclusive of:

- Sophisticated database and technology,
- Vegetation database management/development
- Cost of advertising cutting activity,
- Traffic management,
- Plant and equipment (including vehicles), and
- Contractor overheads and profits.

The rates used for each input are discussed in more detail in the following sections.

6.3.1 Scoping (Spans and Service Lines)

The scoping of spans and service lines is considered to be a contiguous program of works. We have taken the total volumes of spans and service lines from the 2014 VDB as described in sections 6.2.1 and 6.2.3 above. We have adopted an average span scoping rate of 15 spans per hour based on our opinion and knowledge of industry practice, noting that the actual scoping rate can vary depending on span types, environmental conditions, the amount of consultation required and data-point collection.

Industry rates for inspectors are approximately $70-$90 per hour depending on the experience and arboriculture qualifications of those undertaking the scoping activity.

Considering that CitiPower requires the inspectors to undertake all notification and consultation with landowners and councils as part of scoping/inspection, and also to forecast the future cutting requirements of the vegetation, GHD considers the upper end of this range ($90 per hour) to be reasonable, and the resultant unit rate of $6 per span to be appropriate.

6.3.2 Cutting

To derive unit rates for cutting, GHD built up rates using our own assessment of the crew mix and rates for various work elements as provided in CitiPower's vegetation contract[6]. We have used these rates as they are comparable to our knowledge of similar rates of other contractors, which we cannot cite due to commercial in confidence reasons, and are therefore deemed to be reasonable. We calculated the cost per hour for each crew type and estimated the number of spans per hour that could be cut in order to derive a cost per span. We then applied a percentage to each type of crew (refer Table 6), acknowledging that the actual deployment of

[6] Refer to the Schedule of Rates in Schedule 3 of the Supply of Vegetation Management Services Modification No. 5 dated 14 March 2012.

crews is dependent on many factors throughout the program. The percentages applied come from our knowledge of contractor cutting practices.

Table 6 Cutting Crew Mix

Crew type	Average crew mix
EWP	70%
Climber	10%
LLC	20%

Rates calculated include traffic management and site clean-up works. The GHD derived rate is $274.12 per span.

6.3.3 Service Line Cutting

Service lines are insulated and generally much shorter than average spans and have lesser clearance requirements than bare conductors.

We have allowed for a rate of $54.82 per service line. This rate allows for 20% of the effort required for clearing spans (i.e. the rate is 20% of the unit rate we calculated for cutting).

Based on GHD's industry experience, this rate is considered to be a prudent and efficient cost for the minimal cutting work that would be normally expected for clearance of service lines.

6.3.4 Minor Programs

In addition to the core scoping and cutting programs, there are a number of minor programs required to manage vegetation clearances effectively to meet regulatory obligations in line with the Vegetation Management Plan as approved by ESV. The additional costs applicable for these programs represent 1% of GHD's forecast of overall vegetation management costs. This percentage is consistent with our expectations of the contribution of minor programs to the costs of an overall vegetation management program in an urban environment. The rates and volumes that have been adopted for these minor programs are based on our experience and knowledge of similar programs in other jurisdictions.

The unit costs for the minor programs were derived as follows:

Hazard Trees and Tree Removal

The cost for removal of trees is highly variable depending on the location of the tree, its proximity to the powerlines, the tree species and dimensions, and the remediation works required following removal.

The cost for live line crews is approximately $300 per hour (accounting for the skill requirement of the workers and the necessary safety equipment). In CitiPower's network it is feasible that a single tree removal could take a 3 crew team up to 8 hours. Traffic control will also be required for this time, at a cost of approximately $150 per hour, plus remediation costs. Including the cost of stump removal, we have allowed for (on average) $5000 per tree.

6.3.5 Negotiation/Liaison with Other Responsible Persons (ORPs)

CitiPower or its representative contractor is required under the Vegetation Management Plan to identify vegetation that is the responsibility of ORPs which is a priority or requires urgent clearance and negotiate/liaise with the relevant ORP for its clearance.[7]

[7] CitiPower, 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan, 31 July 2014, section 3.8.2.

GHD has allowed for one FTE for this activity based on the 2013/2014 historic volumes of vegetation which has been identified and notified to ORPs. This FTE is required to maintain the database of ORPs, scope the relevant vegetated spans and liaise with the ORPs to ensure necessary clearances are maintained.

6.3.6 Additional Costs

As vegetation management programs are typically undertaken by external parties (and GHD's modelling reflects this), it is efficient and prudent for a distributor to incur additional costs in liaising with the contractor, receiving reports and conducting its own field audits to ensure the integrity of the contractor.

Based on our knowledge of the practices of other NSPs, we have provided an allowance for combined auditing and management costs equal to 2.5% of the total proposed cost. Anything up to 5% is considered prudent and reasonable.

6.4 Risks

Key risks to undertaking the vegetation management program within the proposed budget over the RCP include:

- GHD's assumption as to the current compliance of the network with the 2010 Regulations and Vegetation Management Plan does not hold,
- A changed Regulatory environment (move to the 2015 Regulations) results in additional obligations with respect to vegetation management,
- Changes to NVS, VS and NCR spans, for example an increase in VS spans relative to those currently coded VS in the 2014 VDB,
- Increased rainfall relative to what GHD assumed for its modelling,
- An increase in the market rate for external contractors, and
- Infrastructure modifications, for example an increase in powerlines/spans in CitiPower's network.

7. Conclusion

The model developed by GHD provides a transparent outlook of the cost build-up for the efficient and prudent forecast vegetation management expenditure for the 2016-20 RCP, required for CitiPower to maintain compliance with the 2010 Regulations in line with the Vegetation Management Plan approved by ESV.

The model has been developed with consideration to:

- Cost effectiveness, and
- Comparisons with other distributors where relevant.

Table 7 below shows the output from the Model.

Table 7 Model Outputs (in $2014)

Item		2016	2017	2018	2019	2020
Scoping	Volume	29,554	29,554	29,554	29,554	29,554
	Rate	$6.00	$6.00	$6.00	$6.00	$6.00
		$177,324	$177,324	$177,324	$177,324	$177,324
Cutting	Volume	10,687	10,687	10,687	10,687	10,687
	Rate	$274.12	$274.12	$274.12	$274.12	$274.12
		$2,929,567	$2,929,567	$2,929,567	$2,929,567	$2,929,567
Service Line Scoping	Volume	60,405	60,405	60,405	60,405	60,405
	Rate	$6.00	$6.00	$6.00	$6.00	$6.00
		$362,427	$362,427	$362,427	$362,427	$362,427
Service Line Cutting	Volume	6,040	6,040	6,040	6,040	6,040
	Rate	$54.82	$54.82	$54.82	$54.82	$54.82
		$331,142	$331,142	$331,142	$331,142	$331,142
Liaison	1xFTE	$172,800	$172,800	$172,800	$172,800	$172,800
Tree Removal	Volume	5	5	5	5	5
	Rate	$5,000	$5,000	$5,000	$5,000	$5,000
		$25,000	$25,000	$25,000	$25,000	$25,000
Hazard Trees	Volume	2	2	2	2	2
	Rate	$5,000	$5,000	$5,000	$5,000	$5,000
		$10,000	$10,000	$10,000	$10,000	$10,000

Item		2016	2017	2018	2019	2020
Subtotal (Compliance to VMP)		$4,008,261	$4,008,261	$4,008,261	$4,008,261	$4,008,261
CitiPower Contractor Management		$50,000	$50,000	$50,000	$50,000	$50,000
CitiPower Auditing		$50,000	$50,000	$50,000	$50,000	$50,000
Subtotal (CitiPower Internal Costs)		$100,000	$100,000	$100,000	$100,000	$100,000
TOTAL		$4,108,261	$4,108,261	$4,108,261	$4,108,261	$4,108,261

7.1 Declaration

In preparing this report and the accompanying model the author has made all the inquiries that are believed to be desirable and appropriate and no matters of significance that are regarded as relevant have, to the author's knowledge, been withheld.

Signed 

Peter Keys

Dated 25 March 2015

Appendices

Appendix A – Index of Materials

Document Number	Date	Document
1		Table showing CitiPower's and Powercor's vegetation management allowances for 2011-2013 and their actual expenditure
2	12/12/2008	Powercor and Vemco contract, Supply of Vegetation Management Services dated 12 December 2008
3	16/12/2009	2009 Deed of Variation Supply of Vegetation Management Services, Powercor and Vemco dated 16 December 2009
4	23/12/2009	Supply of Vegetation Management Services Modification No. 1
5	27/09/2010	Supply of Vegetation Management Services Modification No. 2
6	10/01/2011	Supply of Vegetation Management Services Modification No. 3
7	03/2011	2011 Deed of Variation, Supply of Vegetation Management Services, Powercor and Vemco
8	24/11/2011	Supply of Vegetation Management Services Modification No. 4
9	01/2012	2012 Deed of Variation, Supply of Vegetation Management Services, Powercor and Vemco
10	14/03/2012	Supply of Vegetation Management Services Modification No. 5
11	25/01/2013	2013, 2014, 2015 Deed of Variation - Supply of Vegetation Management Services, Powercor and Vemco dated 25 January 2013
12	05/09/2014	2014 and 2015 Deed of Variation - Supply of Vegetation Management Services, Powercor and Vemco dated 5 September 2014
13	10/2014	Note from T Christoffersen on data files described in two tabs below
14	2009-2013	TAC 2009-2013 'combined data final for submission' (vegetation management volume data)
15	02/09/14	Vemco monthly volume data for 02/09/14
16	09/14	Vemco CitiPower Powercor Vegetation Data Accuracy audit for September 2014
17	11/2013	AER, Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution
18	11/2013	AER, Better Regulation, Explanatory Statement - Expenditure Forecast Assessment Guideline

19	21/07/10	CitiPower's Revised Regulatory Proposal 2011-15 (extracts concerning vegetation management expenditure)
20	21/07/10	Powercor's Revised Regulatory Proposal 2011-15 (extracts concerning vegetation management expenditure)
21	26/10/10	Nuttall Consulting Report - Capital Expenditure Victorian Electricity Distribution Revenue Review Revised Proposals (Report to the AER), Appendix G
22	29/10/10	AER's Victorian Distribution Determination Final Decision 2011-15 (extracts concerning vegetation management expenditure)
23	29/10/10	AER's Distribution Determination for CitiPower 2011-15
24	29/10/10	AER's Distribution Determination for Powercor 2011-15
25	28/09/12	AER's Distribution Determination for CitiPower 2011-15 (amended pursuant to orders of the Tribunal in Application by United Energy Distribution Pty Ltd [2012] ACompT 1)
26	04/10/12	AER's Distribution Determination for Powercor 2011-15 (amended pursuant to orders of the Tribunal in Application by United Energy Distribution Pty Ltd [2012] ACompT 1)
27	13/05/11	CitiPower's/Powercor's Outline of Joint Submissions on Vegetation Management Step Change Grounds for Review (non confidential version)
28	06/06/11	AER's Outline of Submissions Concerning Vegetation Management Step Change (non confidential version)
29	25/06/2012	CitPower/Powercor - Vegetation Management Submission re Tribunal Order (Confidential Version), attaching: • Application by United Energy Distribution Pty Ltd [2012] ACompT 1 (extract only produced here) • Letter from AER to CitiPower/Powercor dated 25 May 2012 re: Timetable for implementing the Tribunal's Orders of 5 April 2012 • Letter from DLA Phillips Fox to CitiPower/Powercor dated 21 June 2010 • Letter from Vemco to CitiPower/Powercor dated 13 July 2010 • Energy Safe Victoria, Exemption from the Requirement to Maintain a Clearance Space in Accordance with Tables 1, 2 and 3 of the Regulations of Practice for Electric Line Clearance in the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to Powercor Australia in respect to certain requirements for the maintenance of a clearance space for certain electric lines - January 2011, 18 February 2011

		• Energy Safe Victoria, Exemption from the Requirement to Maintain a Clearance Space in Accordance with Tables 1, 2 and 3 of the Regulations of Practice for Electric Line Clearance in the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to CitiPower in respect to certain requirements for the maintenance of a clearance space for certain electric lines - January 2011, 18 February 2011 • CitiPower/Powercor, Board of Directors, Provision of Vegetation Management Services for CitiPower and Powercor -'Full Compliance Services for 2013' dated 17 April 2012 • Matthew Joyce, Witness Statement dated 30 August 2010
30	Undated	Excel spreadsheet showing vegetation management allowance in AER's final decision for 2010-15
31	Undated	Excel spreadsheets regarding revised vegetation management costs submitted to AER in remittal
32	05/07/2012	Letter from CitiPower/Powercor to AER re AER's ability to consider new information on remittal
33	16/07/2012	Letter from CitiPower/Powercor to AER re Vegetation Management remittal (redacted in part), enclosing: • CitiPower, 2012 to 2013 Electric Line Clearance [Vegetation] Management Plan, Version 1, dated 2 March 2012 • Powercor, 2012 to 2013 Electric Line Clearance [Vegetation] Management Plan, Version 1, dated 2 March 2012 • Excel spreadsheet containing comparison with SP AusNet's vegetation management costs • Energy Safe Victoria, 'Assessment by Energy Safe Victoria of EDPR Safety-Related Programs' dated 14 September 2010 • Matthew Joyce, Witness Statement dated 30 August 2010
34	20/07/2012	Letter from CitiPower/Powercor to AER dated 20 July 2012 re Vegetation Management Opex Step Change
35	08/2012	AER, CitiPower and Powercor - Vegetation Management Forecast Operating Expenditure Step Change 2011-15 - Draft Decision (pursuant to Orders of the Australian Competition tribunal in Application by United Energy Distribution Pty Ltd (No 2) [2012] ACompT 8)
36	08/2012	AER, CitiPower/Powercor - Vegetation Management Forecast

		Operating Expenditure Step Change 2011-15 - Final Decision (pursuant to Orders of the Australian Competition tribunal in Application by United Energy Distribution Pty Ltd (No 2) [2012] ACompT 8)
37	03/2014	AER, Better Regulation - Explanatory Statement - Final regulatory information notices to collect information for category analysis
38	25/03/2014	AER, Regulatory Information Notice under Division 4 of Part 3 of the National Electricity Law relating to category analysis
39	11/2013	AER, Better Regulation - Explanatory Statement - Regulatory information notices to collect information for economic benchmarking
40	28/11/2013	AER, Regulatory Information Notice under Division 4 of Part 3 of the National Electricity Law relating to economic benchmarking
41	07/03/2014	AER, Regulatory Information Notice issued under Division 4 of Part 3 of the National Electricity (Victoria) Law - CitiPower
42	07/03/2014	AER, Regulatory Information Notice issued under Division 4 of Part 3 of the National Electricity (Victoria) Law - Powercor
43	02/06/2014	Letter from CitiPower/Powercor to AER regarding category analysis regulatory information notice
44	02/06/2014	CitiPower, AER Category Analysis RIN - Basis of Preparation Documents (Part A)
45	02/06/2014	CitiPower, Category Analysis Vegetation Management Template - consolidated information
46	02/06/2014	CitiPower, Category Analysis Vegetation Management Template - actual information
47	02/06/2014	CitiPower, Category Analysis Vegetation Management Template - estimated information
48	02/06/2014	CitiPower, Category Analysis Input Tables Template 2.12 - consolidated information
49	02/06/2014	Powercor, AER Category Analysis RIN - Basis of Preparation Documents (Part A)
50	02/06/2014	Powercor, Category Analysis Vegetation Management Template - consolidated information
51	02/06/2014	Powercor, Category Analysis Vegetation Management Template - actual information
52	02/06/2014	Powercor, Category Analysis Vegetation Management Template - estimated information
53	02/06/2014	Powercor, Category Analysis Input Tables Template 2.12 - consolidated information

54	Undated	All DNSPs' vegetation management category analysis RIN responses (spreadsheets)
55	15/08/2014	AER, Draft category analysis benchmarking metrics (word document)
56	15/08/2014	AER, Draft category analysis benchmarking metrics (spreadsheets)
57	25/08/2014	Parsons Brinckerhoff, Energy Networks Association - Review of Category Analysis RIN basis of preparation
58	08/2014	Energy Networks Association RIN Review - Category Analysis RIN Spreadsheets
59	Undated	Confidentiality deed polls of CitiPower and Powercor
60	1998	Excerpt from the Electricity Safety Act 1998 (Vic)
61	2010	Electricity Safety (Electric Line Clearance) Regulations 2010 (Vic)
62	10/14	Energy Safe Victoria's Key Changes Proposed for the Electricity Safety (Electric Line Clearance) Regulations 2015 and its Code of Practice
63	13/10/14	Letter from Energy Safe Victoria enclosing Regulatory Impact Statement for the Electricity Safety (Electric Line Clearance) Regulations 2015
64	2007	Standards Australia - Australian Standard AS 4373-2007 - Pruning of amenity trees
65	31/07/2014	Powercor, 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan
66	27/03/2014	CitiPower, 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan
67	January 2014	Vemco Inspection Reference Manual 2014 V4 23.10.2014
68	October 2014	CitiPower October Monthly Report
69	October 2014	Powercor October Monthly Report
70	Undated	Victorian distribution Reset RIN – notice – draft
71	October 2014	Victorian DNSP 2016-20 – Reset RIN templates
72	02/2/2015	Victorian distribution Reset RIN – notice
73	02/2/2015	Victorian DNSP 2016-20 – Reset RIN templates
74	2014	2014 – Herbicide – Corridor maintenance list

75	21/11/2014	2014 PAL Easement Cutting list update 21.11.2014
76	5/11/2014	2014 Plantations Database 05.11.2014
77	10/11/2014	Comms inspection update 10.11.2014
78	28/7/2014	Customer Installation Defect Reports - 28.07.2014
79	Undated	Data base definitions
80	10/11/2014	FFU Tracking Sheet 10.11.2014
81	Undated	Lidar Summary 2013-2014
82	November 2014	Nov 14 data extract for GHD
83	10/10/2014	ORP Database Sept 2014 10.10.2014
84	3/7/2014	Service Cable insulated conductor transition status at 03.07.2014
85	6/11/2014	Trees of Interest Database - Oct 2014 at 06.11.2014
86	25/11/2014	VDB Report 25.11.2014
87	Undated	Attachment MJ7 to the witness statement of Matthew Joyce dated 30 August 2010 - HBRA cost calculations spreadsheets
88	27/10/2014	ActewAGL 2015-19 - RIN response - Regulatory proposal - templates consolidated – CONFIDENTIAL 27 October 2014
89	27/10/2014	Aurora 2008-13 - RIN response - Category Analysis - templates consolidated - PUBLIC27 Oct 2014
90	27/10/2014	Ausgrid 2015-19 - RIN response - Regulatory proposal - templates consolidated – CONFIDENTIAL 27 october 2014
91	27/10/2014	Citipower 2008-13 - RIN response - Category Analysis - templates CONSOLIDATED – CONFIDENTIAL 27 Oct 2014
92	27/10/2014	Endeavour Energy 2015-19 - RIN response - Regulatory proposal - templates consolidated – CONFIDENTIAL 27 Oct 2014
93	27/10/2014	Energex 2008-13 - RIN response - Category Analysis - templates consolidated - CONFIDENTIAL27 October 2014
94	27/10/2014	Ergon 2008-13 - RIN response - Category Analysis - templates consolidated - PUBLIC27 Oct 2014
95	27/10/2014	Essential 2015-19 - RIN response - Regulatory proposal - responses - consolidated – CONFIDENTIAL 27 Oct 2014
96	27/10/2014	Jemena 2008-13 - RIN response - Category Analysis - templates consolidated - CONFIDENTIAL 27 oct 2014
97	27/10/2014	Powercor 2008-13 - RIN response - Category Analysis - templates CONSOLIDATED – CONFIDENTIAL 27 Oct 2014

98	27/10/2014	SA Power Networks 2008-13 - RIN response - Category Analysis - templates consolidated – CONFIDENTIAL 27 Oct 2014
99	27/10/2014	SP Ausnet 2008-13 - RIN response - Category Analysis - templates consolidated - CONFIDENTIAL 27 Oct 2014
100	27/10/2014	United Energy 2008-13 - RIN response - Category Analysis - templates consolidated – CONFIDENTIAL 27 Oct 2014
101	Undated	ActewAGL 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
102	Undated	Aurora 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
103	Undated	Ausgrid 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
104	Undated	Citipower 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
105	16/09/14	Endeavour Energy 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
106	30/4/2014	Energex 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
107	Undated	Ergon 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
108	29/04/2014	Essential 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
109	30/04/2014	Jemena 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
110	Undated	Powercor 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
111	Undated	SA Power Networks 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
112	Undated	SP Ausnet (Dist) 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
113	Undated	United Energy 2006-13 – Economic Benchmarking RIN response - templates consolidated – PUBLIC
114	Undated	Book1 (spreadsheet which outlines number of data audits, number of sites checked, number of variances etc)
115	Undated	EnergySafe Victoria 2015 Electric Line Clearance Regulations Fact Sheet
116	9/09/13	Letter from ESV to Powercor enclosing updated exemption from the

		Electricity Safety (Electric Line Clearance) Regulations 2010 granted to CitiPower
117	9/09/13	Letter from ESV to Powercor enclosing updated exemption from the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to Powercor
118	19/12/13	Letter from ESV to Powercor enclosing exemption from the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to Powercor for the town of Ballan
119	15/10/14	Letter from ESV to CitiPower approving 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan
120	15/10/14	Letter from ESV to Powercor approving 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan
121	31/12/14	VDB Report 31.12.2014
122	31/12/14	TC volume version of Vegetation Database 31-12-14 v3 (predictive model)
123	11/02/15	Service Line Count

Appendix B – Curriculum Vitae of Report Author and Assistants

Curriculum Vitae

Peter Keys
Principal Consultant - Asset Management

Qualified. Associate Diploma in Accounting; PAS 55 Endorsed Assessor - Institute of Asset Management

Connected. Member, Institute of Asset Management
Attendance to the annual Arborists Conference (Utilities) since 2009.

Relevance to project.
Peter is the Team Leader of GHD's South Australian Asset and Facilities Management group and has over 20 years' experience in asset and facilities management in government and private industry sectors including telecommunications, water & power infrastructure, transport, crime prevention and aviation.

Vegetation Program Cost Justification | SA Power Networks
Detailed review and assessment of SA Power Networks' vegetation management strategy to justify funding requirements for the next regulatory period. This work included liaising with other DNSPs and vegetation management contractors to build knowledge base.

Vegetation Management – Program Manager | SA Power Networks
Reporting directly to the General Manager Field Services for the 2011 Pre Fire Danger Season Vegetation Clearance Program.

Asset Management Strategy | SA Power Networks
Prepared an asset management road map for SAPN against ISO55001 to plan for alignment by 2020.

Review of Quality of Supply Customer Response | ESCOSA
Review of SA Power Networks' response to Quality of Supply complaints by customers.

Auditor | SA Power Networks
External Clearance Auditor since 2009 determining compliance with powerline clearance legislation pursuant to the Electricity Act.

City of Melbourne
Reviewed and provided advice for Maintenance, Cleaning and Property Management Specifications. A member of the tender evaluation panel.

Country Health Facilities Management Audit | Dept. Planning Transport & Infrastructure
Engaged to undertake a compliance audit of 7 Country Health Facilities for the SA government.

Asset Management Policies & Guidelines | QLD Government Department of Public Works & Housing
Undertook an assessment of the Queensland Government building asset management framework against needs and alignment to ISO55001. Included the development of an improvement strategy based on the needs of each Agency.

Asset Management Planning | Flinders Ports Peter has overseen the engagement by Flinders Port
Provided a range of asset management planning services including project and risk management frameworks.

Southeast Queensland State's Water Reform Project
An assessor for a Water Infrastructure Capital Works assessment for 3 local government authorities as part of a physical due diligence reviewing 10 Council's.

Curriculum Vitae

Jennie Gater
Electrical Regulatory Consultant

Qualified. B. Eng (Electrical & Electronic) (Hons), Adelaide University 2002
Connected. Member, Institute of Engineers Australia
Relevance to project. Jennie has 10 years' experience in the Mining, Power Generation and Power Distribution industries, and safety and regulatory aspects of the electrical supply industry in South Australia and in the industrial sector. Starting her career with the Office of the Technical Regulator, she has a good knowledge of South Australian legislation.
Jennie has a client-focused approach to job management and design development. She also has proven ability to lead and manage an engineering team, imparting technical and safety related information.

Economic Benchmarking RIN Review | Transend
Undertook a review of the data presented in the AER templates for Economic Benchmarking for consistency and compliance with the requirements of the RIN.

RIN Reviews | SA Power Networks
Undertook a review of the data presented in the AER templates for Economic Benchmarking, Category Analysis and Reset RINs for consistency and compliance with the requirements of the RIN.

Vegetation Program Cost Justification | SA Power Networks
Detailed review and assessment of SA Power Networks' vegetation management strategy to justify funding requirements for the next regulatory period. This work included liaising with other DNSPs and vegetation management contractors to build knowledge base.

SRMTMP Audit | SA Power Networks
With a background working for the Office of the Technical Regulator, Jennie has undertaken annual audits of ETSA Utilities' Safety Reliability Maintenance Technical Management Plan (SRMTMP).

Generator Compliance Review | Multiple Generators
Jennie undertook an audit of compliance against the requirements of the Generator licence for multiple generators across South Australia.

Review of Bushfire Disconnection Procedures | SA Power Networks
Conducted reviews of standard operating procedures and bushfire disconnection/ reconnection procedures for SA Power Networks recommending changes as appropriate.

Review of Substation Design Manual | SA Power Networks
Conducted review of documentation for an electrical utility, making recommendations for development of a new Substation Design Manual.

Review of SA Power Networks' five year Demand Management Program | ESCOSA
Jennie conducted a review of SA Power Networks' demand management program against the requirements of the 2005-2010 Electricity Distribution Price Determination.

Review of Quality of Supply Customer Response | ESCOSA
Review of SA Power Networks' response to Quality of Supply complaints by customers.

Previous Experience
Office of the Technical Regulator
Legislation reviews, including the remaking of the Electricity (Principles of Vegetation Clearance) Regulations. Involvement included stakeholder consultation (including ETSA Utilities, local Councils and general public) and preparation of impact statements.

Curriculum Vitae

Paul de Mar
Principal Natural Resources

Qualified. B. Arts, M Environmental Planning

Connected. Member, Institute of Foresters Australia, and International Association of Wildland Fire. Active professional networks with forestry, fire/emergency service and utility arborist national peak bodies.

Relevance to project. Paul has extensive operational, management and policy experience in forestry, fire and risk management. His management and operations experience includes senior roles with Forests NSW, including leadership and management of fire management, and engineering functional areas (forest engineering, fleet and workshops management, and asset management). Paul has undertaken a number of projects for clients in the electricity supply sector including review of bushfire risk mitigation planning systems, preparation and review of bushfire management plans, and a review of network service provider vegetation management practices.

Review of Vegetation Management Business Model | Aurora Energy
Paul conducted a review of the Vegetation Management Business Model for Aurora Energy. This included a comprehensive efficiency review of their vegetation management programs, contracting models and contract management arrangements, with recommendations for improvement of cost efficiency and risk management.

Cost Pass Through Application | SA Power Networks
Provided a comparative analysis of rainfall and temperature in SA in the period leading up to and including 2005, and the 2010-2012 period. Analysis of how vegetation responds to seasonal climate variability including the use of the Normalised Difference Vegetation Index for the different periods to was used to characterise the differences in growth rates between well below average growth seasons, average growth seasons and well-above average growth seasons.
The application to the AER for a pass through event was successful, on the basis of a material increase in costs to clear vegetation following changed and unforeseen climatic conditions.

Expert Witness | Confidential clients
Paul has also been engaged as an expert witness in relation to litigation arising from bushfire events, including the provision of fire ignition and behaviour technical advice involving fires found or alleged to be caused by power lines (including three of the Black Saturday fire class actions).

Vegetation Program Cost Justification | SA Power Networks
Paul prepared a detailed climate and vegetation dynamics analysis to inform forecast costs for 2015-2020 Vegetation Management Program.

Bushfire Risk Assessment | Forestry Corporation of NSW
Paul conducted a State-wide assessment of bushfire risk for Forestry Corporation of NSW, reviewed FC's current and proposed bushfire risk management capacity/organisation changes, with recommendations for minimum bushfire risk management capacity standards.

Review of Bushfire Risk Assessment | Elementus Energy
Paul conducted a peer review of bushfire risk assessment for a 118 MW Solar Farm and the associated 22 kV powerline connection to the substation.

Development of Fire Management Plans | Department of Defence
Paul managed development of fire management plans for 40+ Defence properties covering more than 2 million ha in WA, NT, NSW and Tasmania (2007-09).

Bushfire Risk Mitigation Plan | Transend
Developed a bushfire risk management plan covering all Transend asset classes, including risks to and from network assets.

Appendix C – Instructions from DLA Piper

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Your reference

Our reference
SLG/SLG/346715/34
AUM/1207795323.2

3 March 2015

By Email Only : Peter.Keys@ghd.com.au

Dear Peter

VEGETATION MANAGEMENT CONSULTANCY

We act for Victorian Power Networks Pty Ltd (**VPN**).

VPN would like to engage GHD to provide an independent forecast of CitiPower Pty's (**CitiPower's**) and Powercor Australia Ltd's (**Powercor's**) prudent and efficient vegetation management expenditure for the 2016-20 regulatory control period.

A. PURPOSE

1. The purpose of this letter is to set out the nature, scope and purpose of the work that VPN is seeking GHD to undertake. This is described in section D below.

B. BACKGROUND ON THE VPN BUSINESSES AND THEIR PREVIOUS REGULATORY PROPOSALS

CitiPower and Powercor

2. Both CitiPower and Powercor operate electricity distribution networks in Victoria. CitiPower's and Powercor's corporate structure is shown in the diagram in Attachment A to this letter.

3. CitiPower's network services central Melbourne. Powercor's network services Western Victoria (to the South Australian border in the west and the New South Wales border in the north), in addition to western and southern suburbs of Melbourne.

4. The location of CitiPower's and Powercor's networks, together with vital statistics in respect of those networks, is shown in Attachment A to this letter.

DLA Piper Australia is part of DLA Piper, a global law firm, operating through various separate and distinct legal entities.

A list of offices and regulatory information can be found at www.dlapiper.com

Vegetation Management Contractual Arrangements

5. CitiPower's and Powercor's vegetation management clearance work is currently undertaken by an independent third party contractor, Vemco Pty Ltd (**Vemco**).

6. The current Vemco contract between Vemco and Powercor provides for lump sum payments in respect of each of the CitiPower distribution area and the Powercor distribution area for the vegetation management services specified in Schedule 1 to the contract that are required for satisfaction of relevant regulatory requirements including in particular those of the *Electricity Safety (Electric Line Clearance) Regulations 2005* (as amended from time to time). In addition, the contract provides for additional vegetation management services to be provided on an hourly or fixed charge basis upon request by Powercor. A non-exhaustive list of examples of these additional services is set out in section 6 of Schedule 1 to the contract.

7. The current Vemco contract commenced on 1 January 2009 and had an initial term of 3 years ending 31 December 2011, with Powercor having the option to extend the term by a period of 12 months on up to three occasions. Powercor has exercised each of these options and, on the last occasion, negotiated the extension of the contract for an additional 12 month period to 31 December 2015. In addition, the contract (including the services to be provided and the quantum of lump sum payments) has been varied on a number of occasions.

8. The current Vemco contract and its variations are included in the material provided to you with this letter.

Vegetation management compliance requirements

9. The principal sources of compliance requirements for vegetation management for Victorian distribution network service providers (**DNSPs**) are contained in the following legislative instruments:

   9.1 *Electricity Safety Act 1998*; and

   9.2 *Electricity Safety (Electric Line Clearance) Regulations 2010* which prescribe the current Code of Practice for Electric Line Clearance.[1]

10. The *Electricity Safety (Electric Line Clearance) Regulations 2010* will expire on 29 June 2015 and will be replaced by new Regulations containing a new Code of Practice. Energy Safe Victoria has published a document setting out key changes proposed for the *Electricity Safety (Electric Line Clearance) Regulations 2015* and its Code of Practice. On 13 October 2014 Energy Safe Victoria published the Regulatory Impact Statement for the *Electricity Safety*

[1] Regulation 7 and the Schedule to the *Electricity Safety (Electric Line Clearance) Regulations 2010*.

(Electric Line Clearance) Regulations 2015. These documents are included in the material we are providing to you.

The AER and the economic regulatory regime

11. The AER is responsible for the economic regulation of electricity distribution services in Victoria under the National Electricity Law (**NEL**). The AER is required to make distribution determinations for DNSPs, including CitiPower and Powercor, under the National Electricity Rules (**NER**).[2] The constituent decisions on which such a distribution determination is predicated relevantly include:

    11.1 a decision on the annual revenue allowance for the DNSP for each regulatory year of the regulatory control period to which the determination relates; and

    11.2 a decision in which the AER either accepts the DNSP's total opex forecast for that regulatory control period or does not accept that forecast, in which case the AER must determine an estimate of the DNSP's required opex for that period.[3]

12. The annual revenue allowance for the DNSP for each regulatory year of the regulatory control period must be determined using a building block approach, under which the building blocks include the forecast opex for that year as accepted or substituted by the AER in making the distribution determination.[4]

13. Vegetation management expenditure is a component of forecast opex for both CitiPower and Powercor.

CitiPower's and Powercor's 2011-15 regulatory proposals

14. In their Revised Regulatory Proposals for the 2011-15 regulatory control period Powercor forecast $91.1 million and CitiPower forecast $19.2 million of incremental opex for vegetation management relative to the expenditure incurred in the 2009 "base year", referred to as "step changes". The proposed step change or incremental expenditure related to the changed regulatory obligations associated with the termination of *the Electricity Safety (Electric*

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[2] Where we refer in these instructions to provisions in Chapter 6 of the NER we are referring to the provisions in Chapter 6 contained in version 58 of the NER. Clause 11.60.3 of the Savings and Transitional Rules in Chapter 11 of the NER provides that subject to the matters specified in paragraphs (b), (c) and (d) of that clause, the provisions of 'current Chapter 6' apply in respect of the making of distribution determinations for Victorian DNSPs for the next regulatory control period. Clause 11.65.2(a) of the NER provides that references to 'current Chapter 6' are to be read as Chapter 6 of the NER as in force immediately after the *National Electricity Amendment (Network Service Provider Expenditure Objectives) Rule 2013* came into force. That Rule came into force on 26 September 2013 and version 58 of the NER was the version of the NER in force from 26 September 2013. Accordingly, the NER currently provides that Chapter 6 in version 58 of the NER applies to the making of distribution determinations for Victorian DNSPs for the next regulatory control period.

[3] Clause 6.12.1(2) and (4) of the NER.

[4] Clause 6.4.3(a)(7) and (b)(7).

Line Clearance) Regulations 2005 and the commencement of the *Electricity Safety (Electric Line Clearance) Regulations 2010*.

15. On 29 October 2010, the AER issued its *Victorian electricity distribution network service providers: Distribution determination 2011 to 2015 Final Decision* (**Final Decision**). In its Final Decision, the AER did not include, in its estimate of CitiPower's and Powercor's required opex for the 2011-15 regulatory control period, the total amount of their proposed step changes to account for the incremental expenditure on vegetation management relative to the expenditure incurred in the 2009 base year. The AER forecast opex of $56.4 million for Powercor and $9.2 million for CitiPower for their vegetation management step changes. Those allowances were determined by benchmarking the relevant unit costs of other Victorian DNSPs.

Vegetation management appeal to Tribunal

16. On 19 November 2010, CitiPower and Powercor applied to the Australian Competition Tribunal (**Tribunal**) for leave to apply for review of the AER's Final Determination under s71B(1) of the NEL.

17. On 6 January 2012, the Tribunal found that the AER's assessment of the costs of CitiPower's and Powercor's work programs was unreasonable because the AER's consultant, Nuttall Consulting, failed to pay proper regard to the differences between CitiPower's and Powercor's networks and those of other DNSPs and failed to take proper account of the differences between the work programs put in place by CitiPower and Powercor and those of other DNSPs.[5] The Tribunal remitted the Final Determination to the AER to be remade in light of a reconsideration by the AER of CitiPower's and Powercor's claims in accordance with the NER in respect of the vegetation management opex step change claimed by CitiPower and Powercor.[6]

18. Even though the Tribunal found in favour of CitiPower and Powercor, it considered that the AER was justified in not being satisfied with the information which had been provided to it by CitiPower and Powercor.[7] In particular in making its decision, the Tribunal concluded that Mr Joyce (Managing Director of Vemco at that time) had not explained in his statement dated 30 August 2010 how he had derived the unit costs which he used in formulating his cost estimate for vegetation management work.[8]

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[5] *Application by United Energy Distribution Pty Ltd* [2012] ACompT 1 at [666].

[6] *Application by United Energy Distribution Pty Ltd* [2012] ACompT 1 at [668] and Tribunal's order.

[7] *Application by United Energy Distribution Pty Ltd* [2012] ACompT 1 at [643]-[665].

[8] *Application by United Energy Distribution Pty Ltd* [2012] ACompT 1 at [643].

Vegetation management remittal to AER

19. In the remittal process, CitiPower and Powercor submitted revised forecast opex vegetation management step changes of $72.8 million and $16.5 million respectively.[9]

20. Since their Revised Regulatory Proposals, CitiPower and Powercor had re-negotiated their vegetation management contract with Vemco. The re-negotiation of the contract was triggered by several events including an exemption provided by Energy Safe Victoria requiring CitiPower and Powercor to achieve full compliance with the *Electricity Safety (Electric Line Clearance) Regulations 2010* by 31 December 2013.

21. At the time of the remittal, CitiPower and Powercor had exercised options to extend the Vemco contract for an additional two years to 31 December 2013 and there was a further option to extend the contract for a third year (to 31 December 2014) which CitiPower and Powercor told the AER it was their intention to exercise.[10] However, the 2013 Deed of Variation had not been finalised.[11]

22. As a result, the expenditure CitiPower and Powercor sought on remittal reflected the revised contract values with Vemco for 2011 and 2012, the forecast Board approved contract value for 2013 and estimated vegetation management expenditure for 2014 and 2015.[12]

23. The AER concluded on remittal that CitiPower's and Powercor's revised forecast opex vegetation management step changes reasonably reflected the opex criteria having regard to the opex factors (clause 6.5.6(c) of the NER).[13]

24. In its Remittal Decision, the AER used a modified benchmarking approach to assess CitiPower's and Powercor's vegetation management step changes. Using that approach the AER determined that CitiPower's and Powercor's Remitter Proposals compared well to the forecast opex allowances the AER determined in the Final Decision for Jemena Electricity Networks (Vic) Ltd (**JEN**), SPI Electricity Pty Ltd (now AusNet Service Group, (**AusNet)**) and United Energy Distribution Ltd (**UED**).[14] The AER noted that, unlike the benchmarking analysis undertaken in its earlier determination process, its analysis on remittal factored in network scale effects and was a superior assessment approach.

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[9] CitiPower and Powercor Vegetation Management: Tribunal Order submission to the AER dated 25 June 2012 (**CitiPower/Powercor's Remitter Proposal**), pp16-17.

[10] CitiPower/Powercor's' Remitter Proposal, pp2-3 & pp7-9.

[11] CitiPower/Powercor's Remitter Proposal, p9.

[12] CitiPower/Powercor's Remitter Proposal, pp1, 5 & 13-15.

[13] AER *Final Decision, CitiPower Pty Powercor Australia Ltd Vegetation Management Forecast Operating Expenditure Step Change 2011-2015*, August 2012, p2 (**Remittal Decision**).

[14] Remittal Decision, p9.

25. In regard to its modified benchmarking approach, the AER said:[15]

> *… there are some common characteristics across the Victorian DNSPs that can usefully form the basis of a benchmarking analysis in these circumstances and which are not undermined by the differences between the Victorian DNSPs. The AER's benchmarking analysis as part of this Remittal has further considered the possible factors which can be used to better compare the Victorian DNSPs in relation to their vegetation management practices.*
>
> *For example, SP AusNet's distribution network is comparable in size and scope of service to rural customers with Powercor. Similarly, JEN and CitiPower are to some extent comparable given they both operate distribution networks in urban areas, as does UED. Further, SP AusNet services the eastern half of Victoria where the terrain is more generally mountainous than in the western half of Victoria which Powercor services. This would suggest that the vegetation management costs SP AusNet incurs should be greater than that of Powercor. However, this may be to some extent offset by the greater distances that need to be travelled in the western half of Victoria.*
>
> *In the AER's opinion, a cost ratio on the basis of a proportion of line length may be an appropriate indicator for the comparison of costs. This cost ratio reflects the physical size of the network under consideration and thus factors the scale of the network into the calculation and provides a useful indication of relative efficiency. In calculating these cost ratios, comparability with the Remitter Proposal was maintained by aggregating the capital expenditure and operating expenditure for both insulated cable lengths and exemptions for each of JEN, UED and SP AusNet. The AER notes that this ratio does not account for differences in species type, rainfall, terrain and vegetation regrowth rates.*
>
> *The AER considered but rejected customer numbers, energy delivered and maximum demand as potential benchmark ratios because, for vegetation management activity, each of these ratios gives limited direct information on the relative efficiency of each business or does not adequately account for the different operating environment of each business.*

26. A table showing CitiPower's and Powercor's vegetation management allowances for 2011-15 and their actual expenditure is provided in volume 1 of the documents provided to you together with this letter.

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[15] Remittal Decision, pp8-9.

C. BACKGROUND ON THE AER'S ASSESSMENT OF VEGETATION MANAGEMENT OPERATING EXPENDITURE FOR 2016-20

27. Due to significant changes to the NER in 2012, the regulatory determination process for Victorian DNSPs for the 2016-20 regulatory control years is provided for in transitional provisions in Chapter 11 of the NER, which provide for the reopening of the distribution determinations. The Australian Energy Market Commission's (**AEMC's**) Rule Determination in respect of the 2012 changes to the NER states the following in respect of the distribution determination process for Victorian DNSPs:[16]

> *Energex, Ergon, SA Power Networks are due to commence their next regulatory period on 1 July 2015 while CitiPower, Jemena, Powercor, SP AusNet and United Energy are due to commence theirs on 1 January 2016. This group of DNSPs will have their determination processes delayed by five months and will be subject to the preliminary determination with mandatory re-opener model. At its most elementary, this model involves:*
>
> - *using the AER's draft determination as a placeholder for a NSP's revenue requirement and prices until the final determination is made; and*
>
> - *using an adjustment mechanism to account for any difference between the draft and final determinations in NPV neutral terms.*
>
> *From a legal perspective, a binding determination must be in place before the regulatory period commences. The draft determination is therefore referred to as a preliminary determination while the final determination which revokes and replaces the preliminary determination, is referred to as a substitute determination. Although the terminology differs, the decision making and consultation process that occurs between the preliminary and substitute determinations are intended to be the same as that would occur between a draft and final determination.*

28. Under the current proposed timetable for the AER's determination process for Victorian DNSPs for the 2016-20 regulatory control period:[17]

    28.1 Victorian DNSP's (including CitiPower's and Powercor's) regulatory proposals are due on 30 April 2015.

    28.2 The AER expects to make its distribution determinations for Victorian DNSPs by 31 October 2015.

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[16] AEMC's Rule Determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, p214.

[17] Clause 11.40.4 of the NER.

28.3 There is then an ability for Victorian DNSPs to make submissions on the revocation and substitution of the distribution determinations by January 2016.

28.4 By 30 April 2016, the AER will revoke its distribution determinations and make new distribution determinations for Victorian DNSPs in substitution for the revoked determinations which will take effect as at the date they are made and apply for the 2016-20 regulatory control period.

NER requirements regarding opex

29. The AER is required to accept a DNSP's forecast opex where it is satisfied that the forecast opex for the regulatory control period reasonably reflects the following criteria (**opex criteria**) in clause 6.5.6(c) of the NER being:

29.1 the efficient costs of achieving the opex objectives in clause 6.5.6(a) of the NER (**opex objectives**);

29.2 the costs that a prudent operator would require to achieve the opex objectives; and

29.3 a realistic expectation of the demand forecast and cost inputs required to achieve the opex objectives.

30. Similarly if the AER is not so satisfied and, accordingly, does not accept the DNSP's forecast of the required opex, the AER must estimate the DNSP's required opex that it is satisfied reasonably reflects the opex criteria taking into account the opex factors (clauses 6.5.6(d) and 6.12.1(4)(ii)).

31. The opex objectives in clause 6.5.6(a) of the NER are to:

31.1 meet or manage the expected demand for standard control services over the regulatory control period;

31.2 comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;

31.3 to the extent that there is no applicable regulatory obligation or requirement in relation to:

31.3.1 the quality, reliability or security of supply of standard control services; or

31.3.2 the reliability or security of the distribution system through the supply of standard control services,

to the relevant extent:

31.3.3 maintain the quality, reliability and security of supply of standard control services; and

31.3.4 maintain the reliability and security of the distribution system through the supply of standard control services; and

31.4 maintain the safety of the distribution system through the supply of standard control services.

AER's Expenditure Forecast Assessment Guidelines

32. In 2013, following the amendments made to the NER in 2012 governing the economic regulation of DNSPs, the AER undertook a Better Regulation program. As part of that program in November and December 2013 the AER published a number of Guidelines, together with Explanatory Statements, relevant to its assessment of DNSP's expenditure proposals. Relevantly, in November 2013, as required by clause 6.2.8(a) of the NER, the AER published the following:

32.1 the AER's *Better Regulation Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013 (**Expenditure Forecast Assessment Guideline**); and

32.2 the AER's *Explanatory Statement, Expenditure Forecast Assessment Guideline*, November 2013 (**Expenditure Forecast Assessment Explanatory Statement**).

33. CitiPower's and Powercor's opex forecasts for the 2016-20 regulatory control period will be assessed by the AER in accordance with its Expenditure Forecast Assessment Guideline.

34. In the AER's Expenditure Forecast Assessment Guideline, the AER states that for assessing opex it will require expenditure split by each opex and maintenance activity, namely:[18]

34.1 routine and non-routine maintenance;

34.2 emergency response;

34.3 vegetation management;

34.4 network overheads; and

34.5 corporate overheads.

35. Further, the AER states that for assessing vegetation management expenditure, it will require information on:[19]

[18] AER's Expenditure Forecast Assessment Guideline, p28.

[19] AER's Expenditure Forecast Assessment Guideline, pp29-30.

35.1 expenditure separated into tree trimming, inspection and audit activities; and

35.2 supporting data explaining the volume of activities undertaken in the current regulatory control period, including:

35.2.1 for each defined 'vegetation management area' of the network;

(a) annual expenditure on major vegetation management activities;

(b) length (in kilometres) of overhead conductor;

(c) number of maintenance spans;

(d) proportion of that area in urban and rural regions;

(e) data on fire starts and outages due to vegetation contact;

(f) impact of new or changing legal and regulatory obligations; and

(g) information on audit outcomes (for example, compliance and non-compliance with standards).

36. In Attachment B to the AER's Expenditure Forecast Assessment Explanatory Statement which is entitled 'Economic benchmarking data requirements', the AER describes the data it will collect from DNSPs for economic benchmarking purposes. That data includes data on particular operating environment factors of DNSPs which the AER has identified as having a material effect on DNSPs' efficiency.[20] Included in the operating environment factors are 'terrain factors' relevant to the economic benchmarking of vegetation management expenditure. Those factors are:[21]

36.1 bushfire risk;

36.2 rural proportion;

36.3 vegetation encroachment: growth;

36.4 vegetation encroachment: topography;

[20] Section B.4 of the Expenditure Forecast Assessment Explanatory Statement.

[21] AER's Expenditure Forecast Assessment Explanatory Statement, p157.

36.5 vegetation encroachment: bushfire risk; and

36.6 standard vehicle access.

37. In respect of those factors, the AER states its Expenditure Forecast Assessment Explanatory Statement:[22]

> *We consider terrain factors (such as bushfire risk, rural proportion, difficult terrain, vegetation growth and vegetation encroachment) are appropriate environmental variables to include in our short list. Differences in terrain are likely to have an impact on a NSP's costs, for example a NSP with a high proportion of its network in bushfire prone areas is likely to have more vegetation management costs than a more urban NSP that does not operate in bushfire prone areas. The extra costs associated with mitigating bushfire risk may include more stringent inspection and maintenance programs.*

38. Specifically in respect of the three vegetation variables, the AER states its Expenditure Forecast Assessment Explanatory Statement:[23]

> *The vegetation variables are intended to capture three potential drivers of vegetation management; These are:*
>
> *1. Topography – the type of environment the NSP's lines pass through. For example lines that run through trees will require more vegetation management than grasslands.*
>
> *2. Regrowth – the rate at which vegetation regrows. For example a NSP in a tropical region or coastal region may have to undertake the same vegetation clearance tasks more frequently than a NSP in a dry inland region.*
>
> *3. Legislative requirements – these requirements are a requirement beyond a NSP's control and provide an additional cost over NSPs that do not have this requirement. This includes assessing bushfire risk.*
>
> *We note information on vegetation management related legislative requirements will be collected as a part of our category analysis. We consider capturing the extent of bushfire risk to be an important variable to assess the impact of bushfire related legislative requirements. Other legislative requirements will be assessed qualitatively as a part of our overall analysis on operating environment factors.*

[22] AER's Expenditure Forecast Assessment Explanatory Statement, p158.

[23] AER's Expenditure Forecast Assessment Explanatory Statement, p159.

39. In section C.7 of Attachment C to the AER's Expenditure Forecast Assessment Explanatory Statement which is entitled 'Category analysis', the AER outlines its proposed approach to assessing the vegetation management 'category' of opex, the reasons for its proposed approach and the data it will require for its assessment.

40. The AER notes that in past determinations it has primarily relied on the revealed cost approach when setting vegetation management opex forecasts.[24] However, in its upcoming expenditure assessments, it intends to review vegetation management on a more disaggregated basis and to inform its vegetation management review with benchmarking and trend analysis.

41. The AER states in its Expenditure Forecast Assessment Explanatory Statement that its process for assessing vegetation management expenditure is likely to be as follows:[25]

    41.1 The AER will examine and assess the disaggregated data provided to it by the DNSP and assess the breakup of costs and outcomes. This includes, but is not limited to:

        41.1.1 trend assessment - the AER will examine base year costs of vegetation management activities by trending forward prior years' expenditures. This will be applied to activities such as tree cutting, inspections and vegetation corridor clearing;

        41.1.2 category benchmarking - the AER will compare unit costs and drivers for specific vegetation management activities (for example, cost per tree cutting, vegetation corridor clearing) across DNSPs. It will evaluate a DNSP's performance with comparable DNSPs. It will conduct further assessment when its techniques indicate a significant difference in the costs or effectiveness of a DNSP's vegetation management program;

        41.1.3 assessing data on vegetation caused outages and fire starts to determine the effectiveness of DNSPs' vegetation management programs; and

        41.1.4 using information collected on normalisation factors such as legislative requirements for qualitative assessment. If the AER identifies differences in unit costs across DNSPs, it will consider if the normalisation factors can account for the difference.

[24] AER's Expenditure Forecast Assessment Explanatory Statement, p203.

[25] AER's Expenditure Forecast Assessment Explanatory Statement, p204.

41.2 The AER will consider technical reviews, governance reviews and material submitted for review by the DNSP.

42. The AER states in its Expenditure Forecast Assessment Explanatory Statement that it will continue to assess vegetation management expenditure as part of its overall base step trend approach to opex at the aggregate level.[26] The AER states that it may adjust base year opex where there is evidence of inefficiency, including with respect to the vegetation management component of total opex.

43. In respect of category benchmarking, the AER states in its Expenditure Forecast Assessment Explanatory Statement:[27]

> *Benchmarking costs at the activity level will indicate the relative efficiency of the NSP in conducting vegetation management works. This will be useful in addition to trend assessment because it will indicate the NSPs' historical efficiencies, and it will allow us to adjust a NSP's revenue allowance accordingly. We intend to benchmark a number of activities on a per kilometre of line basis. We consider this is an effective comparative measure because a per unit comparison—specifically, a per kilometre measure—will be simple to calculate. Such benchmarks are expected to form a solid basis for comparing like activities and various cost differences between NSPs, and hence will help us understand NSPs' individual operating environments.*

44. The AER also observes that if they do so already, DNSPs operating over larger geographic areas should classify expenditure and quantitative measures according to 'zones'.[28] The AER considers that classification by zone is intended to broadly reflect material differences in the type and growth rates of vegetation as well as legal obligations that do not affect the network uniformity.

45. The AER notes that data availability issues may arise as disaggregated vegetation management data may only be collected by the DNSP'ss vegetation management contractor, rather than directly by the DNSP.[29] The AER observes that where information is not available from contractors, DNSPs will be required to provide their best estimates of cost and volume data and to outline their methods of estimation. The AER expects that as contracts expire, DNSPs will ensure new contracts provide for the collection and reporting of more accurate data.

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[26] AER's Expenditure Forecast Assessment Explanatory Statement, p204.

[27] AER's Expenditure Forecast Assessment Explanatory Statementp204.

[28] AER's Expenditure Forecast Assessment Explanatory Statement, p204.

[29] AER's Expenditure Forecast Assessment Explanatory Statement, p205.

AER's Regulatory Information Notices

46. The following regulatory information notices issued by the AER require the provision by CitiPower and Powercor of information in relation to vegetation management expenditure:

    46.1 the final regulatory information notice for economic benchmarking information issued by the AER in November 2013 (**Economic Benchmarking RIN**), together with its Explanatory Statement;[30]

    46.2 the final regulatory information notice for category analysis data requirements issued by the AER in March 2014 (**Category Analysis RIN**), together with its Explanatory Statement;[31] and

    46.3 the regulatory information notices the AER has issued to CitiPower and Powercor for the purposes of its distribution determinations (**CitiPower/Powercor Reset RINs**).

Economic Benchmarking RIN

47. The AER's Economic Benchmarking RIN has been issued by the AER to obtain the kind of economic benchmarking information it describes as requiring in Attachment B to its Expenditure Forecast Assessment Explanatory Statement. In its Economic Benchmarking RIN the AER requires information on particular vegetation management variables in worksheet 8 entitled 'Operating environment factors worksheet'.

48. The AER requires the following vegetation management information in table 8.2 'terrain factors' in worksheet 8 of its Economic Benchmarking RIN:[32]

    48.1 Number of urban and CBD vegetation maintenance spans;

    48.2 Number of rural vegetation management spans;

    48.3 Total number of vegetation maintenance spans;

    48.4 Total number of spans;

    48.5 Average urban and CBD vegetation maintenance span cycle (years);

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[30] AER, *Regulatory Information Notice under Division 4 of Part 3 of the National Electricity (State) Law* dated 28 November 2013; AER, *Better Regulation, Explanatory Statement, Regulatory information notices to collect information for economic benchmarking,* November 2013 (**Economic Benchmarking RIN Explanatory Statement**).

[31] AER, *Regulatory Information Notice under Division 4 of Part 3 of the National Electricity (State) Law* dated 25 March 2014; AER, *Better Regulation, Explanatory Statement, Final regulatory information notices to collect information for category analysis*, March 2014 (**Category Analysis RIN Explanatory Statement**). The relevant data template for the vegetation management variables is worksheet 8 entitled 'Operating environment factors worksheet'.

[32] Template 8 'Operating environment factors worksheet'.

48.6 Average rural vegetation maintenance span cycle (years);

48.7 Average number of trees per urban and CBD vegetation maintenance span;

48.8 Average number of trees per rural vegetation maintenance span;

48.9 Average number of defects per urban and CBD vegetation maintenance span;

48.10 Average number of defects per rural vegetation maintenance span;

48.11 Tropical proportion (number of spans);

48.12 Bushfire risk (number of spans).

49. The AER describes the vegetation management variables on pages 49 to 54 of the Economic Benchmarking RIN Explanatory Statement. Those variables are also described on pages 39 to 41 of the Economic Benchmarking Data Template Instructions and Definitions in Appendix B to the Economic Benchmarking RIN.

50. The AER requires the vegetation management span variables to be disaggregated by rural and CBD/urban vegetation maintenance spans. The AER states that this is because vegetation management practices can differ for urban and rural areas which may necessitate different vegetation management plans which may not be captured by an average figure.[33]

51. Several of these variables are defined in section 9 of the Economic Benchmarking Data Template Instructions and Definitions in Appendix B to the Economic Benchmarking RIN or on pages 39 to 41 of that document.

52. 'Maintenance span' is defined in the Economic Benchmarking Data Template Instructions and Definitions as:[34]

> *A span in DNSP's network that is subject to active vegetation management practices in the relevant year. Active vegetation management practices do not include Inspection of vegetation Maintenance Spans.*

53. 'Tree' is not defined in the Economic Benchmarking Data Template Instructions and Definitions contained in Appendix B to the Economic Benchmarking RIN.

54. The Economic Benchmarking RIN is an ongoing RIN which required DNSPs to provide information relating to the 2009 to 2013 regulatory years by 30

[33] Economic Benchmarking RIN Explanatory Statement, p49.

[34] Appendix B to the Economic Benchmarking RIN, p50.

April 2014 and requires DNSPs to provide information for subsequent regulatory years on the last business day of the fourth month following the expiration of the regulatory year (or the next business day if that day is not a business day).[35] All of the DNSPs' have responded to the AER's Economic Benchmarking RIN.[36] In particular, CitiPower and Powercor provided data in respect of the vegetation management variables for 2009 to 2013.[37]

Category Analysis RIN

55. The AER's Category Analysis RIN has been issued by the AER to obtain the kind of category information it describes as requiring in Attachment C to its Expenditure Forecast Assessment Explanatory Statement. In its Category Analysis RIN the AER requires information on vegetation management in templates 2.7 and 2.12. The AER describes how template 2.7 should be completed in Part 12 of Appendix E of the Category Analysis RIN.

56. The AER's Category Analysis RIN template 2.7 for vegetation management requires the following information on a zone basis for 2009 to 2013:

    56.1 Information on the following 'descriptor metrics across all zones - unplanned vegetation events':

        56.1.1 Number of fire starts caused by vegetation grow-ins (DNSP responsibility);

        56.1.2 Number of fire states caused by vegetation blow-ins and fall-ins (DNSP responsibility);

        56.1.3 Number of fire starts caused by vegetation grow-ins (other party responsibility); and

        56.1.4 Number of fire starts caused by vegetation blow-ins and fall-ins (other party responsibility).

    56.2 Information on the following 'description metrics by zone':

        56.2.1 Route line length within zone;

        56.2.2 Number of maintenance spans;

---

[35] 'Regulatory year' is defined in the Economic Benchmarking RIN as 'Each consecutive period of 12 calendar months in a *Regulatory Control Period* (under the NER) or equivalent regulatory period under a preceding regulatory framework. The first such 12 month period commences at the beginning of the *Regulatory Control Period* (or equivalent regulatory period, as the case may be) and the final 2 month period ends at the end of the *Regulatory Control Period* (or equivalent regulatory period, as the case may be)'. There is an explanatory note to the definition which provides '*For NSPs whose regulatory reporting is on a financial year (April to March or July to June) basis, the Regulatory Year has a 6 month lag. That is, the 2013 Regulatory Year is the 2012/2013 financial year*'.

[36] DNSPs' responses to the Economic Benchmarking RIN are available on the AER's website at www.aer.gov.au/taxonomy/term/1495 .

[37] CitiPower's Economic Benchmarking RIN Response is available on the AER's website at www.aer.gov.au/node/24174. Powercor's Economic Benchmarking RIN Response is available on the AER's website at www.aer.gov.au/node/24370.

56.2.3 Total length of maintenance spans;

56.2.4 Length of vegetation corridors;

56.2.5 Average number of trees per maintenance span; and

56.2.6 Average frequency of cutting cycle (years);

56.3 Information on the following 'expenditure metrics by zone':

56.3.1 Tree trimming (excluding hazard trees);

56.3.2 Hazard tree cutting;

56.3.3 Ground clearance;

56.3.4 Vegetation corridor clearance;

56.3.5 Inspection;

56.3.6 Audit;

56.3.7 Contractor liaison expenditure;

56.3.8 Tree replacement program costs; and

56.3.9 Other vegetation management costs not specified in the sheet.

57. The AER's Category Analysis RIN states that to identify vegetation management zones across the geographical area of its network, a DNSP should consider:[38]

57.1 areas where bushfire mitigation costs are imposed by legislation, regulation or ministerial order; and

57.2 areas of the network where other recognised drivers affect the costs of performing vegetation management work.

58. 'Maintenance span' is defined in Appendix F of the AER's Category Analysis RIN as:

> *A span within CitiPower's [Powercor's] network that is subject to active* vegetation management *practices in the relevant year. Active* vegetation management *practices do not include inspection of vegetation* maintenance spans.

[38] Paragraph 12.1 of Appendix E to the Category Analysis RIN.

59. 'Vegetation management' is defined in Appendix F of the AER's Category Analysis RIN as:

> *Activities that:*
>
> - *are primarily directed at removing, altering, or managing vegetation to maintain safe or regulated clearances from distribution or transmission assets; and*
> - *are not emergency or fault related activities; and*
> - *are not initiated by a request from a distribution or transmission customer, excluding customers that are network service providers; and*
> - *are not activities for which expenditure could be attributed to the AER expenditure category "Augmentation, replacement, or non-routine maintenance activities".*

60. 'Tree' is defined in Appendix F of the AER's Category Analysis RIN as:

> *For the purposes of calculating the* average number of trees per maintenance span, *a tree is a perennial plant (of any species including shrubs) that is:*
>
> - *equal to or greater in height than 3 metres (measured from the ground) in the relevant reporting period; and*
> - *of a species which could grow to a height such that it may impinge on the vegetation clearance space of power lines.*

61. Template 2.12, entitled 'Input tables' of the AER's Category Analysis RIN requires the following information in respect of each vegetation management zone for 2009 to 2013:

61.1 Direct material expenditure;

61.2 Direct labour expenditure;

61.3 Contract expenditure ;

61.4 Other expenditure;

61.5 Related party contract expenditure; and

61.6 Related party contract margin expenditure.

62. The Category Analysis RIN is an ongoing RIN which required DNSPs to provide information relating to the 2009 to 2013 regulatory years by 30 April 2014 and requires DNSPs to provide information for subsequent regulatory years by 30 April (or if 30 April is not a business day, the next business day)

of the following year.[39] All of the DNSPs have responded to the AER's Category Analysis RIN and provided information on vegetation management for the periods 2009 to 2013.

63. On 15 August 2014 the AER provided the DNSPs with some analysis prepared by the AER staff on the category analysis data provided by the DNSPs in response to the Category Analysis RIN (**Preliminary Category Analysis**). The Preliminary Category Analysis is contained in a word document entitled 'Category benchmarking metrics for DNSPS', together with Excel spreadsheets. In the email providing the Preliminary Category Analysis, the AER stated that the Analysis does not contain information over which DNSPs have claimed confidentiality. The Preliminary Category Analysis states that AusNet and JEN claimed confidentiality over their vegetation management data.[40] However, the Preliminary Category Analysis does contain some information pertaining to AusNet and it unclear whether this is intentional and therefore whether that information is confidential or not confidential.

64. In the email providing the Preliminary Category Analysis, the AER also noted that it is considering using the charts contained in the Analysis for the next round of AER decisions on forecast capital and operating expenditure. In addition, the email states that the Preliminary Category Analysis would not be included in the 2014 Annual Benchmarking report because the AER could not meet the timeframes for inclusion in that report, however, the Analysis (supplemented by revised historic and new data for 2013-14 over the coming months) would form the basis of the analysis to be presented in the 2015 benchmarking report.

65. There are three graphs in the AER's Preliminary Category Analysis word document which relate to vegetation management opex and which are entitled:

    65.1 Figure 1.3.1 Vegetation management opex per maintenance span ($000, 2014);[41]

    65.2 Figure 1.32 Total vegetation management opex ($000, 2014);[42] and

    65.3 Figure 1.33 Average vegetation management opex for 2009-13 against route line length ($000, 2014).[43]

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[39] In the Category Analysis RIN 'regulatory year' takes its meaning from the NER as 'Each consecutive period of 12 calendar months in a *regulatory control period*, the first such 12 month period commencing at the beginning of the *regulatory control period* and the final 12 month period ending at the end of the *regulatory control period*. For *AEMO*, each *financial year* is a *regulatory year*'.

[40] AER's Preliminary Category Analysis, p19.

[41] AER's Preliminary Category Analysis, p19.

[42] AER's Preliminary Category Analysis, p20.

[43] AER's Preliminary Category Analysis, p20.

66. The Energy Networks Association (**ENA**) commissioned a report from Parsons Brinckerhoff entitled 'Energy Networks Association Review of Category Analysis RIN basis of preparation' dated 25 August 2014 (**ENA Category Analysis Report**) which:[44]

66.1 reviews the Category Analysis RIN basis of preparation documents submitted by DNSPs to the AER as part of their responses to the Category Analysis RIN;[45] and

66.2 identifies variables within the Category Analysis RIN which may not be comparable as a result of:

66.2.1 differences between DNSPs in interpretation of the definitions;

66.2.2 incomplete or missing data; and

66.2.3 estimation that leads to data that is insufficiently accurate to be comparable.

67. The ENA Category Analysis Report includes a 'heat map' on the comparability of Category Analysis RIN data between the reviewed DNSPs (Appendix A) and spreadsheets which provide additional information on the reasons for the review findings. The Report classifies data as 'comparable', 'comparable with some inaccuracy', 'not comparable' and 'not applicable'.

68. The documents in respect of the AER's Category Analysis RIN which are provided to you together with this letter of instructions include a copy of each of the DNSP's templates 2.7 in respect of vegetation management, the AER's Preliminary Category Analysis and the ENA's Category Analysis Report. However, as noted above, AusNet and JEN claimed confidentiality over their vegetation management data and at this stage CitiPower and Powercor have not yet been provided with a confidential version of AusNet's and JEN's template 2.7.

CitiPower/Powercor Reset RINs

69. For the purposes of its distribution determinations the AER issued CitiPower and Powercor with the CitiPower/Powercor Reset RINs requiring particular information, including information in respect of vegetation management.[46]

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[44] ENA Category Analysis Report, pp1-2.

[45] Clause 1.2 of Schedule 2 of the Category Analysis RIN requires DNSPs to prepare a Basis of Preparation in accordance with the requirements specified in Schedule 1. The Basis of Preparation must demonstrate how the information provided is consistent with the requirements of the RIN, explain the source of the information, explain the methodology for providing the information and explain the basis of any estimates provided where actual information is not provided.

[46] AER, *Regulatory Information Notice issued under Division 4 of Part 3 of the National Electricity (Victoria) Law* issued to CitiPower and Powercor on 2 February 2015.

The AER requires CitiPower and Powercor to provide the following, in respect of vegetation management:

69.1 in table 3.7.2 'terrain factors' of template 3.7 'operating environment factors for economic benchmarking', the same information required by table 8.2 in worksheet 8 of the Economic Benchmarking RIN on a forecast basis for each of the years 2015 to 2020; and

69.2 in template 2.12 'input tables', the same information required by template 2.12 of the Category Analysis RIN on a forecast basis for each of the years 2015 to 2020.

D. SCOPE OF WORK

70. VPN would like GHD to provide the following:

70.1 A 'bottom up' build of forecast vegetation management costs for each of the regulatory years of the 2016-20 regulatory control period contained in a robust and transparent model for each of CitiPower and Powercor that:

70.1.1 reports CitiPower's and Powercor's forecast unit costs and clearance volumes; and

70.1.2 is prepared consistently with CitiPower's and Powercor's Guideline for Best Practice Spreadsheet Modelling (attached at Attachment B).

70.2 A report or reports which, for each of CitiPower and Powercor:

70.2.1 describes and explains the model, including explaining and justifying all assumptions in the model;

70.2.2 identifies the factors which are expected to drive vegetation management expenditure for CitiPower and Powercor in 2016-20, including, for example:

(a) regulatory obligations in respect of vegetation management; and

(b) operating environment factors; and

70.2.3 comments on any other matters GHD considers relevant.

71. The models and report(s) should be suitable for inclusion with CitiPower's and Powercor's regulatory proposals and, accordingly, should be prepared on the basis they will be provided to the AER.

72. For the purpose of undertaking the above work, we will provide you with a copy of the documents listed in Attachment C to this letter.

E. CONFIDENTIAL INFORMATION

73. For the purpose of undertaking the work described in section D of this letter, you will be provided with data which is confidential to other DNSPs. The AER has collected information from DNSPs in order to conduct its economic benchmarking and category analyses, some of which is confidential to DNSPs.

74. CitiPower and Powercor have signed confidentiality deed polls which enable them to be provided with confidential information of other DNSPs provided in response to the AER's benchmarking and category analysis regulatory information notices for approved purposes[47] (**Disclosed Information**). The purpose of the confidentiality deed polls is to protect the confidential nature of the Disclosed Information.

75. The confidentiality deed polls restrict CitiPower and Powercor from providing Disclosed Information to their officers, employees, agents or contractors who are involved in, or responsible for 'competitive activities' including the procurement of third party services or the commercial aspects of contestable or unregulated services.[48]

76. Under the confidentiality deed polls CitiPower and Powercor are able to disclose the Disclosed Information to their representatives, including lawyers and expert advisors.[49] Under clause 3(c) of the confidentiality deed polls before disclosing the Disclosed Information to a representative, CitiPower/Powercor must provide the representative with a copy of the deed poll and ensure that the representative complies with the terms of the deed poll. Further, on request by a DNSP who has disclosed Disclosed Information, CitiPower/Powercor must provide written notice to that Disclosing DNSP of the identity of the representative who has received that Disclosed Information.

77. We note that GHD has signed a confidentiality deed poll under which:

    77.1 GHD acknowledges that it has received read and understood the terms of the CitiPower/Powercor confidentiality deed poll; and

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[47] The approved purposes are defined in clause 2 of the confidentiality deed polls and include to (i) understand and assess the matters which informed the AER's benchmarking analyses; and (ii) make submissions to the AER in relation to a distribution determination that applies to CitiPower/Powercor.

[48] This does not include persons who do not have authority to negotiate or enter into any contract in respect of a third party service or a contestable unregulated service (definition of 'excluded representative' in clause 9 of the confidentiality deed polls). 'Competitive activities' is defined in clause 9 of the confidentiality deed polls as 'activities in respect of which the Recipient NSP is or is likely to be in competition with one or more of the Disclosing NSPs in relation to: (a) supply or likely supply of goods and services; and (b) acquisition or likely acquisition of goods or services.'

[49] Clause 9 of the confidentiality deed polls.

77.2 GHD undertakes to CitiPower and Powercor that it will comply with the CitiPower/Powercor confidentiality deed poll as if it were the recipient NSP and, in particular, that it will comply with the obligations of confidentiality set out in clause 3 of that deed poll.

78. You should assume that all of the Category Analysis RIN data of other DNSPs is confidential as are any reports or analyses that include (or may include) that data, including the AER's Preliminary Category Analysis and the ENA Category Analysis Report. Accordingly, you should maintain confidentiality over that information in accordance with your confidentiality deed poll.

F. EXPERT WITNESS

79. As noted above VPN anticipates providing a copy of GHD's models and reports for each of CitiPower and Powercor to the AER for the purpose of their respective regulatory proposals.

80. To this end, VPN has attached a copy of the Federal Court of Australia's Practice Note CM7 'Expert Witnesses in Proceedings in the Federal Court of Australia' (Attachment D). The Practice Note contains useful direction regarding the steps that should be taken by expert witnesses to ensure the veracity of their reports. VPN requires GHD to comply with the Practice Note in preparing its models and reports.

81. A list of all documents provided to GHD as well as those documents relied upon by GHD should be included in the report(s) and those documents should be annexed to the report(s) or, in the alternative, provided to VPN if they were not provided to GHD by VPN.

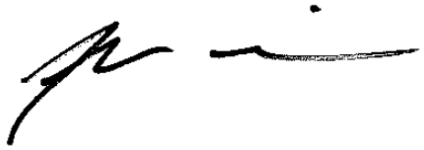
82. In addition, you should attach to the report(s) a copy of the CVs of those at GHD who prepare the models and report(s) containing their qualifications and relevant experience.

G. TIMING

83. VPN requests GHD to provide it with its final models and reports by March 2015.

Please contact us if you have any questions regarding this letter.

Yours sincerely



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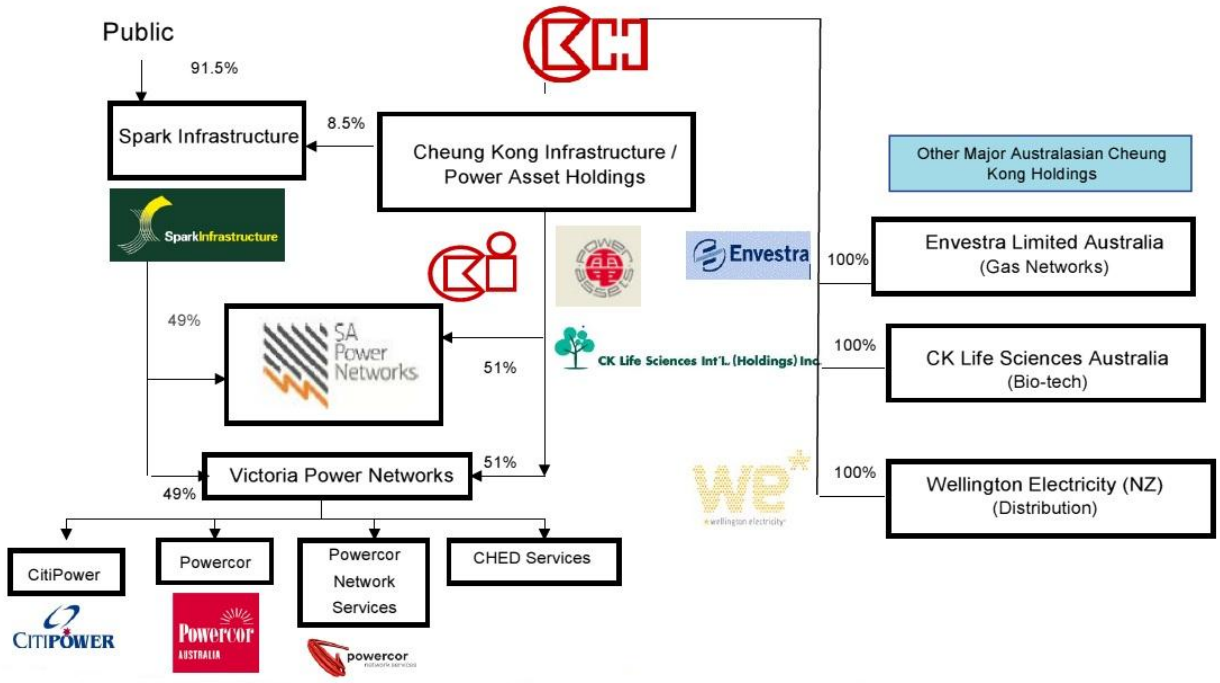
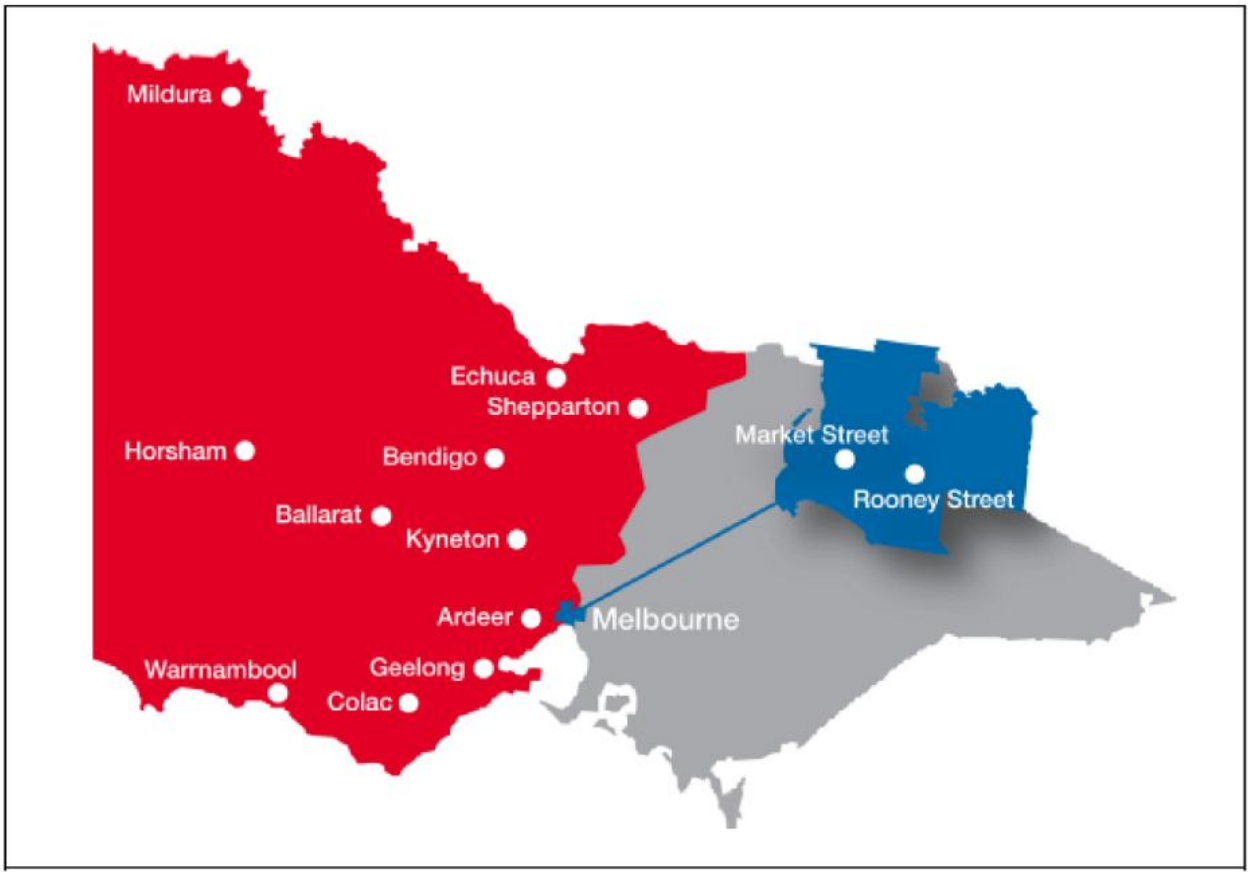
ATTACHMENT A

CORPORATE STRUCTURE CHART



CITIPOWER'S AND POWERCOR'S DISTRIBUTION NETWORKS



CITIPOWER'S DISTRIBUTION NETWORK AND VITAL STATISTICS

Network line length: 7,324km

Network area: 157sq km

Customers: 341,554

Customer density: 2,048c/sq km

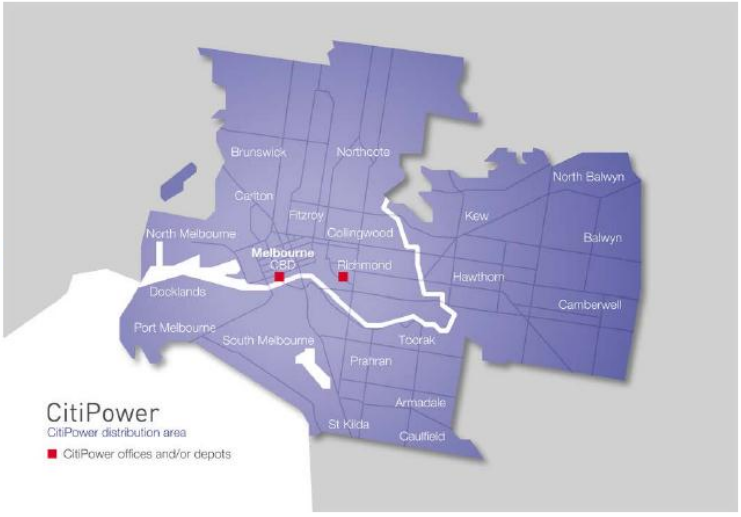
Zone substation transformers: 106

Distribution transformers: 4,621

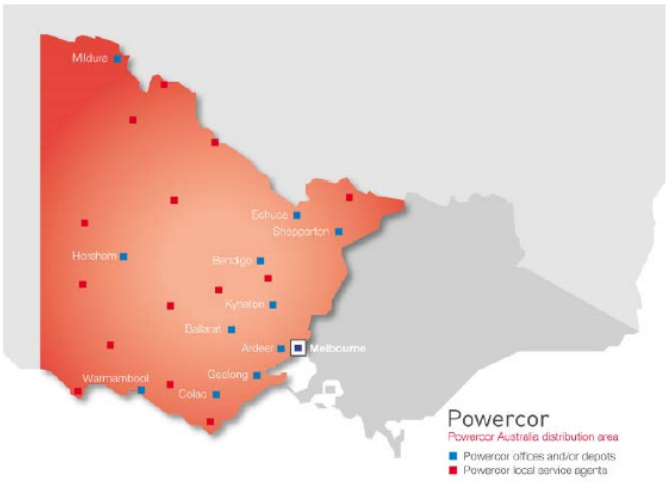
Poles: 58,847

Underground lines: 40%

Network reliability: 99.98%



POWERCOR'S DISTRIBUTION NETWORK AND VITAL STATISTICS



Network line length: 85,883km

Network area: 145,651sq km

Customers: 758,406

Customer density: 5.2c/sq km

Zone substation transformers: 140

Distribution transformers: 82,780

Poles: 529,919

Underground lines: 10.6%

Network reliability: 99.97%

ATTACHMENT B

CITIPOWER'S AND POWERCOR'S GUIDELINE FOR BEST PRACTICE SPREADSHEET MODELLING

Guideline for Best Practice Spreadsheet Modelling

This Guideline provides10 Design Rules for Better Spreadsheet Modelling in Excel

Financial Planning and Economic Analysis

Last Updated: April 2014

Contents

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1 Introduction

1.1 Purpose of this Document

The main purpose of this Guideline is to encourage the consistent application of best spreadsheet practices. There are two main sections to this document.

The first section highlights the "ten commandments" of spreadsheet modelling. Implementation of these ten design rules will yield a number of benefits for our business. These benefits include:

- Enhancing the quality of models;
- Improving usability by making models more user friendly;
- Ensuring their internal consistency;
- Making models more robust with reduced risk of errors;
- Making models easier to review; and
- Ultimately improving the reliability of financial outputs.

It is therefore intended that the ten design rules presented in this Guideline be adopted by all users of spreadsheets in Victoria Power Networks (VPN).

The second section of this document provides guidance on some of Excel's formula functions by outlining some of the most useful functions whose adoption will enhance the efficiency of calculations within a model, as well as some of Excel's more volatile functions that should be avoided where possible.

This document is saved on *myConnect*:
Knowledge Bank > 10 Finance and Revenue > 15 Financial Planning

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1.2 Related Documents

The FAST Standard

The full version of the *FAST Modelling Standard* can be accessed on the internet via the following link:

http://www.fast-standard.org/document/FastStandard_01b.pdf

The VPN Styles and Formats Template

The *VPN Styles and Formats Template* is saved on *myConnect*:

Knowledge Bank > 10 Finance and Revenue > 15 Financial Planning

Spreadsheets and Other User-Developed Applications Controls policy

The spreadsheet design principles presented in this Guideline are consistent with those in the *Other Best Practice Guidelines* section of the *Spreadsheets and Other User-Developed Applications Controls* policy.

The *Spreadsheets and Other User-Developed Applications Controls* policy document is saved on *myConnect*:

Knowledge Bank > 10 Finance and Revenue > 15 Financial Planning > 10-75-CP0001

1.3 The Basis of Best Practice Spreadsheet Modelling

The best practice recommendations provided in this document are primarily based on the FAST Modelling Standard (i.e. Flexible, Accurate, Structured, and Transparent).The following table provides a brief outline of each of these fundamental design priorities:

The FAST Standard	
Design Priority	Description
Flexible	The design and modelling techniques applied to spreadsheet models should allow them to be both flexible in the immediate term and adaptable in the longer term.
Accurate	Spreadsheet models should reflect key business assumptions directly and faithfully without being over-built or cluttered with unnecessary detail.
Structured	Rigorous consistency in the layout and organisation of spreadsheet models will allow for its logical integrity to be retained over time. The consistent approach used to structure workbooks, worksheets and formulas allows for efficiency of process in adapting, learning, or maintaining spreadsheet models.
Transparent	Spreadsheet models should largely rely on simple, clear formulas that can be understood by other modellers and non-modellers alike. Confidence in the model's integrity should be assured via clarity of logical structure and layout.

The full version of the *FAST Modelling Standard* can be accessed on the internet via the following link:

http://www.fast-standard.org/document/FastStandard_01b.pdf

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1.4 Definitions

Definitions to some of the commonly used terms within this document are detailed below:

Calculation Block	Autonomous paragraphs on a worksheet, separated by at least one space. The traditional calculation block has a single calculation on the last row of the block and precedents above it.
Check	An internal integrity crosscheck in a model that necessarily indicates a flaw in the model logic, i.e. no matter what the business scenario, these checks should not fail.
Constant	A line item represented by a single value cell, i.e. with a value that does not change over time or may not even have a time specification to it, e.g. an IRR calculation.
Corkscrew	A special form of calculation block where the opening balance is equal to the previous period's closing balance.
Dashboard	A dashboard is a visual, graphical display of the most important information needed to achieve one or more objectives. A good dashboard fits entirely on a single computer screen so it can be monitored at a glance.
Data Range	The range of continuous cells that make up a series line item's numerical values.
FAST Standard	The FAST Modelling Standard which advocates a philosophy of good financial model design rules founded on the FAST acronym: Flexible, Accurate, Structured and Transparent
Flag	Used to denote the occurrence of a particular event, that is, to place a certain value in time. Flags contain values of either 0s or 1s only and are used either in simple multiplication or often as the basis of an IF statement conditional.
Indexation Factor	A factor-type line item often used to separate the complexity of inflation into a separate modelling component, alternately referred to as escalation factors or simply inflation factors. Discount factors are essentially reciprocals of indexation factors.
Input	Input is any cell that does not contain cell references and hence has no precedents, i.e. are not calculations. Input is generally used as short form for input cells or input-type line items.
Line Item	A unit of information displayed on a line, row or column, of its own with its own label.
Partial Period Factor (PPF)	The analogue form of a timing flag, where values can range between 0 and 1. Generally used in simple multiplication to scale the amount of a flow applicable to a given time period when (say) operations are present in only a fraction of a given period.

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2 The 10 Key Design Rules

2.1 Adopt the VPN Styles and Formats

The recommended styles and formats for use on all company spreadsheets are provided in the *VPN Styles and Formats Template* in Excel format.

The *VPN Styles and Formats Template* is saved on *myConnect*:
Knowledge Bank > 10 Finance and Revenue > 15 Financial Planning

Save the *VPN Styles and Formats Template* onto your desktop. Then work directly in the *VPN Styles and Formats Template* when you begin working on a new spreadsheet. Remember to *"Save As"*.

Header Design

All header text should be detailed in the first 5 rows of each sheet (in white font with a navy blue background). These rows should also be frozen using the *Freeze Panes* tool.

Cell A1 of the header pane details the model name and cell A2 details the sheet name. If a sheet description is required, this can be entered into cell A3.

For time-based sheets (i.e. sheets that have a time series), the period start date should be detailed in row 3, and the period end date in row 4. It is also advisable to include the period number in row 2 and the duration of the period in row 5 (refer to cells K2:M5 in the screenshot below).

For sheets that include error checks, a master error check should be included in a cell in the header pane (refer to cell I2 in the screenshot below). Error Checks are covered in more detail in section 2.9 of this document.

The screenshot below illustrates a suitable VPN header design. Remember, this formatting has already been prepared of you in the *VPN Styles and Formats Template*.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	< Model Name >												
2	< Sheet Name >							Sheet Master Check:	OK	Period No.		1	2
3	< Sheet Description >									From		1-Jan-13	1-Jan-14
4										To		31-Dec-13	31-Dec-14
5					Line Item Heading		Constants	Units	Checks	Duration		365	365

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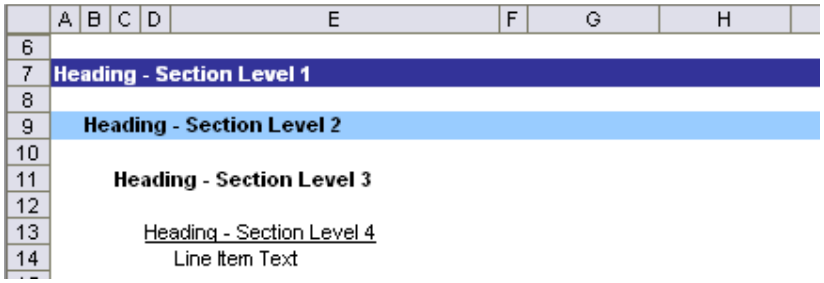
Section Headers

Columns A-D of all of the sheets in the *VPN Styles and Formats Template* are designated for section headers. Note that they are thinner than other columns.

Having designated columns for section headers has two key advantages:

1. The format of all the headers for a section level can be set in one motion by simply highlighting the column and adjusting the format accordingly.
2. It allows tabbing between different sections. For instance, navigating through column A (say) for main section headings is facilitated with CTRL+ UP ARROW / DOWN ARROW when this column is not cluttered with other data.

The screenshot below illustrates the VPN section header designs. Note that all section heading text is typed in the thin columns of A, B, C and D.



Colour Coding

The colour coding protocol for cells and sheets can be viewed in the *Formats* sheet of the *VPN Styles and Formats Template*.

It is very important that input cells are distinguished from calculation and output cells. Input cells are for hard-coded numbers or text that do not contain cell references and hence have no precedents. Inputs are essentially the assumptions relied upon by the calculations and should have a light yellow background with blue font.

To quickly set a cell to one of the formats in the *Formats* sheet, copy the cell on the *Formats* sheet , then use the *Paste Special* tool to paste the format into the desired cell. i.e. *Home > Clipboard > Paste > Paste Special > Formats > OK*

Summary

- Make use of the *VPN Styles and Formats Template*
- Include the model name and sheet name in the header pane.
- Use designated columns (A-D) for the four levels of section headers.
- Colour code cells and sheets in accordance with the VPN protocol.

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2.2 Separate Sheets for Inputs, Calcs, Outputs & Control

Sheets within a model should be grouped into the following four functions.

1. Inputs

Inputs are the assumptions and main underpinnings of the model. Input sheets will include all of the input cells, i.e. those with hard-coded numbers or text that do not contain cell references and calculations.

2. Calculations

Calculation sheets are akin to a model's 'engine'. Calculations are built up from the inputs and are the workings that calculate the results to be presented in the Outputs. Calculation sheets should be arranged so that calculation order flows from left to right.

3. Outputs

Outputs are essentially the presentational element of the spreadsheet model, i.e. the model's dashboard and primary showroom.

Outputs might include financial statements, charts, primary commercial inputs, and summary results. In addition, remember to consider the print setting on all Output sheets.

Consider the design of the Outputs prior to starting work on a model. This will prompt you to think about what the model is ultimately being built for, and what Inputs and Calculations these Outputs will require.

4. Control

Control sheets are the model's main control devices and engine status indicators.

An important Control sheet is the Checks sheet which summarises the checks from all the other sheets. This is covered in more detail in section 2.9 of this document.

Control sheets can also include control of sensitivities and scenarios, change tracking, list of pending changes, version control, and table of contents.

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Summary

- Group the model sheets by Input, Calculation, Output and Control.
- Consider the design of the Outputs prior to starting work on a model.

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2.3 Each Column to have a Single and Consistent Purpose

Set-up a standard column definition and apply this across all sheets, even if this causes a requirement for 'extra', unused columns on some sheets.

For instance, the column used for the following elements should usually be conformed across all sheets in a model:

- Section headers
- Labels
- Constants
- Checks
- Units
- Subtotals
- The first column of given time series

Exclusive use of a given column for a specific purpose not only improves clarity and structure, but can yield additional advantages. For example, as discussed earlier in this document, having dedicated columns for header section allows easy adjustment of formats as well as the ability to tab between sections (using the CTRL + UP ARROW / DOWN ARROW keys). Furthermore, a separate column for Units will leave the model user in no doubt as to the intended unit designation of a value.

Compare the *Input* sheet to the *Calcs* sheet in the *VPN Styles and Formats Template,* note how in both sheets the column for Units is column H.

Of high importance is the alignment of the first column of given time series. For example, if many of the sheets in the model are using an annual time series, it is highly preferable that the year 2015 (say) is in the same column in every sheet.

Summary

- Each column should have a dedicated purpose across all sheets.
- This has a number of advantages such as improving the clarity and structure of the model.

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2.4 Avoid Merging or Hiding Cells

Avoid Merging Cells

There are four key reasons to avoid merging cells:

1. It disrupts your ability to select columns and/or rows efficiently, i.e. it can prohibit the selection of just one column or row.
2. It can prohibit pasting into the merged cells.
3. When a selection of cells containing multiple data values are merged into one cell, then only the upper-left most data value is kept and the rest are deleted. Unmerging these cells will not bring back those initial cell values.
4. Unmerging cells is time consuming.

Using Excel's *Centre Across Selection* setting can allow text to be centred across a number of columns or rows, providing the same look as a merged cell where text is centred.

Home > Cells > Format > Format Cells > Alignment > Horizontal > Centre Across Selection

Merging cells is one of those options that seems like a good idea at the time but then turns out not to be. From a first principles perspective, merging cells breaks the only element of inherent structure that Excel starts with.

Avoid Hiding Cells

Hiding cells should be avoided. However, there is one exception to this rule which is a strong design imperative and should be done on nearly all sheets. Columns beyond the defined time axis should always be hidden, i.e. the columns to the right that are beyond the sheets' modelling range.

Hiding these columns give the sheet a 'hard edge' and can assist tabbing operations (i.e. CTRL + RIGHT ARROW).

Note how the columns are hidden after column AC in the *Calcs* sheet of the *VPN Styles and Formats Template.*

A useful alternative to hiding cells is to utilise Excel's *Group* tool. This effectively hides the rows or columns that can then be expanded by clicking an icon.

Data > Outline > Group > Group

Summary

- Avoid merging cells as it causes usability problems and loss of data.
- Instead of merging cells, use the *Centre Across Selection* settings.
- Avoid hiding cells except to give sheets a 'hard edge'.
- Grouping rows or columns can avoid the need to hide cells.

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2.5 Use Timing Flag and Factor Components Routinely

Use timing flags (or if required, partial period factors) and separate indexation factors universally. Conditional logic embedded in complex formula to test for timing issues should never exist; separating this complexity from the primary calculation with timing flags or factors is always the preferred solution.

If there is a question of setting the time period or inflation that is not driven by flags and factors respectively, then the calculation block is likely to be poorly designed.

Use a dedicated section or sheet to calculate timing, flags, partial period factors, as well as indexation factors. This information can then link directly to other parts of the model. This can be called the 'Timing and Escalation' section or sheet, often labelled 'T&E' for short.

Model Time Series

A time series is a set of dates that denotes the start and end of each period represented by a column.

Presuming the model can be designed with a consistent time resolution throughout (e.g. monthly, quarterly, annual), each worksheet in the model should have an identical time axis. This time axis should include the start and end date of each period and should be displayed in rows 3 and 4 respectively. It is also advisable to include the period number in row 2 and the duration of the period in row 5.

Each worksheet therefore uses the same column for each period with the time ruler running to the same length, even if this means that some worksheets have unused columns.

Inconsistent time rulers in different parts of the model cause confusion; keeping the time ruler as consistent as possible vastly improves readability and reduces possibility that serious errors are missed during the review process.

The screenshot below is an example of an annual time series in the frozen header pane.

	E	J	K	L	M	N	O	P	Q
1									
2		Period No.		1	2	3	4	5	6
3		From		1-Jan-13	1-Jan-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18
4		To		31-Dec-13	31-Dec-14	31-Dec-15	31-Dec-16	31-Dec-17	31-Dec-18
5		Duration		365	365	365	366	365	365

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Flags

Flags are essentially yes/no arguments to denote which periods are to be included for given circumstances. For example, the given circumstance could be the project operating period. The flags would therefore be a set of 1s or 0s to denote whether or not a given time period falls within the project operating period. These can then be used in calculation arguments where only data for the operating period is relevant.

Note that display totals should be included on all rows of flags.

The Excel screenshot below illustrates a typical operating period flag (where the operating period starts in 2014 and ends in 2017). The display total is in cell J19 and shows that the operating period covers 4 model periods.

	E	J	K	L	M	N	O	P	Q
1									
2			Period No.	1	2	3	4	5	6
3			From	1-Jan-13	1-Jan-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18
4			To	31-Dec-13	31-Dec-14	31-Dec-15	31-Dec-16	31-Dec-17	31-Dec-18
5			Duration	365	365	365	366	365	365
18									
19	Operations Period Flag	4		--	1	1	1	1	--

Partial Period Factors

Partial Period Factors (PPFs) are similar to flags, with the exception that they are presented as percentages rather than 1s and 0s. For example, the project operating period might start and end partway through one of the defined model periods. In this case, the first period and the last period would denote the proportions represented by the operating period.

The Excel screenshot below illustrates a typical PPF (where the operating period is between 1-Jul-14 and 1-Oct-17).

	E	J	K	L	M	N	O	P	Q
1									
2			Period No.	1	2	3	4	5	6
3			From	1-Jan-13	1-Jan-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18
4			To	31-Dec-13	31-Dec-14	31-Dec-15	31-Dec-16	31-Dec-17	31-Dec-18
5			Duration	365	365	365	366	365	365
18									
21	Operations Period PPF	325%		--%	50%	100%	100%	75%	--%

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Indexation Factors

Indexation factors are typically used to calculate estimated inflation multiples over a period of time, enabling nominal financial values to be derived from real financial values in any given period (or visa versa).

For example, if it is estimated that the real cost of a project to be paid for in one year's time is $100 (i.e. in "today's money") and the cost is subject to escalation, then the nominal cost will depend on the indexation rate. If this rate is estimated to be 2.5%, the nominal cost of the project to be paid in one year's time will be $102.50.

A simple example of indexation factors is illustrated in the screenshot below. The indexation rate is 2.5% per annum. These indexation factors could be multiplied with real cost estimates to ascertain the expected nominal cost. Note that the indexation factors are displayed with three decimal places.

Remember, the formats for factors can be implemented quickly by copying and pasting formats from the *Factor* column of the *Formats* sheet in the he *VPN Styles and Formats Template.*

	E	J	K	L	M	N	O	P	Q
1									
2		Period No.		1	2	3	4	5	6
3		From		1-Jan-13	1-Jan-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18
4		To		31-Dec-13	31-Dec-14	31-Dec-15	31-Dec-16	31-Dec-17	31-Dec-18
5		Duration		365	365	365	366	365	365
18									
23	Indexation Factors			1.000	1.025	1.051	1.077	1.104	1.131

Summary

- A model time series should denote the start and end of each period. Each worksheet should use the same column for each period with the time ruler running to the same length.
- Use timing flags (or if required, partial period factors) and separate indexation factors universally.
- Conditional logic embedded in complex formula to test for timing issues should never exist.

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2.6 Implement Version Control

Naming Convention

Adopting a standard naming convention for all Excel files will facilitate version control as the key details of the file can be seen easily within the file name.

A suggested naming convention is presented below:

[Company Name]_[Model Name]_[YYMM]_[Workbook Name]_[vX.XX]

- The *Company Name* might relate to whether the file details information on CitiPower or Powercor. CP and PAL can be used as abbreviations respectively.
- The *Model Name* relates to the title of the Model.
- *YYMM* relates to the current month in the format of the year number first and the month number second. Putting the year first and month second has the benefit of allowing files in the same folder to be sorted by date when the folder settings are actually set to sorting by file name.
- Including a *Workbook Name* will only be relevant when the Model includes a number of workbooks.
- vX.XX relates to the latest version of the model. The first version of the Model should be v1.00.

There is one unique circumstance where this naming convention is inappropriate. This is when a multi workbook model includes a Macro which relies upon the file name of one of the workbooks. In this instance, the Model will always need to maintain the same file name. Therefore, the "YYMM' and "vX.XX" elements denoting the month and version number respectively will need to be omitted. Since new versions of the Model will have the same file name, each new version will need to be saved in a different folder to the previous version.

Summary

- Adopting a standard naming convention for all Excel files will facilitate version control.
- In circumstances where a Macro relies upon the file name, the file name will need to remain the same. The folders where different versions of the file are saved will therefore require consideration.

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Version Control Log

A Version Control Log is used to track the structural changes made to the spreadsheet. Structural changes can be described as those which relate to “renovating” or “rebuilding” parts of the model, and are not concerned with changing the input assumptions.

At a minimum, a Version Control Log should include the following information:

- Version Number
- Date
- Cell Reference
- Sheet Reference
- Operator
- Description of Change

An example Version Control Log can be seen in the *VPN Styles and Formats Template*. It is suggested that this be included in a Control sheet that might also include inputs relating to the Model set-up, for example the Model name and version number.

Multi Workbook Models

Generally, models with multiple workbooks should be avoided where possible. The main reason is that multiple, inter-linked workbooks are usually difficult to manage.

However, there are particular circumstances of a modelling project where a so-called ‘split model’ is warranted. These circumstances are detailed as follows:

- When a single workbook would be too large and intimidating. This also relates to the file size of the model. If the file size exceeds 30mb, then it is certainly wise to consider splitting the model into more than one workbook.
- When different files should be sent to different recipients.
- When more than one modeller must work concurrently.

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2.7 Build Optimal and Consistent Calculation Formulas

Calculate Only Once

A given calculation should appear only once in a model. While this may sound obvious, it is often violated in practice. Even if it is simple to do otherwise, ensure that subsequent requirements to display or use a set of figures are created by a direct link back to the source calculation, not by repeating a calculation.

Avoid using Embedded Constants in Formulas

Embedding (also known as 'hard-coding') commercial information within a formula, for example an inflation rate, is never a good idea. The reasons for this are that these constants will not be included in the model assumptions, making the model less transparent and more difficult to review, and means that these assumptions cannot be changed with ease.

All commercial information of this type should have its own input cell. The formula can then reference this input cell to perform its calculation.

Use "-1 *" Coefficient for all Sign Switches

When sign switches are required, make the action as apparent as possible, i.e.

-1 * a rather than simply **-a**.

The visual difference in presentation assists with communicating the intention of the sign being switched.

Use Brackets Appropriately

Brackets are used to separate the logic in formulas and their use should be kept to a minimum.

In some circumstances however, Excel's order of calculation can be made clearer by adding brackets that are not mathematically necessary. For example:

($a / 2) * b reads more easily than the functionally identical **$a / 2 * b**.

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Use Anchoring Appropriately

Anchoring is the use of the '$' sign within a formula to anchor a referenced cell to either a row or a column.

It is important not to anchor beyond what is required to effect a consistent formula. Surplus and unnecessary '$' signs not only clutter the formula from a reading perspective, but disrupt the ability to copy calculation blocks for re-use with different ingredient lines.

Avoid Lengthy and Over-Complicated Formulas

Formulas that do not fit into one row of the formula bar are almost certainly too complex, impractical to review, and suffer from the added annoyance (in Excel 2003 and before) that the column letters on the sheet will be masked, further hampering model review.

If a formula turns out to be long and complex, break it into smaller components to make it easier to understand, change and review.

Avoid using Array Formulas

Array formulas are those that require the keys CTRL SHIFT and ENTER to be pressed once the formula has been written, rather than just ENTER which is pressed after entering a normal / non-array formula. Array formulas are also enclosed in curly braces { } within the formula bar.

Array formulas should be avoided as their complexity is not usually warranted.

The only exceptions are when Excel's *Data Table* feature is being used, or when a calculation simply can't be achieved without the use of an array formula.

Build Efficient Calculation Blocks that can be Replicated

Appropriate anchoring within formulas will enable calculation blocks to be constructed quickly and efficiently and also replicated for other calculation blocks.

Use only one formula for each row or column, i.e. once the formula in the top left cell of a calculation block has been constructed, it should be possible to copy this cell down and to the right in order to complete the calculation block.

Applying minimum anchoring on formulas and row-anchoring all links will also facilitate re-using the structure of a calculation block.

Summary

- Calculate only once.
- Avoid using embedded constants in formulas.
- Use “-1 *” coefficient for all sign switches.
- Use brackets and anchoring appropriately.
- Avoid lengthy, over-complicated formulas and array formulas.
- Build calculation blocks that can be copied down & to the right and replicated.

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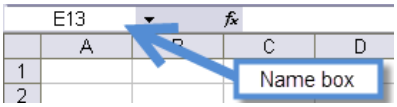
2.8 Use Named Ranges Appropriately

There are a number of limited circumstances when cell ranges should be named. Except for the limited circumstances which are described below, naming ranges should be avoided as they positively harm flexibility and transparency.

To name a range, select the cell or range of cells to be named (e.g. E13), then click in the Name box to the left of the formula bar. Type the desired range name (with no spaces) and press Enter.



To manage, change and delete your named ranges, us the *Defined Names* tool:

Formulas > Defined Names > Name Manager

Referencing Non-Local and Single-Cell Input Precedents

If an input cell (i.e. a single-cell input and not therefore a range of cells) is a highly utilised assumption that is referenced as a precedent in formulas across a number of different sheets, then it is appropriate to name this cell. An example might be to name the cell that includes the Weighted Average Cost of Capital (WACC).

Referencing Macros

If a specific cell (or range of cells) is required to be referenced in a Macro, then it is preferable to name the cell range. Doing this will ensure that adding rows or columns to a sheet does not disrupt or break the Macro, thereby ensuring that the spreadsheet model's logical integrity is retained over time.

Sometimes you might name a cell or range after it has been referenced in a number of formulas. Editing each and every formula to include the newly named range would be an arduous task. Instead, follow these commands to update the named ranges in your spreadsheet:

Formulas > Defined Names > Define Name > Apply Names

To insert the full list of names included within a spreadsheet next to their sheet and cell references, select the cell you wish to be top of the list, then:

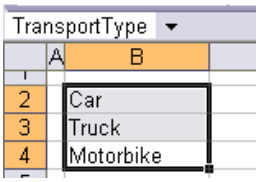
Formulas > Defined Names > Use in Formula > Paste Names > Paste List

Referencing Inputted Lists for Data Validation Drop-Down Menus

If you wish to create a drop-down menu via Excel's *Data Validation* tool, the range of cells that includes the inputted list should be named. Naming the range (i.e. the inputted list) in this situation can alleviate the need to keep repeating the list throughout the model if the drop-down menu is required on multiple sheets (and where an Excel version 2003 or earlier is being used)

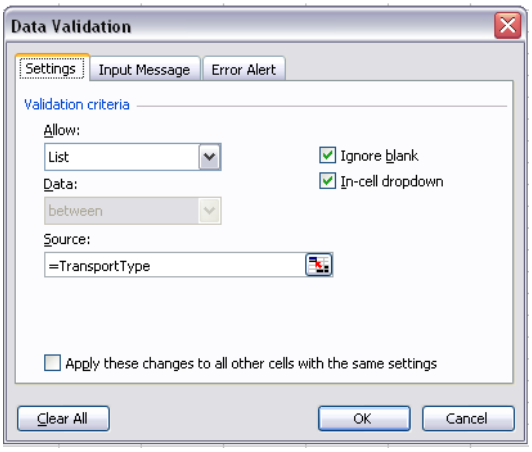
To make a drop-down menu, follow the 4-step procedure below which is for an example list of transport types:

1. Make the list and name the range in the Name Box (i.e. "TransportType"). The name cannot include spaces.

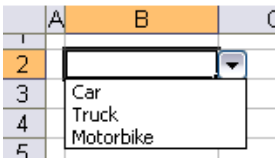


2. On a different sheet, click on the cell where you wish to create your drop-down menu, e.g. B2.

3. Use the *Data* > *Data Tools* > *Data Validation* commands to bring up Excel's *Data Validation* tool. Then in *Settings* click "List" in the *Allow* box, and input the range name preceded by the 'equals' sign (i.e. "=TransportType") in the *Source* box. As per the screenshot below:



4. A drop-down menu will now appear in the cell you selected in step 2, i.e. cell B2.



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Summary

- Naming cells and ranges should generally be avoided and only used in the following circumstances:
  - For non-local and single-cell input assumptions repeatedly used as formula precedents.
  - For cells referenced by *Macros*.
  - For inputted lists referenced by the *Data Validation* tool that are used for creating drop-down menus.

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2.9 Build an Error Check System

For highly simple models consisting of only one calculation sheet, an Error Check System may not be warranted.

However, it is advised that in all other situations, a comprehensive Error Check System be built into the spreadsheet model.

There are three components to an Error Check System:

1. Error Checking Line Items
2. The Sheet Master Check
3. The Model Master Check

Error Checking Line Items

As described already, error checks should be located in the same column of every sheet (where there is no error checks in a particular sheet, the column will be left empty).

Error checking at the line item level might involve checking that a sum total is the same as the total defined in the inputs.

The *VPN Styles and Formats Template* includes the format for Line Item Error Checks. This cell is based on formatting that will result in "**Check**" appearing whenever the cell is not equal to zero, and "**OK**" appearing when the cell *is* equal to zero. The aim of a successful check should therefore be to equal zero.

The Sheet Master Check

The Sheet Master Check is located in the header pane of all sheets that include Line Item Error Checks, and will result in "**Check**", if any one of the Line Item Error Checks are showing "**Check**", and "**OK**" if all of the Line Item Error Checks are showing "**OK**".

The Sheet Master Check is therefore calculated by summing the Line Item Error Checks within the sheet.

A Sheet Master Check works in the same way as the Line Item Error Check (i.e. that zero results in "**OK**" and non-zero results in "**Check**").

The *VPN Styles and Formats Template* includes the format for Sheet and Master Error Checks in column F. In the *Calcs* sheet, the *Sheet Master Check* can be seen in cell I2.

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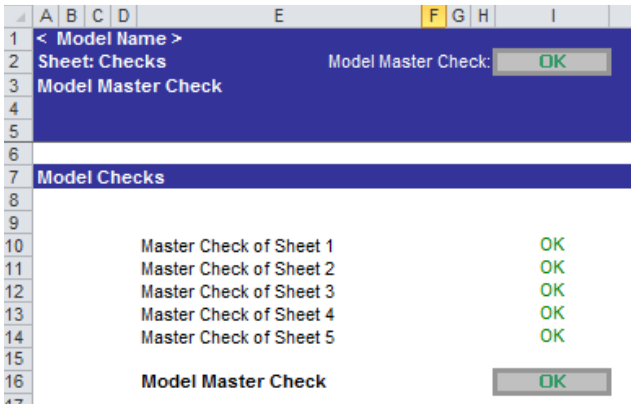
The Model Master Check

Where the model contains more than one calculation sheet, the Model Master Check should be presented on a separate sheet. This sheet is called the "Checks" sheet which is a type of Control sheet.

The Checks sheet should display all of the Sheet Master Checks (linked from the header panes of the respective sheets). Summing the Sheet Master Checks results in the Model Master Check.

The Model Master Check is simply a sum of the Sheet Master Checks that will result in "**OK**" where it sums to zero, or "**Check**" if it sums to anything other than zero.

A simple example of a Checks sheet (as per the *VPN Styles and Formats Template*) is presented below:



Summary

- Build an Error Check System that consists of the following:
  - Error Checks for Line Items.
  - Sheet Master Checks located in the sheet header panes.
  - A Model Master Check located in a dedicated Checks sheet.

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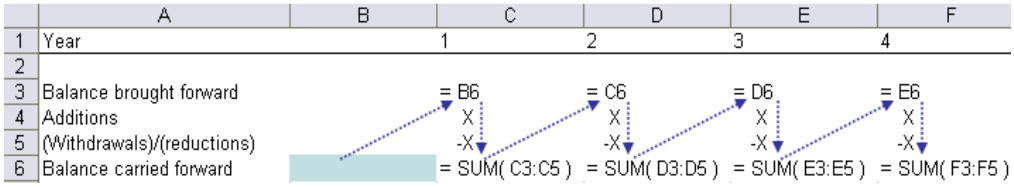
2.10 Use Corkscrew Blocks for Balance Accumulation

Corkscrew Blocks are used for calculating balance accumulations.

Sometimes, balance accumulations are performed with a cumulative SUM function, but using Corkscrew Blocks is preferred as it is the optimal way of calculation.

A simple example of a Corkscrew Block is illustrated below:



An example of when a Corkscrew Block could be useful includes the calculation of a change in creditors. The “Additions” could be the accruals and the “Reductions” could be the cash paid. Calculating the change in creditors could then be achieved by subtracting the “Balance brought forward” from the “Balance carried forward”.

Another example for the use of a Corkscrew Block is for calculating the balance of a debt facility. The “Additions” could be the drawdowns and the “Reductions” could be the repayments. The “Balance brought forward” will then show the debt facility balance at the start of the period, with the “Balance carried forward” showing the balance at the *end* of the period.

Summary

- Use Corkscrew Blocks for balance accumulations.
- Corkscrew Blocks are more efficient than using a cumulative SUM function.
- There are numerous instances where implementing Corkscrew Blocks can be useful. For example, calculating the change in creditors, or the running balance of a debt facility.

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3 Excel Formula Functions Guide

This section outlines some of the most useful functions whose adoption enhance the efficiency of calculations within a model, as well as some of Excel's functions that should be avoided where possible.

3.1 Useful Functions to Utilise

INDEX

The primary use for the INDEX formula is to find the value from a table or range. It can often be used as a simpler alternative to the CHOOSE function. It looks like this:

=INDEX(array, row_number, [column_number])

For example, if the formula was written as below, it would return whatever value was in cell A5, because A5 is the row number (or 5th row in the range)

=INDEX(A1:A10, 5)

The INDEX function is particularly useful when building a Scenario Manager in the Input sheet. The row or column number would relate to the Scenario number, allowing efficient and user friendly selection of different scenarios.

MATCH

The MATCH function returns the relative position of an item in a data area.

It looks like this: **=MATCH(lookup_value, lookup_array, match_type)**

The lookup_value relates to the value we want to find the relative position of.

The lookup_array is the range where the lookup_value can be found.

A match_type of zero identifies an exact match. 1 or -1 find the nearest match and require the data to be sorted in ascending or descending order respectively.

MATCH is often used to identify coordinates and can therefore be used in conjunction with the INDEX formula as a more transparent alternative to the VLOOKUP or HLOOKUP formulas. A simple example is provided below: this allows the inputted Dept to be changed in the yellow cell to show the respective number of employees in the calculated cell next to it (i.e. 10 employees).

	A	B	C	D
1				
2		**Dept**	**No. of Employees**	
3		Finance	20	
4		HR	10	
5		Sales	50	
6		Marketing	15	
7				
8		HR	=INDEX(C3:C6,MATCH(B8,B3:B6,0))	

AND

The AND formula allows the selection of an option when two or more tests are passed. When used effectively, it can alleviate the need to build a formula with multiple other IFs nested within it. Instead, it can be used alongside a single IF to determine if two or more tests are passed. It looks like this:

= AND($test_1$, $test_2$, $test_3$… $test_n$)

It can be used within an IF statement as demonstrated below. In this example, if all of the tests are passed, the result will be 1, if any of the tests are failed, the result will be zero.

= IF(AND($test_1$, $test_2$, $test_3$… $test_n$),1,0)

OR

The OR formula allows the selection of an option when two or more tests are passed. When used effectively, it can alleviate the need to build a formula with multiple other IFs nested within it. Instead, it can be used alongside a single IF to determine if any one or a number of tests are passed. It looks like this:

= OR($test_1$, $test_2$, $test_3$… $test_n$)

It can be used within an IF statement as demonstrated below. In this example, if any of the tests are passed, the result will be 1, if all of the tests are failed, the result will be zero.

= IF(OR($test_1$, $test_2$, $test_3$… $test_n$),1,0)

3.2 Functions to Avoid where Possible

OFFSET

The OFFSET formula gives a reference to a range, from a given starting point with given height and width in cells. It looks like this:

=OFFSET(starting point, rows to move, columns to move, height, width)

There are two issues with using OFFEST. The first is that it's a volatile function and therefore recalculates each time any cell in the workbook is changed (slowing down the spreadsheet). The second is that a spreadsheet with lots of OFFSET formulas is very difficult to audit.

However, OFFSET can be useful on limited occasions where dynamic ranges are required. For example, OFFSET can be used to calculate depreciation.

INDIRECT

The INDIRECT function allows you to put the address of one cell in another, and get data from the first cell by referencing the second. For example, if cell A1 has the value "C3", then =INDIRECT(A1) will return the value in C3.

There are two issues with using INDIRECT. The first is that it's a volatile function and therefore recalculates each time any cell in the workbook is changed (slowing down the spreadsheet). The second is that a spreadsheet with lots of INDIRECT formulas is very difficult to audit.

NPV

The NPV function is used to identify the Net Present Value of a cash flow.

Generally, financial models are built where the financial reporting is done on the 'End of Period' basis. In these types of models the NPV function should not be used because it discounts the Cash Flows for a period. This yields a wrong result because Cash Flows which are reported on the End of Period should be discounted as such.

For the above scenario in particular, the XNPV function can be used instead of the NPV function. However, both functions have limitations and cannot be used to cater for varying discount rates.

ATTACHMENT C

INDEX OF MATERIALS

Tab	Date	Document
1.		Table showing CitiPower's and Powercor's vegetation management allowances for 2011-2015 and their actual expenditure
Contractual arrangements with Vemco		
2.	12/12/2008	Powercor and Vemco contract, Supply of Vegetation Management Services
3.	16/12/2009	2009 Deed of Variation, Supply of Vegetation Management Services, Powercor and Vemco
4.	23/12/2009	Supply of Vegetation Management Services Modification No. 1
5.	27/09/2010	Supply of Vegetation Management Services No. 2
6.	10/01/2011	Supply of Vegetation Management Services Modification No. 3
7.	03/2011	2011 Deed of Variation, Supply of Vegetation Management Services, Powercor and Vemco
8.	24/11/2011	Supply of Vegetation Management Services Modification No. 4
9.	01/2012	2012 Deed of Variation, Supply of Vegetation Management Services, Powercor and Vemco
10.	14/03/2012	Supply of Vegetation Management Services Modification No. 5
11.	25/01/2013	2013, 2014, 2015 Deed of Variation - Supply of Vegetation Management Services, Powercor and Vemco
12.	05/09/2014	2014 and 2015 Deed of Variation - Supply of Vegetation Management Services, Powercor and Vemco
13.	10/2014	Note from T Christoffersen on data files described in two tabs below
14.	2009-2013	TAC 2009-2013 'combined data final for submission' (vegetation management volume data)
15.	02/09/14	Vemco monthly volume data for 02/09/14
16.	09/14	Vemco CitiPower Powercor Vegetation Data Accuracy audit for September 2014

Tab	Date	Document
AER's expenditure forecast assessment guideline and explanatory statement		
17.	11/2013	AER, Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution
18.	11/2013	AER, Better Regulation, Explanatory Statement - Expenditure Forecast Assessment Guideline
Revised Regulatory Proposals and AER's Distribution Determinations		
19.	21/07/10	CitiPower's Revised Regulatory Proposal 2011-15 (extracts concerning vegetation management expenditure)
20.	21/07/10	Powercor's Revised Regulatory Proposal 2011-15 (extracts concerning vegetation management expenditure)
21.	26/10/10	Nuttall Consulting Report - Capital Expenditure Victorian Electricity Distribution Revenue Review Revised Proposals (Report to the AER), Appendix G
22.	29/10/10	AER's Victorian Distribution Determination Final Decision 2011-15 (extracts concerning vegetation management expenditure)
23.	29/10/10	AER's Distribution Determination for CitiPower 2011-15
24.	29/10/10	AER's Distribution Determination for Powercor 2011-15
25.	28/09/12	AER's Distribution Determination for CitiPower 2011-15 (amended pursuant to orders of the Tribunal in *Application by United Energy Distribution Pty Ltd* [2012] ACompT 1)
26.	04/10/12	AER's Distribution Determination for Powercor 2011-15 (amended pursuant to orders of the Tribunal in *Application by United Energy Distribution Pty Ltd* [2012] ACompT 1)
Submissions on Appeal to Australian Competition Tribunal		
27.	13/05/11	CitiPower's/Powercor's Outline of Joint Submissions on Vegetation Management Step Change Grounds for Review (non confidential version)
28.	06/06/11	AER's Outline of Submissions Concerning Vegetation Management Step Change (non confidential version)
Vegetation Management Remittal Documents		
29.	25/06/2012	CitPower/Powercor - Vegetation Management Submission re Tribunal Order (Confidential Version), attaching: • *Application by United Energy Distribution Pty Ltd* [2012]

Tab	Date	Document
		ACompT 1 (extract only produced here) • Letter from AER to CitiPower/Powercor dated 25 May 2012 re: Timetable for implementing the Tribunal's Orders of 5 April 2012 • Letter from DLA Phillips Fox to CitiPower/Powercor dated 21 June 2010 • Letter from Vemco to CitiPower/Powercor dated 13 July 2010 • Energy Safe Victoria, *Exemption from the Requirement to Maintain a Clearance Space in Accordance with Tables 1, 2 and 3 of the Regulations of Practice for Electric Line Clearance in the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to Powercor Australia in respect to certain requirements for the maintenance of a clearance space for certain electric lines - January 2011*, 18 February 2011 • Energy Safe Victoria, *Exemption from the Requirement to Maintain a Clearance Space in Accordance with Tables 1, 2 and 3 of the Regulations of Practice for Electric Line Clearance in the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to CitiPower in respect to certain requirements for the maintenance of a clearance space for certain electric lines - January 2011*, 18 February 2011 • CitiPower/Powercor, Board of Directors, Provision of Vegetation Management Services for CitiPower and Powercor -'Full Compliance Services for 2013' dated 17 April 2012 • Matthew Joyce, Witness Statement dated 30 August 2010 [Note the Vemco contractual documents which were attached to this submission are included in Volume 1]
30.	Undated	Excel spreadsheet showing vegetation management allowance in AER's final decision for 2010-15
31.	Undated	Excel spreadsheets regarding revised vegetation management costs submitted to AER in remittal
32.	05/07/2012	Letter from CitiPower/Powercor to AER re AER's ability to consider new information on remittal
33.	16/07/2012	Letter from CitiPower/Powercor to AER re Vegetation Management remittal (redacted in part), enclosing: • CitiPower, 2012 to 2013 Electric Line Clearance [Vegetation] Management Plan, Version 1, dated 2 March 2012 • Powercor, 2012 to 2013 Electric Line Clearance [Vegetation] Management Plan, Version 1, dated 2 March 2012

Tab	Date	Document
		• Excel spreadsheet containing comparison with SP AusNet's vegetation management costs • Energy Safe Victoria, 'Assessment by Energy Safe Victoria of EDPR Safety-Related Programs' dated 14 September 2010 • Matthew Joyce, Witness Statement dated 30 August 2010
34.	20/07/2012	Letter from CitiPower/Powercor to AER dated 20 July 2012 re Vegetation Management Opex Step Change
35.	08/2012	AER, CitiPower and Powercor - Vegetation Management Forecast Operating Expenditure Step Change 2011-15 - Draft Decision (pursuant to Orders of the Australian Competition tribunal in *Application by United Energy Distribution Pty Ltd (No 2)* [2012] ACompT 8)
36.	08/2012	AER, CitiPower/Powercor - Vegetation Management Forecast Operating Expenditure Step Change 2011-15 - Final Decision (pursuant to Orders of the Australian Competition tribunal in *Application by United Energy Distribution Pty Ltd (No 2)* [2012] ACompT 8)
Vegetation Management Category Analysis and Benchmarking Documents		
37.	03/2014	AER, Better Regulation - Explanatory Statement - Final regulatory information notices to collect information for category analysis
38.	25/03/2014	AER, Regulatory Information Notice under Division 4 of Part 3 of the National Electricity Law relating to category analysis
39.	11/2013	AER, Better Regulation - Explanatory Statement - Regulatory information notices to collect information for economic benchmarking
40.	28/11/2013	AER, Regulatory Information Notice under Division 4 of Part 3 of the National Electricity Law relating to economic benchmarking
41.	07/03/2014	AER, Regulatory Information Notice issued under Division 4 of Part 3 of the National Electricity (Victoria) Law - CitiPower
42.	07/03/2014	AER, Regulatory Information Notice issued under Division 4 of Part 3 of the National Electricity (Victoria) Law - Powercor
43.	02/06/2014	Letter from CitiPower/Powercor to AER regarding category analysis regulatory information notice
44.	02/06/2014	CitiPower, AER Category Analysis RIN - Basis of Preparation Documents (Part A)
45.	02/06/2014	CitiPower, Category Analysis Vegetation Management Template - consolidated information

Tab	Date	Document
46.	02/06/2014	CitiPower, Category Analysis Vegetation Management Template - actual information
47.	02/06/2014	CitiPower, Category Analysis Vegetation Management Template - estimated information
48.	02/06/2014	CitiPower, Category Analysis Input Tables Template 2.12 - consolidated information
49.	02/06/2014	Powercor, AER Category Analysis RIN - Basis of Preparation Documents (Part A)
50.	02/06/2014	Powercor, Category Analysis Vegetation Management Template - consolidated information
51.	02/06/2014	Powercor, Category Analysis Vegetation Management Template - actual information
52.	02/06/2014	Powercor, Category Analysis Vegetation Management Template - estimated information
53.	02/06/2014	Powercor, Category Analysis Input Tables Template 2.12 - consolidated information
54.	Undated	All DNSPs' vegetation management category analysis RIN responses (spreadsheets)
55.	27/10/2014	ActewAGL 2015-19 - RIN response - Regulatory proposal - templates consolidated (confidential)
56.	27/10/2014	Aurora 2008-13 - RIN response - Category Analysis - templates consolidated (public)
57.	27/10/2014	Ausgrid 2015-19 - RIN response - Regulatory proposal - templates consolidated (confidential)
58.	27/10/2014	Citipower 2008-13 - RIN response - Category Analysis - templates (confidential)
59.	27/10/2014	Endeavour Energy 2015-19 - RIN response - Regulatory proposal - templates consolidated (confidential)
60.	27/10/2014	Energex 2008-13 - RIN response - Category Analysis - templates consolidated (confidential)
61.	27/10/2014	Ergon 2008-13 - RIN response - Category Analysis - templates consolidated (public)
62.	27/10/2014	Essential 2015-19 - RIN response - Regulatory proposal - responses - consolidated (confidential)

Tab	Date	Document
63.	27/10/2014	Jemena 2008-13 - RIN response - Category Analysis - templates consolidated (confidential)
64.	27/10/2014	Powercor 2008-13 - RIN response - Category Analysis - templates consolidated (confidential)
65.	27/10/2014	SA Power Networks 2008-13 - RIN response - Category Analysis - templates consolidated (confidential)
66.	27/10/2014	SP Ausnet 2008-13 - RIN response - Category Analysis - templates consolidated (confidential)
67.	27/10/2014	United Energy 2008-13 - RIN response - Category Analysis - templates consolidated (confidential)
Vegetation Management Category Analysis and Benchmarking Documents (continued)		
68.	15/08/2014	AER, Draft category analysis benchmarking metrics (word document)
69.	15/08/2014	AER, Draft category analysis benchmarking metrics (spreadsheets)
70.	25/08/2014	Parsons Brinckerhoff, Energy Networks Association - Review of Category Analysis RIN basis of preparation
71.	08/2014	Energy Networks Association RIN Review - Category Analysis RIN Spreadsheets
72.	Undated	Confidentiality deed polls of CitiPower and Powercor
Regulatory obligations and requirements		
73.	1998	Excerpt from the *Electricity Safety Act 1998* (Vic)
74.	2010	*Electricity Safety (Electric Line Clearance) Regulations 2010* (Vic)
75.	9/09/13	Letter from ESV to Powercor enclosing updated exemption from the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to CitiPower
76.	9/09/13	Letter from ESV to Powercor enclosing updated exemption from the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to Powercor
77.	19/12/13	Letter from ESV to Powercor enclosing exemption from the Electricity Safety (Electric Line Clearance) Regulations 2010 granted to Powercor for the town of Ballan
78.	10/14	Energy Safe Victoria's Key Changes Proposed for the *Electricity Safety*

Tab	Date	Document
		(Electric Line Clearance) Regulations 2015 and its Code of Practice
79.	13/10/14	Letter from Energy Safe Victoria enclosing Regulatory Impact Statement for the *Electricity Safety (Electric Line Clearance) Regulations 2015*
80.	2007	Standards Australia - Australian Standard AS 4373-2007 - Pruning of amenity trees
Other documents		
81.	31/07/2014	Powercor, 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan
82.	27/03/2014	CitiPower, 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan
83.	15/10/14	Letter from ESV to CitiPower approving 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan
84.	15/10/14	Letter from ESV to Powercor approving 2014 to 2015 Electric Line Clearance (Vegetation) Management Plan
85.	01/14	Vemco Inspection Reference Manual 2014
86.	10/14	CitiPower October Monthly Report
87.	10/14	Powercor October Monthly Report
88.	2014	2014 – Herbicide – Corridor maintenance list
89.	21/11/2014	2014 PAL Easement Cutting list update 21.11.2014
90.	5/11/2014	2014 Plantations Database 05.11.2014
91.	10/11/2014	Comms inspection update 10.11.2014
92.	28/7/2014	Customer Installation Defect Reports - 28.07.2014
93.	Undated	Data base definitions
94.	10/11/2014	FFU Tracking Sheet 10.11.2014
95.	Undated	Lidar Summary 2013-2014
96.	11/2014	Nov 14 data extract for GHD

Tab	Date	Document
97.	10/10/2014	ORP Database Sept 2014 10.10.2014
98.	3/7/2014	Service Cable insulated conductor transition status at 03.07.2014
99.	6/11/2014	Trees of Interest Database - Oct 2014 at 06.11.2014
100.	25/11/2014	Vegetation database (VDB) Report 25.11.2014
101.	31/12/2014	Vegetation database (VDB) Report 31.12.2014
102.	31/01/2015	Volume forecasts for Powercor (provided by VPN) (TC volume version of vegetation database 31.12.2014)
103.	31/01/2015	Volume forecasts for CitiPower (provided by VPN) (TC volume version of vegetation database 31.12.2014)
104.	2014	2014 – Herbicide – Corridor maintenance list
105.	Undated	Book1 (spreadsheet which outlines number of data audits, number of sites checked, number of variances etc)
106.	Undated	Attachment MJ7 to the witness statement of Matthew Joyce dated 30 August 2010 - HBRA cost calculations spreadsheets
107.	Undated	Victorian distribution Reset RIN – notice – draft
108.	10/14	Victorian DNSP 2016-20 – Reset RIN templates – October 2014
109.	2/02/15	Letter from AER to CitiPower enclosing Reset RIN notice for Victorian distribution determinations
110.	2/02/15	Victorian DNSP 2016-20 – Reset RIN templates

ATTACHMENT D

FEDERAL COURT'S PRACTICE NOTE 'EXPERT WITNESSES IN PROCEEDINGS IN THE FEDERAL COURT OF AUSTRALIA'

FEDERAL COURT OF AUSTRALIA
Practice Note CM 7
EXPERT WITNESSES IN PROCEEDINGS IN THE FEDERAL COURT OF AUSTRALIA

Practice Note CM 7 issued on 1 August 2011 is revoked with effect from midnight on 3 June 2013 and the following Practice Note is substituted.

Commencement

1. This Practice Note commences on 4 June 2013.

Introduction

2. Rule 23.12 of the Federal Court Rules 2011 requires a party to give a copy of the following guidelines to any witness they propose to retain for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based on the specialised knowledge of the witness (see **Part 3.3 - Opinion** of the *Evidence Act 1995* (Cth)).

3. The guidelines are not intended to address all aspects of an expert witness's duties, but are intended to facilitate the admission of opinion evidence[1], and to assist experts to understand in general terms what the Court expects of them. Additionally, it is hoped that the guidelines will assist individual expert witnesses to avoid the criticism that is sometimes made (whether rightly or wrongly) that expert witnesses lack objectivity, or have coloured their evidence in favour of the party calling them.

Guidelines

1. General Duty to the Court[2]

1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.

1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential.

1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

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[1] As to the distinction between expert opinion evidence and expert assistance see *Evans Deakin Pty Ltd v Sebel Furniture Ltd* [2003] FCA 171 per Allsop J at [676].

[2] The "*Ikarian Reefer*" (1993) 20 FSR 563 at 565-566.

2. The Form of the Expert's Report[3]

2.1 An expert's written report must comply with Rule 23.13 and therefore must

(a) be signed by the expert who prepared the report; and

(b) contain an acknowledgement at the beginning of the report that the expert has read, understood and complied with the Practice Note; and

(c) contain particulars of the training, study or experience by which the expert has acquired specialised knowledge; and

(d) identify the questions that the expert was asked to address; and

(e) set out separately each of the factual findings or assumptions on which the expert's opinion is based; and

(f) set out separately from the factual findings or assumptions each of the expert's opinions; and

(g) set out the reasons for each of the expert's opinions; and

(ga) contain an acknowledgment that the expert's opinions are based wholly or substantially on the specialised knowledge mentioned in paragraph (c) above[4]; and

(h) comply with the Practice Note.

2.2 At the end of the report the expert should declare that "[the expert] has *made all the inquiries that* [the expert] *believes are desirable and appropriate and that no matters of significance that* [the expert] *regards as relevant have, to* [the expert's] *knowledge, been withheld from the Court.*"

2.3 There should be included in or attached to the report the documents and other materials that the expert has been instructed to consider.

2.4 If, after exchange of reports or at any other stage, an expert witness changes the expert's opinion, having read another expert's report or for any other reason, the change should be communicated as soon as practicable (through the party's lawyers) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court[5].

2.5 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.

2.6 The expert should make it clear if a particular question or issue falls outside the relevant field of expertise.

2.7 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports[6].

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[3] Rule 23.13.

[4] See also *Dasreef Pty Limited v Nawaf Hawchar* [2011] HCA 21.

[5] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565

[6] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

J L B ALLSOP
Chief Justice
4 June 2013

GHD

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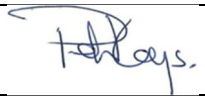
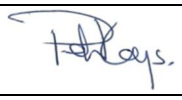
1	J Gater	P Keys		P Keys		25/03/2015

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