GHD

Supply to Panorama

Demand Forecast Independent Verification and Assessment

Transgrid

9 November 2022

→ **The Power of Commitment**

Project name	Demand Forecast Validation						
Document title	Supply to Panorama | Demand Forecast Independent Verification and Assessment						
Project number	12592242						
File name	Demand Forecast Validation						
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
Final	1	Tony Loveday	Bruce Clarke	▉	Bruce Clarke	▉	09/11/22

GHD Pty Ltd 39 008 488 373

180 Lonsdale Street

Melbourne, Vic 3000, Australia

T +61-3-8687-8000 | **F** +61-3-8687- 6522 | **E** maelmail@ghd.com | **ghd.com**

→ **The Power of Commitment**

Glossary

AER	Australian Energy Regulator
OER	Options Evaluation Report
PACR	Project Assessment Conclusions Report
PADR	Project Assessment Draft Report
RIT-T	Regulatory Investment Test for Transmission

Contents

1.   Introduction

Transgrid has received a work request from Essential Energy to investigate to provision of supply to the McPhillamys Gold Mine in the Central Tablelands region of New South Wales. To support the assessment of this project, Transgrid has engaged GHD to perform an independent verification and assessment of the project's demand forecasts, the use of information about the proposed load provided by Essential Energy, and the reasonableness of the timing of load increases.

1.1   Purpose of this report

The purpose of this report is to independently review and verify the basis of the load forecasts provided to Transgrid by Essential Energy associated with supply to the proposed McPhillamys Gold Mine project, including the network augmentation required to meet or manage the expected demand for prescribed transmission services. The ability to supply the forecast load has to be addressed to meet and comply with the NER requirement of Joint Planning and Prescribed transmission services at the lowest overall cost while meeting the NER and System Standards to maintain voltages within acceptable limits.

1.2   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 Transgrid.

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. GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

GHD has prepared this report on the basis of information provided by Transgrid, 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.

1.3   Assumptions

The following assumptions have been made when writing this report:

- There have been no major changes to the intentions of proponents in relation to spot loads or DNSP forecasts since information was provided to Transgrid during development of the Options Evaluation Report (OER-N2546 revision 1.0. Dated 31/10/2022).

2.   Supply to Panorama

GHD has reviewed the process that Essential Energy and Transgrid have used to develop the load forecast for the Panorama area against the principles and process detailed in the Australian Energy Regulator (AER) document "Forecasting Best Practice Guidelines[1]". This document was developed to provide guidance to AEMO's forecasting practices and processes as they relate to their integrated system plan and its updates.

We consider that these best practice guidelines, and in particular Chapter 4: Best Practice Forecasts, would be equally applicable to ensuring that a TNSP has correctly prepared forecasts for the purposes of evaluating the timing and nature of works required to satisfy limitations identified during in the OER and which will then progress into the RIT-T process.

Best Practice Forecasts sets out three principles that should apply across the forecasting process. These are:

1. Forecasts should be as accurate as possible, based on comprehensive information and prepared in an unbiased fashion.
2. The basic inputs, assumptions and methodology that underpin forecasts should be disclosed.
3. Stakeholders should have as much opportunity to engage as is practicable.

To achieve these principles the following factors should be considered:

-   Transparent forecasting methodology
-   Consultation
-   Reasonable inputs and assumptions
-   Transparent drivers of forecasts/effects of inputs
-   Scenario and sensitivity analysis for individual forecasts/Constructing scenarios
-   Use and disclosure of data

GHD has reviewed each of these factors below and documented if and how they have been addressed by TransGrid in the preparation of the first step in the RIT-T process to address the identified need which is detailed in the "Supply to Panorama Area" OER.

2.1   Transparent forecasting methodology

The methodology used for developing and updating the load forecasts for the area supplied have been clearly set out in the OER and in e-mails between Transgrid and Essential Energy which were provided to GHD for this review. The OER details the fact that demand forecasts for McPhillamys Gold Mine provided by Essential Energy are the key driver of the identified need for a solution to supply the mine as the existing underlying distribution network from Panorama would be unable to supply the forecast maximum mine load without constraining off large amounts of demand during system normal conditions.

2.1.1   Underlying load growth

The load growth at transmission Bulk Supply Points has been assessed by Transgrid using load forecasts provided by the DNSP responsible for the area - Essential Energy. The load forecast for McPhillamys Gold Mine has been provided to Transgrid by Essential Energy. GHD has reviewed the process used by Essential Energy to develop the forecast provided for use in the OER. GHD considers that the process has delivered a forecast that is realistic in magnitude and timing.

---

[1] AER - Forecasting best practice guidelines - 25 August 2020.pdf

2.1.2 Specific spot loads

For this OER only one load has been considered, that of the new McPhillamys Gold Mine project who have requested a network connection to operate their mining equipment. Essential Energy has confirmed that there are no other proposed loads in the area and no known network modifications planned in the Panorama area, other than normal maintenance activities. Hence the mine load is the only driver for augmentation explored in the OER.

2.1.3 Review

GHD has reviewed the load forecasts presented in the OER by Transgrid and we consider that the forecasts have been developed in a transparent manner that has used the provided data appropriately.

Essential Energy has passed the loading data provided by the McPhillamys Gold Mine owner to Transgrid. Transgrid questioned Essential Energy about the committed or anticipated status of the more speculative Stage 2 of the project and excluded the load associated with that stage in order to develop a realistic load forecast to allow them to develop and evaluate augmentation options required to supply the expected customer load in the OER.

Essential Energy has held discussions with the mine owner to determine the likelihood of the load forecast from the mine being achieved. Outcomes were that an initial load increase from 0 to 25MVA in the first year of operation (2023/24) will be achieved, followed by a steady increase over 5 years up to a demand of 35MVA in 2029. The mine has also raised the possibility of Stage 2 load increases beyond the 5 year horizon which would bring the total mine load to 50MVA. These additional increases are more uncertain and did not meet the classification of committed or anticipated as defined by the AER (See Appendix A) due to their speculative nature and as such have not been included in the demand forecast used within the OER analysis of augmentation options for the Supply to Panorama.

2.2 Consultation

The RIT-T process is inherently consultation focussed with each step being published publicly and feedback being required from any interested parties in response to the published documents.

As the RIT-T progresses Transgrid has confirmed in the OER they will consult with potential providers of non-network solutions to seek alternatives to the identified preferred network solution which may provide a more economic outcome. However the preferred option to supply the mine load does not have reactive support requirements and network investment will be required to connect the load.

GHD considers that the load forecast provided to Transgrid by Essential Energy has been developed by consulting closely with the McPhillamys Gold Mine to confirm that the anticipated demand is realistic in magnitude and timing.

The OER developed by Transgrid assumes that the reactive support expected to be procured for Stage 1 of the proposed non-network solution for the Supply to Bathurst, Orange and Parkes RIT-T project, planned to be delivered in ▮▮▮▮▮▮, is available. However, the capital expenditure involved with the augmentation required for the supply arrangement to McPhillamys Gold Mine load was not taken into account in the Supply to Bathurst, Orange and Parkes RIT-T project. Therefore, despite the reactive support provided by the Bathurst, Orange and Parkes project, a suitable connection arrangement is required to facilitate the connection of the McPhillamys Gold Mine load and meet the demand increase as per the latest demand forecasts.

2.3 Reasonable inputs and assumptions

The most accurate and relevant data available for inputs might include sensitive customer data and consideration must be given on how to utilise such information while maintaining confidentiality. In this OER Transgrid has used information provided to Essential Energy by the mine proponent intending to connect to the Essential Energy network to develop the load forecasts.

Essential Energy has passed the loading data provided by the McPhillamys Gold Mine owner to Transgrid. Transgrid questioned Essential Energy about the committed or anticipated status of the more speculative and subsequent Stage 2 of the project and has not included the load associated with that stage in order to develop a realistic load forecast to allow them to develop and evaluate augmentation options required to supply the expected

customer load in the OER. Transgrid asked for and received permission from Essential Energy to disclose the load forecast provided by McPhillamys Gold Mine[2].

GHD has reviewed the information provided by Essential Energy to Transgrid and considers that an appropriate assessment has been made against the AER definitions for committed and anticipated projects and that the loads and their timing associated with that project has been considered correctly when formulating the load forecast used in in OER analysis.

Inputs and information should be as up-to-date and comprehensive as practicable, considering publication timeframes and time needed for consultation. Transgrid confirmed all the load forecasts with Essential Energy prior to use in the analysis of the OER. This ensured that the most up to date data that was available at the time was utilised in formulating the report.

2.4 Transparent drivers of forecasts/effects of inputs

The RIT-T process provides a very transparent analysis of the drivers of forecasts, the effects of inputs and how this affects the outcome of the RIT-T analysis. There is no additional assessment of the Transgrid processes required for this factor in load forecasting as they have met the requirements for the RIT-T process when developing the OER.

2.5 Scenario and sensitivity analysis for individual forecasts/Constructing scenarios

GHD considers that the load forecasting and analysis used in the OER has been realistic and has provided recommended results which will not change under expected ranges of variation of the input variables. A range of network solutions has been considered and those that have not been progressed further have been detailed along with the reasons why they were not considered suitable. Analysis of the optimal timing of the solution has been performed with this showing that the solution will need to be commissioned within the 2023-2028 regulatory control period.

2.6 Use and disclosure of data

The Forecasting Best Practice Guidelines state that the most accurate and relevant data should be used when preparing forecasts, including, where appropriate, confidential data. It also states that, subject to confidentiality, all key data used in the development of forecasts should be published.

GHD considers that Transgrid meets this requirement by making use of the most recent updated forecasting input data when developing load forecasts of the OER analysis. It also makes appropriate use of any data by analysing the probability of the associated project proceeding and then using that data in relevant forecasting scenarios.

2.7 Conclusions

GHD is satisfied that Transgrid, and Essential Energy, have utilised the available proposed mine loading data appropriately to develop a realistic load forecast for use in the OER for the Panorama region of NSW. Transgrid have been open with the provision of data for this analysis as well as providing details of the process that was used to develop a realistic assessment of the load forecast. Essential Energy has passed the loading data provided by the McPhillamys Gold Mine owner to Transgrid. Transgrid questioned the committed or anticipated status of the more speculative Stage 2 of the project and excluded the load associated with that stage in order to develop a realistic load forecast to allow them to develop and evaluate augmentation options in the OER that are required to supply the expected customer load.

GHD considers that all the network augmentation options explored in the OER are able to deliver the reliability and quality of supply required by network customers under normal and contingency conditions and that the capital cost of each option is realistic. We consider that the most cost effective network option has been identified in the OER

---

[2] Permission to release demand forecast data requested by Transgrid by e-mail to Essential Energy on 4th September 2022. Permission to release the relevant information received by e-mail by Transgrid from Essential Energy Major Network Connections Manager on 6th September 2022.

following the evaluation of network options, including their sensitivity under different scenarios. Opportunities for non-network solutions are limited in that they could only assist with providing reactive support for the non-preferred option to connect the mine load at 66kV. Other options do not have reactive support requirements and network investment is required to connect the load.

Appendix A – Committed or Anticipated Project

The AER definition of a **committed project** provided in the Glossary of the AER – Regulatory Investment Test for Transmission[3] is a project that meets the following criteria:

- the proponent has obtained all required planning consents, construction approvals and licenses, including completion and acceptance of any necessary environmental impact statement;

- construction has either commenced or a firm commencement date has been set;

- the proponent has purchased/settled/acquired land (or commenced legal proceedings to acquire land) for the purposes of construction;

- contracts for supply and construction of the major components of the necessary plant and equipment (such as generators, turbines, boilers, transmission towers, conductors, terminal station equipment) have been finalised and executed, including any provisions for cancellation payments; and

- the necessary financing arrangements, including any debt plans, have been finalised and contracts executed.

Alternatively, an **anticipated project** is defined by the AER as:

- a project which does not meet all of the criteria of a *committed project* and is in the process of meeting at least three of the criteria for a *committed project*.

---

[3] AER - Regulatory investment test for transmission - 25 August 2020.pdf