# Better regulation

# Explanatory statement

# Draft regulatory information notices to collect information for category analysis

December 2013

AUSTRALIAN ENERGY REGULATOR

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# Shortened forms

| Shortened term | Full title |
|---|---|
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| Augex | Augmentation (capital) expenditure |
| Capex | Capital expenditure |
| DNSP | Distribution network service provider |
| ENA | Energy Networks Association |
| Guideline | Expenditure Forecast Assessment Guideline |
| kW | Kilowatt |
| kVa | Kilovolt-amps |
| MEU | Major Energy Users |
| MVA | Megavolt ampere |
| MW | Megawatt |
| NEL | National Electricity Law |
| NEM | National Electricity Market |
| NEO | National Electricity Objective |
| NER | National Electricity Rules |
| NSP | Network service provider |
| Opex | Operational expenditure |
| Repex | Replacement (capital) expenditure |
| RIN | Regulatory information notice |
| RIO | Regulatory information order |
| STPIS | Service target performance incentive scheme |
| TNSP | Transmission network service provider |

# Introduction

The Australian Energy Regulator (AER) is undertaking the Better Regulation program of work to deliver an improved regulatory framework, which focuses on promoting the long term interests of electricity consumers. A key element of this program was the development of an enhanced approach to assessing the forecast expenditures proposed by electricity network service providers (NSPs) under the National Electricity Rules (NER). This approach has been encapsulated in our Expenditure Forecast Assessment Guideline (the Guideline) which was published on 29 November 2013. The Guideline sets out the various assessment techniques we will employ to determine efficient expenditure allowances and the information we require from NSPs to do so.

The bulk of our consultation on the Guideline over the last 12 months has been on two new benchmarking techniques that we intend to use in conjunction with our existing assessment techniques. The first is developing a nationally consistent reporting framework that will allow us to benchmark expenditure at the disaggregated category level, referred to as category analysis. The second is economic benchmarking, which will allow us to analyse the efficiency of NSPs over time and compared to their peers at a more aggregated level.[1] The draft Regulatory Information Notices (RINs) issued alongside this statement relate specifically to category analysis.

As we have noted in consultation with stakeholders, we need to collect a large amount of data from NSPs to implement these new benchmarking techniques. The data requirements for category analysis are different from those in economic benchmarking. The category analysis data is disaggregated because we will be using it in direct comparisons to drivers and workloads for different activities. For economic benchmarking we require aggregated data because we will use it for top-down analysis. This means that we need to collect information on similar topics for both techniques at different levels of aggregation.

We have been consulting extensively with stakeholders in relation to the process, techniques and data requirements associated with benchmarking. Following the publication of our issues paper in December 2012, we conducted a series of workshops between March and June 2013. For category analysis, we set out our approach and data requirements in a detailed appendix to the draft Guideline explanatory statement we published in August, along with indicative data templates, for stakeholder comment. Following this we sought initial feedback from all NSPs in the form of an informal survey as well as in joint meetings in several capital cities.[2] We also hosted more in-depth bilateral meetings and sought further material from all NSPs on specific elements of the templates. This was useful in helping us understand the circumstances (particularly reporting arrangements and likely compliance burden) of each NSP and resulted in amendments to the templates that now form part of the draft RINs. Importantly, these discussions have allowed us to streamline the templates and, in some cases, significantly reduce the data burden anticipated with respect to the indicative templates we initially released.

This explanatory statement should be read in conjunction with the following draft RINs we have now released:

- RINs issued on Ausgrid, Essential Energy, Endeavour Energy, ActewAGL, TransGrid and Transend, collecting information relevant to our assessment of forecast expenditures under the NER, as well as benchmarking reports. Specifically, a full time series of historic and forecast

[1] More information on data requirements for economic benchmarking can be found on our website: http://www.aer.gov.au/node/21836

[2] Meeting summaries and the indicative templates can be found on our website: http://www.aer.gov.au/node/21843

expenditure data expressed by major expenditure categories. The data and requirements relating to these templates are referred to here as the "**Reset RINs**".

- RINs issued on other DNSPs and TNSPs requesting this same category expenditure data, however only for the most recently completed five regulatory years. The data and requirements relating to these templates are referred to here as the "**Category Analysis RINs**".

The aim of the expenditure data templates contained within these two sets of RINs (referred to collectively as the "**category templates/ data**") is to collect a consistent, standardised time series of expenditure and related drivers or volume measures. The main use of this information is to conduct trend and benchmarking analysis, which will be supplemented by other information collected at the time of the reset for each NSP, as well as in ad hoc requests leading up to the publication of our new benchmarking reports.

Issuing the draft RINs commences the formal process of consultation with interested stakeholders before we issue final RINs in 2014. As noted above, the Reset RINs are being developed for NSPs submitting regulatory proposals on 31 May 2014. The Category Analysis RINs are being developed at the same time and will apply to the other NSPs. The parallel processes are driven by the need to collect the same information from all NSPs at the same time in order to conduct benchmarking and other analysis in network decisions and in our benchmarking report in late 2014. While the requirements (for the category data) in each RIN are essentially the same, there are several instances where the two sets of RINs diverge (aside from collecting historic and forecast information) including differences between requirements for DNSPs and TNSPs, which are explained throughout in this document.

As flagged in consultation over 2013, we intend to publish the information received in response to these RINs and engage with the sector in conducting analysis of this standardised data. We expect to host further workshops and other relevant meetings on these data from around mid-2014. Our first formal consideration of this analysis will be in the form of our issues paper[3] released as part of the NSW/ACT and Transend reviews around July 2014. Similar to our current process in publishing performance reports[4], we will give NSPs an opportunity to comment on benchmarking results before we prepare and publish our first annual benchmarking report in September 2014.

Over the medium term, with visibility of NSP data and our assessment techniques, we expect our analysis of expenditures will inform, and be informed by, analysis and modelling conducted by interested parties, including NSPs and consumer representatives. Ultimately the major output of this analysis will be to rigorously test the expenditure proposals put to us by NSPs at the time of each reset, as required by the National Electricity Rules (NER). More broadly, and in conjunction with our separate (but related) dataset for economic benchmarking, this work will assist in a greater engagement and understanding of the different drivers and other influences affecting NSPs across the NEM.

Our data requirements at the aggregated category level generally align with what all NSPs have reported to the AER (and previous jurisdictional regulators) in the past. However the move to a nationally consistent reporting framework that embodies a more detailed set of information (required to support a much more rigorous assessment approach) will involve NSPs having to bear some burden and costs in providing this information. This also involves recasting information already

[3] NER clauses 6.9.3(b) and 6A.11.3(b) require the AER to publish an issues paper 40 business days after the receipt of the NSP's proposal. While this is not required under transitional arrangements for these next resets, we consider such issues papers to be a valuable step in the reset process and intend to publish them outside of the NER requirements.

[4] NER clause 8.7.4.

provided to the AER into new formats. In many cases this will require NSPs to make assumptions or estimations in order to generate the historic information we require to conduct robust time series and benchmarking analysis. We do not consider these estimations or assumptions will necessarily detract from the analysis we propose to undertake, and the robustness of information is something the AER (on advice from NSPs and other stakeholders) will need to consider when undertaking assessments of efficient expenditure. The processes undertaken by NSPs to generate this information will also be subject to appropriate auditing and certification requirements, and we intend for these estimation methods to be published alongside the data provided.

In the most recent consultation on the category templates, NSPs raised concerns around their ability to provide robust and reliable historic data in the templates we initially proposed. As per the situation with economic benchmarking data requirements, this concern included the anticipated requirements on NSPs to provide auditing and statutory assurances on the accuracy of historical information.

We have been mindful of issues around providing clear instructions on the preparation of data, including through appropriate definitions and requesting transparency on how NSPs have prepared data. This clarity and transparency is critical in allowing NSPs and other stakeholders to understand potential issues in comparability and analysis of the category data. We welcome further discussion on defining terms and recognise this will be an ongoing process that may result in refinement to the data requirements over the medium term.

Prior to issuing final RINs, we will host further workshops and bilateral meetings with NSPs as appropriate to discuss these issues. We hope this explanatory statement will provide a useful reference document for these discussions, as well as assist NSPs in making informed and targeted submissions on the draft RIN.

### Next steps

A summary of the key indicative dates for upcoming RINs for both benchmarking workstreams is as follows. Note RINs and related processes relating to NSPs submitting regulatory proposals after May 2014 are not listed.

**Table 1 Milestones for expenditure data requirements**

| Date | Economic benchmarking | Category analysis/ reset RINs |
|---|---|---|
| 15 November 2013 | Issue final RIN | |
| 6 December 2013 | | Issue draft RINs |
| Mid December/ early January | | Bilateral meetings with NSPs |
| 17 January 2014 | | Written submissions on draft RIN due |
| 16 February 2014 | RIN responses due | |
| Late February/ early March 2014 | Commence data testing and validation | Issue final RINs |
| April 2014 | Data published on AER website | |
| 31 May 2014 | Audit reports due | RIN responses due |
| April 2014 | | Data published on AER website |
| June 2014 | Publication of AER issues paper | |
| September 2014 | Publication of AER benchmarking report | |
| November 2014 | Publication of draft decisions for NSW/ACT NSPs and Transend | |

## Request for submissions

Pursuant to section 28J of the National Electricity Law and the terms of the draft RINs, we invite written submissions on the draft RINs. Stakeholders are allowed 20 business days to make submissions. The closing date and time for submissions is 5 pm Australian Eastern Daylight Time on Friday, 17 January 2014.

Instructions on where and how to send submissions to the AER are contained in each draft RIN, and differ depending on whether or not they relate to NSPs commencing resets next year.

Enquiries about this paper or about lodging submissions should be directed to the Network Operations and Development Branch of the AER on (03) 9290 1444.

# 1 General issues

This chapter justifies the value of the information requirements set out in the draft RINs and associated templates, including the significant improvements made with respect to the indicative templates we released for consultation on 9 August 2013.[5] It also explains related issues around the consultation process, definitions, auditing and general data issues in developing the draft RINs. Some of these matters were also raised in relation to consultation on RINs for economic benchmarking techniques, in particular for auditing and assurance requirements.

Issues raised in relation to the individual category templates are dealt with in the remaining chapters of this explanatory statement.

## 1.1 Data burden and quality

### 1.1.1 AER position

We consider the incremental burden on NSPs arising out of new or changed reporting arrangements in the draft RINs is offset by the expected improvements in our ability to assess expenditure proposals (including through preparing benchmarking reports). We have articulated the relevance and use of all information we are seeking and have carefully balanced this against the ability and effort required of NSPs, ascertained over the last few months of discussions, in providing this information.

We will only request 5 years of actual/ historic data, meaning:

- January 2008 to December 2012 for DNSPs in Victoria
- April 2009 to March 2013 for SP AusNet (transmission)
- July 2009 to June 2013 for all other NSPs.

The reset RINs will collect these same years of actual historic data plus data for July 2013 to June 2019, encapsulating forecasts for the five years of the forthcoming regulatory control period as well as an estimate for the final year of the current period.

In line with our different assessment approaches for operational expenditure (opex) and capital expenditure (capex), forecast/ estimated data will be required for capex categories only. NSPs will have discretion to develop and present opex forecasts using their own methods and categories, however these will not be requested in standardised templates. This is in accordance with our opex assessment approach, which relies on scrutiny of "base year" or actual expenditures as a basis for considering efficient forecast opex into the forthcoming regulatory control period (as opex is largely recurrent).

### 1.1.2 Reasons for AER position

In developing the draft RINs, the burden on NSPs in providing requested data has been significantly reduced with respect to that anticipated in the indicative templates we released in August.

During consultation on the indicative templates, NSPs expressed concern at the heavy burden generated, not only in terms of the time taken to populate them but also the opportunity cost of their staff in doing so. NSPs questioned whether the AER would make much use of the data in the

[5] The indicative category templates can be found here: http://www.aer.gov.au/node/21843

templates. They reiterated concerns raised as part of general consultation on the Guideline that requiring NSPs to generate historic data in new formats, through estimation or assumptions, would adversely affect data quality and consistency.

Several NSPs also indicated that, while historic data presented difficulties, they would be able to report data for future years in the AER's format. They noted, however, this would require significant expenditures and lead time to implement changes to allow data capture, and so they would require a firm commitment that this information would be a lasting requirement and a high priority for the AER. In this context, some NSPs noted efforts already being undertaken to capture data with respect to more recent AER assessment techniques (primarily the replacement capital expenditure or 'repex' model) and expressed concern that the current consultation process considered further changes to the related information requirements. Some NSPs also noted that they were expecting to improve data capture for some activities regardless of the AER's requirements (e.g. for their own management purposes).

Overall we have addressed these concerns. There is potential scope for further refinement to the templates, instructions and definitions, however we are comfortable that the data required is the minimum necessary to undertake robust category analysis.

We have also accounted for NSPs' concerns around providing 10 years of back cast data, including data availability, changes to systems or corporate structures over time, and in general having to estimate or make assumptions to generate historic information. We consider 5 years of historic information will be sufficient to undertake trend and benchmarking analysis.

## 1.2 Process for RIN development

### 1.2.1 AER position

As communicated throughout consultation on the Guideline, our intention with respect to category analysis data is to align consultation and the issuing of RINs to meet the timeframes for the upcoming resets for NSW/ACT NSPs and Transend. Specifically, all data for category analysis purposes will be submitted to the AER by 31 May, alongside regulatory proposals for these NSPs. Justifications for these timeframes are briefly discussed below but also contained in chapter 7 of the Explanatory Statement to the final Guideline.[6] Briefly, these timeframes will ensure that the AER has a full set of category analysis data from all NSPs in order to conduct benchmarking and trend analysis for the upcoming resets and in its first annual benchmarking report.

### 1.2.2 Reason for AER position

#### Overlapping and multiple RINs

Ultimately the AER has the current objectives with respect to reporting of expenditure information:

- continue collecting data for the same categories/ definitions currently used by NSPs in order to monitor performance with respect to current regulatory determinations
- move to new, standardised categories for the purposes of improving our assessment of relative performance at disaggregated levels of activity/ costs

[6] AER, *Explanatory Statement – Expenditure Forecast Assessment Guideline*, November 2013, pp. 105-110.

- begin collecting information on input, output and environmental factors for the purposes of monitoring efficiency at aggregated levels.

The timing requirements for new expenditure data are driven by the need to gather sufficient information to generate our first annual benchmarking report, as well as for use in assessing the expenditure proposals for the next round of network determinations.

We have indicated our preference to merge all annual data reporting requirements into a Regulatory Information Order (RIO) for the sector from 2015.[7] This reflects that we anticipate collecting sufficient historic/ backcast information in the RINs to be issued in late 2013/ early 2014, with NSPs providing annual information thereafter in the same format and at the same time for category and economic benchmarking data.

In recent discussions, NSPs noted the inconvenience of having to comply with and consult on multiple RINs. For example, some NSPs are currently:

- collating data for annual reporting purposes in compliance with (annual reporting) RINs the AER has already issued
- consulting on revised annual reporting RINs that deal with the remaining years of existing regulatory determinations
- preparing data in response to RINs for economic benchmarking
- consulting on RINs for category analysis
- anticipating further consultation on RINs to be issued for regulatory determinations commencing in 2014 and beyond.

We are mindful of the burden these multiple processes create for NSPs. We have, at each opportunity, sought to explain their justification in line with the objectives set out above.

Similar to the RINs for economic benchmarking, the draft RINs contain an obligation for NSPs to continue to report category analysis data in the same format on an annual basis. The drafting allows for this obligation to be superseded by any separate process to consult separately and issue a standing RIO to consolidate many of the separate reporting arrangements currently applicable to NSPs. Such a process of consolidation has also been provided for in the RINs for economic benchmarking.

### Pre-consultation on the category analysis templates

In early September we contacted all NSPs, inviting them to attend state-based workshops as well as to complete a brief survey indicating their initial responses to each of the category templates. Most NSPs were able to complete this survey and all NSPs attended these workshops (held in late September). While the ability of some NSPs to engage in this stage of consultation was limited for various reasons (noted below) we considered these exchanges were highly valuable in identifying common areas of concern, as well as in investigating potential improvements to the templates. Most concerns related to the level of detail in some of the templates, and the usefulness of this information as part of the AER's expenditure assessments. NSPs found this process useful by gaining clarity on more general issues, including the process and scope of data collection, as well as in being able to

[7] AER, *Explanatory Statement – Regulatory information notices to collect information for economic benchmarking*, September 2013, p. 10.

reiterate important concerns around the quality of information and auditing assurances (discussed further below). From these discussions we requested further information from all NSPs, mostly regarding their current processes of data collection and, related to this, the degree of burden involved in completing the indicative templates. In tandem with these information exchanges, many NSPs also facilitated direct access to their subject matter experts to enable AER staff with responsibility for each template to further understand the reporting and operational arrangements affecting the data in the individual templates. We were able to take this information and, taking account of our improved understanding of the issues raised and further input by our internal technical advisors, make considerable refinements to the templates.

We have also been able to leverage off the consultation on economic benchmarking RINs and thus come to a more considered position for the draft RINs for the category templates. This primarily relates to auditing and certification requirements which are of particular concern to NSPs. We have also continued the practice of issuing an explanatory statement (though not required under the NEL provisions) to accompany the draft RINs to better explain how we have reached our positions.

These positive outcomes notwithstanding, we recognise the process of development leading to the draft RINs has been under a more compressed timeframe than we would have liked and not all NSPs were able to engage on all the details to the same extent. This explanatory statement notes some particular areas where we consider NSPs are likely to want further guidance on aspects where we have made material changes to the indicative templates. Such areas are, however, limited in number and reflect an overall reduction in the volume of data requested, and thus should be resolvable through further discussions and written submissions prior to the issue of final RINs in 2014.

We note that several NSPs expressed some concerns at the timeframes and process of engaging in consultation on the indicative templates, including because of:

- expectations there would be a separate consultation process outside written submissions on the draft Guideline and explanatory statement
- staff resourcing on competing AER consultations (e.g. other Better Regulation workstreams as well as other RINs)
- the NSP's desire to provide a thorough review of the full scope of the data templates, including of their ability/ difficulties in providing the information and a review of data currently held in the NSP's systems
- confusion on the scope of the data requested in the indicative templates, including for transmission and distribution, and whether historic or forecast information was sought, and for which years.

One NSP noted (although is a view likely to be shared with other NSPs) that the indicative category templates proposed to collect significantly more information than contemplated in economic benchmarking templates, however the time afforded to consulting on the former was not commensurate in light of this comparison. It considered that the first opportunity to provide formal comments on the templates would be limited to written submissions on the draft RIN, and the time allowed to prepare this response would be constrained by the Christmas/ New Year period.

Other NSPs noted that, while they appreciated the opportunity to meet with AER staff to discuss the templates, their ability to provide considered responses at meetings was limited due to the availability of subject matter experts that could attend.

It would have been desirable to commence more detailed consultation on category analysis templates at an earlier stage, however, commencing this process in August was necessitated by having to reach firm positions on the assessment approach, as expressed in the draft Guideline. Appendix B of the explanatory statement to the draft Guideline contained our analysis of data requirements, primarily based on discussions with stakeholders at the many workshops and bilateral meetings we held over the first half of 2013. In addition, and as noted further below, commencing discussion on data requirements later in the process was also in response to the preferences of NSPs on the whole.

Overall we made the best use of the limited time available through workshops, bilateral meetings and direct information exchanges and discussions with NSP staff as outlined above. We consider this has enabled us to reach a solid landing on the draft RINs and this should allay NSP concerns.

It is the case the economic benchmarking templates were able to be released more quickly, but this is largely because much of the consultation over 2013 on this information was around identifying and defining more aggregated input/ output and environmental variables. The concurrent consultation on category analysis has, in contrast, focussed on identifying key cost drivers and the many disaggregated activities NSPs undertake in their daily operations and environments. This has taken considerably more time. The different timeframes and consultation approaches across the two workstreams also reflect that economic benchmarking data will be subjected to a discrete testing and validation process over early 2014 to narrow down model specifications. Once category analysis data is collected and published, the trend and benchmark comparisons that are possible should be clearer.

The compressed timeframes for development of the draft category analysis RINs is also in part a reflection of our attempts to ensure stakeholders were "up to speed" on our overall approach. This was in direct response to NSP concerns that the AER had taken a too narrow focus on benchmarking and category analysis techniques at the earliest stages of consultation:

> Experience with the first several workshops run by the AER confirms the ENA's concern that too much is being attempted at once. It seems that relatively little effort is focused on the AER's overall approach and expenditure assessments, including those to be used in the immediately upcoming round of reviews. Meanwhile, most of the effort is being directed at work related to annual benchmarking reports, as well as category assessment and benchmarking techniques that are more likely to be employed in subsequent regulatory review rounds. Given the extensive effort required of businesses and the AER in the workshop process, with multiple workshops being held on a near weekly basis, the ENA believes that the effort needs to be better balanced to reflect the task set out by the NER. This is not to say that the AER should not be consulting on matters relating to annual benchmarking reports, in fact the ENA welcomes this consultation. However, the main purpose of the guidelines should not be sidetracked by detail that may be better covered in separate forums.[8]

Many early workshops were characterised by NSP resistance to discussing details of economic benchmarking and category assessments before any discussion of the overall assessment approach. This was resolved in the fullness of our consultation agenda and in publishing our approach in the draft Guideline, however we had concluded that proposing detailed data requirements in earlier discussions (that would have allowed a longer consultation on RIN templates for category analysis) would have further inflamed concerns over engaging prematurely on matters of detail.

[8] Energy Networks Association, *Better Regulation – Expenditure forecast assessment guidelines for electricity distribution and transmission – Issues paper*, 8 March 2013, pp. 3-4.

### Legal matters

We were also particularly mindful of NSP comments on the economic benchmarking RINs regarding various issues under the NEL, including the need for the AER to:[9]

- more fully explain reasons for requiring the information in each RIN template as required by s. 28K(1)(c)
- demonstrate the RIN is 'reasonably necessary' as required by s. 28F(1)
- consider the likely costs to NSPs as required by s. 28F(2)(b)
- demonstrate we have reason to believe NSPs are capable of providing the information (such as back cast data) as required by s. 28(1).

We consider we have complied with the NEL. This explanatory statement addresses all of these points for individual categories of expenditure. In addition, the draft RINs contain a statement of reasons that references documentation around Better Regulation documentation that addresses:

- the need for the RIN
- why we are collecting the information
- why the cost of compliance to NSPs and the AER is heavily outweighed by the benefits.

We consider NSPs are capable of providing the information required by the draft RINs as we have allowed NSPs to generate best estimates where it is not possible for them to provide actual information. In addition, recent consultation on the indicative templates has involved questioning areas where some NSPs do not currently maintain information in the format we have proposed. In many cases we have removed this information in developing the draft RINs.

## 1.3 Auditing and certification process

### 1.3.1 AER position

Overall we have adopted the same auditing and certifications requirements as the recently issued RINs for economic benchmarking.

All requested (historic) data should be audited. Our position is to require reasonable (positive) assurance on actual financial information and negative assurance on all other information. The audit standard for estimated financial information is ASRE 2405 and actual financial information is ASA 805. The audit standard for non-financial information is ASAE 3000. A NSP can use suitably qualified non-financial auditors to audit non-financial information if the AER currently allows this for the non-financial information the NSP reports annually.

The draft RINs require NSPs to prepare bases of preparation for historical information reported in their RIN responses. The basis of preparation outlines how a NSP prepared its response to the RIN and in doing so complied with the requirements of the RIN. To assist NSPs in doing this this, we developed instructions (as an appendix to the RIN) on how to complete (and comply with) the RIN templates and the requisite bases of preparation. Bases of preparation will be published alongside responses to the RINs.

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[9] AER, *Explanatory Statement – Regulatory information notices to collect information for economic benchmarking*, November 2013, p. 17.

### 1.3.2 Reasons for AER position

Overall we expect that data will be prepared or estimated on a reasonable basis. Historical costs should be measured as costs that are incurred 'on the job' and are reconcilable to the NSPs' internal cost recording systems. NSPs must report historical cost data in a way that is consistent over time and reconciled to statutory and regulatory accounts. Without consistent reporting, we cannot conduct benchmarking analysis. The auditing and certification process provides us with assurance that NSPs have complied with our requirements.

Forecast category data provided to us in the reset RINs must also be reconciled to regulatory proposals and the NSPs' internal planning documents. It must also reconcile to any models that NSPs provide as part of the regulatory process or used to justify their proposals. We may not accept, or may place low weight on, information sources that we find to be irreconcilable or inaccurate.

We recognise the potential risk that an audit firm could be subject to a legal challenge if a member of the public suffers loss from using the audit report for unintended purposes. While it is most likely a small risk, we agree that nonetheless it is a risk, particularly given the special purpose nature of our RIN requirements. As long as the RIN responses are independently audited and reviewed and NSPs provide the reports to us, we can be comfortable with the veracity of the RIN responses. This is also consistent with current AER requirements. As such, we will not publish audit reports provided on the RIN responses.

For annual reporting RINs for some NSPs we currently allow qualified non-financial auditors (such as engineering firms) to review non-financial information. Consistent with our stance on data collected for economic benchmarking, and in the interests of RIN compliance and cost minimisation for NSPs, we will continue to allow NSPs to use suitably qualified non-financial assurance practitioners to audit non-financial information where this is currently the case for annual reporting, provided the assurance practitioner meets the requirements of ASAE 3000.

These features of the draft RINs for category analysis data are in reflection of suggestions made by NSPs on the requirements of the economic benchmarking RINs, particularly to:[10]

- develop a Regulatory Accounting and Assurance Guidelines that set out a framework for providing information to the AER, providing guidance for NSPs and auditors
- provide more information and guidance on audit requirements
- require NSPs to provide information with the RIN responses that explains basis upon which the responses were prepared, including accounting policies and assumptions
- use particular auditing standards for actual and estimated information, as well as financial and non-financial information
- recognise issues around the publishing of audit reports.

We consider the bases of preparation, as well as the detailed instructions and definitions in the draft RINs, provide a suitable framework for auditing requirements as well as transparency for the AER and other stakeholders looking to understand how data are prepared. This includes addressing potential issues around the need to estimate data and impacts on comparability across NSPs and over time.

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[10] AER, *Explanatory Statement – Regulatory information notices to collect information for economic benchmarking*, November 2013, pp. 23–24.

The following sections address details around compliance and implementation issues.

## RIN compliance

We want to underline our expectations around compliance with the RINs, in that:

- NSPs must complete all input cells in the templates. The templates clearly mark which cells require input and which are calculated. NSPs must enter a value into the cell that corresponds to the unit required. NSPs must not input 'N/A' or similar – this will amount to non-compliance.
- Exceptions to this are limited circumstances where data are not applicable to a NSP or not required by us. The instructions and definitions document and the templates clearly identify the variables that fall into this 'not applicable/not required' category. A NSP may, for these data only, black out the cells rather than input information.

For example, some cells in the data templates have been designed to accommodate instances where NSPs may capitalise or expense certain items or provide services under different NER service classifications. NSPs that do not capitalise certain costs, or do not provide particular services, are not expected to generate this information. Such variables are fully identified in the RIN instructions and are generally limited to:

1. non-network items (for example, IT and vehicles) subject to purchase and lease decisions
2. customer-initiated works categories, including metering and public lighting, where service classifications may not be applicable to some NSPs
3. customer-initiated works categories subject to different capitalisation/ expensing approaches
4. overheads categories that are subject to different capitalisation/ expensing approaches.

There may be other input cells that a NSP considers do not apply to it. For these cells, the NSP must nevertheless provide an input, even if that input is '0'. For these cells, NSPs should consider the variable as a question and the input they are providing as a response to the question. For example, if a NSP incurs expenditure on a certain activity but does this entirely with in-house resources, the NSP can still provide a logical answer to the question 'how much expenditure was incurred on contract costs for that activity?" by inputting '0'.

It would not, however, be logical to answer the question 'what is the weather adjusted non-coincident maximum demand at the zone substation level?' with '0' because maximum demand (weather adjusted or not) cannot logically be 0.

Further, this also means that NSPs must not enter '0' because they consider it would be difficult or burdensome to provide the information if a variable warrants a non-zero response.

In order to comply with the RINs, a NSP must provide estimates for some variables, and depending on the variable this could be for particular years or for the whole back cast time series. In such circumstances, NSPs must provide their best estimates and explain how they produced the estimate. Compliance with the RIN requires NSPs to genuinely consider their method of estimation is the best available to it and to explain, in its basis of preparation, how it produced the estimate.

This basis of preparation will be of paramount importance to stakeholders wishing to understand any issues in how NSPs have generated data, particularly in considering benchmarking results affected by these data and estimation methods. The additional public scrutiny applied to these bases of

preparation should provide a degree of discipline on NSPs to make these documents clear and comprehensive, as well as ensure they have made genuine efforts to use the best available method of estimating data where this is required. We reiterate that while NSPs will be required to generate estimates in some cases, where they use best endeavours to do so we do not anticipate compliance issues.

#### Issues register

We will not be publishing or maintaining a general issues register for NSPs completing the RINs given this may result in non-compliance. In particular, we a reluctant to provide for NSPs' responses to the RIN (and hence their compliance with an instrument issued under the NEL) contingent upon further unspecified guidance or discussions with between NSPs and the AER. That said, NSPs will be welcome to contact us via expenditure@aer.gov.au while completing the RINs should they require clarification.

#### Implications of no audit opinion or adverse audit opinion

The draft RINs require NSPs to submit audit and review reports with their completed templates on 31 May 2014. If a NSP's auditor does not provide an opinion, the NSP will not comply with the RIN.

We expect adverse opinions would arise only in circumstances where a NSP does not complete the RIN templates or does not adequately explain how it has completed the templates. We do not expect adverse opinions to arise simply because the NSP has been required to generate an estimate and this is difficult to do. If NSPs are concerned about receiving an adverse opinion, they should consult with their auditors to ensure they are completing the templates and bases of preparation appropriately and in accordance with the RIN requirements.

## 1.4 Statutory declaration

### 1.4.1 AER position

Consistent with our approach on the economic benchmarking RINs, NSPs are required to certify that historical data are true and accurate (for actual information) or the NSP's best estimates (for estimated information). The NSP's chief executive officer (CEO) must make the statutory declaration.

For the sake of clarity (and in light of the approach adopted for RINs issued for economic benchmarking) the statutory declaration and auditing requirements for category analysis data applies to the full five years of back cast data.

### 1.4.2 Reasons for AER position

NSPs are required to provide the statutory declaration with the audited data when submitting data in May 2014. We will place less weight on information that has not been audited or certified. This is to ensure veracity of all the information received in response to the RIN.

The CEO is the officer responsible for making the statutory declaration. Administratively, this should place less of a burden on NSPs given that a CEO should be able to make the declaration without needing to hold a meeting with the NSP's Board of Directors.

The statutory declarations for the draft RINs have been drafted to take account that it may be unreasonable for an officer of a NSP to certify that the information provided in response to the RIN is fit for the AER's requirements. We will be satisfied if information is provided in accordance with the RIN, which includes NSPs providing actual information unless it is not possible to do so and best

estimates in all other instances. It is for the AER to determine the usefulness of the information once we have received it.

This position is in direct response to submissions on the economic benchmarking RINs that raised issues regarding:

- the form of the statutory declaration, particularly the requirement that NSPs certify that the information is fit for the AER's requirements
- signing a declaration on unaudited data
- ambiguity regarding who should sign the declaration.[11]

Our requirement to have all 5 years of historic category analysis data audited is consistent with the approach adopted for economic benchmarking data. We do not consider this will add unnecessary burden and this level of scrutiny will provide important assurances on the information provided by NSPs.

## 1.5 Input and contract costs

### 1.5.1 AER Position

We have made revisions to the templates to significantly reduce the data requested for the reporting of direct costs by input type (labour, materials, contractors, network and corporate overheads) as well as our approach to capturing costs for large service contracts and for related parties.

We now only require input costs reported at the aggregate level. For example, for a given type of pole replacement we only require the total cost for this activity and not broken into component inputs costs. However, at the more aggregated level (sub category/group) we will require NSPs to break costs down into the following:

- Direct labour
- Direct materials
- Contracts (with non-related parties)
- Contracts (with related parties)
- Margins (on contracts with related parties)
- Other direct costs.

The sum of direct labour, direct materials, contracts (with non-related parties), contracts (with related parties) and other direct costs should equal total expenditure for the relevant sub category.

To undertake analysis of labour costs at an aggregated level, we will also be requiring NSPs to report the composition of their internal labour force across high level expenditure areas (e.g. replacement expenditure). We are requesting labour costs for different classification levels of employee to be reported against ordinary earnings plus on costs, overtime earnings plus on costs, allowances and other. We will also require NSPs to report stand down periods. All of the metrics we require should be

[11] AER, *Explanatory Statement – Regulatory information notices to collect information for economic benchmarking*, November 2013, p. 27.

reported as yearly averages for grades of employee and we consider should generally reflect high level information available from NSPs' financial systems.

### 1.5.2 Reasons for AER position

#### Input cost information

The reduction in reporting of input costs reflects a key change in the volume of information contained in the indicative category templates, which requested all costs across the all asset types (e.g. for repex) and activities (e.g. vegetation management) to be disaggregated into their various inputs.

We still require the breakdown of expenditure at the higher level to show the key drivers of cost within the categories, their changes through time and the relative differences across NSPs. We consider this will allow us to better target areas for further assessment and understand differences in unit costs across firms while imposing relatively limited additional burden on NSPs.

NSPs indicated in recent consultation that disaggregating these costs in the way envisaged in our indicative templates was infeasible, however, they noted that they generally capture input costs at broader activity/group and project levels in their financial systems.

The information on labour costs in the draft RINs will allow us to examine actual labour costs and employment practices as they are reflected in their expenditure and identify potential inefficiencies for further analysis. We consider NSPs should generally record this information at this level and be able to report this information; however, we will be seeking submissions on this issue.

We have refined the definitions of these common input costs as per Table 1.1

**Table 1.1 Input cost definitions**

| | |
|---|---|
| Direct Labour | Expenditure on salaries comprising base salary, bonus, and overtime allowances, as well as provisions for superannuation, payroll tax, long service leave that can be directly attributed to the asset being replaced. In accordance with an approved cost allocation methodology. |
| Direct Material | Expenditure on materials that is specifically attributable to the asset being replaced. In accordance with an approved cost allocation methodology. |
| Contractor/Outsource | Expenditure on outside agents employed by a network service provider (NSP) to perform a specific task rather than the NSP performing the same task in-house, in accordance with a contract entered into with the NSP usually following a competitive process for the awarding of the right to enter into that contract. A contractor can be either a related party or a non-related party to the NSP. |

#### Approach to contractors costs

We acknowledge that NSPs may have contracts that relate to expenditure across multiple expenditure categories. This is a particular issue for IT & Communications contracts. Where NSPs have contracts that relate to multiple reporting areas in our templates they should allocate costs across the templates and indicate their method of allocation. For example, if a NSP has a lease related to 20 light commercial vehicles, some of which were principally acquired for network usage and some of which were acquired for non-network usage, we would expect the NSP to allocate the vehicles principally acquired for network use accordingly and record the estimated expenditure

associated with these vehicles and their utilisation data in the relevant network motor vehicles section of the template. We would expect the estimated expenditure and utilisation measures relating to the vehicles principally acquired for non-network use to be recorded in the relevant non-network motor vehicles section of the template.

In consultation, many NSPs noted that the unit cost composition included in the indicative category analysis templates did not align with their contractor's cost breakdown structures. They noted that a split of labour/materials/contractors would be more appropriate. We have amended our input cost composition accordingly and now only require a break-down of contract costs in relation to contracts with related parties and associated margins and for larger augmentation projects and programs.

### Related party contracts

We will assess related-party contracts using the approach we have outlined in the final Guideline.[12] Efficient contract costs are those expected costs based on outcomes in a workably competitive market. We will need complete information on contracts to determine whether they reflect such efficient costs, including information on:

- related-party contracts, and
- contracts that fail the presumption threshold.

For these contracts, we will benchmark contract costs as they related to our various category and activity data, and for those that fall outside the trend or benchmark, we will conduct a detailed review on the cost components (in particular, the contractor's margin).

We will also require NSPs to provide other supporting information that justifies the efficiency of costs under these contracts, as well as information relevant to satisfying our presumption threshold, including:

- details/explanation of the NSP's ownership structure
- a description of the tender processes, including tender documents, bid details and tender evaluation
- a description of outsourcing arrangements
- justification of amounts paid to related parties (for example, a consultant's report on benchmarking of margins)
- copies of related party contracts
- probity reports by an external auditor on the NSP's tender process.

As we explained in the explanatory statement for the final Guideline, we already applied this assessment approach in previous determinations, and we believe the assessment approach is transparent and well-understood. In future resets, we will assess contracts using the same approach, whilst consulting with NSPs and having regard to information confidentiality requirements of the NER.

We will require data for all related party contracts, and in particular, related party contracts that are material or major. In the draft RINs, we require data on the total contract cost and the related party

[12] See for example AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution,* November 2013, pp. 9–10.

margin. This information is relevant to our assessment approach, in that we benchmark the total costs of related party contracts as a first step, and if any of these appear inefficient, we will look at the related party margin and other cost components.

Our examination of related party contracts as a specific cost item also relates to new NER requirements for treating capitalised related-party margins when rolling forward the regulatory asset base.[13] We therefore require data on margins in related-party contracts for an ex post assessment, if necessary.

## 1.6 Miscellaneous issues

### 1.6.1 AER Position

We have also improved the templates or made revisions to:

- removed the requirement to classify aggregated expenditure according to the feeder classifications for reliability reporting (i.e. CBD, urban etc.)
- significantly expand the number of definitions as well as clarified definitions that were previously in the indicative templates
- provide guidance, where possible, on how NSPs should allocate costs or develop assumptions where definitions are potentially ambiguous or where data have to be estimated
- create versions of the templates depending on whether forecast years are required (i.e. for reset RINs) as well as for transmission and distribution
- made the templates them more user friendly and to reduce their file size.

### 1.6.2 Reasons for AER position

#### Definitions and guidance

In the draft RINs we have set out an extensive list of detailed definitions, including some examples of where typical costs/ activities should be included or excluded from particular items. Clarity of on where and which costs are captured is of paramount importance where benchmarking analysis is to be employed.

Ultimately complete details and definitions cannot be provided that will cater for all possible circumstances. In instances where NSPs are to use discretion on assigning costs to particular cells in the templates, they will be required to clearly set out their interpretations and assumptions used, and to provide supporting documentation/ workbooks where this is the case. This information will be published to ensure stakeholders are aware of any differences in interpretation and to consider any resulting comparability/ quality issues.

NSPs should ensure when providing information:

- any estimate is based on a causal link between the raw data and the data we require, or
- if no causal link can be established without undue cost and effort, the most appropriate estimate should be used, and NSPs should explain why it is an appropriate estimate. In explaining why it is

[13] NER, clauses S6.2.2A and S6A.2.2A

the most appropriate estimate, NSPs should outline other options considered and why they were not the most appropriate estimate.

NSPs raised at several points during consultation the importance of providing clear and concise definitions, and also suggested the AER publish a "regulatory accounting guideline" to provide a structured auditing and data preparation framework for NSPs. While we have not published a guideline, the instructions to the draft RIN should provide sufficient guidance to NSPs in completing the templates, and we welcome feedback on whether improvements could be made.

We consider that under a review engagement an auditor will be able to derive a conclusion as to whether the methodology and assumptions applied to a given data set is not unreasonable (negative assurance). The AER would need to assess the appropriateness in addition to the audit, based on the level of knowledge obtained from receipt of all NSP estimated data.

In considering the NEL provisions, we do not consider it unreasonable to require NSPs to generate or re-estimate historical information from their current records. As was clear in recent consultation, NSPs will not have much of the data we request in the exact form we require it. In many cases, NSPs will be able to find close approximations for their existing asset types, activities and work codes in the definitions contained in our templates. We have considered the resulting manual effort required in some cases and tried to minimise this type of information as much as possible (in particular see section 4.1.2 relating to augmentation project data). We also expect there will be instances where NSPs will need to consider allocation methods which may not be immediately straight-forward, however our minimum expectation is that NSPs will use their best endeavours to estimate these data and to be transparent in how they have done so.

More generally, compliance with RIN requirements is essential to the AER being able to perform its functions under the NEL and NER, so we expect that NSPs would take all the necessary steps to provide the information requested.

### The distinction between actual and estimated information

In response to comments made on the economic benchmarking RINs, we have used specific definitions for 'actual' and 'estimated' information, given that financial information may include accounting estimates such as accruals and provisions. The distinction is important because the RIN requires a positive assurance audit of 'actual' financial information but a negative assurance review of 'estimated' financial information. These definitions are consistent with those in the economic benchmarking RINs:

> ***Actual information:*** *information presented in response to the Notice whose presentation is materially dependent on information recorded in the NSP's historical accounting records or other records used in the normal course of business, and whose presentation for the purposes of the Notice is not contingent on judgments and assumptions for which there are valid alternatives, which could lead to a materially different presentation in the response to the Notice.*
>
> *Accounting records include trial balances, the general ledger, subsidiary accounting ledgers, journal entries and documentation to support journal entries. Actual financial information may include accounting estimates, such as accruals and provisions, and any adjustments made to the accounting records to populate the NSP's regulatory accounts and responses to the Notice. 'Records used in the normal course of business', for the purposes of non-financial information, includes asset registers, geographical information systems, outage analysis systems, and so on.*
>
> ***Estimated information:*** *information presented in response to the Notice whose presentation is not materially dependent on information recorded in the NSP's historical accounting records or other records used in the normal course of business, and whose presentation for the purposes of the Notice is contingent on judgments and assumptions for which there are valid alternatives, which could lead to a materially different presentation in the response to the Notice.*

Note these terms differ from (but may coincide with) references to the regulatory years contained in the reset RIN templates, namely "actual" data in regulatory years up to 2012/13, and "estimated" data for 2013/14.

### Removal of geographical splits by feeder classification

During consultation on our Guideline we were keen to explore the impact of geographical issues as this has been identified as a key cost driver and potential challenge to undertaking benchmarking of Australian NSPs.[14] Our discussions with NSPs on these cost drivers did not result in a clear method or measure to reflect these costs. In the absence of a better alternative, we proposed to adopt the feeder classifications for reliability reporting as a commonly understood categorisation that may be relevant to capture the impact of issues such as density.

During more recent consultation it became apparent that, while NSPs appeared to be generally aware of these cost drivers, they were not regarded as material across many activities we proposed to benchmark or would tend to be overwhelmed by other drivers and "averaged out". NSPs also indicated they do not capture cost information relevant to investigating the impact of these drivers. This included those that undertook or participated in other benchmarking studies, as well as the Victorian DNSPs, which have been reporting costs against CBD, urban, rural etc. classifications for many years. It is also apparent that NSPs would tend to organise their internal work practices to overcome locational cost impacts, e.g. locating depots in light of transport costs or packaging work activities to minimise traffic disruption in heavily congested areas.

Nevertheless, we consider that customer density metrics (i.e. applied at the total network level and found in other benchmarking studies) are readily available and would be sufficient to test the typically held view that density is a key driver or normalisation variable that must be considered when comparing network expenditures between NSPs. Much of the expenditure and normalisation data we propose to collect is at a disaggregated level e.g. average cost per volume of work, where the cost of density or rural/ urban factors would, as suggested by the NSPs, unlikely be material or at least difficult to determine. Moreover, measures of density, or indeed our proposal of splitting costs geographically, would not be easily reconcilable to a linear or predictable relationship with costs, and require additional modelling with data that are beyond the scope of our templates.

For some expenditure categories, however, we have retained CBD, urban and rural distinctions or provided NSPs discretion to nominate locational aspects that may affect expenditures. We have also requested DNSPs to report, with their asset age profiles, the number/ length of poles, overhead conductors and underground cables that are located in CBD, urban, rural short and rural long areas. These proportions will be used to approximate the amount of workload and expenditure undertaken in these geographic splits. While this will be a broad approximation, this information should be provided at low cost to DNSPs while being an additional method to test NSP claims that regional/ geographic factors are a cost driver and potential impediment to proper benchmarking.

The definitions we use for these geographic/ density distinctions have been drawn from a national approach to feeder classifications that were developed for reliability reporting, and may need to be re-examined in the context of expenditure assessment. We will also be examining the impact of other environmental factors through economic benchmarking techniques, and generally expect NSPs to furnish us with evidence of any exogenous factors affecting their costs in the context of assessing efficiency.

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[14] See for example, Productivity Commission, *Electricity Network Regulatory Frameworks*, Report No. 62, 2013, pp. 171–172.

### Usability of the templates

Some NSPs also commented on the size of the indicative templates, noting that, while it included both transmission and distribution data, it only represented a single year of data reporting. Hence when expanded to cover five years of historic and six years of forecast/ estimated data, the templates would potentially become unmanageable or unstable.

In many cases we have been able to significantly reduce the volume of data from what was originally anticipated and expect this has improved the workability and layout of the templates. We have also sought to streamline the templates although expect in some cases they can still be improved upon, and seek further feedback on this. Overall we have sought to improve the formatting and navigation of the templates to make them more user friendly.

We also note that we are reviewing the templates released with the draft RINs with a view to make them compatible with automated data extraction/ manipulation, hence anticipate that the data tables released with the final RINs may look significantly different.

# 2 Reconciliations and summary sheet

This section explains the expenditure summary sheet of the draft RINs. These sheets provide an overview of the expenditure data.

## 2.1 Summary sheet

### 2.1.1 AER Position

The summary sheet combines aggregated data from other templates with inserted data to provide a complete table of the NSP's total capex and opex, including across the major service classifications, including dual function assets where relevant.

We require NSPs to reconcile the expenditure reported in our category templates with expenditure reported in both their regulatory accounts and their statutory accounts. For the purposes of such reconciliation, expenditure that is reported multiple times in different templates (for example opex on items in the non-network template) should only be used once for the purposes of calculations and reporting in the reconciliation sheet. NSPs should also clearly indicate where any expenditure is reported multiple times. This is expected to be only an issue for expenditures reported in the non-network and overheads template.

Expenditure reported multiple times should be reconciled (and linked to the reconciliation sheet) from the reporting template that most closely relates to their regulatory accounts (e.g. overhead expenditure also reported in non-network template should be reconciled using the expenditure reported in the relevant overhead expenditure templates). In the non-network template we have added two separate totals for each expenditure category: 1) total expenditure in this template; and 2) total expenditure for reconciliation. This should simplify only using the expenditure in the second category for the purposes of the reconciliation sheet and reconciliation to values reported elsewhere, including regulatory accounts and statutory accounts. We expect to discuss potential overlaps and allocation issues with NSPs, however our current thinking is that NSPs should use similar splits in any relevant template and add columns or rows to facilitate transparency where multiple reporting across sheets is an issue.

#### Category RINs

These tables draw in historic data reported elsewhere in the templates, namely:

- capex by driver (only on an as-incurred basis for TNSPs)
- opex by driver.

Both capex and opex are split into standard control and alternative control services for DNSPs.

Input cells are provided for capital contributions (DNSPs only). Other data will be linked directly to tables in other sheets (and currently labelled as such), however formulae have not yet been added in light of NSPs having discretion in providing reconciliations in other sheets and expectation of further input from NSPs on this matter (as noted above).

#### Reset RINs

The tables in these templates are structured the same way as for those in the Category RINs, with additional provisions for:

- capex and opex on dual function assets (Ausgrid and ActewAGL only)
- forecast opex by driver (e.g. recurrent, due to real price and step changes etc.), noting that forecast opex by category (e.g. maintenance, overheads etc.) is not requested in the Reset RINs.

### 2.1.2 Reasons for AER position

In general these tables are more akin to the aggregated expenditure data collected by the AER in the past which tend to serve as a useful reference point for those looking for a general overview of expenditure data, and to provide a base for reconciliations or other comparisons (e.g. to approved allowances or to statutory accounts).

This sheet is considerably different to that contained in the indicative templates. In particular it no longer presents data by input type (e.g. labour, materials) nor requires total expenditure by category to be broken down by geographic regions (CBD, urban etc.).

# 3 Demand forecasting

The draft RIN templates request maximum demand information for the NSP's network, at both the network level and spatial level. Collecting this information is necessary to improve our understanding of the demand patterns and trends on the NSP's network, which in turn improves our forecast expenditure assessments. Increases in demand are a major driver of expenditure on the NSP's network, especially augmentation expenditure (augex), which can (or has) comprise well over 50 per cent of capex in some years.

The draft RIN templates also request ratings of components of its network such as feeders and substations. In combination with maximum demand information, this will inform us (and other stakeholders) on utilisation levels in the NSP's network.[15] We will gain insight on the practices of NSPs regarding the level of capacity they build into their networks. It may also flag inefficient practices (such as overly conservative augmentation of the network) as well as differences in costs or capacity arising from different jurisdictional standards.

The information we request for demand forecasting assessment is (or should be) readily accessible to NSPs and used in their existing management processes. We have been requesting similar, if not more, demand data from NSPs in all recent determination processes. The incremental cost of NSPs providing this information to the AER is low and would be readily accessible to any prudent NSP.

## 3.1 General data requirements

This section sets out information we require to assess demand forecasts under two separate RINs:

- Category analysis RIN—historical information we will collect from all NSPs in the NEM. In general, we require NSPs to provide historical demand data for the most recent regulatory year. Once these templates form part of ongoing reporting obligations, this information will enable us to analyse demand patterns on a regular basis in preparation for upcoming regulatory determinations, and as part of our obligations to publish annual benchmarking reports.[16]
- Reset RINs—we collect data under these templates in the lead up to a determination.[17] These templates collect demand forecast data and supporting information for the forthcoming regulatory control period.[18]

These information requirements apply to both DNSPs and TNSPs, unless otherwise indicated.

### 3.1.1 AER position

#### Category analysis RIN

We require NSPs to provide the following historical maximum demand data for system and spatial demand in megawatts (MW) and megavolt amperes (MVA):

- raw coincident maximum demand (including date and half hour time interval)

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15 Utilisation is the ratio between maximum demand and the rating of the segment. It indicates the proportion of the network segment's capacity that is being utilised. For a more detailed description, see AER, *Guidance document: AER augmentation model handbook,* November 2013, p. 7.

16 NER, clauses 6.2.4, 6.27, 6A.2 and 6A.31.

17 Chapters 6 and 6A of the NER guide the time of issuing determination RIN templates for distribution determinations and transmission determinations, respectively.

18 The first tranche of reset RINs will contain requirements to provide historical data. This would provide the dataset we require to undertake our expenditure forecast assessment, including benchmarking.

- raw non-coincident maximum demand (including date and half hour time interval)—for spatial demand only
- demand figures relating to embedded generation, block loads, temporary switching, permanent transfers and other adjustments in MVA[19]
- weather corrected coincident maximum demand at 10 per cent and 50 per cent probability of exceedance (PoE)[20]
- weather corrected non-coincident maximum demand at 10 per cent and 50 per cent PoE—for spatial demand only.

### Reset RINs

We require NSPs undergoing a regulatory determination to provide the following demand forecast data for system and spatial maximum demand in MW and MVA:

- weather corrected coincident maximum demand at 10 per cent and 50 per cent PoE
- weather corrected non-coincident maximum demand at 10 per cent and 50 per cent PoE—for spatial demand only
- demand figures relating to embedded generation, block loads, temporary switching, permanent transfers and other adjustments in MVA.

NSPs must describe the relationship between their 10 per cent PoE and 50 per cent PoE demand forecasts. Where a NSP uses 90 per cent (or other) PoE demand forecasts as inputs to its capex forecast, it must detail the relationship between those demand forecasts and the 10 per cent PoE and 50 per cent PoE demand forecasts.

Where a NSP does not use weather-corrected maximum demand data to produce demand forecasts, the NSP must provide reasons for not doing so. This includes documentation and evidence demonstrating why weather correction would not produce demand forecasts that reflect a realistic expectation of demand.

NSPs must also demonstrate and describe the relationship between the demand forecast data specified in this section and the demand forecast data they provide for the augex model (section 4.2).

In addition to the standardised data requested in the templates, at the time of the determination we will require NSPs to provide

- any econometric (or other types of) models to produce their top down demand forecasts
- models used to produce spatial demand forecasts
- supporting documentation/data, including inputs, assumptions and sensitivity analysis.

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[19] These 'adjustments' are intended to consider components of the load on the NSP's network that may bias demand forecasts if not appropriately accounted for. For example, it is common practice for large direct connect customers (an example of block loads) to provide their own demand forecasts for assessment. It is therefore common practice to exclude such customers from demand forecasting to avoid double counting.

[20] A 50 per cent PoE means the maximum demand measure adjusted for weather correction is expected to be exceeded fifty out of every one hundred years. A 10 per cent PoE means the maximum demand measure adjusted for weather correction is expected to be exceeded ten out of every one hundred years.

### 3.1.2 Reasons for AER position

We are collecting the demand data in the RIN to facilitate our demand forecast assessments. As we described in the Guideline Explanatory Statement, demand forecasts are a direct input into our assessments of augex forecasts.[21] Obtaining the information described above with the NSP's proposal will ensure we can focus on assessing demand forecasts, and minimise the need for requesting such information, during determinations.

Further, obtaining historical demand data and associated information annually will enable us to understand demand trends and relationships in the years leading up to determinations. This would assist in performing more targeted investigations and assessments during the determination.

We incorporated findings from stakeholder consultations when developing the draft RIN templates and requirements, including comments made by NSPs as well as the Australian Energy Market Operator (AEMO).

AEMO suggested various amendments to the indicative templates to clarify the purpose of the data being collected. AEMO further suggested collecting sub-transmission point demand forecasts. These forecasts provide greater transparency to enable the lower voltage network to be modelled in more detail. Thorough options analysis can be performed to deliver the most efficient solution for consumers.[22] Our amendments to the templates reflect these suggestions.

We retained the requirement for NSPs to provide maximum demand data in both MW and MVA. Several NSPs stated they do not collect demand data in MVA. Some NSPs also stated they use demand in amps to assess augmentation needs at certain levels of the network (such as subtransmission, LV and HV feeder). However, we understand MVA is the most consistent and broadly used measure of demand that triggers augmentation expenditure for most segments of transmission and distribution networks. Amps may be an appropriate unit of measurement to assess subtransmission, LV and HV feeders' augmentation needs. However, we consider provision of demand in MVA terms is important for consistency and for reconciliation purposes. Further, conversion of other units of measure of demand to MVA results in minor inaccuracy which would not materially affect any analysis. We therefore maintain the requirement for NSPs to provide demand data in both MW and MVA.

#### Spatial demand data

The draft RIN templates specify the level of the spatial demand data that NSPs must provide. For example, TNSPs must provide spatial demand data for connection points. Collecting demand data and producing demand forecasts at the connection point level is standard practice in the industry, and is a significant input into augmentation decisions on transmission networks. We, therefore, consider such a requirement to impose little regulatory burden as TNSPs should be collecting such information as part of its regular business practices.

Similarly, the templates require DNSPs to provide spatial demand data for transmission connection points, subtransmission and zone substations, and HV feeders. Collecting demand data and producing demand forecasts at these levels is standard practice, and is a significant input into augmentation decisions on distribution networks. We also require this data to verify the utilisation levels and demand forecasts DNSPs submit for inputting into the augex model (see below).

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[21] AER, *Better Regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 165, 174–175.

[22] AEMO, *Submission on draft expenditure forecast assessment guidelines*, 23 September 2013, p. 6.

The templates also require NSPs to submit demand data at other levels of the network if the NSP relies on that data to produce its expenditure forecasts, especially its augex forecast.

## 3.2 Segment rating data

### 3.2.1 AER position

We require NSPs to provide the rating of each member of specified segments in its network. For example, we require DNSPs to provide the rating of each zone substation in its network (as well as maximum demand information as we described in section 3.1).

More specifically, we require NSPs to provide the normal cyclic rating, in MVA, of each segment in its network.

### 3.2.2 Reasons for AER position

In combination with maximum demand information, segment ratings will inform us and other stakeholders on utilisation levels in the NSP's network.[23] We will gain insight on the practices of NSPs regarding the level of capacity they build into their networks. Publication of such data may also provide a disincentive for inefficient building of excess capacity.

Maximum demand information is vital to our expenditure forecast assessment approach. It provides insight on electricity usage patterns in areas of a NSP's network, and on its network as a whole. However, it provides only half of the picture when it comes to expenditure forecast assessments. Maximum demand information, by itself, does not indicate which areas of the network may need augmentation solutions (or non-network solutions).

A NSP may forecast significant demand growth rates for a zone substation in its regulatory proposal, for example. If that substation has significant excess capacity, however, it may not require augmentation in the forthcoming (or even subsequent) regulatory control period. Conversely, the same NSP may forecast low demand growth rates for another zone substation. If the substation has little excess capacity, it may require augmentation, or other, solutions to enable the provision of network services.

## 3.3 Other changes from the indicative templates

### 3.3.1 AER position

We have made the following amendments to the indicative templates, reflecting consultation with stakeholders such as NSPs and AEMO:

- we have consolidated the formatting of the demand templates to avoid duplication.
- we require NSPs to indicate whether the maximum demand data occurred (or is forecast to occur) in summer or winter. However, we will not require NSPs to provide both winter and summer maximum demand data.
- we have removed the requirement to provide the temperature at the time maximum demand occurred and the weather station the NSP used for that purpose. However, where the NSP uses

[23] Utilisation is the ratio between maximum demand and the rating of the segment. It indicates the proportion of the network segment's capacity that is being utilised. For a more detailed description, see AER, *Guidance document: AER augmentation model handbook,* November 2013, p. 7.

temperature data to produce its demand forecasts (for example, as an explanatory variable in its models), the NSP must provide such data as part of its regulatory proposal.

### 3.3.2 Reasons for AER position

The changes to the indicative templates, as we set out in section 3.3.1, reduce the burden of providing demand information considerably. We discuss the reasons for the amendments in more detail below.

#### Consolidation of demand templates

The indicative templates included four templates to collect demand information (tabs 3.1 to 3.4). Consolidation of these tabs into two templates significantly reduces the burden on NSPs to provide demand data. It also reduces the amount of data we would need to maintain without compromising our ability to assess demand forecasts.

Tabs 3.1 and 3.2 collected demand information in a time series format for our demand forecast assessments. Tabs 3.3 and 3.4 collected similar information; however we formatted them to be consistent with the indicative templates to collect data for the augex model.

After consultation with NSPs, we consolidated the demand templates to incorporate aspects of the respective formats we consider we need to assess demand forecasts, and to utilise the augex model (for DNSPs).[24] The formatting and layout of the demand data templates resembles the time series format of tabs 3.1 and 3.2. However, those templates now also include certain information from tabs 3.3 and 3.4, such as the calculation of power factors and coincidence factors.

#### Summer and winter demand

We consider this to be a reasonable requirement since it is maximum demand on network segments that trigger expenditure such as augex, regardless of the season. It would also reduce the burden to report such data by up to fifty per cent, with little to no loss in our ability to assess demand.

Several NSPs stated they did not keep winter demand data for the majority of substations as the summer maximum demand is significantly greater than winter peaks. A DNSP noted it does not produce a winter demand forecast for similar reasons.[25] We no longer require NSPs to provide historical and forecast demand data for both winter and summer. Instead, the demand templates simply require NSPs to indicate whether the demand data occurred (or is forecast to occur) in summer or winter.

#### Removal of temperature data

Several NSPs questioned why the indicative templates required temperature at the time maximum demand occurred. The NSPs considered it would be difficult to collect such data and noted the temperature at the time of maximum demand may provide little information. We therefore removed the requirement to provide temperature at the time maximum demand occurred, as well as the weather station used.

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[24] AER, 'Meeting summary – Hobart workshop ', *Category analysis data templates*, 23 September 2013, pp. 3–4; AER, 'Meeting summary – Sydney and Canberra workshop, *Category analysis data templates*', 24 September 2013, pp. 5–7; AER, 'Meeting summary – Adelaide workshop ', *Category analysis data templates*, 25 September 2013, pp. 2–3; AER, 'Meeting summary – Melbourne workshop', *Category analysis data templates*, 26 September 2013, pp. 3–5; AER, 'Meeting summary – Brisbane workshop ', *Category analysis data templates*, 27 September 2013, pp. 1–4.

[25] AER, 'Meeting summary – Melbourne workshop', *Category analysis data templates*, 26 September 2013, p. 3.

We understand NSPs, and other organisations, have conducted detailed studies on the relationship between demand and temperature and will continue to do so. From consultation with NSPs and from our experience in past determinations, NSPs use various temperature measures in their analyses. For example, several NSPs consider the average of the maximum and minimum temperature shows a stronger relationship with maximum demand.[26] Asking for temperature at the time maximum demand occurred and the weather station used in our templates or any standardised format may therefore impose additional cost on NSPs for little additional insight in our analysis.

Nevertheless, temperature sensitivity analysis has been and will continue to be an important part of many NSPs' demand forecasts and our assessment of those forecasts. In accordance with our final Guideline, we therefore require NSPs to provide full details of temperature sensitivity analysis, as well as any other models and data underlying their demand forecasts.

## 3.4 Data availability

We consider the demand templates impose little regulatory burden on NSPs. DNSPs already provided some of this information in RINs for previous determinations. TNSPs did not traditionally provide some of this information through the submission guidelines. However, they provided the information as part of their regulatory proposals, or in response to our requests during determinations.

NSPs also collect such data as part of other obligations. For example, chapter 5 of the NER include various requirements for TNSPs and DNSPs to publish demand forecasts as part of their annual planning processes. These include requirements to publish demand forecasts for connection points, subtransmission lines and zone substations.[27]

## 3.5 AEMO's collection of demand data

Upon request from COAG, AEMO will be developing transmission connection point forecasts that we may use to inform future determinations.[28] AEMO will be requesting demand data from NSPs in order to produce its connection point forecasts for future transmission determinations. On 3 October 2013, AEMO requested demand data from the NSW, ACT and Tasmanian NSPs to develop transmission connection point forecasts for the NSW and Tasmanian transmission determinations.

There is overlap between AEMO's and our information requests. However, the differences between those requests, and the purpose and processes associated with them, differ enough to warrant separate requests from the two organisations. For example, we require NSPs, specifically DNSPs, to provide demand data at specific levels of the network for the purposes of the augex model, such as demand forecasts at the zone substation level. AEMO requires data from NSPs in order to produce its transmission connection point demand forecasts.

AEMO did not use a data template for their 3 October 2013 information request, but may do so in the future. For our purposes under the NER, including expenditure assessments in determinations and annual benchmarking reports, we require demand data in a standard format. This would facilitate the immediate assessment of demand data, and minimise the need to clarify idiosyncrasies if NSPs provide the data in various formats. We will endeavour to work with AEMO to minimise the burden on

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[26] AER, 'Meeting summary – Sydney and Canberra workshop, *Category analysis data templates*', 24 September 2013, p. 5; AER, 'Meeting summary – Brisbane workshop ', *Category analysis data templates*, 27 September 2013, p. 2.

[27] NER, clauses 5.12 and 5.13.

[28] AER, *Better Regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 182–183.

NSPs of providing demand information. For example, we may work together to identify areas of overlap so that NSPs provide information on those areas in a consistent format.

# 4 Augmentation capex

We will use the augex RIN templates to collect augmentation expenditure information on the NSP's network. We request information we consider necessary to undertake a rigorous assessment the NSP's augex forecast. The information the NSP provides in the RIN will provide information on the major expenditure components that comprise augex projects. For DNSPs, we will also collect information to enable the application of the augex model. In combination with demand forecast assessments (see section 3) and detailed project reviews, this information will assist in forming a view on whether the augex component of a NSP's capex forecast meets the NER criteria.[29]

It is important to examine the drivers and expenditure components of augex. It is a significant component of NSPs' capex, comprising well over 50 per cent of capex in some years.

We carefully considered the data requirements for augex, in reflection of the materiality of expenditure, the challenges in assessing proposed allowances (particularly for large and diverse projects) and the historic information held by NSPs. We have significantly reduced the volume of data originally anticipated in the indicative templates released in August 2013.[30] However, there is still likely to be a material burden on NSPs in having to manually identify and report disaggregated data for material projects. We have balanced this against the value of obtaining this information up-front. We also identified and removed data requirements for projects that would be already picked up in augex model input data.

This section sets out the information we require to assess the NSP's augex forecast, which we will collect through the category analysis RINs and the Reset RINs. Historical data from the category analysis RIN will enable us to analyse project cost information on a regular basis in preparation for upcoming regulatory determinations, and as part of our obligations to publish annual benchmarking reports.[31] Templates forming part of the Reset RIN will collect the same project cost data and other information for the forthcoming regulatory control period. These information requirements apply to both DNSPs and TNSPs.

## 4.1 Project data

### 4.1.1 AER position

We require NSPs to provide historical expenditure and other information on the major components that comprise individual augmentation projects above a materiality threshold. The break-down of forecast augex project data is identical to historical project data.

We will collect this information for projects grouped by network segment. Broadly speaking, network segments are 'lines' and 'substations'. For each augex project, we require NSPs to provide expenditure and volume data based on the nature of the augmentation (project type), its trigger and the major expenditure components. For example, substation augex generally falls under one of the following project types:

- new substation establishment
- substation upgrade.

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29 NER, clauses 6.5.7 and 6A.6.7.
30 Available on: http://www.aer.gov.au/node/21843.
31 NER, clauses 6.2.4, 6.27, 6A.2 and 6A.31.

Triggers for substation augex include:

- demand growth
- voltage issues
- fault level issues
- reactive power issues.

The templates require NSPs to provide expenditure and other information for the major components of substation augex, including:

- transformers (equipment expenditure only, excluding installation costs)
- switchgear (equipment expenditure only, excluding installation costs)
- capacitors (equipment expenditure only, excluding installation costs)
- other plant item (equipment expenditure only, excluding installation costs)
- installation expenditure (labour)
- civil works expenditure
- other direct expenditure.

We also require NSPs to report expenditures on land purchases and/or easements attributable to the augex project.

We require the NSP to provide details of individual augex projects with a total cumulative expenditure over the life of the project of greater than the materiality threshold of $5 million. We require the NSP to aggregate projects in each segment below this threshold for reconciliation purposes.

Less detail is requested for relatively lower cost, higher volume type augmentations. For augmentation on distribution substations and LV feeders, we require the NSP to provide expenditure and other information aggregated into these respective augex project types, rather than for individual projects.

### Supporting documentation

The Reset RIN requires NSPs to submit information that supports their augex forecasts. In particular, NSPs must discuss their general approach to considering non-network solutions (as alternatives to augex) in their proposals. NSPs must provide documentation that details their consideration of non-network solutions. Such documentation should describe:

- the terms and conditions the NSP specified to non-network solution providers
- net present value (NPV) analysis of the options considered where available, or where this is not available, other evidence supporting the conclusion that the proposed solution is efficient.
- other factors the NSP considered in deciding on the augex project, rather than the non-network (or other network) solutions, as the efficient solution where available, or where this is not available, evidence supporting the conclusion that the proposed solution is efficient.

Documents that detail the NSPs' consideration of solutions include (but are not limited to) those the NSP developed as part of regulatory investment tests for transmission and distribution.

If NSPs do not record augex in the format of the augex RIN templates, they should estimate these expenditures from the total expenditure of the project. The NSPs must provide the documentation and models that detail the estimation procedure.

### 4.1.2 Reasons for AER position

The draft RIN templates collect augex project data in a consistent manner between TNSPs and DNSPs, respectively, across regulatory control periods. This will facilitate greater understanding of the drivers and major cost components of augex and facilitate retention of such knowledge compared to our previous requirements.

We collected augex information to varying levels of disaggregation in past regulatory determination RINs (reset RINs). The submission guidelines required TNSPs to report annual expenditure for each capex project, including augex projects.[32] Previous distribution determination RINs also required DNSPs to provide annual expenditure on augmentations.[33] We also required DNSPs to provide annual expenditure on material projects.[34]

We and our consultants used this information in the process of selecting a sample for detailed project reviews. We also used this data for time series comparisons of actual augex, the NSP's augex forecasts and augex approved by the regulator.[35] This provided a high level indication of the robustness of the NSP's forecasting method. For example, consistent underspending may have indicated systemic over-forecasting practices. Beyond these uses, such aggregated information is of limited use during the determination process. It is also of limited use outside of that determination given the highly variable and unique nature of augmentation projects.[36] Forecast augex assessments from one determination generally did not provide insight on assessments in other determinations.

Hence, the draft RIN templates aim to collect information from which to develop metrics that give insight into NSP cost structures despite the uniqueness of many augex projects. We expect to be able to use such metrics across transmission determinations and distribution determinations, respectively. The following include some benchmarks we may use in future determinations and annual benchmarking reports (though it is not an exhaustive list):

- Benchmarks for major equipment
  - $/megavolt amperes (MVA) added for transformers by voltage
  - $/switchgear by voltage
  - $/pole/tower (including structures, and civil works) for lines and feeders by voltage
  - $/km added of overhead cables for lines/feeders by voltage
- Benchmarks for other major expenditure components

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32 AER, *Submission guidelines: Appendix A (part 1): Cost information*, 28 September 2007.
33 These varied in the level of detail required, reflecting differences in previous jurisdictional information requirements.
34 The materiality threshold for network projects was either a set dollar value, typically $5 million, or a set percentage of the annual revenue requirement.
35 This includes the AER, as well as previous jurisdictional regulators for DNSPs and the ACCC for TNSPs.
36 AER, *Better Regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 171–172.

- $/unit of installation labour at substations or lines
- Units of installation labour per MVA added at substations
- Units of installation labour per km line added.

We acknowledge augmentation projects are often unique. The optimal augmentation (or other) solution to address network constraints will depend on complex factors such as network configuration and planning requirements. Hence, the scale and proportion of augex work can vary dramatically across NSPs and over time, particularly for larger assets in transmission and distribution networks. Despite this complexity, we consider augex forecast assessments essentially consist of two broad questions from a regulator's perspective:

1. Is the proposed augex project the best or most prudent solution to the constraint?
2. If the augex project is the best solution to the constraint, is the NSP incurring efficient expenditure to enact that solution?

The first question is essentially an engineering problem, requiring expertise in load flow analysis among other technical considerations. We will rely on detailed technical reviews of a sample of augex projects to ascertain whether the NSP generally utilises the most efficient solutions to constraints. As we mentioned previously, we will pay particular attention to the extent NSPs consider non-network solutions in their analysis (see section 4.1.1).[37] We will likely utilise technical consultants to assist in such reviews.

The second question is an economic one, and delves into the efficiency of the NSP's management and procurement practices. Assuming a set of augex projects are the optimal solutions to respective constraints, we would expect to observe some consistency or measurable relationship between the cost of major components of project works when normalised for scale (MVA added for substations, or km added for lines and feeders) and/or voltage.

For example, the procurement cost per kilometre of overhead line of a given voltage and rating should not vary beyond a certain range whether the trigger for the augex project is demand growth, or fault levels. Similarly, the procurement cost of transformers of a given voltage and capacity, in per MVA added terms, should not vary beyond a certain range regardless of the configuration of respective substations. Benchmarking such metrics will assist in our assessments of whether the NSP is incurring efficient expenditure for a given solution. We recognise that other components that make up larger projects, including labour costs, land purchases and civil works, will vary considerably and need to be captured and assessed separately. For relatively lower value and higher volume projects, namely HV feeders, LV feeders and distribution substations, we expect project specific costs would average out when aggregated costs are normalised against key volume measures such as km of line and transformer capacity.

Where a NSP's expenditure and/or volume for components of augex projects consistently exceed the benchmarks we may establish, we would likely target those areas for detailed investigation.

This is obviously a much simplified discussion of the actual augex forecast assessments in regulatory determinations. Besides engineering and economic questions, we consider other factors affecting decisions to undertake augex. These include financial and legal risk, labour practices and skills, and

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[37] AER, *Better Regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 168–169.

community engagement.[38] In addition, these considerations are usually intertwined: engineering considerations (and other considerations as we discussed above) inform expenditure considerations, and vice versa. Thus, augex forecast assessments tend to be iterative processes that cover a broad range of interrelated factors. Nevertheless, the discussion captures important questions we ask in our augex forecast assessments in regulatory determinations and provides context to the project data we request in the RINs.

We consider the information in the category analysis RINs and the reset RINs will enable us to construct metrics that give insight into NSP cost structures. Such information will be useful in a detailed project review as a check on the cost components that make up a NSP's augex project. This will add rigor, objectivity and transparency to detailed reviews. For example, we will likely utilise technical consultants to assess a sample of augex projects during a determination. The consultancy will likely require the consultant to estimate alternative augex forecasts for the sample where inefficiency may be present. In our experience, technical consultants' database of augmentation costs may be disparate and incomplete. In these cases, our technical consultants would need to rely more on judgement and industry experience. While useful, basing assessments primarily on judgement and industry experience lacks transparency and rigor. Our collection of augex project data will complement the data technical consultants have on augmentation costs. Over time, we can develop a database of the major components of augmentation works. Such a database would assist in more rigorous and transparent decisions regarding augex forecasts.

Further, we consider the $5 million materiality threshold achieves a reasonable balance between capturing the projects that form a large component of augex, and minimising the burden on NSPs.

In our experience, projects with cumulative expenditure above the materiality threshold tend to be relatively few in number, but comprise a significant component of total augex in a regulatory control period. It is also reasonable to expect NSPs to keep progressively more detailed records the more material the project. Major Energy Users pointed out competent firms carry out considerable investigation of costs of activities and this information is collected in detail. Unless this data is collected, analysed and used to forecast future costs, they lose an essential ability to control their costs.[39] NSPs should therefore be able to report on these few but major expenditure items in detail. In recent discussions with NSPs they indicated that such information is available, although some mapping to the proposed breakdowns would be required, and otherwise could be reported with some costs in manual data manipulation (i.e. would require examining individual project information as this is not currently captured in their systems).

The materiality threshold also reduces the burden on NSPs. Projects with cumulative expenditure below the threshold tend to be more numerous, particularly for DNSPs, even though they may comprise a relatively small percentage of total augex for a regulatory control period. In discussions with NSPs on our indicative templates, serious concerns were expressed at reporting the details of lower value distribution projects (particularly at the HV feeder level and below). We now recognise that such information would have imposed a burden well beyond the expected benefit of using this information, and have benefited from further guidance on how best to capture data on these lower value projects in our templates. However, this does not preclude us from subsequently asking for supporting documentation, such as business cases, on projects below the materiality threshold, or from including such projects in detailed reviews.

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[38] AER, *Better Regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 170–174.

[39] Major Energy Users (MEU), *Proposed guidelines for expenditure assessment: MEU Comments on the draft guidelines*, 20 September 2013, pp. 5, 21–22.

We note AEMO suggested creating a data template for new projects, requesting information relating to additional capacity provided with the assets associated with that new project. It considered the AER should also collect data on projects that relieve non-thermal issues such as voltage control and more specific information on land and line easement expenditures.[40] We consider the augex RIN templates that collect augex project data serves this function.

## 4.2 Augex model data

### 4.2.1 AER position

The Reset RIN templates require DNSPs undergoing a distribution determination to provide data and other information to populate the augex model.[41] We will not be requiring TNSPs to provide information for augex modelling.[42]

The augex model requires information for all 'segments' in a DNSP's network. Segments represent typical planning components—that is, lines and substations of various types.[43] We will collect information for each segment of a DNSP's network, including:

- voltage, and primary type of area supplied by the segment
- capacity at each network segment
- utilisation at each network segment
- utilisation thresholds of assets in the network segment, where utilisation above these thresholds triggers the need for augmentation
- maximum demand forecasts for each network segment
- capacity factors
- unit costs ($ per kVA added).[44]

We also require DNSPs to provide maximum demand forecasts for each network segment.

DNSPs must provide the documentation and models that detail its procedure for estimating capacity factors and unit costs.

DNSPs must also describe the relationship between the demand forecasts it proposes for the augex model and the demand forecasts it uses to develop its augex forecast (see section 3).

### 4.2.2 Reasons for AER position

The Reset RIN templates collect information about a DNSP's network. The augex model will assist in identifying segments of the network that may require augmentations. It will also provide an alternative augex forecast for comparison.[45]

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40 AEMO, *Submission on draft expenditure forecast assessment guidelines*, 23 September 2013, p. 7.
41 For a more fulsome description of the augex mode and its input requirements, see AER, *Guidance document: AER augmentation model handbook,* November 2013.
42 We will not apply the augex model to TNSPs for the time being. See AER, *Better Regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 170–171.
43 AER, *Guidance document: AER augmentation model handbook,* November 2013, p. 11.
44 AER, *Guidance document: AER augmentation model handbook,* November 2013, p. 13.

We have also reconsidered our position with respect to applying the augex models to TNSPs as part of consultation on the final Guideline and as a consequence the draft RIN templates do not contain any of the associated information. Further details of this decision can be found in the Guideline explanatory statement.[46]

Similar to augex project data, the DNSPs provided varied responses on their ability to provide the augex model input data set out in the indicative templates. Some DNSPs stated they can provide most of the data for subtransmission lines and substations and zone substations. Some DNSPs stated providing data from five years ago would be difficult and resource intensive. In general, DNSPs stated it becomes more difficult to provide the requested data for lower levels of the network (HV feeders and distribution substations) and would require estimation or sampling.[47]

The NSPs provided comments and requested clarification on aspects of the information we are collecting to populate the augex model, including:

- the capacity measures that trigger augmentation in the model
- the applicability of 'CBD', 'urban' and 'rural' to classify various segments of the network.

AEMO noted additional funding is triggered in the augex model when asset utilisation meets a specified threshold. There is a risk the augex model could create incentives for NSPs to lower their notified network capability in order to achieve higher asset utilisation rates. The AER should therefore consider whether a proposed augex solution is the most efficient for that need, and whether the forecast expenditures associated with the proposed solutions are efficient. AEMO suggested the AER collects information that allows it to scrutinise an asset's capability, including asset utilisation at peak times and other times, and data on the extent of over-utilisation. NSPs should also be required to explain any reductions in asset ratings.[48] We agree these are important points to consider when utilising the augex model in our augex forecast assessments. However, the types of information noted above require detailed understanding of network segments, including:

- the effect of utilisation on asset life
- fault levels
- reliability arrangements and obligations
- operational constraints, including those imposed by network configuration.

Standardising such complex factors would be difficult to achieve. In any case, we will likely address such issues during the determination process, including through detailed engineering reviews.

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45 For a more detailed discussion of the augex model, including our reasons for applying it, see AER, *Better Regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 168–174.

46 See AER, *Better Regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 170–171.

47 AER, 'Meeting summary – Hobart workshop ', *Category analysis data templates*, 23 September 2013, p. 4; AER, 'Meeting summary – Adelaide workshop ', *Category analysis data templates*, 25 September 2013, p. 3; AER, 'Meeting summary – Melbourne workshop', *Category analysis data templates*, 26 September 2013, pp. 4–5; AER, 'Meeting summary – Brisbane workshop ', *Category analysis data templates*, 27 September 2013, pp. 3–4.

48 AEMO, *Submission on draft expenditure forecast assessment guidelines*, 23 September 2013, pp. 2 and 6.

## 4.3 Other changes from the indicative templates

### Applicability to TNSPs

TNSPs commented it was unclear whether the indicative templates required them to provide augex project data.

The indicative templates did not include templates for collecting augex project data for TNSPs. This was an oversight in preparing the templates. However, the intention was to include templates for augmentations on transmission lines and transmission substations virtually identical to tabs 4.1 and 4.2 of the indicative templates, respectively.

In subsequent discussions we clarified that we require TNSPs to provide augex project data, and provided indicative templates for further consultation. The templates now reflect feedback from TNSPs, as well as AEMO.

### Level of detail

Overall, we have significantly reduced the amount of information we require for augex projects on all levels of the networks compared to the indicative templates. The templates reflect what we consider to be an optimal balance between the costs and benefits of providing augex project information for different levels of the network, as we discussed in section 4.1.2.

As noted above, NSPs expressed strong concerns about the burden and value of augex project data set out in the indicative templates.[49] In general, NSPs considered it would be less burdensome to provide information on large, high value projects with greater consequences of failure, such as transmission lines and substations. DNSPs, however, objected strongly to providing detailed augmentation project data when those projects relate to low value assets such as distribution substations and LV feeders.

TNSPs indicated they could provide the augmentation project data in the indicative templates, although it would be a manual and resource-intensive process. Some DNSPs indicated that it would also be resource intensive but possible to provide detailed breakdowns of expenditure components of larger projects; particularly, augmentation works for subtransmission lines and substations, and zone substations. Other DNSPs stated they did not collect historical augex expenditure for these segments of the network in the manner set out in the indicative templates. However, they would be able to provide estimates to varying levels of disaggregation.

DNSPs stated it would be very difficult to collect detailed information on augmentation projects related to HV feeders, and, especially, distribution substations and LV feeders. Some DNSPs stated they would be able to provide labour, materials and other expenditure for individual projects at the HV feeder and distribution substation level. For augmentation projects related to distribution substations and LV feeders, some DNSPs stated they would be able to provide labour, materials and other expenditure aggregated to classes of projects, rather than for individual projects. Examples of project classes include 'uprate kiosk substation' or 'establish new kiosk substation'.

We have amended the templates to reflect these observations and our further thinking. The indicative templates required NSPs to provide augex project data for different levels of the electricity networks at

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[49] AER, 'Meeting summary – Sydney and Canberra workshop, *Category analysis data templates*', 24 September 2013, p. 6; AER, 'Meeting summary – Adelaide workshop ', *Category analysis data templates*, 25 September 2013, p. 3; AER, 'Meeting summary – Melbourne workshop', *Category analysis data templates*, 26 September 2013, pp. 4–5; AER, 'Meeting summary – Brisbane workshop ', *Category analysis data templates*, 27 September 2013, pp. 3–4.

the same level of detail.[50] As we discussed in section 4.1, the draft RINs only require details for material projects, and request less detail on zone substations projects relative to terminal stations, for example.

[50] The indicative templates did not include a template for collecting augex project data for TNSPs. This was an oversight from the AER. However, the intention was to include templates for augmentations on transmission lines and transmission substations virtually identical to tabs 4.1 and 4.2 of the indicative templates, respectively.

# 5 Replacement capex

This section discusses the replacement expenditure (repex) data requirements contained in templates 2.2 and 5.2 (for distribution) and 2.2 and 4.1 (for transmission).

NSPs will be required to report data that allows us to apply the techniques set out in the Guideline.[51] The data requirements included in the draft RIN are specifically relevant to considering benchmarks, performing trend analysis and other modelling of historical and expected replacement expenditure.

Our data requirements are largely driven by developing inputs to the repex model. Age based replacement modelling is used by all NSPs in some form and many NSPs currently report age and replacement cost information to the AER on an annual basis. In standardising our dataset across all NSPs, the reporting burden may rise in having to conform to new categories, which may be more or less detailed than those currently used by each NSP. However, we do not consider mapping historic information to these new categories, or in configuring reporting arrangements for forecast data, to be particularly difficult for NSPs. The benefits of developing standardised categories will come from a significantly deeper dataset from which to identify and compare instances of different expected lives and replacement costs on comparable assets. Replacement capex has typically been the second biggest category of expenditure after augmentation capex in the previous cycle of revenue/price reviews. However, for future reviews it is expected to become a primary focus for the AER given NSP claims of aging and deteriorating assets being of continuing focus for their capital programs and the likelihood of lower expected levels of augmentations given the flatter demand growth over the next review period.

## 5.1 General definition and data requirements

### 5.1.1 AER position

We have defined replacement expenditure as the non-demand driven capex to replace an asset with its modern equivalent where the asset has reached the end of its economic life. 'Economic life' is determined by the age, condition, technology or environment of the existing asset. Capex is regarded as replacement expenditure if it is primarily determined by the existing asset's ability to efficiently maintain its service performance requirement. This excludes expenditure associated with replacement of communications, IT assets for transmission and SCADA and protection assets for distribution which is captured in our assessment Non-Network expenditure discussed in section 7.6.

In consultation with stakeholders, we have developed standardised replacement expenditure asset categories for both transmission and distribution.[52] For each of these standard asset categories NSPs will be required to report:

- age profile data of existing inventories
- replacement and failure volumes
- unit cost data.

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51 AER, *Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution,* November 2013*;* AER, *Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Transmission,* November 2013*;* AER, *Better Regulation, Explanatory Statement Expenditure Forecast Assessment Guideline,* November 2013.

52 See section 5.2 for a more detailed discussion of the asset categories.

The volume of the required unit cost and asset replacement/ failure data will vary according to whether the NSP is submitting a Reset RIN or historic information under the category analysis RIN:

- Reset RINs will require the most recent 5 years of historic expenditure data, volumes of replacements and disposals, as well as 6 years of estimated/ forecast data that corresponds to forecast replacement expenditure.
- The category analysis RIN will require only 5 years of backcast data.

NSPs will be required to report asset age profile data for the most recently completed regulatory year. This information is required for the repex model. We note that while the results of the repex model will only be published initially during determinations, we will require age profile data to be submitted in the category analysis RIN. This will enhance the comparative analysis we undertake and we note all NSPs across the NEM will be required to report this information as part of their next regulatory proposal.

### 5.1.2 Reasons for AER position

The general data requirements reflected in the draft RIN with respect to repex reflect information necessary to conduct replacement expenditure modelling, and provide for monitoring of replacement volumes across time and NSPs. Further details of these techniques are contained in the explanatory statement to the Guideline.[53]

We developed our definition of replacement expenditure on the basis that NSPs broadly incur replacement expenditure as a result of physical deterioration of the condition of network assets or their immediate surrounds. NSPs typically will undertake preventative replacement programs consistent with asset life-cycle management policies of the reporting network service provider. As such we consider that replacement expenditure should include any inspection, testing, repair or rectification work that is as a result of, or is necessary to complete, the replacement but excludes any repair or rectification work that is not necessary due to the replacement but may be undertaken at the same time and location as the replacement.

NSPs must report expenditure incurred for these reasons as replacement expenditure and attribute it to the standardised asset categories. From our discussions with NSPs we understand a significant portion of replacement expenditure is not straight “like for like” replacement. Often repex involves replacing assets with a modern equivalent that contains additional functionality and capability than what is being replaced. There could be overlap between replacement and augmentation where the modern equivalent asset also allows for prospective demand growth and future capacity needs. Accordingly, in instances where there are multiple drivers of the need for an assets installation NSPs are required to report expenditure as repex if the above considerations are the primary driver of undertaking the works.

## 5.2 Standardised asset categories

### 5.2.1 AER position

As discussed above we have split replacement expenditure into standardised asset categories. These asset categories correspond to higher-level asset groups that are required for repex modelling purposes. We selected these asset groups on the basis that each asset in a NSP’s network serves a

[53] AER, *Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution,* November 2013*;* AER, *Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Transmission,* November 2013*;* AER, *Better Regulation, Explanatory Statement Expenditure Forecast Assessment Guideline,* November 2013.

discrete purpose or set of functions. We aggregated these functions to form the asset groups shown in Table 5.1. We note that we have removed the asset groups SCADA and Protection for distribution and IT and Communications for transmission from the groups we included in our indicative data template as these are covered in Non-Network expenditure.

**Table 5.1 Replacement expenditure asset groups**

| Transmission | Distribution |
|---|---|
| Steel towers | Poles |
| Tower structures | Pole top structures |
| Conductors | Overhead conductors |
| Transmission cables | Underground cables |
| Substation switchbays | Service lines |
| Substation power transformers | Transformers |
| Substation reactive plant | Switchgear |
| Other | Public lighting |
| | Other |

### 5.2.2 Reasons for AER position

To serve our assessment and reporting purposes we have categorised assets corresponding to these groups according to the characteristics of design and function that drive material differences in unit costs and asset lives.

We have been consulting on these asset categories with NSPs over the course of developing the Guideline. NSPs generally support the asset groups set out in Table 5.1. Some DNSPs more recently suggested combining switchgear and transformers into a single 'distribution substation' group. We acknowledge that these components are packaged together when initially installed, where each transformer has one or more switches, however we consider the asset lives of these substation components can vary materially and therefore it is appropriate to keep these groups separate. The tables in Attachment A provide each asset group's definition and a detailed discussion of:

- the classifications used to form the asset categorisations
- how this categorisation has changed from the indicative category analysis data template
- our reasoning and consideration of NSP views.

In consultation, some NSPs noted they would encounter difficulty providing age profile information due to issues such as data retention and the misalignment of the age of a network and its current service provider structure. We note that all NSPs have age and replacement data on the assets they own and operate, however not in the specific asset categories we have proposed. We have engaged closely with NSPs over 2013 in an attempt to refine the categories in such a way that we will capture key cost drivers in terms of asset type as well as comparable standard lives. The move to standardised categories across all NSPs will ultimately involve transitional costs for many NSPs and we have weighed this against the expected benefits of achieving a more comparable dataset.

In instances where NSPs consider it necessary, they are able to split out the standardised asset categories, provided these sub-categories reconcile to a particular standard asset category. It will be incumbent on the NSP to provide transparency on this split and must report the data requirements at the standardised asset category level.

## 5.3 Data required for each asset category

As previously mentioned we require NSPs to report for each asset category;

- age profile data of existing inventories
- replacement and disposal volumes
- input cost data.

### Age profile data

We require age profile data that reflect the volume of each asset category still in use, by year of installation. We also require the mean and standard deviation of the asset population's standard life. This information is required for repex modelling purposes. The model utilises a normal distribution to project the volume of replacement.[54] As noted above, we will initially only publish the results of the repex model as part of the determination process. Given that NSPs are reporting the standardised asset categories for the first time we intend to initially only publishing the results alongside the detailed review accompanying a determination.

An asset category's standard life is the estimated period after installation of the new asset during which the asset will be capable of delivering the intended effective service as it could at its installation date. The period of effective service needs to consider the life cycle costs between keeping the asset in operation and replacing it with its modern equivalent. Life cycle costs of the asset include those associated with the design, implementation, operations, maintenance, renewal and rehabilitation, depreciation and cost of finance.

Given the individual standard lives of the population of an asset category, we consider NSPs can derive the mean and standard deviation.

In instances where the NSP has provided asset sub-categories in addition to the specified asset categories (as noted above) it will be required to provide a weighted average asset life that reconciles to a specified asset category in accordance with the following formula:

$$\text{Standard life of asset category} = \sum_{i=1}^{n} \left( \left( \frac{\text{value of asset sub-category}_i}{\text{total value of asset category}} \right) \times \text{standard life of asset sub-category}_i \right)$$

Where: *n is the number of sub-categories to reconcile with the asset category*

*asset values are determined by the asset category's contribution to the current replacement cost of the network.*[55]

[54] AER, *Electricity Network Service Providers, Replacement expenditure model handbook,* November 2013.

[55] This being the most recent per unit cost of replacement for each asset, multiplied by the number of those assets in service and reported in the "asset age" schedule.

### Asset replacement and disposal volume data

For each asset category, we require number of assets replaced in the relevant period, the replacement volumes include when an asset is replaced with its modern equivalent as per our discussion replacement definitions (see section **Error! Reference source not found.**). This information is required for our trend analysis as well as calibrating the repex model.[56] Further we require the volume of asset failures, this will provide us information on the level of proactive replacements NSPs are conducting.

### Input cost data

For a detailed discussion of the input cost data associated with repex, see the general discussion contained in section 1.5.

[56] AER, *Electricity Network Service Providers, Replacement expenditure model handbook,* November 2013, p. 20.

# 6 Connections and customer-initiated works

This section outlines the data requirements in templates 2.5 and 4.1 to 4.4 for DNSPs and template 2.4 for TNSPs of our draft RIN templates for customer-initiated works.

Customer-initiated services prepare the electricity network to support the connection of new and existing network customers. They are comprised of the following activities:

- new customer connections (standard control and prescribed services for DNSPs and TNSPs, respectively)
- other services (alternative control for DNSPs):
  - elements of new customer connections
  - meter installation and maintenance associated with a new customer connection
  - augmentation of the shared network resulting from a new customer connection and by customer request
  - public lighting installation and maintenance associated with a new customer connection
  - fee based and quoted services common across DNSPs
  - miscellaneous fee based and quoted services that are not attributable to the above service categories.

In designing the templates for these categories, we engaged with NSPs at workshops and subsequently in informal consultations, to address issues mainly relating to NSPs' cost reporting capabilities. During these discussions, NSPs revealed their ability to record and report various cost items. We consider that most NSPs should have ready access to the data required to complete our templates, as we expect NSPs to retain such cost data for customer billing processes. Some NSPs indicated that data could be extracted with database coding. We consider the incremental cost of providing the information requested within our RIN template is low. The expected benefits of being able to compare costs across NSPs and conduct trend analysis are high.

## 6.1 General data requirements

### 6.1.1 AER position

#### Cost reporting requirements for customer-initiated works

The templates disaggregate costs for customer-initiated works into permissible combinations of the following categories for DNSPs:

- Residential, commercial, sub-division, embedded generation customer connections
- Simple, complex type connections
- LV, HV and sub-transmission connections
- Metering services by meter type
- Public lighting services for minor/major roads by light type

- Fee-based and quoted services.

For these, we require DNSPs to provide the total cost and volume data for the customer-initiated services they offer (see RIN template for specific requirements of each customer-initiated service).

We do not require TNSPs to provide detailed cost data in our RIN templates for customer-initiated works. We only require TNSPs to report direct material and labour costs for connection projects in the RIN template. Reporting requirements for TNSPs may change over time as information provided in the course of detailed engineering review reveals the possibility for us to use benchmarking and/or trend analysis. We will require TNSPs to provide detailed business cases justifying the economic merits of the connection project's scale and scope.

We recognise that the terms of customer-initiated services are negotiated between TNSPs and their customers, and are therefore unregulated. However, to the extent that the provision of a negotiated service gives rise to expenditure which may be attributable to a regulated service, we will use our assessment tools to determine whether such expenditure is efficient.

### Description of customer-initiated works

In addition to providing cost data, we will require the TNSPs and DNSPs to describe their overall customer-initiated capital works program by allocating work volumes into the categories presented in table 6.1 below. To meaningfully measure the relative efficiency of each NSP, we must consider customer-initiated expenditure in light of the unique circumstances of the NSP's operating environment. We consider the factors in table 6.1 explain some of the significant differences in the cost of service provision over time and between NSPs. We will use descriptor categories as a high-level indicator of the scope and scale of customer-initiated works to be undertaken over the regulatory period, and in assessing the comparability of DNSPs for category benchmarking analysis.

**Table 6.1 Description of TNSP and DNSP customer-initiated services**

| Service | Descriptor metric - volume of works |
|---|---|
| Connection services - transmission | Connection rating (MVA) |
| | Connection voltage (KV) |
| | Underground/Overhead connection |
| Connection services - distribution | Connections by Urban/CBD/Rural short-long |
| | Underground/Overhead connections |
| | Single/Multi-phase connections |
| | Distribution substation installed (<60/60-600/600+ kVA) |
| | Distribution substation total expenditure (<60/60-600/600+ kVA) |
| | Augmentation MVA added |

| | |
|---|---|
| | Augmentation of HV/LV lines (km) |
| | Quality of supply (mean days to connect LV residential customers) |
| | Quality of supply (Total GSL payments/GSL breaches and volume of customer complains for LV residential connections) |
| Metering services - distribution | Direct connect meters |
| | Current transformer connected meters |
| | Single phase meters |
| | Multi-phase meters |
| Public lighting services - distribution | Light installation for major/minor roads |
| | Light replacement for major/minor roads |
| | Light maintenance for major/minor roads |
| | Cabling used for light installation/replacement/maintenance (km) |
| | Poles installed for new light installation/replacement |
| | Light type |
| | Quality of supply (mean days to rectify/replace public lighting assets) |
| | Quality of supply (Total GSL payments/GSL breaches and volume of customer complaints for public lighting works) |
| Fee-based services - distribution | Total cost |
| Quoted services - distribution | Total cost |

## Reset RIN data requirements

NSP expenditure proposals should be accompanied by planning documentation and other analysis that justifies their forecast expenditures on customer-initiated work programs. As with past revenue proposals, NSPs will continue to be expected to provide spread sheets which demonstrate a detailed build-up of customer-initiated service costs for transmission and distribution connection projects. The calculation of output values within spread sheets should be clearly articulated with formulas included within spread sheet cells, to explain the derivation of expenditure requirements.

### 6.1.2 Reasons for AER position

The reporting categories have not markedly changed from those categories initially listed in our indicative RIN templates. However, following consultation with DNSPs at our most recent round of category analysis benchmarking workshops, we adjusted the category analysis RIN template for DNSPs by:

- removing direct and indirect labour and material expenditure line items
- adding connection classifications to differentiate sub-transmission level connections
- adding quality of supply description metrics for DNSPs' connections and public lighting services
- removing "location" field for NSPs to indicate planning regions/locales which bear a particular influence on the service provision cost
- removing detailed cost reporting of public lighting and fee/quoted services and replaced with average unit cost
- adding transformer total spend, transformer volumes (by capacity type) and augmentation (MVA added) and augmentation km added to descriptor metrics for connections
- adding poles installed/replaced and cabling used (km) to descriptor metrics for public lighting.

At present, we consider that prescribed transmission connections services to be a collection bespoke projects, differing significantly in terms of cost. We consider that a detailed engineering review caters to TNSPs' existing information reporting capabilities, and at present, is an efficient means to assess the qualitative and quantitative characteristics of connection projects. As such, we do not require TNSPs to report detailed sub-component costs for transmission connection projects within the RIN template for benchmarking purposes.

We recognise that the terms of some customer-initiated services are negotiated between TNSPs and their customers, and are therefore unregulated. However, to the extent that the provision of a negotiated service gives rise to expenditure which may be attributable to a regulated service, we will use a detailed engineering review to determine whether such expenditure is efficient.

#### Further guidance on expenditure classification

In recent consultation, most DNSPs sought clarity around our definitions of expenditure categories for the purpose of reporting expenditure related to customer-initiated works. This included guidance around the kinds of activities which were intended to be captured under each expenditure category.

We also note that the bulk of expenditure for customer-initiated works relates to activities that are homogenous across DNSPs; hence our capacity to benchmark cost data is high, provided definitions are sufficiently clear. We undertook a review of DNSPs' categorisation of customer charges and information provided as part of past distribution determinations to assess the consistency of expenditure categories and existing definitions across DNSPs. Additionally, we consulted with DNSPs' regulatory and technical staff to clarify our expectations of the data to be reported within our RIN templates. Definitions have been constructed to be as consistent as possible with existing reporting categories, and as per consultations, we have included examples of the activities likely to be captured within expenditure categories.

Accordingly, we have assembled a list of definitions and activity descriptions, where necessary, for each customer-initiated service as listed in the RIN to provide DNSPs clear guidance about how they should present cost data for reporting in these templates.

## 6.2 Other changes from indicative category templates

Aside from refinements to definitions, the reporting categories outlined above have not markedly changed from those initially listed in our indicative templates. The following sections outline other changes and considerations as a result of recent consultation with NSPs and further reflection on the data necessary to undertake our assessment.

### Connections services for distribution

We have added connection classifications to differentiate sub-transmission level connection projects from HV connections projects. From our discussions with DNSPs, we have identified a number of larger voltage connections projects which may skew the average cost estimate of HV connection projects, if included in the HV connection category. These projects are expected to be few in volume and have a significantly higher cost profile than those common HV connection projects, and as such, should be assessed as a separate category of connections.

We have added transformer total spend, transformer volumes and total spend (by capacity type) and augmentation (cost per HV/LV circuit kilometres added and MVA added) to descriptor metrics for complex connections categories. We have also added descriptor metrics which capture the quality of supply in relation to LV residential connections. We consider that the cost of transformers and augmentation works and quality of service can add significantly to the cost of connection projects. As such, we can account for the cost differences between connection projects from varied use of transformers and augmentation works when making a like-for-like comparison of connection works for category analysis benchmarking. The capacity groupings of transformers have been established to distinguish pole-mounted, ground mounted and indoor transformer types, which each have a specific cost profile that will influence the connection project's cost. Quality of service metrics have been chosen to be consistent with some DNSP's existing guaranteed service level requirements. The quality of service metrics will allow us to make comparisons of each DNSP's service performance and inform our decision to determine the efficient level of expenditure required to ensure that services meet the customers' needs.

### Public lighting services for distribution

We have condensed the cost reporting requirements for public lighting services to an average unit cost for installation, replacement and maintenance of public lighting assets. During our workshops, most DNSPs indicated that detailed reporting of public lighting services cost by the categories within our indicative RIN templates would be difficult and involve some method of estimation, particularly for historical data. We consider that an average unit cost figure for each light type is consistent with the basis on which public lighting services are priced and should be consistent with the way DNSPs record costs. Additionally, we consider that average unit costs provide us with a good basis of comparing public lighting works to apply category analysis benchmarking. We consider that public lighting services are an ongoing and recurrent activity which have involved the same material and labour inputs over time. As such, we consider that it is a service which is amenable to benchmarking of unit cost.

We have added volumes of poles installed/replaced and cabling used (km) to descriptor metrics for public lighting. We consider the variation in the volume of these asset categories to largely explain the difference in cost of providing public lighting services between DNSPs. As such, these metrics will

allow us to account for the difference in the scale and scope of public lighting services across DNSPs as we compare the unit costs of service provision, as part of our category analysis benchmarking.

We have also differentiated public lighting works on the basis of whether the work is performed on a major or minor road. Most DNSPs highlighted this as a significant factor affecting the cost of public lighting services provision. Major road works tend to involve greater traffic control costs which make them materially higher in cost compared to works performed on minor roads.

We have also added descriptor metrics which capture the quality of supply in relation to the provision of public lighting services. Quality of service metrics have been chosen to be consistent with some DNSP's existing guaranteed service level requirements. The quality of service metrics will allow us to make comparisons of each DNSP's service performance and inform our decision to determine the efficient level of expenditure required to ensure that services meet the customers' needs.

### Reporting requirements for contestable services

NSW DNSPs sought clarity about the information reporting requirements for connections and elements of metering services which have been deemed contestable services and are unregulated by the AER. We will not collect information for contestable services which are provided by either an accredited service provider or a DNSP.[57] However, we will collect cost data for elements of connection services which are not contestable. In NSW, DNSPs perform augmentation works for some connections projects as part of standard control services. We would require this expenditure to be reported under our complex connections category. It is worth noting that in our NSW workshop, the NSW DNSPs identified that they are directed by the NSW state Government to perform connection services where there are insufficient or unwilling accredited service providers to undertake the connection service.[58] We would welcome stakeholder views which articulate the quality of these services performed by DNSPs and the benefit of collecting information for the purpose of expenditure benchmarking. In its most recent network tariff proposal, Endeavour Energy listed the costs of providing connection works for projects such as these as part of its requirement by IPART to provide transparency for project costs of this kind.[59]

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57 That said, we do require information on revenues collected from unregulated services as part of our Shared Assets Guideline.

58 AER, *'Meeting summary – Sydney and Canberra workshop, Category analysis data templates'*, 24 September 2013, p. 7.

59 Endeavour Energy, *Network price list 2013/2014*, July 2013, pp. 43–54.

# 7 Non-network expenditure

Template 2.14 (for distribution) and 2.5 (for transmission) of the draft RINs set out the information NSPs must provide in relation to historical and forecast non-network expenditure and asset utilisation.

The templates break up expenditure by five expenditure categories:

- IT & Communications Expenditure
- Motor Vehicles Expenditure
- Property & Buildings Expenditure
- Other Expenditure
- SCADA and Network Control Expenditure.

For these various categories, the templates request expenditure information to be broken down into capex and opex, recurrent versus one-off, as well as supporting information on the volume of activities, such as utilisation data for vehicles and users for IT devices.

We have consulted with NSPs regarding their ability to provide this information and consider it to be readily available in most cases. Hence the incremental cost of preparing this information should not be high, and more than offset by the benefits of being able to understand and compare expenditures on non-network items across NSPs and over time.

The following section summarises the general approach and justifications to the data requested for each of the subcategories of non-network expenditure, including changes from the indicative templates released in August. The subsequent sections discuss specific issues for each of the subcategories.

## 7.1 General data requirements and justifications

The non-network templates require the NSPs to split expenditure between Recurrent Expenditure and Non-Recurrent Expenditure in a number of the categories. We are defining Recurrent Expenditure as expenditure that returns time after time. Examples of recurrent may include: cyclic replacement of assets and related costs (hardware, software, training etc.). Recurrent Expenditure may be either capital expenditure or operating expenditure. Non-Recurrent Expenditure is being defined as expenditure that is not Recurrent Expenditure.

This separation of Recurrent Expenditure from Non-Recurrent Expenditure should facilitate more streamlined assessment for Recurrent Expenditure primarily using trend analysis and potentially some benchmarking. Technical assessment and detailed project review can also be better focused on material Non-Recurrent Expenditure. We consider requiring a separation of Recurrent Expenditure from Non-Recurrent Expenditure should not be of undue burden for businesses given they are able to classify what expenditure they consider recurrent and the appropriate cost drivers related to this expenditure.

For much of the expenditure data in the Non-Network template we require NSPs to report both operating expenditure and capital expenditure. This is to facilitate us examining forecast total expenditure against historical total expenditure trends of the given NSP and also to benchmark total expenditure against the total expenditure of other NSPs. We are examining total expenditure because

expenditure in these categories is commonly incurred as either capital or operating expenditure and procurement methods may change through time. We consider that reporting of both capital expenditure and operating expenditure in this template should not create undue burden. We also note the operating expenditure reported in this template can and should be directly linked to the input cells where it is reported in the relevant operating expenditure templates.

We are wary that, without clear definitions, NSPs may consider expenditure on non-network items to be incurred in the delivery of direct costs, including repex and maintenance, depending on their approaches to capitalisation and cost allocation. Our definitions clearly indicate which items should be captured under these different headings. There are, however, some instances where we have deliberately requested data on non-network items that will also be captured in overheads. While this does not affect our assessment, for the purposes of reconciliation of expenditure in the non-network template we have added separate totals for each expenditure category—expenditure reconciled from this template, and expenditure reconciled from other sheets. We appreciate this may appear unwieldy from a data presentation point of view and seek NSP feedback on whether the templates, definitions or instructions can be improved upon.

For all categories of expenditure in the Non-Network template, we are requiring NSPs to forecast Recurrent Expenditure where possible using identified volume and cost drivers. We consider this is appropriate given recurrent expenditure should have quantifiable volume and cost drivers. We do not consider this will create an excessive burden on NSPs given they are free to identify the cost drivers they consider appropriate.

We had proposed having NSPs report fixed versus variable costs separately for a number of categories as part of the indicative category templates we released in August 2013. We are now not requiring the reporting of fixed and variable costs in any of the Non-Network expenditure categories. However, NSPSs should still report key cost drivers and we note these may be driven by variable or fixed factors.

While we have only specified a certain level of expenditure disaggregation, we expect expenditure to be disaggregated where significantly different cost drivers exist and relate to material amounts of expenditure. We consider any expenditure areas involving over $1M (nominal) over the regulatory period to be material. For example, if material communications expenditure within the IT & Communications Expenditure category is driven by communication data volumes that are quite distinct from IT cost drivers, we would expect the relevant communications expenditure to be separately identified against its cost drivers. We do not consider this will create an excessive burden given the NSPs are free to identify expenditure cost drivers and we only require identification of specific cost drivers where they vary materially from other expenditure cost drivers and also relate to material amounts of expenditure.

Table 7.1 sets out non-network data requirements.

**Table 7.1 Non-network data requirements**

| Major expenditure category | Sub category | Quantitative measures | Qualitative evidence |
|---|---|---|---|
| IT & Communications | Client Devices<br>Recurrent (other than Client Devices)<br>Non- Recurrent (other than Client Devices | Total Organisation Personnel<br>Number of users<br>Number of devices<br>Drivers - NSP to nominate | Economic justification for expenditure |
| Motor Vehicles - (Network/ Non-Network) | Network<br>- Cars<br>- Light Commercial<br>- Heavy Commercial<br>- Elevated Work Platforms - LCV<br>- Elevated Work Platforms - HCV<br>Non- Network<br>- Cars<br>- Light Commercial<br>- Heavy Commercial | Number of vehicles<br>Unit costs (capex and opex)<br>Unit costs per km (opex)<br>Unit costs per km (capex)<br>Average Km travelled<br>Fixed and variable costs<br>Drivers - NSP to nominate | Economic justification for expenditure |
| Buildings and property | Recurrent<br>Non-recurrent | Expenditure by key drivers - NSP to nominate | Economic justification for expenditure |
| Other | Recurrent<br>Non-Recurrent | Expenditure by key driver - NSPs to nominate | Economic justification for expenditure |
| SCADA and network control | Smart Meter Expenditure<br>- IT<br>- Communications<br>Other Expenditure<br>- IT<br>- Communications | Expenditure by key driver- NSPs to nominate | Economic justification for expenditure |

## 7.2 IT & Communications Expenditure

### 7.2.1 AER Position

IT & Communications Expenditure is defined as: all non-network expenditure directly attributable to IT and communications assets including: replacement, installation, operation, maintenance, licensing, and leasing costs but excluding all costs associated with SCADA and Network Control Expenditure that exists beyond gateway device (router, bridge etc.) at corporate offices and:

- Expenditure related to management, dispatching and coordination, etc. of network work crews (e.g. phones, radios etc.)

- Expenditure related to network metering recording and storage at non network sites
- Common expenditure shared between SCADA and Network Control and the IT & Communication with no dominant driver related to either category. For example, expenditure on gateway devices used to carry both network and corporate communications should be reported as IT & Communications Expenditure. Where a dominant driver exists for the expenditure the expenditure should be reported in the expenditure category related to this driver.

### 7.2.2 Reasons for AER Position

We have included SCADA and Network Control expenditure that exists on the corporate office side of the gateway device in the definition of IT & Communications Expenditure as we understand this is commonly considered and recorded as a general corporate IT & Communications expense. We have included expenditure related to the communications and dispatch of work crews in the definition of IT & Communications Expenditure because we consider this expenditure is likely to be relatively minor and often obtained under common contracts with other IT & Communications Expenditure. We have included expenditure related to data storage of SCADA data as this is likely to involve significant common costs with other IT & Communications Expenditure. We consider these groupings of expenditure should better align expenditure reporting with NSP costs centres and cost drivers and should reduce regulatory burden.

We are also requiring NSPs to break down IT & Communications Expenditure into the following sub categories:

- Client Devices Expenditure
- Recurrent Expenditure (other than Client Device Expenditure)
- Non-Recurrent Expenditure (other than Client Device Expenditure).

Client Device Expenditure is defined as expenditure related to a hardware device that accesses services made available by a server. It may include hardware such as desktop computers, laptops, tablets and thin client interfaces and handheld end user computing devices including smart phones, tablets and laptops. Operating expenditure directly related to client devices (software, support etc.) will include costs such as software paid for by the NSP on personal client devices employees use to access work servers from home.

Separately recording and forecasting expenditure related to client devices is due to this expenditure sub category being expected to have distinct identifiable cost drivers and our view that this is likely to be relatively recurrent in nature.

In addition to asking NSPs to identify and report cost drivers associated with different IT & Communications expenditure, we have requested several standard metrics be reported in relation to IT & Communications Expenditure. These are organisational personnel, device numbers and user numbers. Since the release of the indicative category templates we have clarified the definitions of these metrics and changed the name of one metric from employee numbers to organisational personal as we want this metric to include organisational personal who may not be employees. We consider that these quantitative measures should be easily reported with limited burden on NSPs and provide us with some standard expenditure normalisers. However, while we are requiring NSPs to report these standard metrics, we would expect NSPs to report any key cost drivers they face.

### Separation of IT from communications expenditure

NSPs commented that any separation of IT from communications and detailed disaggregation of these categories may be difficult, given IT and communications services are often provided under bundled contracts.[60]

We acknowledge the overlap between IT and communications expenditure, and that these services are often acquired together under contract. For these reasons, we are also only requiring high level disaggregation into three broad expenditure categories except where NSPs can identify specific drivers related to material amounts of specific expenditure in lower level sub categories. This should limit the burden on NSPs associated with reporting this expenditure.

We propose to only require NSPs to identify communications expenditure separately from IT in this expenditure category when they can identify specific drivers in relation to material amounts of expenditure. We consider this is a reasonable compromise that should limit the burden on NSPs by only requiring disaggregation of expenditure and drivers where the cost drivers vary significantly in relation to material amounts of expenditure.

### Definition of Recurrent Expenditure and level of recording

NSPs commented that it is unclear what recurrent expenditure was versus non recurrent expenditure. They also questioned the level of detail required in its recording and if it should be classified at a more macro level.

We note that this issue, while raised in relation to IT & Communications Expenditure, has broader application to all areas of Non-Network Expenditure requiring identification of Recurrent Expenditure. The AER position below is relevant to these other areas of Non-Network expenditure requiring identification of Recurrent Expenditure.

The AER had used recurrent in its common English usage to mean something that returns time after time. We have now defined Recurrent Expenditure to mean expenditure that returns time after time.

While we have identified client devices to be reported separately and given some examples of expenditure we consider likely to be recurrent, we consider it appropriate at this stage for NSPs to determine what they consider to be Recurrent Expenditure. We may review the definition of Recurrent Expenditure in the future after seeing how different businesses classify their expenditures.

We accept that classifying Recurrent Expenditure versus Non-Recurrent Expenditure should be done at a reasonably high level to limit the costs involved. For this reason we are happy for businesses to allocate programs of works, groups of minor projects, and material projects to either Recurrent Expenditure or Non-Recurrent Expenditure with a brief explanation of the basis of their allocations.

### Quantification of benefits from IT investment

NSPs indicated it can be challenging to quantify the gains from IT expenditure incurred to achieve future operational efficiency gains.

We consider that all significant expenditures should be supported with business cases that demonstrate the investments are efficient and prudent. Business cases should set out and estimate

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[60] AER, 'Meeting summary - Overheads, cost allocation, statutory accounting, and capitalisation policies', *Workshop 16: Category analysis work-stream - Overheads, cost allocation, statutory accounting, capitalisation policies (Transmission & Distribution)*, 8 May 2013, p. 4.

the expected benefits of incurring the expenditure (e.g. operational cost savings) and show that the expected benefits outweigh the expected costs in present value terms. These business cases should also demonstrate the chosen project is expected to have the highest net present value of likely viable options.

Generally, if NSPs cannot quantify the benefits of investments sufficiently to show they are expected to have a positive net benefit, we are unlikely to conclude they are prudent and efficient.

### Use of standard IT classifications

In consultation, some NSPs indicated that the use of personal computer expenditure was not a standard IT classification and we should use standard IT classifications for reporting purposes.

In response to this concern we have substituted Client Devices for the Personal Computers expenditure classification that was used in the draft RIN templates published in August 2013. Client Devices is an existing IT expenditure hardware classification we consider consistent with our original intent of capturing expenditure related to personal computers and similar generally corporate user computing devices.

We consider the use of Client Devices should simplify reporting given it is a standard IT category.

### Appropriateness of our drivers for expenditure

NSPs commented that the key drivers of IT expenditure may not be the metrics we identified and these may not represent the IT delivery model of particular NSPs.

NSPs noted that where the delivery model between NSPs varies, for example in relation to the use of insourced versus outsourced procurement, direct comparison of costs across NSPs may not be valid.

Victorian NSPs indicated the key IT & Communications Expenditure cost driver for them was the requirements associated with the current Smart Meter roll out program.

We acknowledge that the quantitative metrics we are requiring NSPs to report may not be the key cost drivers a given NSP faces, particularly at a given point in time. However, we believe they will be useful to target areas for further examination during revenue reviews and note they are commonly used in benchmarking this type of expenditure. We also consider these high level metrics should impose very little reporting burden.

We also believe that while delivery models may vary, prudent and efficient expenditure between delivery models should be comparable.

In addition, irrespective of the metrics we have identified for reporting, we expect all NSPs to identify the material cost drivers they face and any quantitative relationship between these drivers and their expenditure forecasts. When NSPs do this they can report the cost drivers they feel are appropriate, explain why, and show any quantitative relationship/s between the driver and their expenditure.

## 7.3 Motor Vehicle Expenditure

Motor Vehicles expenditure is defined as all expenditure directly attributable to motor vehicles including: purchase, replacement, operation and maintenance of motor vehicles assets registered for use on public roads, excluding mobile plant and equipment. Motor Vehicle Expenditure excludes expenditure on vehicles not generally moved large distances on public roads under their own power which should be recorded under the Other Expenditure category.

### 7.3.1 AER Position

NSPs are required to break down historical and forecast Motor Vehicle Expenditure into the following standardised motor vehicle classes:

- Car
- Light Commercial Vehicle (LCV)
- Heavy Commercial Vehicles (HCV)
- Elevated Work Platform LCV
- Elevated Work Platform HCV

NSPs are required to forecast and historically record the following data for each motor vehicle class:

- Operating expenditure overall and per vehicle and per vehicle km
- Capital expenditure overall and per vehicle and per vehicle km
- a basic explanation of the volume and cost drivers
- the number of vehicles
- the average kilometres travelled per vehicle

Data on motor vehicle classes is to be reported separately for two distinct categories:

- Network Expenditure. This is defined as where the key/dominant driver for purchase or acquisition of the Motor Vehicle is use on the network
- Non-Network Expenditure. This is defined as all Expenditure on Motor Vehicles where the dominant driver for purchase or acquisition of the Motor Vehicle is not use on the Network

### 7.3.2 Reasons for AER Position

We consider that our classifications of motor vehicles are relatively simple and break motor vehicles up into distinct classes of motor vehicle that are likely to have distinct cost drivers. This level of disaggregation should show changes in NSPs' motor vehicle costs and associated cost drivers through time and indicate differences in different NSPs vehicle usage patterns and work practices. We consider collecting expenditure and usage information by these Motor Vehicle classes should impose little burden on NSPs as we consider they should currently collect the majority of the information we are requesting.

The benefits of obtaining this information will be to better assess the efficiency of expenditure via trend analysis and benchmarking of costs across NSPs. This information may also allow us to better understand network costs associated with travel time, different NSP choices with respect to network operations, and assessment of potential step changes.

#### Appropriateness of kilometres as a cost driver

NSPs commented in workshops prior to the publication of the Draft Guidelines that they collected usage data based on hours of vehicle usage as hourly labour costs are the key costs associated with vehicle usage. NSPs also noted that there are a range of reasons benchmark expenditure could vary across networks (e.g. due to different network design and depot locations, or due to different levels of

outsourcing of contracts). It was also noted that lower utilisation may reflect a desire to have more rapid and effective emergency response.[61]

While we acknowledge hours of usage may be a key NSP cost driver, particularly due to labour costs, at this stage we do not intend to require NSPs to report hours of operation for any class of Motor Vehicle. One reason for this is we do not consider this data is consistently recorded across NSPs. We also consider vehicle kilometres travelled can generally be used as proxy for hours of travel usage.

We remain of the view that kilometres travelled should be systematically recorded by all NSPs (for maintenance and other reasons) and reporting this should not be a material burden for any NSP. Vehicle kilometres travelled is a direct driver of direct Motor Vehicle Expenditure.

However, while we are not requiring reporting of vehicles hours of operation for any vehicle classes, where this is a key cost driver that is recorded, NSPs should report this information. We consider hours of use may be a key cost driver for some heavy vehicles and for some elevated work platforms.

Where NSPs have specific drivers for material amounts of their expenditure, for example larger vehicle numbers with lower utilisation to reduce emergency response times (with associated efficiencies and to meet legal requirements), we would generally expect NSPs to report these drivers. We accept that a range of NSP specific factors will drive expenditure and will examine forecast expenditure in consideration of this.

### Vehicle expenditure embedded in contracts

One NSP raised concerns around the benchmarking of vehicle related costs given different work procurement practices.[62] It indicated that it outsourced large amounts of operating and capital works activities and that the contractors supplied the motor vehicles required to do the work under the contracts. Therefore, their vehicle expenditure would benchmark at a very low level relative to NSPs that undertook their own works with their own vehicles.

The AER is aware that Motor Vehicle Expenditure may be incurred directly or indirectly by NSPs and this will be reflected in different directly incurred motor vehicle costs and also in unit costs for certain work activities.

We consider that depending on work procurement practices, we may have to make adjustments to unit costs and be careful when benchmarking Motor Vehicle Expenditure and expenditure in other categories between NSPs. However, we consider that as long as we are aware of the costs a given NSP's expenditure categories contain, we should be able to make valid comparisons between NSPs.

### Motor Vehicle Expenditure recorded as overheads

NSPs indicated that Motor Vehicle Expenditure may be incurred and recorded as Overheads.[63] NSPs questioned if Motor Vehicle Expenditure currently recorded as overheads should continue to be recorded as overheads, or should be recorded in the Non-Network Expenditure template.

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61 AER, 'Meeting summary - Overheads, cost allocation, statutory accounting, and capitalisation policies', *Workshop 16: Category analysis work-stream - Overheads, cost allocation, statutory accounting, capitalisation policies (Transmission & Distribution)*, 8 May 2013, p. 6.

62 AER, 'Meeting summary – Adelaide workshop ', *Category analysis data templates*, 25 September 2013, pp. 7-8; AER,

63 AER, 'Meeting summary – Melbourne workshop ', *Category analysis data templates*, 26 September 2013, p. 7; AER,

Where Motor Vehicle Expenditure is an Overhead, the expenditure should be captured in the relevant Overhead Expenditure category.

However, all Motor Vehicle Expenditure incurred directly by the NSP (e.g. through purchasing or leasing vehicles and any cost associated with those vehicles) should also be reported in the Non-Network Expenditure template. This should provide us with a complete record of direct Motor Vehicle expenditure in this template and facilitate improved analysis of expenditure as a result.

## 7.4 Building and Property Expenditure

Building and Property Expenditure is defined as all expenditure directly attributable to non-network buildings and property assets including: the replacement, installation, operation and maintenance of non-network buildings, fittings and fixtures.

NSPs will be required to report Non-Network Building and Property Expenditure by Recurrent Expenditure and Non-Recurrent Expenditure.

We consider separating out Recurrent Expenditure in this category is justified for this category as a large amount of Non-Network Building and Property Expenditure for both capex and opex.

We also consider assessment of Recurrent Expenditure in isolation from Non-Recurrent Expenditure is also warranted given Non-Recurrent expenditure can vary markedly and be highly material.

## 7.5 Other Expenditure

Other Expenditure is defined as all expenditure directly attributable to the replacement, installation, maintenance and operation of non-network assets, excluding motor vehicle assets, building and property assets and IT and communications assets.

This expenditure category includes mobile plant and equipment including motor vehicles not registered for road use, motor vehicles registered for road used but not normally moved large distances under their own power, tools, and other miscellaneous non-network capital expenditure.

We are requiring this category to be disaggregated between Recurrent Expenditure and Non-Recurrent Expenditure. We consider this is justified as most expenditure is likely to be recurrent and can be assessable in isolation from Non-Recurrent Expenditure via trend analysis. We also consider there may be material Non-Recurrent Expenditure, for example large portable generation that may warrant separate assessment from the Recurrent Expenditure in this category. We consider this level of reporting should not impose excessive burden on NSPs given they can identify what they consider to be Recurrent Expenditure. While we had indicated NSPs should report fixed and variable costs in our indicative templates released in August 2013, we are now not requiring this.

We are requiring operating expenditure to only be reported against this category where assets within a class worth over $1,000,000 in nominal terms have been purchased (i.e. incurred as capital expenditure) over the last five regulatory years for which regulatory accounts have been lodged with the AER. For example, if a firm has purchased elevating work platforms for over $1,000,000 over the last five years lodged regulatory accounts, historical and forecast capital expenditure and operating expenditure related to elevating work platforms should be reported in the Non-Network template. However, if an NSP has incurred less than $1000,000 capital expenditure over the last five years for which they have lodged regulatory accounts, the NSP is only required to report historic and forecast capital expenditure in this category. Any operating expenditure in this case should be reported exclusively in the relevant operating expenditure category template.

We are collecting some operating expenditure in this category because the expenditure can be incurred as either capital or operating expenditure and assessment at the total expenditure level should improve the assessment. However, we are limiting the collection of operating expenditure to material areas of capital expenditure over the prior regulator period to limit the required reporting in this expenditure category.

## 7.6 SCADA and Network Control Expenditure

This covers all expenditure directly attributable to SCADA and Network Control devices (i.e. network control or network monitoring devices) that exist beyond gateway devices (routers, bridges etc.) at corporate offices, and all communications expenditure incurred primarily for communications associated with the control or telemetering of the network (e.g. communications to and from SCADA devices or network control devices to corporate systems). This includes expenditure associated with: the replacement, installation, maintenance, licensing, leasing and operation of SCADA and network control hardware, software and associated IT systems that are dedicated or substantially dedicated to SCADA or network control functions. While we note that smart meter expenditure is not generally considered SCADA and Network Control expenditure, we are collecting some DNSP costs associated with Smart Meters in this expenditure category where SCADA and Network Control functionality is the primary cost driver (e.g. communications costs including sending billing data from the meter). Our definitions allow for common costs shared between SCADA and Network Control and IT & Communications with no dominant driver related to either category to be reported in the relevant IT & Communications Expenditure category. For example, expenditure on gateway devices used to carry both network and corporate communications should be reported under IT & Communications Expenditure. This approach acknowledges the overlap between SCADA and network control, and IT and communications and should lessen the reporting burden on NSPs.

In addition to Recurrent Expenditure and Non Recurrent Expenditure separation, we are requiring DNSPs to split expenditure in this category between Smart Meter Expenditure and expenditure that is not Smart Meter Expenditure and below these categories between expenditure on communications and expenditure on IT. We consider this level of disaggregation is warranted here because of:

- the large amount of Smart Meter Expenditure currently being incurred by some NSPs in particular jurisdictions or in prospect and the distinct cost drivers associated with Smart Meter Expenditure
- the significant difference in cost drivers between IT and communications and the large increases in communications and related expenditure expected from the use of smart meters and
- the significant and ongoing increase in SCADA and Network Control equipment across the networks.

Where equipment for a given purpose has inbuilt SCADA or Network Control functionality which is not its primary purpose, we are requiring the equipment to be reported under its primary purpose category. Some examples of this include:

- Capital expenditure on smart meters should be reported in the metering template.
- Network equipment replaced with new modern equivalent assets that contain SCADA functionality should be reported in the relevant repex category if the replacement meets the definition of repex.

### 7.6.1 Need for SCADA and Network Control category

NSPs raised concerns around whether SCADA and Network Control should be a distinct expenditure category as increasingly modern equivalent assets have SCADA and Network Control functionality built into them.

We agree that modern network assets increasingly have inbuilt SCADA and Network Control functionality and reporting SCADA and Network Control expenditure separately for these assets may be of limited value. For this reason, we will not require modern assets with inbuilt SCADA and Network Control functionality to be reported against the SCADA and Network Control expenditure category where the primary purpose for the asset is not SCADA and Network Control. However, we are of the view it is appropriate to maintain the SCADA and Network Control category given the level of investment in this category and the fact it may increase with increased usage of smart meters and the roll out of smart grid technology.

Irrespective of reporting requirements, we will expect businesses to justify why the modern equivalent asset with inbuilt SCADA and Network Control functionality are the prudent and efficient modern equivalent assets over assets without that functionality (if available) taking into account the incremental costs and benefits of the SCADA and Network Control functionality.

Finally, we note we are not requiring reporting of capital expenditure on actual Smart Meters in the SCADA and Network Control category because the primary purpose of a meter installation under normal circumstances would not be its SCADA and Network Control functionality.

### 7.6.2 Potential overlap with IT and Communications expenditure

NSPs raised concerns that SCADA and Network Control costs are increasingly not distinguishable from non-network IT and Communications expenditure as common equipment and services, for example communication links, are used to provide both categories of expenditure.

The AER acknowledged in the Draft Guideline Explanatory Statement that expenditure could be commonly incurred and artificially separating out this expenditure might be of limited value. For this reason the AER will require NSPs to report common expenditure with no dominant purpose related to either SCADA and Network Control or communications and IT to be reported under the IT & Communications Expenditure category.

# 8 Vegetation management

Template 2.6 (for transmission and distribution) of the draft RINs will be used to collect information on the scale of work and costs associated with a NSP's vegetation management work program. We request information on variables that we consider necessary to improve our understanding of, and improve the comparability of the NSP's vegetation management costs. We also request information on vegetation caused events as a measure of the effectiveness of the NSP's vegetation management work program. The information provided in the RIN will allow us to review the NSP's vegetation management expenditure on a more disaggregated basis in order to assess the breakup of costs and outcomes. We consider it is important to examine the breakup of costs as vegetation management can be a large proportion of a NSP's total opex.

The information we request for vegetation management assessment is (or should be) readily accessible by NSPs and used in their existing management processes. We have not requested disaggregated vegetation management data previously and therefore consulted with NSPs to determine what data they currently collect. We have reconsidered the usefulness and robustness of information originally anticipated in our indicative templates. We have made important changes to data requirements in developing the draft RIN in response to NSP comments and as such consider that the incremental cost of NSPs providing this information to the AER is low.

The following section explains our general approach and reasoning, including changes from the indicative templates released in August.

## 8.1 General data requirements and justifications

### 8.1.1 AER position

We require NSPs to provide us with disaggregated information concerning their vegetation management activities, outcomes and drivers. Table 8.1 and Table 8.2 summarise these data requirements for DNSPs and TNSPs respectively.

The 'major category' column outlines the vegetation management activities for which we intend to collect expenditure data. The 'sub-category' column shows how we propose to disaggregate the expenditures for major categories. 'Quantitative measures' refer to the various drivers and outputs for which we intend to collect standardised data that will be used to explain expenditures. 'Qualitative evidence' outlines the additional, non-standardised information we will consider in our analysis of expenditures.

**Table 8.1 Vegetation management data requirements—distribution**

| Major category | Sub category | Quantitative measures | Qualitative evidence |
|---|---|---|---|
| Tree trimming, ground clearance | Zone | Km of maintenance spans in management area, average number of trees per span, feeder type, cutting cycles, outages and fire starts caused by vegetation contact, vegetation density | Legislative/regulatory requirements |
| Inspection, audit | Zone | Km of maintenance spans, feeder type, vegetation density | Legislative/regulatory requirements |
| Vegetation corridor clearance | Zone | Km of vegetation corridors, feeder type, cutting cycles, outages and fire starts caused by vegetation contact, vegetation density | Legislative/regulatory requirements, |
| Access track clearance | Zone | Km of access track, feeder type, vegetation density | Legislative/regulatory requirements |

**Table 8.2 Vegetation management data requirements—transmission**

| Major category | Sub category | Quantitative measures | Qualitative evidence |
|---|---|---|---|
| Vegetation corridor clearance | Zone | Km of vegetation corridors, cutting cycles, outages and fire starts caused by vegetation contact, vegetation density | Legislative/regulatory requirements |
| Tree trimming | Zone | Km of maintenance spans, average number of trees per span, cutting cycles, outages and fire starts caused by vegetation contact, vegetation density | Legislative/regulatory requirements |
| Access track clearance | Zone | Km of access track, vegetation density | Legislative/regulatory requirements |
| Inspection, audit | Zone | Km of maintenance spans, vegetation density | Legislative/regulatory requirements |

### 8.1.2 Reasons for AER position

We have substantially revised our requested vegetation management data following consultation with NSPs.

Vegetation management can make up a substantial part of a NSP's total operating expenditure. We therefore consider it cost effective to disaggregate this category to improve our ability to assess these costs. We currently assess vegetation management expenditure at the aggregate level. We have not systematically assessed this expenditure at a disaggregated level in the past, reflecting the lack of

standardised data. As a result, we do not have a thorough understanding of vegetation management costs and activities across NSPs.

We will continue to assess vegetation management expenditure as part of our overall base step trend approach to opex at the aggregate level.[64] That is, data on vegetation management activities will be used in our assessment of the efficiency of base year expenditures.

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 for like activities and various cost differences between NSPs, and hence will help us understand NSPs' individual operating environments.

The following sections explain our justifications for the data requested in the draft RIN, including how and why these changed from the indicative templates we released in August for consultation.

## 8.2 Vegetation management zones

### 8.2.1 AER position

The vegetation management zones template is intended to be used as a tool for the NSP to provide us with information on the factors that affect costs across parts of their network. Businesses would set the vegetation management zones. To the extent that they already do so, the NSP should continue to reflect reported data and operating environments across zones. This would be based on the recognised drivers (regulations, vegetation growth and density, and tree cutting cycles). We expect this to be only relevant for larger NSPs (by area). It is optional for the NSP to nominate more than one vegetation management zone.

#### Regulatory/legislative requirements

In the reset RIN, NSPs are asked to provide a list of significant regulations that impact the operation of their vegetation management scheme across their entire network and within vegetation management zones. These regulations are likely to include bushfire mitigation regulations but may extend to any other regulations that have a material impact on costs. We request information on which costs the identified regulations affect, and how those costs are affected. A list of significant regulations that affect distribution businesses is intended to help us determine operating costs for vegetation management activities performed across the entire network, allowing us to identify differences across NSPs.

We do not intend to request information on regulatory requirements with our RIN request for backcast data, unless the regulatory requirements changed significantly during the backcast period.

#### Geographic splits

Feeder type (sub-transmission, urban and rural) is a commonly used geographical disaggregation for DNSPs that we request for vegetation management expenditure. We would expect the costs for a

[64] See section 5.3 of the Explanatory Statement to the final Expenditure Forecast Assessment Guideline.

number of vegetation management works to differ depending on geography, clearance margins, regulations and other factors.

We no longer request vegetation management works be disaggregated by feeder classification, but we request DNSPs provide information on a number of metrics split down by feeder within each zone.

For TNSPs we no longer request expenditures be disaggregated by geography e.g. forest, grassland.

### Cutting cycles

For DNSPs we request an average time in years between vegetation cutting cycles for vegetation in proximity to feeders (sub-transmission, urban and rural) and within each zone.

For TNSPs we request an average time in years of vegetation cutting cycles within each zone.

### NSP imposed standards

Within the reset RIN NSPs are asked to comment on any self-imposed standards associated with their vegetation management activities, and reasons for performing work above what is required by regulations. These standards may include trimming trees far beyond clearance margins than is required by legislation, for example. We will consider this information when assessing other data provided by the NSP on the relevant work category.

We do not intend to request information on NSP imposed standards with our RIN request for backcast data.

## 8.2.2 Reasons for AER position

### Cutting cycles

We request data on the frequency of the cutting cycle, by vegetation management zone because the frequency of cutting affects the cost of tree cutting over an extended period. NSPs would incur the lowest overall costs by finding an optimal cutting cycle, by factoring in both mobilisation and cutting costs. Cutting cycles must be factored into both our trend analysis and category benchmarking.

We now request an estimate of the average cutting cycle recognising that the length of cutting cycles may differ in parts of a NSP's network. This follows Ergon's feedback that they operate under differing cutting cycles across their network.[65]

### Tree growth rates

We no longer intend to collect information from NSPs on tree growth rates, sunshine levels or rainfall.

NSPs consistently provided feedback in consultation that they do not collect data on tree growth rates, tree species, rainfall or sunshine levels.[66] JEM said they collect some information on tree

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65 AER, 'Meeting summary – Brisbane workshop ', *Category analysis data templates*, 27 September 2013, p. 8.

66 AER, 'Meeting summary – Hobart workshop ', *Category analysis data templates*, 23 September 2013, pp. 6–7; AER, 'Meeting summary – Sydney and Canberra workshop, *Category analysis data templates*', 24 September 2013, pp. 9–10; AER, 'Meeting summary – Adelaide workshop ', *Category analysis data templates*, 25 September 2013, p. 8; AER, 'Meeting summary – Melbourne workshop', *Category analysis data templates*, 26 September 2013, pp. 7–8; AER, 'Meeting summary – Brisbane workshop ', *Category analysis data templates*, 27 September 2013, p. 7.

species, but not in the amount of detail that we were requesting.[67] Aurora and Transend said that when they do consider tree growth rates, it is not in manner predictive of expenditure.[68]

We consider that tree growth rates are a significant driver of vegetation management costs, and should be considered by NSPs for their expenditure planning purposes. However we recognise that NSPs will be unable to provide us with this information.

We will use data from the Bureau of Meteorology's Normalised Difference Vegetation Index (NDVI) to consider the growth and density of vegetation, rather than use data on tree growth rates. We will examine changes in vegetation density over time and consider changes in density justify differences in costs of vegetation management works, whether over time or between NSPs.

## 8.3 Vegetation management expenditure

### 8.3.1 AER position

The vegetation management template is intended to provide a breakdown of the NSPs significant vegetation management works. This tab will need to be reproduced for each vegetation management zone the NSP nominates.

#### Vegetation management works

For DNSPs we request costs of vegetation management work split out by a number of works, including tree trimming, hazard tree cutting, ground clearance[69], vegetation corridor clearance and access track clearance. For measurement of the work performed, we request information on:

- the number of maintenance spans
- the total length of maintenance spans
- the total length of vegetation corridors
- the total length of maintained access track
- the average number of trees per maintenance span
- the average length of cutting cycles.

The DNSP's total expenditure of each work category will be divided by the relevant metric to determine per unit costs.

We no longer request DNSPs provide cost data on each of the vegetation management work categories disaggregated by CBD, urban, short-rural and long-rural. We are also not requesting costs be disaggregated by work done in proximity in to low and high voltage feeders. We are, however, requesting volume information (listed above) to be reported by subtransmission, urban and rural subregions.

For TNSPs, costs of vegetation management work are to be split out by a number of works, including vegetation corridor clearance, tree trimming and access track clearance. For measurement of the

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67 AER, Melbourne workshop, 26 September 2013, p. 8.
68 AER, Hobart workshop, 23 September 2013, p. 7.
69 We define ground clearance costs as costs involved in the trimming or removal of low-lying vegetation (e.g. grass, shrubs, tree sprouts). This includes work surrounding the use of herbicides, chemical treatment and washdowns.

work performed, we request information on the number of maintenance spans, the total length of maintenance spans, the total length and the average width of vegetation corridors, the total length of maintained access track, the average number of trees per maintenance span and the average length of cutting cycles. The TNSP's total expenditure of each work category will be divided by the relevant metric to determine per unit costs.

We note that data on the average number of trees per span also is also collected for economic benchmarking purposes, however the category templates request this same data to be reported for each nominated vegetation management zone, and then by subregion, in reflection of the likely differences in costs of performing activities at these different levels.

## Audits and inspections expenditure

We request data on the audit and inspection cost per kilometre within each zone.

If NSPs perform inspections of electricity assets and vegetation simultaneously for maintenance purposes, we request these costs be categorised as maintenance expenditure.

We aim to keep inspection/auditing costs separate from the cost of vegetation management works. Recording these costs on a per kilometre basis is intended to provide comparability of costs across NSPs, after tree density is considered.

We no longer request that DNSPs' costs be disaggregated by feeder type or that TNSPs' costs be disaggregated by geography type.

## Other expenditure

### *Contractor management expenditure*

Most NSPs hire contractors to perform their required vegetation management work. We consider it is necessary to record costs for contract negotiation and contractor liaison because they may be material. Contractor management expenditure is separate from the entire contract cost.

Some NSPs may engage related parties to perform their vegetation management work. We discuss assessing the efficiency of expenditures of related parties in chapter 4 of the explanatory statement to the Guideline.

### *Tree replacement programs*

Best-practice vegetation management programs by DNSPs include funding for the replacement of some trees with trees of a more suitable species considering proximity to lines. We request information on the DNSP's expenditure in this area.

### *Other*

To gain a complete understanding of the NSPs costs associated with vegetation management, we request NSPs provide information on any other costs not requested in other categories.

### *Unplanned, sustained outages and faults and fire starts due to vegetation contact.*

We request data on outages and fire starts caused by vegetation growing into the clearance space and from vegetation falling into or blowing into the clearance space.

For DNSPs, this table is included in the interruptions to supply tables (template 6.3).

### 8.3.2 Reasons for AER position

A number of DNSPs, including Aurora, SA Power Networks, United Energy and Energex, provided feedback in consultation that they do not collect data in some of the categories we proposed to collect, these included hazard tree clearance, ground clearance, easement clearance and access track clearance.[70] We recognise that some NSPs will not be able to provide backcast data under some of the requested categories and may also not be able to provide current data in the short term due to contractual arrangements. We discuss this further in the section on data availability.

We no longer request that DNSPs disaggregate their costs for vegetation management works by feeder type, or to disaggregate the works further by proximity of vegetation to high or low voltage feeders. This follows feedback from Ausgrid, Endeavour and Energex that they do not collect data on their vegetation management expenditures by feeder type (CBD/Urban/rural),[71] and feedback from Energex that the voltage of feeders was not a significant differentiator of costs.[72] We request a breakdown of the each nominated vegetation management zone by total length of sub-transmission, urban and rural feeders. This breakdown will be considered when assessing DNSPs' expenditures within each zone.

TNSPs did not raise any concerns during consultation of providing data in accordance with the proposed breakdown of vegetation management works. However, TransGrid and Powerlink said they did not record information of the type of geography across their network in line with the RIN template, and would have to make arbitrary allocations of expenditure.[73] We no longer request TNSPs record information by type of geography.

The following sections explain where we have modified our data in areas to reflect specific feedback from NSPs.

#### Vegetation management works

##### *Tree trimming*

Data on the average number of trees per span will be examined with the overall cost of tree trimming by zone to determine the costs of tree cutting, factoring in tree density. Tree trimming is a significant part of vegetation management expenditure; therefore we consider it important to examine the unit cost of performing this activity. We also consider ground clearance costs, vegetation corridor clearance costs and access track clearance costs are material and should be examined on a unit cost basis.

DNSPs including SA Power Networks, United Energy, and Energex, submitted that they collect data on the number of spans with trees cut[74], Ausgrid said they collect information on number of trees cut.[75] We now propose to collect data of tree trimming work done by maintenance spans rather than on a per km basis.[76] This is to simplify the data provision process for DNSPs, who mostly record data by span or pole. As we still intend to assess DNSPs costs on a per km basis, we request DNSPs

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70 AER, Hobart workshop, 23 September 2013, p. 7; AER, Adelaide workshop, 25 September 2013, p. 8; AER, Melbourne workshop, 26 September 2013, p. 8; AER, Brisbane workshop, 27 September 2013, p. 8.
71 AER, Sydney and Canberra workshop, 24 September 2013, p. 10; AER, Brisbane workshop, 27 September 2013, p. 8.
72 AER, Brisbane workshop, 27 September 2013, p. 8.
73 AER, Sydney and Canberra workshop, 24 September 2013, p. 10; AER, Brisbane workshop, 27 September 2013, p. 8.
74 AER, Adelaide workshop, 25 September 2013, p. 8; AER, Melbourne workshop, 26 September 2013, p. 8; AER, Brisbane workshop, 27 September 2013, p. 8.
75 AER, Sydney and Canberra workshop, 24 September 2013, p. 9.
76 We define maintenance spans as span within the DNSP's network that is subject to maintenance under the DNSP's vegetation management program.

provide a figure for the total length of their maintenance spans in each of their nominated vegetation management zones.

We now request an average number of trees per maintenance span, by feeder type; rather than the total number of trees trimmed, by feeder type. This change was made to ensure compatibility with general metric data that is collected per span; and has been made to both the DNSP and TNSP templates.

#### *Hazard tree cutting*

In consultation, Aurora said they do not engage in hazard tree cutting.[77] SA Power Networks said they did not collect historical data on hazard tree cutting but that forecast data was being developed for its next regulatory proposal.[78] We consider data on hazard tree work should be collected from DNSPs as hazard tree cutting is an important part of vegetation work aimed at reducing outages and fire starts. We recognise some DNSPs may not be able to provide this data in the short-term.

#### *Ground clearance*

In consultation, Ergon commented that they do not engage in any ground clearance work as was defined, but they could provide information on areas treated with herbicide.[79] Our definition of ground clearance has been amended to incorporate this and similar activities.

#### *Vegetation corridor clearance*

Easement clearance has been renamed as vegetation corridor clearance to avoid any confusion with the use of the term easement. The easement of the line is the area of land legally allocated for electricity network assets. In some circumstances the easement may extend beyond the required clearance margin around towers or lines. We are only interested in the costs of work required in order to comply with required clearance margins.

### Inspections/audits

In consultation DNSPs including SA Power Networks, SP AusNet and United Energy said they collect data on inspection and audit costs.[80] We consider the collection of inspection costs is common to all DNSPs and we will continue to request this information. However, we no longer request DNSPs disaggregate their inspection costs by feeder type. This is in line with the same change for other vegetation management work categories.

Transend said in consultation that it conducts aerial inspections in addition to inspections at ground level.[81] We have amended the definition of inspections make it clear that aerial inspections are included with inspection costs.

### Other categories

#### *Travel costs*

We no longer intend to collect information on travel costs associated with vegetation management work.

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77 AER, Hobart workshop, 23 September 2013, p. 7.
78 AER, Adelaide workshop, 25 September 2013, p. 8.
79 AER, Brisbane workshop, 27 September 2013, p. 8.
80 AER, Adelaide workshop, 25 September 2013, p. 8; AER, Melbourne workshop, 26 September 2013, p. 8.
81 AER, Hobart workshop, 23 September 2013, p. 7.

NSPs including United Energy, CitiPower/Powercor and Ergon provided feedback in consultation that they do not collect information on vegetation management associated travel costs. They explained that travel costs are incorporated in contractors asking fee in the contract negotiation or bidding process; therefore NSPs do not have visibility of these costs.[82]

We consider that travel costs are significant and worth recording but consider any attempt by NSPs to collect this information would be too onerous, and unlikely to provide any information useful for our assessment purposes.

#### Tree replacement programs

We request data on tree replacement programs from DNSPs, recognising their may be a relationship between expenditure on tree replacement programs and expenditure on tree trimming in subsequent cycles, particularly in urban areas.

#### *Unplanned, sustained outages and faults and fire starts due to vegetation contact.*

In consultation Ergon and Energex commented that it was not clear how the outage information requested the vegetation management template differed from the outage data requested in the template for Emergency Response.[83] Recognising this, we now request information on outages and fire starts caused by vegetation in the Emergency Response template for DNSPs (2.8).

We request outage and fire start data caused by vegetation growing into the clearance space and by vegetation falling into or blowing into the clearance space. We will use data on outages and fire starts to consider the effectiveness of a NSP's vegetation management scheme. The data will not be used in a deterministic manner because outages and fire starts may still occur despite NSP compliance with regulatory or statutory obligations. It will be considered as a measure of the effectiveness of a vegetation management scheme when considering any cost changes.

As we do not intend to collect emergency response information from TNSPs, we have left our data request for vegetation caused outages and fire starts within the vegetation management template.

## 8.4 Reset RIN requirements

We request through the reset RIN:

- a map included as a separate document, outlining visually the borders of the NSP's nominated vegetation management zones;
- any compliance audits by the NSP of vegetation management work conducted during the current regulatory control period; and
- any material on factors or drivers the NSP considers unique to its vegetation management expenditure that has not otherwise been requested.

We request a visual outline of the borders of the NSPs nominated vegetation management zones in order to reconcile each zone with NDVI maps. This will be particularly important if NSPs choose to nominate vegetation management zones based on vegetation density or cutting cycles. We also expect bushfire risk areas to exhibit varying levels of tree density which we will examine. An outline of

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82 AER, Melbourne workshop, 26 September 2013, p. 8; AER, Brisbane workshop, 27 September 2013, p. 8.
83 AER, Brisbane workshop, 27 September 2013, p. 8.

the borders of each vegetation management zone will also ensure the NSPs entire network is included within a zone.

We request compliance audits of the NSP's vegetation management works to aid our assessment of the effectiveness of the NSP's vegetation management program. We will consider information on the quality of cutting work when assessing outage and fire start data, for example.

We request any other information NSPs consider may be relevant to inform our assessment of expenditure. We consider any additional information to support expenditure on vegetation management will reduce risk of the AER determining an allowance that does not reflect efficient costs.

## 8.5 Data availability

An issue with collecting disaggregated vegetation management data is that NSPs may not actually collect a large proportion of the data themselves. Much of the data could only be obtained via contractors.

NSPs generally contract their vegetation management works on a medium to long term basis. The contracts may be based on a lump sum payment, by unit rates of work performed, or a combination of the two. The contract may cover the total NSP service area or be broken into a number of separate contracts to facilitate competition and comparison.

Collection of additional data may only occur once new contract periods begin. This could be up to three to five years from now, after which we could request a complete list of data. We collect only aggregate data on vegetation management at present.

We are asking NSPs for data on all vegetation management activities when they are issued with their first data request. If NSPs are unable to provide data in the short term, we will request the NSP provide an indication of when they could provide the data. We will use estimates of the relevant expenditure in the meantime.

# 9 Maintenance

This section explains template 2.7 (distribution and transmission) of the draft RINs.

Maintenance expenditure includes all works to maintain the current working condition of an asset or to address the deterioration of an asset. These works include those that may be driven by gathering information on asset condition, reliability deterioration or an assessment of increasing risk of failure or performance degradation of a network asset.

In workshops held with NSPs after the release of the indicative category templates, most NSPs expressed concern about the level of detail and subcategories required for maintenance expenditure, and their anticipated difficulty in providing backcast data in the form required. We have taken account of these concerns and have amended the templates, with the main changes being data requirements for maintenance activities rather than for asset types, and the reduction or removal of detail/subcategories of maintenance data. These changes, together with the NSPs' continued reporting on their existing categories for maintenance expenditure (as either routine or non-routine maintenance), should result in a reasonable reporting burden on NSPs. Maintenance expenditure makes up a substantial portion of NSPs' total opex, and it is critical that these expenditure data are available for trend analysis, benchmarking and detailed review by the AER. We will also relate maintenance expenditure to the NSPs' capital expenditure (the opex-capex trade-off) and to measures of service reliability (such as frequency or duration of outages).

The following section explains our general approach and reasoning, including changes from the indicative templates released in August.

## 9.1 General data requirements

### 9.1.1 AER position

We will require NSPs to separate maintenance opex into:

- routine maintenance—activities directed at maintaining the current working condition or addressing the deterioration of assets, including discovering information on asset condition, and often undertaken at intervals that can be predicted
- non-routine maintenance—activities predominantly directed at managing asset condition. The timing of these activities depends on asset condition and decisions on when to replace the asset, which may vary over time and across DNSPs.

We will require NSPs to break down each expenditure group by key drivers, mainly by comparable maintenance works on key assets. Some examples of these activities/ assets are:

- pole inspection and treatment
- transmission lines maintenance
- underground cable maintenance
- distribution switchgear maintenance
- substation equipment and property maintenance, including subcategories for power transformers, and property

- SCADA and communication systems maintenance.

For each maintenance activity, we will require standardised data on the quantitative drivers of expenditure, including length of maintenance cycle and number of assets in each category.

If NSPs perform inspections of electricity assets and vegetation simultaneously for maintenance purposes, we request these costs to be reported as maintenance expenditure.

### 9.1.2 Reasons for AER position

The data in the maintenance category templates will be used for trend analysis of historic data and to compare expenditure between NSPs, e.g. the routine maintenance cost for distribution substations.

We have significantly reduced the volume of data in these templates from the indicative templates released in August. This has been based on the consistent feedback received in workshops and in meetings with NSPs on the inability to capture data in disaggregated asset categories. The main changes we have made to the templates are the following:

- maintenance expenditure will be disaggregated by work activity instead of asset types
- we have removed the requirement to break down maintenance expenditure by CBD/urban/rural short/rural long feeder types
- we have removed the requirement to show allocated network and corporate overheads per direct cost category
- for related-party contracts, the total cost and the related party margin has to be reported
- there are additional and clearer instructions on how to fill in the RIN templates, and additional definitions of terms used in the templates
- there are now separate templates for DNSPs and TNSPs
- we have applied consistently the labelling of routine and non-routine maintenance for DNSPs and TNSPs (previously these were field maintenance and operational refurbishment for TNSPs and a source of some confusion).

#### High-level grouping of expenditure into routine and non-routine maintenance

Routine maintenance includes preventive or planned maintenance. Routine maintenance expenditure is recurrent, programmed for a pre-defined set of assets, and occurs at predictable time intervals. Data on this expenditure are useful for trend analysis. Further, routine maintenance data will be useful for benchmarking similar work activities among NSPs, for example, the average cost of regularly maintaining a distribution transformer.

Non-routine maintenance includes corrective, reactive or condition-based maintenance and expenditure in this area is less predictable and unlikely to be recurrent. We are unlikely to rely as much on benchmarking of non-routine maintenance, and for any expenditure above the trend, we will undertake further detailed reviews of components of non-routine maintenance expenditure. That said, we will be mindful of higher volume non-routine activities which could be benchmarked.

NSPs should note the re-grouping of existing maintenance expenditure categories. NSPs currently report on opex categories under the requirements for annual RIN reporting or for reset proposals. These same opex categories should be used by the NSPs under this Guideline, but classified under

the appropriate high-level expenditure. For example, all DNSPs who currently report on 'inspection' or 'planned maintenance' should report these as 'routine maintenance' expenditure, and 'corrective maintenance', 'corrective repair' or 'condition-based maintenance' as 'non-routine maintenance' expenditure.

### Moving away from expenditure by asset types as in the repex model

In the indicative template, we required maintenance expenditure data by asset types, voltage, and (for distribution) region/feeder classification. The asset types and voltage were the same as those in the repex model (i.e. between approximately 250 and 300 categories) that were to be used to help assess NSPs' replacement expenditures. The primary reason for this matching of asset types was to enable us to assess the decisions taken by NSPs between maintaining or replacing assets.

In consultation, NSPs expressed their concern about the level of detail for data required by the indicative template. Some DNSPs indicated that they have no or insufficient data to break down expenditure by asset type or voltage as required by the indicative template. Other DNSPs indicated they collect maintenance expenditure by asset types but not by the details set out in the indicative template. Many DNSPs stated they collect maintenance expenditure by activity, project or job order, not by asset type. The majority of the DNSPs commented that if they had to provide data by asset types, they would have to do historic cost allocations and estimates, and these would be subject to error.

TNSPs provided similar comments, but most have already been capturing costs by asset types, although not by the level of detail (voltages, regions) laid out in the indicative template.

We requested activity/function codes and descriptions from NSPs that they use in their cost accounting systems, in our effort to better understand how NSPs capture/record their costs by activity but not by asset type. We understand that NSPs capture/record costs as, for example, 'transformer maintenance' or 'maintenance of substation building and ground', and that these are line items that, together with other relevant items, could build up to the sum of preventive maintenance expenditure (routine maintenance).

We expect NSPs to develop and apply their own strategies, plans and work instructions for the maintenance and condition monitoring of all major asset categories associated with their distribution/transmission network. It is therefore reasonable to expect that the NSPs' cost capture systems should reflect those strategies and plans, and should provide a feedback mechanism in terms of cost reporting. We have chosen key asset types on which DNSPs and TNSPs perform maintenance works, and we believe our maintenance data requirements are appropriate and will enable us to assess the efficiency of the NSPs' asset maintenance strategies, and to compare these across NSPs.

In the draft RIN template, we have moved away from requiring maintenance expenditure data by asset types, voltage or region. Instead, we have focused on maintenance activities typically undertaken by NSPs for key asset groups in the distribution or transmission network. Further, these are activities to inspect/maintain aggregated types of assets, and not the detailed asset types stated in the indicative template. We now require expenditure data such as on:

- network underground cable maintenance
- distribution switchgear maintenance
- substations maintenance.

### Deciding on the maintenance activity subcategories

We reviewed the key assets for a distribution or transmission network and concluded that the maintenance costs of these key assets are important indicators of the efficiency of a NSP.

We discussed with our internal technical advisors which maintenance activities are important and typical, which key assets maintenance data should be required for, and how to clearly define terms used in the template. We also reviewed expenditure subcategories and retained only lower-level detailed activities that are important; the expenditure categories are mostly high-level groupings.

Average maintenance costs per activity will be an important metric for routine maintenance. The high-level grouping of activities and assets, however, means that some maintenance subcategories refer to a collection of different assets and their respective volumes. The volume driver to be used will be what is regarded as the most critical asset for that subcategory, e.g. per substation or per transformer. The average cost per unit will still be a good approximation of average costs that can be used for trend analysis and benchmarking.

We recognise that clear and concise definitions of each expenditure category (to determine what is included and excluded in the expenditure) are critical to enable valid benchmarking. We will consult further with NSPs to discuss expenditure definitions and mapping of current maintenance expenditure categories to AER categories. This will be done during the consultation period after the issue of this draft RINs.

The asset groupings on which maintenance data are required do not match the asset groups in our repex model. However, we still believe we can undertake an analysis of NSPs' trade-off repair-or-replace decisions using maintenance data with other data (such as on capex and repex) obtained under the RINs.

# 10 Emergency response

This section explains templates 2.8 and 6.3 of the draft RINs for DNSPs.

We will require detailed data on a DNSP's emergency response expenditure to be able to assess the efficiency of the DNSP's base opex. As previously mentioned, we will separate the data requirements for emergency response from other maintenance activities.

Emergency response activities are unplanned activities that represent immediate rectification works to ensure maintenance of asset conditions and/or the capacity of the distribution system or transmission system to distribute or transmit electricity.

We will collect these data from DNSPs only. For TNSPs, emergency response is not a material expenditure and they will continue to report it as part of maintenance expenditure (non-routine maintenance). The information we require on emergency response expenditure should be readily accessible by DNSPs.

During consultation on the indicative category templates, DNSPs stated that they have not collected emergency response data by asset types, that data by causes are not available or require further investigation, or that some data by major storm events are unavailable. We have amended the initial template and significantly reduced the volume of information required. With the draft RINs, we will require data that will enable us to establish a baseline (i.e. relatively recurrent) emergency response expenditure for trend analysis and benchmarking, and to compare this expenditure against measures of service reliability and quality.

Template 6.3 of draft RINs requires DNSPs to provide details on all outages by cause in a consistent and streamlined format for the 5-year historic period. We are aware that this information, for some DNSPs, has been previously requested as part of annual/reset reporting on reliability performance under the Service Target Performance Incentive Scheme (STPIS). We recognise this is more information on outages than anticipated in the indicative templates released in August (although not particularly burdensome) and we will consult with DNSPs further on obtaining this information.

## 10.1 General data requirements

### 10.1.1 AER position

We will require NSPs to provide the following information on emergency response expenditure:

- total emergency response expenditure
- emergency response expenditure due to severe weather events
- other emergency response expenditure.

We will require DNSPs to provide data on the following fault types experienced across their networks for the last 5 years:

- asset failure
- vegetation (grow-ins, blow-ins and fall-ins)
- weather

- third parties
- overloads
- switching and protection error
- fire starts caused by vegetation from both inside and outside clearance margins, and
- unknown causes of outages
- other.

### 10.1.2 Reasons for AER position

This information will be useful in assessing emergency response expenditure, particularly where the AER has not obtained any standardised information in the past. In particular, the above data will enable us to:

- establish a level of recurrent expenditure (i.e. excluding severe weather events)
- examine the events that caused the emergency response (weather, asset failure, etc.)
- relate emergency response expenditure to measures of service reliability.

NSPs currently report emergency response expenditure consistently, but under various account names such as:

- breakdown
- nature induced
- forced maintenance
- emergency & unscheduled power system response & repair.

It will be necessary to discuss further with DNSPs the definitions of costs, and to disaggregate reported costs, if necessary, to align with AER cost categories.

Emergency response expenditure is relatively unpredictable and not immediately amenable to trend or benchmarking assessment. However, emergency response has two distinct components:

- an underlying volume that, while volatile year on year, is relatively consistent over longer periods of time
- a component that is driven by extreme events such as storms and floods.

If the underlying component is separated out from extreme events, then examination of these costs can be meaningful.

The cost information in the draft RINs also reflect a significant reduction in the amount of information contained in the indicative templates. Like maintenance expenditure, the indicative templates requested emergency response expenditure by asset type, as well as causes by these same asset types. During consultation NSPs raised serious concerns on this approach, noting that they do not capture emergency response costs or causes by asset types or work activity. The changes to the

templates reflect these concerns, but are also a reconsideration of addressing emergency response in terms of examining underlying trends rather than asset type as a driver/ normalising variable.

### Data on supply interruptions

Obtaining quality information relating to supply interruptions is critical in understanding the overall resilience of the network. Data on the relative costs incurred by NSPs cannot be meaningfully translated into views of relative efficiency without an understanding of the quality of electricity supply provided to customers. Data on outages, particularly planned outages and those due to asset failure, provide important information in support of the DNSP's decisions to invest in asset replacement and incur expenditure on maintenance and repair. Information on interruptions and fire starts due to vegetation encroachment are also useful in considering volumes of work and costs for vegetation management. For benchmarking purposes, this data needs to be based on consistent definitions in the same way as expenditures and work volumes.

We recognise that much of the information requested in template 6.3 goes beyond what may be considered useful in analysing annual expenditures for benchmarking purposes. However, since the release of the indicative templates in August we have reconsidered the need to collect interruption to supply data by cause. The way in which we aim to collect interruption to supply data is in a different format to the way in which we currently collect it for the purposes of annual performance reporting and for the STPIS. In particular we consider there is a need and opportunity to streamline the collection of historic interruption to supply data in a single RIN request which serves the joint purpose of:

- annual benchmarking reports under NER rule 6.27 (as well as the related assessments of capex and opex proposals)
- calculation of STPIS penalties and rewards under NER clause 6.4.3(a)(5)
- performance reports under section 28V of the NEL.

We are aware that DNSPs maintain detailed records of outage information and consider it would be less burdensome for them to provide data in a format that was closer to the "base" data in their systems, rather than at an aggregated level which would require manipulation.

We also prefer this approach over the alternative option, which would be to gather total, annual data for outages by cause in the Category Analysis RINs and then request further disaggregated information on each outage again at a later stage, namely at the next reset for each DNSP or in revised annual reporting RINs. We seek DNSPs' views on our preferred approach and any alternative options.

In either case, we consider the data requested in the format of template 6.3 should be readily extracted from DNSP's outage reporting systems, and the burden of providing this information is low.

# 11 Overheads

This section explains templates 2.8 (transmission) and 2.9 (distribution) of the draft RINs.

We will require detailed data on a NSP's expenditure on Network Overheads and Corporate Overheads to be able to assess the NSP's base opex as well as capex forecasts.

For DNSPs, network overhead costs typically include network management, network control, and system planning and design. For TNSPs, network overhead typically consists of maintenance support, network monitoring and control, and asset management support. These are costs that are closely related to operating and maintaining the physical network, but could not always be directly attributed to a specific activity, project or job order.

Corporate Overhead costs typically include those for executive management, legal and secretariat, human resources, finance and treasury, and non-network IT and motor vehicles.

During consultation on the indicative category templates, it was unclear to NSPs that the expenditure details in the overheads section were not prescriptive but only examples of expenditure. The data we require for overheads should be readily accessible by NSPs since these are what they currently report on for annual/reset RINs. The incremental cost to NSPs of providing this information to the AER should be low.

## 11.1 General data requirements

### 11.1.1 AER position

We will require NSPs to report overheads as:

- Network Overheads, and
- Corporate Overheads.

For network overheads, we will continue to require NSPs to report against almost all of their existing subcategories as per their internal accounting or in existing annual RINs. Similarly, for corporate overheads, NSPs will have discretion to report against almost all of their already existing subcategories. As NSPs have different organisational and corporate support structures, these subcategories under corporate overheads will vary across NSPs. However, we expect these subcategories to be largely consistent.

For each subcategory under Network Overheads or Corporate Overheads, we will require:

- the allocation of overheads to categories of services (based on the NSP's AER-approved cost allocation method)
- a cost breakdown of the NSP's direct costs into labour, materials, and contract
- for related party contract costs, the amount of total cost and the related party margin.

As a change from the indicative template, we will no longer require a reconciliation of the statutory and regulatory accounts for overheads in the draft template. Instead, this reconciliation will be part of the overall assurance requirements on the NSP's RIN submission, which should include a statement of the basis for preparation of the NSP's RIN submission, and an auditor's assurance that the submission was prepared in accordance with the AER's regulatory reporting framework.

We have not prescribed or standardised the cost allocation methods and capitalisation policies of NSPs, and NSPs should report their historic and forecast expenditure consistent with their current methods and policies. However, we will require details to lend full visibility on how NSPs allocate overheads to opex direct costs or to capex, and their basis for capitalising certain overhead costs.

Specifics of data requirements, including definitions of expenditures, activities, and direct and indirect costs, are the subject of ongoing consultation on regulatory information instruments.

### 11.1.2 Reasons for AER position

#### Benchmarking Network Overheads and Corporate Overheads

We will benchmark each of Network Overhead and Corporate Overhead at an aggregate level, before allocation and capitalisation. This serves to remove the distorting effect of different cost allocation and capitalisation methods of NSPs. Overheads will be scaled by network size, employee numbers and other normalising factors.

As we explained in the explanatory statement for the final Guideline, comparisons of these expenditures against supporting information—including cost allocation methods, capitalisation policies, service classifications and any outsourcing arrangements—will help us better understand NSPs' actual and forecast expenditures, and to scrutinise specific expenditures. In addition to improving our understanding of overhead costs, the separate identification of these overhead costs from direct expenditure categories (such as repex, augex, routine maintenance) will better enable us to robustly compare those direct expenditure categories across NSPs. That is, the impact of NSPs' overheads allocation and capitalisation policies may be significant, and comparing direct expenditure without allocated overheads would be a better way to compare NSP expenditures.

#### Categories of overheads

We will require the NSPs to continue reporting most of their current expenditure categories. This serves our purposes of:

- preserving historic data for trend analysis, and
- minimising the reporting burden on NSPs.

However, for network overheads, DNSPs that currently report 'network operating cost' as a single line item[84] must disaggregate this into the following subcategories in reflection of the different cost drivers for each component of 'network operating cost':

- management (not directly related to any of the functions below)
- network planning (i.e., system planning)
- network control and operational switching personnel
- quality and standards functions including standards and manuals, asset strategy (other than network planning), compliance, quality of supply, reliability, and network records (e.g. GIS)
- project governance and related functions including supervision, procurement, works management, logistics and stores

[84] That is, all DNSPs except Ausgrid, ActewAGL and SA Power Networks

- 'other' including training, OH&S functions, training, network billing, and customer service.

Reporting 'network operating costs' as a lump sum was a feature of regulatory reporting under previous regimes such as the Victorian ESC and other jurisdictional regulators. The components of 'network operating cost' have different cost drivers, such as the scale of the network for network control or switching staff, and works volume for capital governance and related functions such as works management. Hence a disaggregation of costs should improve our capacity to assess 'network operating costs' that are outside the trend or benchmark, since we will have to conduct detailed reviews of any outlying cost.

### Cost allocation methods

The NSPs' different approaches to cost allocation are a source of incomparability in benchmarks. Some NSPs fully allocate their overhead costs to direct activities, while other NSPs allocate costs by different methods or cost allocators.

During consultation on the Guideline, NSPs noted:

- general support for separate reporting of overheads and, due to the NSPs' different cost allocation methods, for assessing overheads at an aggregate level before allocation
- the inclusion of overheads in direct-expenditure categories, and NSPs' different methods to allocate overheads, may adversely impact the AER's ability to benchmark expenditures
- on the other hand, there may be issues in assessing aggregated overheads without an understanding of the different corporate structures or services provided by each NSP (for example, some NSPs provide more unregulated services than other NSPs, and allocation of overhead between regulated and unregulated services will vary across NSPs and affect overhead cost comparison).

During further consultation on the indicative templates released in August, NSPs commented that reporting allocated network and corporate overheads across line items of direct costs (maintenance, emergency response etc.) is problematic because:

- combining allocated overheads with direct costs will not result in comparable costs among NSPs due to differences in cost allocation methods and capitalisation
- it will not account for 100 per cent of overheads (before allocation) unless all the direct costs are itemised in the template, which was not the case
- NSPs have not captured overhead allocation data as laid out in the template, for example, by direct costs by asset types
- backcast data on overhead allocation per direct cost would not be available or would be difficult to work back.

We have taken these concerns into account. We will not require data on overheads to be split into each direct cost category. We will assess and benchmark direct costs only, and separately assess/benchmark network and corporate overheads.

### Capitalisation of overheads

Capitalisation policies differ across NSPs at any time and these differences affect comparisons of direct costs. We will require full visibility of the impact of different capitalisation policies at the detailed

level across all opex categories. That is, for every line item of opex in the overheads template, the NSP should:

- explain the basis for capitalising the operating expense (if any)
- attach supporting information (such as its capitalisation policy document and reference to the relevant specific clause in the document).

For example, a NSP may be capitalising general office overheads for an office that is set up to support the construction of an asset (while other NSPs do not capitalise this expense). In the appropriate line item in the overheads template, the NSP should state this cost treatment, the dollar portion of overhead that is capitalised, its reference to the specific section in the NSP's capitalisation policy, and to its statutory accounts. In reporting this detail, the NSP should consider the materiality of the overhead expenditure, and this visibility would certainly be required of major overhead cost items. The AER will then take this into account in benchmarking overheads among NSPs to avoid comparing incomparable costs.

We have previously examined NSPs' capitalisation policy statements, but NSPs have not demonstrated to us how the application of these policies is reflected in the RIN data. The above information requirements will enable us to understand how the NSP applied its policy, to replicate the NSP's calculated amounts (if necessary), and to analyse differences in NSPs' policies. Because NSPs' capitalisation policies/methods are already required under statutory accounting, there should be no additional reporting burden for NSPs. What we require are simply visibility, explanation, and the provision of underlying working papers (if necessary), and only for material items of expenditure that have been capitalised.

During consultation, NSPs also commented that their capitalisation policies follow statutory accounting rules and have not changed (or do not change), and this AER information requirement is unnecessary. However, the AER can cite an instance where a NSP did change its capitalisation policy in 2011.[85] Therefore, while it is true that NSPs' capitalisation policies have to comply with Australian statutory accounting rules, changes to these policies do happen, and in benchmarking we need to consider the differences in NSPs' policies.

For overheads, we will require the NSPs to indicate the value of expenditure that is capitalised, and the basis/reason for capitalisation. As we explained above in comparing overhead costs, in benchmarking direct costs we would take into account the 'distortions' caused by different capitalisation treatments by NSPs.

[85] SP AusNet, *2013-2017 Gas Access Arrangement Review – Access Arrangement Information*, 30 March 2012, pp. 157-158.

# A Repex detailed data requirements

This attachment relates to our discussion of the standardised asset categories for repex. As discussed in section 5.2.2 the following tables provides each asset group's definition and detailed discussion of:

- the classifications used to form the asset categorisations
- how this categorisation has changed from the indicative category analysis data template
- our reasoning and consideration of NSP views.

Section A.1 applies to DNSPs and section A.2 applies to TNSPs.

# A.1 Repex asset categorisations - Distribution

**Table A.1 Poles**

| | | | |
|---|---|---|---|
| **Definition** | These are assets that provide structural support for overhead conductors or other lines assets.<br>This includes pole-top structures, such as cross-arms, insulators, links, fuses, air break switches and the like, where these are replaced in conjunction with a pole replacement project.<br>It excludes any pole mounted assets that are included in any other asset group. | | |
| **Classified by** | Highest operating voltage | Material type | Staking (if wood) |
| **Changes from indicative template** | Combined voltage classifications applying at lower voltages.<br>The definition for poles now includes the pole top structures where they are replaced in conjunction with a pole replacement project. | | |
| **Reasoning** | The cost of a pole is a function of required levels of height and strength. We consider that the highest operating voltage a pole supports drives its height, this affects how much clearance from the ground any conductors or furnishings will require. Once the height requirement is established, the material type relating to the required level of strength takes into account the complexity of structures or assets the pole is supporting as well as associated lifecycle costs. In instances where DNSPs undertake expenditure to extend the life of an existing wooden pole when found to be defective from testing or inspection, it is classified as staked wooden pole.<br>In consultation, DNSPs were generally supportive of including this asset group and the classifications we proposed. They did note:<br>▪ the material types fail to accurately account for their assets, for example stobie poles or the different classes of wood type poles. We consider the discretion to provide asset sub-categories allows for NSPs to demonstrate these types of situations.<br>▪ clarification regarding the impact of refurbishment works, such as staking, has on classifying existing asset inventory. For example, properly categorising a previously condemned pole. We consider this is expenditure to extend the life of an existing pole, and will only materially apply to wooden poles, therefore constituting a staked wooden pole.<br>▪ a difficulty in allocating existing pole inventories to the location metrics CBD, urban, rural long and rural short. In these cases DNSPs will need to provide appropriate documentation of the estimation methods applied in accordance with the relevant auditing requirement.<br>We also require DNSPs to provide the total number of poles by network areas of CBD, urban, rural long and rural short. This will provide a high-level indicator of the density of poles throughout different areas of the network. | | |

**Table A.2 Pole top structures**

| | |
|---|---|
| **Definition** | These are structures and their components that allow overhead conductors or related assets to be located on a pole and provide adequate clearances. This relates to expenditure incurred when a pole top structure is replaced independently of the pole it is located on.<br>This includes cross-arms, insulators, links, fuses, air break switches and the like.<br>It excludes any pole mounted assets that are included in any other asset group. It excludes pole mounted substations, reclosers, sectionalisers, etc. |
| **Classified by** | Structure complexity<br>Simple: A pole top structure has a simple design function if its primary function is to provide for the continuity of a single circuit segment of the overhead network.<br>Complex: A pole top structure has a complex design function if its primary function is to provide for the continuity of a multiple circuit segment of the overhead network. |
| **Changes from indicative template** | Pole top structures classified by complexity rather than purpose.<br>Retrospective age profile data is no longer required. Given the inventory of existing poles encompasses pole top structures, the age profile is not required for modelling purposes. |
| **Reasoning** | We consider pole-top structures are highly specialised which means there is likely many designs within or between networks. We consider the purpose of the structure determines the design complexity as well as the required materials. As the complexity of the structure increases, the input costs will be higher.<br>In consultation, DNSPs noted:<br>▪ pole top structures are rarely replaced separately from an entire pole replacement. We have amended the definition of poles to include pole top structures when this is done in conjunction with replacing the pole.<br>▪ the purpose based classifications do not reflect the way DNSPs account for these assets and would require broad assumptions. We consider the inclusion of the structure complexity classification resolves these concerns. |

## Table A.3 Overhead conductors

| | |
|---|---|
| **Definition** | These assets have the primary function of distributing power, above ground, within the distribution network.<br>It excludes any pole mounted assets that are included in any other asset group. |
| **Classified by** | Highest operating voltage Number of phases (at HV) |
| **Changes from indicative template** | No longer classifying overhead conductors by rating<br>Included the number of phases on the conductor for the lower voltage classifications |
| **Reasoning** | We consider the volume of materials required for a conductor is the product of its length and cross-sectional area. Highest operating voltage is the main driver of the cross sectional area of a conductor, determining capacity and insulation requirements. . We consider at low voltage the number of phases on the circuit can vary and categorising by the number of phases on the circuit is appropriate.<br>In consultation, DNSPs noted:<br>▪ approaches to standardising network building blocks mean that conductor replacement will be limited to relatively few standardised conductor types. We consider our definition of replacement expenditure to be the replacement of assets with their modern equivalent will reflect changes to internal standards.<br>▪ obtaining historical age profile information will involve broad assumptions. In such cases DNSPs will need to provide appropriate documentation of the estimation methods applied in accordance with the relevant auditing requirement.<br>We also require DNSPs to provide total conductor lengths by the network areas CBD, urban, rural long and rural short. This provides a high-level indicator of the density of conductors throughout the network. Further DNSPs are required to report the total proportion of existing conductors made of steel, aluminium, copper and ACSR (aluminium conductor steel-reinforced). We consider that there are significant differences in a conductor's susceptibility to corrosion for a given material type. |

**Table A.4 Underground cables**

| | |
|---|---|
| **Definition** | These assets have the primary function of distributing power, below ground, within the distribution network.<br><br>This includes cable ends, joints, terminations and associated hardware and equipment (e.g. surge diverters, etc.)<br><br>It excludes any pole mounted assets that are included in any other asset group. It also excludes cable tunnels, ducts, pipes and pits. |
| **Classified by** | Highest operating voltage |
| **Changes from indicative template** | No longer classifying underground cables by rating. No longer classifying cable types by whether they are submarine or non-submarine. We consider the volumes of assets that are submarine are not material. |
| **Reasoning** | Similar to overhead conductors, we consider the volume of materials required for an underground cable is the product of its length and cross-sectional area. The cross sectional area of an underground cable is related to its highest operating voltage. We note that the type of insulation required for the cable is a cost driver, however this is positively correlated to the cables' highest operating voltage. For this reason we consider the highest operating voltage is the key determinant of the amount of material required for a cable.<br><br>In consultation, DNSPs noted the same issues that applied to overhead conductors. Refer to this section for our discussion of these issues.<br><br>We also require DNSPs to provide total underground cable lengths by the network areas CBD, urban, rural long and rural short. This provides a high-level indicator of the density of underground cables throughout the network. |

**Table A.5 Service lines**

| | | | |
|---|---|---|---|
| **Definition** | These are works directly associated with the replacing of service lines assets no longer fit for purpose.<br>This includes assets that provide a physical link and associated assets between the distribution network and a customer's premises.<br>It excludes any pole mounted assets and meters or assets that are included in any other asset group. | | |
| **Classified by** | Connection voltage | Customer type | Complexity |
| **Changes from indicative template** | There have been no material changes, we have removed service line types that are rare do not exist | | |
| **Reasoning** | We consider the characteristics which drive the cost of performing the service are dependent on the voltage of the connection, the customer type and connection complexity.<br>In consultation, DNSPs noted:<br>▪ Clarification of the definition of simple and complex connection types is required. For a detailed description of customer types and connection complexity, see section 6.1.<br>▪ Sub-divisions and residential connections generally only occur at low voltage, as mentioned above we have removed service line types that do not exist. | | |

**Table A.6 Transformers**

| | | | | |
|---|---|---|---|---|
| **Definition** | These are assets used to transform between voltage levels within the network.<br>This includes all its components such as the cooling systems and tap changing equipment.(where installed)<br>It excludes any pole mounted assets that are included in any other asset group.<br>For the avoidance of doubt, this does not include instrument transformers as defined in the National Electricity Rules. | | | |
| **Classified by** | Mounting type | Highest operating voltage | Volt-Ampere rating | Number of phases for low voltage |
| **Changes from indicative template** | Clarified the ampere rating classifications that apply to particular transformer types<br>Aggregated the voltage classifications applying at lower voltages.<br>Included the number of phases on the transformer for lower voltages | | | |
| **Reasoning** | Transformers vary or "transform" the voltage in the segments of the network. They contain components designed to a specific voltage and capacity. The transformer's housing or mounting type is also a key determinant of design.<br>In consultation, DNSPs noted:<br>▪ Transformer replacements are rarely like for like. We consider the definition of replacement expenditure to be the replacement of assets with their modern equivalent accounts for this.<br>▪ Transformers operating at low voltage are typically only pole or kiosk mounted. Our internal technical advice indicates that ground outdoor and indoor/chamber substations are numerous at low voltage. In any case we note that if a categorisation does not apply to a particular DNSP the asset volumes they report will reflect this.<br>We also require DNSPs to report the total MVA replaced within each period. We require this information to be able to account for instances when transformers are classified at the boundaries of our rating bands and will help us understand any differences this may cause in the NSPs relative unit costs or asset lives. | | | |

**Table A.7 Switchgear**

| | | |
|---|---|---|
| **Definition** | These are assets used to control, protect and isolate segments of the network.<br>This includes disconnect switches, fuses, circuit breakers, reclosers, sectionalises, etc.<br>It excludes any pole mounted assets that are included in any other asset group. | |
| **Classified by** | Highest operating voltage | Switch function |
| **Changes from indicative template** | Amended switch functions to those that apply at relevant voltages<br>Aggregated the voltage classifications applying at lower voltages. | |
| **Reasoning** | The function a switch serves is clearly a determinant of the components it comprises. The scale and component type of the switch is positively correlated to the maximum voltage of the segment of the network that switch is operating on. Hence we consider classifying switchgear by the maximum voltage and the function of the switch is appropriate.<br>In consultation, DNSPs noted a number of the categories do not reflect standard industry practice. We have amended the categories based on industry consultation and in-house technical advice and consider the categorisations appropriate. | |

**Table A.8 Public lighting**

| | |
|---|---|
| **Definition** | These assets are utilised by DNSPs to provide public lighting services.<br>It includes all the components that contribute to the illumination of the public space requiring lighting.<br>It excludes poles, pole top structures, conductors, underground cables, services, transformers, switchgear and other network assets. |
| **Classified by** | Asset type Lighting obligation |
| **Changes from indicative template** | Amended the minor/major road definitions to incorporate the Australian Standard AS/NZS 1158 on public lighting. |
| **Reasoning** | We consider that public lighting assets cover a variety of different assets. The design and component types of these assets are related to the level of lighting obligation.<br>In consultation, DNSPs noted:<br>▪ Use of Australian standard AS/NZS 1158 would provide a more meaningful measure of the level of lighting obligation on a DNSP than road type. We have amended the definition of minor/major road to incorporate AS/NZs 1158 as follows:<br>  ▪ Major road: Roads on which the visual requirements of motorists are dominant (e.g. traffic routes). Typically the responsibility of a state or territory road authority.<br>  ▪ Minor road: Roads on which the visual requirements of pedestrians are dominant (e.g. local roads and lighting that is applicable to areas other than roads outdoor public areas, e.g. outdoor shopping). Typically the responsibility of a local Government authority.<br>▪ Whether public lighting is a standard or alternative control service is jurisdictional dependant/AER determined. We note that in the event the form of regulatory control varies, DNSPs are able to sub-categorise to demonstrate this.<br>We note that this differs from public lighting (see section 6). Here we are seeking the replacement of both assets dedicated to providing lighting and public lighting assets that are fixed to other network assets (for example a network pole that also supports a luminaire). |

**Table A.9 Other**

| | |
|---|---|
| **Definition** | Other assets are assets not captured by the above asset groups. |
| **Classified by** | We require DNSPs to report any asset types that do not fit into any of the above-mentioned asset groups to define and report expenditure on these assets in the other assets group. |
| **Changes from indicative template** | Nil |
| **Reasoning** | We acknowledge that to ensure comparability, including an "other assets" group is necessary for NSPs to report expenditure on assets that are not readily defined by the above asset groups. We consider it is likely to be difficult to compare this group across NSP's and expenditure reported in this group will require assessing on a case-by-case basis.<br><br>In consultation, NSPs noted that it was likely the majority of replacement expenditure could be mapped to the asset groups however there would inevitably be certain instances where grouping assets would not be possible necessitating an "other assets" group. |

## A.2 Repex asset categorisations - Transmission

**Table A.10 Steel towers**

| | | |
|---|---|---|
| **Definition** | These are assets that provide structural support for conductors or other lines assets.<br>This includes tower structures, insulators, earthing, footings, where these are replaced in conjunction with a steel tower replacement project.<br>It excludes any assets that are included in any other asset group. | |
| **Classified by** | Highest operating voltage | Circuit configuration |
| **Changes from indicative template** | Minor alterations to the voltage classifications | |
| **Reasoning** | The cost of a steel tower is a function of required levels of height and strength. We consider that the maximum voltage that a steel tower supports drives its height, this affects how much clearance from the ground any conductors or furnishings will require. We initially considered steel towers would be adequately characterised by voltage alone, in response to our straw-man categories, Grid Australia proposed to include circuit type. We accept that once the height requirement of the tower is established, the circuit configuration takes into account the complexity of structures or assets the steel tower is supporting as well as associated lifecycle costs. We have classified circuit configuration as simple or multiple.<br>A single circuit configuration is a transmission line that has one set of conductors that are operated as a single electrical circuit. However, for the purposes of this definition, where a line has been constructed as a multi-circuit line but operates as a single circuit line, it should be included as a multi-circuit line.<br>A multiple circuit configuration is a transmission line that includes more than one electrical circuit.<br>In consultation, TNSPs supported this asset group and the classifications proposed. | |

**Table A.11 Tower structures**

| | | |
|---|---|---|
| **Definition** | These are structures and their components that allow conductors or other line assets to be located on a steel tower and provide adequate clearances. This expenditure relates to that which TNSPs incur when tower structures are replaced independently of the steel tower they are located on.<br>This includes tower section, arms, insulators, earthing<br>It excludes any assets that are included in any other asset group. | |
| **Classified by** | Highest operating voltage | Circuit configuration |
| **Changes from indicative template** | Minor alterations to the voltage classifications | |
| **Reasoning** | We consider the highest operating voltage and the circuit configuration of the steel tower dictates the complexity of structures or assets the steel tower is supporting and drives the lifecycle costs. We have classified circuit configuration as simple or multiple.<br>A single circuit configuration is a transmission line that has one set of conductors that are operated as a single electrical circuit. However, for the purposes of this definition, where a line has been constructed as a multi-circuit line but operates as a single circuit line, it should be included as a multi-circuit line.<br>A multiple circuit configuration is a transmission line that includes more than one electrical circuit.<br>In consultation, TNSPs supported this asset group and the classifications proposed. | |

**Table A.12 Conductors**

| | | | |
|---|---|---|---|
| **Definition** | These assets have the primary function of transmitting power, above ground, within the transmission network.<br>It excludes any assets that are included in any other asset group. | | |
| **Classified by** | Highest operating voltage | Maximum continuous rating | Material type |
| **Changes from indicative template** | Minor alterations to the voltage classifications<br>Clarified the maximum continuous rating applying to relevant conductor types<br>Included the material type of the conductor | | |
| **Reasoning** | We consider the volume of materials required for a conductor is the product of its length and cross-sectional area. A conductor's cross sectional area is determined by its highest operating voltage and maximum continuous rating. In consultation, TNSPs supported classifying conductors by highest operating voltage and maximum continuous rating. We sought feedback on the appropriate rating classifications and were referred to data published by AEMO. Further TNSPs provided classifications on what rating bands would apply to their assets. We have based our rating classification on this information.<br><br>We also require TNSPs to provide total conductor replacement by material type. We consider that the propensity of conductor replacement relates to the material type, noting significant differences in life between copper, aluminium, ACSR and steel This provides a high-level indicator of the density of conductor materials throughout the network. | | |

**Table A.13 Transmission cables**

| | |
|---|---|
| **Definition** | These assets have the primary function of transmitting power, below ground, between segments of the network.<br>This includes the material primarily used to transmit the power and any insulation or housing this material requires.<br>It excludes any assets that are included in any other asset group. |
| **Classified by** | Highest operating voltage |
| **Changes from indicative template** | Nil |
| **Reasoning** | Similar to overhead conductors, we consider the volume of materials required for a transmission cable is the product of its length and cross-sectional area. We note that the level of insulation required for the cable is a cost driver; however, this is highly correlated to the cables' highest operating voltage. |

**Table A.14 Substation switchbays**

| | | |
|---|---|---|
| **Definition** | These are all assets used to provide switching within the substation and includes disconnect switches, circuit breakers, current transformers, voltage transformers and associated busbars and steelwork.<br>It excludes any assets that are included in any other asset group. | |
| **Classified by** | Highest operating voltage | Switch type |
| **Changes from indicative template** | Changes to switch types to reflect those that apply at different voltage levels<br>Removed insulation type as a classification | |
| **Reasoning** | Similar to the switchgear asset group in distribution, the material components included in switchbays is determined by the function the switchbay serves as well as other factors such as available space and the complexity of the confines it is installed in. Further the scale and component type of the switch is highly correlated to the highest operating voltage of the segment of the network that switch is operating on. Our proposed approach to classifying switchgear by the highest operating voltage and switch type is consistent with that put to NSPs in consultation on the Guideline on which we have not received substantive comments or objections. The switch type classifications are:<br>Circuit breaker: a switch that can open under fault current conditions to protect equipment and electrical circuits from damage.<br>Isolators/disconnectors: switches used to de-energise and isolate equipment or portions to the electrical network to allow service or maintenance to be undertaken.<br>Voltage Transformers: transformers used to measure voltage levels for protection or measurement purposes.<br>Current Transformers: transformers used to measure current for protection or measurement purposes.<br>Gas Insulated Switch Module: enclosed gas insulated switchgear that may comprise circuit breakers, disconnectors, isolators, and other gas insulated components. | |

**Table A.15 Substation power transformers**

| | | |
|---|---|---|
| **Definition** | These are assets used to transform between voltage levels within segments of the network.<br>This includes all its components such as the cooling systems and tap changing equipment.<br>It excludes any assets that are included in any other asset group. | |
| **Classified by** | Highest operating voltage | nominal MVA nameplate rating |
| **Changes from indicative template** | Clarified the rating classification applicable at each voltage level | |
| **Reasoning** | Substation power transformers vary or "transform" the voltage in the segments of the network. They contain components designed to a specific voltage and capacity.<br>In consultation, TNSPs supported classifying conductors by highest operating voltage and rating. We sought feedback on the appropriate rating classifications and were referred to data published by AEMO. Further TNSPs provided classifications on what rating bands would apply to their assets. We have based our rating classification on this information. | |

**Table A.16 Substation reactive plant**

| | | |
|---|---|---|
| **Definition** | These are assets used to support the transfer of real power across the network.<br>This includes reactors, synchronous condensers, shunt capacitors, static VAr components, dynamic VAr compensators.<br>It excludes any assets that are included in any other asset group. | |
| **Classified by** | Highest operating voltage | Function |
| **Changes from indicative template** | Removed ampere rating as a classification | |
| **Reasoning** | We initially considered that substation reactive plant should be characterised by highest operating voltage and function, in response to the categorisations included in our straw-man following the issues paper. Grid Australia proposed sub-categorisation of static var compensators, capacitors, synchronous condensers and reactors by voltage level is reasonable, but notes that:<br>▪ The function and capacity of SVCs differ on an individual basis, which makes comparison non-sensible<br>▪ Only one TNSP in the NEM has synchronous condensers, and if replaced these may be replaced with different technology. There is therefore little value in this sub-category for other TNSPs.<br>▪ The reactors sub-category should refer only to oil-filled reactors, and not to smaller air-cooled reactors which are used occasionally and not comparable<br>▪ In the explanatory statement accompanying our draft expenditure forecast guidelines we accepted Grid Australia's proposition that comparisons of reactive plant based on individual units are not sufficiently informative to support benchmarking. | |

**Table A.17 Other**

| | |
|---|---|
| **Definition** | Other assets are assets not captured by the above asset groups. |
| **Classified by** | We require TNSPs to report any asset types that do not fit into any of the above-mentioned asset groups to define and report expenditure on these assets in the other assets group. |
| **Changes from indicative template** | Nil |
| **Reasoning** | We acknowledge that to ensure comparability, including an "other assets" group is necessary for NSPs to report expenditure on assets that are not readily defined by the above asset groups. We consider it is likely to be difficult to compare this group across NSP's and expenditure reported in this group will require assessing on a case-by-case basis.<br><br>In consultation, NSPs noted that it was likely the majority of replacement expenditure could be mapped to the asset groups however there would inevitably be certain instances where grouping assets would not be possible necessitating an "other assets" group. |

# B Connections definitions for expenditure classification

## B.1 Residential customer connections

| Connections definition | Examples of connection works |
|---|---|
| *Simple type connection low voltage*<br><br>Single/multi-phase customer connection service; and /or:<br><br>▪ one span of overhead service wire or standard underground service and/or;<br><br>▪ an overhead road crossing. | Connection of single and small multi-dwelling complexes in urban, as well as semi-rural (rural residential) and rural locations. That is where LV exists within a short distance of the property boundary. It will capture both overhead and underground connections. |
| *Complex type connection low voltage*<br><br>Single/multi-phase customer connection services which are not simple customer connections and, as an example, may involve the following:<br><br>▪ greater than one span of overhead service wire<br><br>▪ extension or augmentation of the LV feeder, overhead and/or underground;<br><br>▪ road crossing (overhead or underground).<br><br>Notes: This also includes the reconfiguration of LV network assets (not including any HV asset works) as a result of specific requests for connection specifications. | Connection of rural properties (e.g. farms) where a LV extension is required, or a multi-dwelling development (e.g. small townhouse complex) where a dedicated LV supply from an existing substation is required. |
| *Complex type connection high voltage*<br><br>Single/multi-phase customer connection services which are not simple customer connections or complex type low voltage connections and, as an example, may involve the following:<br><br>▪ extension or augmentation of the HV feeder, overhead and/or underground; installation of a distribution substation (pole mounted, ground types); | Connection of medium to large multi-dwelling sites (e.g. high-rise residential buildings, town house complexes and the like). Connection of rural properties (e.g. farms), which are some |

- extension or augmentation of the LV feeder, overhead and/or underground;
- greater than one span of overhead service wire;
- road crossing (overhead or underground).

Note: This also includes the reconfiguration of HV network assets (not including any LV asset works) as a result of specific requests for connection.

distance from the nearest LV and/or HV – hence will require an extension of the HV and a distribution substation as well as service mains.

## B.2 Commercial and Industrial connection service definitions

| Connections definition | Examples of connection works |
|---|---|
| *Simple type connection low voltage*<br><br>Single/multi-phase customer service connection and, as an example, may involve the following:<br><br>▪ one or more spans of overhead service wire;<br><br>▪ road crossing (overhead or underground)<br><br>▪ small LV extension or augmentation of overhead and/or underground mains. | Connection of smaller factories/warehouses in an established industrial estate, storefronts (milkbars, small suburban shopping strips) where there is existing LV available in the area. |
| *Complex type connection high voltage (customer connected at LV, minor HV works)*<br><br>Multi-phase customer connection service at LV which are not simple connections and, as an example, may involve the following:<br><br>▪ the installation of a distribution substation (pole mounted, ground types, or indoor types);<br><br>▪ overhead and/or underground HV feeder extension or augmentation associated with the connection of the substation but excluding major feeder extensions or augmentation;<br><br>▪ installation of LV mains associated with the new substation. | Connection of factories/warehouses, supermarkets, storefronts (milkbars, small suburban shopping strips) where there is no existing transformer/switching equipment available and customers are connected at low voltage. |
| *Complex type connection high voltage (customer connected at LV, major HV works – i.e. upstream asset works)*<br><br>Multi-phase customer connections which are not simple connections or Complex type connection high voltage and, as an example, may involve the following:<br><br>▪ large extension or augmentation, overhead and/or underground, of the HV feeder;<br><br>▪ installation of a distribution substation (pole mounted, ground types or indoor types).<br><br>Note: Upstream shared asset alterations expected to be required. This also includes the | Connection of factories/warehouses, supermarkets, office buildings, high-rise developments where the demand cannot be accommodated by the existing HV feeder and customers are connected at LV. |

reconfiguration of HV network assets as a result of specific requests for connection.

| | |
|---|---|
| *Complex type connection high voltage - connecting HV customers*<br><br>Multi-phase customer connections where the customer is supplied at HV and, as an example, may include the following:<br><br>▪ large extension or augmentations of the HV feeders;<br><br>▪ installation of a high voltage switching station or switch room. | This will typically include big industrial connections that require a maximum demand greater than which can be accommodated on the existing shared HV network. |
| *Complex type connection sub-transmission*<br><br>Multi-phase customer connections where the customer is connected via feeders operating between 33kV and 132kV inclusive and, as an example, may include any of the following:<br><br>▪ extension or augmentation of the Sub-transmission network;<br><br>▪ installation of switching stations, switch rooms or similar facilities. | Connection of very large single users with a maximum demand that cannot be accommodated on the HV distribution network and/or who are located remotely from the existing network (e.g. customers such as oil refineries or mines). |

## B.3 Subdivision connection service definitions

| Connections definition | Examples of connection works |
|---|---|
| *Complex type connection low voltage*<br><br>Single/multi-phase customer connection and, as an example, may include the following:<br><br>▪ extension or augmentation of overhead or underground LV feeders including road crossings. | Small subdivisions. |
| *Complex type connection high voltage with no upstream asset works*<br><br>Multi-phase customer connection which are not simple connections and, as an example, may include the following:<br><br>▪ extension or augmentation of HV feeders;<br><br>▪ installation of one or more distribution substations;<br><br>▪ installation of LV mains.<br><br>Notes: Each subsequent connection of a residential premises within a new estate will be treated as a connection. The subdivision category excludes civil works (that is, the cost of trenching, excavation, backfilling or re-instatement within the subdivision development). | Reticulating and connecting medium to larger subdivisions. |
| *Complex type connection high voltage with upstream asset works*<br><br>Multi-phase customer connections which are not simple connections and, as an example, may involve the following:<br><br>▪ extension or augmentation of HV feeders including major upstream works;<br><br>▪ installation of one or more distribution substations;<br><br>▪ installation of LV mains<br><br>Notes: This category is intended to capture the cost of developing the network to serve new | Reticulating and connecting large subdivisions that require significant rearrangement of the HV network and/or the development of new HV feeders. |

estates and possible upstream shared asset alterations that may be required. Each subsequent connection of residential premises within a new estate will be treated as a simple connection. The subdivision category excludes civil works (that is, the cost of trenching, excavation, backfilling or re-instatement within the subdivision development).

## B.4 Embedded generation connection service definitions

| Connections definition | Examples of connection works |
|---|---|
| *Simple type connection low voltage*<br><br>Single/multi-phase customer connection service, and /or:<br><br>▪ one span of overhead service wire or standard underground service wire and/or road crossing; and<br><br>▪ meter upgrade. | Small embedded generation systems connected via the LV network – e.g. residential customer photo voltaic with meter upgrade. |
| *Complex type connection high voltage – small capacity*<br><br>Multi-phase customer connection which are not simple connections and, as an example, may involve the following:<br><br>▪ large extension or augmentation, overhead and/or underground, of the HV/LV feeders;<br><br>▪ installation of a distribution substation (Pole mounted, ground types or indoor types). | Small scale bagasse plants, small scale wind turbine installations, bio-gas (often associated with waste disposal facilities). |
| *Complex type connection high voltage – large capacity*<br><br>Multi-phase customer connection which are not simple connections and, as an example, may involve the following:<br><br>▪ extension or augmentation of HV or sub-transmission feeders;<br><br>▪ installation of switching stations, switchrooms or similar facilities. | Larger capacity embedded generation (e.g. windfarms, or co-generation facilities). |