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***Tonga Power  
Limited***

**Testing of the Fuel  
Component  
Adjustment Model  
for Electricity  
Tariffs**

*14 February 2014*



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Mr Steven 'Esau  
Chief Financial Officer  
Tonga Power Limited  
P O Box 429  
TONGA

14 February 2014

Dear Steven,

In accordance with our engagement letter dated 30 January 2014, we have performed the procedures agreed with you in relation to the financial model (the Model) developed by Tonga Power Limited to calculate the fuel component of the electricity tariffs. The purpose of the procedures, as set out on page 6 of this report, is to provide you with some comfort as to the mathematical reliability of the Model, which you propose to rely on to comply with your regulatory requirements as contracted.

Our engagement letter sets out the tasks to be undertaken in relation to the Model and this letter summarises the results of the procedures you requested us to undertake. Our engagement letter also outlines the restrictions associated with the scope of work you have identified.

If you require any clarification or further information, please do not hesitate to contact us.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'Wayne Munn', with a long horizontal flourish extending to the right.

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# ***Table of contents***

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Executive summary	5
1. Summary of work performed	6
2. Model specification and structure	7
3. Mechanical testing	8
4. Logic and structure testing	10
5. Robustness testing	11
6. Recommendations	12
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Appendix A. - Restrictions	14
Appendix B. - Agreed procedures	16
Appendix C. - Mechanical issues identified	17

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# *Executive summary*

## *Background*

We have prepared this report in accordance with the terms of our engagement letter dated 30 January 2014 and the restrictions set out in **Appendix A**.

The purpose of the testing is to provide you with some comfort as to the reliability of the fuel component adjustment model (the Model), which Tonga Power Limited (TPL, the Company) proposes to rely on to comply with its regulatory requirements as contracted.

## *Summary of findings and recommendations*

### *Mechanical, model logic and structure*

- **Separation of inputs / calculations / outputs** - there are a number of formulas with embedded hard-coded inputs in the Model.
- **Inconsistent formula** – the Model contains a number of inconsistent formulas which are different from those around them.
- **Model controls** – we recommend stating the purpose of the Model on the ‘Index’ worksheet, and correcting the items on ‘Index’ to correspond and link to the Model worksheets.
- **Model checks** – we recommend amending the Model to include ‘dashboard’ checks.

Please refer to Appendix C for details.

### *Formula compliance to the Electricity Concession Contract*

It appears that a number of formulas used in the Model do not comply with the formulas prescribed in the Electricity Concession Contract (the ECC). Namely, these are the formulas used to calculate the forecast electricity demand (kWh billed), forecast fuel prices and over/under recovery balances.

It could be the case that these variations have been agreed between TPL and the Tongan Government for commercial reasons. However, for the purpose of our testing, we have only compared the formulas with the ECC.

We understand that TPL is expecting to enter into negotiations with the Tongan Government later this year to review the terms in the ECC. We recommend you discuss and agree with the Tongan Government the formulas the Model currently uses if these calculations make better commercial sense or reflect other subsequent agreements with the Tongan Government.

In addition, we note that the ECC does not formally contemplate a mix of generation technologies. We recommend that any negotiation of the terms of the ECC explicitly considers multiple generation technologies.

## *Conclusion*

Apart from the issues noted and based solely on those procedures set out in this letter, we confirm that nothing further has come to our attention to suggest that the calculations in the Model are not in all material respects internally consistent and mathematically reliable.

Please refer to the body of the report and the appendices for supporting detail.

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# ***1. Summary of work performed***

## ***Background***

In accordance with our letter of engagement dated 30 January 2014, we have completed our testing of the fuel component adjustment model (the Model) for the Tonga electricity tariffs. The broad procedures that you have requested us to carry out are:

- test the logic of the Model to identify any errors therein,
- test (on a sample basis) the mechanical accuracy of the Model and attempt to identify any errors therein,
- consider the consistency of the outputs for a given set of inputs,
- consider the consistency of the input data and calculations used in the Model with the ECC, and
- consider the implications of the blend between solar and diesel fuel on the model.

The purpose of the testing is to provide you with some comfort as to the reliability of the Model. We have provided no opinion as to the reasonableness of any of the input assumptions. Our report is qualified to this extent.

We have conducted this assignment in accordance with Statement of Agreed Upon Procedures Engagement Standards Number 1, issued by the New Zealand Institute of Chartered Accountants. TPL was solely responsible for the scope of the work carried out and we have carried out only those tests set out in the Appendix to our engagement letter (set out as **Appendix B** to this report).

We reiterate that, in relation to the Model testing, we have carried out only the tests prescribed by TPL and our conclusions are based solely on these tests. Further, we note that it is not practicable to test a computer model to an extent whereby it can be guaranteed that all errors have been detected and accordingly we will give no such guarantee.

The Model testing procedures were carried out with the objective of supporting an overriding conclusion that, based solely on the work carried out, no matters have come to our attention to suggest that the Model is not reliable for its intended purpose.

## ***Sources of information***

In preparing this report we have used the following principal sources of information:

- the Excel Model entitled “Castalia Fuel Tariff Review Effective 1 Feb 2014.xls”, provided on 20 January 2014,
- the Electricity Concession Contract (ECC), provided on 20 January 2014, and
- discussions with Jon Nichols regarding operation of the Model.

All figures in this report are denominated in Tongan Pa’anga (TOP) unless stated otherwise.

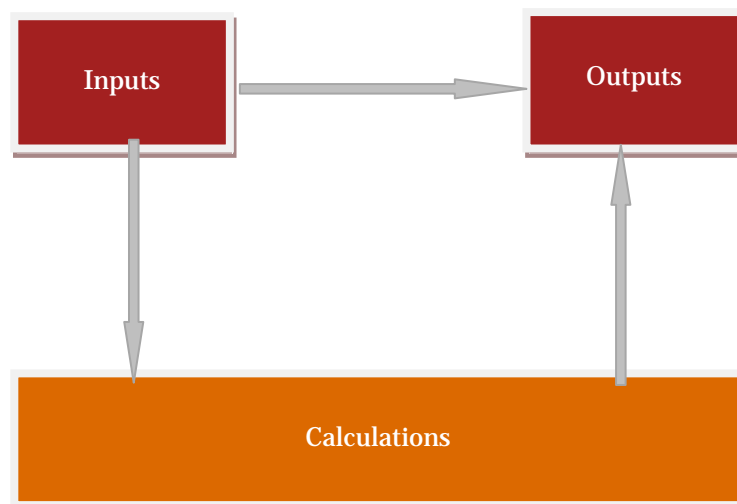
## ***2. Model specification and structure***

Later this year, TPL is expecting to enter negotiations with the Tongan Government to review the terms of the ECC. In preparation for this, TPL is seeking some comfort on the mathematical Model it uses to calculate the fuel component of the Tonga electricity tariffs.

The major inputs of the Model are historical fuel prices and kilowatt hours (kWh) billed (demand), annual discount rate (post-tax nominal WACC), annual growth in electricity demand, target system losses, target fuel efficiency rate targets and bad debts. The primary output of the Model is the net fuel component adjustment.

The Model is intended to adopt the formulas set out in the ECC to calculate the fuel component adjustments.

The Model is approximately 705 kilobytes in size and comprises 15 worksheets. A high level schematic of the Model indicating the interrelationships between sheets is shown below:



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## 3. *Mechanical testing*

### *Summary of work performed*

The tasks performed in carrying out our testing of the Model are set out in Appendix B. In addition, we are required to check whether the input data and calculations used in the Model are consistent with the ECC.

Our findings under the “Mechanical aspects” and “Formula compliance to the ECC” subheadings below refer to the tasks we performed on the Model. The details of those issues summarised below are set out in Appendix C.

### *Mechanical aspects*

We have tested (on a sample basis) of each worksheet in the Model and comment on a number of specific items below.

#### *Hard coding inputs and formulas*

We have observed a number of calculation cells that include hard-coded numbers embedded in formulas. While in most instances these do not produce direct errors, they do reduce the robustness of the Model. One frequent example is where a margin has been frequently hard-coded into formula in the fuel prices data (Appendix C: #5 and #6). In addition, we have observed a number of output cells that are hard-coded, e.g. previous fuel component increases, even though they do not have any dependents and do not impact the ultimate Outputs.

#### *Inconsistent formulas*

The Model contains a number of inconsistent formulas (either different from above/previous or contains hard-coded inputs). Some of the inconsistent formulas do not necessarily have an impact on the Outputs, for example, the total increase in fuel and non-fuel components on Summary worksheet. There are, however, two places where the inconsistent formulas contain hard-codes that are of concern, as they will impact the forecast fuel prices and therefore the fuel component adjustment. These are fuel prices of Vava'u on the 'Data|Fuel Prices' worksheet and fuel prices of Ha'apai on the 'Calc|Historic and Forecast' worksheet.

#### *Macros*

The model does not contain any macros.

#### *Circular references*

We did not observe any circular references or iterative calculations in the Model.

#### *External links*

We did not observe any external links in the Model.

#### *Range names*

Range names are used and appear to function as intended.

#### *Over-complicated formulas*

We did not observe any formulas that we considered over-complicated.

#### *Hidden Cells*

The Model contains one cell that is “hidden” although it does not contain meaningful data or calculation. For best practice, we recommend removing such a cell.



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## Formula compliance to the ECC

In addition to testing the various mechanical aspects of the Model, we have also tested the logical construction of the model, in particular, whether the calculations used in the Model appear consistent with the ECC, formulas and constants provided by management.

Generally, we found that the logic of the calculations appeared reasonable. However, we identified the following observations below in relation to the consistency of the formulas in the Model, with the descriptions contained in Part D, Schedule 5 of the ECC:

- On the 'Calc| Historic and Forecast' worksheet, a formula to forecast the demand for each month is using the 6-months moving average times the monthly growth in electricity demand. By contrast the forecast demand for the months in the next tariff period should be calculated using the demand from 12 months earlier, times the annual growth rate, as specified in paragraph 15 (b).
- On the 'Calc| Historic and Forecast' worksheet, the Model simply uses the previous month's fuel price as a forecast if the actual data is not available. Paragraph 15 (d) of the ECC prescribes that a 'reasonable forecast of fuel prices' should be used for electricity generation, and where better forecasts are not easily available, the fuel price should be calculated as the current fuel price indexed to inflation.
- Paragraph 17 has specified the following formula to calculate the balance of over/under recovered fuel costs in month  $m$  of the current tariff period:  
$$balance_m = (balance_{m-1} + fuel\ component_m \times kWh\ collected_m - Permitted\ fuel\ cost_m) \times (1 + ROR)$$
On the 'Calc| Tongatapu' worksheet, the "Over Recovery" (i.e.  $(fuel\ component_m \times kWh\ collected_m - Permitted\ fuel\ cost_m)$ ) was left outside the brackets. This appears to be a contradiction between the Model and the ECC. The same was repeated on the calculation worksheets for Vava'u, Ha'apai and Eua.
- As stated above, the ECC formula for recovery balances does not specify the government payments/fuel hedging/solar savings, however we observed that these have been added in the calculation of recovery balance for Tongatapu, Vava'u, Ha'apai and Eua.

In addition, Schedule 18 of the ECC defines the tariff period as each successive three-calendar month period commencing 1 October 2008. As such we would typically expect each of the tariff adjustments to happen on the commencing month of the tariff periods. However, we have observed from the Model that the tariffs have not been adjusted at even time intervals and some of the adjustments are made during the tariff periods.

It could be the case that the above variations between the Model and the ECC are agreed between TPL and Tongan Government elsewhere for commercial reasons. However, for our model testing procedures we have solely relied on the ECC as it was provided to us.

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## 4. Logic and structure testing

### *Modelling best practice*

To test the broader logic and structure of the Model we have compared it to good practice modelling principles. Some high level good practice principles are described below.

#### *Separation of inputs / calculations / outputs*

One of the most fundamental principles of good modelling practice is to separate out all input assumptions from calculations and from outputs. This is key to ensuring reliability and robust modelling.

#### *One source and version of the truth*

Strongly linked to the concept of separation is the principle that all input assumptions should exist only once in one place in the Model. Distributed assumptions, or multiple sources of the same assumption, result in high risk of obsolete or out of date assumptions reducing the reliability and robustness of the Model.

#### *Simplicity*

Finally, financial models should be as simple as possible. This applies to layout, formulas and overall construction. A good financial model will be transparent, easy to understand and be free of redundant components. It is important to consider the needs and modelling competency level of the ultimate model user.

### *Observations*

In terms of good practice, we have observed the following in the Model:

- In general, there is separation between input assumptions, calculations and outputs.
- There is an 'Index' worksheet containing a description of the Model workings.
- There is a clear summary of model outputs.
- Most input assumptions exist once and are located close to each other in the Model.
- In most instances, formulas have been applied consistently.

#### *Areas that could be improved*

We are of the opinion that there are a number of elements of the Model that should be improved including:

- There are several places where there could be a greater level of separation. We recommend separating calculations from summary outputs and in particular, calculations from input assumptions.
- We reiterate that multiple sources of an input assumption in a model is highly undesirable. Common examples are the embedding of input assumptions within calculation formulas.
- The items on the 'Index' worksheet do not correspond to the successive worksheets.
- The 'Index' worksheet should state the purpose of the Model.
- The 'Summary' worksheet should include model checks.
- There are redundant sections and calculations to the Model that could be removed.

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## 5. *Robustness testing*

Robustness testing is the process whereby key model inputs are altered and the resulting changes to the model's outputs are checked for reasonableness. This process provides negative assurance that the Model is not performing in such a way that might indicate that the Model is incorrectly specified or coded. It should be noted that this process does not involve checking that the alternative outputs of the Model are correct, rather that the outputs of the Model appear sensible to a person familiar with the Model.

This form of model testing will often also include a process commonly called "stress testing". Stress testing involves changing input assumptions to extreme or unlikely values and testing the outputs of the Model. Outputs of stress testing are generally not intended to be realistic but often provide a valuable insight into the reliability of the Model outputs that change with more realistic variations in model assumptions.

### *Methodology*

We have performed a number of robustness tests by altering the following key assumptions:

- Forecast fuel prices,
- Annual growth in electricity demand (kWh billed), and
- Annual discount rate (post-tax nominal WACC).

For each test we examined the movement in the Model's summary outputs. The specific key outputs that we considered for each test are:

- Tariff increase for new fuel prices and demand (Fuel Adjustment 1 in the ECC),
- Tariff increase to return balance (Fuel Adjustment 2 in the ECC), and
- Net fuel component adjustment.

### *Results*

Generally the Model appeared to function as would be deemed reasonable by someone familiar with the Model. We have summarised our findings below:

#### *Forecast fuel prices*

By flexing the forecast fuel prices, the Model produces logical predictions consistent with what we would expect. Namely, a higher forecast fuel price generates a higher Fuel Adjustment 1, a higher Fuel Adjustment 2 and a higher net fuel component adjustment.

#### *Annual growth in electricity demand (kWh billed)*

Changing the annual growth in electricity demand produces logical predictions consistent with what we would expect. An increase to the growth rate results in a higher Fuel Adjustment 2, a higher net fuel component adjustment, with an unchanged Fuel Adjustment 1.

#### *Annual discount rate (post-tax nominal WACC)*

Changes to annual discount rate assumptions appear to produce logical predictions consistent with what we would expect. An increase in the annual discount rate results in an unchanged Fuel Adjustment 1, a lower Fuel Adjustment 2 and a lower net fuel component adjustment.

# 6. Recommendations

## *Summary of material findings and recommendations*

### *Mechanical, model logic and structure*

- **Separation of inputs / calculations / outputs** - there are a number of formulas with embedded hard-coded inputs in the Model. We recommend separating calculations from summary outputs and in particular, calculations from input assumptions.
- **Inconsistent formulas** – the Model contains a number of inconsistent formulas which are different from adjacent formulas. This is also strongly linked to the concept of separation as some of the formulas contain hard-coded inputs. For model robustness purposes, we recommend listing all of the hard-code assumptions separately and using consistent formula for calculations.
- **Hidden cells** - the Model contains one cell that is 'hidden', although it does not contain any meaningful calculations or outputs. For good practice, we would recommend removing such a cell. If, for presentation purposes, it is desirable not to show all calculation cells, consideration should be had to using the "Group Data" function, or alternatively having more separation between the presentation outputs and the calculations.
- **Model controls** – we recommend stating the purpose of the Model on the 'Index' worksheet, and allowing the items on 'Index' to correspond and link to the successive worksheets.
- **Model checks** – we recommend amending the Model to include 'dashboard' checks.

### *Formula compliance to the ECC*

As stated in section 3, it appears that a number of formulas used in the Model do not comply with the formulas prescribed in the ECC. Namely, these are formulas used to calculate the forecast electricity demand (kWh billed), forecast fuel prices and over/under recovery balances.

As mentioned, it could be the case these variations are agreed between TPL and the Tongan Government for commercial or regulatory reasons. However, for the purpose of our testing, we would recommend you to revise the formula in accordance with the ECC.

We understand that TPL is expecting to enter into negotiations with the Tongan Government later this year to review the terms in the ECC. We recommend you discuss and agree with the Tongan Government the formulas the Model currently uses if these calculations make better commercial sense.

## *Multiple generation technologies*

We note that the ECC does not formally contemplate a mix of generation technologies; it has an exclusive focus on diesel generation. The Model in its current form uses an ad-hoc adjustment to pricing to reflect the relatively recent introduction of solar generation to the network.

We understand there are other energy projects being contemplated for addition to the Tongan network including biomass and wind. This will necessitate a more sophisticated pricing mechanism that allows for a portfolio of electricity supply technologies in Tonga. At a minimum, we recommend that any new contract allows for the current mix of diesel and solar generation plants.

Some factors that you may wish to consider in designing the new price setting formulas include:

- The volume of diesel used in the future will be more variable than at present. The volume of diesel generation required will be determined by electricity demand, line losses, plant efficiency and now a

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variable offset from renewable energy production. To allow for this, the new contract may need to include formulas that include electricity demand being supplied by multiple sources. This could be assisted by including new formula components such as forecast renewable generation (annual average, moving period average or seasonal average for example).

- For the non-fuel component of the electricity tariff calculation, how much will reflect the required asset return and operating expenditures of the new generation plant? This will be potentially a complex issue if the plant assets are vested to TPL, for example from an aid agency. In that particular case, it may be appropriate to incorporate operating costs and TPL's asset commissioning costs into the electricity tariff calculation, but it may not be appropriate to incorporate return on capital or depreciation recovery.

## *Conclusion*

Apart from the issues noted and based solely on those procedures set out in this letter, we confirm that nothing further has come to our attention to suggest that the calculations in the Model are not in all material respects internally consistent and mathematically reliable.

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# ***Appendix A. - Restrictions***

Our work has been dependent on your explanation of the Model to us and how it is intended to be used. We have not been responsible for modifying the Model in response to any issues or errors we have identified. We have reported all errors or issues we have identified, regardless of the possible materiality of their impact.

It is not practical to test a computer application to an extent whereby it can be guaranteed that all errors have been detected and accordingly we give no such guarantee. The comfort we provide on the Model is subject to the specific tests we have performed and the matters we have identified.

Our conclusions relate to the structure and substance of the Model. If any changes are made to the structure or substance of the Model our findings and conclusions will no longer apply.

This report has been prepared solely for the use of the Company and for the purposes set out above. It may not be copied or distributed to third parties without our prior written consent. We will not accept responsibility to any party unless specifically stated to the contrary by us in writing. We will accept no responsibility for any reliance that may be placed on our report should it be used for any purpose other than that for which it was prepared.

Our report has been prepared with care and diligence and the statements and opinions in the report are given in good faith and in the belief on reasonable grounds that such statements and opinions are not false or misleading. No responsibility arising in any way for errors or omissions (including responsibility to any person for negligence) is assumed by us or any of our partners or employees for the preparation of the report to the extent that such errors or omissions result from our reasonable reliance on information provided by others or assumptions disclosed in the report or assumptions reasonably taken as implicit.

We reserve the right, but are under no obligation, to revise or amend our report if any additional information which exists on the date of our report, but was not drawn to our attention during its preparation, subsequently comes to light.

The responsibility for determining the adequacy or otherwise of the Procedures is that of the Company. As the Procedures detailed in this letter do not constitute either an audit performed in accordance with New Zealand Auditing Standards, or a testing performed in accordance with New Zealand's Professional Engagement Standards and Guidance applicable to testing engagements, we do not express any assurance on the Model. The Procedures have been performed solely to assist the Company to have some confidence in the mechanical accuracy of the Model.

Had we performed additional Procedures or had we performed an audit in accordance with New Zealand Auditing Standards, or a testing performed in accordance with New Zealand's Professional Engagement Standards and Guidance applicable to testing engagements, other matters might have come to our attention that would have been reported to you.

## ***Specific limitations to the scope of work***

The Procedures under this engagement excluded the following:

- Any assurance that the Model reflects the anticipated commercial conditions.
- Any testing of or opinion on the reasonableness of the operational or financial assumptions used in the Model or supporting documentation.
- Any consideration of how closely the results actually achieved might compare with the Model's projections.

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- Any testing of the projections produced by the Model. Accordingly we make no comment in any form on the outputs produced by the Model, other than to confirm that the outputs generated by the Model appear to be consistent with the input assumptions considered.

# Appendix B. - Agreed procedures

TPL Model Testing - Statement of Agreed Upon Procedures	Model ref: Done by WP ref.														
<p><b>Model specification and structure</b></p> <p>Review /discuss model specification documentation and development of the Model Develop high level understanding of the nature of key operations, key risks and value drivers</p>	<table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>														
<p><b>Detailed testing of worksheets</b></p> <p>Identify all inputs, including any hard coded inputs Assess key calculation logic and consider reasonableness Formulae checks:</p>	<table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>														
<ul style="list-style-type: none"> <li>formulae appear in correct cells (eg years, line items)</li> <li>formulae copied across columns correctly (especially absolute vs relative cell references)</li> <li>formulae contain no inputs</li> <li>range names correct</li> <li>identify any circular references</li> <li>consider consistency of repeated worksheets</li> <li>run Spreadsheet Detective and summarise findings</li> </ul>	<table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>														
<p><b>Reasonableness of output</b></p> <p>Test reasonableness on a sample basis of <b>(change in)</b> outputs for a sample of alternative inputs (covering minimum of 5 different inputs) into cells such as:</p> <ul style="list-style-type: none"> <li>Zero</li> <li>increasing and decreasing</li> <li>large numbers</li> <li>small or valid negative numbers</li> </ul> <p>Insert or review balance checks</p> <p>High level consideration of the prima facie reasonableness of the Model's outputs given the input assumptions</p>	<table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>														
<p><b>Code check</b></p> <p>Check cells have correct:</p> <ul style="list-style-type: none"> <li>Format</li> <li>units (\$NZ vs \$US, \$ vs \$'000 vs \$M, nominal vs real etc)</li> </ul>	<table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>														
<p><b>Assumptions</b></p> <p>Identify where equivalent input assumptions are repeated and check on a test basis that they contain the same values</p>	<table border="1"> <tr><td></td><td></td></tr> </table>														
<p><b>Macros</b></p> <p>Re-perform operation of macros for one set of assumptions</p>	<table border="1"> <tr><td></td><td></td></tr> </table>														



# Appendix C. - Mechanical issues identified

## Model Testing

### Key

- Value Impact
- Potential Value Impact
- No Value Impact

Impact	No.	Worksheet	Cell Reference	Observation	Recommendation / Comment
<span style="color: green;">●</span>	1	Named Ranges	All	No irregularities found	
<span style="color: orange;">●</span>	1	Index	B5, B6, B12	Not correspond to the model worksheets	Revise the names and link
<span style="color: green;">●</span>	2	Summary	F5	Hardcode input in formula	Separate hardcode into input cell
<span style="color: green;">●</span>	3	Summary	L6	Inconsistent formula (different from above)	No impact
<span style="color: green;">●</span>	4	New Tariff	J15:J100	Inconsistent formula (some hardcodes), cell J48 is a "hidden cell" however no information contained	Assume inputs are correct; no impact
<span style="color: orange;">●</span>	5	Data\Fuel Prices	Column D	Inconsistent formula, hardcode inputs	These are input cells, however D4:D70 results are not complied with the explained calculations, i.e. Tongatapu rate + \$0.02 per litre. They have potential impact on the results
<span style="color: green;">●</span>	6	Data\Fuel Prices	E4: F4	Hardcode inputs in formula, inconsistent formula	Separate hardcode into input cell
<span style="color: green;">●</span>	7	Data\Fuel Prices	C137	Hardcode inputs in formula	Separate hardcode into input cell
<span style="color: green;">●</span>	8	Calc\Historic and Forecast	Column E	Hardcode outputs	No dependents, however could use formula - refer to Column J on "New Tariff"
<span style="color: orange;">●</span>	9	Calc\Historic and Forecast	H14:K14	Inconsistent formula	No impact if actual data is available, however formula should be revised in accordance to the Contract to reflect the forecast demand
<span style="color: red;">●</span>	10	Calc\Historic and Forecast	H101:K101	Forecast demand (kWh billed) uses moving average instead of previous year price and annual growth)	Forecast demand using last year's kWh billed and annual growth as per specified in the Contract; Try =IF('Data\Billings'!E19<>"", 'Data\Billings'!E19, H8*(1+\$F20)) from H20:K20 onwards
<span style="color: orange;">●</span>	11	Calc\Historic and Forecast	N8:N36	Irregular formula and hardcode inputs	Potential impact on outputs
<span style="color: red;">●</span>	12	Calc\Historic and Forecast	L101:O101	Fuel prices are not forecasted	Forecast fuel price calculated as the current fuel price indexed to inflation, unless a reasonable forecast is agreed
<span style="color: green;">●</span>	13	Calc\Historic and Forecast	P66:S77	Hardcode inputs in formula	Separate hardcode into input cell, (50% actual+ 50% island efficiency target)
<span style="color: green;">●</span>	14	Calc\Tongatapu	N7	Hardcode inputs in formula	The Contract does not specify the calculation of opening balance of recovery, separate hardcode from formula
<span style="color: red;">●</span>	15	Calc\Tongatapu	N8: N119	Balance - formulae not complied with Contract	Will impact fuel adjustment (2) hence output, revise formula
<span style="color: red;">●</span>	16	Calc\Tongatapu	Column M, N	Government payments were added in balance calculation	The Contract does not specify the government payment in the balance calculation
<span style="color: green;">●</span>	17	Calc\Vava'u	N7	Hardcode inputs in formula	The Contract does not specify the calculation of opening balance of recovery, separate hardcode from formula
<span style="color: red;">●</span>	18	Calc\Vava'u	N8: N119	Balance - formulae not complied with Contract	Will impact fuel adjustment (2) hence output, revise formula
<span style="color: red;">●</span>	19	Calc\Vava'u	M99, Column N	Government payments were added in balance calculation	The Contract does not specify the government payment in the balance calculation
<span style="color: green;">●</span>	20	Calc\Ha'apai	N7	Hardcode inputs in formula	The Contract does not specify the calculation of opening balance of recovery, separate hardcode from formula

●	21	Calc Ha'apai	N8: N119	Balance - formulae not complied with Contract	Will impact fuel adjustment (2) hence output, revise formula
●	22	Calc Ha'apai	Column M, N	Government payments were added in balance calculation	The Contract does not specify the government payment in the balance calculation
●	23	Calc Eua	N7	Hardcode inputs in formula	The Contract does not specify the calculation of opening balance of recovery, separate hardcode from formula
●	24	Calc Eua	N8: N119	Balance - formulae not complied with Contract	Will impact fuel adjustment (2) hence output, revise formula
●	25	Calc Eua	Column M, N	Government payments were added in balance calculation	The Contract does not specify the government payment in the balance calculation
●	26	Tariff adjustments intervals	General	Tariff has not being adjusted at even time intervals	The Contract specifies the tariff period being 3 months
●	27	Macros	General	No macros contained in the model	
●	28	Robustness test	General	Change in assumptions generate the result we generally expect	
●	29	General comment	General	Many formulae contain hardcode inputs, uneven time intervals for fuel component adjustments, formulas applied on balances, forecast demand/fuel price inconsistent with the ECC	Try to amend model to allow "dashboard" controls and model checks