

FOR BOARD APPROVAL

April 2015 Board Meeting

Revised Smart and Prepay Metering Deployment Plan

Purpose of Paper	To seek approval from Directors of the revised smart and prepay metering deployment plan.
Budget	TOP 4.1m (TOP 3.0m from TPL and TOP 1.1m to come from MFAT funding)
Regulatory Environment	Impacts on the 2015 Regulatory Reset
External Reviews	John McCutcheon has prepared the revised deployment plan with TPL CEO and management input and in accordance with the finalized agreements with the suppliers.
Legal	The final agreements signed by the suppliers are with TPL awaiting board decision.
Financial	The post tax return without debt funding is projected at 11.5% and with 100% debt financing the return is projected to be 20%
Recommendation	<p>THAT the Board:</p> <p>Approves an initial capital budget of TOP4.1m (TOP3.0m to come from TPL and TOP1.2m to come from MFAT) inclusive of 10% contingency on items that are not fixed priced within the Itron and Agility agreements. For deployment of 3,000 prepayment smart meters and provision of smart meters to measure network sections and segments and an ongoing annual operations budget of TOP1m.</p> <p>Approves the balance of funds originally set aside for this project (approx. TOP4m) to go towards implementation of an enterprise resource planning (ERP) system, preparation of TPL systems for integration and distribution spend subject to business case submission and approval by the board.</p> <p>Note that the project is not without risk and that risk is primarily around the successful Itron integration with Agility CIS's Advanced Meter module and the existing Orion CIS currently used by Tonga Power meter data management system however appreciating that these risks are manageable given the pedigree of the vendors and the contingency provision.</p>

Robert Matthews

CHIEF EXECUTIVE

Attached: Smart & Prepay Metering Project Revised 5-Year Deployment Option



SMART & PREPAY METERING PROJECT

REVISED 5-YEAR DEPLOYMENT OPTION

17 April 2015

1. Introduction

On the 19 June 2014 the Tonga Power Board approved the Smart Metering Project progressing with meter and headend vendor Itron and with Tonga Power's current Accounting system vendor Agility. Subsequently Itron were issued a letter of Intent and a press release was issued.

The agreement with Itron has taken a relatively long time to finalise after Tonga Power appointed New Zealand lawyers in late November 2014. The agreement is for a 10 year term and there were no areas of dispute during the agreement drafting process and Itron held true to their offer despite the delays. The agreement is subject to Tonga Power final review.

Tonga Power is proposing to procure the Advanced Meter and Prepayment modules from Agility and this agreement has now also been finalised subject to Tonga Power final review.

Because of the delays in finalising the agreements and the contention for limited capital, the Management of Tonga Power have asked that the Project is re-evaluated with a longer timeframe that reduces the initial capital outlay but still achieves the objectives of deploying prepayment metering and accessing the MFAT funding.

2. Revised Scope

The key changes for this the 5-year deployment option with respect to the Project that was originally approved by the Board includes:

- (i) Project start May 2015
- (ii) Itron SAAS service operational September 2015
- (iii) Agility Advanced Meter and Prepayment modules operational September 2015
- (iv) Deployment commences September 2015
- (v) 3,000 prepayment customers and the commercial and industrial customers (except CT metered customers that would not be remotely disconnected) assumed for the first year of the deployment
- (vi) Installation of meters at key points in the Network to monitor voltage and other power quality parameters
- (vii) The following 4 years assume the remainder of the residential customers have smart meters deployed in equal numbers each year.
- (viii) The project completes in June of 2020.

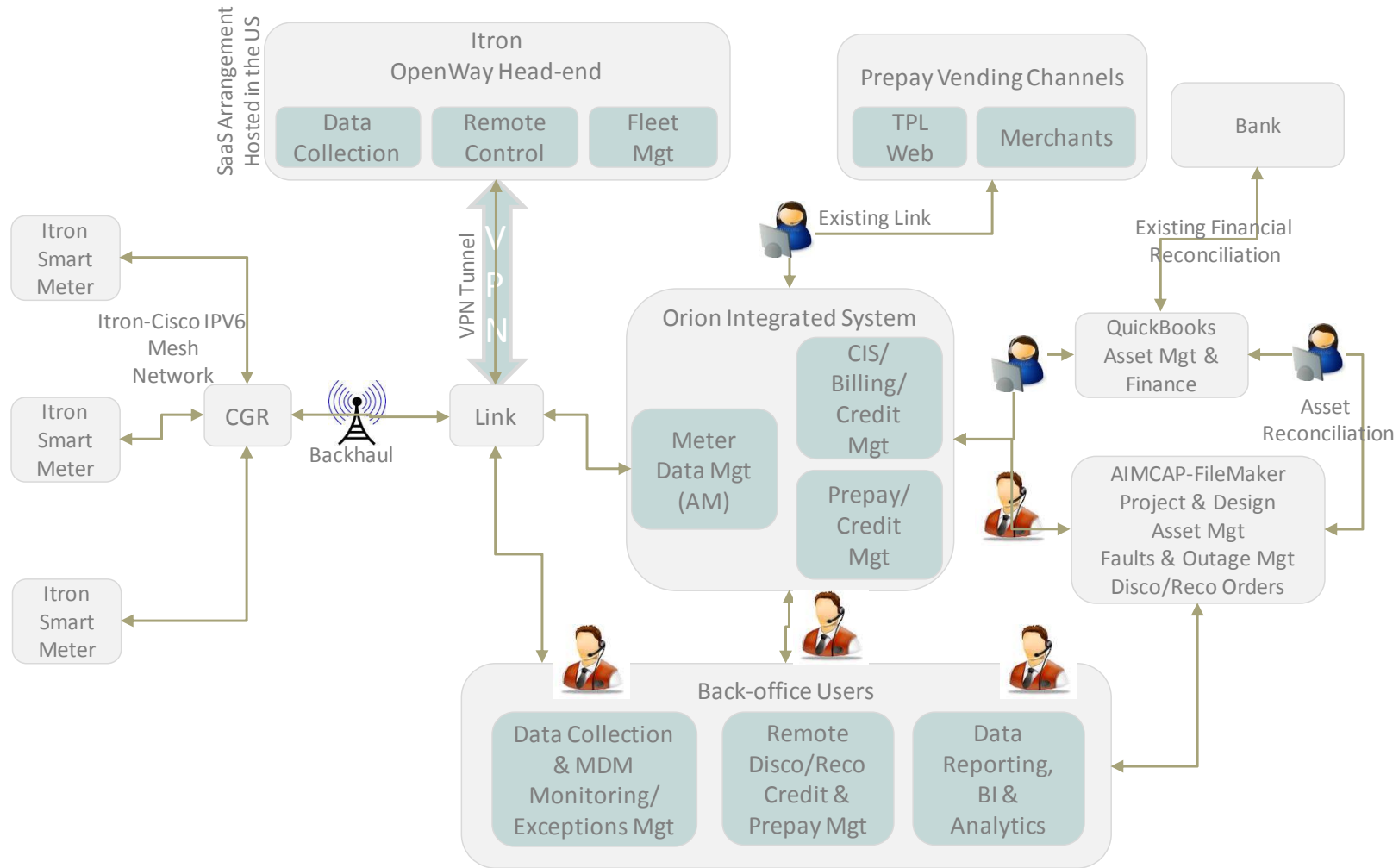
3. Benefits of Smart Metering and Prepayment

The benefit streams as evaluated previously remain unchanged but are realised in later years as the meters are progressively deployed. Annual benefits of TOP2.1m are projected.

4. Architecture of Smart Metering and Prepayment and Existing Systems

The architecture of the proposed systems and the interconnection to existing Tonga Power systems is unchanged and is shown in the following diagram.

TPL AMI Systems Integration Architecture



5. Capital and Operational Costs

The table below shows the costs as agreed in the Itron and Agility agreements. The initial deployment will cost TOP4.1m with the MFAT grant included, and the whole Project if implemented would cost TOP6.3m.

Smart Metering Capital Costs	Initial Deployment (TOP)	Whole Project (TOP)
Cost of Meters & mesh kit (Itron)	1,158,297	3,918,678
Field Installation (TPL)	37,165	161,585
Field Implementation (Itron)	225,012	225,012
Project Management (Itron)	679,784	679,784
Mesh Node Backhaul Network (TPL)	88,400	88,400
Headend Cost (Itron)	1,194,007	1,194,007
MDM & Headend Interfaces (Agility)	71,905	71,905
Prepayment System (Agility)	245,205	245,205
Deployment Management (TPL)	7,098	30,860
Asset Management System (Agility PC sum)	0	100,000
Other miscellaneous costs (TPL)	39,750	53,000
MFAT grant (NZ807,950)	-1,179,607	-1,179,607
Project Management (TPL)	214,000	535,000
Contingency @10%	109,538	219,075
Total	2,890,554	6,342,905

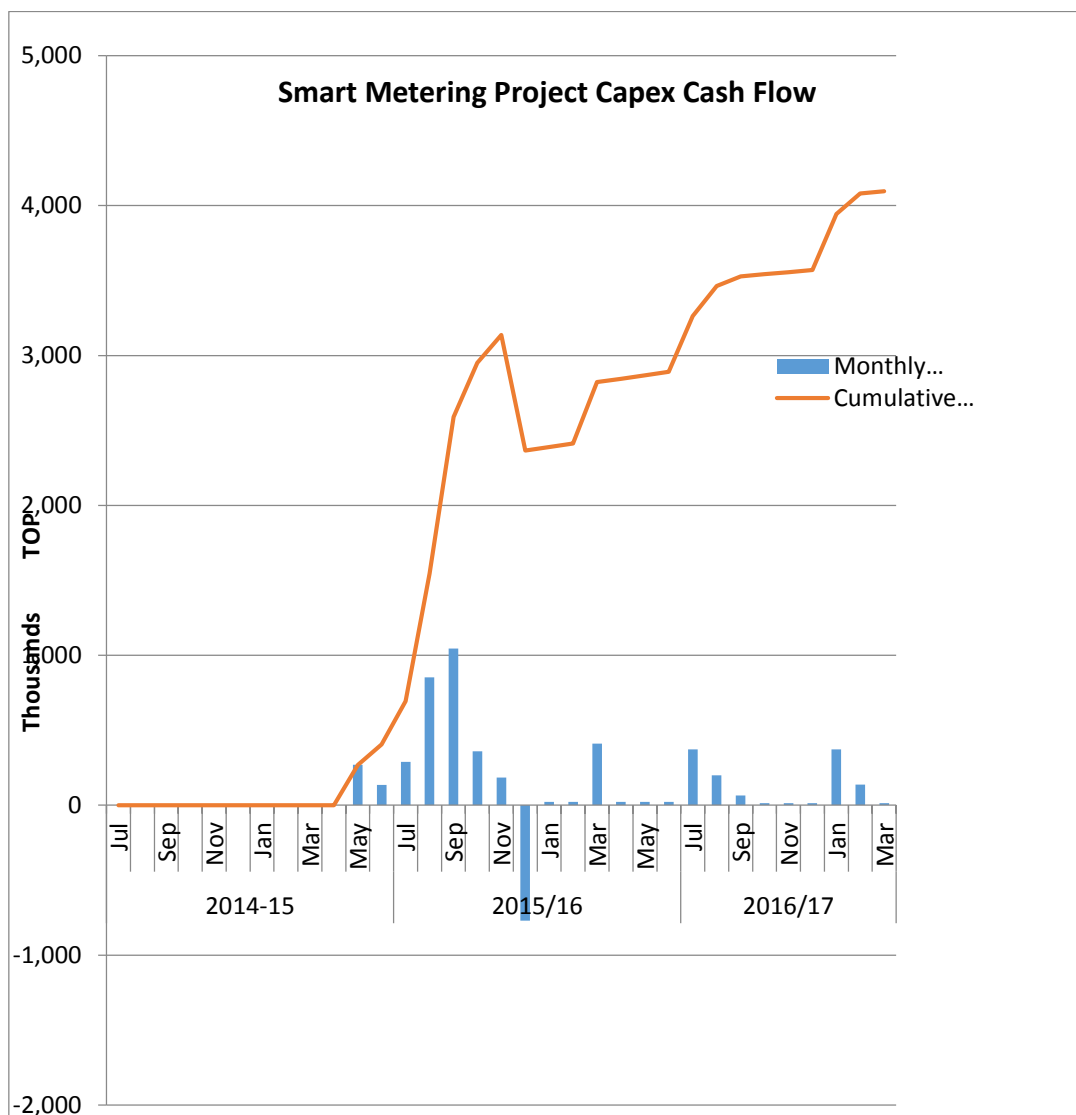
6. Capital Outlay

Approximately 60% of the total capital cost is the smart meters. A 5-year deployment programme significantly defers the capital expenditure. The Itron Headend and Agility Advanced Meter and Prepayment modules can be implemented over a relatively short 5 month period and at commissioning the bulk of payments are due to both vendors.

To implement the smart metering system for 3,000 prepay customers, network metering and the large commercial and industrial customers by the end of the June 2016 financial year, Tonga Power would need to spend TOP4.1m. However the MFAT grant can offset this capital amount by TOP1.1m leaving a **net capital expenditure of TOP3.0m** for Tonga Power to fund.

Tonga Power has the discretion as to when the remainder of the Residential customers have smart meters deployed. Once the base systems are deployed, the meters can be deployed as capital is available.

The graph below projects the Project cash flow for the remainder of this financial year and the following year. The payments due upon signing of the agreements are assumed to occur in May and between August and November the bulk of the Itron and Agility payment would be made assuming a September commissioning of the smart meter system. The MFAT grant is nominally paid in December of this year.



7. Implementation

A staged approach to the implementation is planned to ensure the Project is rolled out in a measured way thereby minimising risk at each hold point. The following stages are envisaged.

- (i) Itron design approval
- (ii) Agility design approval

- (iii) WiFi backhaul acceptance test
- (iv) Factory Acceptance Test approval
- (v) Site Acceptance test approval involving a set of test meters deployed in the field
- (vi) Initial deployment of Network monitoring smart meters
- (vii) Initial deployment of Residential pre-payment meters (single phase)
- (viii) Initial deployment of commercial and industrial (C&I) meters (three phase)
- (ix) When the initial deployments are successfully complete, the remainder of the 3,000 prepayment and C&I meters will be deployed.

8. Economic Analysis

8.1 Basis of analysis

The table below summarises the assumptions adopted for the economic analysis.

Discount rate	8.5%
Inflation Rate	3.0%
Interest Rate	6.0%
Economic life	15 years
Tax depreciation rate	10%
Taxation rate	25%
Debt funding	100%
Present value date	1 June 2015

8.2 Base Case

Using a classical discounted cash flow analysis the economics of the 5-year deployment smart metering project are presented in the table below.

Venture IRR (pre tax)	12.7%
Venture NPV (pre tax)	TOP2.05m
Equity IRR (post tax)	20.0%
Equity NPV (post tax)	TOP2.01m

Previously the Project was planned to be completed over a two year period. This resulted in a pre tax return of 17.6% as the returns more closely matched the capital outlay. Nevertheless the 5-year Project deployment still provides Tonga Power a good return.

9. Risks

Now that the Itron and Agility agreements have been negotiated the financial risks are reduced. However a technology project of this type is not without risk – the following risks remain:

1. Technology functionality: Itron has now has approximately two years experience of customers using the same technology solution that is proposed for Tonga Power so this risk is now significantly reduced from when the Project was approved by the Board. Itron has a large pool of technical experts and the consequence of technology operability issues is only like to be a short delay.
2. Technology Integration: The technical integration between Itron and Agility IT systems is the major risk. However the two vendors participated in an integration workshop in Auckland along with Tonga Power representatives present and both vendors considered this risk to be manageable. Since the workshop Itron has provided Agility with the Application Programming Interfaces and Agility has advised that the integration should be straightforward. Agility has been made the prime for the integration with Itron contracted to support Agility as necessary.

To minimise the risk of deploying the Itron and Agility system in Tonga before being thoroughly tested, a Factory Acceptance Test is planned at Agility's premises with Itron participation. The test environment will have an Itron concentrator and smart meters that connect to the Itron Headend in Spokane, USA and back to Agility's Advanced Meter module via a web interface. Once the systems are deployed in Tonga the Site Acceptance Testing will occur and the system will not be accepted for either vendor until Tonga Power is completely satisfied with the performance.

3. Delay in delivery of Itron meters and RF mesh: Because of the delay in getting to the point of signing the agreements the supply risks have decreased and Itron have advised there will be no product supply delays.
4. Cost overrun: There is a possibility that integration cost budget could overrun and the delay in delivery of meters and Itron technology could result in higher project management fees. However a 10% contingency provision over the whole capital budget, including the fixed price meters and mesh hardware, should be adequate to mitigate this possibility.
5. Benefits: Whilst considerable effort has been expended to quantify and validate the network benefits, these are very difficult to precisely cost as many assumptions are required. As long as the benefits are not less than 23% of those expected a positive post tax NPV will be realised.
6. International Communication Link Failure: In addition to the above there is an additional risk resulting from the SAAS headend and that relates to the use of international communication links. These links must reliable to support the efficient operation of pre-payment system. However these links are considered sufficiently reliable particularly now that that there is a fibre cable connection to Tongatapu. In the event of a failure of the international links no data will be lost as the smart meter stores the meter data typically for more than 3 months.