

# Integrated Photonics

The Next Wave in Photonics Growth

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POET Technologies

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# Safe Harbour

This material will provide “forward-looking information” (within the meaning of applicable Canadian securities laws) and “forward -looking statements” (within the meaning of the U.S. Private Securities Litigation Reform Act of 1995) and the Company is relying on the protections of the safe-harbor created thereby.

Many factors could affect our current expectations and could cause actual results to differ materially. The forward-looking statements and information are based on a number of assumptions and are subject to various risks and uncertainties, including those described in the company’s filings with the U.S. Securities and Exchange Commission and the applicable Canadian securities regulators, many of which are difficult to predict and generally beyond the control of the Company.

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## Agenda

1. Executive Summary
2. POET Technologies  
– Update and Outlook
3. Acquisitions
4. Creating shareholder value
5. Conclusion

# Executive Summary

- POET team executing to plan on Lab to Fab to Monetization of it's highly disruptive integrated opto-electronic technology
- Diversified business plan supporting monetization strategy to address large total available market
- DenseLight (Closed) and BB Photonics (Ongoing) acquisitions accelerates time to product revenue by 18 months
- Other NRE revenues expected within 12 months
- Acquisitions broaden IP base and product portfolio expanding POET's reach in Data communications and Sensing markets
- Immediate product sales distribution channels enabled via DenseLight acquisition with path to EBITDA positive by 2<sup>nd</sup> half 2018

# The Business

<b>Our Business</b>	<ul style="list-style-type: none"><li>• POET will manufacture and market Integrated Opto-Electronic solutions<ul style="list-style-type: none"><li>- Broad applications inclusive of sensing and display</li></ul></li><li>• DenseLight designs, makes and markets Photonics devices to sub-system solutions for test &amp; measurements, structural health monitoring, healthcare, telecom and defense.</li></ul>
<b>What we Do</b>	<ul style="list-style-type: none"><li>• Design, Outsourcing &amp; In-house manufacturing of SLEDs and Laser Products</li><li>• Innovative assembly and test leveraging opto-electronics integration capability</li><li>• Optical engines, Modules and Sub-Assemblies</li></ul>
<b>Our Major Products</b>	<ul style="list-style-type: none"><li>• Short Reach and Very Short Reach Active Optical Cables and Transceivers</li><li>• DFB Lasers, Broadband Super Luminescent LEDs, Narrow Line Width Lasers, Programmable Light Sources</li></ul>
<b>Our Product Applications</b>	<ul style="list-style-type: none"><li>• Data Center and Short Reach Data Interconnects and AOC</li><li>• Defense and Security Applications</li><li>• Micro-displays through application of POET's Smart Pixel technology</li><li>• Fiber Broadband FTTH, 4G/LTE, 5G MMIC Applications</li></ul>

# A Compelling Business Investment Proposition

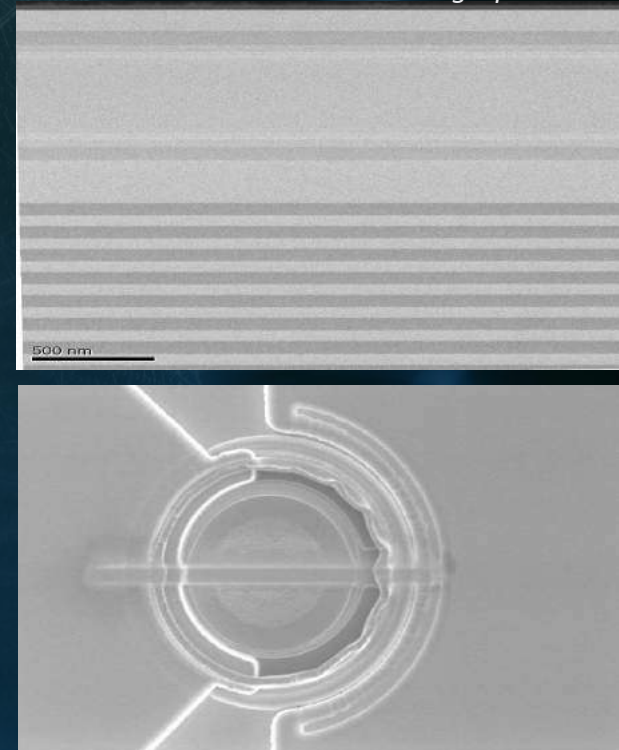
<b>Global Footprint</b>	<ul style="list-style-type: none"><li>• Well established presence through the DenseLight acquisition</li><li>• Global manufacturing partnership enables scalable growth</li></ul>
<b>People</b>	<ul style="list-style-type: none"><li>• Strong and experienced leadership team in place with extensive technological, industrial and commercial expertise</li><li>• Strong and experienced engineering management in optical data communications</li></ul>
<b>Technology</b>	<ul style="list-style-type: none"><li>• Significant investment into industry's first integrated photonics technology capable of integrating electronics and photonics</li><li>• Disruptive technology with applications in multiple market verticals</li></ul>
<b>Customer Engagement</b>	<ul style="list-style-type: none"><li>• Strong interest from strategic customers from component players to network players</li><li>• Working on active customer collaboration with development of the first prototypes</li></ul>
<b>Financials</b>	<ul style="list-style-type: none"><li>• Strong balance sheet - ~\$15.5M (USD) supporting multiple quarters of development</li><li>• Path to EBITDA profitability in 2018 – with 50+% Gross Margin</li><li>• Significant planned year on year growth through DenseLight acquisition</li></ul>

# POET Technologies Update and Outlook

# The Technology - POET puts the pieces together

- First gallium arsenide semiconductor technology to support integration of high speed electronics and high speed photonics
- POET enables a Moore's Law like functional integration to the field of optics
- Compatible with existing manufacturing technology and computing ecosystem
- Data Communications, Mobile, Consumer, Automotive, Industrial, and Military
- POET is adding to its portfolio through acquisition of InP technology and manufacturing capability

*Transmission Electron Micrograph*



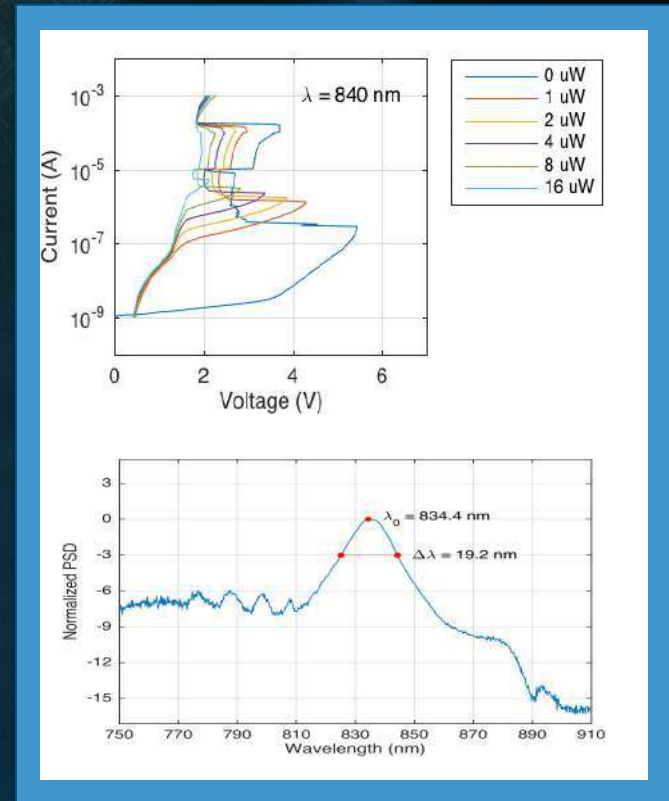


## POET adds to its portfolio through DenseLight and BB Photonics acquisitions

- InP based Photonics Sensing and Laser Technology
- InP manufacturing capability with scalable technology
- Unique and differentiated IP that allows POET to expand its reach to Data Center and Long Haul applications
  - Wavelength stabilized lasers and detectors
  - InP based Photonics Integration
- Expands POET's reach in Data Communications and Sensing

# Key Recent Accomplishments

- Completed process transfer from lab to high volume manufacturing foundry on 6" wafer substrates
  - Process optimization for some critical process steps underway
- Results from first 6" foundry processed wafers demonstrated best in class small signal Resonant Cavity Detector performance
  - Large Signal performance demonstration is next step
- POET's Resonant Cavity design provides much higher sensitivity relative to conventional Detector designs and enables integration
- Thyristor Assisted Responsivity ~ 20X higher on 3X smaller devices relative to 850nm PIN diode detectors in the market
- Established test and characterization capability in San Jose, CA



## Work in Progress – Key Current Activities

- Lab to 6" volume manufacturing fab transition continues per plan
  - Optimize Resonant Cavity processing and performance
  - Improve characterization capabilities
  - Test Automation, Database and Data analytics in support of increased wafer volumes from foundry
  - Demonstrate co-integrated VCSELs and Detectors [essential for any integrated opto-electronic device]
- Install complete manufacturing process flow set up
  - Inclusive of integrating Transistors
  - First fully integrated design/masks currently in process

# POET Technologies Update and Outlook

# “SMAC” Driving Hyper Network Expansion

## INTERNET OF THINGS



**25B**

connected objects by 2015<sup>(2)</sup>

## SMARTPHONES



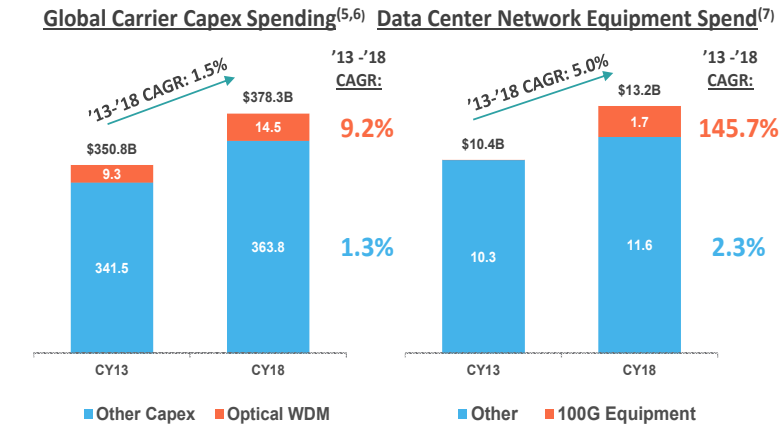
**Over 1.6 Billion**

smartphones and tablets to be sold in 2015<sup>(1)</sup>

## CLOUD COMPUTING



**Increased adoption** by businesses and consumers for applications and infrastructure



## APPS / SOCIAL



**1.8 Billion** photos uploaded and shared every day<sup>(3)</sup>

## OTT VIDEO



**1M Minutes** of video content will pass through networks in 2018 every second<sup>(4)</sup>

## NEW TECHNOLOGIES



Faster speeds through **LTE, FTTH rollouts**

(1) IDC Research.  
 (2) Gartner, "Forecast: Internet of Things, Endpoints, and Associated Services, Worldwide, 2014," October 2014.  
 (3) Mary Meeker "Internet Trends 2014 - Code Conference," May 2014.  
 (4) Cisco VNI "The Zettabyte Era," June 2014.  
 (5) Infonetics, "Optical Network Hardware," November 2014.  
 (6) Infonetics, "Service Provider Capex, Revenue, and Capex by Equipment Type," November 2014.  
 (7) Infonetics, "Data Center Network Equipment," December 2014.

New Phase of Photonics Growth driven by Consumers and Consumer Applications

# The need for Integration in Data Centers

POET is designed to enable true integration of photonics and/or electronics, providing smarter system partition capabilities

Data Centers are primarily about \$/Gbit for getting data from point A to point B

- Low Power Dissipation
- Ability to deliver high volume solutions
- New solutions need to provide COST differentiation
- Packaging cost and other costs affect total cost – its not just about the Laser or Modulator

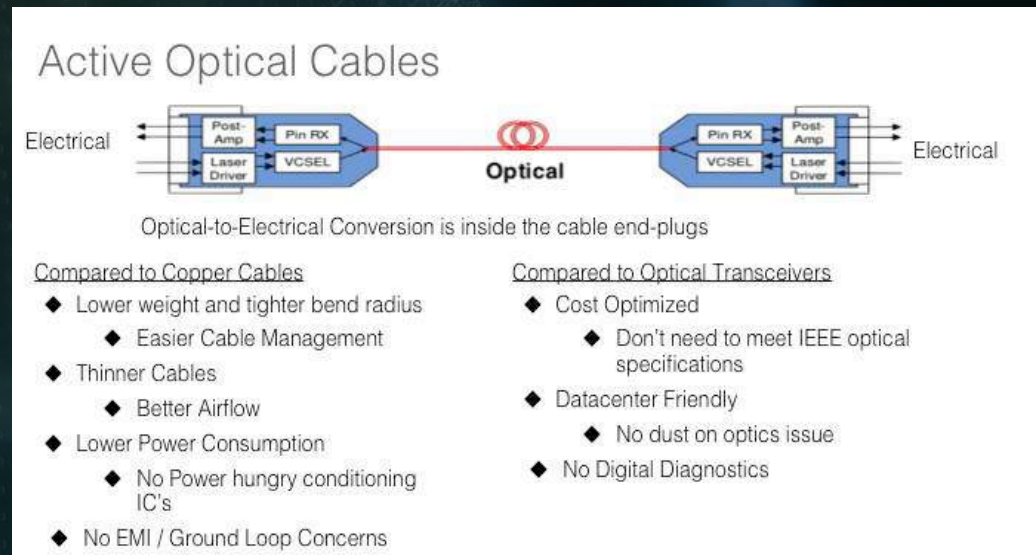
Why is Integration Important ?

- Integration enables new and innovative products
- Integration in semiconductors is essential to meeting goals associated with:
  - Size, Weight
  - Power
  - Performance
  - Cost



# POET offers a superior solution relative to Copper

- POET integrates electronics and optics on a single chip, significantly improving data center links
  - Up to 30X lower power per link (compared to copper)
  - Up to 10X decrease in size
  - Up to 10X lower cost



POET →

Lower  
Operating  
Costs



Higher Margins  
For Data Center  
Providers



# Value Proposition

- Disruptive reduction in both component cost, module cost and form factor
- Initial focus on 10G,/40G solutions with Short Reach (< 100m)

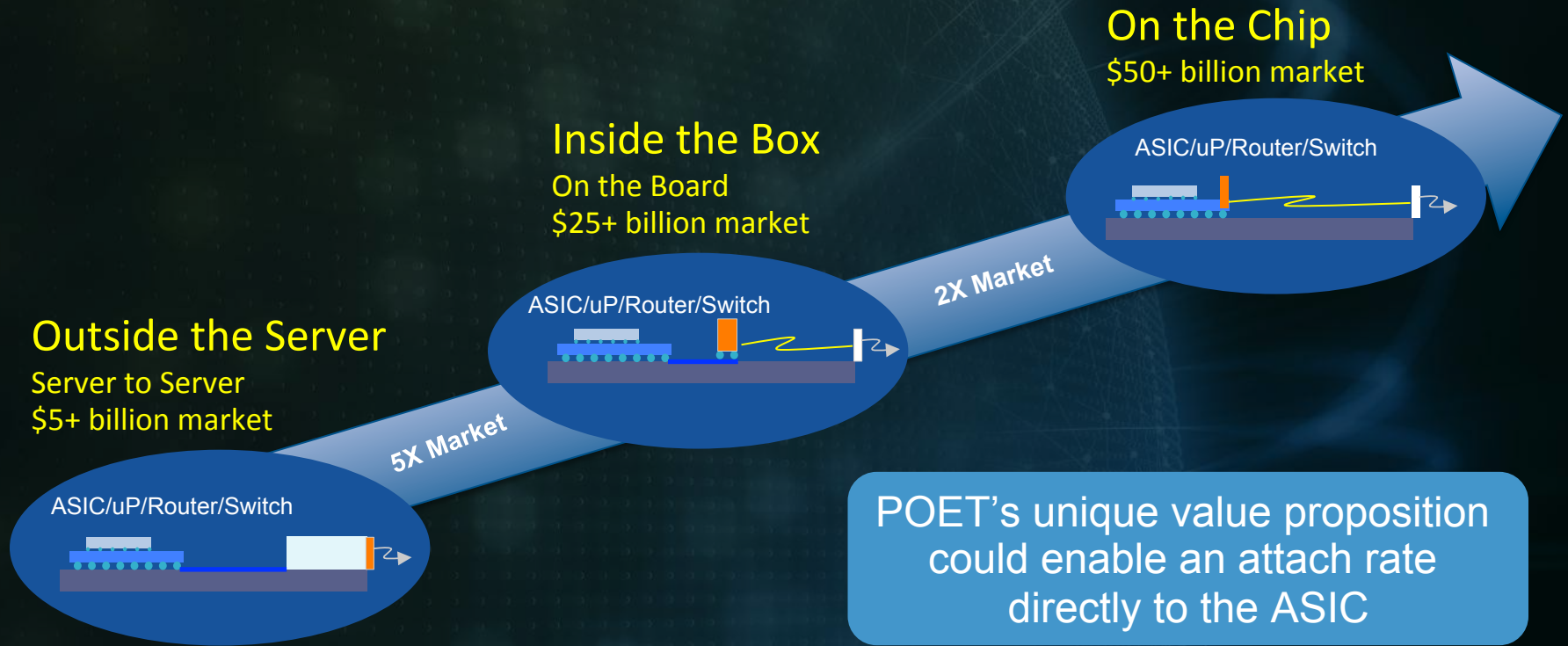
	Direct Attach Copper	Conventional AOC	POET Optical Engine
Power	3W	0.5W	<0.5W
Cost	X	3X	1.5X
Form Factor	-	25mm <sup>2</sup>	~5mm <sup>2</sup>
Weight, Flexibility	No	Yes	Yes
Medium	Copper	MMF	SMF
Bill of Material (BOM)	-	4 chips	Single Chip



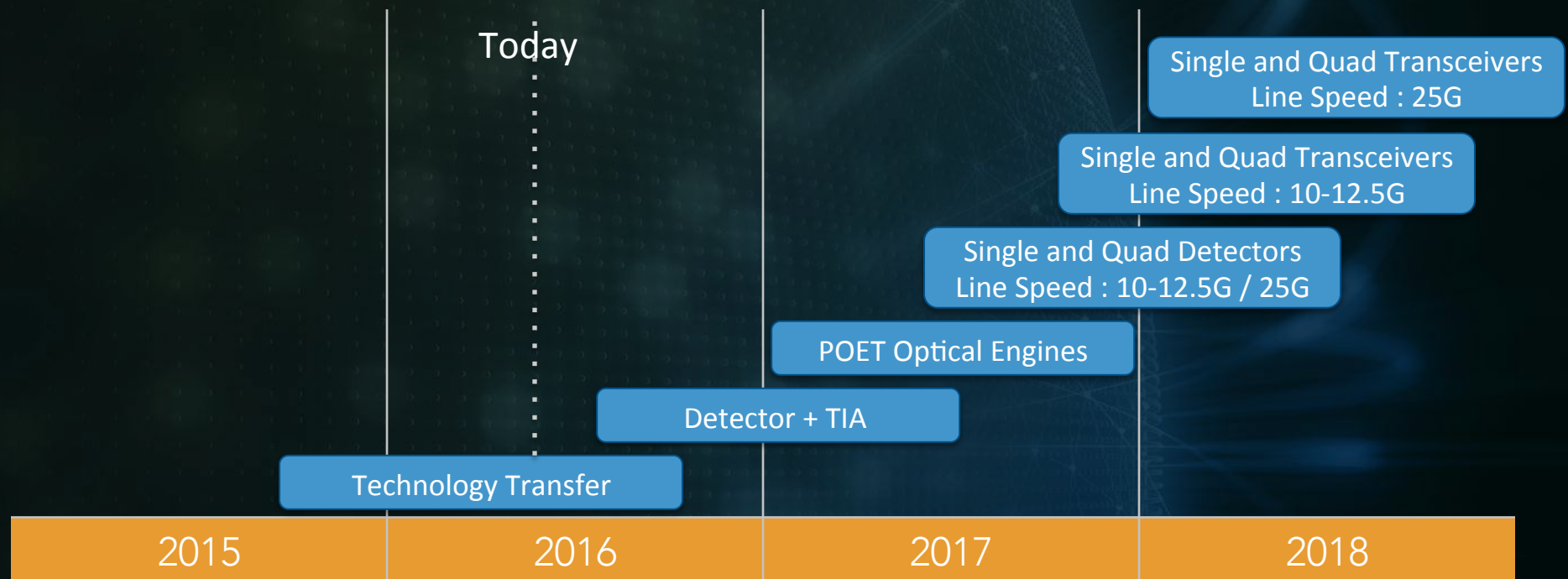
# POET – Component Cost against Competition

<i>Example Opto-Electronic Components</i>	Component Die Cost ('\$)	Benchmark
Single Detector/TIA	1	33X
Quad Detector/TIA	1	27X
Single Channel Transceiver (Design I)	1	2X
Single Channel Transceiver (Design II)	1	19X
Quad Channel Transceiver (Design I)	1	4X
Quad Channel Transceiver (Design II)	1	14X

# POET can enable “on-chip” optics



# Short Reach Communications Transceiver Product Development Roadmap



# Pursuing New Opportunities

- Announced JDA with IMRE Singapore
  - Enables the creation of smart pixels for potential AR (augmented reality) / VR (virtual reality) applications
  - Evaluating translation of the POET epitaxy stack to GaN
- Advanced stage discussions for NRE revenues over next 12 months
  - POET IP enabling multiple applications in aerospace and defense
  - Applications include IR sensors and high power laser sources

*[Referring to safe harbour statement, POET can not assure of such revenues and will announce when such material event happens]*

# Acquisitions

# DenseLight and BB Photonics Acquisitions

## Revenue & Fab

Immediate access to Product Revenue and Qualified Fab Operations

Product Operations Infrastructure

(sales, quality, supply chain)

*Fab Capability for POET R&D*

## Technologists

Tripling number of technologists

Infrastructure for further growth – in low cost region

*Addition of critical skills in RF testing and optical characterization*

## Technologies, IP/Know How

Doubling of the technology portfolio



SLED, NLL

InP DFB Laser Products



*Entry into high growth sensing and Data Com business*

# Expansion of Operations and Product Portfolio

## Operations

- 2inch InP & GaAs
- Upgradeable to 3" or 4" [US\$1.6M in upgrade costs]
- Total past investment – S\$37M
- Wafer capacity expected to double in 2017
- 35 staff

## Business

- Broadband Super Lumiscent LED (SLED)
- Narrow Line Width Lasers (Gain Chip + FBGL)
- Programmable IR Light Sources
- DFB Lasers

# Facility Ownership

- Ownership of fully functional ISO9000 compliant facility
- Reduces manufacturing and sales learning curve
- Reduces future capex
- Faster development of POET technology
- Sales channels and sales team in place
- Negotiating government support for technology





# Applications of Photonics Sensing

## Test & Measurements [TAM : \$10B]

### Monitoring

- Communication and Test – CommTest
- Component-Material Testing / Metrology – CMT

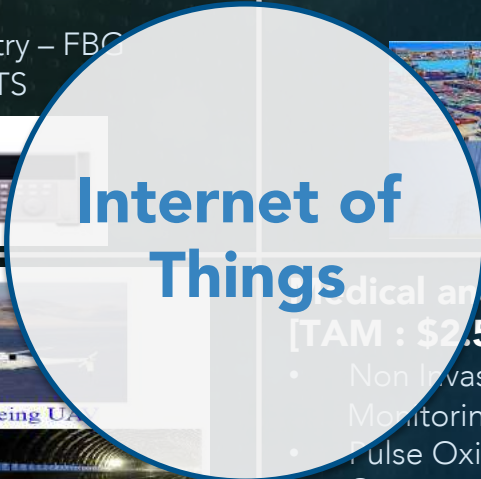
### Sensing

- Fiber Bragg Grating Sensors / Telemetry – FBG
- Distributed Temperature and Strain - DTS



## Structural Health Monitoring [TAM : \$6B]

- Smart Grid – Current Sensor for Power Grid
- FBG-sensor based Fiber Optic Sensing
- BOTDR based Fiber Optic Sensing



## Guidance and Navigation [TAM : \$4.5B]

- Navigational guidance
- Gyrocompass
- Stabilization
- Industrial Robotics/ Automotive
- Automotive self-driving car



## Medical and Health Care [TAM : \$2.5B]

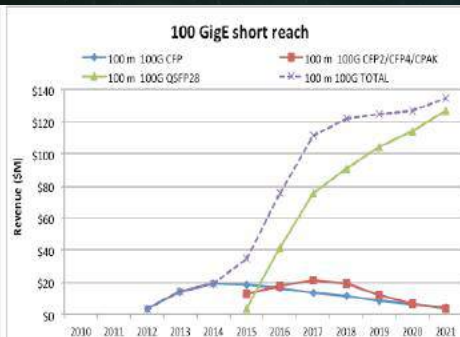
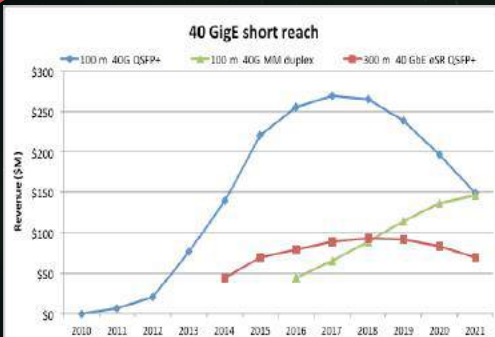
- Non Invasive Blood Glucose Monitoring
- Pulse Oximetry / Regional Oximetry
- Ophthalmic OCT (Optical Coherent Tomography)
- OCT Biomedical Imaging (tissue, arteries, skin, dental)



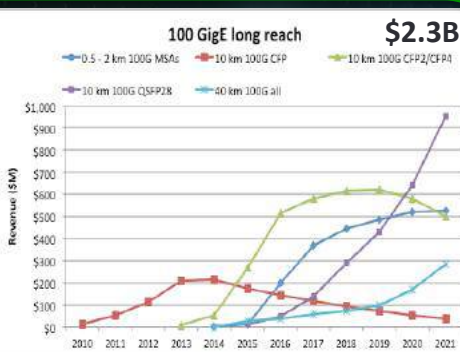
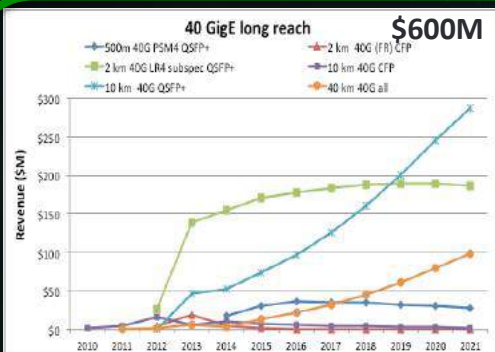
# Expanded Available Markets in Data Communications

	POET	POET + ACQUISITIONS																											
REACH	0-100m	100m-2km																											
APPLICATIONS	Data Centers - DAC replacement, AOC's Consumer - Thunderbold, HDMI On Board / On Chip	Data Centers Pluggable Modules																											
			>10km																										
			Metro / LAN FTTH / PON Telecom																										
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# Acquisitions enhance the total POET SAM



Short Reach SAM  
\$0.5B – \$1B



Long Reach SAM  
\$2B – \$3B

- DenseLight and BB Photonics provide single mode InP technology, extending POET's reach in Data Center market
- Numbers do not include DAC TAM

# Long Reach Communications

## Laser & Transceiver Product Development Roadmap



## Highlight of the Acquisitions

- Immediately revenue accretive to POET's financial results
- Establishes immediate product and market presence
- Path to EBITDA positive for combined company in latter half of 2018
- Enhances factory utilization, Reduces total cost of development, Leverages shared services
- Expands and further differentiates the POET product portfolio and addressable markets
- Provides additional growth opportunities by adding industrial applications like Sensing and Long Reach Data Communications

# Summary

# Enhancing Shareholder Value

- Highly disruptive opto-electronic semiconductor technology and broad IP portfolio
- Broad Product Portfolio and Application Space
  - Expanding reach in Data communications and Sensing markets
- Expanded III-V material base including factory operations
- Customer Focus and Established Supply Chain
- Product sales and anticipated NRE revenues within twelve months
- Platform for profitable revenue growth
  - Expect EBITDA positive in 2nd half of 2018



Thank You