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# Review of Network Investment Plans and Supporting Documents

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27 March 2014

**Stephen Clark**

Executive General Manager/Network Planning and Performance  
TransGrid  
180 Thomas Street  
Sydney NSW 2000

Our ref:

4127095

### **Review of TransGrid's investment planning and regulated capital expenditure**

Dear Stephen,

GHD has been engaged by TransGrid to provide an independent and objective review of their process for identifying the capital expenditure projects which form the basis of the revenue submission for the 2014 – 2019 regulatory period. We have now completed a three stage review process of TransGrid's capital expenditure investment decision making process.

GHD was provided with a list of projects with capital expenditure in the 2014-2019 regulatory period. The list categorised the projects based on the investment driver and indicated the expected level of expenditure. Using this project data GHD selected a representative set of 84 projects that covered all classes of expenditure (augmentation, connection, replacements, easements, and security and compliance).

A three stage review process was completed, which incorporated:

- An initial review of the investment plan documents supporting a representative sample of the capital expenditure projects proposed for the 2014 – 2019 regulatory period.
- Stage 1 repeat assessment of a small number of investment plans that were identified through the initial review as requiring the most improvement in articulation of the justification.
- Stage 2 repeat assessment of a representative sample of the investment plans covered by the initial review focusing on those requiring more minor improvement in articulation of the justification.

We believe that our review of the selected 84 projects, provides a reasonable basis for assessing the quality of documentation and procedural robustness of the TransGrid transmission network investment portfolio for the 2014-2019 regulatory period. The following two sections provide an overview of the outcomes of GHD's review for each category of investment expenditure.



## **Asset replacement**

The suite of investment planning documents for asset replacement projects examined demonstrate that TransGrid has a robust process for assessing the condition of network assets, underpinned by thorough and detailed condition assessment reports. As a result GHD is satisfied that the available condition information presents TransGrid with adequate evidence to base the determination of an investment trigger within the 2014-2019 regulatory period. The information reviewed demonstrates that TransGrid's replacement plans comply with the relevant Asset Management Strategies and the replacement capex proposed is reasonably required to address the asset condition needs identified in condition reports and strategies. The documents examined demonstrated that appropriate internal processes and governance procedures are in place.

## **Augmentation, connection, easements, and security and compliance**

The investment planning documents for projects addressing drivers other than asset replacement provided a reasonable demonstration that the proposed expenditure is prudent and efficient. Collectively they demonstrated that TransGrid's proposed:

- augmentation plans comply with the Transmission Reliability Standard and the augmentation capex proposed is reasonably required to meet that reliability standard.
- augmentation plans have taken into account load flow modelling and network analysis.
- load driven capex plans are consistent with the relevant demand forecasts and there is evidence of an appropriate level of coordination with Distribution Network Service Providers regarding connection point forecasts and TransGrid's load driven capex is reasonably required to meet those demand forecasts.
- investments address an appropriate set of planning criteria including compliance with the NER, safety obligations and transmission reliability standards

The documents examined demonstrated that appropriate internal processes and governance procedures are in place.

A number of investments were proposed to deliver net market benefits. Other than the QNI upgrade project, for which there has been substantial market benefits analysis undertaken, there are a number of other market benefits projects proposed that are less advanced. We understand that these projects will be classified as contingent projects. The investment planning documents reviewed are appropriate for contingent projects and demonstrate that there are reasonable scenarios that may arise across the 2015-2019 regulatory period that would result in material levels of congestion. It is therefore prudent for TransGrid to plan network augmentations that are capable of addressing this congestion should it arise, and for those projects to be considered as contingent projects.



Based on GHD's review we believe there is sufficient evidence to show that the investments explicitly considered as part of this review reflect good industry practice and are prudent and efficient.

GHD understands TransGrid is reviewing its entire suite of network investment justification documents to improve their articulation in light of the results of GHD's review. GHD expects that by diligently addressing the improvement opportunities identified through our three stage review across all projects, TransGrid should be able to reasonably demonstrate their proposed expenditure is prudent and efficient.

Regards,

A handwritten signature in black ink, appearing to read 'David Bones', written in a cursive style.

**David Bones**

Service Group Manager, Power Economics and Regulation  
07 3316 3979



**HILL MICHAEL**  
STRATEGIC ENGINEERING

**TransGrid**

Review of Network Investment Plans  
& Supporting Documents  
Final Review Report

May 2014



# Executive summary

TransGrid engaged GHD Hill Michael (GHD) to provide an independent and objective review of the process undertaken by TransGrid to identify the capital expenditure projects which form the basis of their revenue submission for the 2014 – 2019 regulatory period. The purpose of this review was to provide independent advice that will be included as supporting evidence in TransGrid's submission to the AER. Specifically, this required GHD to assess whether TransGrid has:

- Correctly identified the need for augmentation or replacement
- Provided reasonable substantiation of the timing for the investment
- Considered a reasonable range of options
- Demonstrated that the preferred option is the optimal solution
- Produced investment planning documentation that is complete and robust

GHD and TransGrid agreed upon a review methodology which selected a representative group of projects and scored each project based on a number of weighted criteria. This methodology incorporated a review of the documentation captured over the project development lifecycle, from identification of the need to selection of the solution, and assessed how the process, as applied to each individual project, aligns with TransGrid's regulatory obligations and good industry practice.

A three stage review process was completed, which incorporated:

- An initial review of the investment plan documents supporting a representative sample of the capital expenditure projects proposed for the 2014 – 2019 regulatory period.
- Stage 1 repeat assessment of a small number of investment plans that were identified through the initial review as requiring further work to adequately articulate the investment justification.
- Stage 2 repeat assessment of a broader sample of the investment plans covered by the initial review and identified as requiring further work to adequately articulate the investment justification. .

Status reports were issued at the completion of each phase and a consolidated sign-off letter was issued on completion. The sign-off letter summarised the results of GHD's investigation which found that TransGrid's investment program is considered prudent and efficient based on the sample documentation reviewed by GHD.

This report documents the various stages of the review process, summarising the process steps.

This report is subject to, and must be read in conjunction with, the limitations set out in section 1.3 and the assumptions and qualifications contained throughout the Report.

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# 1. Introduction

## 1.1 Background

TransGrid engaged GHD Hill Michael (GHD) to provide an independent and objective review of the process undertaken by TransGrid to identify the capital expenditure projects which form the basis of their revenue submission for the 2014 – 2019 regulatory period. The purpose of this review was to provide an independent assessment of the prudence and efficiency of TransGrid's investment process that can be included as supporting evidence in TransGrid's submission to the AER.

This analysis required a review of the documents produced through TransGrid's internal network investment planning process. The three stages of the investment planning process and the corresponding documents are identified in Table 1.

**Table 1 – Network Investment Process**

Planning Stage	Planning Document
Identify the need for supply reinforcement or asset replacement and the timing	Needs Statement
Identify options to meet the need and initiate a cost and feasibility review of the options	Option Feasibility Request (one document is prepared for each possible option) and Option Feasibility Studies (the OFS were not the primary focus of GHD's review, however they form a part of TransGrid's internal decision making and compliance process).
Selection of the preferred network or non-network option, based on the need, range of credible options and feedback on costs and feasibility	Options Evaluation Report (a single document)

The three classes of document (Needs Statement, Option Feasibility Request and Options Evaluation Report) identified in Table 1 were the main documents reviewed by GHD. For asset replacement projects condition assessment reports were also reviewed.

This set of investment planning documents was reviewed for 84 projects and programs (taking into account the merging of a number of projects) covering both growth driven and asset replacement investments. The aims of the review were to:

- Correctly identified the need for augmentation or replacement
- Provided reasonable substantiation of the timing for the investment
- Considered a reasonable range of options
- Demonstrated that the preferred option is the optimal solution
- Produced investment planning documentation that is complete and robust

## 1.2 Purpose of this report

The purpose of this report is to summarise the review process undertaken by GHD of the Network Investment Plans and Supporting Documents provided by TransGrid. It is recognised that this report may be provided to the AER as evidence of the review process.

### 1.3 Scope and limitations

*This report: has been prepared by GHD for TransGrid and may only be used and relied on by TransGrid for the purpose agreed between GHD and the TransGrid as set out in section 1.2 of this report.*

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

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

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

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

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

### 1.4 Assumptions

The review process was completed under the following assumptions:

- GHD was provided with the most up to date information available for the projects identified at the time of review
- Any changes to the documentation following GHD's review is out of the scope of this project and any recommendations or comments made by GHD are limited to the versions of documents presented to GHD at the time of the review

## 2. Methodology

GHD and TransGrid agreed upon a review methodology which involved selecting a representative set of projects and scoring each project based on a number of weighted criteria. This methodology incorporated a review of the documentation captured over the project development lifecycle, from identification of the need to selection of the solution, and assessed how the process, as applied to each individual project, aligns with TransGrid’s regulatory obligations and good industry practice.

A three stage review process was completed, which incorporated:

- An initial review of the investment plan documents supporting a representative sample of the capital expenditure projects proposed for the 2014 – 2019 regulatory period.
- Stage 1 repeat assessment of a small number of investment plans that were identified through the initial review as requiring further work to adequately articulate the investment justification.
- Stage 2 repeat assessment of a broader sample of the investment plans covered by the initial review and identified as requiring further work to adequately articulate the investment justification.

### 2.1 Selection of Projects

GHD was provided with a list of projects with capital expenditure occurring in the 2014-2019 regulatory period. The list categorised the projects based on the investment driver and indicated the expected level of expenditure. Using this project Meta data GHD selected a representative set of 84 projects that covered all classes of expenditure (augmentation, connection, replacements, easements, and security and compliance). The sample project list was chosen considering the relative magnitude of total expenditure across each investment class and the value of each individual project.

At various stages in the review process adjustments were made to the list of projects to be reviewed. Those changes took into account refinements to TransGrid’s investment plans resulting in a reduction in the number of projects reviewed to 73. Table 2 summarises the numbers of projects reviewed during the initial and repeat assessments.

**Table 2 –Review of Network & Investment Plans – Summary**

<i>Initial Review</i>	<i>Count</i>
No. of Projects identified for review	84 (2 x NS 42)
No. of Projects reviewed by GHD	73

<i>Stage 1 Repeat Assessment</i>	<i>Count</i>
No. of Projects identified for review	10
No. of Projects reviewed by GHD	10

<i>Stage 2 Repeat Assessment</i>	<i>Count</i>
No. of Projects identified for review	35
No. of Projects reviewed by GHD	32*
No. of Projects not reviewed, as agreed with TransGrid (projects withdrawn due to a change in driver over the review period)	2

\*Projects 2 and 10a were combined at this stage

## 2.2 Review Criteria

At each stage of the review process, GHD’s reviewers assessed the project documentation against the following criteria:

**Table 3 – Review Criteria (Non-Replacement projects)**

No.	Review Criteria
<b>Has TransGrid correctly identified the need for augmentation or replacement (Need Statement)?</b>	
1	Are the assumptions about demand and generation clear and appropriate?
2	Has/have the network limitation(s) been clearly defined?
3	Is it clear that the planning criteria have been correctly applied?
4	Has a risk assessment been carried out using Transgrid risk management methodology, are the results documented, and does this risk assessment support taking the action recommended in the project?
5	Has the need been clearly established?
6	Is the determination of need robust under a range of conditions?
<b>Is the timing reasonable (Need Statement)?</b>	
7	Has the trigger for the timing been clearly identified?
8	Is the timing consistent with the trigger?
<b>Has TransGrid assessed the appropriate options (Options Feasibility Request and Options Evaluation Report)?</b>	
9	Is the range of options assessed reasonable (Are there any obvious omissions)?
10	Is it clear that non-network options have been considered?
11	Have the options been adequately analysed, demonstrating that they meet the need?
12	Have other projects in TransGrid’s capital program been adequately factored into the options?
13	For option feasibility requests, is the scope of work appropriate?
<b>Is it clear that the correct option has been identified (Options Evaluation Report)?</b>	
14	Have all identified feasible options been analysed?
15	Has option feasibility been addressed?
16	Is the economic analysis reasonable?
17	Is it clear that lead time been considered in the analysis?
18	Is it clear that the correct option has been selected?
<b>Is the documentation complete and robust (all documents)?</b>	
19	Is the documentation provided sufficient?
20	Is the project documentation consistent and consistent with other documents (TransGrid’s APR, NTNDP, TransGrid’s Strategic Network Development Plan)?

**Table 4 –Review Criteria (Replacement projects)**

No.	Review Question
<b>Has TransGrid correctly identified the need for augmentation or replacement (Need Statement)?</b>	
1	Have the asset populations & condition been clearly identified via detailed asset specific

	strategies?
2	Have maintenance, refurbishment & replacement criteria been clearly established in asset specific strategies?
3	Have the assets in question been recently assessed against the documented maintenance, refurbishment & replacement criteria?
4	Has a risk assessment been carried out using Transgrid risk mgt methodology, are the results documented, and does this risk assessment support taking the action recommended in the project?
5	Has the need for this specific asset replacement project been clearly established?
6	Is the project need robust under a range of conditions ie sensitivity analysis?
<b>Is the timing reasonable (Need Statement)?</b>	
7	Has the trigger for the timing been clearly identified?
8	Is the timing consistent with the trigger?
<b>Has TransGrid assessed the appropriate options (Options Feasibility Request and Options Evaluation Report)?</b>	
9	Is the range of options assessed reasonable (Are there any obvious omissions)?
10	Is it clear that non-network options have been considered?
11	Have the options been adequately analysed, demonstrating that they meet the need?
12	Have other projects in TransGrid's capital program been adequately factored into the options?
13	For option feasibility requests, is the scope of work appropriate?
<b>Is it clear that the correct option has been identified (Options Evaluation Report)?</b>	
14	Have all identified feasible options been analysed?
15	Has option feasibility been addressed?
16	Is the economic analysis reasonable?
17	Is it clear that lead time been considered in the analysis?
18	Is it clear that the correct option has been selected?
<b>Is the documentation complete and robust (all documents)?</b>	
19	Is the documentation provided sufficient?
20	Is the project documentation consistent and consistent with other documents (TransGrid's APR, NTNDP, TransGrid's Strategic Network Development Plan)?

The GHD reviewers considered each of the questions above for each project, given the documentation provided by TransGrid. An assessment of the documentation was made and each question was scored on a 1-5 grading scale (1 = Very Poor, 5 = Very good) (refer to Table 5). Commentary was provided as to why the reviewer had awarded the grade and the sort of clarifications that would be required to allow the score to be improved (as appropriate).

**Table 5 – Grading Assessment Scale (Guide)**

Grading	Assessment	Description
1	Very Poor	requirements not included/considered
2	Poor	some requirements analysed and/or poor data
3	Moderate	requirements included but lacking in evidence
4	Good	requirements included and evidence provided
5	Very good	requirements included and supporting evidence robust

## 2.3 Initial Review

The Initial Review consisted of a review of 73 projects (refer to Table 2). On provision of documentation, each project was assessed against the appropriate question set, as dictated by its project type (replacement or other).

TransGrid used the review information provided by GHD to update and improve their project documentation (as appropriate).

## 2.4 Stage 1 Repeat Assessment

To ensure the issues identified in the initial review were well understood, 10 projects identified as requiring further work to adequately articulate the investment justification were selected and a workshop organised to discuss each of these in detail with TransGrid subject matter experts. The workshop allowed efficient testing of approaches to improve the articulation of the investment decision. These 10 projects are listed in Table 6.

**Table 6 – Key Projects for Stage 1 repeat Assessment and Workshop**

Category	Project Need Number	Description	Value
Augmentation	10a	Uprating of 01 Upper Tumut to Canberra and 2 Upper Tumut to Yass lines 85 to 100 degrees c.	\$38.3M
Replacement	276/435	Forbes No. 1&2 Transformer	\$8.28M
Replacement	57	Sydney North 330/132kV Substation Secondary Systems Replacement	\$41M
Replacement	64	Sydney West Control Room Replacement	\$18.5M
Replacement	186	Wallerawang-Orange Transmission Line Refurbishment	\$71M
Replacement	209	Cooma 132kV Substation Rebuild	\$37.5M
Replacement	231	Vales Point Substation Secondary Systems Replacement	\$51.2M
Replacement	43	Supply to Sydney Inner Metropolitan Area and CBD	\$361M
Compliance	594	Low spans Programme Northern Pole Lines	\$40.7M
Augmentation	190	Supply to Beryl	\$31M

Following the workshop TransGrid revised the investment planning documentation for the 10 projects. The revisions included:

- Providing asset condition reports and supporting asset strategy documentation for replacement projects where these had not previously been provided
- Revising the need statements to better articulate the justification for the need and proposed timing
- Expand the OER where appropriate to include a staged risk based option for asset replacement projects
- For market benefit projects, providing an indicative assessment of the range of potential market benefits. It was also decided that a number of these projects would be classified as contingent projects, with the trigger event being the robust demonstration that the delivered market benefit is likely to exceed the project cost.

- Document the prioritisation strategy used to assess which low spans on transmission lines would be treated during the 2014-19 regulatory period.

TransGrid also advised that where appropriate similar revisions would be made to the set of investment planning documents for other projects.

## **2.5 Stage 2 Repeat Assessment**

The Stage 2 repeat assessment reviewed the revised investment planning documents for 35 of the previous sample of 84 projects. The complete project list is provided in the Appendix A and included the following:

- Three projects carried forward from the Stage 1 review
- The project addressing need 42, titled “Capability of Cable 41 Sydney South to Beaconsfield” for which planning documents had not been available as part on the initial review
- 30 projects selected for repeat assessment from those assessed in our initial review. This included 19 addressing asset replacement needs and the remaining 11 addressing other needs

The objective of the stage 2 assessment was to verify whether applying the remedial activities identified through the stage 1 repeat assessment to other projects flagged during the initial review delivered planning documents that adequately articulated the investment justification for those project.

## 3. Results

The review results are summarised in the following sections.

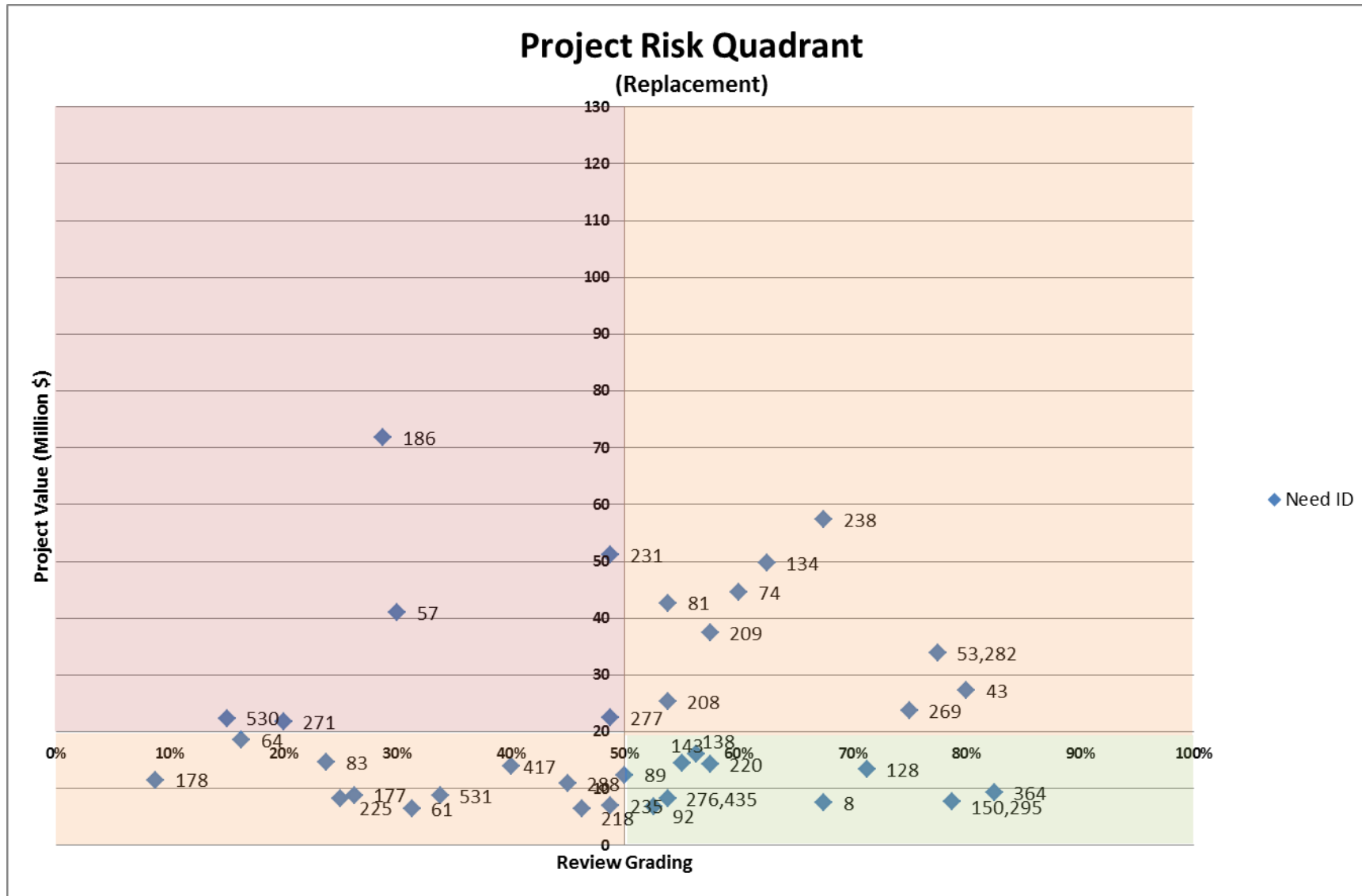
### 3.1 Stage 1 - Initial Review & Repeat Assessment

The project scores assigned during the initial review were aggregated on scatter plots to provide an indication of the value of those projects associated with a particular investment driver and the need to revise the associated investment plans to adequately articulate the investment justification.

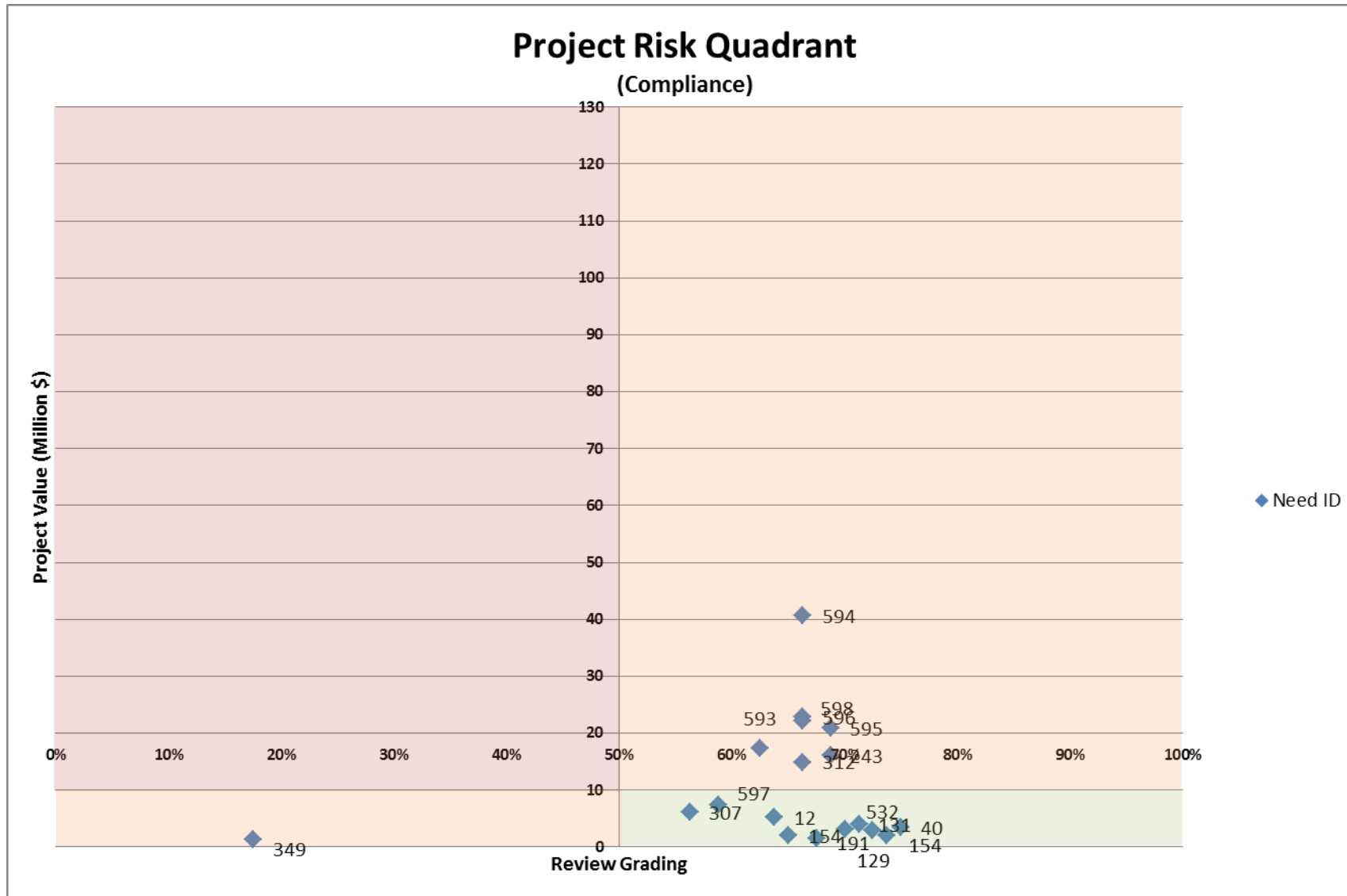
The results for each project were plotted on axes measuring the weighted score across all scoring categories and the proposed level of expenditure. The scatter diagrams shown in figures 1 to 4 provided an overview of the scores across the projects addressing each need category.



**Figure 1 – Summary Results – Replacement Projects**



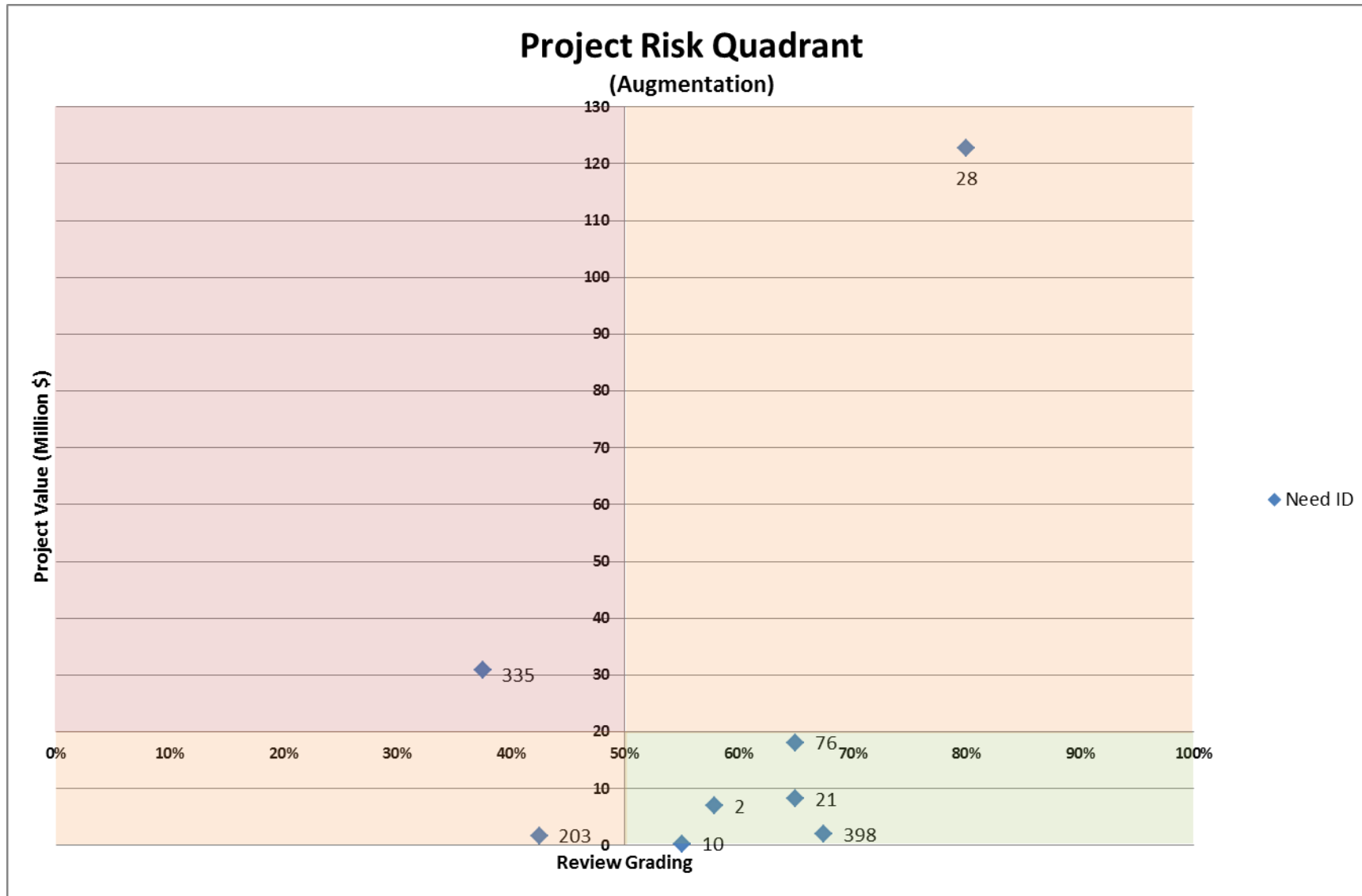
**Figure 2 – Summary Results – Compliance Projects**



**Figure 3 – Summary Results – Connection Projects**



**Figure 4 – Summary Results – Connection Projects**



The scatter diagrams indicated that the asset replacement category had the highest number of projects for which the planning documents required further work to adequately articulate the investment justification. This suggested the need to prioritise additional work in this category. Further analysis identified deficiencies in documentation across all sub categories of replacement projects. Some common issues were identified across a number of projects. The 10 projects selected for discussion at the workshop and the stage 1 repeat assessment were selected to adequately demonstrate those common issues and include representative projects for each replacement sub category. Three projects addressing drivers other than asset replacement were also included in the stage 1 repeat assessment process.

Upon review of TransGrid’s revised documentation for the 10 key projects nominated for the Stage 1 repeat assessment, GHD was satisfied that for the majority of projects TransGrid’s process for identifying regulated capital investment reflects industry practice and is not inconsistent with the intent of the regulated investment guidelines. TransGrid demonstrated that it has produced or can produce the required documentation, but additional work was required in the presentation of this documentation in a structured, orderly and consistent manner to assist independent review of investment plans.

The outcome of the stage 1 review resulted in GHD identifying 35 projects that should be reassessed once TransGrid has revised the investment planning documents.

### 3.2 Stage 2 repeat assessment

TransGrid provided revised investment plans and condition reports for the 35 projects included in the stage 2 repeat assessments. A majority of the 35 projects were in the Asset Replacement category however there were a small number from the other categories. On reviewing this information GHD was satisfied that sufficient evidence existed to significantly improve the project scores.

Figure 5 and Figure 6 show the improvement in scores between the initial stage 1 review and subsequent stage 2 review for the outstanding 35 projects.

**Figure 5 – Comparison of Results – Asset Replacement**

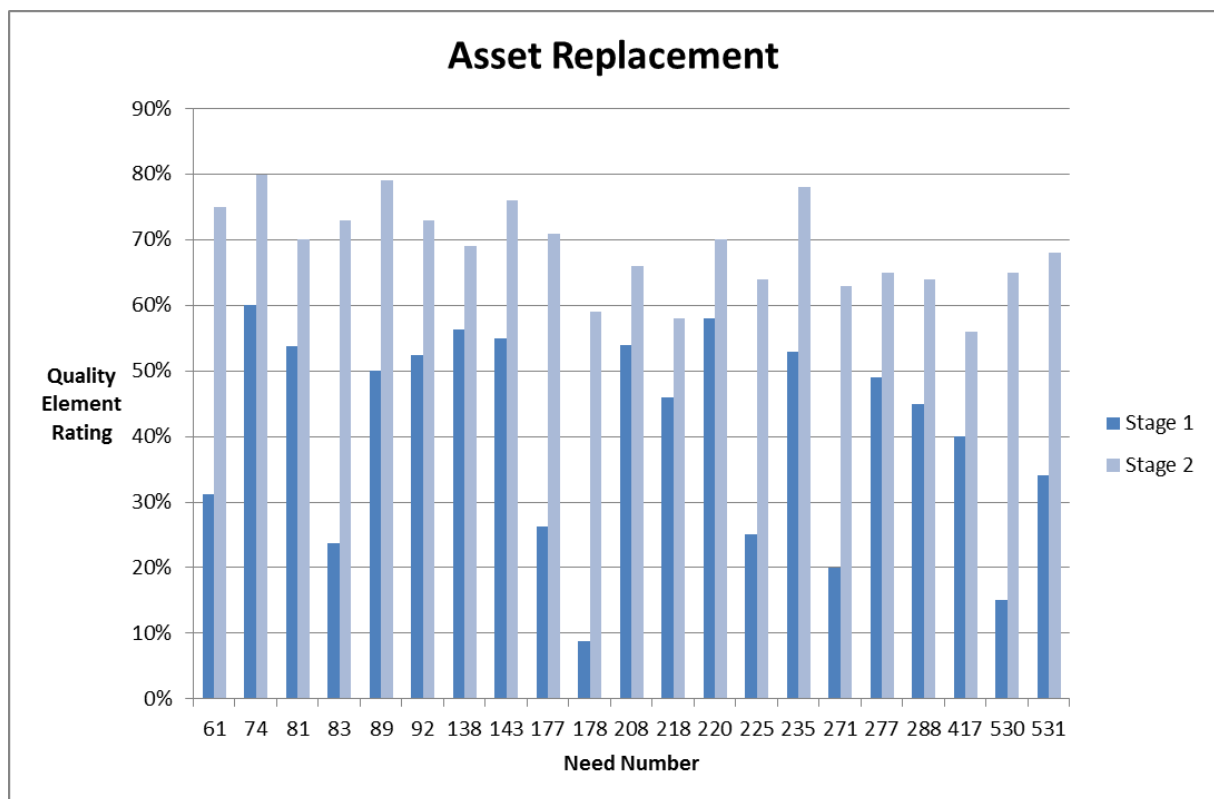
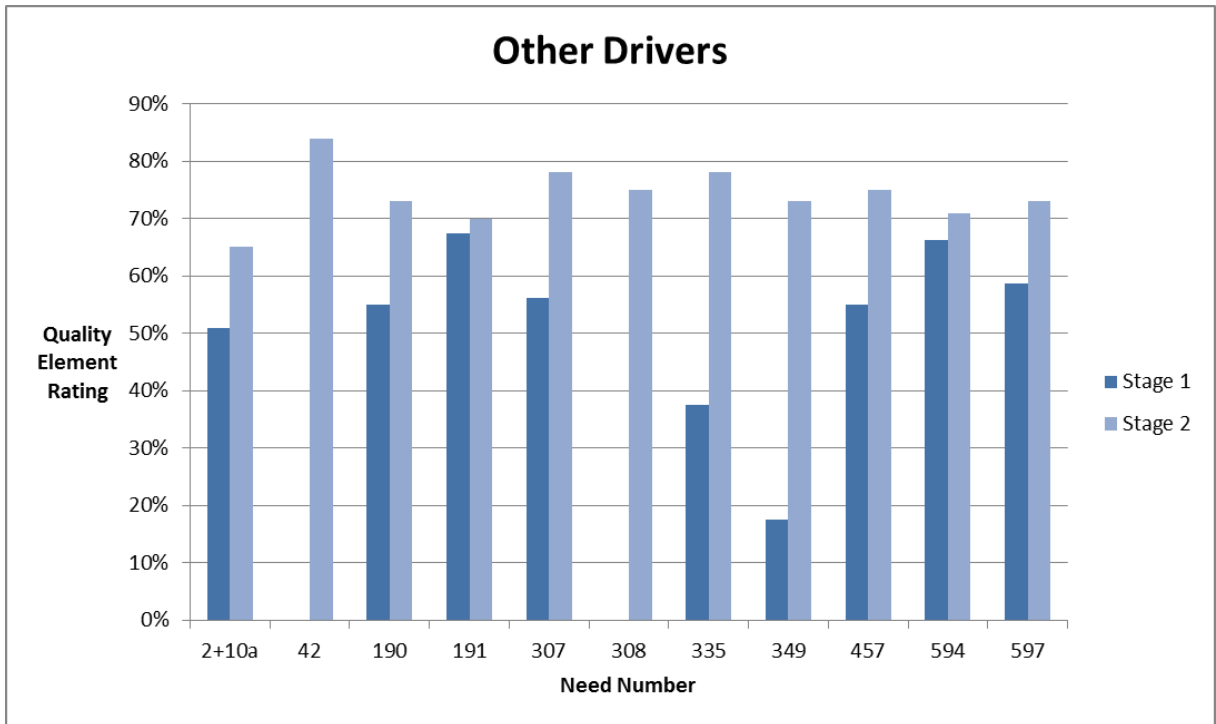


Figure 6 shows the changes that have occurred from the initial to the Stage 2 review process for the projects that can be considered under the category of Other Drivers (not Asset Replacement).

**Figure 6 – Comparison of Results – Other Drivers**



## 4. Conclusion

Based on GHD's review we believe there is sufficient evidence to show that the investments explicitly considered as part of this review reflect good industry practice and are prudent and efficient.

GHD understands TransGrid plans to apply the lessons learned through this review process to its entire suite of network investment justification documents. GHD expects that by diligently addressing the improvement opportunities identified through our three phase review across all projects, TransGrid should be able to demonstrate their proposed expenditure is prudent and efficient.

# Appendices



# Appendix A – Stage 2 Projects for Review

Projects requiring revision to planning documents and re-review by GHD – count = 14<sup>1</sup>

Need Number	AER Expenditure Category	Need Description
2	PS Augmentation	Reinforcement of Southern Supply to the Newcastle – Sydney – Wollongong Area
10	PS Augmentation	Reinforcement of Snowy to Yass/Canberra Capacity
10(a)		Reinforcement of Snowy to Yass/Canberra Capacity
42		Capability of Cable 41 Sydney South to Beaconsfield
42		Capability of Cable 41 Sydney South to Beaconsfield
190		Supply to Beryl
191	PS Security/Compliance	Beryl 132/66kV Substation – Provision of Improved Communication Links
203	PS Security/Compliance	Uprating of the 999 Yass To Cowra 132kV Transmission Line
307	PS Security/Compliance	Multiple Contingency System Protection Scheme
308	PS Security/Compliance	Modification of the Synchronising Angle at Major Generation Sites
335	PS Augmentation	Walleroo 330kV Switching Station
349	PS Security/Compliance	Surge Arresters Instal'n at 330kV Line Entries
457	PS Augmentation	Beryl 132-66kV Substation - 66kV Bay for ESE Gulgong West ZS
594		Remediation of Low Spans on Northern Region Pole Lines
597	PS Security/Compliance	Remediation of Low Spans on Southern Region Tower Lines

<sup>1</sup> The 14 projects listed include project 10 and 10a. Only project 10 was reviewed, and it is to be noted that this Need has now been combined with Need 2 by TransGrid. In addition TransGrid has withdrawn project 203.

Projects requiring provision of condition reports – count = 21

Need Number	AER Expenditure Category	Need Description
61		Haymarket Secondary System Replacement
74	PS Replacement	Newcastle Substation Condition
81	PS Replacement	Tamworth 132/66kV Substation Rebuild
83	PS Replacement	Armidale Secondary System Replacement
89	PS Replacement	Line 21 - 330kV Transmission Line - Sterland (Tuggerah Tee) to Sydney North
92	PS Replacement	TL 959/92Z 132kV – Sydney North to Sydney East
138	PS Replacement	Yanco 132-33kV Substation Condition
143	PS Replacement	Condition of Line 99F (Uranquinty to Yanco)
177	PS Replacement	Albury Secondary System Replacement
178	PS Replacement	Griffith Secondary System Replacement
208	PS Replacement	Orange 66kV & Secondary System Condition
218	PS Replacement	Line 8 - 330kV Transmission Line - Marulan to Dapto
220	PS Replacement	Line 11 Condition
225	PS Replacement	Kangaroo Valley Secondary System Replacement
235	PS Replacement	Line 2M - 330kV Transmission Line - Munmorah to Sterland (Tuggerah Tee)
271	PS Replacement	Liddell Secondary System Replacement
277	PS Replacement	Condition of Line 99J (Yanco to Griffith)
288	PS Replacement	Tamworth 330kV No.2 Transformer Condition
417	PS Replacement	96H 132kV Line - Coffs Harbour to Koolkhan - Wood Pole Replacement
530	PS Replacement	Taree 132kV Substation Secondary Systems Condition
531	PS Replacement	Taree Substation 33kV Switchyard Condition

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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1.0	David Bones	Conor O'Brien		David Bones		30/3/14
2.0	David Bones	Conor O'Brien		David Bones		12/5/14
3.0	David Bones	Conor O'Brien		David Bones		23/5/14



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