



1H 2018 Results Presentation
August 29, 2018
(ASX: PVS)



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Table of Contents

Section	Section title	Page
1	Introduction	4
	First Half 2018 Financial Results	5
	Industry developments – Semicon West	10
2	Industry Overview	11
3	Pivotal Systems Overview	16
4	Corporate	29
5	Summary	33
Appendices		
A	Semiconductor Manufacturing Process	35

Introduction to Pivotal Systems

Pivotal Systems Corporation designs and manufactures innovative gas flow controllers (GFCs) which significantly improve semiconductor manufacturing yields, alleviate key process inefficiencies and increase production output

Global leader in gas flow control solutions

- Leading provider of innovative gas flow control solutions which are integral in the production of semiconductor devices (semiconductors)
- Pivotal's portfolio of [gas flow controllers] GFCs assist semiconductor manufacturers to stabilise and control the delivery of gases used to deposit or remove materials during the semiconductor manufacturing process (see Appendix B for further detail)

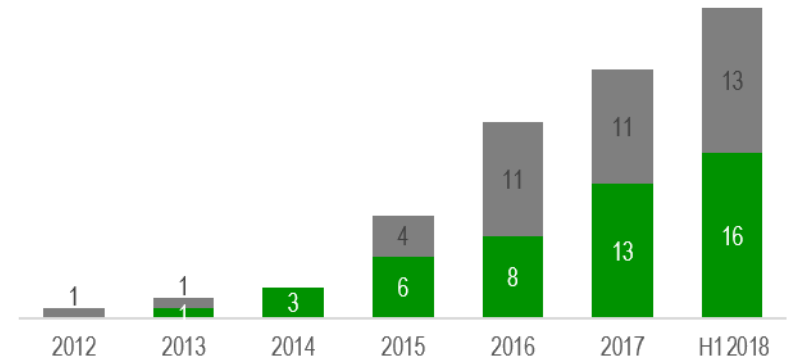
Strong financial performance and growth trajectory

- Forecast Pro Forma FY18 revenue US\$30.1 million representing CAGR of 84.3% since 2015. US\$11.19m delivered in 1H 2018.
- Forecast Pro Forma FY18 EBITDA US\$4.1 million. (US\$0.17m) EBITDA in 1H2018

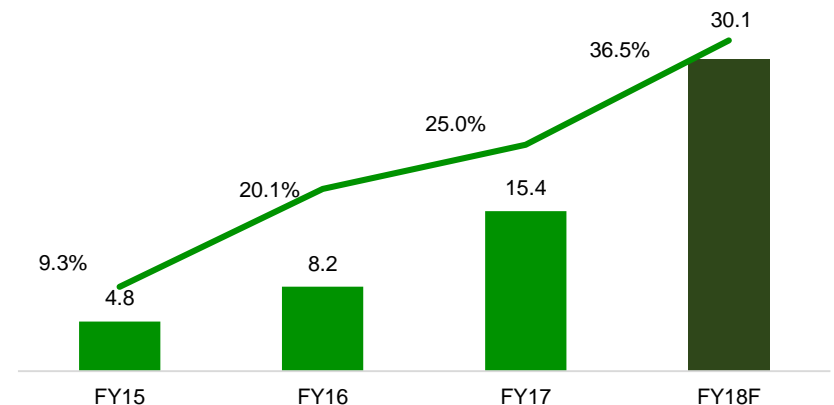
Positioned within multibillion dollar industry

- The broader mass flow controller (MFC) market forecasted to grow to US\$1.4 billion by 2023, representing a CAGR of 5.4% from 2017
- Pivotal's customer base includes some of the largest integrated device manufacturers (IDMs) and original equipment manufacturers (OEMs)
- Opportunity for significant increase in customer penetration and expansion of overall market share

Customer growth



Revenue (US\$m) and gross margin



2018 1H Financial Results

Financial Information

	2017 1H	2018 1H	% change
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Amounts in US\$'000 unless otherwise stated

Revenue	9,065	11,187	23%
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Gross profit	1,612	4,172	159%
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Gross margin	18%	37%	
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Cost of goods sold	7,453	7,015	6%
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As expected, in 1H Pivotal generated ~40% of its full year revenue forecast, with 2H expected to benefit from new fabrication plants that commenced in 1H by leading IDM customers to experience greater volume in 2H18 in addition to orders expected from new customers.

+23%

in revenue to \$11.2m
(2017 1H \$9.1m)

+159%

in gross profit to \$4.2m
(2017 1H \$1.6m)

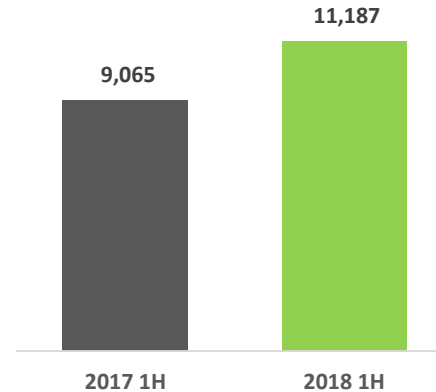
37%

Gross Margin
(2017 1H 18%)

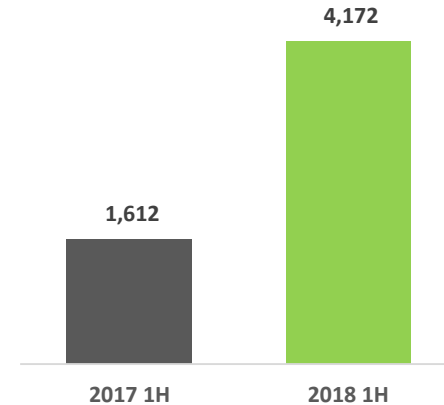
2018 1H Highlights

- Strong cash position of \$28.4m
- Introduction of the new Flow Rate Control (FRC) Product
- Cashflow positive from operations
- AU\$36m from Initial Public Offering to expand global operations
- Gross margins of 37% exceeded FY2018 forecasts
- Subsidiary incorporated in South Korea

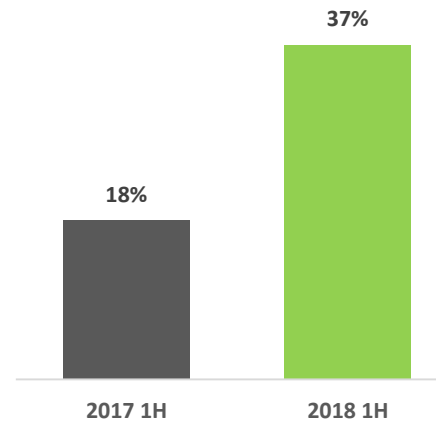
Revenue



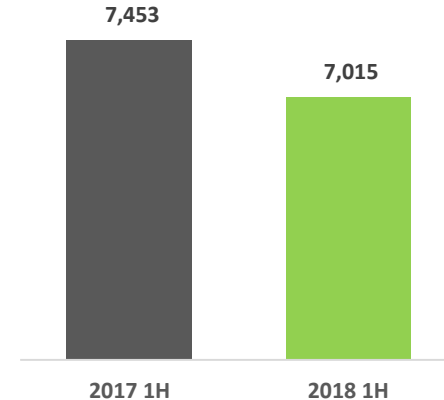
Gross profit



Gross margin

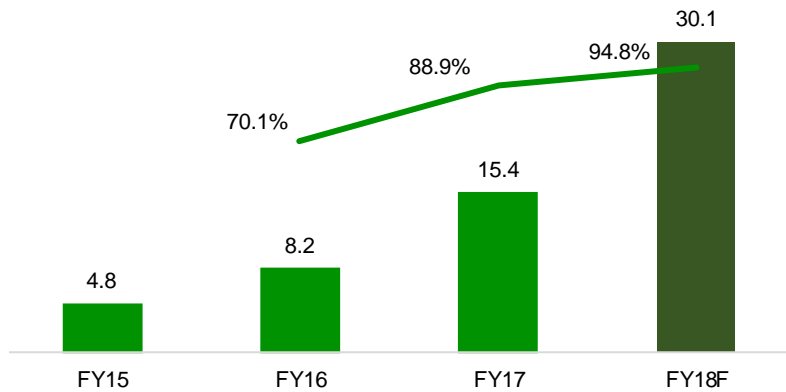


Cost of goods sold

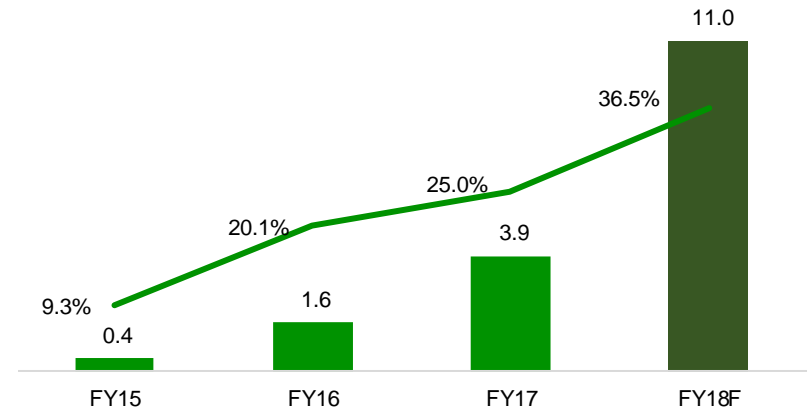


Key financial metrics

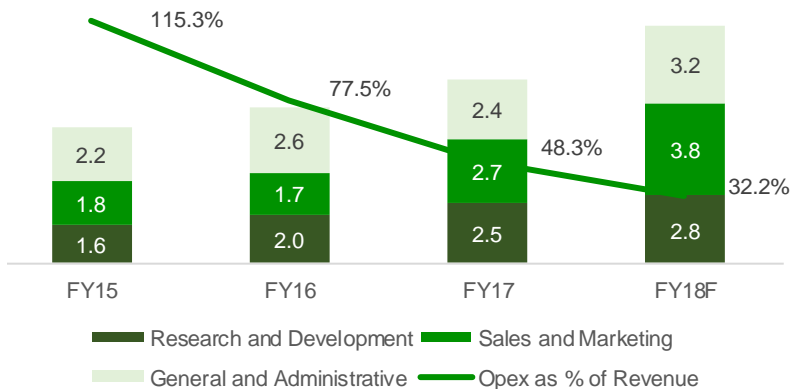
Revenue Growth Analysis (US\$m)



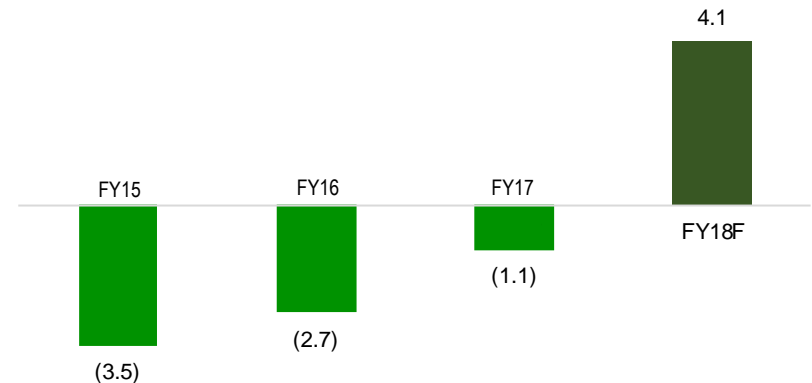
Gross Profit Growth Analysis (US\$m)



Operational Expenditure Analysis (US\$m)



EBITDA (US\$m)



1H 2018 Profit and Loss

US\$'000				Forecast
December year end	FY2016	FY2017	1H2018	FY2018
Revenue	8,175	15,446	11,187	30,091
Cost of Goods Sold	(6,535)	(11,589)	(7,015)	(19,117)
Gross profit	1,640	3,857	4,172	10,974
<i>Gross Margin</i>	20.1%	25.0%	37.3%	36.5%
Research and Development expenses	(1,976)	(2,451)	(1,567)	(2,763)
Sales and Marketing expenses	(1,744)	(2,650)	(1,694)	(3,763)
General and Administrative expenses	(2,618)	(2,367)	(2,344)	(3,155)
Total operating expenses	(6,388)	(7,468)	(5,605)	(9,682)
EBIT	(4,698)	(3,611)	(1,433)	1,292
Proforma (loss) / profit after tax	(4,698)	(3,611)	(1,433)	1,292

EBITDA Reconciliation

EBIT	(5,092)	(4,698)	(1,433)	1,292
Depreciation and Amortisation	1,590	2,009	1,266	2,794
EBITDA	(3,503)	(2,689)	(166)	4,086

- Revenue growth is primarily due to the successful market penetration into leading OEM and IDM customers for the acceptance and integration of Pivotal's GFC product
- Gross profit has increased as a result of, but not limited to:
 - Leveraging fixed manufacturing overheads;
 - Unit cost reduction
 - Volume leverage on variable costs; and
 - Product mix
- Pivotal is targeting Gross Margin in the range of 40-45% as the business continues to scale up its production volumes
- The company expects to move certain operations to its contracted manufacturing facility in South Korea during 3QFY18 and realise cost savings in manufacturing labour and freight costs
- Research and Development, Sales and Marketing and General and Administrative expenses have increased primarily as a result of headcount additions. Sales and Marketing expenses have also increased with commissions to third party sales agents and travel related to increased revenue

1H 2018 cash flow

US\$'000				Forecast
	FY2016	FY2017	1H2018	FY2018
Receipts from customers	5,768	15,884	10,719	26,496
Payments to suppliers and employees	(8,739)	(17,252)	(9,977)	(25,381)
Payment related to exercise of put option of warrants related to debt discount	-	-	(315)	-
Interest Paid	-	-	(102)	-
Net cash flows (used in) / from operating activities	(2,970)	(1,368)	325	1,115
Cash flows from investing activities				
Payments for property, plant and equipment	(41)	(386)	(192)	(172)
Payments for capitalized development	(2,647)	(3,065)	(1,771)	(3,891)
Cash flows used in Investing activities	(2,688)	(3,452)	(1,963)	(4,063)
Cash flows from financing activities				
Capital raised for shares issued	5,855	31	39,540	-
Payment to selling Shareholders, net of costs	-	-	(12,955)	-
Payment of share issue costs	-	-	(1,761)	-
Exercise of options / warrants	5	255	61	62
Proceeds from exercise of warrants	2,100	-	1	-
Proceeds from issue of preferred stock	-	-	2,000	-
Proceeds from bank loans	-	3,425	1,917	1,917
Repayment of bank loans	(18)	(2,898)	-	-
Net cash from financing activities	7,941	813	28,803	1,979
Net (decrease) / increase in cash and cash equivalents held	2,283	(4,007)	27,165	(969)
Cash and cash equivalents at beginning of financial years	1,913	4,658	1,148	1,148
Net effect of foreign exchange			61	
Cash and cash equivalents at end of financial year	4,195	651	28,374	179

Semicon West 2018 Key Takeaways

1 Flow Ratio Controller

- 3 channel
- 5 channel
- 8 channel

2 High Flow GFC

- Pivotal entered the deposition market in 2017 with its High Flow GFC
- Pivotal's total addressable market more than doubled from US\$200 million per year to US\$500 million per year
- Previously the company has demonstrated its 5 SLM, 20 SLM and 50 SLM Products

3 CAPEX Spending for 2018

- Mixed Signals from Various Analysts
- Lam and AMAT presented slightly different views
- Pivotal has not changed its view

4 Excellent Meetings with all 3 Strategic OEM's and multiple Strategic IDM's

- ASX Listing
- New Manufacturing Center
- New Product Opportunities

02.

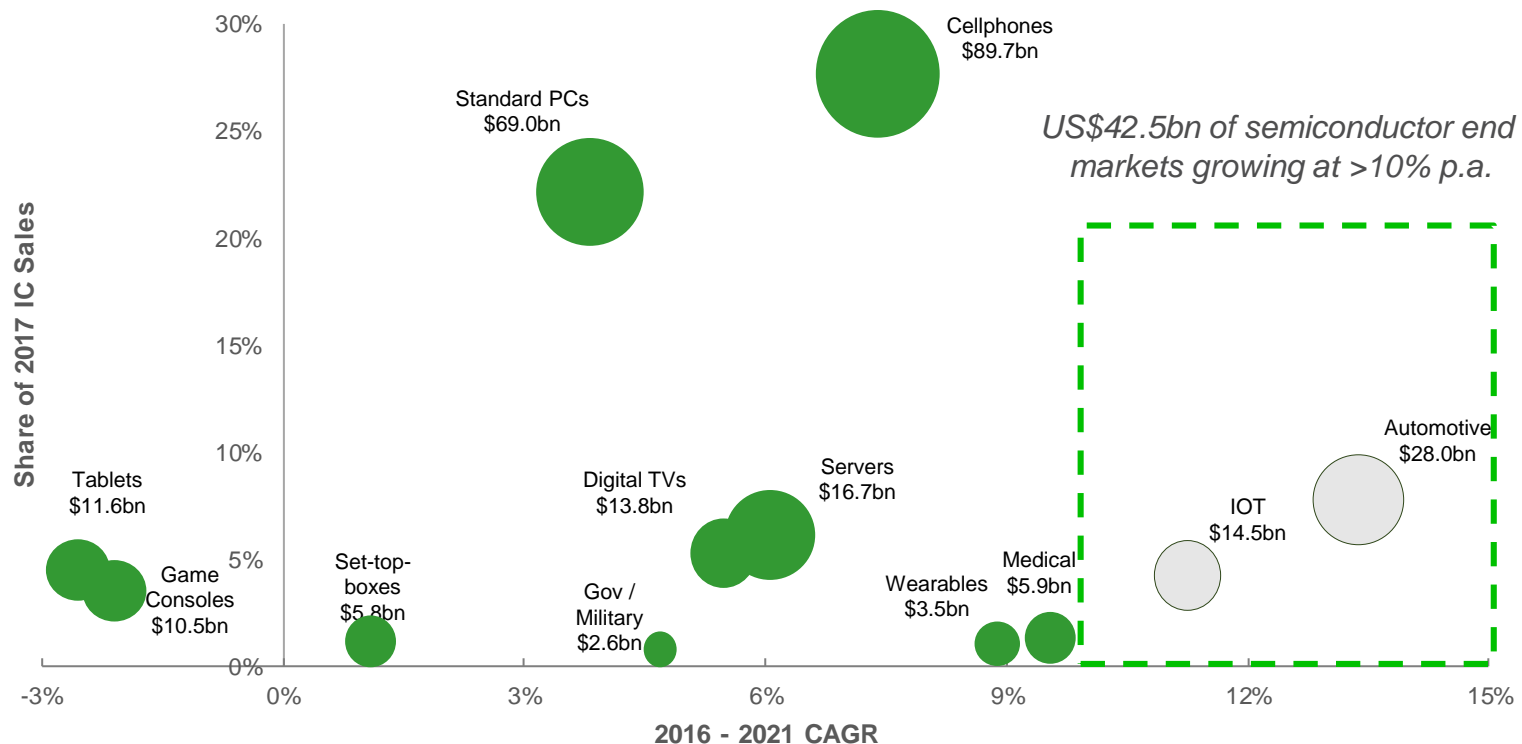
INDUSTRY OVERVIEW



Semiconductor end markets

The increasing use of cell phones, PCs and IOT connected devices is expected to drive the global semiconductor industry. Demand for flow control technology will grow as end product volume sales increase.

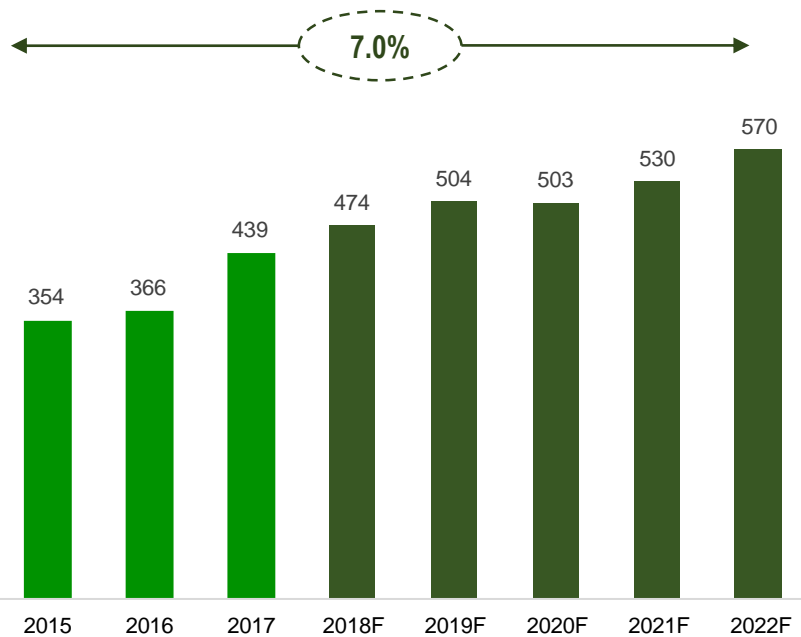
Semiconductor market size by top 10 end-use products



Industry size

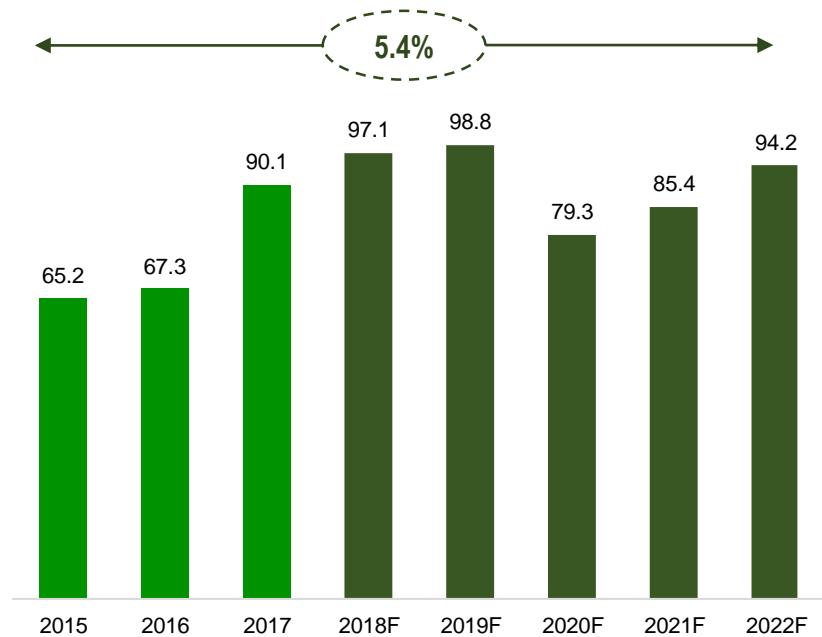
Global semiconductor market¹ (US\$b)

CAGR (2015-2023)



Global semiconductor capital expenditure¹ (US\$b)

CAGR (2017-2023)



- Global growth in the Semiconductor market is driven by growth in end-use products including communication devices, personal computers, vehicles and Internet of Things
- Technology trends require increasing number of semiconductors to be used per connected device, underpinning this consistent market growth

- The core growth catalyst of the semiconductor capital equipment market is the pipeline of new fabrication plants being constructed by IDMs
- Current step up in capex largely reflects Samsung 'catch up' in 3D NAND flash and DRAM capacity

Market overview

Flow controllers are an important component which make up the instrumentation used in semiconductor manufacturing

Market size - \$1b¹

Flow controller manufacturers

- Manufacturers of gas flow control devices
- Industry participants include:
 - Horiba, Ltd.
 - Brooks Instruments
 - Fujikin
 - Hitachi Metals
 - Pivotal Systems

Market size \$90b²


Original equipment manufacturers (OEMs)

- Designers and manufacturers of process tools used in the production of semiconductors
- Industry participants include:
 - Applied Materials
 - Lam Research
 - Tokyo Electron

Market size \$439b³

Integrated device manufacturers (IDMs)

- Semiconductor and integrated device manufacturers
- Industry participants include:
 - Samsung
 - Intel
 - TSMC
 - Texas Instruments
 - SK Hynix

 Represents Pivotal's addressable customer base

Note:

1. Market and Markets, November 2017 . Includes etch, deposition and other markets.

2. IC Insights, 2018 McClean Report.

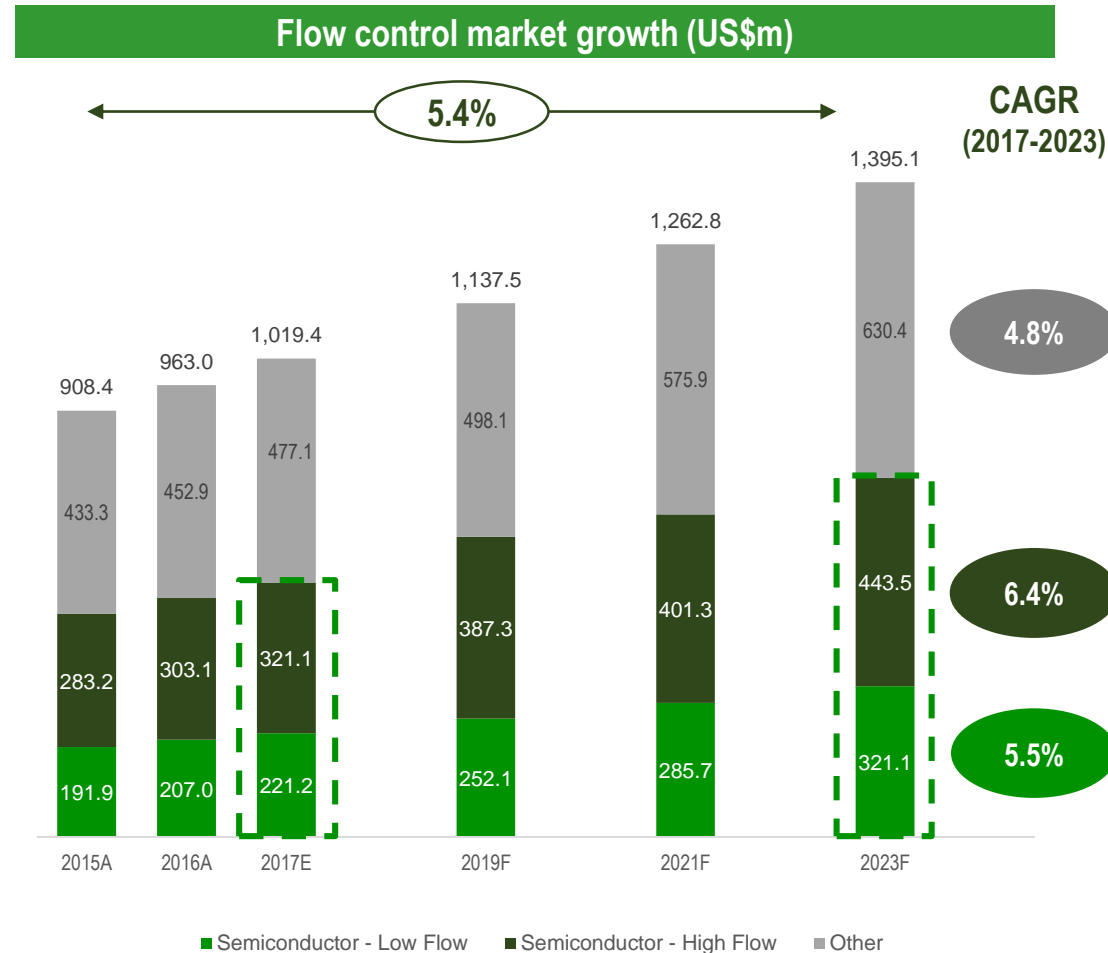
3. IC Insights, 2018 McClean Report.

Flow control market

Strong growth in the global mass flow controller market is expected to continue. Investment in semiconductor manufacturing plants (fabs) including etch and deposition tools has been driven by investment in capacity for big data and AI

Flow control demand drivers

- Historical growth in flow control devices has been underpinned by the expansion of fab capacity to accommodate for the rise in applications of mobile devices, AI and data storage (big data)
- IDM's require leading-edge tools to make increasingly complex chip designs (smaller geometries) with greater numbers of transistors in each chip
- As IC geometries get smaller, tools need to be configured to provide the greater speed and precision in gas flows required for each step in the manufacturing process
- Market and Markets estimate the flow control market for semiconductors to achieve 5.9% CAGR from 2017 to 2023 to reach US\$764.6 million
- The semiconductor MFC market is segmented by the type of tool in which the MFCs are installed - low flow MFC (predominantly etch) and high flow MFC (predominantly deposition)
- The reported flow control data (see right) represents new sales and does not reflect retrofits or maintenance



03.

OVERVIEW OF PIVOTAL



What is the problem?

The production of semiconductors is expensive, complex, and highly competitive, with a small number of blue chip manufacturers competing largely on cost and yield

One important issue for semiconductor manufacturers is variability in gas flows

An inability to accurately measure and control gas flows creates a range of issues for semiconductor manufacturers



Wide range of production yields due to difficulty in producing repeatable gas flows. Yields may vary in a wide range between 85-99% of total factory output



The various gases that are used in the manufacturing process can be expensive and toxic, with control and waste minimisation be



Gas flow errors in production process lead to expensive wafer materials being scrapped



Slow machine turn-on and turn-off times (settling times) contribute to lower productivity and output



Maintenance costs involved with the manual recalibration of flow controllers, including manufacturers holding 'back-up' MFCs to be used during recalibrations



Limited gas flow intelligence and diagnostic capabilities



Expensive upstream and downstream equipment (valves, regulators etc.) required to help stabilize gas flows

Pivotal's solution

Pivotal designs and manufactures innovative GFCs which help improve semiconductor manufacturing yields, alleviate key process inefficiencies and increase production output



Highly accurate proprietary nanotechnology derived valve delivers industry leading accuracy



Sensors able to monitor & control gas flows in real-time, every millisecond



Built-in machine learning software capable of identifying and avoiding expensive production errors before they occur



Fastest turn on and turn off times in the industry – provides an increase in productivity for customers



Self calibration software – avoids the need for systems to ever come offline, saving valuable production time



Highly intelligent software platform capable of providing ongoing updates and product improvements



Innovative hardware design eliminates need for supporting upstream or downstream machinery, alleviating additional

Company timeline



Management identifies a decade-long lack of innovation in gas flow control technology and begins research into GFCs, incorporating the gas flow monitoring technology developed to date

Leading Korean IDM qualifies Pivotal's technology. Two of the leading US OEMs commence their own validation for use of Pivotal's products on process equipment

Pivotal awarded its second Global Red Herring Award

2018

Contracted manufacturing facility in Korea. Expected to expand production capacity to 10,000 units per month.

Continued validation of Pivotal's products by leading IDMs and OEMs.

2017

2016

2015

2014

2012

2011

2003

Pivotal Systems Corporation founded by Dr. Joseph Monkowski to commercialise IP development around gas flow analysis and monitoring and process tool communication.

The leading Korean IDM purchases first units to begin validation of the Pivotal technology in a production environment

Leading Asia-based OEM commences validation of Pivotal's technology. Shipments of units to the leading US OEMs commence.

Pivotal awarded Red Herring 100 Award for North American and global companies categories and ranks 1st in Inc.500 for engineering companies

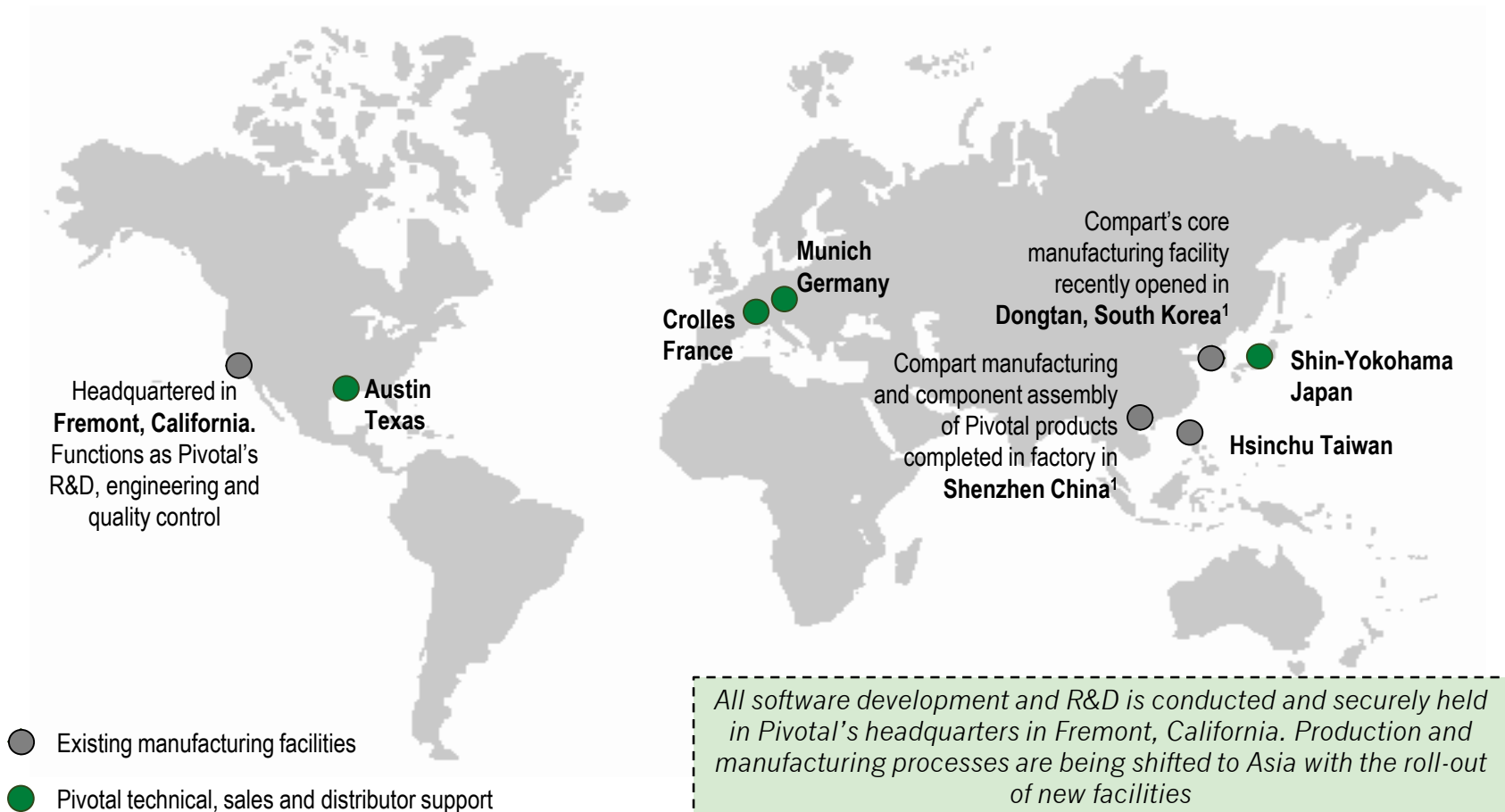
PIVOTAL
SYSTEMS

Inc.
500

RED
Herring
100
WINNER
GLOBAL

Global footprint

Pivotal has a manufacturing and sales and technical support presence across the US, Europe and Asia

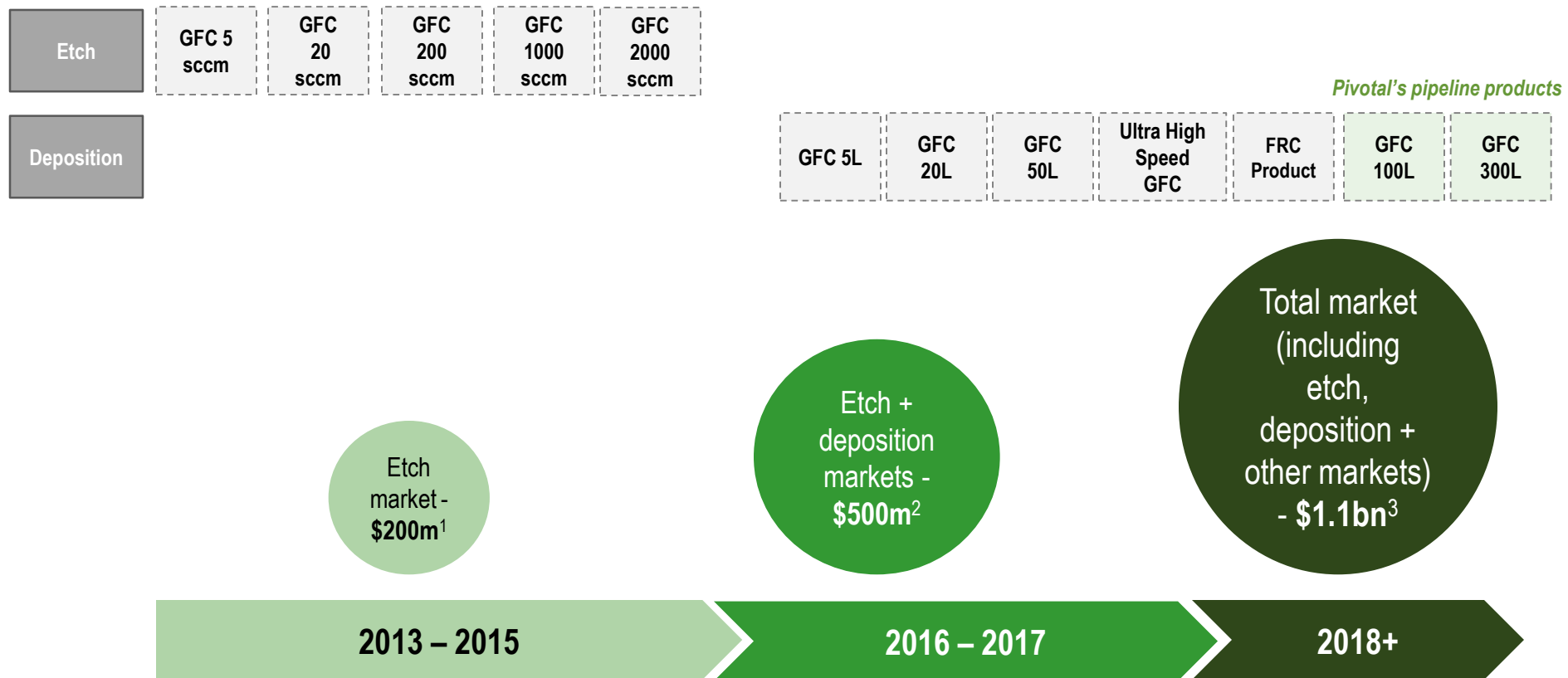


Note:

1. Manufacturing facilities in Korea and China are owned and operated by third party contractor Compart Systems, but certified and operated to Pivotal's specifications and running on Pivotal's proprietary MES software.

History of continuous innovation

Pivotal's software enabled products have been designed such that they can be easily modified to be used in other manufacturing processes and verticals with minimal changes to hardware required, providing significant opportunity to further grow the Company's addressable market



Notes:

1. Market and Markets Nov-17 report estimates the market size for low flow controllers to be over \$200 million in 2017. Low flow controllers are primarily used in the Etching (Etch) application.
2. Market and Markets Nov-17 report estimates the market size for low and high flow controllers to be over \$500 million in 2017. High flow controllers are primarily used in the Chemical Vapour Deposition (CVD) application.
3. Market and Markets Nov-17 report estimates the total market size for flow controllers to be over \$1 billion in 2017. This includes the ETCH, CVD and flat panel LED applications.

Competitive advantage

Pivotal has a proprietary advantage over its competitors in the critical areas of flow speed, accuracy, flow range and diagnostic capabilities

	Description	PIVOTAL SYSTEMS	Competitor 1	Competitor 2	Competitor 3
Flow sensor type	Underlying process technology used to measure and control gas flow	Pressure and position based	Pressure	Pressure	Thermal
Accuracy	Degree to which you can accurately control desired gas flow	0.5%	1.0%	1.0%	1.0%
Turn on speed	The time required to switch on gas flow	0.1 sec	≤0.5 sec	<1 sec	1.0 sec
Turn off speed	The time required to switch off gas flow	<0.1 sec	≤0.5 sec	<1 sec	1.0 sec
Self-diagnostic monitoring	Ability to recalibrate during operation	✓	✗	✗	✗
Machine learning	Ability to calibrate and adjust flow settings in real time to maintain speed and accuracy in the production process	✓	✗	✗	✗

Notes:

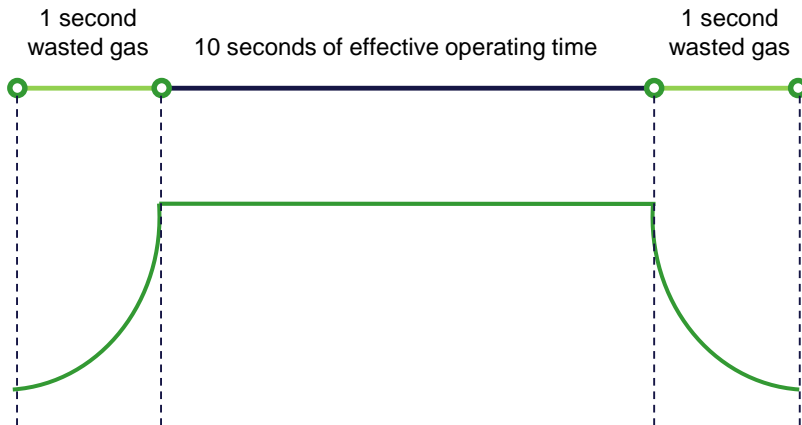
1. Metrics represent the performance of Pivotal's standard GFCs processing 0.025 sccm to 2L.
2. Includes core competitor models addressing both deposition and etch processes. All competitor data has been sourced directly from customer specification sheets, websites and presentations.

Comparative performance

Pivotal's technology advantage provides a number of operational and process efficiency benefits to its customers

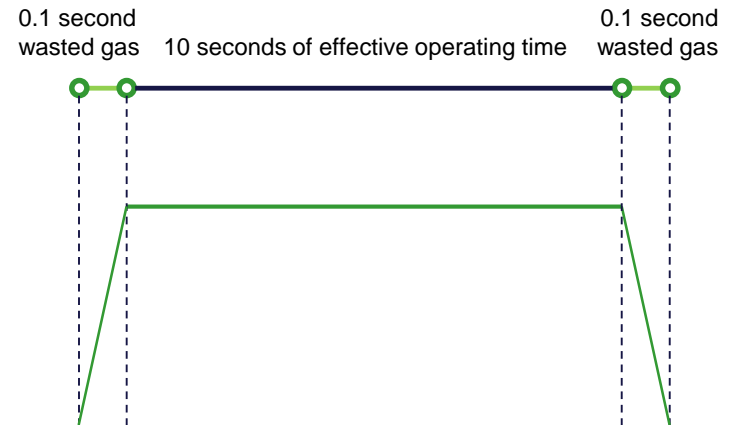
- On average, in a 10 second manufacturing process on a production line, Pivotal's GFC will be able to complete this process at the desired gas flow in ~10.2 seconds, versus competitor products which can require up to ~12.0 seconds to perform the same process
- This improves operating efficiencies by reducing the total elapsed time for the process step, while also reducing gas wastage while the gas flow is being stabilised or switched off

Competitor MFC



12 second process step

Pivotal GFC



10.2 second process step

Customer value proposition

Pivotal's GFCs allow customers to increase efficiency during the semiconductor manufacturing process, enabling output expansion and lower per unit costs

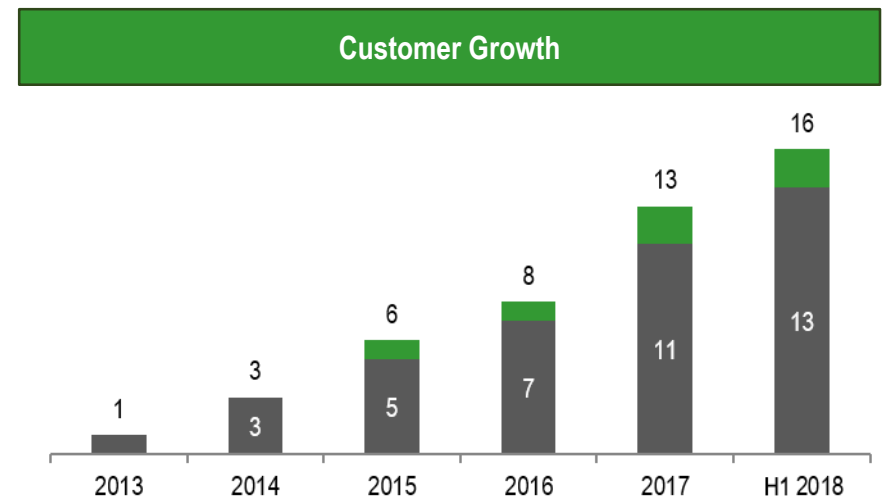
Revenue	1	Increased output	Enhanced diagnostics speed increases overall production capacity
	2	Increased yield	Potential to increase semiconductor manufacturing device and line yield by reducing variability in production output
Costs	3	Efficient use of inputs	National Institute of Science and Technology (NIST) traceable accuracy, real-time monitoring and leading settling times may reduce production errors and the waste of process gases
	4	Reduced production down-time	National Institute of Standards and Technology (NIST) Traceable Accuracy and self calibration eliminates the requirement to periodically recalibrate competitors flow controllers and reduces the requirement to hold back up production systems
Other	5	Product longevity and replacement cycle	Pivotal products have a life span of up to 20 years and have also proven to be very robust in use cases with corrosive gases. The speed and accuracy of the devices may be improved via software upgrades
	6	Easy to install	Tool-agnostic, capable of being specified into any semiconductor manufacturing tool and easily installed into the production process

Blue chip customer base

Pivotal's GFCs have already been validated by its blue chip customer base who have driven demand of Pivotal's products through adoption of the technology in their semiconductor manufacturing processes

- Pivotal currently has 29 customers (including those currently undertaking validation), which is reflective of the structure of the semiconductor industry where a relatively small number of large global companies command a significant share of the market
- Pivotal has managed to gain a strong share within IDMs retrofitting existing semiconductor tools with Pivotal's GFC technology. As a technology leader, Pivotal is well placed to capture market share gains as these IDMs roles out new semiconductor fabs over the short-medium term
- Pivotal's GFCs have already been validated by a number of its customers. The Company is beginning to experience accelerating sales with certain customers as they adopt Pivotal's products across both new fabs and retrofits

Sample of customer base	
IDMs	<ul style="list-style-type: none">• Samsung• SK Hynix• Texas Instruments• TSMC
OEMs	<ul style="list-style-type: none">• Applied Materials• Lam Research• Tokyo Electron



- Note:
1. Customers include first-time orders, repeat customers, as well as those customers who are in the validation phase with Pivotal's technology.
 2. Repeat customers defined as a customer who has ordered a Pivotal product on more than one occasion.

Continued growth opportunities

Pivotal's near term focus is to drive sales to their well established customer base which have already validated the technology. Over the longer term, Pivotal plans to expand its product portfolio to address new markets

1 Customer penetration

- Pivotal's growth strategy involves capitalising on well established customer relationships where customers have already been through lengthy product testing and validation phases -
- IDM customer base have announced large capex plans for new fabs in 2018, 2019 and 2020 creating a large, near term need for gas flow controllers. Pivotal continues to work with OEMs to become a standard specification into etch and deposition tools
- Major customers continue to retrofit existing fabs with new technologies and tooling

2 Expand product lines and increase addressable market

- Pivotal entered the deposition market in 2017 with its High Flow GFC
- Pivotal's' total addressable market more than doubled from US\$200 million per year to US\$500 million per year
- In July 2018, Pivotal announced the entry into a new market with the introduction of a new Flow Ratio Control (FRC) product. The FRC features three channel controls with average channel flow being two litres per minute. The FRC can be configured for either DNET or EtherCat and is compatible with all current and advanced generation OEM tool sets. This additional market is expected to add ~\$100m to Pivotal's total addressable market.
- Pivotal is also intending to release a derivative of the High Flow GFC in 2018, entering the metal-organic deposition, solar, LED and flat panel markets which may increase the total addressable market to over \$1.0 billion

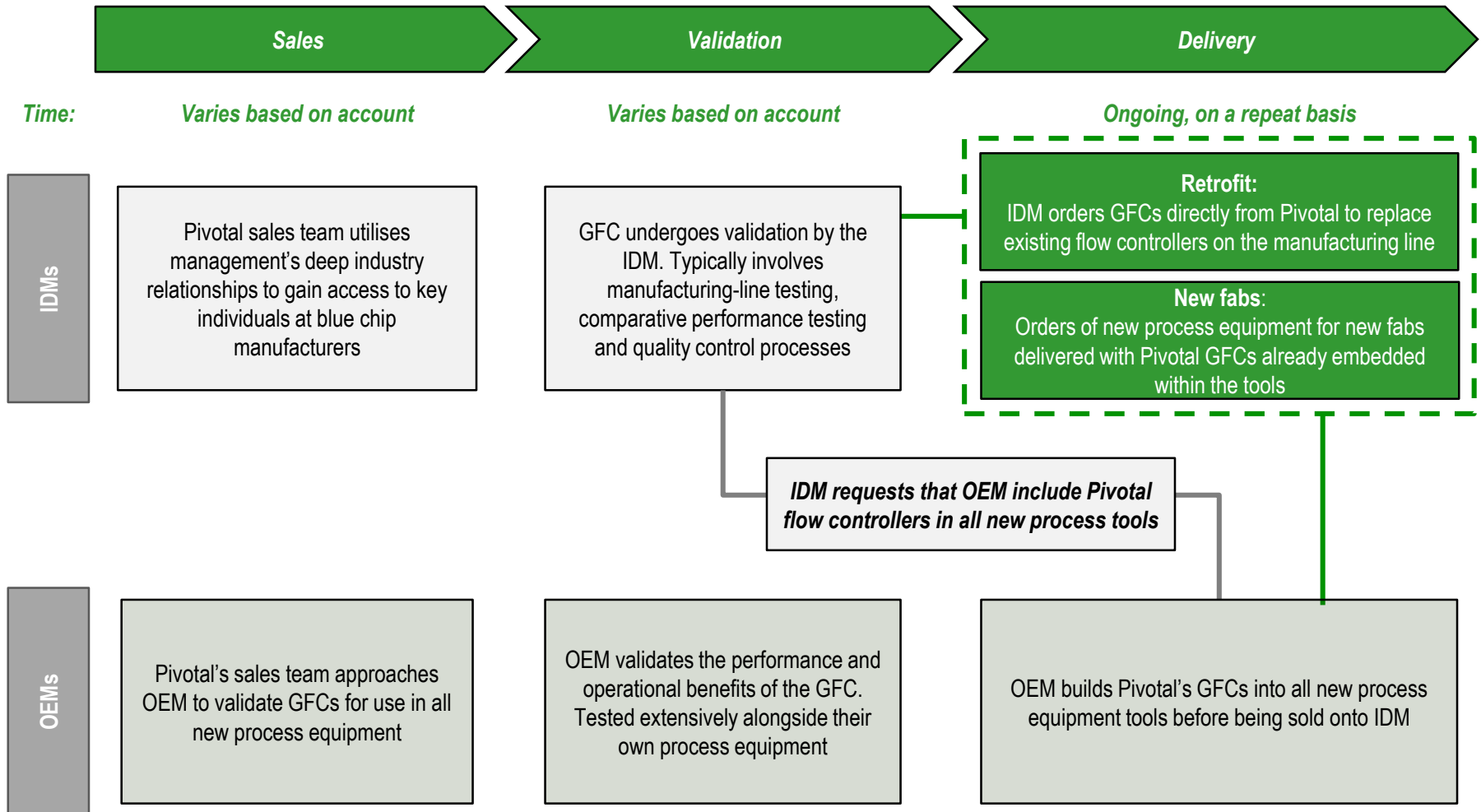
3 Software sales

- Pivotal has not changed the hardware on the GFC in recent years. It will begin to offer software upgrades to the industry in the medium term

Revenue model

Customer use	Primary revenue model	Distribution channel	Revenue contribution (1H18) (%)
New fabrication plants	Repeat unit orders for the fit out of new fabrications being constructed by IDMs. Directly tied to capital expenditure plans, providing OEMs and their suppliers (including Pivotal) with reasonable visibility over the IDM's future capital equipment requirements and the timing of associated tool deliveries	OEMs	61.2%
Retrofits	One-off sale of GFCs to replace old or non-performing GFCs already installed in the fabrication plant. Largely tied to the capital replacement cycles and investment in new equipment to meet increasingly complex semiconductor design rules	IDMs	38.8%
Software sales	Sale of Pivotal's underlying operating software platform under a recurring subscription based revenue model. This is expected to be offered to customers in the medium-term.	IDMs	n.a.

Sales model



04.

CORPORATE



Management team

John Hoffman
*Executive Chairman and
Chief Executive Officer*

- John has over 30 years of global technology management experience in both the semiconductor and information technology markets
- Senior Vice President with Spencer Trask Ventures, a New York based venture capital firm where he was primarily involved in the solar and integrated circuit efforts of the firm
- Previously CEO of RagingWire Enterprise Solutions
- Worked in various general manager roles at Applied Materials for 18 years, including President of the Etch Group, VP and General Manager of Process Control and Diagnostic Business Group and General Manager of the Customer Service Division
- B.S. from the United States Military Academy at West Point and an Executive MBA from Stanford University

Joseph Monkowski
*Chief Technology Officer
and Executive Director*

- Joseph has extensive experience in the semiconductor industry focused on providing process equipment and metrology solutions for next generation device manufacturing
- Previously Senior Vice President of Business Development for Advanced Energy Industries, and held senior executive positions at Pacific Scientific, Photon Dynamics and leading OEM Lam Research
- Joseph has authored numerous patents and publications in the semiconductor and flow controller space
- B.S., M.S. and Ph.D. in Electrical Engineering and an M.S. in Materials Science, all from Penn State University
- He also served as a Professor of Electrical Engineering for six years at Penn State University

Omesh Sharma
Chief Financial Officer

- Omesh has over 20 years of financial management experience in the public and private sectors
 - Held several key senior financial and management positions at RagingWire Enterprise Solutions, Media Arts Group Inc. and Nortel Networks
 - Demonstrated ability to streamline operational procedures has helped a number of companies achieve significant cost-efficiencies
 - Omesh holds Master's degrees in finance, business administration and economics from Salem State University and economics from Panjab University
-

Board of Directors

John Hoffman

Executive Chairman and Chief Executive Officer

See previous page

Joseph Monkowski

Chief Technology Officer & Executive Director

See previous page

Kevin Landis

Independent Non-Executive Director

Kevin is the CIO of Firsthand Capital Management, an investment management firm he founded in 1994. Kevin has over two decades of experience in engineering, market research, product management, and investing in the technology sector. Kevin holds a bachelor's degree in electrical engineering and computer science from the University of California at Berkeley and an MBA from Santa Clara University.

Ryan Benton

Non-Executive Director

Ryan has been the CFO of Brainchip (ASX: BRN) since August 2017. He served as CEO and Board Member at Exar Corporation (NYSE: EXAR), which was acquired by MaxLinear Corporation (NASDAQ: MXL) in May 2017. Previously CFO of SynapSense Corporation, CFO of SoloPower, Inc., and financial consultant for the US subsidiary of ASM International NV (a semiconductor capital equipment company). Ryan holds a B.A. from the University of Texas at Austin and is a licensed Certified Public Accountant.

David Michael

Non-Executive Director

David is Managing Director at Anzu Partners, which invests in innovative industrial technology companies. He is also a Board member of Nuburu, Axsun, and Terapore. David was formerly Senior Partner and Managing Director of The Boston Consulting Group (BCG). He led BCG's Greater China business and their Asia Technology Practice. He served a range of clients in semiconductors, components, hardware, software, and services. He remains a Senior Advisor to the firm. David holds a B.A. in Economics from Harvard University and an M.B.A. from Stanford.

Peter McGregor

Independent Non-Executive Director

Peter has over 30 years' experience in senior finance and management roles, including having been CEO of tech company, Think Holdings, CFO of the ASX50 transport company, Asciano, and a partner in the Investment Banking firm of Goldman Sachs JBWere. He also spent time as a Managing Director within the Institutional Banking & Market division of CBA and was COO of Australian Infrastructure Fund (ASX:AIX). He holds a Commerce Degree from the University of Melbourne, is a Fellow of FINSIA and a Member of the AICD.

06.

SUMMARY



Pivotal Summary



- 1 Opportunity to gain exposure to the growing global semiconductor industry
- 2 Clear technology leader with a proven product that has received validation from a number of key blue chip customers
- 3 Large and growing addressable market with further opportunity for significant expansion of market share
- 4 Opportunity for diversification of revenue streams with growth in high quality subscription revenues from the sale of software upgrades
- 5 Close relationships with high quality customer base comprised of leading blue-chip IDMs and OEMs
- 6 Strong customer retention and a highly defensible product model
- 7 Highly aligned management team with the technical and commercial experience to deliver on the Company's growth strategies

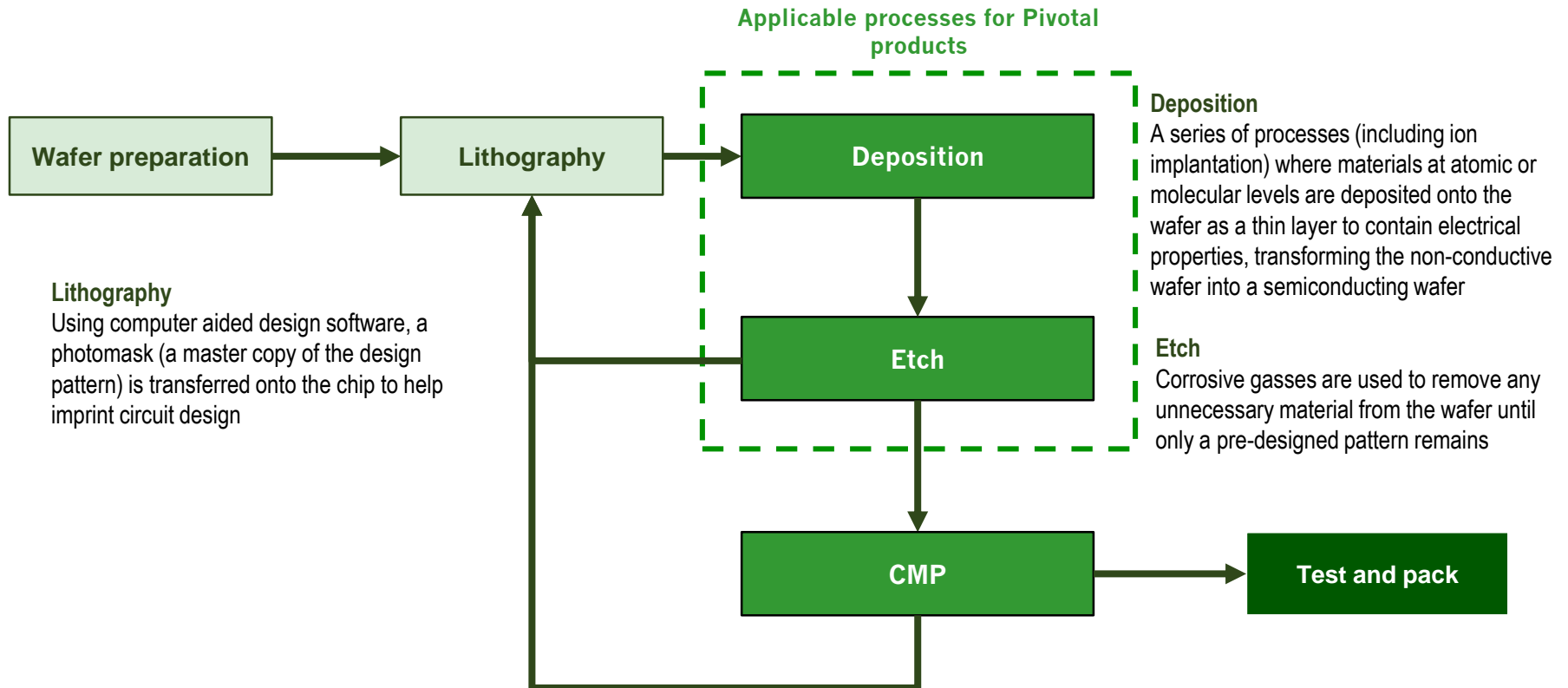
Appendix A:

SEMICONDUCTOR MANUFACTURING PROCESS



Semiconductor manufacturing process

The semiconductor manufacturing process typically consists of more than a hundred individual steps, of which Pivotal's GFC solutions are applicable to the core steps of deposition and etch



Deposition and etch tools used in the fabrication of semiconductors are key drivers of the market for flow control devices. These tools have experienced strong recent growth as fabrication capacity has expanded and production processes grow more complex.