TMT ANALYTICS

XPED Ltd.

Enabling "Things" to communicate on the IoT

Semiconductor company XPED Limited (XPE) has developed a technology that enables devices to wirelessly communicate with each other, regardless of brand, manufacturer, type etc. This universal ADRC protocol (Auto Discover Remote Control) has the potential to become an essential element of wireless communications protocols that facilitate the rapid growth of the Internet of Things (IoT) in the next five years.

Early endorsement by Intel and Telink Semiconductor

The potential of XPE's technology is underlined by the collaboration agreement XPE signed with Intel and the license agreement signed with Telink Semiconductor. Both companies are actively pursuing opportunities that are presented to the semiconductor industry by the fast growth of the IoT. In addition to Telink we also expect XPE to sign a commercial IP licensing agreement with Intel in the near term, commencing in FY17.

The IoT opportunity will be worth US$1TN by 2020

The strong growth of the IoT is driven both by consumer and industrial applications, including smart cities, healthcare, transportation and smart buildings/infrastructure. All these verticals can be addressed using XPE's technology, which brings substantially improved functionality and cost savings opportunities.

Cisco estimates the number of connected devices will total 50BN by 2020, valuing this industry at ~US$1TN, growing 33% CAGR. XPE will be addressing this market using an asset-light business model, selling IP to semiconductor manufacturers, OEM's and consumer electronics companies, allowing for high ROIC's once scaled.

Conclusion: BUY rating with A$0.24 price target

Given XPE's relatively short commercialization track record, we have been conservative in our estimates, assuming five semiconductor customers will adopt ADRC in the next eighteen months. However, given the sheer size of the global IoT market we potentially see strong upside to our numbers if XPE is able to land some of the bigger names in the industrial IoT and consumer electronics space, such as Cisco, Qualcomm, STMicro, NXP/Freescale, Texas Instruments, Sony, Samsung and Panasonic.

We start our research coverage of XPE with a BUY rating and a price target of A$0.24 per share, which is derived from a DCF valuation using a discount rate of 12%.

XPE.ASX			FY16E	FY17E	FY18E	FY19E
Number of shares (m)	1,871	Revenues	0.4	1.0	4.2	17.5
Number of shares FD (m)	2,241	EBITDA	-2.4	-2.0	-2.0	6.3
Market capitalisation (A$ m)	142.2	NPAT	-2.4	-2.0	-2.0	6.1
Free Float (%)	72%	EPS FD	-0.001	-0.001	-0.001	0.003
12 month high/low A$	0.028 / 0.11	EV/EBITDA	N/A	N/A	N/A	20.9
Average daily volume (m)	53.2	EV/Sales	352.6	134.6	32.9	7.5

Company report

XPE.ASX

Software & Services

Australia

Risk: High

XPED has developed technology that facilitates connection of smart phones to electronic devices by a single tap, enabling users to control all of their electronic devices remotely from one app. XPE addresses both the consumer and industrial global IoT market.

The company listed on the ASX on 5 April 2016 and raised A$ 8M through a prospectus offer.

BUY

Current price: A$ 0.076

Price target: A$ 0.24

7 July 2016

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XPE.ASX

FY-end June

Profit & Loss account	2016E	2017E	2018E	2019E
Revenues	0.4	1.0	4.2	17.5
EBITDA	-2.4	-2.0	-2.0	6.3
EBITDA %	*N/A*	*-195.0%*	*-47.0%*	*36.0%*
Depreciation & Amortisation	-0.1	-0.1	-0.1	-0.2
EBIT	-2.5	-2.0	-2.1	6.1
EBIT %	*N/A*	*-203.6%*	*-50.2%*	*34.8%*
Interest income & expense net	0.1	0.1	0.1	0.0
Other items	0.0	0.0	0.0	0.0
Profit before Tax	**-2.4**	**-2.0**	**-2.0**	**6.1**
Taxes	0.0	0.0	0.0	0.0
Net earnings	**-2.4**	**-2.0**	**-2.0**	**6.1**
Ordinary shares outstanding	1,871	1,871	1,871	1,871
Fully diluted # shares	2,241	2,241	2,241	2,241
Earnings per share	**-0.001**	**0.00**	**-0.001**	**0.003**
Earnings per share fully diluted	-0.001	0.00	-0.001	0.003

Cash Flow Statement	2016E	2017E	2018E	2019E
Net income P&L	-2.4	-2.0	-2.0	6.1
Depreciation & amortisation	0.1	0.1	0.1	0.2
Impairments	0	0	0	0
Change in working capital	-0.1	0.0	0.0	0.3
Other items	0	0	0	0
Cash flow from operations	**-2.5**	**-1.9**	**-1.9**	**6.6**
Net cash flow from investments	**-0**	**-0.2**	**-0.3**	**-0.4**
Dividend paid	0	0	0	0
Change in equity	1.8	0	0	0
Change in debt	0	0	0	0
Other items	0	0	0	0
Cash flow from financing	**1.8**	**0.0**	**0.0**	**0.0**
Net cash flow	**-0.7**	**-2.1**	**-2.2**	**6.2**

Balance Sheet	2016E	2017E	2018E	2019E
Current assets				
Cash and marketable securities	9.0	6.9	4.7	10.9
Accounts receivable	0.1	0.1	0.6	2.4
Inventories	0.0	0.0	0.0	0.0
Other current assets	0.4	0.4	0.5	0.7
Total current assets	**9.4**	**7.5**	**5.8**	**14.0**
Fixed assets				
Net property, plant & equipment	0.01	0.2	0.5	0.7
Goodwill	1.7	1.6	1.5	1.4
Other intangible assets	0	0	0	0
Other assets	2.0	2.0	2.0	2.0
Total fixed assets	**3.7**	**3.8**	**3.9**	**4.1**
Total assets	**13.1**	**11.2**	**9.8**	**18.2**
Current liabilities				
Short-term debt	0.0	0.0	0.0	0.0
Accounts payable	0.46	0.05	0.1	0.5
Dividends payable	0	0	0	0
Other current liabilities	0.1	0.0	0.1	0.2
Total current liabilities	**0.1**	**0.2**	**0.8**	**3.1**
Long-term debt	0	0.0	0.0	0.0
Total provisions	0.3	0.3	0.3	0.3
Total group equity	**12.6**	**10.7**	**8.6**	**14.7**
Total liabilities and equity	**13.1**	**11.2**	**9.8**	**18.2**

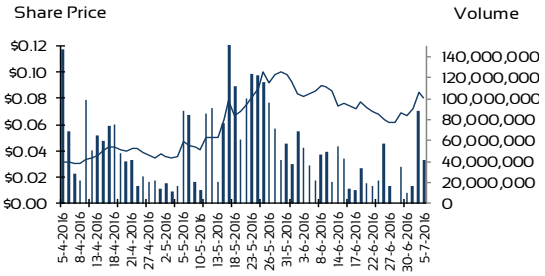
Valuation	2016E	2017E	2018E	2019E
Relative valuation				
P/E (reported)	N/M	N/M	-70.2	23.3
P/B	11.3	13.3	16.5	9.6
P/CF	N/A	N/A	N/A	21.6
Price to sales	376.3	141.4	34.1	8.1
EV / sales	352.6	134.6	32.9	7.5
EV / EBITDA	N/A	N/A	N/A	20.9
Dividend yield	0.0	0.0	0.0	0.0
EV / Common equity	10.6	12.7	15.9	8.9
Discounted Cash Flow				
Assumptions				
Long term interest rate				2.5%
Risk premium				4.3%
Marginal tax rate				30%
Long term growth				3%
Leveraged Beta				1.44
Implied WACC				*9.1%*
TMT Analytics applied WACC				12%
DCF fair value range per share				A$ 0.24

Profitability ratios	2016E	2017E	2018E	2019E
Return on Equity	-19%	-18%	-23%	41%
Return on Assets	-19%	-17%	-21%	34%
Return on Invested Capital	-20%	-80%	-78%	222%
EBITDA margins	N/A	-195.0%	-47.0%	36.0%
EBIT margins	N/A	-203.6%	-50.2%	34.8%
Net margins	N/A	-194.8%	-48.5%	34.9%

Financial Strength	2016E	2017E	2018E	2019E
Net debt	-8.9	-6.9	-4.7	-10.9
Net debt / Equity	-0.7	-0.6	-0.5	-0.7
Net debt / EBITDA	3.7	3.5	2.4	-1.7
Interest coverage	N/M	N/M	N/M	N/M

Capital Structure

Ordinary shares (m)	1,871
Performance shares (m)	150
Options and warrants (m)	220
Fully diluted (m)	2,241
Market capitalisation (A$ m)	142.2
Market cap. fully diluted (A$ m)	170.3
Free float %	72%
12 month high/low A$	0.028 / 0.11
Average daily volume (m)	53.2



Source: Factset, TMT Analytics

XPE solves wireless connectivity issues as the IoT takes off

The technology XPED Limited (XPE) has developed and is currently commercializing aims to solve a problem that has plagued mankind since the Biblical times of Babel, i.e. how to communicate with each other when we all speak different languages. In XPE's case, this problem is addressed at the level of machines and devices needing to communicate with each other as well as people and devices needing to interact with each other.

The problem with machine-to-machine (M2M) communication is that manufacturers of electronics, appliances, devices and machines in general, have always had a preference to incorporate their own communication languages and protocols into their products. For instance, to protect their ecosystem from unwanted infringers or simply because different companies have different ways of doing things, including communicating.

In any case, in a world where devices generally didn't communicate that much, having different languages for different brands of electronics and industrial machines wasn't that much of an issue. However, as more and more electronic devices and machines are fitted with components that facilitate wireless and wired communication across global networks, the need for more universal M2M and HMI communications (Human Machine Interface) is becoming very apparent.

The Internet of Things will enable connectivity among all electronic devices

Based on the ongoing proliferation of semiconductors in all sorts of devices and the ever-increasing number of wireless communications protocols, such as 4G, Wi-Fi, Bluetooth, Near Field Communication (NFC), Z-Wave and ZigBee in their various appearances, more and more devices can be connected to the internet.

In fact, the sheer number of devices that is expected to be connected to the Internet in the future (Cisco estimates 50BN devices will be connected to the Internet by 2020) has led to the term Internet of Things (see Figure 1). Cisco has even coined the term Internet of Everything as that is where we seem to be heading, i.e. humans and machines all interacting on the same network.

However, in order for the network nodes to interact and for humans to have access to, and control over all these devices, we need to have common languages and access protocols across a substantial part of the network.

Figure 1: The Internet of Things / The Internet of Everything

Source: Information Week, TMT Analytics

The lay of the land in wireless IoT connectivity

A myriad of wireless connectivity protocols is currently available to companies looking to facilitate IoT connectivity of their products. The key specifications of each protocol include the radio frequency that is used, the effective range of the signals, the rate at which data is transmitted and energy consumption.

Main frequencies are 2.4GHz and 900MHz

The radio frequency that is used by a protocol partially determines for which applications the protocol can be used. For instance, Wi-Fi uses the 2.4GHz frequency, which needs a relatively open area without too many walls and obstructions to work properly. Sub-1GHz frequencies, such as 900MHz. with a longer wavelength, have less trouble passing through walls and therefore usually work better in industrial environments.

Great variability in range

The range a signal can travel can vary widely from protocol to protocol. NFC has an effective range of no more than 10 centimeters, while cellular technology essentially enables global connectivity.

Data rates to suit every sort of application

Data rates indicate the amount of data that is transferred per second and vary from just a few dozen kilobytes per second (kbps) in NFC to 10 megabytes (Mbps) in cellular technology and more than 100Mbps in high-end Wi-Fi technology. The data rate of a connectivity protocol is a major variable in determining the application areas of the protocol. For instance, ZigBee's 250kbps data rate would make it useless for applications that require transfers of large amounts of data. Alternatively, having a 10Mbps data rate for a contactless payment system makes no sense given the very small amount of data that needs to be transferred in such an application.

Power consumption matters, especially for remote devices

Unlike most devices connected to the Internet today, many future devices connected to the IoT will not have a permanent power connection. For instance, smart meters and remote sensors may go years without servicing and will need battery power during all that time. But power consumption matters even for devices that can be recharged daily, such as smart phones and wearables. Therefore, power consumption is a key variable in wireless connectivity protocols.

Mix 'n' Match with today's main protocols

Today's main wireless connectivity protocols are typically used in combination in order to provide connectivity in various scenarios. For instance, smart phones have Wi-Fi, Bluetooth and cellular capabilities enabling users to connect to the internet and other devices under various circumstances.

Going forward, however, we expect IoT devices to generally become more dedicated, i.e. doing one specific task all the time, such as sensors, requiring just one connectivity protocol present on the device. Today's most common wireless connectivity protocols are described below:

Near Field Communication (NFC)

NFC is used for very close range (max 10 centimeters) wireless connectivity to exchange very small data packages at a relatively low rate of up to 420kbps. The protocol is used in contactless payments systems, access control (e.g. hotel doors), consumer electronics etc, where only small packets of data need to be transferred across very short distances.

Wi-Fi

Wi-Fi is probably the best known wireless connectivity protocol and is used across both consumer and industrial applications. Data rates are high with consumer applications achieving 100 Mbps under good conditions and industrial applications reaching maximum rates as high as 600 Mbps with a maximum range of 50 meters. Given the high data rates, Wi-Fi is ideally suited for high volume data exchange. The operational frequencies of 2.4GHz and 5GHz limit the applicability of Wi-Fi in areas with many walls and obstructions, hence the requirement for lower bandwidth solutions for industrial applications.

Bluetooth

Another well-known and widely used protocol is Bluetooth. Operating at 2.4GHz and with a data rate of 1Mbps, Bluetooth is well-suited for limited data transfers in relatively open areas. Bluetooth Low-Energy (BLE), aka Bluetooth Smart, is a version of Bluetooth that offers a similar range as Bluetooth, but with substantially lower energy consumption, which makes BLE a good protocol for IoT applications requiring low data rates across shorter distances.

One of the main advantages of Bluetooth and BLE is the wide adoption of the protocol in wireless devices, such as smart phones, wearables etc, making BLE an obvious choice for many consumer applications wanting to connect to these devices.

Figure 2: Today's main wireless connectivity protocols

Source: Information Week, TMT Analytics

ZigBee

ZigBee is another widely used connectivity protocol, especially in industrial applications that require relatively infrequent data exchanges. ZigBee data-rates are lower than Bluetooth's, 250kbps versus 1Mbps, while the maximum range is 100 meters. Operating at 2.4MHz, ZigBee uses the industry standard IEEE802.15.4 protocol, also used by Thread (see below). Because of low energy consumption and data rates, ZigBee is well-suited for sensors and wireless control within the IoT.

Z-Wave

Limited availability of Z-Wave-enabled semiconductors make this wireless connectivity protocol a niche technology. While aimed at home automation, the sub-1GHz radio frequency used by Z-Wave also makes the technology suitable for densely constructed areas. Z-Wave operates across short ranges (up to 30 meters) and has low data rates (up to 100kbps).

Thread

While not a truly IoT-focused protocol, the relatively new Thread protocol can be seen as complementary to Wi-Fi for home automation in particular. With the ability to connect up to 250

wireless devices, such as lights, blinds, thermostats, home appliances, garage doors etc, requiring only small data transfers across short distances, Thread is a more versatile option for home automation than Wi-Fi, which is better suited to larger data transfers.

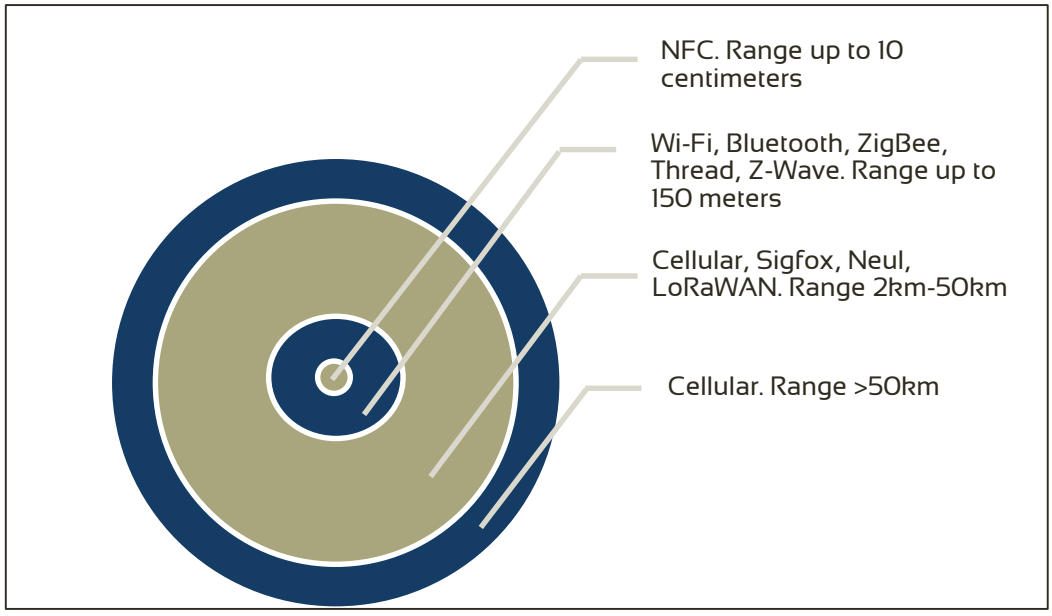
Cellular technology

Well-known cellular technologies used in mobile phones, such as 2G (GSM/GPRS/EDGE), 3G (UMTS/HSPA) and 4G (LTE), can also be used to connect wireless devices, in particular across long distances. Data rates range from low (maximum 170kbps using GPRS) to high (up to 12.5Mbps using 4G). However, relatively high costs and power consumption limit the applicability of cellular IoT connectivity to high end applications or very remote locations.

Other long distance protocols

Sigfox, Neul and LoRaWAN are wireless connectivity protocols that can send small bits of data across long distances, 2 to 50 kilometers, using sub-1GHz frequencies. Because of the long ranges these technologies can cover, they are ideally suited for applications in Smart Cities, and sensors in remote locations, such as rainfall sensors in rural areas. Additionally, because of the very low power consumption, wireless devices using Sigfox, Neul or LoRaWAN can stay in the field for many years without needing battery changes. These technologies offer an alternative for more expensive cellular technologies, such as GPRS, 3G, CDMA and LTE.

FIGURE 3: OPERATING RANGE OF DOMINANT WIRELESS CONNECTIVITY PROTOCOLS



Source: TMT Analytics

The choice of connectivity protocol to be used by an equipment manufacturer will depend on the intended application of the device, which determines factors such as required range, data speed and amounts, security, power demands and battery life.

XPE does not compete with these protocols but rather uses several of them to establish a connection between a device and its controller, for instance a smart phone. XPE's Intellectual Property revolves around the way the device and controller communicate once a connection has been established.

XPE's key technology: Auto Discover Remote Control

XPE's technology uses several of the protocols described above to enable wireless communications among devices. It is a so-called Application Layer Protocol called Auto Discover Remote Control (ADRC) and is essentially a combination of hard- and software. Regardless of brand or product type, ADRC enables seamless wireless communication between multiple devices through a single touch, for instance between a smart phone and a smart TV at home or between an industrial battery sensor in a data center and the tablet of a mobile maintenance engineer in that datacenter.

Easy pairing of a phone to any ADRC-enabled device

The phone or tablet will need to be enabled with very-short-range radio transmission capability, such as Bluetooth Low Energy (BLE) or NFC. By tapping the phone/tablet on the device, XPE's technology enables the phone or tablet to automatically detect the device, connect to it and have the device send specific information about itself to the phone/tablet, e.g. what sort of device it is, its functionality, its user interface and which parts of the device may be controlled by the smart phone.

FIGURE 4: ONBOARDING OF IOT DEVICES AND USE THROUGH A SINGLE APP

Once paired, the user can control the device from the phone/tablet, both from a short distance, e.g. using a Bluetooth connection, or remotely through the Internet and a Wireless Local Area Network (WLAN) using Wi-Fi. In a home environment, this setup allows consumers to control the TV, lights, thermostat, DVD player, aircon etc from any location, be it the couch, from work or on holiday.

> *While tap-to-connect isn't unique in the market, the universal control of all ADRC-enabled devices from just one app is unique, as we will elaborate on below. This capability is protected by a patent granted in the USA, China, Japan, Russia and other countries.*

ADRC is unique in several ways

In several key aspects ADRC is different from other wireless communications protocols and products on the market today, such as remote-controlled thermostat NEST or remote-controlled security cameras etc. Firstly, pairing ADRC devices to a mobile phone is substantially easier compared to other products. Most IoT devices today require installation of an app and subsequent connectivity configuration by the user, e.g. establishing a Wi-Fi connection. In the ADRC protocol this all happens automatically once the phone is tapped on the device.

More importantly, the ADRC protocol is universal, meaning that devices of different brands and types can be controlled through the phone using the same app. So rather than having a different app for every brand of connected devices, users only need one app that controls all device brands that use the ADRC protocol.

Convenient for consumers, but profit-generating in industrial settings

While the latter feature is convenient in a consumer setting, we believe the benefits of ADRC go well beyond convenience in an industrial setting, where substantial cost savings may be achieved when devices in datacenters, factories, medical environments etc can be easily connected regardless of supplier. For instance, installing wireless battery monitors in data centers rather than wired monitors can save US$0.5M in Capex per data center.

XPE's solution consists of three elements

Device manufacturers such as consumer electronics companies and Original Equipment Manufacturers (OEM's), looking to integrate XPE's technology into their products and modules will require three elements of XPE's technology:

1. XPE's ADRC IoT Stack
2. The Device browser (DeB), which is a downloadable app for smart phones and tablets, used to control the connected devices, and
3. Either a "hub" based system, which is used to connect multiple phones to multiple devices and allows remote access to a device, e.g. through the Internet or a "hub-less" system where one phone connects to one device using a direct Bluetooth connection.

Additionally, in order to connect all elements together, XPE has developed its open source Resource Modelling Language (RML), used to describe the actual device being connected (e.g. manufacturer, model, version etc), the Application Programming Interface (API), the user interface of the devices being connected to the DeB and other data such as Web links to where information such as user manuals, FAQs etc can be found. It works in a similar way to HTML, which can describe every web page to an internet browser, however RML describes every device to a device browser.

The file containing all the specific information regarding the device being connected to the phone is called the RML file and is located on the device itself and is sent to the phone or tablet when touched/tapped by that phone or tablet.

Ad 1) The ADRC IoT stack is the heart of the technology

The ADRC IoT Stack (IoT stack) contains the essence of XPE's technology to manage wireless communications between devices. This key technology is patented under number 9,136,913 in the United States, China, Japan, Russia (and others) with patents pending in Europe and Australia (PCT/AU2010/000358).

The IoT stack includes XPE's hardware design for the modules that go into the devices, the connectivity and communications protocols as well as the RML File.

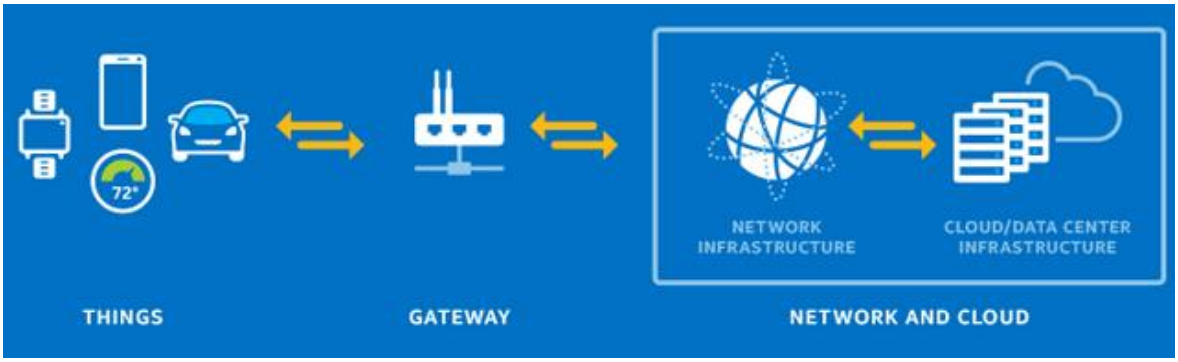
The IoT stack is available in various configurations for OEM's and electronics companies to purchase depending on the level of integration they require. Typically, the more elaborate solutions will be more expensive. We estimate prices/license fees for XPE's solution to range between US$0.10 for high volume applications and US$20/25 for fully integrated modules. Alternatively, XPE may sell its technology through a royalty arrangement, i.e. a percentage per product sold.

A complete module with integrated ADRC chipset

This is the most comprehensive solution XPE offers customers and involves integrating the entire ADRC module into a customer's device. For instance, an OEM may sell an IoT gateway product for industrial infrastructure devices that uses gateway technology, such as Intel's DK100 IoT Gateway (formerly known as Moon Island). These gateways form the connection between

individual devices and the Internet connecting them to a Datacenter/Cloud environment as illustrated in Figure 5. XPE's technology is compatible with Intel's technology and OEM's may integrate technology from Intel and XPE into one, single gateway.

FIGURE 5: DEVICES CONNECTED TO THE INTERNET THROUGH GATEWAYS



Source: Intel, TMT Analytics

Chip-only solution requiring design-in by customers

Another way for customers to use XPE's solution is to only purchase the chip design and further integrate this into their own products. For instance, Chinese chip designer Telink Semiconductor (Telink) is integrating XPE's IoT firmware into one of its Integrated Circuits (IC's) aimed at various end markets, including consumer electronics, lighting, healthcare, wearables and smart toys (i.e. toys connected to the Internet). In turn, Telink sells its chip designs to a range of companies active in these various end markets.

Firmware-only solutions

Customers with proprietary semiconductor technology or with large electronic design departments can purchase firmware-only solutions from XPE. Firmware is a system's "resident" software that controls, monitors and processes data within devices and systems. Customers, such as large consumer electronics companies, can integrate XPE's firmware into their products, e.g. smart TV's, using their own semiconductor design and chipsets.

Ad2) Device browser to interact with devices

The Device Browser, or DeB, is an application that will be free for users to download from app stores. When installed on smart phones and tablets that are BLE or NFC-enabled, DeB can be used to control connected devices, be it consumer devices in a home, such as TV's, lights, sound systems, thermostats etc, or industrial devices, such as remote sensors and camera's, medical equipment, manufacturing equipment etc. A Beta version became available at the end of June, and it is expected that the final, multilingual version will be launched in September.

Ad 3) The ADRC Hub

Through an ADRC Hub, which connects a mobile phone's Wi-Fi signal to the ADRC chip inside connected devices, multiple mobile phones/tablets can be connected to multiple ADRC-enabled devices. Additionally, the Hub facilitates remote access to connected devices through the Internet and local Wi-Fi connections, e.g. for consumers wishing to turn on the home air conditioner when leaving the office.

In addition to home IoT gateways, many companies provide industrial IoT gateways using Intel's Moon Island IoT gateway platform, which is supported by Intel's Quark and Atom processors. XPE and Intel have jointly developed a mini PCI-express card that adds the ADRC IoT Stack to Moon Island based gateways.

Business model centered around selling IP

In commercially rolling out its products and technical solutions, XPE aims to partner with established industry players by enhancing functionality of their existing products. Instead of manufacturing IC's itself, XPE sells the Intellectual Property for a license fee and/or royalties, which allows for very limited capital investments on the part of XPE.

Such asset-light business models make for very high Returns on Invested Capital (ROIC). However, in order for this sales strategy to succeed, it will be key for XPE to become part of broader industry standards around hard- and software design for communications protocols.

Essential to be part of industry standards and ecosystems

Past format wars underline importance of being on the winning side

Readers may remember the video format war of the 1980's in which Betamax, VHS and Video 2000 fought a fierce battle to become the global industry standard in home video players. More recently the DVD format war between Blu-ray and HD DVD has resulted in several major casualties. The winners in these wars, such as Sony, have not only set back the competition a few years in terms of technological development (the losers had to catch up with the winners' technology on the R&D front), but have also had the opportunity to monetize their patents around the winning technology for many years. Philips' patents around Compact Disc technology, for instance, have been a major, high margin, contributor to the company's bottom line for many years.

When it comes to communications protocols and hardware design in the electronics industry, similar wars rage around standards, but in the background, i.e. largely invisible to the average consumer. However, for participants in this space, being on the winning side in these wars is just as important as it was for Sony to win the video tape and Blu-ray wars.

IoT and IoE create opportunities and pose risks at the same time

The advent of the Internet of Things, and eventually the Internet of Everything, is creating an opportunity for established and new players to create industry standards around communications protocols for all these "things". At the same time though, the flip side of this opportunity is that not being part of new, to-be-established, industry standards essentially means missing out on one of the most interesting elements of standards setting, i.e. license fees and royalty income. Additionally, not teaming up with the winning players implies the product revenue opportunity will be smaller as well.

XPE following the right partnering strategy

For the reasons mentioned above, it is essential for XPE to team up with industry leaders in the IoT space, such as Intel and Cisco. Seen in this light, XPE's recent progress announcements around compatibility with Intel's existing Quark D2000 Microcontroller is a very substantial step for XPE, in our view.

> *The Quark D2000 Microcontroller is a device which can be connected to "things", which may previously have been standalone devices, and enables these things to communicate with the broader IoT. For instance, older buildings may have heating, ventilation and air conditioning systems (HVAC) that have always required on-site monitoring because they were not connected to the outside world. Using chipsets, such as Intel's Quark range, in so-called IoT Gateways (see Figure 5), system integrators can connect such industrial infrastructure to a remote control room, providing substantially more efficiency in monitoring these systems.*

There are several major suppliers of key components for IoT Gateways, such as Cisco and Intel as well as providers of semiconductor IP for IoT devices, such as NXP, ARM, Freescale and (again) Intel. So compatibility of XPE's wireless communications protocol with Intel's IoT product offering already covers a substantial part of the sector.

Going forward, we expect XPE to make further announcements regarding compatibility with other key manufacturers in IoT hardware, such as chip companies and manufacturers of networking equipment.

Potentially joining the Open Connectivity Foundation has upsides and drawbacks

XPE has been invited to join the Open Connectivity Foundation (OCF), which is an industry organization aiming to provide secure IoT interoperability for consumers, businesses and industries. Key members include Intel, Cisco, Microsoft, GE, Samsung, Qualcomm, Dell, Honeywell and IBM. Joining the OCF would provide XPE with key inroads into powerful, standard-setting companies, helping the company to make ADRC technology part of industry standards.

However, the key question is how much of the ADRC technology and IP the company would have to give up, for instance, in case certain partial elements of IoT connectivity technology other than XPE's are favored by Foundation members. We expect XPE to make a decision on joining the OCF within the next few months.

Most "things" will likely support multiple communications protocols, initially...

Standard-setting in the consumer electronics industry typically takes a number of years. Additionally, many industrial applications still have supplier-dependent technology. For these reasons, we believe IoT communications among "things" will likely be facilitated by more than one protocol for some time to come. That is, until early-stage technologies mature, organizations such as the OCF make headway in getting a single solution broadly accepted and/or a group of dominant players forces their technology onto the rest of the industry, similar to Sony and Blu-ray.

In other words, we expect ADRC to co-exist with other technologies in consumer electronics and IoT gateways in the next several years even though it is more expensive for equipment manufacturers to facilitate multiple protocols in one device. We believe this time will allow XPE to develop broad industry relationships rather than having to bet on a single horse when it comes to future IoT connectivity and communications standards.

However, over time we expect only a few technologies around IoT communications to be commercially viable, for instance one or two for home connectivity and one or two for industrial connectivity, such as smart cities, healthcare and infrastructure.

CoAP is a competing protocol, but for simple devices only

One competing IoT communications technology is CoAP (Constrained Application Protocol), which is also an Application Layer Protocol, like ADRC. The OCF supports CoAP as one of its compatible transports. However, CoAP is primarily aimed at simple devices with limited capabilities, such as low-power sensors, switches and valves. For instance, sensors in wireless sensor networks have limited battery power and functionality, i.e. they measure temperature, pressure, sound etc, but nothing else.

We believe ADRC is much more versatile given its scope, i.e. the ability to control many different types of devices of varying complexity, and would therefore be a welcome addition to CoAP within the OCF. In fact, ADRC could even tunnel through CoAP if desired.

IoTivity, Alljoyn, HomeKit and IIC not broadly supported

Other communications protocols currently being developed, either open source or specific to an ecosystem, mostly address separate applications areas, i.e. either industrial or home applications. Furthermore, projects such as IoTivity, Alljoyn, HomeKit and the Industrial Internet Consortium (IIC) are relatively fragmented in terms of member companies. In other words, there is not a lot of overlap among members, which typically doesn't bode well for broad acceptance of a potential standard down the line.

Key relationships with Intel and Telink Semiconductor

In the past several months XPE has developed key relationships with multiple industry players that are significant in different respects.

Support from Intel opens doors

XPE recently announced it has completed testing of ADRC technology on Intel's Moon Island IoT Gateway platform, which Intel is currently verifying. Upon successful verification, ADRC can be showcased to Intel customers, such as OEM's and consumer electronics companies, who can then integrate ADRC into their respective industrial or consumer end products.

In addition to technical cooperation, the invitation for XPE to join the Open Connectivity Foundation actually came in through Intel, which is a founding member. We believe the rapidly developing relationship with Intel, being one of the major facilitators of IoT connectivity globally, is a very significant endorsement for the ADRC technology.

Fast-growing Telink provides inroads into Chinese mass market

Shanghai-based Telink Semiconductor is a fabless IC design company focusing on chips for the Internet of Things, i.e. low power radio frequency and mixed signal chips for wireless control of devices, such as toys, lighting, healthcare and consumer electronics. Fabless means that the company does not have its own manufacturing facilities, but sells semiconductors that are manufactured by third parties, such as chip foundries TSMC and SSMC. XPE aims to use a similar business model when it starts commercialization.

While Telink isn't the largest chip design house in the industry, with an estimated revenue of US$20-25M in 2016, it is growing very fast (estimated 20%-30% annually) on the back of some high profile customers, including Cisco, Foxconn, Toshiba, General Electric and Lenovo. Additionally, Telink predominantly targets the massive, high volume, Chinese market.

First IP licensing agreement with Telink

In early May XPE announced a collaboration with Telink to integrate XPE's ADRC technology into one of Telink's existing chip designs for IoT applications, predominantly for the consumer electronics, wearables and healthcare markets. In early July, this resulted in XPE signing its first IP licensing agreement with Telink.

Additionally, Telink and XPE are planning joint development of a sub-GHz chipset for IoT applications with ADRC technology on-board, which allows Telink to target the industrial, smart building and home automation markets, e.g. selling these chipsets into Cisco's industrial IoT gateway products.

We believe the Telink relationship has the potential for XPE to expedite its commercial roll out, in China in particular, but also in other markets where Telink's customers are active.

Acquisition of JCT Healthcare provides first entry into Healthcare market

On 7 June, 2016 XPE announced the acquisition of JCT Healthcare (JCT) for a consideration of A$0.75M in cash, a further A$0.75M in cash dependent on two commercial milestones and A$1.25M worth of XPE shares. A further A$1.5M in three separate milestones of A$0.5M each is to be paid if JCT achieves revenues of A$3M, A$6M and A$12M within 12, 18 and 24 months from 1 July, 2016 respectively.

JCT provides communication solutions to Healthcare facilities, such as hospitals, aged care, independent living and disability care, for instance, wireless communication devices for nurses' stations (messaging and non-talk-back devices). Combining such products with future ADRC-enabled devices, such as monitors and sensors (heart rate monitors, fall detectors, incontinence sensors etc) provides a very substantial growth opportunity in remote healthcare monitoring over the IoT, in our view.

35% stake in Vital Xense provides exposure to data centers

Singapore-based Vital Xense is an emerging company active in sensor technology. XPE recently acquired a 35% stake in Vital Xense, which provides it with inroads into the data center market for IoT equipment, i.e. remote, wireless sensors. ADRC-enabled wireless sensors will make traditional copper-based wiring in data centers redundant for a number of applications, including battery monitoring.

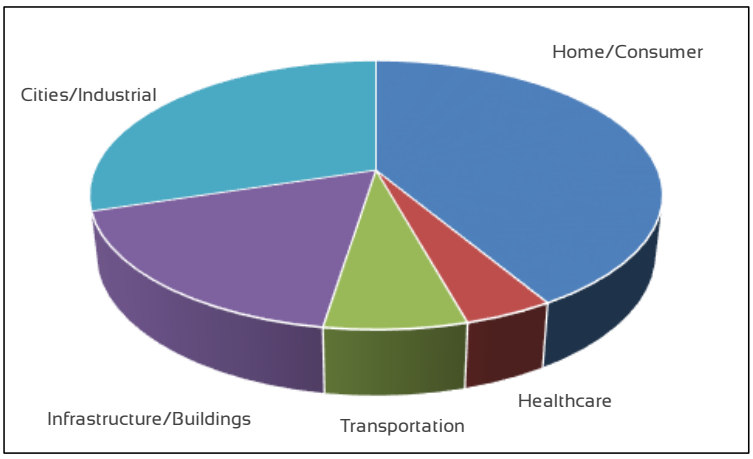
XPE's addressable markets are very substantial

The type of things that are, and will be, connected to the Internet, come in a wide variety and will affect a range of different verticals.

Consumer applications

Apart from everyday devices that have already been connected to the Internet for years, such as mobile phones, tablets, PC's, we are seeing new categories of devices being connected in the home environment. Examples include connected lighting, such as Philips' Hue connected light bulb, irrigation control, security cameras and alarm systems, energy monitoring, infotainment, pet feeding, kitchen appliances etc.

FIGURE 6: INTERNET OF THINGS A US$435BN MARKET IN 2017



Source: Harbor Research, TMT Analytics

Transportation

Various brands of cars, such as Tesla and Jeep, already have IoT capabilities integrated into their most recent models enabling remote monitoring of many hundreds of sensors in a single car. However, the implications of the IoT for the transportation sector will be substantially more comprehensive than just sensor monitoring and will include areas such as smart parking, dynamic fleet routing, self-driving cars and all sorts of supply chain aspects.

Cities & Industry

Smart cities of the not-too-distant future will be connected to the IoT in many different ways. For instance, we expect to see traffic lights, dynamic signage, parking garages, electrical grids, street lighting and utilities being connected, effectively forming a massive information network to be dynamically used and monitored. Additionally, whole industrial facilities are already connected to the IoT, including power plants, offshore oil rigs, factories etc. with many more to come.

Buildings & Infrastructure

In addition to the earlier-mentioned HVAC systems, we expect a variety of other building and infrastructure-related systems to be IoT-connected, including security and emergency systems, lighting and electrical networks as well as structural integrity sensors, e.g. in earthquake sensitive areas.

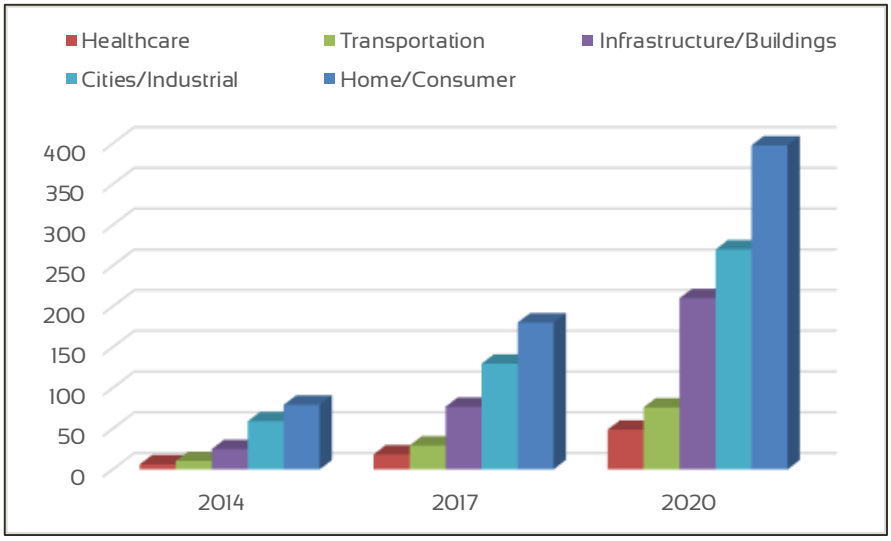
Healthcare

Lastly, a very obvious vertical where IoT-connectivity is game-changing is healthcare. Remote monitoring is a key theme in healthcare, which applies to various sub segments of this vertical, for instance remote monitoring of patients (heart rate, the elderly) and medical devices, remote diagnostics and bio wearables, as well as hospital hygiene.

Value of the IoT opportunity to grow to US$1TN by 2020

While Cisco anticipates approximately 50BN devices will be connected to the IoT by 2020, other research puts a value on the IoT opportunity through 2020. Global revenues derived from the IoT opportunity are expected to grow by 33% CAGR from US$180BN in 2014 to approximately US$1TN in 2020, according to Harbor Research.

FIGURE 7: IOT REVENUE OPPORTUNITIES BY VERTICAL



Source: Harbor Research, TMT Analytics

Home and consumer segment to remain the largest revenue opportunity

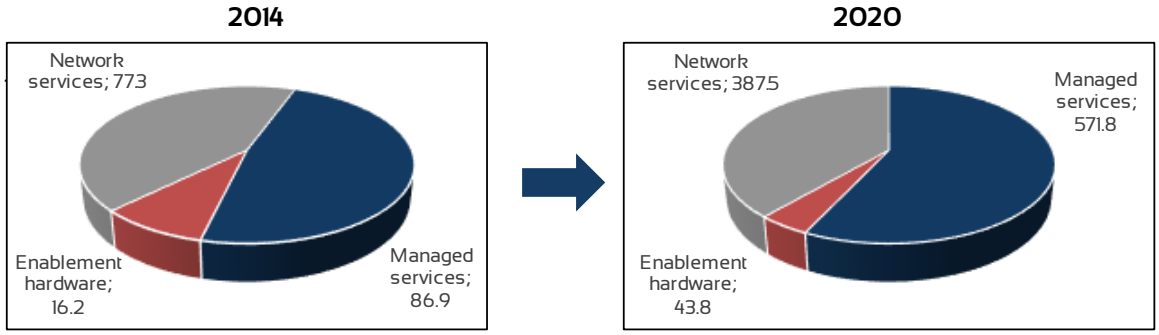
Broken down by segment, healthcare, transportation and infrastructure/smart buildings are expected to grow above-average during this period at 41%, 39% and 43% respectively. However, home and consumer applications are expected to remain the largest segment within the IoT space, growing from US$79BN in 2014 to an estimated US$398BN in 2020, or 40% of the IoT addressable market.

We would also like to emphasize the substantial opportunities that infrastructure/buildings and smart cities/industrial present. By 2020 these markets are expected to present an IoT-related revenue opportunity of US$210M and US$270M respectively, or nearly 50% of the IoT market.

XPE addressable segments growing strongly through 2020

Looking at the IoT opportunity from a service and product perspective (Figure 8), we anticipate strong growth (>30%) for both Network Services (cloud data storage, network provisioning etc) and Managed Services (data management, analytics, security etc). XPE will initially address the Enablement Hardware segment (sensors, chips etc), which is expected to grow by 18% CAGR through 2020, to total US$44BN by 2020. As the installed base of ADRC chips grows, the company will be able to collect and manage increasing amounts of user data, allowing for direct and indirect monetization over time. In addition to high growth, these managed services carry a very high margin and should provide an attractive revenue stream going forward.

FIGURE 8: IOT REVENUE BREAKDOWN BY SERVICE / PRODUCT OFFERING (IN US$ BN)



Source: Harbor Research, TMT Analytics

Potential revenue opportunities from broadcasting and advertising industry

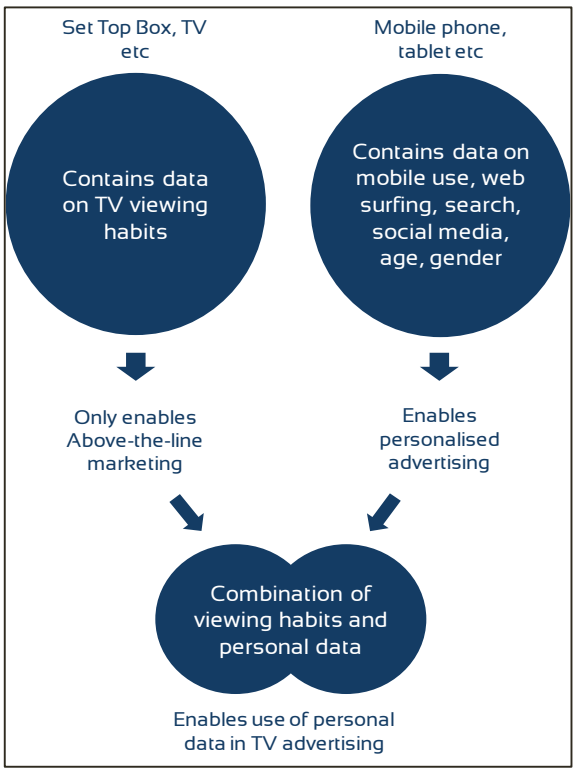
In addition to seamless connections of mobile phones and tablets to consumer and industrial devices (to remotely control them), we believe ADRC can potentially also facilitate value-added services, for instance for TV broadcasters. Digital Video Broadcast systems (DVB) in TV broadcasts and Radio Data Service (RDS) in radio broadcasts allow broadcasters to send specific information along with the content, e.g. program information, electronic TV guides and traffic information.

In its simplest form, broadcasters could send additional information along with a broadcast that triggers XPE's chip inside the TV to send a signal to the user's connected controller (the mobile phone or tablet), based on the user's known preferences. For instance, with halftime coming up during a sports match, a signal triggering an advertisement and web link for pizza delivery might be sent along with the broadcast. Such targeted, context-based, advertisement opportunities are very valuable to broadcasters and could provide a substantial additional revenue stream that XPE could tap into through revenue sharing or licensing deals.

Missing link between granular user info on a mobile phone and TV viewing habits

Furthermore, XPE's software on the mobile phone can register each action on a connected device by the user, e.g. when a certain TV program is watched, when channels are changed, when air-conditioning or lights are turned on remotely etc. The software can also tap into personal information already available on the mobile phone, e.g. web surfing habits, searches, social media activity etc.

FIGURE 9: MERGING UNCONNECTED DATA SOURCES



Source: TMT Analytics

In our view, by combining the two pools of information, XPE will be sitting on a highly unique, and thus, valuable source of data, given that the two sources (TV viewing habits and personal profiles stored in mobile phones) have never really been connected before (Figure 9).

While this feature may currently be out-of-scope for XPE, i.e. not a priority at this time, longer term we believe XPE should be able to monetize on this merged data by reselling it to ad agencies, broadcasters and brands.

Revenue model based on IP sales and services

We anticipate XPE generating revenues from various sources, including license and royalty revenues from semiconductor IP, services revenues such as customization of the device browser for enterprise customers and revenues from data sets, e.g. for big data plays and the aforementioned potential opportunities in the global advertising market.

The latter revenue stream will be a function of the installed base of ADRC-enabled chips over time and will depend on the pricing model XPE will be using for these services. In our model we have only included revenues from semiconductor IP and services as we believe incorporating revenues from sales of data is too premature at this stage.

Revenues from Semiconductor IP based on license fees and royalties

The revenue model for XPE's semiconductor IP is well-proven in the global semiconductor industry. Many fabless semiconductor companies, such as ARM, Broadcom and Telink Semiconductor, sell designs and IP through license and/or royalty agreements. License fees are typically one-off payments for use of the technology, while royalty revenues are a percentage of the sales price of customers' semiconductors that include (part of) the IP, with royalties typically ranging from 5% to 20%.

In forecasting these revenues, the main variables are the rate of customer sign-up, volumes sold by customers, customers' semiconductor average selling prices (ASP's) and royalty percentages. Given the uncertainty around development of these variables when modelling XPE's future revenues, we have taken a cautious approach.

Intel and Telink assumed to be the first two customers

On the back of XPE's existing relationships with Intel and Telink, we have assumed these will be XPE's first two customers for the company's ADRC solution, i.e. Telink for consumer applications and Intel for industrial applications. Furthermore, we have assumed XPE will sign on three more, mid-sized, customers in the next eighteen months, e.g. semiconductor or equipment companies already active in IoT and/or near-field wireless connectivity markets.

Actual semiconductor shipments typically lag signing of a licensing agreement by six to eighteen months, depending on the amount of non-recurring engineering that needs to be done to integrate the design into the customers' own chipsets and products. In the case of Telink and Intel, we believe this time lag will be relatively limited, should XPE sign Intel as customer, given that the companies have already been working together over the past few months. In our modelling we have assumed initial shipments will commence in 2HY17, i.e. in the first half of calendar 2017.

We expect volumes to be relatively limited in the first twelve months, i.e. 1.5M units for Telink and 700,000 for Intel, ramping to 20M for Telink and 13M for Intel in FY20.

Large difference in ASP between Telink and Intel

Given that Telink is currently targeting the high volume, lower margin Chinese consumer electronics market, we have assumed an ASP of US$1.20 per chip, growing to US$1.45 by 2020. Intel, on the contrary, is targeting the higher margin and more complex industrial IoT segment. For this reason, we have assumed a substantially higher ASP for Intel's IoT chip of US$7.50, growing to US$10 by 2020.

Customers #3, #4 and #5 assumed to be mid-sized

We have assumed subsequent customers will be mid-sized, i.e. substantially larger than Telink but clearly smaller than Intel, which is reflected in the sales metrics, i.e. unit shipments ramping from 1M in year 1, assumed to be from 1Q18 onwards, to 16M in FY2020 for customers #3 and

#4. Their chip ASP is assumed to be US$3 growing to US$5 by 2020. Customer #5 is assumed to start shipping product from 3Q18 onwards with similar volume and ASP developments over time.

Royalty percentages may vary widely

Regarding royalty percentages, we have taken the view that larger companies will pay lower percentages than smaller ones. In other words, we expect the announced royalties of 17.95% Telink will pay to XPE will be clearly higher than anything Intel would pay. In our model we have assumed royalties of 7.5% in case Intel is signed as a customer. Furthermore, we assume customers #3, #4 and #5, being mid-sized, will pay royalties of 10%. We have not incorporated one-off license payments in our model.

Upside risk to revenue projections

Our assumptions above translate into revenues and earnings as summarized in Figure 10. Even though our revenue projections indicate quite a steep revenue growth profile for XPE in the next five years, we believe there may be upside risk to our estimates, given that XPE has only just started commercializing its technology.

FIGURE 10: XPE P&L SUMMARY

A$M	2016F	2017F	2018F	2019F	2020F
License & Royalty revenues	0.0	0.2	3.2	15.9	44.2
Services revenues	0.0	0.4	0.6	1.2	3.0
R&D Tax concessions	0.4	0.4	0.4	0.4	0.4
Total income	*0.4*	*1.0*	*4.2*	*17.5*	*47.6*
EBITDA	-2.4	-2.0	-2.0	6.3	31.8
EBITDA margins	N/M	N/M	-47%	36%	67%
NPAT	-2.4	-2.0	-2.0	6.1	22.5
EPS reported (c)	-0.001	-0.001	-0.001	0.003	0.012

Source: TMT Analytics

We see clear upside to our estimates should XPE be able to acquire more than the currently projected five customers and/or should customers manufacture substantially more semiconductors using XPE's technology than currently projected, both of which scenarios are quite possible, in our view.

> *In our experience, the semiconductor industry has previously shown very rapid uptake of new technologies, far exceeding initially cautious expectations, in cases where the technological innovation brought an exponential improvement of functionality, which we believe is the case with XPE's technology.*

DCF-based valuation indicates substantial upside

In valuing XPE we haven't used a peer group multiple. We expect XPE to start generating revenues from 2017 onwards, ramping gradually in the first few years, implying that any valuation based on peer group multiples looking at the near term will not accurately reflect XPE's potential, in our view.

Rather, we have used the Discounted Cash Flow method to capture XPE's long term value. Using an unlevered beta of 1.5, a long term growth rate of 3%, a long interest rate of 2.5%, a risk premium of 4.3% and a marginal tax rate of 30%, yields an implied, theoretical, WACC of 9.1% and a value per share of A$0.35.

A higher required rate of return warranted to account for high risk

However, XPE is still pre-revenue and considering the uncertainties surrounding future customer uptake, sales volumes, customers' ASP's and royalty percentages, we believe a higher rate of return, i.e. WACC, is required for an investment in XPE to account for this inherently higher investment risk compared to more mature companies. In our view, a WACC of 12% is more appropriate, implying a fair value of A$0.24 per share.

We have listed a range of fair values in Figure 11 to provide some sensitivities around the required rate of return for XPE.

FIGURE 11: FAIR VALUE RANGE (PER SHARE) BASED ON DIFFERENT REQUIRED RATES OF RETURN

9.1%	0.35
10%	0.31
11%	0.27
12%	**0.24**
13%	0.21
14%	0.18
15%	0.16

Source: TMT Analytics

Conclusion

In our view, the technology XPE is currently commercializing brings substantially improved functionality and cost savings opportunities to the IoT semiconductor space. The current collaborations with Intel and Telink Semiconductor are testament to that. Given XPE's relatively short commercialization track record, we have been conservative in our estimates. However, given the sheer size of the global IoT market we potentially see strong upside to our numbers in case XPE lands some of the bigger names in the industrial IoT and consumer electronics space, such as Cisco, Qualcomm, STMicro, ARM, NXP/Freescale, Texas Instruments, Sony, Samsung and Panasonic.

Start research coverage with a BUY recommendation

We start our research coverage of XPE with a Buy rating and a price target of A$0.24 per share.

Near term share price catalysts

In addition to expected news flow around Intel and Telink Semiconductors, e.g. regarding technical validation of ADRC and commercial agreements, we expect XPE to be able to sign additional collaboration and/or commercial agreements with other semiconductor companies and OEM's during the next several quarters.

Appendices

Board of Directors

Chris Wood (Executive Director and CTO): Mr. Wood has extensive experience in large telecommunications companies developing mission critical software applications. He has architected projects worth up to $200M and supported by a pool of 200 IT staff. Mr. Wood is a domain expert in the areas of GPS, inertial sensors and communications and also possesses substantial technology development commercialization experience. In 2003 he founded Neve Technologies Pty Ltd, a company which developed and commercialized an augmented GPS system for positioning vehicles in areas where GPS signals are severely degraded. In the commercialization process Mr. Wood established a joint venture with the University of South Australia. Neve secured COMET funding, raised capital and successfully commercialized its technology internationally.

Athan Lekkas (Executive Chairman and CEO): Mr. Lekkas has participated in a broad range of business and corporate advisory transactions, specializing in the restructure and recapitalization of various companies through his institutional funding contacts in Asia and North America. He has completed successful turnaround projects in manufacturing, logistics and implemented successful operational changes restoring companies into profitability. He was instrumental in the structuring and funding of the XPE transaction. Mr. Lekkas is also a Director of ASX listed investment company First Growth Funds Limited.

John Schultz (Executive Director and Head of Engineering): Mr. Schultz is a serial entrepreneur founding and successfully growing several companies over the last two decades specializing in the design, manufacture and business development of electronics systems. He has a wealth of experience running design and manufacturing businesses, managing staff and subcontractors and secured significant international business exporting vehicle immobilizers to Malaysia for aftermarket distribution and direct fit to Honda. This contract saw a peak of 30 employees locally employed and managed at Technology Park. Mr. Schultz' involvement in this project will encompass system specification, design, product design and manufacture, resource management and developing initial commercialization opportunities.

Michael Clarke (Executive Director and Head of IT): Mr. Clarke has extensive experience in the IT industry and has worked across both public and private enterprises during his career. He has assisted a number of private and public companies with management and advisory services and was influential in ensuring a smooth RTO process for the XPE transaction. Mr. Clarke has consulted and provided services to a variety of industries including manufacturing, retail, technology, resources, government and education. He is also a Director of First Growth Funds Limited.

XPE SWOT Analysis

Strengths

- Patent protected, highly innovative technology, which addresses a global, high growth market.
- Early endorsement by industry leader Intel.
- Substantial cash balance, providing eighteen months of operational runway.

Weaknesses

- The relatively short operational track record provides limited insight into the company's performance.
- The company's size relative to its business partners, which are typically substantially larger, may lead to suboptimal outcomes in commercial negotiations.

Opportunities

- The Internet of Things is large and growing very fast, creating many opportunities for agile technology companies in the semiconductor space, services around the hardware design and implementation as well as Big Data derived from the installed base of IoT devices.
- In addition to the very substantial market for IoT-related semiconductors we see large potential for XPE to monetize its future data base of user preferences and user behavior, e.g. when users switch on home appliances, lights etc. as well as TV viewing habits. In our view, this data may be highly valuable to a range of companies, such as advertising and consumer focused companies.

Threats

- Competing technology, potentially emerging from large industry peers, would limit the market potential of XPE's technology.
- Potential exclusion from standard-setting bodies, such as the OCF, may substantially inhibit XPE's future growth.

Patents

XPE owns eight patents (granted or pending) in fourteen geographies, including the US, Australia, Europe and China, the key patent being #9,136,913 granted in the US and globally under PCT/AU2010/000358).

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