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# AMCL Review of EMCa's Report to the Australian Energy Regulator

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A Report for  
**TransGrid**  
from  
AMCL

Version 2.0  
23<sup>rd</sup> December 2014

**Review of Proposed Replacement  
Capex in TransGrid Revenue  
Proposal 2014 – 2019**

**AMCL Review of EMCa's Report  
to the Australian Energy Regulator**

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## Executive Summary

TransGrid is the owner and manager of one of the largest high voltage transmission networks in Australia, connecting generators, distributors and major end users in NSW and the ACT. Its network includes around 12,800 kilometres of high-voltage transmission lines and underground cables and over 90 substations and switching stations, and links to Queensland and Victoria.

On 2<sup>nd</sup> June 2014, TransGrid provided its Revenue Proposal for the 2014/2015 to 2018/2019 regulatory control period to the Australian Energy Regulator (AER). The AER engaged EMCa (a consultancy firm) to review TransGrid's Revenue Proposal and provide technical advice on the reasonableness of TransGrid's proposed replacement capital expenditure, to assist the AER in establishing an appropriate capital expenditure allowance as an input to its Draft Decision on TransGrid's allowable revenue. On 30<sup>th</sup> October 2014, EMCa provided its final draft report to the AER. EMCa's report was forwarded to TransGrid for review and response shortly before the draft decision was published.

In reviewing EMCa's report and preparing a response, TransGrid has appointed AMCL (a consultancy firm) to review EMCa's report and provide a view on the reasonableness of the observations, rationale, and conclusions, based on AMCL's understanding of TransGrid's asset management system, and the findings from the recent ISO 55001 certification audit of TransGrid's asset management system. This audit involved 32 interview sessions involving more than 48 TransGrid personnel over a period of seven days, and a review of a comprehensive suite of documentation relating to TransGrid's asset management system.

Some of the observations in the EMCa report would appear to be consistent with the findings from AMCL's ISO 55001 audit of TransGrid's asset management system. However, there is a disconnect between the observations made and many of the conclusions drawn. The report does not contain any detailed analysis to justify the proposed percentage reductions in funding for TransGrid's replacement capital expenditure for the major project categories assessed.

EMCa's report also repeatedly indicates that there is insufficient evidence and that certain things were not well defined or understood, or that the assessment is brief and high-level with a small sample set, but then proceeds to draw conclusions anyway, quite often making generalised observations and implying systemic issues. Many of these conclusions would appear to have been used to support the proposed reduction in funding for the various project categories assessed.

Of particular note are the conclusions that are drawn on the basis of TransGrid's approach to risk management. Whilst the observations on TransGrid's risk management processes align with the findings from the recent ISO 55001 audit, i.e. the risk assessment processes appear to overestimate of risk in real dollar terms and is a key area for improvement, there are a number of important considerations that appear to have been overlooked by EMCa. In our opinion EMCa has placed too much emphasis on the dollar value of risk in the decision-making process, whereas in reality the risk dollars represent a relative score to enable comparison between projects and to support investment decision making. It is not used as financial justification of projects.

One of the observations which appears to be at odds with the conclusions drawn, concerns the lack of a long-term renewal forecast. This may be an indicator that TransGrid does not have a view of the sustainability of its replacement expenditure, but the lack of this financial forecast does not provide any justification for a reduction of expenditure during the next regulatory period as the projects within the next RCP are largely based on individual projects with their own justification.

Another apparent inconsistency between observations made and conclusions drawn is the deliverability of projects. EMCa initially commented on TransGrid's management and control of projects being good industry practice, but in a later section assumed that projects will slip based on some 'potential scenarios' but without appropriate evidence or justification. EMCa subsequently concluded that it would be reasonable to assume that the projects would be deferred, thus justifying a reduction in the associated renewal expenditure.

In its assessment, EMCa does not appear to give due consideration to the fundamental shifts over the last few years that contributes to the increase in TransGrid's renewal expenditure, that: growth has dropped, resulting in a substantial decrease in capacity projects; it has become more economical to replace some of the assets due to broader condition issues whereas previously targeted individual equipment replacement strategy to extend the life of the asset was a more attractive solution; in some cases substantial technology upgrades are required to enable more efficient management of the network and to prevent technological obsolescence and associated costs and risks, that can be expected to realise value in a more sustainable and reliable manner over a longer period.

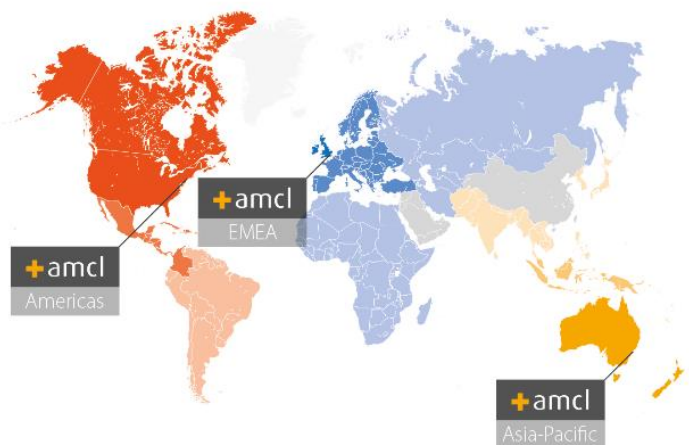
In the assessment of management strategies for the substations renewal and transmission lines rebuild project categories, EMCa made multiple comments and observations that appear to be based on management strategies that are more relevant to distribution assets, which are

typically characterised by many assets with low consequences and relatively high probabilities of failure. These distribution-focused management strategies are generally not suitable to TransGrid's transmission business and asset types. EMCa's observations and comments in this regard, particularly in its analysis of TransGrid's substation and transmission line assets, are thus considered to be inappropriately justified.

In its assessment of TransGrid's communications upgrade projects, EMCa appeared to have dismissed the amount of resources and time that TransGrid has invested in establishing the OPGW strategy and its associated projects, based on a limited review that is qualitative and high level.

## About AMCL

AMCL is a global organisation with demonstrable Asset Management leadership, particularly in the transport, energy, and water sectors. AMCL is at the forefront of transforming asset management organisations, and has extensive experience in the areas of Asset



Management diagnostics and assessments, strategy development and planning, through to implementation and benefits realisation and assurance. We have been involved in the definition of best appropriate practice and development of associated Asset Management Improvement Roadmaps and Change Management Implementation Programs across the globe.

AMCL has established a reputation for delivering high value consultancy services to clients, having assisted them in improving their asset governance, risk management, and in maximising value from assets in a sustainable manner, via good practice asset management. We have a holistic approach to assisting clients, from the developing of people (i.e. training, mentoring), developing organisations (i.e. developing best practice Asset Management systems and capabilities), and working collaboratively with clients to deliver improvements and realise benefits from improved Asset Management systems and practices. We have completed over 100 assessments to date for clients around the world, and continue to support many clients on their journey to excellence in Asset Management.

AMCL is one of the few organisations worldwide to be an Institute of Asset Management (IAM) Endorsed Assessor as



Developing People



Developing Organisations



Delivering Improvements

well as an IAM Endorsed Training Provider. AMCL has been involved in establishing the BSI PAS 55 standard in 2004 and 2008, and we continue to contribute to the discipline by positively influencing the establishment of ISO 55001, sector specific asset management guidelines, and

the ongoing development of the Global Forum on Maintenance and Asset Management (GFAM) 39 Subjects and the Asset Management Landscape document.

AMCL has undertaken a number of major organisation-wide asset management assessments and consultancy engagements within the Australian and New Zealand energy sector, including ActewAGL, Ausgrid, AusNet Services (previously SP AusNet), Essential Energy, Jemena, Top Energy, TransGrid, Transpower, West Power, and Western Power.



## Author Bios



### **Richard J Edwards**

Richard Edwards is the Technical Director of the AMCL Group who led the development of the AMCL Asset Management Excellence Model over the last 10 years and over 40 assessments of asset intensive businesses. He is a Board Member and President of the Institute of Asset Management (IAM) and is actively involved in the development of the Asset Management Landscape through his participation in the Global Forum on Maintenance and Asset Management (GFMAM). He has extensive experience in the application and assessment of Asset Management, PAS 55, and ISO 55001 in the rail and utility sectors. He has worked in the transport and utility industries for over 25 years in a range of front-line management, strategic management and consultancy roles.



### **Brenton C Marshall**

Brenton Marshall is AMCL's Territory Manager for Australia and New Zealand. Brenton has been responsible for creating strategies and implementation of Asset Management across multiple industries and countries. He has extensive experience in Asset Management, including assessments and audits to PAS 55 and ISO 55001, life cycle planning, asset management information systems, procurement strategies, organisational structures and asset management planning. He is also experienced in long-term financial modelling and life cycle costing to drive value from assets and meet service delivery targets. His wide range of experience has been gained in a diverse range of experience including; gas, electricity, hydro-electricity, water, wastewater, irrigation, parks and gardens, roads, rail and buildings projects in Australia, New Zealand, USA and Canada.



### **Ming W Lee**

Ming Lee is a senior management consultant with a broad knowledge base encompassing engineering, strategic asset management, and business administration, with experience across a range of sectors, including water, wastewater, electricity, transport, environment, and manufacturing. Ming has led and delivered a range of consulting engagements, assessments, and audits for large global corporations and a variety of organisations across Australia, Hong Kong, and the Middle East. He has worked with complex organisations towards achieving compliance to internationally recognised standards (PAS 55 and ISO 55001) and towards good practice asset management, to realise improved governance, improved risk management, and additional value from their assets.

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## 1 Introduction

On 2<sup>nd</sup> June 2014, TransGrid provided its Revenue Proposal for the 2014/2015 to 2018/2019 regulatory control period to the Australian Energy Regulator (AER). AER engaged EMCa (a consultancy firm) to review TransGrid's Revenue Proposal and provide technical advice on the reasonableness of TransGrid's proposed replacement capital expenditure, to assist the AER in establishing an appropriate capital expenditure allowance as an input to its Draft Decision on TransGrid's allowable revenue. On 30<sup>th</sup> October 2014, EMCa provided its final draft report to the AER. EMCa's report was forwarded to TransGrid for review and response shortly before the draft decision was published.

In reviewing EMCa's report and preparing a response, TransGrid has appointed AMCL (a consultancy firm) to review EMCa's report and provide a view on the reasonableness of the observations, rationale, and conclusions, based on AMCL's ongoing assessment understanding of TransGrid's asset management system, and the findings from the recent ISO 55001 (an internal asset management standard) certification audit of TransGrid's asset management system, that involved 32 interview sessions involving more than 48 TransGrid personnel over a period of seven days, and a review of a comprehensive suite of documentation relating to TransGrid's asset management system.

This report presents the findings of AMCL's review of EMCa's report.

### 1.1 Objectives and Scope

This report aims to provide TransGrid with a view on the reasonableness of EMCa's findings and conclusions on TransGrid's proposed replacement capital expenditure.

The scope of this review is EMCa's report that consists of the following components:

- Assessment of governance and management framework;
- Assessment of forecasting methods; and
- Assessment of proposed expenditure.

### 1.2 Approach

The approach taken for this review are as below:

- Review EMCa's report;

- Examine for consistency and alignment with our understanding of TransGrid's asset management system and findings from the recent certification audit to ISO 55001;
- Examine the reasonableness of EMCa's approach, rationale, findings, and conclusions, based on our understanding of TransGrid's asset management system and good asset management practices; and
- Outline our findings in this report.

## 2 Findings

### 2.1 Evidence-based Conclusions

1. On multiple occasions, EMCa indicates that there is insufficient evidence, and that certain things were not well defined or understood, or that the assessment is brief and high-level with a limited sample set, but on most occasions proceeds to draw conclusions anyway. As a result, there is a disconnect between observations made and the conclusions drawn.
2. These conclusions are then used to justify the proposed reduction in funding. In the absence of sufficient coverage of all projects in question, it would appear that the conclusions drawn are not sufficiently informed or justified. There are also instances which indicate that exceptions have been used to make a generalised observation and imply existence of systemic issues.
3. On multiple occasions, EMCa appears to qualify its own observations across various sections of its report, thereby leading to some doubt as to the quality, accuracy, and representativeness of many of the observations and corresponding conclusions drawn. Some examples are as below:
  - a. using exceptions to make inferences: *"We found exceptions that indicate TransGrid's application of the asset management framework for the purpose of including repex projects in the Revenue Proposal was not sufficiently rigorous."* (see EMCa point 35);
  - b. indicates lack of information and limited review: *"... however no documentation was provided to describe how this risk is to be assessed at a project level of evidence of the calculations used to determine the consequence cost level."* (see EMCa point 45);
  - c. indicates lack of information and limited review: *"...In the absence of the requested information, we were not able to draw meaningful conclusions on the implied cost of risk selected by TransGrid"* (see EMCa point 46);
  - d. indicates lack of information and limited review: *"...It is not clear how, if at all, the risk cost calculated as part of the Needs Statement is used in the assessment and prioritisation of projects... However, for projects reviewed, there was no*

*assessment of prudent timing for the project based on the risk assessment.” (see EMCa point 47);*

- e. drawing conclusions and implying systemic issues based on only two projects reviewed: the Yanco substation renewal project and Orange substation renewal project. (see EMCa report, section 3.2.2);
  - f. indicates lack of information and limited review: “...*no explanation was provided as to whether (or if so, how) the proposed allowance for the forthcoming RCP fits into this long term capital plan...*” (see EMCa report, point 72);
  - g. indicates lack of information and limited review: “...*however they have neither advised the method used to assess the current risk, nor shown evidence of increasing risk or the desired level of risk in order to measure the effectiveness of the proposed program...*” (see EMCa report, point 75); and
  - h. indicates lack of information and limited review: “...*There is insufficient evidence that the increased level of expenditure reflects an efficient means of managing the identified risks.*” (see EMCa report, point 76).
4. EMCa’s assessment was completed over one day of on-site interviews on 25<sup>th</sup> August 2014, with a limited number of TransGrid’s personnel, and most of the analysis was carried out based on available documentation. As a result, many of the observations and conclusions were derived based on the limited availability and quality of documentation made available for review and within a limited time period.
5. Considering the implications and significance of the conclusions (i.e. substantial proposed reduction in funding for all categories assessed), it may be prudent for the AER to engage an assessment of all of TransGrid’s projects in question in sufficient detail, in order to draw informed conclusions and justify the proposed reduction in funding. This should also take into account project specific considerations and context.

## **2.2 Proposed expenditure cuts**

EMCa concluded that there is an over-estimation of required expenditure in the forthcoming RCP for all the project categories assessed and correspondingly suggested reduction in funding by these amounts.

For ease of reference in this section, 'proposed reduction in funding' should be also be read as 'overestimation of required expenditure'.

The proposed reduction in funding is summarised as follows:

<b>Project categories</b>	<b>Order of overestimation of expenditure / Proposed reduction in funding</b>
Substation renewal	10% to 20%
Secondary systems renewal	20% to 30%
Communications upgrades	50% to 60%
Transmission line rebuilds	10% to 20%
Other repex	Pro-rata adjustment
<b>Overall (aggregate)</b>	<b>20% to 30%</b>

Source: EMCa report.

1. EMCa suggested major reductions in funding for the four major categories, suggested a pro-rata of adjustment of the four major categories to estimate the 'Other repex' category, and then merged these into an aggregate reduction across the forecast replacement capital expenditure.
2. The report does not:
  - a. provide any analysis to justify the proposed percentage reductions in funding based on the observations made;
  - b. justify if the pro-rata adjustment would be appropriately applied to the 'Other repex' category, without any assessment; and
  - c. provide any analysis to explain how EMCa determined the aggregate percentage reductions.
3. As there is no analysis provided by EMCa as to how the proposed reductions in funding were estimated, it must be concluded that these estimates are based on value judgement only. It is also concluded that EMCa's assessment was undertaken at a level that was not sufficient to draw meaningful and reasonable percentage reductions in funding.

4. In proposing such significant reductions in funding, it would be considered prudent for EMCa to:
  - a. adopt an evidence-based approach to justify the proposed percentage reductions in funding;
  - b. detail the methodology, assumptions, analysis, and calculations in estimating these percentage reductions;
  - c. justify any amounts of proposed reduction in funding with specific projects (or parts of) and associated qualitative and quantitative assessments on the impact to TransGrid's management, technical, and risk elements;
  - d. provide an analysis on the level of accuracy of the estimation of percentage reductions; and
  - e. provide an analysis on the risk implications arising from the proposed reduction in funding, to justify the reasonableness of the proposed percentage reductions.

## **2.3 Approaches to risk management**

1. Whilst the observations on TransGrid's risk management processes align with the findings from the recent ISO 55001 audit, i.e. the risk assessment processes appear to overestimate risk in real dollar terms and is a key area for improvement, there are a number of important considerations that appear to have been overlooked by EMCa:
  - a. Although risk is a key driver of investment, the dollar value of risk is a relative score that is used to compare between projects and to support investment decisions for the projects. TransGrid recently migrated from risk scores to risk in real dollar terms as a transitional step towards developing whole-life cost modelling capabilities in the future;
  - b. Risk (expressed in dollars) is therefore not used as financial justification for projects;
  - c. Risk is used as an indicator to identify if some action is required based on the Corporate Risk Strategy, which may be subsequently managed via asset and/or non-asset solutions; and



- d. The Cost of Failure values adopted align with the Risk Matrix provided by the Board, and therefore represents the Board's appetite for risk.
2. EMCa would appear to have placed too much emphasis placed on the dollar value of risk in the decision-making process, whereas in reality the risk dollars represent a relative score, to facilitate comparison between projects.

## **2.4 Long-term renewal forecast**

The report identified a lack of long-term capital expenditure plans / renewal forecast (see EMCa report, Sections 3.2.5 and 3.3).

1. While the lack of long term capital expenditure plans may be an indicator that TransGrid does not fully understand its future financial sustainability, it does not provide any justification for a reduction of expenditure during the next regulatory period as the projects within the next RCP are largely individual projects with their own justification.
2. EMCa seems to be inferring that if TransGrid had a better estimate of its longer term risk and renewal expenditure profile then it would be able to delay projects into the following RCP period but there is no justification for this being the case.

## **2.5 Asset type and management strategies (distribution vs transmission)**

1. EMCa made multiple comments and observations in Section 5 of its report that appear to be based on management strategies that are more relevant to distribution assets, which are typically characterised by many assets with low consequences and relatively high probabilities of failure. EMCa appears to be applying distribution-focused management strategies that are generally unsuitable to TransGrid's transmission business and assets, where consequences of failure are typically very high and often considered unacceptable.
2. An example of this is where the report has referred to using system wide performance indicators as a guide to the level of investment required on the TransGrid network but one major failure could result in a significant skew of the system wide performance indicators. These indicators are lagging indicators and must be used with caution on a transmission network as the basis for determining investment requirements. It is also noted that these indicators are influenced by many factors and not just the level of replacement capital expenditure.

3. TransGrid's approach is to closely monitor the condition of the assets and to plan renewal projects with aims to prevent failures from occurring. An N-1 approach is used to ensure redundancy in the system in the event of failures or outages. N-1 should not be used as an excuse to push the assets to a point where failure is likely, especially for transmission assets where consequence of failure are typically very high.
4. EMCa's observations and comments in this regard, particularly in its analysis of TransGrid's substation and transmission line assets, are thus considered to be inappropriately justified. (see EMCa report, Sections 5.2.2 and 5.2.4).

## **2.6 Changing business environment and network profile**

EMCa suggests that TransGrid has over-estimated the required expenditure in the forthcoming RCP, and that TransGrid adopts a 'technology' driven replacement program that is considered 'aggressive' (see EMCa's report, various sections, particularly Section 5).

1. The preceding two regulatory periods required heavy investment in system capacity due to growth in demand. There have been some fundamental shifts in the last few years that may not have been due consideration by EMCa in its assessment, particularly:
  - a. Many renewals have been delayed due to the high number of growth projects over the last 10 years; and
  - b. Repex expenditure has increased substantially, while demand growth expenditure will decrease substantially, as the business has been required to shift focus due to decreasing demand and aging assets, many of which are approaching or are past its nominal technical life.
2. Many of the assets are now approaching 50 to 60 years old, past its nominal technical life, and whilst TransGrid has adopted economical options to extend the life of its assets via targeted replacement of equipment, in some cases this lever is becoming less economical as some of these assets are now in a state where asset replacement (instead of targeted individual equipment replacement) has become a more attractive option due to the broader asset condition issues and associated costs and risks. This is particularly relevant to the substation assets.
3. In some cases, particularly the secondary and communication systems, substantial technology upgrades are required to enable more efficient management of the network, and to prevent technological obsolescence and associated costs and risks, that can be

expected to realise value in a more sustainable and reliable manner over a longer period.

## 2.7 Delivery capability

EMCa identified in its review of the investment planning and portfolio governance that their review "...has identified a strong orientation to project control, project risk identification, scope management and project delivery...", and that TransGrid's processes relating to the management of projects were considered to be good industry practice (see EMCa report, point 62).

1. This is consistent with the ISO 55001 audit findings that TransGrid's Portfolio Management Office / Capital Project Delivery project management structure in place is focused on delivering capital projects on time and to budget. TransGrid has a good track record in the last few years of achieving this.
2. However, EMCa subsequently presumed that several projects will overrun and therefore concluded these projects should be deferred as a result (see EMCa point 109).
3. This is an example of inconsistency between the observations made and the conclusions drawn. The observations and conclusions drawn are not evidence-based. EMCa's observations, justification, and conclusion are summarised as follows (see EMCa report, point 109):
  - a. EMCa presumed that it is highly likely that some projects will 'slip' from the forthcoming period; and
  - b. EMCa subsequently attempted to justify this presumption with an "...*For example, if...*" scenario, and presents a 'combination of potential scenarios', and then proceeds to draw a conclusion based on this presumption that "...*it is reasonable to assume that this could occur*".

## 2.8 Review of Repex projects

1. Several of the Repex projects reviewed are currently in construction and will be completed before the start of the next regulatory period. To base the next regulatory assessment on previous justifications invalidates many of the conclusions. Over 50% of the reports reviewed are in construction or almost complete for which the analysis was completed some time ago.

2. Most of EMCa's observations and conclusions on specific projects appear to focus entirely on reliability risk. There appears to be no consideration in EMCa's proposed deferral or scope reduction arguments for any safety, environment, or compliance type risks, whereas TransGrid's project risk assessments use a multi hazard approach that incorporates these key risk elements.
  - a. For example, EMCa's suggested solution for Cooma substation is to purchase spares, then replace regulators and transformers as they fail, however there is no assessment if this is acceptable from a safety or environmental point of view.
3. It is our understanding that EMCa were engaged to form a view on TransGrid's replacement capital expenditure (Capex) program only. TransGrid's operating expenditure (Opex) program has been assessed separately by the AER using an efficient year, multiplied by a forecast rate of change for each year, then allowing for any step changes in Opex not captured by the base year or rate of change. In most cases EMCa's project reviews suggest deferrals or temporary work with an Opex implication, but the AER is at the same time determined that Opex should be cut for a number of other reasons. This does not seem to be sound from a good asset management principles perspective of managing the Capex and Opex trade off across the life cycle of the assets.

## 2.9 Substations

1. In Section 5.2.1 of its report, EMCa suggested substantial reduction in funding of up to 20% for substation renewal projects. However, the report does not provide any analysis to justify this proposed reduction in funding. Also refer to Section 2.2 of this document.
2. One of EMCa's key observations relate to the excessive assessment of risk costs by TransGrid. However, as discussed in Section 2.3 of this document, EMCa's observations based on risk values in real dollar terms may not be valid.
3. Some other observations made by EMCa relate to excessive scope, insufficient consideration of the option to defer major renewals by undertaking interim work and the use of spares. These observations and corresponding conclusions may not be appropriately informed, as EMCa would appear to apply management strategies characteristic of distribution businesses to TransGrid's transmission business (see also Section 2.5 of this document).

- a. TransGrid's management strategy is to prevent transformers failing and the approach is therefore to closely monitor condition of the transformers and to replace / rebuild them before the risk of a transformer failing increases to an unacceptable level;
- b. Any deviation from this will potentially expose staff at an unacceptable safety risk and will leave the network without its N-1 protection for an extended period of time; and
- c. Holding spare transformers to replace failed transformers may be appropriate for distribution assets as a management strategy, but it is unlikely to be acceptable for transmission assets due to the high level of risk and consequences of failure. TransGrid still maintains spare transformers, but only in case of major failures that were not predicted, not as part of its management strategy to run to failure which would not be appropriate for large transmission assets.

## **2.10 Communications upgrades**

1. EMCa proposed substantial reduction in expenditure of up to 60% for communications upgrades, mainly on the basis that the OPGW strategy (a major strategy that is integral to the long term performance of the network) is not sufficiently justified. However, the report does not provide any analysis to justify this proposed reduction in funding; the proposed reduction is not justified and not evidence-based (see EMCa's report, Section 5.2.3). Also refer to Section 2.2 of this document.
2. EMCa would appear to have dismissed the amount of resources and detailed analysis that TransGrid has invested in establishing the OPGW and associated projects, on the basis of some high level observations that are not sufficiently backed by evidence.
3. TransGrid has invested substantial amount of time and resources, backed by detailed analysis by specialists, in order to establish this OPGW strategy and associated projects. These investigations and analysis carried by TransGrid appear to have been dismissed by EMCa based on its high level, qualitative assessment.

### 3 Conclusions

The conclusions from AMCL's review of the EMCa report are summarised below.

Some of the observations in the EMCa report would appear to be consistent with the findings from AMCL's ISO 55001 audit of TransGrid's asset management system. However, there is a disconnect between the observations made and many of the conclusions drawn. The report does not contain any detailed analysis to justify the proposed percentage reductions in funding for TransGrid's replacement capital expenditure for the major project categories assessed.

EMCa's report also repeatedly indicates that there is insufficient evidence and that certain things were not well defined or understood, or that the assessment is brief and high-level with a small sample set, but then proceeds to draw conclusions anyway, quite often making generalised observations and implying systemic issues. Many of these conclusions would appear to have been used to support the proposed reduction in funding for the various project categories assessed.

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In the assessment of management strategies for the substations renewal and transmission lines rebuild project categories, EMCa made multiple comments and observations that appear to be based on management strategies that are more relevant to distribution assets, which are typically characterised by many assets with low consequences and relatively high probabilities of failure. These distribution-focused management strategies are generally not suitable to TransGrid's transmission business and asset types. EMCa's observations and comments in this regard, particularly in its analysis of TransGrid's substation and transmission line assets, are thus considered to be inappropriately justified.

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