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## **ASX Release**

3 February 2016

### **Dispatch of Notice of Meeting and Independent Expert's Report**

Notice of Meeting documents, as per ASX announcement on 28 January 2016, have been dispatched to shareholders.

The Independent Expert's Report accompanies the documents dispatched and can be found following this notice along with a copy of the Technical Expert Review.

**By order of the Board**

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**RAYA GROUP LIMITED**  
**Independent Expert's Report**

15 January 2016

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# Financial Services Guide

The Financial Services Guide ('FSG') is provided to comply with the legal requirements imposed by the Corporations Act 2001 and includes important information regarding the general financial product advice contained in this report ('this Report'). The FSG also includes general information about BDO Corporate Finance (QLD) Ltd ('BDO CFQ' or 'we', 'us' or 'our'), including the financial services we are authorised to provide, our remuneration and our dispute resolution.

BDO CFQ holds an Australian Financial Services Licence to provide the following services:

- (a) financial product advice in relation to deposit and payment products (limited to basic deposit products and deposit products other than basic deposit products), securities, derivatives, managed investments schemes, superannuation, and government debentures, stocks and bonds; and
- (b) arranging to deal in financial products mentioned in a) above, with the exception of derivatives.

## General Financial Product Advice

This Report sets out what is described as general financial product advice. This Report does not consider personal objectives, individual financial position or needs and therefore does not represent personal financial product advice. Consequently any person using this Report must consider their own objectives, financial situation and needs. They may wish to obtain professional advice to assist in this assessment.

## The Assignment

BDO Corporate Finance (QLD) Ltd ABN 54 010 185 725, Australian Financial Services Licence No. 245513 has been engaged to provide general financial product advice in the form of a report in relation to a financial product. Specifically, BDO CFQ has been engaged to provide an independent expert's report to the non-associated shareholders of Raya Group Limited ('Raya' or 'the Company') in relation to the proposed acquisition ('the Proposed Transaction') of Xped Holdings Ltd ('Xped').

Further details of the Proposed Transaction are set out in Section 3.0. The scope of this Report is set out in detail in Section 4.0. This Report provides an opinion as to whether or not the Proposed Transaction is 'fair' and 'reasonable' to the non-associated shareholders of Raya and has been prepared to provide information to the non-associated shareholders of Raya to assist them to make an informed decision on whether to vote for or against the resolutions that comprise the Proposed Transaction.

This Report cannot be relied upon for any purpose other than the purpose mentioned above and cannot be relied upon by any person or entity other than those mentioned above, unless we have provided our express consent in writing to do so. A shareholder's decision to vote in favour of or against the Proposed Transaction is likely to be influenced by their particular circumstances, for example, their taxation considerations and risk profile. Each shareholder should obtain their own professional advice in relation to their own circumstances.

## Fees, commissions and other benefits we may receive

We charge a fee for providing reports. The fees are negotiated with the party who engages us to provide a report. We estimate the fee for the preparation of this Report will be approximately \$60,000 plus GST. Fees are usually charged as a fixed amount or on an hourly basis depending on the terms of the agreement with the engaging party. Our fees for this Report are not contingent on the outcome of the Proposed Transaction.

Except for the fees referred to above, neither BDO CFQ, nor any of its directors, employees or related entities, receive any pecuniary benefit or other benefit, directly or indirectly, for or in connection with the provision of this Report.

Directors of BDO CFQ may receive a share in the profits of BDO Group Holdings (QLD) Pty Ltd, a parent entity of BDO CFQ. All directors and employees of BDO Group Holdings (QLD) Pty Ltd and its subsidiaries (including BDO CFQ) are entitled to receive a salary. Where a director of BDO CFQ is a shareholder of BDO Group Holdings (QLD) Pty Ltd, the person is entitled to share in the profits of BDO Group Holdings (QLD) Pty Ltd.

## Associations and relationships

From time to time BDO CFQ or its related entities may provide professional services to issuers of financial products in the ordinary course of its business. These services may include audit, tax and business advisory services. BDO CFQ has not provided any services to Raya or Xped in the past two years.

The signatories to this Report do not hold any shares in Raya or Xped and no such shares have ever been held by the signatories.

To prepare our reports, including this Report, we may use researched information provided by research facilities to which we subscribe or which is publicly available. Reference has been made to the sources of information in this Report, where applicable. Research fees are not included in the fee details provided in this Report.

## Complaints

We are members of the Financial Ombudsman Service. Any complaint about our service should be in writing and sent to BDO Corporate Finance (QLD) Ltd, GPO Box 457, Brisbane QLD 4001.

We will endeavour to resolve the complaint quickly and fairly. If the complaint cannot be satisfactorily resolved within 45 days of written notification, there is a right to lodge a complaint with the Financial Ombudsman Service. They can be contacted on 1300 780 808. This service is provided free of charge.

If the complaint involves ethical conduct, a complaint may be lodged in writing with Chartered Accountants Australia and New Zealand, Queensland Branch, GPO Box 2054, Brisbane QLD 4001. The Australian Securities and Investment Commission ('ASIC') also has an Infoline on 1300 300 630 which can be used to make a complaint and obtain information about investor rights.

## Contact Details

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## Glossary

Reference	Definition
ABV	Asset-based valuation
ADRC	Auto-discovery remote control
ASIC	Australian Securities and Investment Commission
ASSOB	Australian Small Scale Offering Board
ASX	Australian Securities Exchange
AUD or \$	Australian dollars
BDO CFQ	BDO Corporate Finance (QLD) Ltd
BDO Persons	BDO CFQ, BDO (QLD) or any of its partners, directors, agents or associates
Capital Raising, the	The public offer under the prospectus to raise \$8.0 million through the issue of 320 million shares in the Combined Entity
CME	Capitalisation of maintainable earnings
Company, the	Raya Group Limited
Conditional Resolutions, the	Notice of Meeting Resolutions 1 to 5 (inclusive) and 8
Corporations Act, the	The Corporations Act 2001
DCF	Discounted cash flow
Explanatory Memorandum, the	Notice of Extraordinary General Meeting and Explanatory Memorandum prepared by Raya and dated on or about 15 January 2016
Flocom Report, the	'Technical Expert Review' report prepared by Flocom Consulting
FSG	Financial Services Guide
GEL	Geothermal exploration licence
Geothermal Exploration Assets	Raya's geothermal exploration assets including the Sokoria Geothermal Project
IoT	Internet of Things
IPP	Independent power producers
MBV	Market-based valuation
Notice of Meeting, the	Notice of Extraordinary General Meeting and Explanatory Memorandum prepared by Raya and dated on or about 15 January 2016
PPA	Power purchase agreement
Proposed Transaction, the	The proposed acquisition of Xped by Raya
PYM	Pryme Energy Limited
Raya	Raya Group Limited
Regulations, the	The Corporation Regulations 2001
Report, this	This independent expert's report prepared by BDO CFQ dated 15 January 2016
RET	Renewable energy target
RG 111	Regulatory Guide 111: Content of Expert Report
RGs	Regulatory guides published by ASIC
SGI	PT Sokoria Geothermal Indonesia, a joint venture between Raya and PT Bakrie Power
VWAP	Volume weighted average price
We, us, our	BDO Corporate Finance (QLD) Ltd
Xped	Xped Holdings Ltd

The Directors  
Raya Group Limited  
C/- Mr Michael Clarke  
Non-Executive Director  
PO Box 16059  
Collins St West, VIC, 8007

15 January 2016

Dear Shareholders,

## Independent Expert's Report

### 1.0 Introduction

BDO Corporate Finance (QLD) Ltd ('BDO CFQ', 'we', 'us' or 'our') has been engaged to provide an independent expert's report ('this Report') to the non-associated shareholders of Raya Group Limited ('Raya' or 'the Company') in relation to the proposed acquisition ('the Proposed Transaction') of Xped Holdings Ltd ('Xped').

The consideration to be offered by Raya under the Proposed Transaction is:

- 640 million ordinary shares in Raya; and
- 150 million management performance shares attainable on meeting various milestones.

For ease of reference, and to assist to differentiate between Raya prior to the all-scrip acquisition of Xped shares and Raya post the all-scrip acquisition of Xped shares, we refer to the company acquiring Xped as 'Raya' or 'the Company' and we refer to the combined entity post the all-scrip acquisition as 'the Combined Entity'. Accordingly, all references to the Combined Entity set out in this Report should be taken as references to Raya following the Proposed Transaction.

A more detailed description of the Proposed Transaction is set out in Section 3.0 of this Report.

This Report has been prepared to provide information to the non-associated shareholders of Raya to assist them to make an informed decision on whether to vote for or against resolutions 1 to 5 (inclusive) and 8 ('the Conditional Resolutions') that comprise the Proposed Transaction at the Extraordinary General Meeting. Apart from the purpose stated directly above, this Report cannot be used or relied on for any other purpose or by any other person or entity.

This Report should be read in full, including the assumptions underpinning our work together with the other information provided to the non-associated shareholders of Raya in conjunction with this Report, including the Notice of Extraordinary General Meeting and Explanatory Memorandum prepared by Raya and dated on or about 15 January 2016 ('the Notice of Meeting' and 'the Explanatory Memorandum').

This Report does not address circumstances specific to individual Raya shareholders. A Raya shareholders' decision to vote for or against the Conditional Resolutions that comprise the Proposed Transaction is likely to be influenced by their own particular circumstances including, for example, their taxation considerations and risk profile. Raya shareholders should obtain their own professional advice in relation to their own circumstances.

APES 225 'Valuation Services' issued by the Accounting Professional & Ethical Standards Board sets out mandatory requirements for the provision of quality and ethical valuation services. BDO CFQ has complied with this standard in the preparation of this Report.

## 2.0 Summary of Opinion

This section is a summary of our opinion only and cannot substitute for a complete reading of this Report.

### 2.1 Fairness of the Proposed Transaction

This section provides a summary of our assessment of the fairness of the Proposed Transaction. A more detailed assessment of the fairness of the Proposed Transaction is set out in Section 10.0 of this Report.

To assess whether the Proposed Transaction is 'fair' to the non-associated shareholders of Raya we:

- Calculated the value of a Raya share immediately prior to the Proposed Transaction on a controlling interest basis using a Market Based Valuation ('MBV') methodology. For the purpose of our MBV we relied on a significant number of shares issued by Raya over the period from 1 July 2014 to 22 October 2015<sup>1</sup> (the number of shares in Raya increased from 342,483,030 to 640,000,000 over this period) in addition to Raya share trading data. To provide additional information to the non-associated shareholders of Raya we have also considered the value implied for Raya's assets and liabilities from our MBV to assist to determine whether there is any information to suggest that our MBV methodology is unreasonable in the circumstances;
- Calculated the value of a share in the Combined Entity post the Proposed Transaction on a minority interest basis using an MBV methodology. For the purpose of our MBV we have considered a range of information, including two share placements completed by Raya post the announcement of the Proposed Transaction, the \$8.0 million capital raising that the Proposed Transaction is conditional on ('the Capital Raising') and also the Raya share trading data post the announcement of the Proposed Transaction; and
- Compared our value of a Raya share prior to the Proposed Transaction to the value of a share in the Combined Entity following the Proposed Transaction, assuming that the Proposed Transaction is implemented.

Table 2.1 below summarises our valuation of a share in Raya prior to the Proposed Transaction and of a share in the Combined Entity immediately following the Proposed Transaction for the purpose of assessing the fairness of the Proposed Transaction.

**Table 2.1: Assessment of Fairness of the Proposed Transaction**

	Low Value (\$)	Mid Value (\$)	High Value (\$)
Value of Raya prior to the Proposed Transaction - (controlling interest)	0.0065	0.0098	0.0130
Value of the Combined Entity post the Proposed Transaction (minority interest)	0.0200	0.0250	0.0300

Source: BDO CFQ analysis

After considering the information summarised above and set out in more detail in Section 10.0 of this Report, in our view, the Proposed Transaction is **Fair** to the non-associated shareholders of Raya as at the date of this Report.

### 2.2 Reasonableness of the Proposed Transaction

Table 2.2 below summarises the advantages and disadvantages of the Proposed Transaction. For a more detailed assessment of the Proposed Transaction, refer to Section 11.0 of this Report.

**Table 2.2: Advantages and Disadvantages of the Proposed Transaction**

Advantage	Disadvantage
The Proposed Transaction is fair	There is a change in the nature and scale of Raya's business
The potential for near term revenue generation relative to Raya's geothermal assets	The Combined Entity has no track record of generating sustainable revenues and earnings
The principal business activity will be clearly focussed on development of the Xped business	Investment in the Combined Entity is speculative and high risk

<sup>1</sup> We have adopted the date of 22 October 2015 as this was the last date of trading prior to Raya announcing the Proposed Transaction.

Advantage	Disadvantage
The Combined Entity will be better placed, relative to Raya, to pursue growth opportunities as a result of funding	Limited ability to receive dividends in short term
Larger market capitalisation and potentially higher liquidity on the ASX	Practical level of control of controlling shareholders
	Reduced chance of receiving a future takeover offer due to controlling shareholders
	Dilutionary impact on the existing non-associated shareholders of Raya

Source: BDO CFQ analysis

After considering the advantages and disadvantages of the Proposed Transaction summarised above and set out in more detail in Section 11.0 of this Report, in our view the Proposed Transaction is **Reasonable** to the non-associated shareholders of Raya as at the date of this Report.

### 2.3 Other Considerations for the Non-associated Shareholders of Raya

Before forming a view on whether to vote in favour of or against the Proposed Transaction, we strongly recommend that the non-associated shareholders of Raya:

- Consult their own professional advisers;
- Carefully read all relevant documentation provided to them, including this Report and the Explanatory Memorandum; and
- Consider their own specific circumstances.

The analysis set out in this Report has relied on certain economic, market and other conditions prevailing as at the date of this Report. We note that changes in these conditions may have a material impact on the results presented in this Report. BDO CFQ is not responsible for updating this Report in the event that these circumstances change.

Notwithstanding our view above, we note that Raya is a company engaged in exploration and Xped is a company that is yet to generate material revenue and sustainable earnings. In our view, we regard both companies as high risk and speculative and we note that the value of such companies may increase or decrease materially over short time periods depending upon milestones met (or missed) and changes in economic circumstances.

In forming our view on the Proposed Transaction, we have had regard to the information available in relation to the MBV of both Raya and the Combined Entity. There is no guarantee that the conditions that existed at the time of our valuation work will persist to the date of the Extraordinary General Meeting on 26 February 2016 or beyond. We note that the Proposed Transaction is conditional on Raya raising \$8.0 million at a \$0.025 subscription price.

The decision to vote in favour of or against the Proposed Transaction is a separate decision to the investment decision to hold or divest shares in the Combined Entity in the event the Proposed Transaction is approved. We recommend shareholders consult their own professional advisers in relation to the decision on whether to hold or divest shares in the Combined Entity.

We note that if the Proposed Transaction is not approved, the Directors of Raya will seek to identify another investment opportunity. We note that the Directors of Raya have investigated a number of opportunities prior to the Proposed Transaction and it is the directors' view that the Proposed Transaction represents the best opportunity for the Company and the non-associated shareholders of Raya.

The non-associated shareholders of Raya should refer to Section 11.3 of this Report for a more detailed discussion of the position of the non-associated shareholders of Raya in the event that the Proposed Transaction is not approved and implemented.

### 3.0 Description of the Proposed Transaction

This section sets out an overview of the Proposed Transaction and is structured as follows:

- Section 3.1 provides an overview of the Proposed Transaction;
- Section 3.2 sets out the conditions of the Proposed Transaction;
- Section 3.3 sets out the effect of the Proposed Transaction on Raya's ownership structure; and
- Section 3.4 discusses the strategic rationale for the Proposed Transaction.

#### 3.1 Overview of the Proposed Transaction

This section sets out an overview of the Proposed Transaction. This section is a summary only.

The Proposed Transaction consists of the Conditional Resolutions (i.e. resolutions 1 to 5 (inclusive) and 8) in the Notice of Meeting. A detailed summary of the resolutions is contained within the Explanatory Memorandum.

The terms of the Proposed Transaction are set out in the binding Heads of Agreement between Raya and Xped, and summarised in the Notice of Meeting and Explanatory Memorandum. Broadly, the Proposed Transaction can be categorised into the following components:

- Acquire all the issued capital in Xped from the Xped shareholders for consideration comprising 640 million shares. Approximately 580 million of these shares will be issued to JK Group Australia Pty Ltd ('JK Group') and Alanticx Technologies Pty Ltd ('Alanticx') or their nominees, the two major Xped shareholders;
- Issue a total of 50 million management performance shares to JK Group and Alanticx that convert on a 1 for 1 basis if both of the following are satisfied within 18 months from the admission date:
  - The market capitalisation of Raya is not less than \$75 million for 20 consecutive trading days on ASX; and
  - The revenues of Raya for any 12 month period is not less than \$1 million;
- Issue a total of 50 million management performance shares to JK Group and Alanticx that convert on a 1 for 1 basis if both of the following are satisfied within 24 months from the admission date:
  - The market capitalisation of Raya is not less than \$100 million for 20 consecutive trading days on ASX; and
  - The revenues of Raya for any 12 month period is not less than \$2.5 million;
- Issue a total of 50 million management performance shares to JK Group and Alanticx that convert on a 1 for 1 basis if both of the following are satisfied within 30 months from the admission date:
  - The market capitalisation of Raya is not less than \$125 million for 20 consecutive trading days on ASX; and
  - The revenues of Raya for any 12 month period is not less than \$5 million;
- Change the Company's name to 'Xped Limited';
- Undertake a \$8.0 million capital raising ('the Capital Raising') to issue 320 million shares in the Combined Entity for a \$0.025 subscription price;
- Apply the funds raised from the above capital raising to:
  - Business development and commercialisation of the technology;
  - Contribute to the working capital required to fund the development of the Combined Entity; and
  - Pay the costs of the Transaction; and
- Issue up to a further 15 million shares and 30 million options to various parties who have provided services to the Company or to Xped.

The Proposed Transaction will only proceed if all of the Conditional Resolutions are passed by the non-associated shareholders of Raya at the Extraordinary General Meeting and the capital raising is successfully completed. Raya shareholders should refer to the Explanatory Memorandum for more information in relation to the Proposed Transaction.

### 3.2 Conditions of the Proposed Transaction

Completion of the Proposed Transaction is subject to a number of conditions precedent being met by both the Company and Xped. The conditions precedent are outlined in the Explanatory Memorandum and include the following key conditions:

- The Company and the majority shareholders of Xped each being satisfied in their absolute discretion with the results of their own due diligence;
- Obtainment of an Independent Expert's Report as to the fairness and reasonableness of the Proposed Transaction;
- All necessary regulatory approvals being obtained to enable the completion of the Proposed Transaction;
- All necessary shareholder approvals being obtained by the Company in respect of the Proposed Transaction;
- The Company undertaking the Capital Raising;
- Each Xped shareholder entering a restriction agreement (as to the extent required by ASX); and
- There being no materially adverse change in respect of Xped or the Company.

### 3.3 Effect on Ownership Interests

Tables 3.1 and 3.2 below assist to estimate the change in ownership interests following the Proposed Transaction. For details on the current equity structure of Raya refer to Section 5.2 of this Report. In relation to Tables 3.1 and 3.2 below we note the following:

- **Post Transaction - Undiluted:** Assumes the issue of 640 million shares to Xped shareholders or their nominees, 320 million shares issued as a result of the Capital Raising and 15 million shares to various advisors;
- **Post Transaction - Exercise of options:** Assumes the exercise of approximately 381 million existing Raya options and 30 million advisor options; and
- **Post Transaction - Management Performance Shares Converted:** Assumes the 150 million management performance shares are converted into ordinary shares.

**Table 3.1: Effects of the Proposed Transaction on Ownership Interests in Raya - Number of Shares**

	Prior	Post Transaction - Undiluted	Post Transaction - Exercise of Options	Post Transaction - Performance Shares Issued
Raya shareholders and option holders	718,364,311	718,364,311	1,099,716,668	1,099,716,668
Xped - JK Group and Alanticx	-	580,112,422	580,112,422	730,112,422
Xped - Other	-	59,887,578	59,887,578	59,887,578
Capital raising	-	320,000,000	320,000,000	320,000,000
Advisors and other	-	15,000,000	45,000,000	45,000,000
<b>Total</b>	<b>718,364,311</b>	<b>1,693,364,311</b>	<b>2,104,716,668</b>	<b>2,254,716,668</b>

Source: BDO CFQ analysis

**Table 3.2: Effects of the Proposed Transaction on Ownership Interests in Raya - Percentage Ownership**

	Prior	Post - Undiluted	Post - Exercise of Options	Post - Performance Shares Issued
Raya shareholders and option holders	100.0%	42.4%	52.3%	48.8%
Xped - JK Group and Alanticx	0.0%	34.3%	27.6%	32.4%
Xped - Other	0.0%	3.5%	2.8%	2.7%
Capital raising	0.0%	18.9%	15.2%	14.2%
Advisors and other	0.0%	0.9%	2.1%	2.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: BDO CFQ analysis

(a) For completeness we note that the maximum relevant interest that would be attained by JK Group and Alanticx (inclusive of their nominees) is approximately 39.6% which assumes that the 381 million existing Raya options and the 30 million advisor options are not exercised

### 3.4 Strategic Rationale for the Proposed Transaction

The Directors of Raya are of the view that the present market outlook in the energy sector is not strong and/or rewarding for shareholders in the near to medium term. The Directors of Raya had previously sought funding from the sophisticated and broker community to assist with potential energy opportunities and access to capital was becoming limited and levels of interest were becoming low.

As a result of the above and in line with recent market announcements, Raya had reviewed a number of potential opportunities in the energy and non-energy sectors that would protect its shareholders from over dilution whilst at the same time attracting an acquisition opportunity that could reward its shareholders in the longer term.

The Directors of Raya identified the Xped opportunity and an agreement was formed that provided benefit to both parties in the transaction. The board first reviewed all publicly available information surrounding Xped and then proceeded to meet with the Xped Directors on a number of occasions under non-disclosure agreements to review their business and technology.

The Directors of Raya chose to proceed with the Proposed Transaction having regard to the following matters:

- The level of investment the founders have made in the company to date;
- The portfolio of patents in numerous jurisdictions that provide value and protection;
- The management team in place and their backgrounds;
- Demonstrations of the technology and how it fits into the lucrative Internet of Things ('IoT') sector;
- The opportunities and markets that the Xped technology can exploit going forward;
- The founders previous success in business and entrepreneurship;
- The technology is at commercialisation stage;
- The level of interest from outside parties to cooperate and utilise their technology in trials ahead of entering possible agreements;
- The focus to grow potential Asian customer base from head office in Singapore;
- Encouraging signs of forming relationships with large multinationals to adopt their technology; and
- Early revenue opportunities being beneficial.

After in depth discussions and a review of the Xped technology, the Directors of Raya considered the acquisition of Xped to be the most viable option to proceed with and instructed their legal advisors to draft a Heads of Agreement. Subsequently the parties formalised a final agreement which was executed and released to the ASX on 26 October 2015.

## 4.0 Scope of Report and Methodology for Assessment

### 4.1 Scope of Report

An independent expert, in certain circumstances, must be appointed to meet requirements set out in the Corporations Act 2001 ('the Corporations Act'), the Corporations Regulations 2001 ('the Regulations'), the regulatory guides ('RGs') published by the Australian Securities and Investments Commission ('ASIC') and the listing requirements of the stock exchanges on which a company is listed. We have summarised the requirements of the Corporations Act and the Regulations, and the ASX listing requirements in Sections 4.1.1 and 4.1.2 below. We have summarised the guidance provided by the RGs in Section 4.2 below.

The sole purpose of this Report is to express BDO CFQ's opinion on whether the Proposed Transaction is fair and reasonable to the non-associated shareholders of Raya. This Report cannot be used by any other person for any other reason or for any other purpose. We understand that this Report will be distributed to the non-associated shareholders of Raya together with the Explanatory Memorandum.

This Report is general financial product advice only and has been prepared without taking into account the objectives, risk profile, financial situation or needs of individual Raya shareholders. Before deciding whether to vote in favour of or against the Proposed Transaction, individual Raya shareholders should consider the appropriateness of the advice having regard to their own objectives, financial situation or needs, including their own taxation consequences. Raya shareholders should read in full the Explanatory Memorandum in relation to the Proposed Transaction.

The decision to vote in favour of or against the resolutions that comprise the Proposed Transaction is a matter for individual shareholders based on their expectations as to value and future market conditions and their particular circumstances including risk profile, liquidity preference, investment strategy, portfolio structure and tax position. Raya shareholders should consult their own professional adviser in relation to their own circumstances and the way in which the Proposed Transaction may impact their own circumstances.

#### 4.1.1 Requirements of the Corporations Act and Regulations

Section 606 of the Act states that, subject to the exceptions set out in section 611, a 'relevant interest' in issued voting shares in a listed company cannot be increased from 20% or below to more than 20%, or from a starting point that is above 20% and below 90%. Broadly, a 'relevant interest' is defined as an interest giving the holder the power to control the right to vote or dispose of shares.

If the Proposed Transaction is approved and implemented, Xped shareholders or their nominees will be issued 640 million ordinary shares in Raya and 150 million management performance shares. This includes the following:

- 580,112,422 shares will be issued to JK Group and Alanticx or their nominees. Based on 1,693,364,311 shares outstanding in the Combined Entity following the Proposed Transaction, JK Group, Alanticx and their nominees (who we understand are associates) will hold a relevant interest of 34.3% in the Combined Entity; and
- A total of 150 million management performance shares will be issued to JK Group and Alanticx. Based on 2,254,716,668 shares outstanding in the Combined Entity following the Proposed Transaction (assuming full conversion of the 382 million existing Raya options, the 30 million advisor options and the 150 million management performance shares), JK Group and Alanticx (inclusive of their nominees) will hold a relevant interest of 32.4% in the Combined Entity. For completeness we note that the maximum relevant interest that would be attained by JK Group and Alanticx (inclusive of their nominees) is approximately 39.6% which assumes that the existing Raya options are not exercised.

Having regard to the above, as JK Group's and Alanticx Technologies' relevant interest in Raya will potentially increase from below 20% to above 20%. An exemption from section 606 must therefore be sought under item 7 of section 611 of the Act.

Item 7 of section 611 allows a party to gain a relevant interest in shares of a public company that would otherwise be prohibited under section 606 of the Act if the Proposed Transaction is approved in advance by a resolution passed at a general meeting of the Company, and:

- No votes are cast in favour of the resolution by any party who is associated with the party acquiring the shares, or by the party acquiring the shares; and

- There was full disclosure of all information known by both the party proposing to make the acquisition, their associates and the Company in relation to the Proposed Transaction which was material to a decision on how to vote on the resolution.

Regulatory Guide 74 'Acquisitions agreed to by Shareholders' states that the obligation to supply shareholders with all information that is material can be satisfied by the non-associated directors of Raya by either:

- Undertaking a detailed examination of the Proposed Transaction themselves if they consider that they have sufficient expertise; or
- Commissioning an independent expert's report.

We have been requested to prepare this independent expert's report to provide additional information to the non-associated shareholders of Raya to assist them to form a view on whether to vote in favour of or against the Proposed Transaction.

#### 4.1.2 Listing Requirements

We understand that the ASX requires the Proposed Transaction be approved by the non-associated shareholders of Raya in accordance with various provisions of Listing Rule Chapter 7: *Changes in Capital and New Issues* and Listing Rule Chapter 11: *Significant Transactions*. These requirements are discussed in more detail in section 2 of the Explanatory Memorandum.

We note that shareholder votes required for the Proposed Transaction under these rules do not require the preparation of an expert report and this Report has not been prepared for the purposes of complying with any listing rules.

#### 4.2 Methodology for Assessment

The Corporations Act does not provide any specific guidance in relation to the principles and content of an expert's report relating to the approval of the issue of securities under item 7 of section 611 of the Act. However ASIC are of the view that the report should follow the requirements of other expert reports under the Act and ASIC have set out specific guidance in RG 111: *Content of Expert Reports* ('RG 111') in relation to the approval of the issue of securities under item 7 of section 611 of the Act.

RG 111 states that, in the event that a company issues securities to the vendor of another entity or to the vendor of a business and, as a consequence, the vendor acquires over 20% of the company incorporating the merged interest, the transaction should be analysed as if it was a takeover bid. In such circumstances, references to the 'bidder' and 'target' should be taken to mean the 'allottee' and the 'company' respectively.

When analysing a takeover bid, RG 111 states that an expert is required to give an opinion as to whether the Proposed Transaction is 'fair and reasonable' to the shareholders. The expert's report should explain how the particulars of the proposal were evaluated as well as the results of the examination and evaluation. RG 111 also provides guidance on common valuation methodologies and certain matters which should be considered by an expert when completing a valuation.

To meet the ASIC requirements, an expert seeking to determine whether a proposal is 'fair and reasonable' should complete the steps set out below.

##### 4.2.1 Step 1 - Assessment of Fairness

To assess whether the Proposed Transaction is 'fair', in our view it is appropriate to:

- Determine the value of a share in Raya, on a controlling interest basis, immediately prior to the Proposed Transaction; and
- Compare the value determined above with our valuation of a share in the Combined Entity on a minority interest basis immediately following the Proposed Transaction.

Under RG 111, the Proposed Transaction will be considered 'fair' to the non-associated shareholders of Raya if the value of a share of the Combined Entity following the Proposed Transaction is equal to or greater than the value of a Raya share prior to the Proposed Transaction.

#### 4.2.2 Step 2 - Assessment of Reasonableness

To assess whether the Proposed Transaction is 'reasonable', in our view it is appropriate to examine other significant factors to which the non-associated shareholders of Raya may give consideration prior to deciding whether to vote in favour of or against the Proposed Transaction. This evaluation may involve comparing the likely advantages and disadvantages of approving the Proposed Transaction with the position of a Raya shareholder if the Proposed Transaction is not approved.

#### 4.2.3 Step 3 - Expert's Opinion

Upon completion of steps 1 and 2 above, it may be possible to conclude whether the Proposed Transaction is 'fair' and/or 'reasonable' to the non-associated shareholders of Raya. We note that under RG 111, the Proposed Transaction is considered to be 'reasonable' if it is 'fair'. It may also be possible to conclude that the Proposed Transaction is 'reasonable' if there are sufficient valid reasons for the approval, notwithstanding that the Proposed Transaction may not be 'fair' to the non-associated shareholders of Raya.

This Report will conclude by providing our opinion as to whether or not the Proposed Transaction is 'fair and reasonable'. While all relevant issues must be considered prior to forming an overall opinion, we will assess the fairness and reasonableness issues separately for clarity.

In this Report we have not provided any taxation, legal or other advice in relation to the Proposed Transaction. Other advisors have provided advice on those matters to Raya in relation to the Proposed Transaction.

In the process of assessing the Proposed Transaction, we have relied on certain economic, market and other conditions prevailing at the date of this Report. We note that changes in these conditions may have a material impact on the results presented in this Report. BDO CFQ is not responsible for updating this Report in the event that these circumstances change.

## 5.0 Overview of Raya

### 5.1 Description of Raya

Raya is a geothermal exploration and development company with a range of projects in Australia and Indonesia. Raya was initially incorporated as Uranoz Limited in October 2006 to acquire the uranium interests of WCP Resources Limited in South Australia and Western Australia. Following the acquisition of Scopenergy Pty Ltd, which held geothermal exploration assets and rights relating to the Limestone Coast Geothermal Project, and Panax Geothermal Pty Ltd during the financial year ended 30 June 2008, the company changed its name from Uranoz Limited to Panax Geothermal Limited. The uranium assets were disposed of during the same year and Panax Geothermal Limited was solely focussed on geothermal energy. During May 2013, the company changed its name from Panax Geothermal Limited to Raya Group Limited.

The principal activity of Raya is the exploration of geothermal opportunities in Australia and Indonesia. Notwithstanding this, in the June 2015 quarter Raya commenced examining new business alternatives including some outside of energy with a stated emphasis to improve shareholder wealth.

Raya holds two geothermal mining tenements exclusively in Australia and holds three geothermal mining tenements jointly with PT Bakrie Power in Indonesia. Raya is based in Melbourne, Victoria.

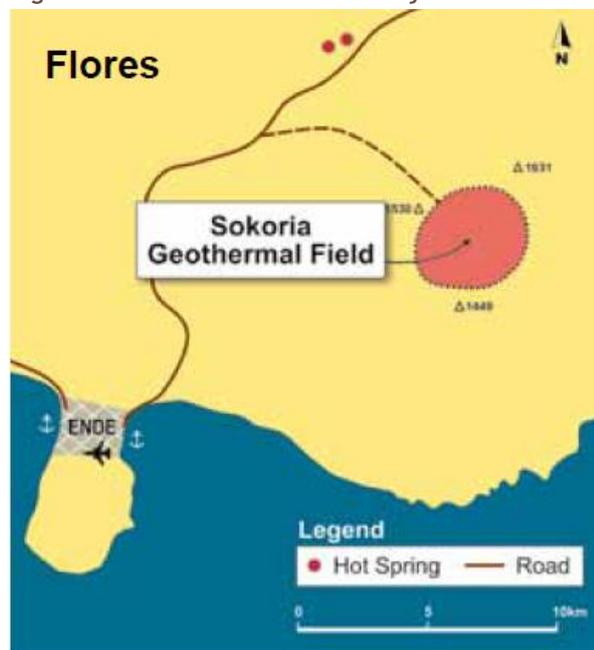
An overview of Raya's current projects is set out in Section 5.1.1 below.

#### 5.1.1 Overview of Raya's Current Projects

##### Sokoria Geothermal Project (Raya 45%)

The Sokoria Geothermal Project is located on the island of Flores in Indonesia and is expected to have a power capacity of 30MW. The project entity, PT Sokoria Geothermal Indonesia ('SGI'), is a joint venture between Raya and PT Bakrie Power. Raya has a 45% interest in this project which was acquired during the financial year ended 30 June 2010.

Figure 5.1: Sokoria Geothermal Project



Source: Annual Report 2010

Raya and PT Bakrie Power entered into a Heads of Agreement with Space Con Pty Ltd during January 2015 for the sale and purchase of 85% of the Sokoria Geothermal Project. The Heads of Agreement was terminated in March 2015 after Space Con Pty Ltd did not pay the required deposit in time. Raya has provided some indicative metrics for the Sokoria Geothermal Project based on this transaction, including:

- A total capacity of 30 MW;
- Cost of approximately USD160 million;

- Proposed capital structure of 75% debt and 25% equity;
- The net present value for the project has been calculated by Raya to be USD\$25.5 million for a 100% interest (or USD\$11.5 million for a 45% interest); and
- The project IRR has been calculated by Raya to be 11.21% and an equity IRR of 21.58%.

A 30 year power purchase agreement ('PPA') was signed between PT PLN, the National Electricity Grid in Indonesia, and SGI during October 2014. An overview of the agreement is provided in Table 5.1.

**Table 5.1 Key Project and Financial Details for PPA with PT PLN**

Item	Terms
Modules	6 x 5MW
Power Capacity	30 MW
Minimum Tariff	USD12.5c per kWhr
Transmission Line	70kV interconnect to PLN incomer Ropa - Ende
Term of PPA	30 years

Source: ASX Announcement 8 October 2014

An initial transmission study proposal was submitted to PT PLN during January 2015. As at 30 October 2015, the project was awaiting approval on the transmission tariff from PL PTN. During the quarter ended 30 September 2015, Raya and PT Bakrie Power met with a European power group to discuss potential involvement in the Sokoria Geothermal Project.

#### **Ngebel Geothermal Project (Raya 35%)**

The Ngebel Geothermal Project has an expected power capacity of 165 MW and is located on the island of East Java in Indonesia. The project is a joint venture between Raya and PT Bakrie Power with Raya holding a 35% interest which was acquired during the financial year ended 30 June 2011.

An impairment charge was recorded against the full carrying value of the asset during the financial year ended 30 June 2015 and Raya has no further commitments to develop this project.

#### **Dairi Prima Geothermal Project (Raya 51%)**

The Dairi Prima Geothermal Project has an expected power capacity of 25MW and is located in northern Sumatra. The project is a joint venture between Raya and PT Bakrie Power with Raya holding a 51% interest which was acquired during the financial year ended 30 June 2010.

An impairment charge was recorded against the full carrying value of the asset during the financial year ended 30 June 2015 however Raya may consider development of the project in the future.

#### **Limestone Coast Project (Raya 100%)**

The Limestone Coast Project is in the area covered by Geothermal Exploration Licence ('GEL') 611 in the south-east of South Australia. It was originally acquired in October 2007 through the acquisition of 100% of the issued shares of Scopenergy Pty Ltd.

The project was fully impaired during the financial year ended 30 June 2012. Raya stated that it would not commit any significant amounts of its own funds to the projects until the Australian government committed substantial financial support to the industry. The project is in a maintenance phase with work undergoing for licence renewals to ensure that the tenement remains in good standing.

#### **Penola Trough Project (Raya 100%)**

The Penola Trough Project is in the area covered by GEL 223 in the south-east of South Australia. It was originally acquired in December 2008 through the acquisition of 100% of Osiris Energy Limited, an unlisted geothermal exploration company.

The project was fully impaired during the financial year ended 30 June 2012. Raya stated that it would not commit any significant amounts of its own funds to the projects until the Australian government committed substantial financial support to the industry. The project is in a maintenance phase with work undergoing for licence renewals to ensure that the tenement remains in good standing.

### 5.1.2 Overview of Raya's Prior USA Oil and Gas Project

During the quarter ended December 2014, Raya acquired oil and gas leases within an identified Area of Interest in northern Oklahoma. The leases were acquired with a 100% Working Interest and an 81.25% Net Revenue Interest with a 3 year primary term and a 2 year bonus term. During February 2015, Raya entered into a Joint Operating Agreement with Empire Energy Limited to undertake a low cost vertical well development program on an Area of Mutual Interest in northern Oklahoma.

Due to the downturn in oil prices, in June 2015, Raya executed a Purchase and Sale Agreement with Pryme Energy Limited ('PYM') for the sale of the oil and gas leases. For Tranche 1 of the consideration, Raya received 100 million fully paid PYM shares and \$250,000. Tranche 2 and 3 consideration payments of \$350,000 in total are conditional on each of the 2 wells drilled containing equal to or greater than 31 Mbo of oil and 200 MMcf of natural gas. The Directors of Raya believe it is likely that the Tranche 2 and 3 consideration payments will be received.

In July 2015, Raya purchased an additional 35,014,214 shares in PYM for \$162,500.

On 12 October 2015, Raya sold its entire PYM holdings via on market trades and received \$667,000 after brokerage.

## 5.2 Equity Structure of Raya

Table 5.2 below summarises the shares issued by Raya since 30 June 2013.

**Table 5.2: Summary of Raya's contributed equity**

	No. of Ordinary Shares	Issue Price (\$)
<b>Balance at 30 June 2013</b>	<b>166,983,029</b>	<b>43,288,755</b>
Issue of shares - Share Purchase Plan, Melbourne Capital	122,000,000	1,220,000
Issue of shares - Share Purchase Plan, Directors	17,500,000	175,000
Issue of shares - Share Purchase Plan, Sophisticated Investors	16,000,000	165,000
Issue of shares - Melbourne Capital compensation	20,000,000	200,000
Share issue expenses	0	(385,831)
<b>Balance at 30 June 2014</b>	<b>342,483,029</b>	<b>44,662,924</b>
Issue of shares - Share Purchase Plan, Sophisticated Investors	16,666,667	250,000
Issue of shares - Placement, ASC Resources Pty Ltd	33,333,333	500,000
Issue of shares - Placement, ASC Resources Pty Ltd	10,000,000	150,000
Issue of shares - Placement, Peloton Capital Pty Ltd	2,500,000	37,500
Issue of shares - Share Purchase Plan, Sophisticated Investors	20,000,000	200,000
Issue of shares - Share Purchase Plan, Sophisticated Investors	66,916,667	401,500
Issue of shares - Sophisticated Investors	108,100,304	540,500
Share issue expenses	0	(115,901)
<b>Balance at 30 June 2015</b>	<b>600,000,000</b>	<b>46,626,523</b>
Issue of shares - Directors	40,000,000	20,000
Issue of shares - Sophisticated Investors <sup>(a)</sup>	30,000,000	600,000
Issue of shares - Exercise of options	200,000	3,000
Issue of shares - Exercise of options	1,000,000	15,000
Issue of shares - Sophisticated Investors <sup>(a)</sup>	40,000,001	1,400,000
Issue of shares - Exercise of options	1,076,450	16,147
Issue of shares - Exercise of options	3,450,000	51,750

	No. of Ordinary Shares	Issue Price (\$)
Issue of shares - Exercise of options	1,870,000	28,050
Issue of shares - Exercise of options	492,860	7,393
Issue of shares - Exercise of options	275,000	4,125
<b>Balance at 8 January 2016</b>	<b>718,364,311</b>	<b>48,771,988</b>

Source: *Raya 2014-2015 Annual Report and BDO CFQ analysis of Raya announcements*

(a) *These shares are to be held in voluntary escrow until the completion of the Proposed Transaction.*

In addition to the ordinary shares referred to above, Raya also has the following options on issue as at 11 January 2016:

- 381,352,357 listed options to acquire ordinary shares exercisable at \$0.015 expiring 21 July 2016;
- 475,000 unlisted options to acquire ordinary shares exercisable at \$0.75 expiring 15 December 2016;
- 425,000 unlisted options to acquire ordinary shares exercisable at \$1.00 expiring 15 December 2016;
- 100,000 unlisted options to acquire ordinary shares exercisable at \$1.25 expiring 15 December 2016; and
- 100,000 unlisted options to acquire ordinary shares exercisable at \$1.50 expiring 15 December 2016.

### 5.2.1 Top 10 Shareholders of Raya Ordinary Shares

The top 10 shareholders of Raya ordinary shares as at 14 January 2016 are set out in Table 5.3 below. Table 5.3 does not consider the impacts of any changes in shareholding arising from the Proposed Transaction.

**Table 5.3: Top 10 Raya Shareholders as at 14 January 2016**

	Shareholder	Number of Shares <sup>(a)</sup>	Percentage of Total Shares (%)
1	Dalex Pty Ltd	36,700,000	5.66
2	Aegian Pal Pty Ltd	25,000,000	3.86
3	Sparke Enterprises Pty Ltd	21,350,000	3.29
4	Red And White Holdings Pty Ltd	13,504,922	2.08
5	Mr Arash Doudman	12,197,999	1.88
6	Medek Investments Pty Ltd	8,992,315	1.39
7	Romfal Sifat Pty Ltd	8,650,011	1.33
8	Citicorp Nominees Pty Limited	8,172,432	1.26
9	J P Morgan Nominees Australia Limited	7,407,590	1.14
10	Linemark Investments Pty Ltd	6,000,000	0.93

Source: *Raya Shareholder Register, 14 January 2016*

(a) *The number of shares does not include the 30,000,000 and 40,000,001 ordinary shares held in voluntary escrow until completion of the Proposed Transaction*

### 5.3 Trading of Raya Shares on the ASX

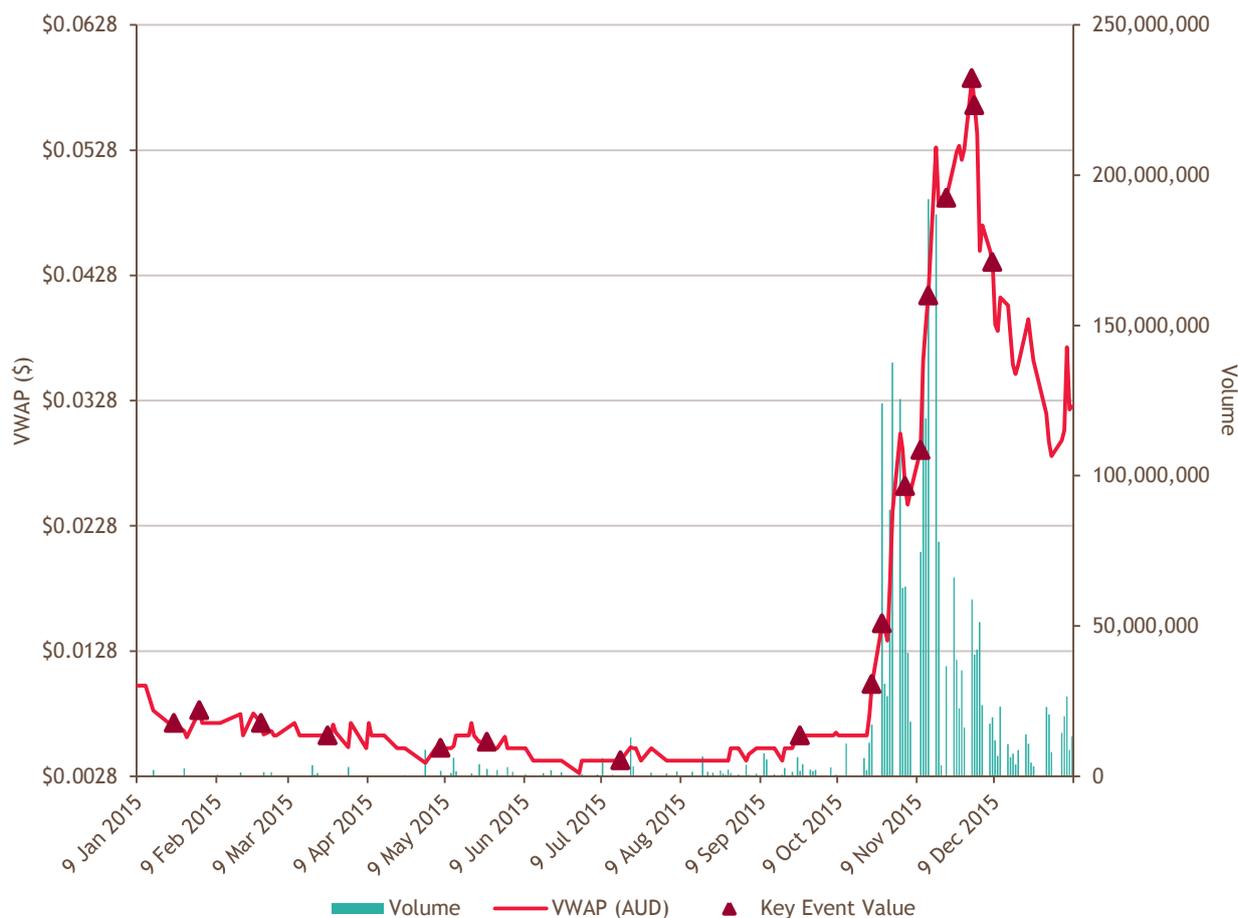
This section sets out our analysis of the share market performance of Raya by considering:

- The recent price of Raya shares listed on the ASX; and
- The liquidity of Raya shares.

#### 5.3.1 Raya's Share Price

Raya's shares are listed on the ASX. Figure 5.2 below sets out Raya's daily volume weighted average price ('VWAP') and volume traded over the period from 9 January 2015 to 8 January 2016.

Figure 5.2: Raya's Daily VWAP from 9 January 2015 to 8 January 2016



Source: Capital IQ as at 11 January 2016

Over the period graphed in Figure 5.2, the Raya daily VWAP shows a period low of \$0.0030 on 30 June 2015 and a period high of \$0.0585 on 30 November 2015.

In addition to the share price and trading data, we have also provided additional information in this Report to assist readers to understand possible reasons for movements in Raya's share price and volume of share trades over the time period analysed. We have provided a summary of Raya's announcements over the period from 9 January 2015 to 8 January 2016 in Table 5.4 below.

Table 5.4: Summary of Raya's Announcements over the period from 9 January 2015 to 8 January 2016

Date	Announcement
23 January 2015	Raya announced that Raya and PT Bakrie Power had entered into an agreement with Space Con Pty Ltd to sell an 85% stake in PT Sokoria Geothermal Indonesia for \$2 million.
2 February 2015	Raya announced that its US Subsidiary had executed formal documents in relation to a Joint Venture with the US subsidiary of Empire Energy Group.
26 February 2015	Raya announced that it had received \$0.40 million in funding.
23 March 2015	Raya announced that the agreement between Raya, PT Bakrie Power and Space Con Pty Ltd was terminated.
7 May 2015	Raya announced that it expected to receive \$0.54 million in funding.
25 May 2015	Raya announced that it had appointed Brendan De Kauwe as Non-Executive Director.
17 July 2015	Raya announced that it had changed its share registry provider to Automic Registry Services for shareholders.
24 September 2015	Raya held Special/Extraordinary Shareholders Meeting.

Date	Announcement
22 October 2015	Raya announced that Daniel Lanskey had retired from the board.
26 October 2015	Raya announced that it had signed a Heads of Agreement to acquire a 95.6% stake in Xped Holdings Limited.
4 November 2015	Raya announced that it had received the right to acquire 100% of Xped Holdings Limited.
10 November 2015	Raya announced that it had raised \$0.60 million through private placement to a strategic Asian based technology investor.
13 November 2015	Raya announced that Xped and a leading chip manufacturer were collaborating to accelerate the market adoption of ADRC technology.
20 November 2015	Raya announced a \$1.4 million institutional placement at \$0.035 per share.
30 November 2015	Raya announced that it expects to receive an R&D rebate of \$64,500.
1 December 2015	Raya announced that Raya and Xped have formally and satisfactorily completed their due diligence and Raya will now proceed forward in acquiring 100% of the shares in Xped.
8 December 2015	Raya announced that it had appointed KTM Capital as lead manager to raise up to \$6.8 million for the proposed prospectus offering.

Source: ASX Announcements, Capital IQ, Raya 2015 Annual Report and Raya September 2015 Quarterly Report

In Table 5.5 below we have set out Raya's VWAP for the 1 week, 1 month, 3 months, 6 months, 9 months and 12 months prior to 26 October 2015, being the date Raya publicly announced the Proposed Transaction, and 8 January 2016. We have set out Raya's VWAP prior to 26 October 2015 to provide additional information regarding Raya's share price performance excluding the effects of the Proposed Transaction.

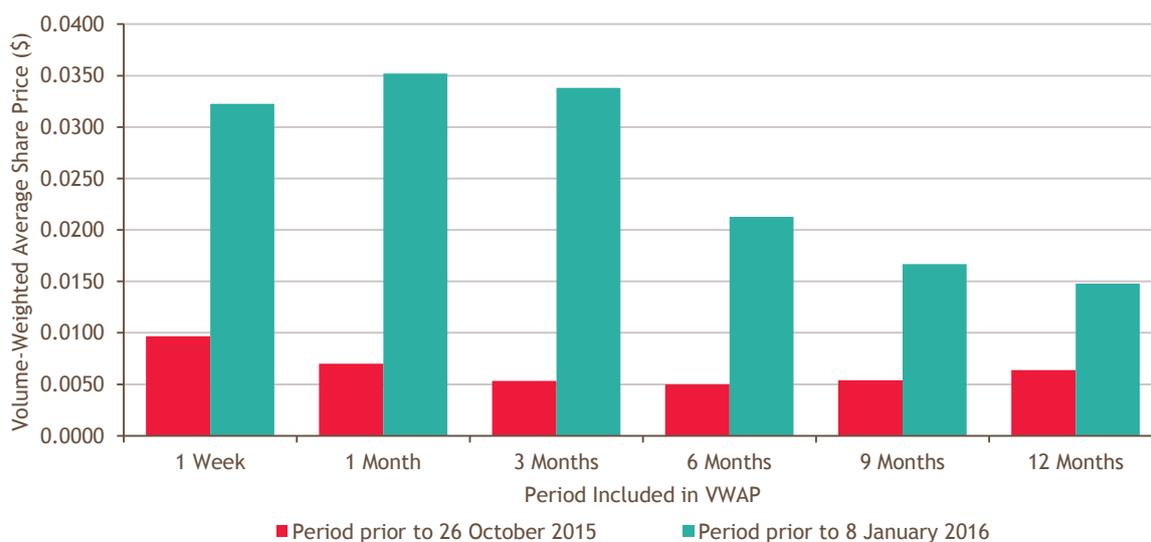
**Table 5.5: Raya's VWAP prior to 26 October 2015 and 8 January 2016**

Period before 26 October 2015	VWAP (\$)	Period before 8 January 2016	VWAP (\$)
1 Week	0.0097	1 Week	0.0323
1 Month	0.0070	1 Month	0.0352
3 Months	0.0053	3 Months	0.0338
6 Months	0.0050	6 Months	0.0213
9 Months	0.0054	9 Months	0.0167
12 Months	0.0064	12 Months	0.0148

Source: Capital IQ as at 11 January 2016

The information set out in Table 5.5 above is also expressed graphically in Figure 5.3 below.

Figure 5.3: Raya VWAP over Specified Periods



Source: Capital IQ as at 11 January 2016

### 5.3.2 Liquidity of Raya Shares

Table 5.6 below summarises the monthly liquidity of Raya shares from November 2014 to 8 January 2016. Liquidity has been summarised by considering the following:

- Volume of Raya trades per month;
- Total value of trades per month;
- Volume of Raya trades per month as a percentage of total Raya shares on issue at the end of the month; and
- Monthly VWAP.

Table 5.6: Liquidity of Raya Shares

Month	Volume	Value of Trades	Shares Outstanding <sup>(a)</sup>	Volume per Shares Outstanding	Monthly VWAP
January 2016 (to 8th)	83,015,480	2,776,240	718,309,310	11.56%	\$0.0334
December 2015	358,059,160	15,056,480	717,062,170	49.93%	\$0.0421
November 2015	1,384,258,760	57,421,580	668,060,680	207.21%	\$0.0415
October 2015 (from 26th)	407,875,790	7,978,020	640,000,000	63.73%	\$0.0196
<b>Total Post Transaction Announcement</b>	<b>2,233,209,190</b>	<b>83,232,320</b>	<b>685,858,040</b>	<b>325.61%</b>	<b>\$0.0373</b>
October 2015 (to 22nd)	51,262,540	426,840	614,545,450	8.34%	\$0.0083
September 2015	41,952,020	223,200	600,000,000	6.99%	\$0.0053
August 2015	20,565,140	82,010	600,000,000	3.43%	\$0.0040
July 2015	26,139,560	121,950	600,000,000	4.36%	\$0.0047
June 2015	11,317,420	49,780	600,000,000	1.89%	\$0.0044
May 2015	30,091,750	156,740	515,064,050	5.84%	\$0.0052
April 2015	4,242,750	28,210	491,899,700	0.86%	\$0.0066
March 2015	8,124,030	50,950	491,899,700	1.65%	\$0.0063
February 2015	4,468,230	31,110	424,983,030	1.05%	\$0.0070
January 2015	6,079,540	39,800	412,255,760	1.47%	\$0.0065
December 2014	8,173,860	65,510	404,983,030	2.02%	\$0.0080
November 2014	2,976,220	34,790	404,983,030	0.73%	\$0.0117
<b>Total Pre Transaction Announcement</b>	<b>215,393,060</b>	<b>1,310,890</b>	<b>513,384,479</b>	<b>41.96%</b>	<b>\$0.0061</b>

Source: Capital IQ as at 11 January 2016

(a) Average number of shares outstanding including escrowed shares

Having regard to Table 5.6 above we note the following:

- Pre-Announcement of the Proposed Transaction: Based on an average number of 513,384,479 Raya shares on issue, approximately 41.96% of Raya shares on issue were traded over the period from 1 November 2014 to 22 October 2015. We consider that Raya exhibited low to medium liquidity over the period prior to the announcement; and
- Post-Announcement of the Proposed Transaction: Based on an average number of 685,858,040 Raya shares on issue, approximately 325.61% of Raya shares on issue were traded over the period from 26 October 2015 to 8 January 2016. We consider that Raya exhibited high levels of liquidity over the period post the announcement.

#### 5.4 Raya Historical Financial Information

This section of this Report sets out the historical financial information of Raya. As this Report contains only summarised historical financial information, we recommend that any user of this Report read and understand the additional notes and financial information contained in Raya's annual reports which include the full statements of comprehensive income, statements of financial position and statements of cash flows.

Raya's accounts were audited by Pitcher Partners. BDO CFQ has not performed any audit or review of any type on the historical financial information of Raya. We make no statement as to the accuracy of the information provided. However, we have no reason to believe that the information is misleading.

##### 5.4.1 Comprehensive Income

The consolidated statements of comprehensive income of Raya for the 12 months ended 30 June 2013, 2014 and 2015 are summarised in Table 5.7 below.

**Table 5.7: Summarised Raya Statements of Comprehensive Income**

	12 Months Ended 30-Jun-13 Audited (\$)	12 Months Ended 30-Jun-14 Audited (\$)	12 Months Ended 30-Jun-15 Audited (\$)
<b>Revenue and other income from continuing operations</b>	<b>318,377</b>	<b>297,730</b>	<b>201,678</b>
Employee and contracting expenses	(945,875)	(341,725)	(407,745)
Finance costs	(4,671)	(5,246)	(4,292)
Consulting and advisory fees	(255,272)	(270,451)	(56,749)
Office running costs	(189,912)	(156,036)	(103,586)
Travel	(164,445)	(87,860)	(114,332)
Reporting expenses	(106,272)	(66,972)	(71,406)
Office rentals	(89,201)	-	-
Accounting and audit fees	(86,428)	(88,500)	(111,500)
Depreciation and amortisation	(23,192)	-	-
Legal fees	(43,936)	(19,936)	(31,892)
Impairment of capitalised tenement costs	(1,976,358)	(1,563)	(2,090,265)
Impairment of capitalised joint venture costs	-	(132,509)	-
Fair value loss on investments	-	(8,333)	(133,500)
Other expenses	(67,770)	-	-
<b>Total expenses</b>	<b>(3,953,332)</b>	<b>(1,179,131)</b>	<b>(3,125,267)</b>
<b>Profit/(Loss) before tax</b>	<b>(3,634,955)</b>	<b>(881,401)</b>	<b>(2,923,589)</b>
Income tax expense	-	-	-
<b>Profit/(Loss) after tax</b>	<b>(3,634,955)</b>	<b>(881,401)</b>	<b>(2,923,589)</b>
Other comprehensive income	-	-	-
<b>Total comprehensive income</b>	<b>(3,634,955)</b>	<b>(881,401)</b>	<b>(2,923,589)</b>

Source: Raya 2013-15 Annual Reports

In relation to the financial performance of Raya set out in Table 5.7 above we note the following:

- Raya has experienced net loss in total comprehensive income in all periods reported;
- Raya impaired capitalised tenement costs in FY2013 and FY2015. Approximately \$2.0 million was impaired in FY2013 in relation to exploration and evaluation expenditure relating to Indian tenements. Approximately \$2.1 million was impaired in FY2015 in relation to exploration and evaluation expenditure relating to the Dairi Primi and Ngebel tenements in Indonesia;
- Raya impaired \$0.1 million against SGI, its joint venture with PT Bakrie Power in Indonesia in FY2014; and
- R & D tax concessions comprise the majority of Raya's revenues.

#### 5.4.2 Financial Position

The consolidated statements of financial position of Raya as at 30 June 2013, 2014 and 2015 are summarised in Table 5.8 below.

**Table 5.8: Summarised Raya Statements of Financial Position**

	As at 30-Jun-13 Audited (\$)	As at 30-Jun-14 Audited (\$)	As at 30-Jun-15 Audited (\$)
<b>Current assets</b>			
Cash and cash equivalents	187,672	528,062	414,146
Trade and other receivables	99,360	13,562	36,646
Other financial assets	-	91,667	3,167
<b>Total current assets</b>	<b>287,032</b>	<b>633,291</b>	<b>453,959</b>
<b>Non-current assets</b>			
Other financial assets	100,000	100,000	100,000
Exploration and evaluation expenditure	1,955,560	1,953,997	1,100,000
Investments accounted for using the equity method	1,770,204	1,828,704	1,880,212
<b>Total non-current assets</b>	<b>3,825,764</b>	<b>3,882,701</b>	<b>3,080,212</b>
<b>Total assets</b>	<b>4,112,796</b>	<b>4,515,992</b>	<b>3,534,171</b>
<b>Current liabilities</b>			
Trade and other payables	278,305	126,628	97,710
Borrowings	37,122	13,227	20,314
Provisions	-	81,332	-
<b>Total current liabilities</b>	<b>315,427</b>	<b>221,187</b>	<b>118,024</b>
<b>Non-current liabilities</b>			
Provisions	271,106	189,774	271,106
<b>Total non-current liabilities</b>	<b>271,106</b>	<b>189,774</b>	<b>271,106</b>
<b>Total liabilities</b>	<b>586,533</b>	<b>410,961</b>	<b>389,130</b>
<b>Net assets</b>	<b>3,526,263</b>	<b>4,105,031</b>	<b>3,145,041</b>
<b>Equity</b>			
Contributed equity	43,288,755	44,662,924	46,626,523
Reserves	2,330,204	2,416,204	2,416,204
Accumulated losses	(42,092,696)	(42,974,097)	(45,897,686)
<b>Total equity</b>	<b>3,526,263</b>	<b>4,105,031</b>	<b>3,145,041</b>

Source: Raya 2013-15 Annual Reports

In relation to the financial position of Raya set out in Table 5.8 above we note the following:

- Other financial assets relate to term deposits held as security in favour of the South Australia Government for the Limestone Coast tenements. The term deposits are recognised and measured as held-to-maturity financial assets;

- Capitalised exploration and evaluation expenditure declined significantly in FY2015 due to impairment;
- A portion of provisions, which relates to rehabilitation expenses, was classified as current liabilities in FY2014 as work was expected to be carried out in FY2015. However this was re-classified back to non-current liabilities in FY2015 as the work has been pushed back to future years; and
- Contributed equity increased from \$43.3 million in FY2013 to \$44.7 million in FY2014 and \$46.7 million in FY2015 due to the issue of shares set out above in Section 5.2.

#### 5.4.3 Cash Flows

The consolidated statement of cash flows of Raya for the 12 month periods ended 30 June 2013, 2014 and 2015 are summarised in Table 5.9 below.

**Table 5.9: Summarised Raya Statements of Cash Flow**

	12 Months Ended 30-Jun-13 Audited (\$)	12 Months Ended 30-Jun-14 Audited (\$)	12 Months Ended 30-Jun-15 Audited (\$)
<b>Cash flows from / (used in) operating activities</b>			
Interest received	10,092	12,918	5,020
Interest paid	(4,671)	(5,246)	(4,292)
R&D tax concession received	308,285	284,812	196,658
Payments to suppliers and employees	(1,368,029)	(1,011,357)	(768,918)
<b>Net cash flows from / (used in) operating activities</b>	<b>(1,054,323)</b>	<b>(718,873)</b>	<b>(571,532)</b>
<b>Cash flows from / (used in) investing activities</b>			
Payments for exploration and evaluation assets	(815,007)	(191,011)	(1,280,569)
Proceeds from term deposits and others	33,272	-	-
Payments for other financial assets	-	(100,000)	(45,000)
<b>Net cash flows from / (used in) investing activities</b>	<b>(781,735)</b>	<b>(291,011)</b>	<b>(1,325,569)</b>
<b>Cash flows from / (used in) financing activities</b>			
Proceeds from borrowings	-	-	7,086
Repayment of borrowings	(10,179)	(23,896)	-
Proceeds from share issues	1,962,665	1,474,000	1,892,000
Share issue costs	(280,542)	(99,830)	(115,901)
<b>Net cash flows from / (used in) financing activities</b>	<b>1,671,944</b>	<b>1,350,274</b>	<b>1,783,185</b>
<b>Net increase / (decrease) in cash held</b>	<b>(164,115)</b>	<b>340,390</b>	<b>(113,916)</b>
Opening cash balance	351,787	187,672	528,062
<b>Closing cash balance</b>	<b>187,672</b>	<b>528,062</b>	<b>414,146</b>

Source: Raya 2013-15 Annual Reports

In relation to the cash flows of Raya set out in Table 5.9 above we note the following:

- Payments for exploration and evaluation assets in FY2015 mostly relate to US oil and gas tenements; and
- Raya's operating and investing activities have been funded by proceeds from share issues from financing activities since the beginning of FY2013.

## 6.0 Overview of Xped

### 6.1 Description of Xped

Xped Holdings Limited is an unlisted technology company founded in 2008 with the aim to commercialise Internet of Things ('IoT') technology. The current status quo within technology is that remote controls are produced for specific devices and are not compatible with any other device. Xped is working to develop a solution whereby any smart phone or tablet can replace the functions of multiple remote control devices. Xped aims to achieve this through developing auto-discovery remote control ('ADRC') technology so devices can communicate with people and other devices via a generic device browser and a common language based on XML.

As at October 2015, Xped had applied for 8 patents of which 2 had been granted, 5 were in national phase and 1 was in provisional phase.

Xped's proposed core business is to licence ADRC for integration into third party products. The 3 proposed business areas are:

- IP Licensing: IP can be packaged and licenced in several forms including the supply of software stacks, pre-programmed chips or chips on a module to semiconductor businesses, product designers and manufacturers;
- Seed market: designing a range of consumer products which include the ADRC technology, licensing the designs, and contracting third party manufacturers to manufacture and sell the products. Xped would receive a royalty for the products produced; and
- Service revenue: ADRC technology could be leveraged to provide cloud and e-commerce services. Xped is exploring ways to commercialise these services with partners.

### 6.2 Overview of IoT Industry

IoT requires the production of things that can communicate via the internet with people or with other things. While the IoT is deemed a new field, the principles behind IoT have been adopted within the manufacturing, mining and defence industries for many decades. The recent developments have involved taking this traditional process control ideology and applying it to everyday life. The main difference is that in the past, this took place in highly controlled environments with heavily engineered solutions while the current push into IoT is driven by consumer style devices, low power and sparsely connected environments.

Further information on the Xped technology is set out in the 'Technical Expert Review' report prepared by Flocom Consulting ('the Flocom Report') and attached as Appendix D to this Report. The Flocom Report is dated 15 December 2015 and prepared by Dr Daniel Floreani.

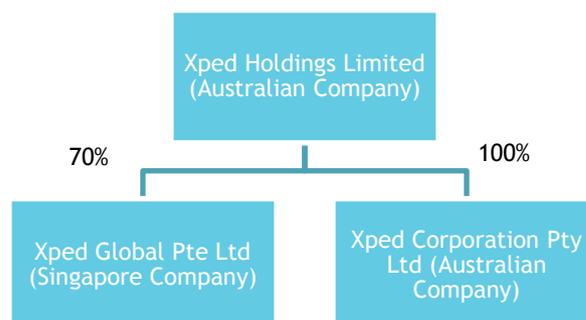
The Flocom Report attached as Appendix D addresses the following matters:

- The current state of the IoT market and how Xped fits within this market;
- A description of, and comments on, the Xped business model;
- A description of the Xped solution, an analysis of the key technical functions, and lists of competitive technology and vendors; and
- A list of technical risks in the IoT marketplace.

### 6.3 Corporate Structure of Xped

Figure 6.1 below illustrates the group structure of Xped prior to the Proposed Transaction.

Figure 6.1: Xped Structure Prior to the Proposed Transaction



Source: Xped Management

With reference to Figure 6.1 above, we note the following:

- Xped Holdings Limited is a non-trading IP holding company that is listed on the Australian Small Scale Offering Board ('ASSOB');
- Xped Corporation Pty Ltd is the operating entity that pays staff and other operating expenses;
- Xped Global Pte Ltd is domiciled in Singapore and is responsible for sales, marketing and customer support functions in Asia; and
- 30% of shares in Xped Global Pte Ltd are held by John Stefanac, a director of Xped, on trust for Xped Holdings Limited. Xped Holdings Limited beneficially holds 100% of Xped Global Pte Ltd.

### 6.3 Equity Structure of Xped

As at 23 November 2015, Xped had 111,584,080 shares on issue.

#### 6.3.1 Top 10 Shareholders of Xped Ordinary Shares

The shareholders of Xped ordinary shares as at 23 November 2015 are set out in Table 6.1 below.

Table 6.1: Xped Shareholders as at 23 November 2015

Shareholder	Number of Shares	Percentage of Total Shares (%)
1 JK Group Australia Pty Ltd	55,628,470	49.85
2 Alanticx Technologies Pty	45,514,203	40.79
3 Baldmonk Pty Ltd ACN 603	5,182,134	4.64
4 Chong Che Wong	2,500,000	2.24
5 Rdlk Pty Ltd ACN 141 986 030	1,000,000	0.90
6 Carol Ivy Michalicek	375,000	0.34
7 Kim Thye Toh	375,000	0.34
8 Ciaron Daniel Murphy House	325,933	0.29
9 William Tat-Nin Chang	250,840	0.22
10 David Moray Pringle	187,500	0.17
Other shareholders	245,000	0.22
<b>Total Shares on Issue</b>	<b>111,584,080</b>	<b>100.00</b>

Source: Xped Register Current Holdings, 23 November 2015

## 6.4 Trading of Xped Shares

In February 2015, Xped raised capital on the ASSOB in return for equity. Three rounds of investment were proposed:

- Round 1 offering: To receive 3,749,950 ordinary shares for the contribution of \$299,996 cash at 8 cents per share;
- Round 2 offering: To receive 4,166,600 ordinary shares for the contribution of \$499,992 cash at 12 cents per share; and
- Round 3 offering: To receive 14,285,500 ordinary shares for the contribution of \$1,999,970 cash at 14 cents per share.

Round 1 was taken up, and then the HOA was entered into with Raya.

## 6.5 Xped Historical Financial Information

This section of this Report sets out summarised historical financial information of Xped.

Xped's accounts for the 2013, 2014 and 2015 financial years have been audited by Bentleys (SA) Partnership. An audit opinion was issued by Bentleys (SA) Partnership for XPED, which included a qualification in relation to Bentley (SA) Partnership's inability to obtain sufficient and appropriate audit evidence regarding costs constituting the intangible asset, in addition to an emphasis of matter in relation to XPED's ability to continue as a going concern in the absence of the acquisition by the Company.

BDO CFQ has not performed any audit or review of any type on the historical financial information of Xped. We make no statement as to the accuracy of the information provided however we have no reason to believe that the information is misleading.

### 6.5.1 Comprehensive Income

The consolidated statement of comprehensive income of Xped for the 12 month periods ended 30 June 2013, 2014 and 2015 are summarised in Table 6.2 below.

**Table 6.2: Summarised Xped Statements of Comprehensive Income**

	12 Months Ended 30-Jun-13 Audited (\$)	12 Months Ended 30-Jun-14 Audited (\$)	12 Months Ended 30-Jun-15 Audited (\$)
Interest received	-	1,145	-
Government grants	22,500	-	-
R & D tax refund	335,003	301,156	377,804
<b>Total Income</b>	<b>357,503</b>	<b>302,301</b>	<b>377,804</b>
Accounting fees	(4,185)	(3,000)	(31,615)
Administration costs	-	(200)	-
Advertising	(3,838)	(3,248)	(23,952)
Bank charges	(1,363)	(699)	(2,092)
Computer expenses	(1,273)	(2,364)	(3,990)
Contract Work	(57,295)	(38,555)	(34,979)
CPA Global	-	(20,596)	(7,235)
Depreciation - plant and equipment	(19,798)	(19,904)	(7,826)
Depreciation - office furniture & equipment	(1,932)	(1,555)	(1,686)
Fees and Permits	(460)	(26,670)	(15,895)
Freight & cartage	(7,811)	(3,462)	(4,615)
Global funding partners	-	-	(3,600)
Internet expenses	(718)	(539)	(4,201)
Legal expenses	(26,404)	(22,851)	(20,305)
Materials	(40,917)	(43,268)	(61,311)

	12 Months Ended 30-Jun-13 Audited (\$)	12 Months Ended 30-Jun-14 Audited (\$)	12 Months Ended 30-Jun-15 Audited (\$)
Patent & trademark fees	(189,828)	(132,061)	(155,330)
Printing	(482)	(258)	(1,330)
Professional fees	-	(17,625)	-
Repairs and maintenance	-	(535)	-
R & D devices	-	-	-
R & D tax consultancy	(5,625)	(1,250)	(6,875)
Staff training & welfare	(3,158)		
Subcontractors	(161,535)	(146,112)	(204,648)
Subscriptions	(7,955)	(7,285)	(2,172)
Sundry expenses	(1,462)	(1,479)	(5,916)
Superannuation contributions	(30,435)	(26,003)	(21,724)
Telephone	(1,622)	(1,266)	(1,784)
Travelling expenses	(3,784)	(11,950)	(15,511)
Wages	(363,184)	(310,274)	(243,394)
Workercover	(1,549)	(1,345)	(906)
<b>Total expenses</b>	<b>(936,613)</b>	<b>(844,354)</b>	<b>(882,892)</b>
<b>Profit/(Loss) before tax</b>	<b>(579,110)</b>	<b>(542,053)</b>	<b>(505,088)</b>
Income tax expense	-	-	-
<b>Profit/(Loss) after tax</b>	<b>(579,110)</b>	<b>(542,053)</b>	<b>(505,088)</b>

Source: Xped 2013-2015 Financial Statements

In relation to the financial performance of Xped set out in Table 6.2 above we note the following:

- Xped's main source of income in recent years is from R & D tax offsets;
- Xped's main expenditure relates to wages and subcontractors;
- A significant portion of Xped's expenditure relates to patent & trademark fees;
- Xped has experienced net losses in all periods reported; and
- To align the accounting policies of Xped with the Combined Entity, the financial information set out in schedule 7 of the EM includes a number of adjustments as follows:
  - Write-off of existing Xped intangible assets which are deemed to not meet the capitalisation requirements under the accounting standards;
  - Recognition of Xped employee back pay totalling \$159,158 owing at 30 June 2015 to be settled by way of provision of equity by majority shareholders; and
  - Recognition of unpaid Xped employee benefits totalling \$147,166 owing at 30 June 2015, including on costs.

## 6.5.2 Financial Position

The consolidated statements of financial position of Xped as at 30 June 2013, 2014 and 2015 are summarised in Table 6.3 below.

**Table 6.3: Summarised Xped Statements of Financial Position**

	As at 30-Jun-13 Audited (\$)	As at 30-Jun-14 Audited (\$)	As at 30-Jun-15 Audited (\$)
<b>Current assets</b>			
Cash and cash equivalents	7,333	6,119	1,574
Trade and other receivables	356,647	305,852	397,859
Other financial assets	-	-	69
<b>Total current assets</b>	<b>363,980</b>	<b>311,971</b>	<b>399,502</b>
<b>Non-current assets</b>			
Property	32,540	11,081	11,926
Intangible assets	1,400	4,394,385	4,394,385
<b>Total non-current assets</b>	<b>33,940</b>	<b>4,405,466</b>	<b>4,406,311</b>
<b>Total assets</b>	<b>397,920</b>	<b>4,717,437</b>	<b>4,805,813</b>
<b>Current liabilities</b>			
Trade and other payables	132,670	187,234	360,788
Cash overdraft	-	-	26,565
Income in advance	-	-	28,686
<b>Total current liabilities</b>	<b>132,670</b>	<b>187,234</b>	<b>416,039</b>
<b>Non-current liabilities</b>			
Financial liabilities	5,352,550	5,766,571	5,986,630
<b>Total non-current liabilities</b>	<b>5,352,550</b>	<b>5,766,571</b>	<b>5,986,630</b>
<b>Total liabilities</b>	<b>5,485,220</b>	<b>5,953,805</b>	<b>6,402,669</b>
<b>Net assets</b>	<b>(5,087,300)</b>	<b>(1,236,368)</b>	<b>(1,596,856)</b>
<b>Equity</b>			
Issued capital	1,320	1,320	145,920
Reserves	499,880	499,880	499,880
Retained earnings	(5,588,500)	(1,737,568)	(2,242,656)
<b>Total equity</b>	<b>(5,087,300)</b>	<b>(1,236,368)</b>	<b>(1,596,856)</b>

Source: Xped 2013-2015 Financial Statements

In relation to the financial position of Xped set out in Table 6.3 above we note the following:

- Intangible assets relate to capitalised development costs. We note that previously, these costs were expensed, however development costs were restated in 2015 (including the 2014 year) to include costs up to FY2011. The large variation in retained earnings is also the result of this reclassification;
- Most of the financial liability relates to loans owing to JKR Corporation Pty Ltd;
- Trade and other payables have increased significantly from FY2013 to FY2015 despite total expenses remaining relatively flat; and
- A number of adjustments, as described in Section 6.5.2 above, have been made to align the accounting policies of Xped with the Combined Entity including to write off intangible assets, recognise employee back pay and to recognise unpaid employee entitlements.

### 6.5.3 Cash Flows

The consolidated statement of cash flows of Xped for the 12 month periods ended 30 June 2013, 2014 and 2015 are summarised in Table 6.4 below.

**Table 6.4: Summarised Xped Statements of Cash Flow**

	12 Months Ended 30-Jun-13 Audited (\$)	12 Months Ended 30-Jun-14 Audited (\$)	12 Months Ended 30-Jun-15 Audited (\$)
<b>Cash flows from / (used in) operating activities</b>			
Payments to suppliers and employees	-	(773,002)	(681,033)
Interest received	-	1,145	-
Interest paid	-	(25)	(4,201)
R & D tax offset received	-	335,003	301,156
GST received/(paid)	-	21,644	(1,335)
<b>Net cash flows from / (used in) operating activities</b>	<b>-</b>	<b>(415,235)</b>	<b>(385,413)</b>
<b>Cash flows from / (used in) investing activities</b>			
Payment for plant and equipment	-	-	(10,357)
<b>Net cash flows from / (used in) investing activities</b>	<b>-</b>	<b>-</b>	<b>(10,357)</b>
<b>Cash flows from / (used in) financing activities</b>			
Proceeds from borrowings - related parties	-	414,021	220,061
Proceeds from share issue	-	-	144,600
<b>Net cash flows from / (used in) financing activities</b>	<b>-</b>	<b>414,021</b>	<b>364,661</b>
<b>Net increase / (decrease) in cash held</b>	<b>-</b>	<b>(1,214)</b>	<b>(31,109)</b>
Opening cash balance	7,333	7,333	6,119
<b>Closing cash balance</b>	<b>7,333</b>	<b>6,119</b>	<b>(24,990)</b>

Source: Xped 2013-2015 Financial Statements

In relation to the cash flows of Xped set out in Table 6.4 above we note that operating activities are mainly funded by R&D tax offsets received.

## 7.0 Overview of the Combined Entity

### 7.1 Combined Entity Company Overview

Under the Proposed Transaction, Raya will obtain a 100% interest in Xped. It is intended that Xped will remain a wholly owned subsidiary of the listed entity and that the listed entity will change its name from Raya to 'Xped Limited'.

The Combined Entity's operations will focus on the commercialisation of Xped's IoT technology given the Directors' of Raya's view that Xped represents a greater opportunity to realise revenue over a shorter time frame relative to Raya's geothermal assets.

It is the intention of the Combined Entity to continue to seek a strategic partner for the Sokoria Geothermal Project or consider divestment. There has been limited interest in the other Geothermal Exploration Assets and the Combined Entity intends on divesting these assets in a cost effective manner.

### 7.2 Directors and Management

At the date of this Report, the Directors of Raya are Mr Athan Lekkas, Mr Michael Clarke and Mr Brendan de Kauwe. Mr Brendan de Kauwe intends to resign as a Director immediately following the Proposed Transaction.

On completion of the Proposed Transaction, the following directors will be appointed:

- John Schultz - Executive Director;
- Christopher Wood - Executive Director and Chairman; and
- Mr Athan Lekkas and Mr Michael Clarke - Executive Directors.

Further, on completion of the Proposed Transaction, the existing Xped management team will be retained in the Combined Entity and John Stefanac will be engaged as 'Head of Asia'.

### 7.3 Pro Forma Financial Information

Raya shareholders should refer to schedule 7 of the Explanatory Memorandum for further information in relation to the pro forma financial position of the Combined Entity.

## 8.0 Value of Raya on a Minority Interest Basis Prior to the Proposed Transaction

This section sets out our valuation of Raya shares prior to the Proposed Transaction and is structured as follows:

- Section 8.1 sets out our view of the most appropriate methodology to adopt to value each Raya share;
- Section 8.2 sets out our calculation of the value of each Raya share using the market based valuation methodology;
- Section 8.3 sets out an allocation of Raya's market based valuation to Raya's asset value prior to the Proposed Transaction; and
- Section 8.4 sets out our view on the most appropriate value per Raya share prior to the Proposed Transaction to adopt for the purpose of assessing the fairness of the Proposed Transaction.

### 8.1 Valuation Approach

In our view, the MBV methodology is the most appropriate methodology to apply in order to calculate the value of shares in Raya for reasons which include:

- Raya's shares are listed on the ASX and it is possible to observe the market price of trades in Raya shares; and
- Raya has issued a significant number of shares from 1 July 2014 to 22 October 2015 which resulted in an 86.87% increase in shares on issue (i.e. from 342,483,030 shares to 640,000,000 shares).

To provide additional information to the non-associated shareholders of Raya we have attributed the total value calculated to each of Raya's identifiable assets and liabilities with the residual being attributed to Raya's geothermal exploration assets ('Geothermal Exploration Assets'). We have considered this residual value to determine whether it provides any information to suggest that our MBV methodology is unreasonable in the circumstances. To the extent relevant, in completing this analysis, we have considered the future cash flows prepared by Raya for the Sokoria Geothermal Project (the only one of Raya's assets sufficiently developed to have future cash flows prepared) and the discounted value of these cash flows.

In our view, it is not appropriate to apply a CME valuation methodology given Raya does not generate an earnings stream suitable for use in a CME valuation at the current time. We are informed that the Directors of Raya do not expect this to change in the immediate future.

### 8.2 Market Based Valuation of Raya prior to the Proposed Transaction

#### 8.2.1 Market Based Valuation - Minority Interest

To form a view on the MBV of Raya prior to the Proposed Transaction we have considered:

- ASX trading data; and
- Share issues made by Raya.

#### Consideration of Raya ASX Share Trading Data

To complete our market based valuation of Raya prior to the Proposed Transaction we have had regard to the Company's share trading performance in the period prior to the announcement of the Proposed Transaction. We have not considered the share trading performance of Raya post the announcement of the Proposed Transaction as, in our view, the prices at which the Company's shares have traded post the announcement of the Proposed Transaction may include value (positive or negative) attributed by the market in relation to the Proposed Transaction.

In relation to Raya's share market performance, we have considered a range of factors including the following:

- The VWAP of Raya shares traded on the ASX. We note that the VWAP of Raya shares over the 1 week, 1 month, 3 month, 6 month, 9 month and 12 month periods prior to 26 October 2015 ranged from \$0.0050 to \$0.0097. Refer to Section 5.3 of this Report for further information in relation to the trading of Raya shares on the ASX;

- The monthly VWAP of Raya shares ranged from \$0.0040 to \$0.0083 during the six months prior to and including October 2015 (based on calendar months). We have only considered the monthly VWAP of Raya for October 2015 up to 22 October 2015 to ensure that no trades are included post the announcement of the Proposed Transaction on 26 October 2015. Refer to Section 5.3 of this Report for further information in relation to the monthly VWAPs of Raya shares on the ASX; and
- In our view, the market for Raya shares exhibits a low to medium level of liquidity with a total of 41.96% of Raya shares outstanding being traded in the period from 1 November 2014 to 22 October 2015. Refer to Section 5.3 of this Report for further information in relation to the liquidity of Raya on the ASX.

### The Share Issues by Raya

Raya has completed numerous share placements over the period from 1 July 2014 to 14 October 2015 (the last capital raising date prior to the announcement of the Proposed Transaction). These capital raisings have been primarily to fund the Company's development and provide working capital.

Table 8.1 below summarises Raya's past share issues.

**Table 8.1: Summary of Shares Issued by Raya**

Share Issue Date	Transaction	Ordinary Shares Issued	% of Raya Shares Outstanding Prior to Transaction	Share Price (\$)	Value (\$)
30-Jul-14 21-Oct-14	On 23 July 2014, Raya announced its intention to raise up to \$750,000 through the issue of up to 50 million fully paid ordinary shares at an issue price of \$0.015 with an attaching option exercisable at \$0.015 on or before 21 July 2016.	50,000,000	14.60%	0.011 <sup>1</sup>	750,000
18-Aug-14	The first tranche of 16.7 million shares was issued to sophisticated investors on 30 July 2014. The second tranche of 33.3 million shares was issued to ASC Resources Pty Ltd on 21 October 2014. Raya issued 2.5 million shares to Peloton Capital as consideration for consulting services valued at \$37,500.	2,500,000	0.70%	0.015	37,500
21-Oct-14	Raya issued 10 million shares to ASC Resources as consideration for strategy advisory services valued at \$150,000.	10,000,000	2.53%	0.015	150,000
16-Jan-15	Raya issued 20 million shares to sophisticated investors at an issue price of \$0.01 per share.	20,000,000	4.94%	0.010	200,000
27-Feb-15	Raya issued 66.9 million shares to sophisticated investors at an issue price of \$0.006 per share with a free attaching option exercisable at \$0.015 on or before 21 July 2016.	66,916,667	15.75%	0.005 <sup>2</sup>	401,500
25-May-15	Raya issued 108.1 million shares to sophisticated investors at an issue price of \$0.005 per share.	108,100,304	21.98%	0.005	540,500
13-Oct-15	Raya issued 40 million shares to the Raya directors at an issue price of \$0.0005 per share	40,000,000	6.67%	0.0005	20,000

Source: ASX Announcements, BDO CFQ Analysis

- <sup>1</sup> The \$0.011 share issue price has been determined by subtracting the value of the attaching option from the \$0.015 placement price. The attaching option was valued at \$0.004 using the Black-Scholes formula with an exercise price = \$0.015, time to maturity = 2 years, interest rate = 2%, volatility = 80% and dividend yield = 0%. The share price adopted was \$0.011 implied as a result of the placement and was determined having regard to an iterative process.
- <sup>2</sup> The \$0.005 share issue price has been determined by subtracting the value of the attaching option from the \$0.006 placement price. The attaching option was valued at \$0.001 using the Black-Scholes formula with an exercise price = \$0.015, time to maturity = 1.4 years, interest rate = 2%, volatility = 80% and dividend yield = 0%. The share price adopted was \$0.005 implied as a result of the placement and was determined having regard to an iterative process.

With reference to Table 8.1 above, we note the following:

- There have been approximately 297.5 million Raya shares issued at between \$0.0005 and \$0.015 per share since 1 July 2014. This represents an increase of approximately 86.87% from the number of shares on issue at 1 July 2014 of 342,483,030;
- The share issues above \$0.010 were in the period from July 2014 to October 2014 while the share issues post this date were at or below \$0.010; and
- The share trades have separately represented between 0.70% and 21.98% of the total shares outstanding prior to the completion of each issue of shares. We consider the transactions to relate to non-controlling parcels of shares.

#### Conclusion on MBV - Minority Interest Basis

Having regard to the information set out above, in our view it is appropriate to adopt a value in the range of \$0.005 to \$0.010 per Raya ordinary share on a minority interest basis for our market based valuation. This value broadly correlates with:

- 1 week, 1 month, 3 month, 6 month, 9 month and 12 month periods prior to 26 October 2015; and
- The shares issued by Raya since 1 January 2015.

#### 8.2.2 Adjustment for Control Premium

We note that the price of a company's shares observed on an exchange represents the value of those shares on a minority interest basis. For the purpose of assessing the Proposed Transaction, and in accordance with the requirements of RG111, the value to adopt for Raya prior to the Proposed Transaction should be on a controlling interest basis.

A controlling interest in a company is generally regarded as being more valuable than that of a minority interest as it may provide the owner with the following:

- Control over the operating and financial decisions of the company;
- The right to set the strategic direction of the company;
- Control over the buying, selling and use of the company's assets; and
- Control over appointment of staff and setting of financial policies.

The increase in value for a controlling interest is often observed where an acquirer launches a takeover bid, or some other mechanism for control, for another company. Empirical research suggests that control premiums are typically within the range of 20% to 40% which is consistent with recent transactions in Australia (refer to Appendix C for our control premium research).

To determine a value of Raya on a controlling interest basis for the purpose of the analysis set out in this Report, it is our view that it is appropriate to adopt a control premium for Raya of 30%, as set out in Appendix C.

Table 8.2 below summarises the value per Raya share on a controlling interest basis prior to the Proposed Transaction.

**Table 8.2: Value per Raya Share on a Controlling Interest Basis**

	Low	Mid	High
Value per Raya share on a minority interest basis	\$0.0050	\$0.0075	\$0.0100
Control premium	30%	30%	30%
Value per Raya share on a controlling interest basis	\$0.0065	\$0.0098	\$0.0130

Source: BDO CFQ analysis

In our view, based on the MBV methodology, the value per Raya share is within the range of \$0.0065 and \$0.0130 on a controlling interest basis.

### 8.3 Allocation of MBV to Raya's Asset Value Prior to the Proposed Transaction

Table 8.3 sets out our calculation of the enterprise value of Raya prior to the Proposed Transaction. A share price of \$0.0065 to \$0.0130 implies a market capitalisation of \$4.67 million to \$9.34 million on a controlling interest basis. Allowing for listed options the total equity value equals \$4.74 million to \$10.23 million (we have not considered any other options on issue as they do not have any material value as they are materially out of the money having regard to the above calculated share values). Borrowings of \$20,314 have been added back to calculate enterprise value.

**Table 8.3: Calculation of Enterprise Value**

	Low (\$)	Mid (\$)	High (\$)
Value per Raya share on a minority interest basis	0.0050	0.0075	0.0100
Control Premium Adopted	30.0%	30.0%	30.0%
<b>Value per Raya share on a controlling interest basis</b>	<b>0.0065</b>	<b>0.0098</b>	<b>0.0130</b>
Number of Shares on Issue	718,364,311	718,364,311	718,364,311
<b>Market Capitalisation (controlling interest basis)</b>	<b>4,669,368</b>	<b>7,004,052</b>	<b>9,338,736</b>
Options <sup>(a)</sup>	73,491	356,259	891,029
<b>Total Equity Value</b>	<b>4,742,859</b>	<b>7,360,311</b>	<b>10,229,765</b>
Add Debt (insurance premium funding)	20,314	20,314	20,314
<b>Enterprise Value</b>	<b>4,763,173</b>	<b>7,380,625</b>	<b>10,250,079</b>

Source: Raya 2015 Annual Report and BDO CFQ analysis

(a) Option value has been calculated based on a Black Scholes option pricing model adopting a risk free rate of 2%, volatility of 80%, dividend yield of 0%, expiry date of 21 July 2016, share price range of \$0.007 to \$0.013 and 381,352,357 options on issue

Table 8.4 sets out an apportionment of the above enterprise value to Raya's assets and liabilities, with the residual value being assigned to Raya's Geothermal Exploration Assets.

**Table 8.4: Apportionment of Raya's Enterprise Value to Assets and Liabilities**

	Low (\$)	Mid (\$)	High (\$)
Cash <sup>(a)</sup>	2,014,500	2,014,500	2,014,500
Trade and other receivables	36,646	36,646	36,646
Investments in listed entities	3,167	3,167	3,167
Term deposits	100,000	100,000	100,000
Deferred tax assets <sup>(b)</sup>	-	-	-
Trade and other payables	(97,710)	(97,710)	(97,710)
Insurance premium funding	(20,314)	(20,314)	(20,314)
Rehabilitation	(271,106)	(271,106)	(271,106)
Geothermal Exploration Assets <sup>(c)</sup>	2,997,990	5,615,442	8,484,896
<b>Enterprise Value</b>	<b>4,763,173</b>	<b>7,380,625</b>	<b>10,250,079</b>

Source: Raya 2015 Annual Report and BDO CFQ analysis

(a) Cash is calculated to be \$2.4 million as at 11 January 2016 less \$0.5 million transaction costs remaining less \$0.3 million break fee payable if the Proposed Transaction does not proceed plus \$64.5K research and development rebate receivable plus \$350K Tranche 2 and 3 consideration payments for the sale of the oil and gas leases

(b) Raya has accumulated tax losses of \$14.3 million as at 30 June 2015 which could potentially be used to offset against future taxable income. However, we have not assigned any value to the accumulated tax losses as it is not possible to predict whether Raya will be able to generate any material earnings in the future to utilise the tax losses. This is consistent with Raya's decision not to recognise the tax losses as a deferred tax asset as they do not satisfy the recognition criteria under the accounting standards.

(c) The value apportioned to the Geothermal Exploration Assets was the residual value after adjusting for the other assets and liabilities

Having regard to Table 8.4 above, the residual value assigned to the Geothermal Exploration Assets is in the range of \$3.0 million to \$8.5 million. We have considered this residual value and are of the view that it does not provide any information to suggest that our MBV methodology is unreasonable in the circumstances. In forming this view we considered:

- The Geothermal Exploration Assets do not have any defined resources. As at the date of this Report, there is no specific information to suggest that the Geothermal Exploration Assets can be economically extracted;
- Raya's Geothermal Exploration Assets are on care and maintenance and Raya has only budgeted to spend the minimum amounts required to maintain these assets;
- The Directors of Raya have run a sales process in relation to the Geothermal Exploration Assets and have only received limited interest. The feedback that the Directors received from the market is that at the current time:
  - Parties looking to acquire assets can afford to be selective in the current environment with many projects available to consider;
  - There is a lack of parties willing or able to commit capital to develop the Geothermal Exploration Assets;
- If Raya is unable to find a party to acquire its South Australian geothermal assets, it will be required to incur a rehabilitation cost of approximately \$270,000 to restore the Salamander-1 well site;
- Raya's Indonesian assets (Ngebel Geothermal Project and Dairi Prima Geothermal Project) were impaired to a carrying value of zero during the financial year ended 30 June 2015 and Raya has no further commitments to develop these projects. The Directors of Raya are of the view that there is only a limited chance they will be able to realise value for these assets if they can't realise value for the Sokoria Geothermal Project (which they consider to be a superior project);
- In relation to the Sokoria Geothermal Project we note:
  - The Sokoria Geothermal Project does not currently have a bankable feasibility study. The work required to obtain a bankable feasibility study is expected to cost \$5 million. Until a bankable feasibility study has been completed, there is no information to suggest that the Sokoria Geothermal Project can be economically extracted;
  - Raya has spoken to numerous parties in relation to its interest in the Sokoria Geothermal Project with limited success to date;
  - Raya and PT Bakrie Power previously entered into a Heads of Agreement with Space Con Pty Ltd during January 2015 for the sale and purchase of 85% of the Sokoria Geothermal Project. Although the agreement was terminated, the consideration for 85% in the Sokoria Geothermal Project was approximately USD\$3.0 million with the remaining 15% having a 'free carry' interest in the project for Raya and PT Bakrie Power (of which 6% was attributable to Raya);
  - The funding requirement for the Sokoria Geothermal Project (assuming a bankable feasibility study is successfully completed) is expected to be approximately USD\$160 million and has not been secured as at the date of this Report;
  - The net present value for the Sokoria Geothermal Project has been calculated by Raya to be USD\$25.5 million for 100% (or USD\$11.5 million for a 45% interest). We note that this value is subject to a number of assumptions which cannot be verified as at the date of this Report and assumes that a bankable feasibility study is able to be successfully completed;
- The Directors of Raya are of the view that Raya does not have the capability to fund the construction of geothermal projects itself; and
- The development of the Geothermal Exploration Assets (including the Sokoria Geothermal Project) is not a priority for Raya. The Directors' priority is to complete an acquisition that will bring optimal value to Raya shareholders and, if the Proposed Transaction is not approved, the Directors have instructed us that they will continue to seek to identify an alternative transaction.

#### 8.4 Value of a share in Raya prior to the Proposed Transaction

Having regard to our valuation of Raya shares, in our view, for the purpose of our assessment of the Proposed Transaction it is appropriate to adopt a value in the range of \$0.0065 and \$0.0130 per Raya share on a controlling interest basis. This valuation range was determined primarily having regard to the MBV and is, in our view, supported by our allocation of MBV to Raya's asset value.

For completeness we note that the valuation range adopted above is a relatively wide range. It is our view that it is appropriate to adopt a relatively wide range having regard to the relatively early stage of development of the Geothermal Exploration Assets of Raya and the speculative nature of exploration companies generally.

## 9.0 Value of the Combined Entity Following the Proposed Transaction

This section sets out our valuation of a share in the Combined Entity following the Proposed Transaction and is structured as follows:

- Section 9.1 sets out our view of the most appropriate valuation approach to adopt when determining the value of the Combined Entity;
- Section 9.2 sets out our valuation of the Combined Entity immediately following the Proposed Transaction on an MBV basis; and
- Section 9.3 concludes on the value that we are adopting for the Combined Entity for the purposes of the analysis set out in this Report.

### 9.1 Valuation Approach

In our view, the MBV methodology is the most appropriate methodology to apply in order to calculate the value of shares in the Combined Entity immediately following the Proposed Transaction, assuming that the Proposed Transaction is approved and implemented. Reasons for this include:

- Since the announcement of the Proposed Transaction, the market for shares in Raya have demonstrated a high level of liquidity with approximately 323% of the shares on issue trading in the period between the announcement of the offer (26 October 2015) and 8 January 2016;
- Raya has issued a material number of shares since the announcement of the Proposed Transaction which resulted in a 12.24% increase in shares on issue (i.e. from 640,000,000 shares as at the date of the announcement to 718,364,311 shares as at 8 January 2016) at prices which can be observed;
- The Proposed Transaction is conditional on the Capital Raising of \$8.0 million; and
- The share trading data and shares issued post the announcement of the Proposed Transaction provide relevant information in relation to the value of the Combined Entity immediately following the Proposed Transaction. In our view, the most relevant measure of value for the non-associated shareholders of Raya is the price that they may be able to sell their shares either immediately or in the short-term. It is important to note that the decision to hold shares in the Combined Entity for a longer period of time is a separate investment decision to be made having regard to each shareholder's individual circumstances and view on the long term prospects of the Combined Entity.

In our view, it is not appropriate to apply the DCF or CME valuation methodologies to determine a value of the Combined Entity for the following reasons:

- The DCF methodology relies on projections which predict the future cash flows of a company. We have not been provided with detailed cash flow projections over a suitable period of time for use in a DCF valuation. Further, due to the nature and stage of development of Xped's IoT technology, in our view, future cash flows of the Combined Entity cannot be determined with the appropriate level of certainty or accuracy at the current time. The information is not available to us and the DCF methodology is not appropriate for calculating the value of the Combined Entity's shares; and
- The business activities of Raya and Xped do not generate an earnings stream at the current time and it is expected that earnings will not be generated in the short term following the Proposed Transaction. Neither Raya nor Xped generate and report maintainable earnings suitable for use in a CME valuation of the Combined Entity's shares.

## 9.2 Market Based Valuation of the Combined Entity

This section sets out our valuation of the Combined Entity immediately following the Proposed Transaction.

### 9.2.1 Share Trading Data Post the Announcement of the Proposed Transaction

Table 9.1 below summarises the weekly liquidity and price of Raya shares post the announcement of the Proposed Transaction.

**Table 9.1: Liquidity and Price of Raya Shares Post the Announcement**

Week	Volume	Value of Trades	Shares Outstanding <sup>(a)</sup>	Volume per Shares Outstanding	Weekly VWAP
4 January 2016 to 8 January 2016	83,015,480	2,776,240	718,309,310	11.56%	\$0.0334
28 December 2015 to 3 January 2016	51,747,900	1,549,280	718,089,310	7.21%	\$0.0299
21 December 2015 to 27 December 2015	32,583,350	1,256,290	718,089,310	4.54%	\$0.0386
14 December 2015 to 20 December 2015	37,203,790	1,348,740	718,089,310	5.18%	\$0.0363
7 December 2015 to 13 December 2015	78,987,560	3,240,410	717,045,600	11.02%	\$0.0410
30 November 2015 to 6 December 2015	216,360,750	11,073,560	713,656,450	30.32%	\$0.0512
23 November 2015 to 29 November 2015	179,074,000	9,234,470	695,415,290	25.75%	\$0.0516
16 November 2015 to 22 November 2015	305,424,340	14,664,090	670,950,000	45.52%	\$0.0480
9 November 2015 to 15 November 2015	530,485,250	21,535,080	655,000,000	80.99%	\$0.0406
2 November 2015 to 8 November 2015	310,450,980	8,576,140	640,000,000	48.51%	\$0.0276
26 October 2015 to 1 November 2015	407,875,790	7,978,020	640,000,000	63.73%	\$0.0196
<b>Total</b>	<b>2,233,209,190</b>	<b>83,232,320</b>	<b>691,331,325</b>	<b>323.03%</b>	<b>\$0.0373</b>

Source: Capital IQ as at 11 January 2016

(a) Average number of shares outstanding including escrowed shares

In relation to Raya's share trading data between the date of the announcement and 8 January 2016 we note the following:

- The overall VWAP over the period is \$0.0373; and
- Between 4.54% to 80.99% of the total shares outstanding have been traded on a weekly basis. We consider that Raya exhibited high liquidity over the weeks post the announcement.

### 9.2.2 Share Issues

Table 9.2 below summarises Raya's share issues post the announcement of the Proposed Transaction.

**Table 9.2: Raya Movements in Ordinary Share Capital post the Announcement of the Proposed Transaction**

Date	Transaction	Ordinary Shares Issued	% of Raya Shares Outstanding Prior to Transaction	Transaction Share Price (\$)	Transaction Value (\$)
11-Nov-15	Share placement	30,000,000	4.69%	0.0200 <sup>(a)</sup>	600,000
13-Nov-15	Exercise of options	200,000	0.03%	0.0150	3,000
17-Nov-15	Exercise of options	1,000,000	0.15%	0.0150	15,000
20-Nov-15	Share placement	40,000,001	5.96%	0.0350	1,400,000
26-Nov-15	Exercise of options	1,076,450	0.15%	0.0150	16,147
03-Dec-15	Exercise of options	3,450,000	0.48%	0.0150	51,750
09-Dec-15	Exercise of options	1,870,000	0.26%	0.0150	28,050
10-Dec-15	Exercise of options	492,860	0.07%	0.0150	7,393
05-Jan-16	Exercise of options	275,000	0.04%	0.0150	4,125

Source: ASX Announcements, BDO CFQ Analysis

(a) For completeness we note that at the time of announcing this placement, it was envisaged that, subject to shareholder approval, a further 10 million shares may be issued for no additional consideration. As set out in the Notice of Meeting, Raya and the investor have agreed that these shares will no longer be issued.

With reference to Table 9.2 above, we note the following:

- On 11 November 2015, Raya issued 30 million shares to a strategic Asia based technology investor at an issue price of \$0.02 per share to fund some of the costs associated with the acquisition of Xped. All the shares are held in escrow until the purchase of Xped is complete and Raya complies with chapter 1 & 2 of the ASX listing rules; and
- On 20 November 2015, Raya issued 40 million shares to a group of institutional funds and sophisticated investors at an issue price of \$0.035 per share to fund some of the costs associated with the acquisition of Xped. All the shares are held in escrow until the purchase of Xped is complete and Raya complies with chapter 1 & 2 of the ASX listing rules.

Notwithstanding that the share issues referred to above occurred while the Proposed Transaction remained subject to the satisfaction of the conditions precedent set out in Section 3.2 of this Report (including shareholder approval), in our view they provide an indication of the value of a share in the Combined Entity following the Proposed Transaction.

### 9.2.3 Capital Raising

As discussed in Section 3.2 of this Report, concurrent with the implementation of the Proposed Transaction, Raya will raise \$8.0 million through the issue of 320 million shares via the Capital Raising.

In our view, the subscription price of \$0.025 under the Capital Raising provides a relevant indicator of the value of a share in the Combined Entity under the MBV following the Proposed Transaction.

### 9.2.4 Conclusion on MBV - Minority Interest Basis

Having regard to the information set out above, in our view it is appropriate to adopt a value in the range of \$0.02 to \$0.03 per ordinary share in the Combined Entity on a minority interest basis for our market based valuation. This range was determined having regard to the Capital Raising, placements and Raya share trading information post the announcement of the Proposed Transaction.

### 9.3 Value of a Combined Entity Share Following the Proposed Transaction

In our view, the most relevant measure of value for the non-associated shareholders of Raya is the price that they may be able to sell their shares in the Combined Entity either immediately or in the short-term. Any decision to hold shares in the Combined Entity for a longer period of time is a separate investment decision to be made having regard to each shareholders' individual circumstances and view on the long term prospects of the Combined Entity.

Having regard to the above, in our view, for the purposes of the analysis set out in this Report it is appropriate to adopt a value for the Combined Entity based on our MBV of \$0.02 to \$0.03 per share following the Proposed Transaction on a minority interest basis.

In considering our valuation range, we note that the assets of both Raya and Xped are yet to prove that they can generate sustainable positive operating cash flows. In our view, the value of such companies may increase or decrease materially over short time periods depending on the ability to meet certain milestones.

We regard any investment in the Combined Entity as high risk and speculative and shareholders should consider that there is a risk that the share price may move materially before shareholders are able to sell and realise the proceeds of their shares.

## 10.0 Fairness of the Proposed Transaction

To assess the fairness of the Proposed Transaction, we have:

- Determine the value of a share in Raya, on a controlling interest basis, immediately prior to the Proposed Transaction; and
- Compare the value determined above with our valuation of a share in the Combined Entity on a minority interest basis immediately following the Proposed Transaction.

Under RG 111, the Proposed Transaction will be considered ‘fair’ to the non-associated shareholders of Raya if the value of a share of the Combined Entity following the Proposed Transaction is equal to or greater than the value of a Raya share prior to the Proposed Transaction.

### 10.1 Value of a Raya Share Prior to the Proposed Transaction

For the purpose of assessing the fairness of the Proposed Transaction, we calculated the value of a Raya share to be within the range of \$0.0065 to \$0.0130 on a controlling interest basis immediately prior to the Proposed Transaction (refer Section 8.0 of this Report for our valuation of Raya).

### 10.2 Value of the Combined Entity Following the Proposed Transaction

For the purpose of assessing the fairness of the Proposed Transaction, we calculated the value of a share in the Combined Entity to be within the range of \$0.02 to \$0.03 on a minority interest basis immediately following the Proposed Transaction (refer Section 9.0 of this Report for our valuation of the Combined Entity).

### 10.3 Assessment of the Fairness of the Proposed Transaction

Table 10.1 below sets out our assessment of the Proposed Transaction.

**Table 10.1: Fairness of the Proposed Transaction**

	Low Value (\$)	Mid Value (\$)	High Value (\$)
Value of Raya prior to the Proposed Transaction (controlling interest)	0.0065	0.0098	0.0130
Value of the Combined Entity post the Proposed Transaction (minority interest)	0.0200	0.0250	0.0300

Source: BDO CFQ analysis

With reference to Table 10.1 above, we note that the value of the consideration offered per Raya share is greater than the value range of a Raya share immediately prior to the Proposed Transaction. After considering the information summarised above and set out in detail in the balance of this Report, in our view the Proposed Transaction is Fair to the non-associated shareholders of Raya as at the date of this Report.

## 11.0 Reasonableness of the Proposed Transaction

This section of this Report is set out as follows:

- Section 11.1 outlines the advantages of the Proposed Transaction to the non-associated shareholders of Raya;
- Section 11.2 outlines the disadvantages of the Proposed Transaction to the non-associated shareholders of Raya;
- Section 11.3 considers the position of the non-associated shareholders of Raya in the event that the Proposed Transaction is not approved; and
- Section 11.4 provides our assessment of the reasonableness of the Proposed Transaction.

### 11.1 Advantages of the Proposed Transaction

Table 11.1 below outlines the potential advantages to the non-associated shareholders of Raya in the event that the Proposed Transaction is approved and implemented.

**Table 11.1: Advantages of the Proposed Transaction**

Advantage	Explanation
The Proposed Transaction is fair	As set out in Section 10.0 above, the Proposed Transaction is fair to the non-associated shareholders of Raya as at the date of this Report. RG 111 states that an offer is reasonable if it is fair.
Near term revenue generation relative to Raya's geothermal assets	<p>Raya does not currently hold any income producing assets and the Directors of Raya do not expect that Raya's assets will be able to generate revenue in the short to medium term.</p> <p>The directors have investigated a number of opportunities which have been available to the Company and are of the view that the Proposed Transaction represents a greater opportunity to realise revenue over a shorter time frame relative to Raya's geothermal assets.</p>
Principal business activity will be clearly focussed on development of the Xped business	<p>Prior to the announcement of the Proposed Transaction Raya's future business activities were uncertain given the Company's announcement that it has been working with Otsana Capital (as strategic adviser) to identify new business alternatives, including some outside the energy sector.</p> <p>The Proposed Transaction will shift and streamline the focus of the Company toward a more defined goal of the commercialisation of Xped's technology. This more defined focus will allow the Combined Entity to be identifiable by the market as a technology company and the market will more easily be able to assess the future prospects of the Company.</p>
The Combined Entity will be better placed, relative to Raya, to pursue growth opportunities as a result of funding	<p>If the Proposed Transaction proceeds then the Combined Entity will be well funded relative to Raya prior to the announcement of the Proposed Transaction. This is as a result of:</p> <ul style="list-style-type: none"> <li>■ Existing cash balance of \$2.4 million as at 11 January 2016 which was materially influenced by the \$2.0 million in institutional placements on 11 November 2015 and 20 November 2015;</li> <li>■ The \$8.0 million to be raised through the Capital Raising; and</li> <li>■ Cash that may potentially be received if the \$0.015 options are exercised.</li> </ul> <p>These funds will enable the Combined Entity to pursue further opportunities for growth.</p>

Advantage	Explanation
Larger market capitalisation and potentially higher liquidity on the ASX	Based on the price at which Raya shares traded on the ASX prior to the announcement of the Proposed Transaction, Raya had a market capitalisation in the range of \$3.6 million to \$7.2 million (calculated assuming approximately 718 million shares on issue with a share price of \$0.005 and \$0.01).  If the Proposed Transaction is approved and implemented, the Combined Entity will have a market capitalisation of between \$33.9 million and \$50.8 million (calculated assuming approximately 1.7 billion shares on issue with a share price of between \$0.02 and \$0.03) based on our valuation of the Combined Entity set out in Section 10.2 of this Report. This is a significantly higher market capitalisation than Raya prior to the Proposed Transaction which may lead to greater market awareness and higher liquidity in the Combined Entity's shares relative to Raya.

Source: BDO CFQ analysis

## 11.2 Disadvantages of the Proposed Transaction

Table 11.2 below outlines the potential disadvantages to the non-associated shareholders of Raya in the event that the Proposed Transaction is approved and implemented.

**Table 11.2: Disadvantages of the Proposed Transaction**

Disadvantage	Explanation
There is a change in the nature and scale of Raya's business	Raya was previously incorporated as a geothermal exploration and development company. If the Proposed Transaction is approved and implemented, the Combined Entity will operate in the technology sector with a focus on the development of Xped's technology. This change to the nature and scale of the activities of Raya may not be consistent with existing Raya shareholders' investment objectives.  For completeness we note that irrespective of the outcome of the Proposed Transaction, Raya is seeking to diversify its business activities beyond its existing portfolio of geothermal assets.
The Combined Entity has no track record of generating sustainable revenues and earnings	We have considered an expert report that indicates that Xped's IoT technology works in the manner intended. Notwithstanding this, until Xped is able to demonstrate a track record of generating revenue and sustainable earnings, there is uncertainty in relation to the future prospects of the Combined Entity.  There is no guarantee that the Combined Entity will be able to successfully commercialise its products and realise significant revenues going forward.
Investment in the Combined Entity is speculative and high risk	We consider an investment in the Combined Entity to be speculative and high risk. By way of example of the speculative nature of the investment, the value implied for Xped's IoT technology is in the range of \$27 million to \$43 million based on our valuation of the Combined Entity. While this value may reflect current enthusiasm and speculation in relation to the potential for Xped's IoT technology in a better funded entity listed on the ASX, this value is significantly greater than the costs to develop the IoT technology and the value is not yet able to be supported by a track record of generating revenue and sustainable earnings.  As set out in the Flocom Report report (attached as Appendix D), there are a number of competitors to the Xped technology including those offered by significant technology companies. There is a risk that these competitors will significantly hamper Xped's ability to commercialise its technology.  Raya shareholders should consider that there is a risk that the share price may move materially before they are able to sell and realise the proceeds of their shares in the Combined Entity.

Disadvantage	Explanation
Limited ability to receive dividends in short term	Xped has not yet demonstrated a track record of generating sustainable earnings. Until such time as it is able to do so it is unlikely that the Company will be in a position to pay a recurring dividend. For completeness we note that this is similar to the position of shareholders in Raya prior to the Proposed Transaction.
Practical level of control of controlling shareholders	<p>When shareholders are required to approve an issue that relates to a company there are two types of approval levels. These are general resolutions and special resolutions. A general resolution requires 50% of shares to be voted in favour to approve a matter and a special resolution required 75% of shares on issue to be voted in favour to approve a matter.</p> <p>If the Proposed Transaction is approved and implemented, Raya will issue approximately 580 million shares to JK Group and Alanticx, which represents an interest of approximately 34.3% of the total shares outstanding in the Combined Entity (and this interest will potentially increase further if JK Group and Alanticx are able to convert their performance shares).</p> <p>JK Group and Alanticx Technologies will have significant influence over the Combined Entity and may be able to influence the outcomes of resolutions sought at meetings of the Combined Entity, including the ability to block special resolutions.</p>
Reduced chance of receiving a future takeover offer due to controlling shareholders	As noted directly above, if the Proposed Transaction is approved and implemented, JK Group and Alanticx Technologies will hold approximately 34.3% of the shares outstanding in the Combined Entity. The opportunity for Raya shareholders to realise a premium for control from any future transaction may be reduced as, in order for any future transaction to progress, JK Group and Alanticx Technologies would be required to vote in favour.
Dilutionary impact on the existing Raya shareholders	<p>Raya shareholders currently hold 100% of the issued share capital in Raya. If the Proposed Transaction is approved and implemented, existing Raya shareholders will hold approximately 42.4% of the Combined Entity.</p> <p>While we note that existing Raya shareholders will effectively hold shares in a different corporation with different prospects to Raya, Raya shareholders may be of the view that it is preferable to collectively hold 100% of the shares in Raya.</p>

Source: BDO CFQ analysis

### 11.3 Position of the non-associated shareholders of Raya if the Proposed Transaction does not proceed

Table 11.3 below summarises the possible impacts on the non-associated shareholders of Raya in the event that the Proposed Transaction is not approved. We note that the Proposed Transaction may not proceed for a number of reasons including, but not limited to, Raya and Xped not satisfying the conditions precedent to the Proposed Transaction which are set out in Section 3.2 of this Report.

**Table 11.3: Position of the non-associated shareholders of Raya if the Proposed Transaction does not proceed**

Position	Potential Impact on the non-associated shareholders of Raya
Raya shareholders will continue to hold shares in Raya	<p>If the Proposed Transaction is not approved, Raya shareholders will continue to collectively hold 100% of the issued capital in the Company. Raya shareholders will be entitled to share in any potential upside or downside risks associated with the future operations of Raya. Raya shareholders will receive any benefits or losses which may arise from the Company's future operations and endeavours.</p> <p>Raya's operations are likely to include continuing to explore and develop the Sokoria Geothermal Project joint venture with Bakrie Power (subject to finding a suitable investment/funding partner) and to pursue a portfolio pipeline of additional non-geothermal projects with the objective of increasing shareholder value and shareholder wealth.</p>

Position	Potential Impact on the non-associated shareholders of Raya
<p>Raya's share price may be significantly adversely affected if the Proposed Transaction does not proceed</p>	<p>If the Proposed Transaction is not completed, it is likely that Raya shares would trade at a discount to their recent trading levels. Prior to the announcement of the Proposed Transaction, Raya's shares were trading at approximately \$0.005 and had a 12 month VWAP of \$0.0064. In the period from the date of the announcement to 8 January 2016, the VWAP of Raya's share trades has been approximately \$0.0373 and the shares have traded as high as \$0.0585.</p> <p>There is potential for Raya's share price to decline significantly if the Proposed Transaction doesn't proceed.</p>

The Directors' priority has been to complete an acquisition that will bring optimal value to Raya shareholders. The directors have investigated a number of opportunities which have been available to the Company and are of the view that the Proposed Transaction represents the best opportunity to realise long-term growth in value for the Company's shareholders.

The Directors will seek to identify another investment opportunity

If the Proposed Transaction is not approved, the Directors will seek to identify an alternative transaction. There is significant uncertainty as to when, or if, an alternative transaction could be concluded, what form it would take and whether it would be more favourable than the Proposed Transaction.

Source: BDO CFQ analysis

#### 11.4 Reasonableness of the Proposed Transaction

In our opinion, after considering all of the issues set out in this Report, it is our view that in the absence of any other information, the Proposed Transaction is **Reasonable** to the non-associated shareholders of Raya as at the date of this Report.

## 12.0 Sources of Information

This Report has been prepared using information obtained from the following sources:

- Raya annual report for the year ended 30 June 2013;
- Raya annual report for the year ended 30 June 2014;
- Raya annual report for the year ended 30 June 2015;
- Raya ASX announcements;
- Xped annual report for the year ended 30 June 2013;
- Xped annual report for the year ended 30 June 2014;
- Xped annual report for the year ended 30 June 2015;
- Raya company website ([www.rayagroup.com.au](http://www.rayagroup.com.au));
- Xped company website ([www.xped.com](http://www.xped.com));
- Capital IQ;
- Various transaction documents including the Heads of Agreement, Notice of Extraordinary General Meeting and Explanatory Memorandum prepared by Raya;
- Various other research publications and publicly available data as sourced throughout this Report; and
- Various discussions and other correspondence with Raya and Xped directors, management and their advisers.

## 13.0 Representations, Indemnities and Warranties

Raya has agreed to our usual terms of engagement in addition to the indemnities and representations set out below.

### 13.1 Indemnities

In connection with BDO CFQ's engagement to prepare this Report, Raya agrees to indemnify and hold harmless BDO CFQ, BDO (QLD) or any of the partners, directors, agents or associates (together 'BDO Persons'), to the full extent lawful, from and against all losses, claims, damages, liabilities and expenses incurred by them. Raya will not be responsible, however, to the extent to which such losses, claims, damages, liabilities or expenses result from the negligent acts or omissions or wilful misconduct of any BDO Persons.

Raya agrees to indemnify BDO Persons in respect of all costs, expenses, fees of separate legal counsel or any other experts in connection with investigating, preparing or defending any action or claim made against BDO Persons, including claims relating to or in connection with information provided to or which should have been provided to BDO CFQ by Raya (including but not limited to the directors and advisers of Raya) as part of this engagement.

### 13.2 Representations & Warranties

Raya recognises and confirms that, in preparing this Report, except to the extent to which it is unreasonable to do so, BDO Persons will be using and relying on publicly available information and on data, material and other information furnished to BDO Persons by Raya, its management, and other parties, and may assume and rely upon the accuracy and completeness of, and is not assuming any responsibility for independent verification of, such publicly available information and the other information so furnished.

Raya management represent and warrant to BDO Persons that all information and documents furnished by Raya (either directly or through its advisors) in connection or for use in the preparation of this Report will not, at the time so furnished, contain any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein.

Raya has acknowledged that the Company's engagement of BDO CFQ is as an independent contractor and not in any other capacity including a fiduciary capacity.

## 14.0 Experience, Disclaimers and Qualifications

BDO CFQ has extensive experience in the provision of corporate finance advice, including takeovers, valuations and acquisitions. BDO CFQ holds an Australian Financial Services Licence issued by ASIC for preparing expert reports pursuant to the Listing Rules of the ASX and the Corporations Act.

BDO CFQ and its related parties in Australia have a wide range of experience in transactions involving the advising, auditing or expert reporting on companies that have operations domestically and in foreign jurisdictions. BDO in Queensland and in Australia is a national association of separate partnerships and entities and is a member of the international BDO network of individual firms.

Mark Whittaker and Steven Sorbello have prepared this Report with the assistance of staff members. Mr Whittaker and Mr Sorbello are directors of BDO CFQ and have extensive experience in corporate advice and the provision of valuation and business services to a diverse range of clients, including large private, public and listed companies, financial institutions and professional organisations.

This Report has been prepared at the request of the directors of Raya to provide the non-associated shareholders of Raya with information to assist them to decide whether to vote in favour of or against the Proposed Transaction. BDO CFQ hereby consents to this Report being used for that purpose. Apart from such use, neither the whole nor any part of this Report, nor any reference thereto may be included in or with, or attached to any document, circular, resolution, statement, or letter without the prior written consent of BDO CFQ.

BDO CFQ takes no responsibility for the contents of other documents supplied in conjunction with this Report. BDO CFQ has not audited or reviewed the information and explanations supplied to us, nor has it conducted anything in the nature of an audit or a review of any of the entities mentioned in this Report. However we have no reason to believe that any of the information or explanations so supplied is false or that material information has been withheld.

Any forecast information which has been referred to in this Report has been prepared by the relevant entity and is generally based upon best estimate assumptions about events and management actions, which may or may not occur. Accordingly, BDO CFQ cannot provide any assurance that any forecast is representative of results or outcomes that will actually be achieved.

With respect to taxation implications of the Proposed Transaction, it is strongly recommended that Raya shareholders obtain their own taxation advice, tailored to their own particular circumstances.

APES 225 'Valuation Services' issued by the Accounting Professional & Ethical Standards Board sets out mandatory requirements for the provision of quality and ethical valuation services. BDO CFQ has complied with this standard in the preparation of this Report.

The statements and opinions included in this Report are given in good faith and in the belief that they are not false, misleading or incomplete. This Report is current as at the date of this Report.

**BDO Corporate Finance (QLD) Ltd**



**Mark Whittaker**  
Director



**Steven Sorbello**  
Director

## Appendix A: Industry Overview: Geothermal Mining in Indonesia<sup>2</sup>

As discussed in Section 5.0 of this Report, Raya is involved in the exploration of geothermal opportunities in Australia and Indonesia. Geothermal energy refers to the production of energy from naturally occurring sources of heat under the Earth's surface.

As at the date of this report, Raya was actively progressing one project, the Sokoria Geothermal Project while the other projects were on hold. As such, this appendix focuses on Geothermal mining in Indonesia. This summary is not intended to be a comprehensive analysis of the Indonesian Geothermal industry. We recommend that Raya shareholders refer to the original sources of information and any other information they believe to be relevant to their decision in relation to the Proposed Transaction. This appendix should be referred to as a broad guide only.

### A.1 Geothermal Energy

Geothermal Energy is the energy stored as heat in the earth. Energy is brought to the earth's surface by extracting hot water that is circulating amongst the sub surface rocks, or by pumping cold water into the hot rocks and returning the heated water to the surface, to drive steam turbines and produce electricity. Geothermal resources may also be used directly for heating, drying and in chillers.

There are two broad categories of geothermal resources, convective and conductive resources. We have summarised each of these below:

- Convective geothermal resource - heat is moved through the earth by the movement of water or steam. These resources are typically high temperature and associated with volcanic activity and/or tectonic plate boundaries; and
- Conductive geothermal resource - heat flows through the earth without any movement of material or fluid. These resources tend to have lower temperatures or greater depths than convective geothermal resources.

All geothermal energy generation systems have three common components being: the geothermal resource (sub surface heat), access to the resource (wells), and the heat utilisation activity (direct use or power generation facility).

### A.2 Demand Drivers of Geothermal Energy

Table A.1 below summarises several demand drivers for geothermal energy.

**Table A.1: Geothermal Energy Demand Drivers**

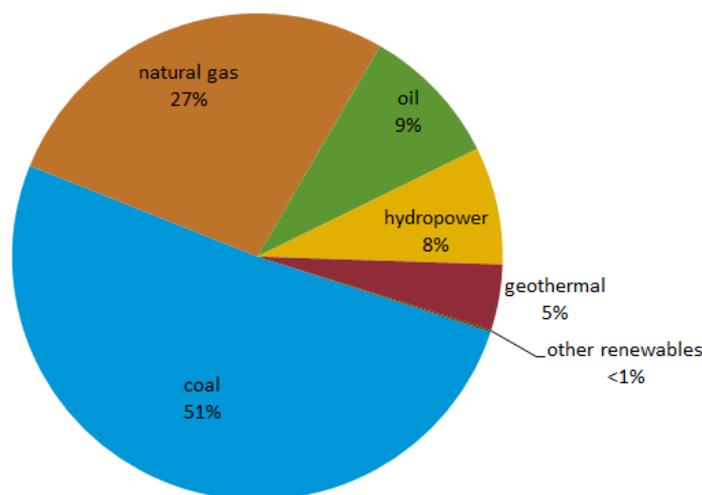
Demand Driver	Explanation
Prices of fossil fuel	The industry competes with rival electricity generators, particularly fossil fuel electricity generators. The price of fossil fuel impacts on the demand for geothermal energy. Recently, fossil fuel prices (e.g. oil and coal) have been relatively low, so renewables may not be as attractive for investment in the near term.
Supply from fossil fuel electricity generators	Increases in the generation capacity of fossil fuel electricity generators may lower wholesale energy prices and therefore reduce geothermal energy operators' revenue. As a result, greater fossil fuel electricity generation negatively affects the industry.
Public concerns over environmental issues	Rising public concern about the environment typically benefits the geothermal energy industry as consumer demand for renewable energy products tends to grow. Going forward, public concerns regarding environmental issues are anticipated to increase, assisting industry players.
Government emissions reductions programs	There is an increasing trend for governments to implement emissions reductions programs, such as the Renewable Energy Target ('RET') scheme. Over the past five years, these programs have encouraged large electricity users to source energy from renewable generators.

<sup>2</sup> Information in this section has been sourced from the U.S. Energy Information Administration, IBISWorld Industry Report D2619: Wind and Other Electricity Generation in Australia, and other publicly available information.

### A.3 Industry Overview

Geothermal energy provides one source of energy within Indonesia's electricity sector. In 2013, 87% of Indonesia's electricity came from fossil fuel sources, with the remainder coming from hydroelectric (8%) and geothermal (5%). This is set out in Figure A.1 below.

Figure A.1: Indonesia Power Generation by Source, 2013



Source: Indonesia's Ministry of Energy and Mineral Resources

Source: U.S. Energy Information Administration October 7, 2015

Indonesia is the third-largest geothermal energy generating country in the world. In 2013, it had an installed electric capacity of more than 1.3 GW with geothermal plants scattered around Java, North Sumatra and North Sulawesi. However, it is estimated that only 5% of the potential 29 GW of geothermal capacity has been developed.

### A.4 Regulatory Environment

Prior to 2014, one impediment to the development of geothermal mining in Indonesia was the definition of geothermal developments as mining activity which restricted projects in conservation areas. In 2014, Indonesia passed a new Geothermal Law which eliminated this regulation for geothermal development. The law also:

- Attempted to raise investment in geothermal projects by making the prices more closely match development costs;
- Limited the permitting process to review by only the central government; and
- Aimed to alleviate land acquisition issues by providing benefits for the local population.

State-owned PLN is the main player in Indonesia's electricity sector. As of 2014, it owned and operated approximately 70% of Indonesia's electricity generating capacity through its subsidiaries and maintained an effective monopoly over distribution activities.

The Indonesian government has set a target to increase total renewable energy to 19% of the total energy portfolio by 2019 and to 23% by 2025. Most of this is expected to come from geothermal and hydropower sources. The Indonesian government plans to have an additional 5 GW of geothermal capacity by 2022, primarily operated by independent power producers ('IPPs') and private companies. To stimulate this investment, the government has mandated PLN to offer guaranteed PPAs for IPPs to supply power to PLN. Other key developments in geothermal energy include:

- In 2012, the government signed an agreement with New Zealand for joint development of geothermal energy projects; and
- Plans by PT Medco Power Indonesia, an Indonesian company, to commission the 330 MW Sarulla power plant, which will be the world's largest geothermal plant, by 2018.

## Appendix B: Common Valuation Methodologies

A 'fair market value' is often defined as the price that reflects a sales price negotiated in an open and unrestricted market between a knowledgeable, willing but not anxious buyer and a knowledgeable, willing but not anxious seller, with both parties at arm's length. The valuation work set out in this Report assumes this relationship.

There are a number of methodologies available to value an entity at fair market value. In preparing this Report, we have considered, amongst other metrics, the valuation methodologies recommended by ASIC in RG 111 regarding content of expert reports. The methodologies include those mentioned directly below.

### B.1 Discounted Future Cash Flows ('DCF')

The DCF approach calculates the value of an entity by adding all of its future net cash flows discounted to their present value at an appropriate discount rate. The discount rate is usually calculated to represent the rate of return that investors might expect from their capital contribution, given the riskiness of the future cash flows and the cost of financing using debt instruments.

In addition to the periodic cash flows, a terminal value is included in the cash flow to represent the value of the entity at the end of the cash flow period. This amount is also discounted to its present value. The DCF approach is usually appropriate when:

- An entity does not have consistent historical earnings but is identified as being of value because of its capacity to generate future earnings; and
- Future cash flow forecasts can be made with a reasonable degree of certainty over a sufficiently long period of time.

Any surplus assets, along with other necessary valuation adjustments, are added to the DCF calculation to calculate the total entity value.

### B.2 Capitalisation of Future Maintainable Earnings ('CME')

The CME approach involves identifying a maintainable earnings stream for an entity and multiplying this earnings stream by an appropriate capitalisation multiple. Any surplus assets, along with other necessary valuation adjustments, are added to the CME calculation to calculate the total entity value.

The maintainable earnings estimate may require normalisation adjustments for non-commercial, abnormal or extraordinary events.

The capitalisation multiple typically reflects issues such as business outlook, investor expectations, prevailing interest rates, quality of management, business risk and any forecast growth not already included in the maintainable earnings calculation. While this approach also relies to some degree on the availability of market data, the rate is an alternative way of stating the expected return on an asset, allowing for a risk premium over the risk free rate.

The CME approach is generally most appropriate where an entity has historical earnings and/or a defined forecast or budget. Further, a CME is usually considered when relevant comparable information is available.

### B.3 Asset Based Valuations ('ABV')

Asset based valuations ('ABV') are used to estimate the fair market value of an entity based on the book value of its identifiable net assets. The ABV approach using a statement of financial position alone may ignore the possibility that an entity's value could exceed the book value of its net assets, however, when used in conjunction with other methods which determine the value of an entity to be greater than the book value of its net assets, it is also possible to arrive at a reliable estimate of the value of intangible assets including goodwill.

Alternatively, adjustments can be made to the book value recorded in the statement of financial position in circumstances where a valuation methodology exists to readily value the identifiable net assets separately and book value is not reflective of the true underlying value. Examples of circumstances where this type of adjustment may be appropriate include when valuing certain types of identifiable intangible assets and/or property, plant and equipment.

The ABV approach is most appropriate where the assets of an entity can be identified and it is possible, with a reasonable degree of accuracy, to determine the fair value of those identifiable assets.

#### B.4 Market Based Valuations ('MBV')

Market based valuations ('MBV') relate to the valuation of an entity having regard to the value which securities in the entity have recently been purchased at. This approach is particularly relevant to:

- Entities where the shares are traded on an exchange. The range of share prices observed may constitute the market value of the shares where sufficient volumes of shares are traded and the shares are traded over a sufficiently long period of time; and/or
- Entities where it is possible to observe recent transactions relating to the transfer of relatively large parcels of shares (e.g. recent capital raisings).

For listed entities, the range of share prices observed may constitute the market value of the shares where sufficient volumes of shares are traded and the shares are traded over a sufficiently long period of time. Share market prices usually reflect the prices paid for parcels of shares not offering control to the purchaser.

## Appendix C: Control Premium Analysis

A controlling interest in a company is usually regarded as being more valuable than a minority interest as it provides the owner with control over the operating and financial decisions of the company, the right to set the strategic direction of the company, control over the buying, selling and use of the company's assets, and control over appointment of staff and setting financial policies.

The increase in value for a controlling interest is often observed where an acquirer launches a takeover bid, or some other mechanism for control, for another company. For the purposes of our research on control premiums, we have defined a controlling interest to be an interest where the acquirer has acquired a shareholding of greater than 50% in the target company.

Generally, control premiums may be impacted by a range of factors including the following:

- Specific acquirer premium and/or special value that may be applicable to the acquirer;
- Level of ownership in the target company already held by the acquirer;
- Market speculation about any impending transactions involving the target and/or the sector that the target belongs to;
- The presence of competing bids; and
- General market sentiment and economic factors.

To form our view of an appropriate range of control premium applicable to Raya for the purposes of this Report, we have considered information which includes:

- Control premiums implied in merger and acquisition transactions of energy companies in Australia, which indicate median control premiums in the range of 22% to 32%;
- Recent independent expert's reports which apply control premiums in the range of 20% to 40%;
- Various industry and academic research, which suggests that control premiums are typically within the range of 20% to 40%;
- Various valuation textbooks; and
- Industry practice.

Having regard to the information set out above, in our view, it is appropriate to consider control premiums within the range of 20% to 40% for the purposes of assessing the Proposed Transaction within the context of this Report. For the purposes of the calculations set out in this Report we have adopted a control premium of 30%, being the mid-point of the control premium range that we consider is appropriate based on our research.

Appendix D: Expert's Report on Xped Technology



# Xped Holdings Ltd

## Technical Expert Review

**Flocom Consulting**

*[www.flocomconsulting.com](http://www.flocomconsulting.com)*

*[danielf@flocomconsulting.com](mailto:danielf@flocomconsulting.com)*



## Executive Summary

The IoT market has been estimated to grow to 50 billion devices, and an addressable global market of \$80 billion by 2020. If IoT is implemented correctly, integrating people, places, and things into our cities, industries and homes, it is expected a grand total of \$14 trillion worth of value would be released to the global economy. Unsurprisingly there are many competitive companies chasing this market. IoT requires solutions that encompass cloud services, analytics, communications, things and thing services. This requires companies to become part of larger ecosystems for solutions and standards.

Xped have created one of the world's first human friendly solutions for the on-boarding, control and management of an IoT enabled "thing" by a smart device (PC, phone, cloud app). In a world where there are currently no overriding standards, and many large players are jostling for position, Xped has real technology that can be integrated into devices by manufacturers, reducing their time-to-market.

The key aspect of the solution is to utilise the NFC function that is increasingly found in our smart phones and smart watches to interface with a wide range of IoT devices, extracting information from the "thing" to carry out a large range of tasks. Xped's solution leverages existing standards wherever possible. Where they have defined new open standards, such as their markup language for data within a "thing", they seem to be closely aligned to other standard body's activities.

The Xped go to market model of open sourcing their protocols and languages, but retaining the right to sell their IoT stack via a number of form factors, aligns with the trend adopted by some participants in the IoT marketplace. Xped has protected its key intellectual property via patents. In addition, they have developed other related technical concepts that are also patented which may generate future revenue streams.

The IoT market is in a stage of flux, with strategic partnerships forming, security risks being ameliorated, and new products being brought to market. In this dynamic stage of development, Xped is offering the ADRC solution to speed up the go to market plans of other players who wish to develop IoT based products. Xped is also intending to introduce other IoT devices of its own for sale. Adopting a flexible business model allows Xped to pivot into different IoT markets (hardware, cloud services, and subsystems).

Whilst Xped is in a very competitive market, the approach adopted by ADRC is appealing due to its simplicity and ease of use. I am confident that other vendors would look at ADRC, either to integrate some functionality, or to licence the technology for their own hardware.

### KEY POINTS

The IoT Market is expected to be \$80 billion by 2020.

Xped have developed a novel solution that simplifies interactions with IoT devices, called the Auto Discovery Remote Control Protocol (ADRC).

Xped have protected their intellectual property via various patents.

The ADRC solution works in standalone mode, or in conjunction with cloud services to provide more value.

The Xped go to market plan is flexible, planning to sell to integrated circuit manufacturers, product manufacturers, and in some cases direct to the end customer.

Xped have also developed and patented other concepts related to IoT and ADRC that might generate revenue in the future.

Whilst the IoT market is real and huge, many issues threaten to slow IoT adoption such as security, cost benefits and standardisation.

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# Opening Statements

## **Statement of Work**

This report has been prepared on behalf of the RAYA Group to provide an independent technical expert review on the technology developed by Xped Holdings Ltd (Xped). RAYA Group has advised that this report will be included in the RAYA Group prospectus to be dated on or about 18 January 2016 in connection with the acquisition of Xped and providing for a public offer of 320,000,000 ordinary shares in RAYA Group to raise \$8,000,000. The report has also been prepared to be attached to the independent expert's report being prepared by BDO Corporate Finance (QLD) Ltd. The report is based on information gathered from Xped, material supplied by RAYA Group, and information collected from the Internet.

The following aspects have been addressed within the report:

- **IoT Opportunity** - the current state of the IoT market and how Xped fits within this market.
- **Business Assessment** – a description of, and comments on, the Xped business model.
- **Technical Assessment** - a description of the Xped solution, an analysis of the key technical functions, and lists of competitive technology and vendors.
- **Risk Assessment** - a list of technical risks in the IoT marketplace.

It must be noted that the IoT market is highly dynamic where many vendors are offering diverse solutions, void of an agreed standard architecture. In such an environment the analysis is a representation of opinions at a single point in time.

## **Statement of Expertise**

***Dr Daniel Floreani, Director Flocom Consulting.***

Daniel has 25+ years of experience in the communications industry. He has worked for a major Internet solution provider in national and global roles and has been involved in defence, manufacturing and academia. In his career he has designed, sold and installed IP solutions, all the way up to business development for IoT consulting services. Daniel has a PhD in Communications, a Bachelor of Engineering and a Bachelor of Science, is TOGAF certified, and has a GAICD.

## **Disclaimer**

The opinions expressed in this Report have been based on the information supplied to Flocom Consulting by Xped Holdings. The opinions in this report are provided in response to a specific request from RAYA Group to do so. Flocom Consulting has exercised all due care in reviewing the supplied information. Whilst Flocom Consulting has assessed the provided information based on experience and other resources, the accuracy of the opinions in the review are entirely reliant on the accuracy and completeness of the supplied information. Flocom Consulting advises that:

- a) Flocom Consulting has no interest in the outcome of the transaction between Raya and Xped.
- b) Flocom Consulting has considered its independence with respect to ASIC Regulatory Guide 112: Independence of experts and is, in its opinion, independent of both Raya and Xped.
- c) Flocom Consulting has the appropriate skill and experience to prepare the Technical Expert Review.

SIGNED



DATE 15 – 12 - 2015

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Daniel Floreani, Director, Flocom Consulting

# Introduction

The Internet of Things (IoT) requires the production of “things” that can communicate via the Internet with people, or to other “things”. The latter is often called machine to machine communications (M2M). These “things” can range from complicated machines such as automobiles, to household devices such as sprinklers. Some “things” are sensors, some “things” are actuators. Some “things” are neither, such as a bus stop, which is just a location where people need information. As a result the wider IoT ecosystem involves people, places, and “things”.

The driving force behind many IoT solutions is to gain deeper insight into systems via analytics to automate menial tasks, enhance productivity, create new business models, and generate new revenue streams. IoT is then seen as a generator of massive amounts of data by “things” that can be stored and analysed in the cloud or elsewhere. As such IoT is linked to the other big current technology drivers of “big data” and “analytics”.

Whilst IoT is deemed a new field, the principles behind IoT have been adopted by manufacturing, mining and defence industries for many decades. The recent IoT push is now taking the traditional process control ideology and applying it to everyday life. This implies applying it to our home, our cities, the environment, and our bodies to name just a few scenarios. In essence IoT aims to solve the mantra - ***you cannot control what you cannot see***. What is different is that past efforts have been in highly controlled environments with heavily engineered solutions. The current IoT environment is driven by consumer style devices, smartphones, and low power and sparsely connected environments. ***It is into this ecosystem that Xped intends to supply its solution in order to provide a robust scalable platform for IoT and M2M applications.***

The Xped solution evolved from a desire to revolutionise how “things” are controlled via remote control style interfaces. The intent was to replace the multiple remote control devices with a solution that enables any smart device to replace the functions of multiple controllers. This then led to the auto-discovery remote control (ADRC) technology suite that utilises near field communications (NFC) to provide an extensible and dynamic interface to “things” so that they can talk to people and other devices via a generic device browser, using a common language based on XML. Unlike most IoT solutions, Xped have not started with the premise that devices must contain an IP protocol stack in order to be part of a network. However the ADRC control mechanisms invented can also be used to run over a wide range of communication links, including IP networks.

Note – for consistency this report uses the term “thing” to encompass products that are connected to the network and are controllable or provide input into some IoT process. It uses the term “smart devices” to refer to products such as smart phones or tablets.

# The Internet of Things

## Opportunity

Many of the largest players in the world IT economy such as Cisco, General Electric, IBM as well as the major consulting firms such as KPMG, Accenture and Forbes have predicted a massive growth in the IoT revolution. Numbers vary<sup>1</sup>, but estimates of up to 50 billion devices connected to the Internet by 2020 and a total addressable market in the order of US\$80 billion and an increase in global productivity of US\$300 billion by 2020<sup>2</sup>. From a local perspective the Australian market for IoT is expected to be in the order of A\$200 million by 2020<sup>3</sup>.

The IoT market can be segmented into many smaller market verticals, as well as into horizontal vendors and service providers<sup>4</sup>. Some of the verticals include:

- Home (toys, security, automation, lifestyle/entertainment)
- Transport (public transport, personal vehicles, international transport)
- Connected cities (tags, public security, environmental monitoring, traffic monitoring, smart buildings)
- Person (fitness, healthcare, wearables)
- Industry (trackers, meters, sensors, actuators)

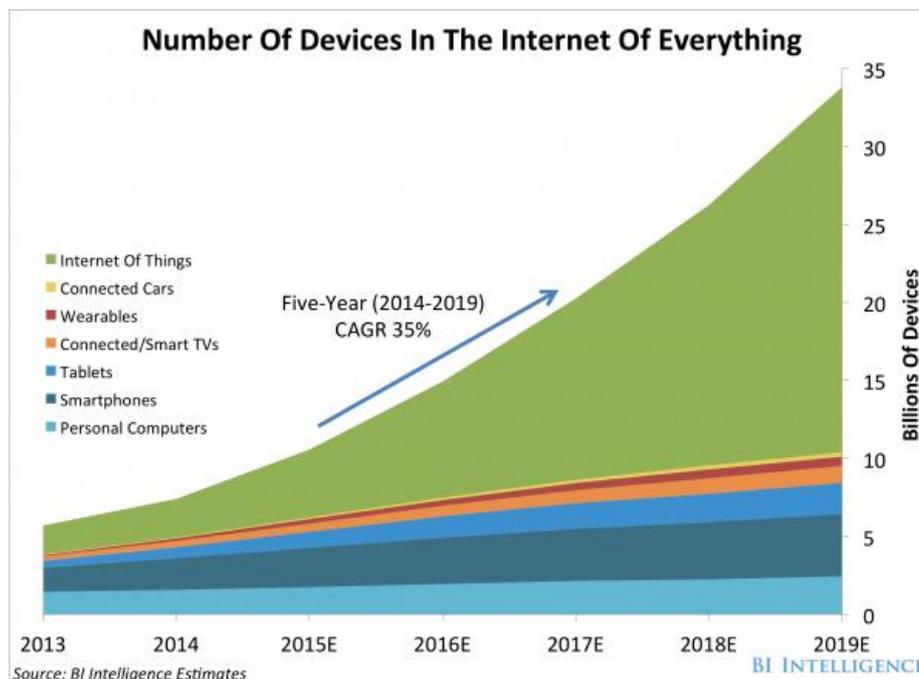


Figure 1 – IoT Device Number Predictions<sup>2</sup>

<sup>1</sup> <http://www.ironpaper.com/webintel/articles/internet-things-market-statistics-2015/>

<sup>2</sup> <http://www.forbes.com/sites/gilpress/2014/08/22/internet-of-things-by-the-numbers-market-estimates-and-forecasts/>

<sup>3</sup> <http://www.iotaustralia.org.au/2015/11/06/iot-facts-and-forecasts/aussie-iot-in-the-home-spend-tipped-to-top-200m-in-2020/>

<sup>4</sup> IEEE Standards Association (IEEE-SA) Internet of Things (IoT) Ecosystem Study

The providers of IoT hardware and services fall into a number of categories:

- Providers of sub systems of things (chips, firmware, modules).
- Providers of things.
- Providers of communications.
- Providers of applications.
- Providers of cloud services.

Most IoT vendors work across some of the categories above in order to provide a working solution. This means those who traditionally specialise in the provision of “things”, now need to understand communications, applications and a level of cloud services. Alternatively providers of cloud services now need to understand how to interface to “things”. It is into this new dynamic market, complicated by a lack of standards, or conversely too many competing standards<sup>5</sup>, that Xped is entering and attempting to solve.

## Ecosystem

The recent interest in IoT is driven by the desire to access some of the US\$ 14 trillion “value at stake” estimated by companies such as Cisco<sup>6</sup> between 2013 and 2022. This study factors in the ability of IoT to reduce costs and increase revenue. In order to make this a reality a new ecosystem is required that delivers the full suite of IoT related services to customers.

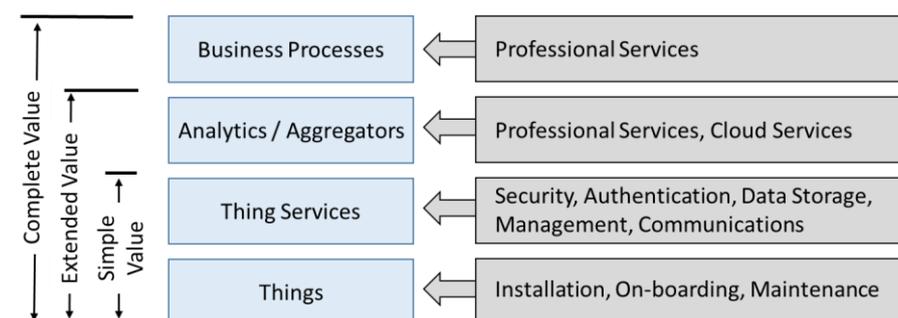


Figure 2 – IoT Ecosystems and Value at Stake

The installation of “things” and the basic services that sit above them, provide the first level of value and is based on simple self-contained IoT services. To gain extended value the IoT data is then aggregated to the cloud to gain further insight or automation via analytics. Interfaces with other IoT verticals is also achieved at this level (ie health systems interacting with transport systems). These solutions will need a level of professional services to conceive, design and implement. Finally in order to gain the full level of benefit from IoT, enterprises and organisations will need to invent new, or change existing business processes to unleash a new age of productivity and cost reduction.

***Xped will need to select a range of partners that allows them to be part of a complete IoT ecosystem to ensure that their solutions release the promised “value at stake”.***

<sup>5</sup> <http://standards.ieee.org/innovate/iot/stds.html>

<sup>6</sup> [http://www.cisco.com/web/about/ac79/docs/innov/loE\\_Economy.pdf](http://www.cisco.com/web/about/ac79/docs/innov/loE_Economy.pdf)

# Business Assessment

## ***Stated Business Model***

The aim of Xped is to deliver a solution that “makes technology human again” by markedly simplifying the IoT on-boarding process and the provision of a single application or browser to control “things”. Xped’s ADRC IoT platform technology is now in the commercialisation phase. The company is currently engaged at various stages with a number of parties in Australia and Asia. To further drive acceptance and implementation of Xped’s technology in a rapidly changing market, Xped has developed the following business models<sup>7</sup>:

- Xped’s core business is to license ADRC to be integrated into 3rd party products. A diverse offering ensure IP can be integrated at any stage in a product’s development cycle. The IP can be packaged and licensed in several forms including supplying a software stack, a pre-programmed chip or a chip on a module. Providing solutions that target semiconductor vendors, product designers and manufacturers provides greater flexibility and minimises barriers to entry.
- Xped have designed a range of consumer products that would be made for available through local and international distribution and retail channels. The preferred model is for these designs to be licensed as reference designs for 3rd party Original Equipment Manufacturers (OEMs) to manufacture and sell through their own channels. Xped would receive a royalty for each unit produced.
- Xped’s platform disrupts industry business models by transforming manufacturers from box movers to service providers fostering direct relationships between all stakeholders. The platform provides the ability to monetise services with revenue streams coming from cloud service charges through to e-commerce. Xped will continue to develop and explore opportunities to commercialise these services through partners

## ***Comments on the Business Model***

### *Novelty of Solution*

Xped have the technology and the appropriate patent protection to execute against the business model listed above. The ADRC solution is a novel approach to interfacing between “things” and smart devices that is intuitive and quick to adopt. It requires the manufacturer to embed the information required to on-board a product within the device, reducing installation complexity. This is one of the driving forces of the IoT industry, taking complex IT technology and making it usable for the consumer. Xped have taken a significant step towards achieving this goal.

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<sup>7</sup> <http://www.xped.com/what/licensing/>

## *Speed to Market*

The Xped ADRC solution may appeal to vendors of “things” who are not tied to large vendors, or existing standards bodies, and who want to get to market quickly in an independent manner. The business model of supplying a simple IoT stack to insert into their devices and things is an attempt to lower the cost of entry into the IoT market.

The Xped customers would benefit as they can enter the market with the majority of the communications, applications, and cloud services already available. By adopting a proven solution they are also able to leverage off the software and security testing inherent in the Xped solution.

Application and cloud providers can develop and sell products and services based on ADRC as they have a known open interface when they interact with ADRC compatible devices. This would provide more incentives for hardware vendors to integrate ADRC firmware as their time to market will be quicker with already existing cloud providers familiar with ADRC.

## *Development Flexibility*

The current Xped “go to market plan” is quite open, allowing them to partner with companies in all aspects of the IoT ecosystem (chips, products, cloud, etc). This is enhanced by the potential wide range of uses for the ADRC solution. At this early stage it is unclear which path will succeed, but the inherent flexibility brings with it the ability to develop the solution in many directions to meet future customer demand.

## *Competition*

The IoT market is very crowded with many diverse solutions. This website<sup>8</sup> created in August 2014 lists 49 companies alone that are active in the IoT space. There are likely to be hundreds more in existence.

There are others who provide similar services to Xped such as Open Remote<sup>9</sup>. They provide design services, cloud and account services, as well as licencing technology for OEM or system providers who wish to enter the IoT marketplace. Whilst it is not clear how much of their technology is unique they do offer a complete service similar to what Xped plans to offer their customers.

## *Standardisation Issues*

Xped claim to help fix the lack of an overarching IoT standard by releasing their own open standard for others to adopt. There are many paths to creating a standard, one is standardisation by size of market or customer influence which favours major vendors (Apple, Google, Cisco) and not Xped.

An alternate path to standardisation is to claim early adopter position which Xped can with its patents and ADRC technology demonstrators.

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<sup>8</sup> <https://blog.profitbricks.com/top-49-tools-internet-of-things/>

<sup>9</sup> <http://www.openremote.com/>

However the easiest path to standardisation is for ADRC to be adopted by a number of major manufacturers or chip vendors which can carry out the standardisation effort on behalf of Xped in standards bodies.

For ADRC to be widely adopted it is crucial to be involved in standardisation in some way.

### *Single Browser Claims*

Xped claim that their solution requires just one app to talk to IoT things. We suspect that any user would probably use with multiple apps, even in a pure ADRC world, for each IoT domain. There would be one for city based things, one for home things, and one for work things. This segmentation would be required for scalability, management, and security aspects. This is an opportunity as represents the ability to sell the solution multiple times to different customers for services delivered to the same end customer.

### *Possible New Services*

If the ADRC solution is adopted by a number of significant hardware device manufacturers, then the owners of ADRC are then in a powerful position to develop extra functionality tied to ADRC that can create more value and revenue. Future services have been proposed within the ADRC and NFC payment framework such as sales vouchers, location based services and promotional material. Some aspects of these concepts have been patented by Xped.

A benefit of the ADRC solution is the ability to have unique information placed in the “things” IoT stack during manufacture. During the on-boarding process, the “thing” could automatically register with the manufacturer and carry out an automatic warranty initiation process. On top of saving warranty procedural costs, this could help the manufacturer understand where the product was actually installed for sales and marketing purposes. This includes investigating grey marketing practises.

The automatic warranty service could be used to develop a direct relationship with customers and allow direct marketing on product specials, security announcements, end of warranty announcements, device firmware upgrade notices and other e-commerce opportunities.

Xped plan to develop a cloud version of their Hub which will allow simpler collection and dissemination of IoT data, as well as accessible cloud analysis applications in the future. Cloud based solutions are important for larger smart city based solutions. They are also important for sharing data between IoT domains (home, work, city). The development of an Xped cloud service could open up other revenue streams for Xped in the future.

When Xped starts to build cloud services they will need to build and test cloud security features, including securing the data at rest in the cloud.

***Xped is currently in a flexible position as it has protocols and software, multiple form factors for its IoT stack, and the intent to sell IoT devices via an OEM model. This makes it well positioned to enter many of the IoT verticals, and maximise its potential addressable market size.***

# Technical Assessment

## *The IoT Models of Operation*

IoT solution providers have adopted some common models to deliver IoT solutions. The first option is that creators of “things” start by building an Internet connected device, then build a cloud based service for it to talk to. This serves the dual purpose of providing a secure interface to a smart device and to provide a common and secure interface for “things”.

If a customer has multiple separate vendors of “things” at home then they will have just as many apps and cloud services on their smart device. If a customer wants to integrate separate solutions they need another cloud service to interface to their existing cloud services to share information. This is called the cloud centric model shown in figure 3(a) below.

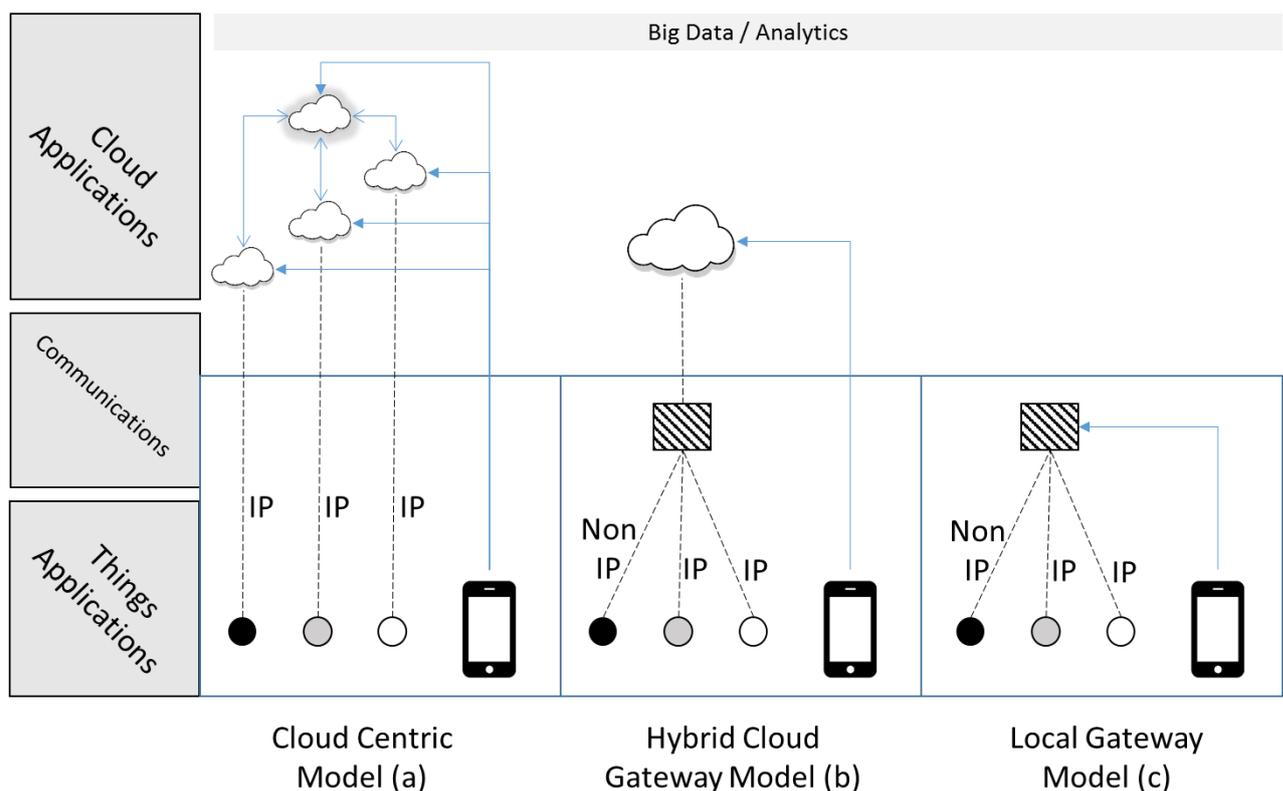


Figure 3 – Traditional IoT System Models

The simplest approach is to provide a gateway that does not need to connect to the Internet or any cloud service. This is the oldest approach and is inherently the most secure model as well. This is the Local Gateway Model shown in figure 3(c). Gateways allow “things” to have the option to utilise low power Non IP radio bearers for communications as well as power hungry and CPU intensive IP based protocols such as TCP/IP or 6LoWPAN. This allows

simple “things” to be connected that have low power and communication overheads, but still have access to an IP connected smart device via the gateway.

Alternatively, other IoT solution providers offer a gateway that can interface with multiple different types of “things” over many different communications bearers (WiFi, Bluetooth, Zigbee, LPD433, etc). This requires the gateway provider to invest heavily in order to integrate large numbers of heterogeneous devices using many different standards. A cloud service is also required in order for the smart device to have a secure connection and allow the devices to be seen and controlled from anywhere. This is the hybrid cloud gateway model shown in figure 3(b).

***Based on a few dependencies, Xped’s ADRC technology can be deployed in all three models above for IP, non-IP and legacy devices.***

## ***Xped Solution and IoT***

The Xped solution<sup>10</sup> comprises 5 different modes of operation between “things” and smart devices.

Firstly a smart device can talk directly to an ADRC enabled “thing” via a bump mechanism where the smart device is placed near the “thing”, (figure 4(a)). This initiates a communication path for the commencement of the on-boarding process. The smart device and the “thing” initiate a NFC forums standards based process to transfer information called NFC Data Exchange Format<sup>11</sup> (NDEF). It then transfers the following information in order to initiate the ADRC process:

- Meta data such as manufacturer, model, icons, etc.
- Security keys for communications.
- Available bearers and MAC addresses for the “thing”.

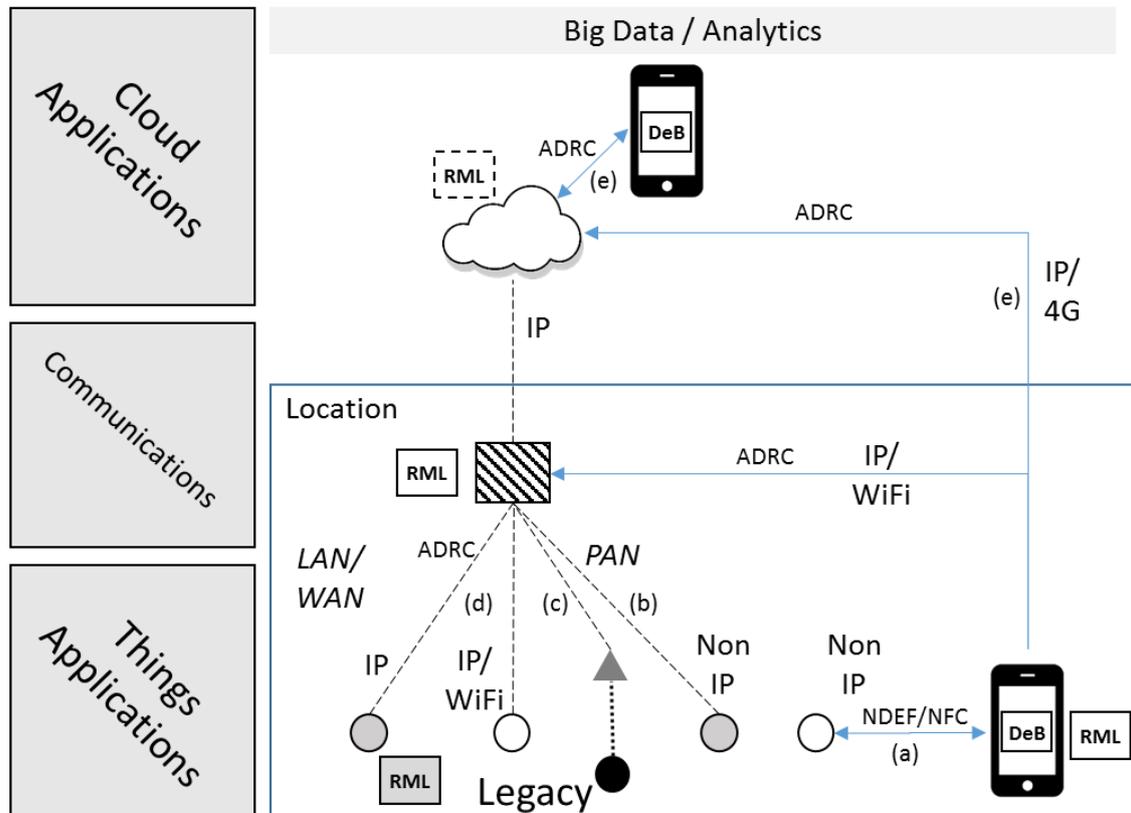
Armed with this information, the smart device then communicates with the ADRC hub. The hub then probes the thing via the chosen PAN technology (Zigbee) and transfers resource meta language files (RML) embedded in the thing to the Hub and to the smart device. This all occurs within seconds. The on-boarding of the “thing” to the smart device’s device browser (DeB) can now occur. In its simplest form the smart device now becomes a smart version of the remote control for the “thing”. The key point here is the information about the “thing’s” capabilities are now known and can be stored on the smart device or the gateway for later use.

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<sup>10</sup> ADRC Marketing Material, [www.xped.com](http://www.xped.com), Xped Corporation

<sup>11</sup> [http://members.nfc-forum.org/specs/spec\\_list/](http://members.nfc-forum.org/specs/spec_list/)

The second mode is that once the “thing” has been on-boarded, the smart device can now interact with the gateway or ADRC hub from anywhere in range of the local WiFi (figure



4(b)). The hub will have been placed in a location so that a personal area network (PAN) connection to the “thing” is possible. The hub will also have a copy of the RML file as a result of the on-boarding process. Control can then occur via the ADRC protocol from smart device to the “thing” using a local fixed or wireless IP network.

Figure 4 – Xped IoT System Models

The third mode is for legacy “things” that don’t support NFC or the ADRC protocol (figure 4(c)). Xped have developed intermediary devices that convert ADRC to native RF or IR control signals like traditional remote controls.

The fourth mode is for “things” that already contain IP stacks and can communicate via cables or over WiFi to an IP network (figure 4(d)). Smart devices could talk directly to the thing via IP via their proprietary interfaces, but Xped are proposing that they utilize the ADRC solution to unify their approach and have a common browser and resource description file for all “things” (IP and Non-IP enabled). A common laborious task of on-boarding IP devices is the initial setup and IP configuration. The ADRC on-boarding process is by comparison much simpler and would alone be a benefit to any traditional IoT solution.

The modes described so far are available in the offline mode where the gateway or ADRC hub is offline from the Internet. The fifth mode is when this gateway is connected to the wider Internet and it is then possible for the smart device to access its “things” from anywhere. This mode also includes the possibility of other applications in the cloud being able to automatically and remotely access, monitor and control “things” (figure 4(e)).

As described above, Xped modes (b), (c), (d), and (e) map to the traditional IoT models shown in figure 3. However even mode (a), which is purely local and non-IP, can still introduce a novel mechanism for placing uniform resource locators (URL) within the RML files (figure 5). This enables the smart device to browse the URL via a traditional browser and access relevant information. This could be seen as the equivalent to a quick response code (QR code). The differentiator is that if the “thing” has some mechanism for altering its URL then the information provided is dynamic and the “thing” is really part of the Internet of Things.

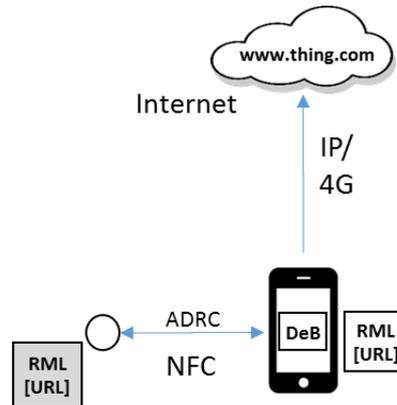


Figure 5 – Connecting Non IP devices to the IoT

Another service that Xped technology can deliver to all Xped enabled IoT “things” is the simplification of the on-boarding process (figure 6). This is traditionally a complicated function for novice users, but also a time consuming task for the expert installer. The ADRC solution allows an off-the-shelf device to associate with the user’s smart device via NFC and have the SSID, security key and other options such as desired IP address to be transmitted in a secure manner to the un-configured “thing” via the hub. This then allows the “thing” to become part of the local IP network. The hub is normally a separate device, but the functionality can be included in a specialised smart device if required for standalone on-boarding only.

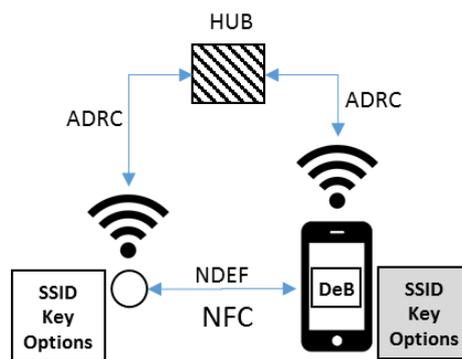


Figure 6 – On-boarding IP-based IoT devices

The Xped business model is to license ADRC in the “thing” in various form factors listed earlier. This relies on embedding a module in the “thing” that interfaces to the application for control of the “thing”, and to existing communications via the radio module. The IoT module contains the NFC capability, ADRC protocols, and the storage capability for RML files (figure 7).

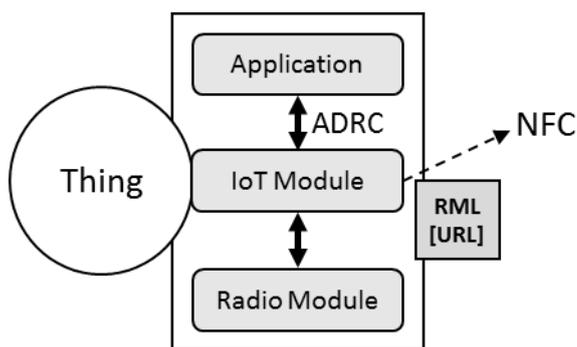


Figure 7 – IoT Module (ADRC) in a Thing

## ***Xped Technology Assessment***

This section lists the key Xped technology and competing vendors and technologies.

### *Dynamic Device Profiles*

Described in patent USPTO#2012/0021684

Xped set out to solve the problem of devices needing a base set of common controls and then a set of device specific controls. This then leads to interoperability problems as the specific controls end up being vendor specific. Xped created a novel description language for modelling available resources available in a thing based on XML. It is the Resource Modelling Language (RML). RML files are stored within the “thing” as a descriptor of the complete set of controls available and their current settings. RML files are based on a hierarchical structure which allows the description of multiple “things” within the one unit. An example of this is a TV with an embedded DVD player. Each has its own description in RML and can be controlled separately but be part of the one larger RML file.

### *Auto-Discovery Remote Control (ADRC)*

Patent USPTO#2012/0021684

ADRC is the term given to the process of establishing communications between a smart device and an ADRC enabled “thing”. It defines the process of on-boarding the “thing” to the smart device’s control software and transferring the specific RML file for the “thing”. This enables the smart device to control the “thing”. The protocol for transferring RML files is called the Remote Control Protocol (RCP) and is also an invention of Xped. The uniqueness of the Xped patent is the combination of the NFC process with the communications process via the hub.

Other efforts are underway in standards bodies such as the Open Group to create standards for the equivalent of RML<sup>12</sup> and RCP<sup>13</sup>. There is at least one academic paper on the use of peer to peer communications describing the security mechanisms for the transmission of information<sup>14</sup> over NFC. There are also patents in a similar field<sup>15</sup> to ADRC.

<sup>12</sup> Open Data Format (O-DF), an Open Group Internet of Things (IoT) Standard

<sup>13</sup> Open Messaging Interface (O-MI), an Open Group Internet of Things (IoT) Standard

<sup>14</sup> LLCPS: A New Secure Model For Internet of Things Services Based On The NFC P2P Model

There are many companies and standards bodies that are working in the field of IoT to develop protocols and standards that might compete with ADRC such as:

- Google with brillo and weave<sup>16</sup>.
- Samsung with artik<sup>17</sup>.
- Apple with homekit<sup>18</sup>.
- ARM with mbed<sup>19</sup>.
- Intel with its IoT Platform<sup>20</sup>.
- Texas Instruments with ConnectMore<sup>21</sup>
- Phillips, Sony, Faber, Honeywell, HTC, LG and more, with its AllJoyn Framework and the Allseen alliance<sup>22</sup>. An additional 13 members joined this alliance during the writing of this report.
- Qualcomm<sup>23</sup> has a vast range of IoT related products with various protocols and solution architectures.
- 8 standards bodies and 230 hardware and software vendors and service providers are part of the M2M onem2m standardisation effort<sup>24</sup>.

The problem with this scenario is that this competitiveness often leads to a myriad of new vendor standards, which is no different to the current status quo in remote control technology. This very problem is what Xped and the Open Group is attempting to solve with ADRC. It is interesting to note that one of the largest standards bodies has adopted a similar approach to Xped, which implies that the effort required to align solutions in the future would not be large.

### *Device Browser (DeB)*

Patent USPTO #2014/0154983, #2012/0021684, #2013/176106

Xped have developed a generic device browser that can see, control, and measure device attributes by rendering a common device language (RML) to a smart device or PC browser. This allows a device to have a single browser to control all the things in the home (if they are ADRC enabled).

It is interesting to note that Google has tried to solve the same problem by creating extensions to chrome to allow NFC tags to push information to the browser to share information<sup>25</sup>. They call this concept the “physical web”, allowing browsers to talk to physical things, not just other computers.

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<sup>15</sup> USPTO 8929815 Apparatus and method for controlling functions of a mobile phone via NFC communications with an external reader, USPTO 9042819 Method, system, and apparatus having near field communication (NFC) chip with configurable memory that is updatable via a host processor

<sup>16</sup> <https://developers.google.com/brillo/>

<sup>17</sup> <https://www.artik.io/>

<sup>18</sup> <https://developer.apple.com/homekit/>

<sup>19</sup> <https://www.mbed.com/en/>

<sup>20</sup> <http://www.intel.com/content/www/us/en/internet-of-things/infographics/iot-platform-infographic.html>

<sup>21</sup> [http://www.ti.com/ww/en/internet\\_of\\_things/iot-challenges.html](http://www.ti.com/ww/en/internet_of_things/iot-challenges.html)

<sup>22</sup> <https://allseenalliance.org/>

<sup>23</sup> <https://www.qualcomm.com/products/internet-of-everything>

<sup>24</sup> <http://www.onem2m.org/>

<sup>25</sup> <http://blog.chromium.org/2015/04/reaching-and-re-engaging-users-on.html>

The Swedish company Linkafy<sup>26</sup> has claimed to develop a single application to talk to IoT “things” via a series of APIs. This is the model of one cloud provider joining other cloud services together as shown in figure 3(a) above. If This Then That<sup>27</sup> (IFTTT) is another example of using a cloud service to solve the unified browser problem. The differentiator is that DeB communicates with the “thing” directly or via the gateway, whereas these other examples rely on a cloud service which is vulnerable to Internet outages. Customers will be hesitant to fully adopt an IoT solution if there are major issues with its operation if their Internet service is interrupted.

IoT is customer facing technology and as such localisation is critical when aiming for global markets. Xped have implemented DeB using extensible language files and have currently successfully tested English and Chinese browser languages.

While most browser concepts are either patented or open source already, Xped have applied for a patent for a unique mechanism that indicates the status of a control action entered on a smart device via DeB. This informs the user whether the action has actually occurred and the current status of the control link to the thing via a blinking coloured dot on the screen.

### *Embedded IoT Stack*

USPTO #2012/0021684

A major part of the Xped business plan is to gain revenue by selling its ADRC protocol stack embedded into multiple types of hardware. This flexibility is critical in the IoT market due to the vast range of devices expected but also due to the varying technical IoT capability of future Xped customers.

There are other examples of similar approaches to the IoT market. DigiKeys Electronics<sup>28</sup> offers development boards for their NFC/IoT solution. ARM offers development boards and embedded chips as part of its eco system to encourage adoption of its ARM chips and IoT software.

Chip manufacturers such as Intel and Qualcomm have solutions for every current IoT vertical. They have products and solutions that work in the application, communication, “thing” and subsystem level.

### *ADRC Hub*

USPTO #2012/0021684

A benefit of the ADRC hub as a standalone product is that the data that is collected via the hub is local and owned by the customer. This allows customers to decide how protect or use their IoT data. IoT solutions which tether directly to cloud services result in the data being available to the single cloud application and it can become difficult to export this data to other applications.

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<sup>26</sup> <http://www.linkafy.com/>

<sup>27</sup> <https://ifttt.com/>

<sup>28</sup> <http://www.digikey.com.au/en/product-highlight/n/nxp-semi/nfc-for-iot>

## Other Technologies

This section discusses the ancillary technology that Xped has developed. A separate report on Xped technology covers some of these features in more detail<sup>29</sup>.

### Power Management

Technology that Xped has developed related to patent #2012/0021684

The management of power in the IoT ecosystem is critical with the large number of battery powered devices expected. Xped have invented a power management circuit to monitor local power and have included this status into the RML language so that battery levels (current and historical) can be presented to the user via the DeB.

### NFC based coupons

Patent #2013/0176106

This covers the ability of a vendor to push data and triggers to a smart device after it completes a NFC payment cycle during a tap event. As an example, the data now stored on the smart device can be used as vouchers that can be used by the customer next time they shop. The trigger portion of the information can time out the voucher or make it useable after a certain time has elapsed.

### Near Field Ping

Patent #2013/0225077

This covers the capability to provide a communications path over near field magnetic induction that has longer range than NFC communications. It also utilises 1/10<sup>th</sup> of the power of similar technologies to achieve the same outcomes. This is a good candidate for IoT solutions that require low power characteristics.

### Wireless Charging

Not Patented – but technology that Xped has developed related to patent #2015/0044966. This covers the capability to provide wireless chargers and devices that operate in the near magnetic field. This allows devices to charge when sitting on a charge mat while simultaneously providing a data connection for the devices via the same process.

### All in one Controllers

Patent #2013/0176106

This covers the ability to provide a controller for devices that integrates smart device and hub capability. This also describes the issues involved in having multiple controllers in any one environment.

### ADRC Wand

Patent # 2015/0044966

This covers the ability to provide a wand that can carry out the NFC tap portion of the ADRC process when the smart device does not have integrated NFC capability. Xped could use smart watches as the ADRC wand, allowing a new set of use cases to be introduced into the IoT market.

### Retail Precincts

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<sup>29</sup> Statement of opinion about Xped Corporation, Invertech Electronics, Adelaide, South Australia.

Patent #2011/0270712

This covers the ability of a smart device to tap a particular kiosk in an environment (such as smart city or retail) and be automatically logged into the appropriate wireless network for that precinct. This facilitates smart searches of local services. This patent also covers the ability to nest precincts so that searches can be tailored to a specific location (eg. a specific shop) within a larger environment (eg. a shopping mall).

## Risk Assessment

The following section describes risks in the technology and the current market that are apparent at the time of review.

### **Security**

The use of IoT technology in itself does not introduce any new risks above what is already present in other IP enabled products. However it can become a problem due to the predicted massive size of the unit numbers and the limited ability to update or patch software and firmware in “things”. Many adopters of IoT devices will get them to work with minimal security settings and default passwords then leave them alone. This means the fine tuning of security parameters, the ongoing monitoring, and patching of the device is unlikely to be a common occurrence. We see this today in many solutions connected to the Internet, for example baby monitors and standalone IP video surveillance cameras where hackers take control of “things” and use them for a multitude of sinister outcomes.

Xped style technology is exposed to security risks on a number of fronts:

- Internet - The Xped hub can be an Internet facing device that is susceptible to hacking.
- Radio – The Xped DeB application, or the IoT stack in the thing, may be vulnerable to NFC related spoofing leading to identity theft. This then opens up the devices and things to unauthorised access.
- Firmware – The process of upgrading the IoT stack in the thing needs special attention as the lack of automated upgrades can lead to out of date and insecure code remaining on a device. On the other hand automated processes can be hijacked to spread non desirable firmware to things in order to take over these devices. A balance is required to provide the optimum security.

Security is normally an afterthought to the design phase. Xped have designed security into the ADRC process, but until a comprehensive investigation (Penetration Test) of the Xped solution is carried out it is hard to declare the effectiveness of security present in the current solutions. After such a test it will be possible for Xped to mitigate against security flaws that may or may not be found. This is planned to occur during the Xped technology development roadmap. The outcome of this test cannot be predicted in this report.

Xped have planned for a separate access control function in their roadmap for ADRC implementation to scale for secure deployments in enterprise or citywide installations.

Initial NFC bump is available as a mechanism to enable a secure key exchange between devices and controllers limited by low power and coverage of NFC. From that point on the ADRC communication uses standards based secure transport methods.

## ***Customer Demand and Return on Investment (ROI)***

For any IoT solution to be widely adopted it needs to pass a simple test. It must offer a return on investment on the premium required to buy IoT connected devices. In the home market the return can be in simplicity, functionality or personal health. In other markets it must be tied to reduced expenses, improved productivity or intangibles such as security and employee wellbeing.

The latter often requires that IoT solutions be tied to a change in business process in order to obtain the promised ROI. IoT solutions sold just for technologies sake are likely to fail in the long run due to the increased operating costs incurred without the realisation of the associated savings.

For Xped technology to be widely adopted it needs to be associated with the correct mix of partners who can deploy IoT into an environment and assist the end customer enact the business process changes accordingly.

## ***Architecture, Technology and Standards***

As there are numerous technologies involved in the creation of a complete IoT solution, there are many different standards that need to be observed. This is complicated by the fact that currently there is no agreed upon overseer of architecture framework for IoT solutions. For example chip manufacturers could adopt one standard, communications companies another, and the home product vendors yet another standard. Add to this the fragmentation of the M2M standards bodies competing with the IoT standards and the picture is more complex.

Whilst the claim that ADRC is a valid option for a future standard for IoT, there are many other standards efforts under development. Whilst some standards seem compatible with ADRC such as the Open Group standards, many others are not as similar. There is a risk that Xped may not gain the traction it desires with ADRC if a suitable pathway to standardisation is not found.

## ***Market Fragmentation and Sales***

As mentioned earlier, the IoT market ranges from the home, to transport, to smart cities, to the human body, to food production, and finally to industry. Each of these verticals are large enough to support their own standards as they so often have in the past. However a significant part of the appeal of IoT is the inter-connectedness of all “things” and smart devices to unlock new services and unleash productivity gains. If a comprehensive single set of IoT standards is developed, then the solutions will fragment along market lines.

A fragmented market is far more complicated to sell into, and the end market for Xped is then limited to the market segments that evolve around ADRC solutions.

## ***Partnering and Revenue Sources***

The IoT market is segmented into cloud, communications and “thing” providers. Additionally there are those who can provide the intelligence to the “things”. Any successful business model will need to have partners in most of the areas to succeed. The current IoT partner environment can be characterized as follows:

- standalone powerful vendors with their traditional existing partners (Apple, Google, Samsung)
- large groups teaming to provide ecosystems (Allseen Alliance, ARMs Mbed, Open Group, OneM2M). Allseen currently lists 185 partners, mbed lists 50 partners and M2M 230 partners.
- and individual small players.

Xped will need to find a way to influence standards in the IoT area that can compete with these existing efforts. It is possible that the unique NFC based ADRC approach may be able to influence the development of future IoT standards.

Much of the revenue planned for Xped is based around the selling or licensing of embedded devices. This requires Xped to partner with chip or microcircuit manufacturers in order to bring their solutions to market within the appropriate price, size and power constraints. The inability to find and maintain these relationships are a risk to success.

Cost margins are hard to predict. IoT devices can command a premium at first for the early adopters. However if the features become common place and the functionality doesn't provide a real ROI, then there will be market pressure to integrate IoT at reduced cost. The IoT stack will then be seen as an expense that can be trimmed, hence pressure for reducing margins on the devices or licenses.

The IoT is the opportunity for chip manufacturers to move up the value chain and start to offer end customer solutions (refer to AMDs standardisation effort). Conversely it's the opportunity of consumer product manufacturers to create standards and offer embedded solutions to other vendors to attempt to promote their IoT standards. This implies that companies that traditionally are in separate ecosystems (hardware, microchips, software, services, communications, etc) are now in competition for IoT mindshare. It is also not uncommon for companies to be involved in multiple standardisation efforts simultaneously.

Xped will need to join an existing standardisation effort, or build an ecosystem of their own.

## ***Technology Shortcomings and the Hype Cycle***

The market for IoT devices is predicted to be huge. It must be said however that many of the early adopters of IoT technology have been disappointed with the current state of the

Internet of Things. High additional cost for IoT aware products, lack of integration to other IoT devices, security concerns, the burden of ongoing maintenance, the lack of failsafe operation when communications or power is down are all dampeners on the demand of IoT products. It is hoped that the second generation of IoT products that are produced as part of the newly formed standards bodies will address some of these issues. However IoT technology is still seen by many as too early or too risky for prime time adoption. It is up to industry to solve these problems and repair perceptions if the market is to truly embrace IoT and deliver the large sales numbers as predicted.

## References

### *Patents*

US Patent 2012/0021684, Arrangement for managing wireless communication between devices
US Patent 2011/0270712, Arrangement for managing mobile device access to precinct regions containing services and products and information
US Patent 2013/0225077, Wireless device detection and communication apparatus and system
US Patent 2015/0044966, Method and apparatus for forming association and communicating between devices
US Patent 2014/0154983 Remote Control Arrangement
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