July 20, 2020

Zacks Small-Cap Research

Sponsored – Impartial - Comprehensive

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POET Technologies Inc. (TSX-V: PTK)

Initiation Disrupting Photonics Pricing and Functionality Through Innovation and Scalable Automation

Given its unique product offering and large TAM we believe POET shares could reach CN$6.38 by 2024 given no further equity dilution than forecast.

Current Price (07/17/20)	CN$0.58
Valuation	**CN$6.38**

OUTLOOK

POET Technologies is a startup seeking to disrupt the photonics industry with a new design that eliminates parts of an optical transceiver and replaces them with a single integrated device which is smaller, cheaper and faster than the current solutions. It just announced a $50M joint venture with Sanan IC to make and sell optical engines to data centers and telecom. Its solution can be produced in a fab, eliminating costly manual steps, and allowing it to be easily produced in large quantities. We believe POET's platform can be applied to many other large photonics markets including high speed computing, co-packaged optics, augmented reality, LIDAR, and the Internet of Things.

SUMMARY DATA

52-Week High	**CN$0.71**
52-Week Low	**CN$0.23**
One-Year Return (%)	**45.5**
Beta	**1.0**
Average Daily Volume (sh)	**274,520**
Shares Outstanding (mil)	**293**
Market Capitalization ($mil)	**CN$168**
Short Interest Ratio (days)	**0.6**
Institutional Ownership (%)	**0**
Insider Ownership (%)	**0**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**N/A**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/M**
P/E using 2020 Estimate	**N/M**
P/E using 2021 Estimate	**N/M**

Risk Level	**Above Average**
Type of Stock	**Small-Growth**
Industry	**Elec Comp-Semis**

ZACKS ESTIMATES

Revenue
(in millions of US$)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2018	$0.0 A	$0.0 A	$0.0 A	$0.0 A	$0.0 A
2019	$0.0 A	$0.0 A	$0.0 A	$0.0 A	$0.0 A
2020	$0.0 A	$0.0 E	$0.1 E	$0.5 E	$0.6 E
2021					$5.0 E

Earnings Per Share

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2018	-$0.01 A	-$0.02 A	-$0.02 A	-$0.01 A	-$0.06 A
2019	-$0.01 A	-$0.01 A	-$0.01 A	$0.03 E	$0.00 E
2020	-$0.01 A	-$0.01 E	-$0.01 E	-$0.01 E	-$0.05 E
2021					-$0.06 E

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KEY POINTS

- The Holy Grail in photonics is cost reduction (through efficiencies in process and materials) combined with lower power consumption. Throw in a smaller size, and higher performance, and customers should beat a path to your door. POET believes it can provide all four with its proprietary "optical interposer" based on a novel low-loss material that can allow multiple components to be integrated into a single package entirely at wafer-scale. What this means is that it can eliminate steps in the labor-intensive assembly process currently used when manufacturing optical transceivers. Manual assembly results in higher scrap rates, longer production times, and higher equipment costs. Also, its base material is far better suited to use in the management of light than silicon due to its lower loss and planar architecture, thus allowing lower powered lasers, resulting in lower power consumption and the ability to use less expensive lasers. POET hopes to disrupt the current market for photonics devices and have its Optical Engine platform become the standard in the industry.

- POET recently announced a Letter of Intent (LOI) to establish a $50 million joint venture with Xiamen Sanan Integrated Circuit Co. Ltd. of Xiamen, China. POET will be contributing know how and a license to some of its technology, and Xiamen will contribute intellectual property, capital and production facilities. It will ultimately be 53% owned by Sanan IC and 47% by POET. Its first products will be optical engines (POET's interposer combined with Sanan's lasers) to be sold to manufacturers of 100G, 200G, and 400G devices for use in data centers and telecommunications. The venture hopes to convince incumbent or new module suppliers to adopt its lower cost Optical Engine, which can be sold at prices below the costs of the legacy component suppliers. This joint venture could generate as much as $200-$300 million in revenues per year by 2025 by taking modest market share.

- POET recently reinvented itself by selling its foundry in Singapore and redeploying the cash to pursue the development of products with higher return on equity due to demand, market growth, and low capital requirements. It is capitalizing on management's expertise in processes, lasers and design to target a number of industry segments in the photonics market with the highest return, with the first two being 100G and 400G for data centers, and supercomputers for use with Artificial Intelligence.

- POET has presented NRE proposals to numerous companies targeting a variety of markets and we await news on at least three agreements in 2020. We expect the company to generate a few million dollars in revenues from these proposals.

- We expect that POET will start producing samples for customers late this year and early next and should be ready to ramp into production starting at the end of 2021. The POET-owned equipment on which the optical interposers are made reside at a Malaysian foundry. That equipment, and the process recipes, are solely for its use in order to protect its trade secrets. The capacity of that equipment set should be sufficient to provide initial production quantities; the company can add equipment as needed in this location to expand volumes. Completed optical interposers will be shipped to the JV for assembly, testing, and sale to transceiver manufacturers and others.

- The stock currently trades at a fully diluted enterprise value of $130 million. The global market for optical transceivers is estimated to be $5.7 billion in 2020 and projected to reach a value of $9.2 billion by 2025, representing a CAGR of 10.0%, according to MarketsandMarkets Research Private Ltd. POET's product is a component of an optical transceiver and market is about a third of the transceiver market. If POET can secure even a small portion of that market with its unique offering, its valuation should far exceed its current price. We believe the stock could be worth $4.70 by 2024 based on $200 million in revenues in 2025 at 7.8xs EV to Sales, in line with its peers.

OVERVIEW

POET Technologies is a start-up headquartered in Toronto that is seeking to disrupt the photonics market with a new device that is designed and manufactured differently than current products. Photonics is a ubiquitous industry that uses light rather than electricity to transmit information. Light moves much faster than electrons and only by using light can speeds be improved. This is particularly important for applications that need even more rapid transmission to even exist, such as self-driving cars (LIDAR), 5G, high-speed computing, and certain artificial intelligence and IoT applications. POET has taken its expertise in both photonics design and manufacturing, to create a new way of producing an optical engine (which is the key component of an optical transceiver) by introducing a device that would integrate photonics and electronics at the wafer level.

This new product would allow customers to use a solution that is cheaper, smaller, more easily adapted, more reliable, and able to be used in a wider range of applications than currently available. We believe this innovation could be provided at 30% less than the cost of comparable solutions and would be far more scalable, providing users incentive to switch to POET's technology. The company is currently in talks with a number of potential customers. It is already past proof of concept with one possible customer and is at the point where it has started to deliver sample prototypes for testing. We still do not know if its technology will be commercially viable or scalable, but if so there is a huge available market to penetrate. If viable, it will still be about a year or more from this point until it actually signs a customer and begins delivery of product. Hopefully milestones along the way give investors signs that POET will be able to become a commercial success.

POET Technologies was originally operating as OPEL International and changed its name in 2013 to POET Technologies. Last fall it sold its main business (DenseLight) in order to focus on developing its product platform. It sold DenseLight to a Chinese company for $26 million in cash on November 8, 2019. This cash should see it through to 2021 given its expectation to burn $2.5 million per quarter without any NRE revenues. It employs 26 people only one of which is located in Canada (Toronto). Eight employees are in Allentown, Pennsylvania where research & design is located, 14 in Singapore, where its new product introduction is centered, while the CEO and CFO and two others reside in California.

Joint Venture with Xiamen Sanan Integrated Circuit Co.

POET recently announced a letter of intent for a 47/53% joint venture with Xiamen Sanan Integrated Circuit Co. Ltd. (Sanan IC) of Xiamen, China, to manufacture and sell optical engines. Sanan IC is a wafer foundry that uses an advanced compound semiconductor technology platform, and serves the optical, RF microelectronics and power electronics markets. It is a subsidiary of Sanan Optoelectronics Co. Ltd., a $14.4 billion company that is listed on the Shanghai stock exchange at 600703. Sanan Optoelectronics is the leading manufacturer of advanced ultra-high brightness LED epitaxial wafers and chips in the world. If agreement is reached, the deal is expected to close early in Q4 2020 and is valued at $50 million.

POET will be contributing licenses to IP and production know how, and Sanan IC will contribute capital, IP and manufacturing capabilities. The JV is expected to design, develop, manufacture, and sell 100G, 200G, and 400G optical engines with customized lasers and photodetectors from Sanan IC combined with optical interposer platform technology from POET. POET will provide a finished interposer from its Singapore plant and send it to Xiamen where it will be combined with lasers, detectors, and other active devices to create an optical engine to be sold to companies that make optical transceiver modules and systems. All sales will be taking market share from the incumbents that make conventional TOSAs, ROSAs, and TROSAs components. Since the POET solution should be protected by patents, and can be provided to customers below the cost of current solutions and provide better performance and size, we expect it to replace significant portions of the components used.

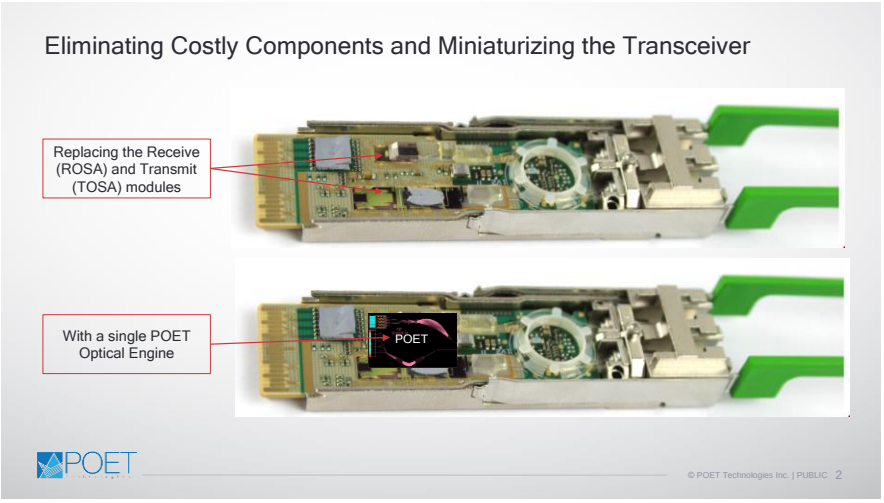
The joint venture has been given the rights to market 100G and 200G products worldwide. For 400G it has the rights to market to Greater China (China, Taiwan, Hong Kong and Macao.) POET retains the right to market 400G in the rest of the world both because it is already spent a lot of time developing 400G solutions and is well on its way to potential customer design ins, and because 400G is made in such small volumes that the benefit of Sanan IC production in that market is not as vital. However, when deemed more practical, the JV will still be able to serve non-China customers. The list of potential customers for these new optical engines includes transceiver manufacturers, systems integrators, as well as the large end users themselves. They are: Delta, Hisense, Molex, Acctron, Accelink, Huali, Google, Amazon, Facebook, Apple, and AliBaba.

The JV will be based in Xiamen and it will be hiring its own management and staff. POET personnel will do the hiring. The company expects to hire 15 people in the first year, and five to ten more in the second year. POET will provide support the JV from three locations: Allentown, Singapore and Shenzhen. POET's direct expense for specific designs of the interposer will be covered by NRE contracts, starting in Year 1 and for additional interposer designs in subsequent years. We expect the JV to be spending approximately $3 million in expenses in 2021, of which approximately half the losses will show on POET's income statement.

PRODUCTS AND TECHNOLOGY

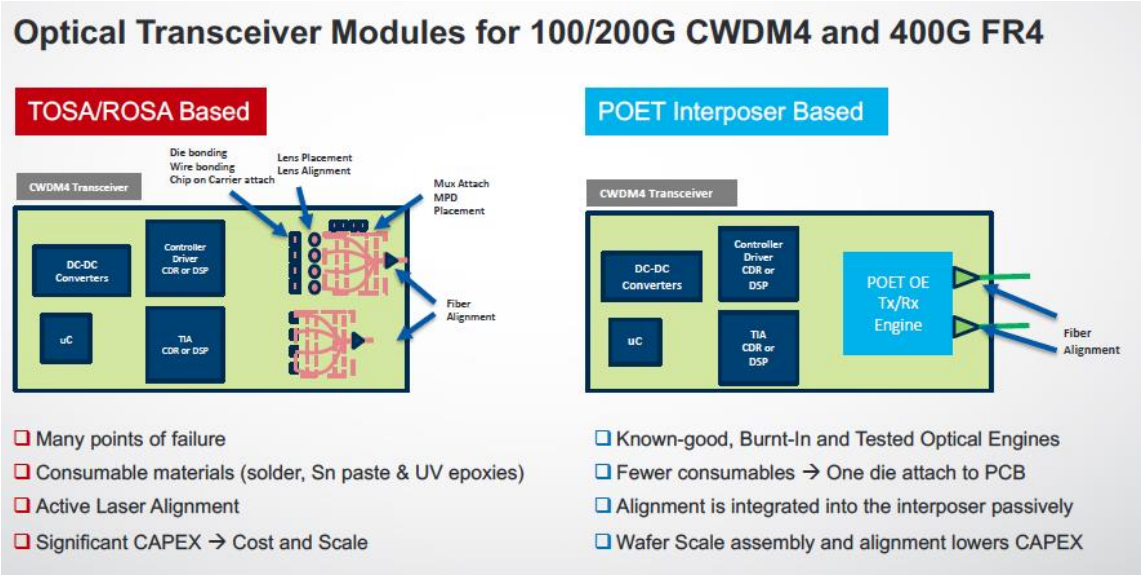
POET seeks to reinvent photonic integration by using a novel material, rather than pure silicon or indium phosphide, which has much more suitable properties for integrating devices such as lasers with other photonic or electronic devices. By using a material that is compatible with all other photonic material systems and a planar architecture, it is able to redesign devices to eliminate kludgy products that are large and inefficient, produced with lots of manual labor, and have a high scrap rate. POET has created a wafer-level solution using 8-inch CMOS that replaces the section shown below with a smaller, cheaper, and better integration platform. The current generation of devices requires different components to be assembled by people one at a time. Employees in a factory take an optical engine add electronics and a laser, align that laser to strict tolerances with expensive machines, test the results and then, throw out as much as the 30% of them that don't work. POET's solution is produced as a wafer-level optical engine. That optical engine can then be put into an optical transceiver. Since POET's design uses a material that is more translucent, less powerful lasers can be used, and tolerances are wider, so no one has to sit on a bench adjusting alignments. This speeds production and produces less scrapped product. Below is a picture of the current products used versus a POET product.

Figure 1. Current Silicon-based Optical Engine versus New POET Design



Source: POET Technologies

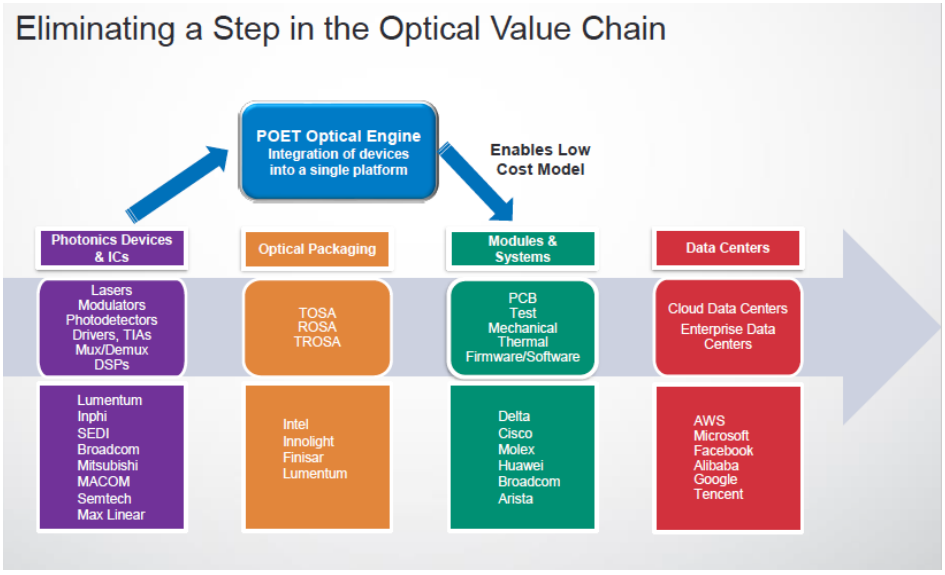
Figure 2. Schematic of Current TOSA/ROSA-based Technology versus New POET Design



Source: POET Technologies

With this new design, manufacturers such as Delta, Cisco, Molex, Huawei, Broadcom and Arista, shown in green below, can skip a step in optical packaging as shown in orange below resulting in cost reductions of as much as 30%. The product will also use less energy for the same output power. These results are particularly well suited for use with 400G for which cost and power usage are the main impediments to adoption.

Table 1. Components and Steps to the Production of an Optical Transceiver



Source: POET Technologies

POET Technologies' design improvements can be used for a wide variety of applications. It is initially targeting four of them:

Data Centers

Its first focus for the company has been on optical engines for 100G, 200G, 400G, and 800G transceivers. The company is pursuing this market with its joint venture assembly partner Sanan IC. The joint venture will

focus on the lower speeds as margins are being greatly squeezed in this market and demand already exists. The company has also been in talks with a tier-1 North American company for use in future 400G devices and we expect to hear more about progress on this relationship in the next few months.

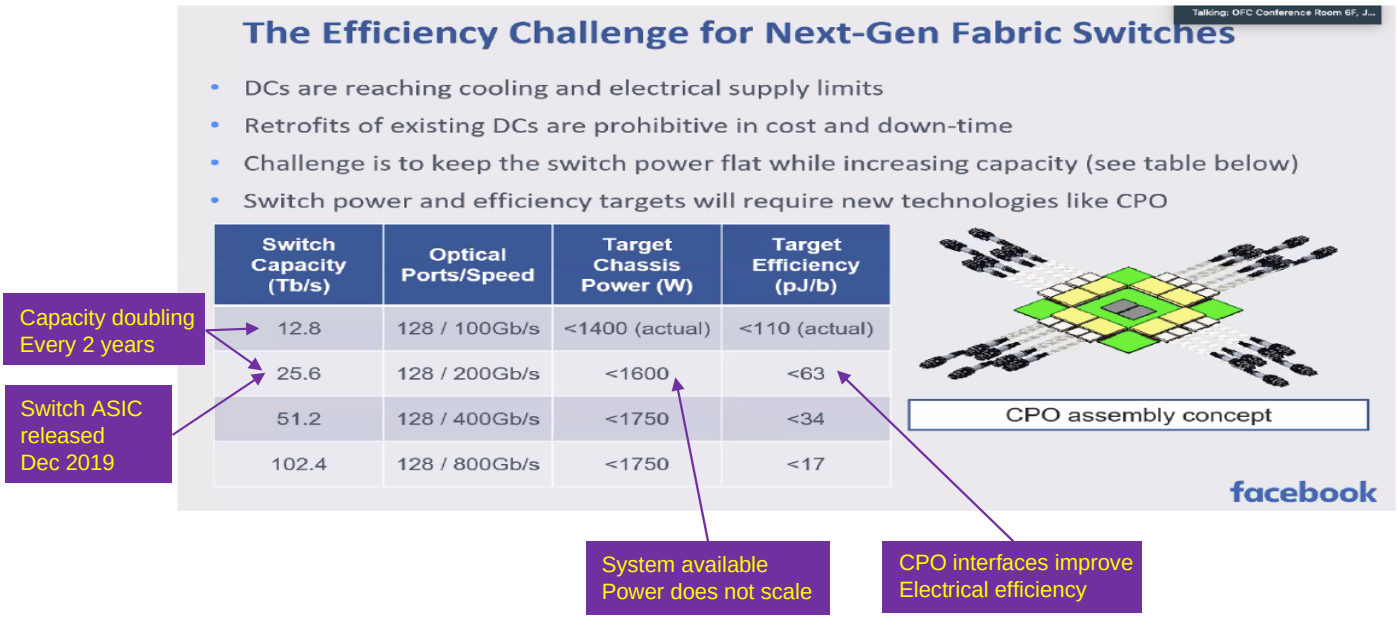
Observers had expected the industry to swiftly move to 400G for at least the past year but high costs and limited availability of certain electronic chips have stymied that transition. The few end users that are forging on are making due with 100G, 200G, 2 X 200G, or even 4 X 100G transceivers rather than pay a premium for the far more expensive current 400G transceivers available. Specifically, Amazon is said to be paying up for 400G, while Facebook has opted to use 100G and 200G for now. Microsoft has said that it refuses to implement 400G until it can use 400GZR to connect its regional data centers so possible not until next year. Widespread deployment has not occurred because data centers also need to figure out the power and cooling distribution to support it. Even with that figured out, costs still need to come down. A 400G transceiver module is still costs more than 7 times the cost of one 100G module for 2+ km reach. While users will pay up for 400G, it is believed prices still need to come down to 3X 100G before sales of 400G will take off, fitting in perfectly with the costs saving POET may be able to provide.

Another key application within the Data Center market that is being pursued by POET includes:

Co-Packaged Optics (CPO)

As switching capacity continues to double every couple of years, data centers are reaching their limits in terms of cooling and electrical capacity. In December 2019, Broadcom released its 25.6 Terabit per second switch ASIC which can support up to 64 400G ports. By 2021 that capacity should reach 51.2 Terabits per second or 128 400G optical ports. This creates a cooling, power, and faceplate density challenge. Companies such as Facebook and Microsoft have started initiatives for CPO solutions. The advantage of a CPO solution is the 75-90% power reduction that results from placing the transceiver module in close proximity to the network switch ASIC itself, eliminating all the printed circuitry between the ASIC chip and the back of the box where the transceiver would normally be located. In this, POET has several advantages, including its ability to accurately place multiple lasers and modulators on a single substrate, to pull out the heat from those devices, and eventually to package the ASIC directly with photonics in a standard, wafer-level CMOS compatible process.

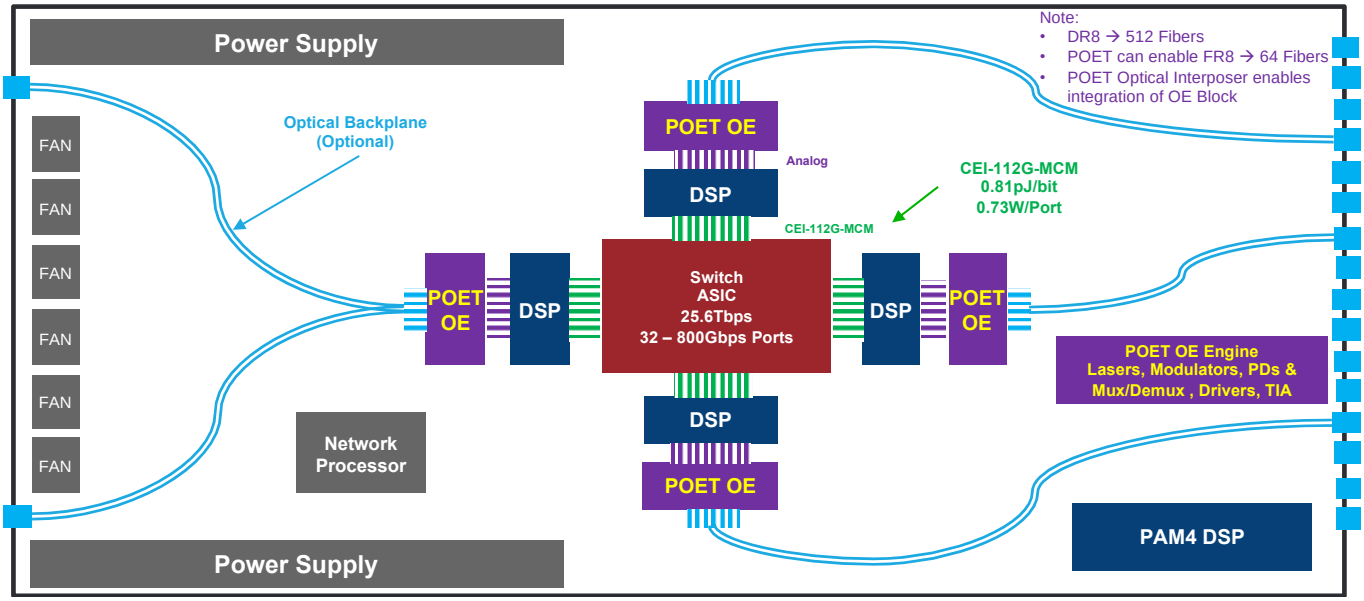
Figure 3: High-Speed Switching driving need for Co-Packaged Optics



Source: Facebook, 2019 OFC Rump Session, with notes by POET Technologies

Another advantage of a CPO solution from POET is the possibility of reducing fiber count and increasing overall throughput of the switch. Figure 4 below shows one possible CPO solution. In this case the purple OE box is the POET Optical Engine consisting of lasers attached and coupled. In addition to the photonic components, all the electronic devices other than the switch itself and the digital signal processor can be built right into the interposer at wafer-level, minimizing connection losses, and maximizing production efficiencies.

Figure 4: CPO configuration using POET Optical Interposers



Source: POET Technologies

Because multiplex and demultiplex capabilities are built into the waveguides in the optical interposer, more data can be carried on fewer fibers. In this example, by co-packaging the equivalent of 8 100G transceivers in a single Optical Engine, POET's solution would use only 64 total fibers coming in and out of the switch blade, compared to 512 fibers in designs now being considered.

Applications outside the Data Center

Applications outside the data center are also growing rapidly and include a variety of "Edge" devices, including among others, remote sensing, autonomous vehicles, augmented reality, and the Internet of Things (IoT). The common element to all these applications is the need for a hybrid, chip-scale packaging method to bring together the optical components and electronic components into a single low-power, high performance computing package.

High Performance Computing for Artificial Intelligence Applications

One such example that POET is working with a customer on is a complete system-in-package for optical computing, all built on an optical interposer. Taking advantage of a flexible platform for hybrid device integration, the optical interposer enables co-packaging of a variety of analog, digital, electronic, and photonics devices into a chip-level, self-contained computing accelerator. Its performance can match or exceed traditional processors from NVIDIA and others, but consumes a fraction of the power and can be manufactured for a fraction of the cost. By handling the mathematic computations required for Machine Learning (ML) and Deep Learning (DL) in the optical domain, rather than the digital electronic domain of a typical GPU, this technology is well suited for the low-power requirements of multiple Edge AI applications. POET's Optical Interposer is extendable to self-contained optical systems now being developed for Artificial Intelligence applications.

This self-contained system-in-package leverages all the advantages of the optical interposer - coupling different active devices such as lasers and photodetectors to waveguides, multiplexers, and custom silicon-based digital and analog processors. Other unique properties of the platform include the ability to remove heat from active devices and the high-speed copper and aluminum traces within the interposer, which provide the fastest available connections between all the devices within the system.

Telecommunications, including 5G networks

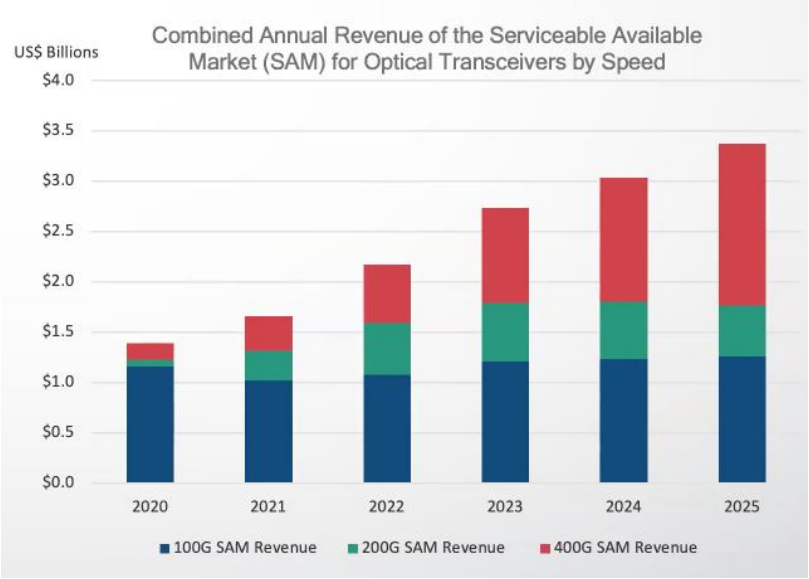
The joint venture will also be selling to the telecom market where 5G is beginning to be rolled out particularly in China where fiber infrastructure abounds. 5G has been delayed in the west as fiber-poor countries grapple with the challenge of using fiber efficiently. The US and Europe have struggled to get more performance out of less fiber. The company is working on a white box solution made with commoditized parts that could improve throughput with POET's unique multiplexing and demultiplexing capabilities.

INDUSTRY OUTLOOK

The Market for 100G, 200G, and 400G

The Sanan joint venture is specifically targeting the worldwide market for optical engines to be used both in data centers and telecom. The JV will have the exclusive rights to sell 100G and 200G worldwide as well as 400G in China. Below is a graph of what POET believes is the value of the market for optical engines. It is a subset of the market for optical transceivers, as the optical engine is only part of an optical transceiver. . POET's current Optical Engine does not include some of the electronic devices that are on a small circuit board within the transceiver module. However, as speeds increase, those could be included on interposer, taking advantage of the high-speed copper and aluminum traces contained in the layers of silicon within the interposer, rather than relying on bond pads and copper interconnects.

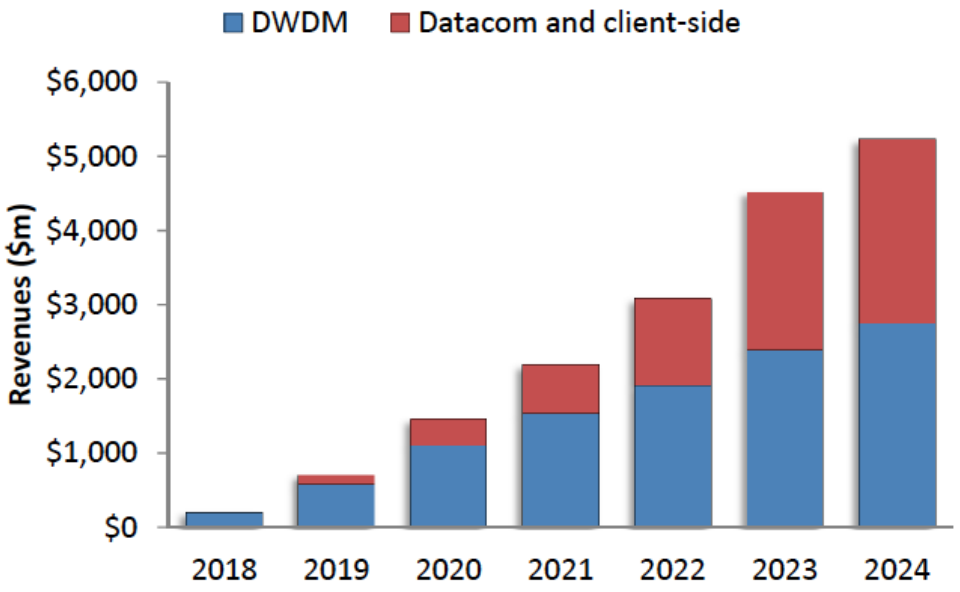
Graph 1. Joint Venture Serviceable Available Market



Source: POET Technologies

POET will have the right to sell optical engines designed and produced at the JV in all areas outside of China. If looking at the total worldwide market, 400G has the highest growth and according to Ovum that growth is predicted to be 70% per year over the next six years. Of that, telecom should show 54% growth while datacom grows 80%.

Graph 2. Worldwide Market for 400G



Source: Ovum (2020), with permission.

According to LightCounting, the global optical transceiver (of which an optical engine is a third) is expected to grow 24% in 2021 after muted growth in 2020. Backhaul will see the greatest growth almost doubling (up 92%) primarily due to 5G expansion in China.

Graph 4. Global Optical Transceiver Market

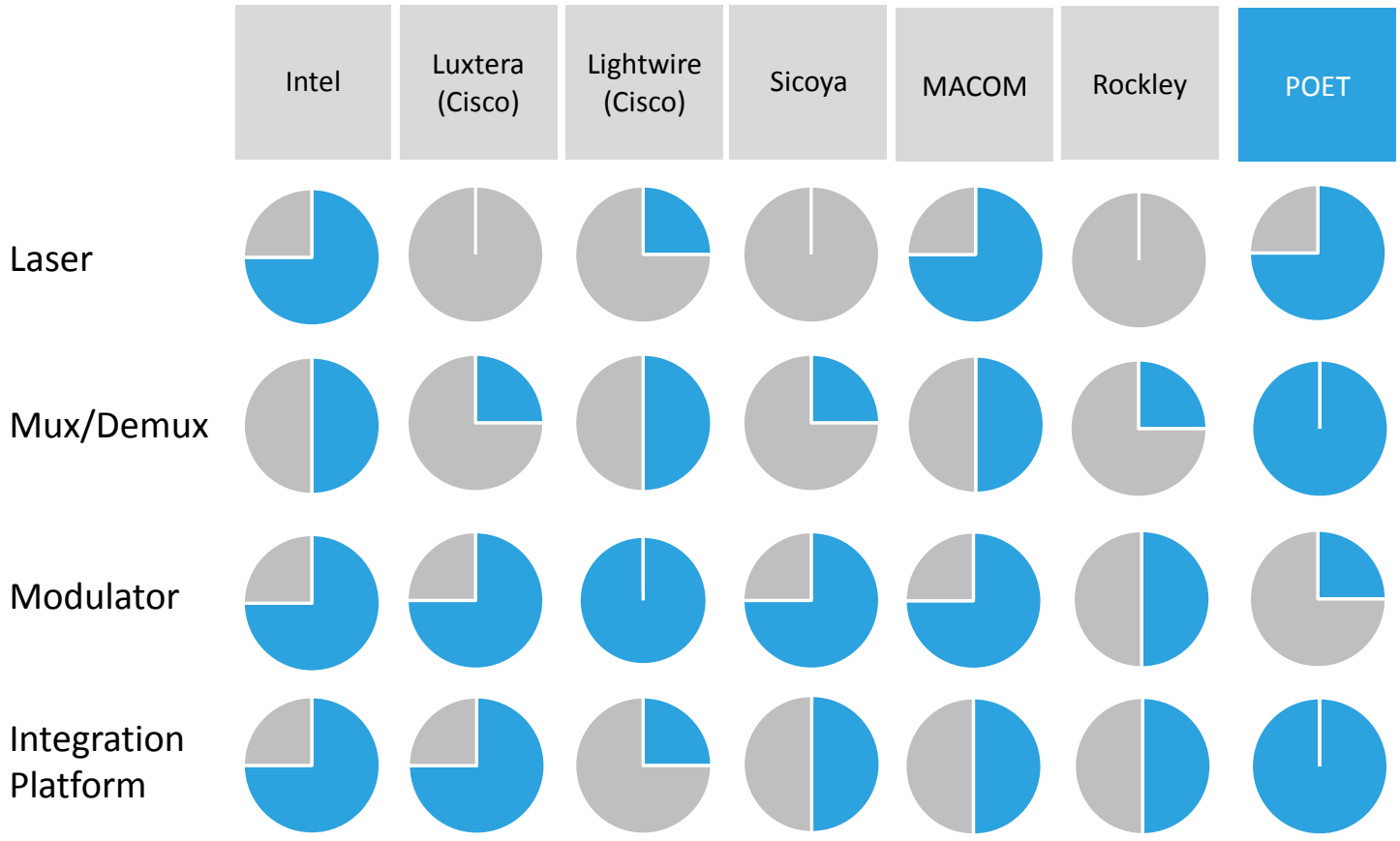


Source: LightCounting

COMPETITION

POET is developing a new way to make Optical Modules and Systems so its competitors (and in many cases potential customers) are all the companies that make these systems and components for these systems. Its solution is a substitute for certain packaged optical components (e.g. TOSA, ROSA and TROSA) and instead customers can buy an "optical engine." The optical packaging companies are Intel (NASDAQ: INTC), ZhongJi Innolight (300380.SZ), Finisar (NASDAQ: IIVI), and Lumentum (NASDAQ: LITE), as shown on the chart in orange. Other component manufacturers include Inphi (NYSE: IPHI), SEDI-ATI (private), Broadcom (NASDAQ: AVGO), Mitsubishi (MSBHY), MACOM (NASDAQ: MTSI), Semtech (NASDAQ: SMTC), and MaxLinear (NYSE: MXL). Any of these companies may choose to purchase an Optical Engine from POET as a substitute for the photonic internals from current suppliers. In this respect, POET's or the JV's market share would essentially be invisible to the outside world. Neither POET nor the JV expects to sell completed modules to systems integrators or end users.

Graph 5. POET's Competition Showing Strengths and Weaknesses



Size of blue area indicates relative strength

Source: POET Technologies

Competitors

Intel (NASDAQ:INTC) is the biggest player in this market but is heavily invested in silicon photonics because that is its wheelhouse. This technology is limited by its loss of light (requiring high powered lasers that use more energy) and its lack of tolerance for heat. Ultimately the properties of the materials used will stop it from reaching higher speeds in the future. The company's advantage is its fab facilities that make the economics of using 12-inch wafers somewhat feasible for them, but no one else, due to the extremely high cost to build a fab. The industry winner will be the company that can find a scalable solution using ubiquitous and cheap 8" facilities and even smaller sizes.

Cisco (NASDAQ:CSCO) is a $197 billion company located in San Jose, California and involved in almost every product and service in communications technology including networking, security, collaboration, applications, and the cloud and it operates worldwide.

Skorpios Technologies is a private company based in Albuquerque, New Mexico. It specializes in Silicon Photonics serving the aerospace & defense, bioelectronics and communications markets. It has had $67.9 million in funding and was founded in 2009. In 2017 it bought Novati Technologies, a fab based in Austin, Texas, which had $40 million in revenues and 101 employees in 2016. It has approximately 125 employees. Cisco, Ericsson, Deutsche Telecom and Semtech are all investors.

Sicoya was founded in 2015 and was a spin off from Technische Universität Berlin (TU Berlin) where it is based. To date it has raised €4.5 million. It is a fabless provider of silicon photonics semiconductor chips for telecom and datacom, specifically optical transceiver chips for power efficient and scalable datacenter solutions. It integrates photonics and electronics on a single chip producing significant cost savings as well as a reduction in power consumption and size. In March it signed a deal to build a silicon photonics packaging factory in China to serve the Chinese market. There it will make transceivers and engines for 5G wireless front haul, and 100G/400G Ethernet based datacenter applications, utilizing Sicoya chips.

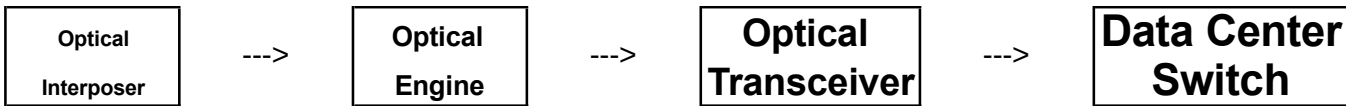
MACOM (NASDAQ: MTSI) is a 70-year-old company based in Lowell, MA. It has a $2.2 billion market cap and is expected to generate $509 million in revenues this year. It provides of high-performance analog semiconductor solutions for use with radio frequency (RF), microwave, millimeter wave, and photonic spectrums. It has multiple design centers, silicon, gallium arsenide and indium phosphide fabrication, manufacturing, assembly and test, and operational facilities worldwide. It also offers foundry services.

Rockley Photonics is POET's closest competitor in its approach to a solution. It is based in Pasadena, CA and was founded in 2013. It manufactures photonics chips and custom integrated packaged products. Although privately held, it filed information that in 2018 it reached almost $20 million in revenues, spent $45 million on R&D, and lost $38.4 million. It has had $92 million invested in four funding rounds, the latest being on March 12, 2020. In addition it has had capital contributed by its joint venture partner Hengtong Opto-Electric of Jiangsu, China adding another $93 million. It is currently rumored to have a valuation over $500 million. This joint venture is to make high performance optical transceiver modules and it is targeting the market for 400G optical transceivers in data centers. Rockley has a development partnership with the Tyndall National Institute in Cork, Ireland, and announced a year ago that it had already raised more than $100 million in aggregate funding to support its expansion.

Lightwave Logic (LWLG) was founded in 1991 and is based in Englewood, CO. It has raised $51.6 million in capital and has been a public company since 2006. It is a development stage company focused on applying organic polymers for use in electro-optical devices. It is also targeting 100G and 400G markets. It currently trades at a market cap of $62 million. It has product in alpha and beta testing with customers.

Glossary of Terms

In order to understand POET is important to understand the industry terminology and the supply chain. An optical interposer is a component of an optical engine, which is a component of an optical transceiver, which is a component that plugs into a data center switch.



Optical interposer – a unique platform that enables the combination of photonic and electronic devices within the same chip-level package. It features super-efficient transmission of light among multiple photonic devices via proprietary waveguides and high-speed communication with electronic devices either within or outside the package.

Optical Engine – the combination of an optical interposer and all the devices needed to emit light (lasers) and detect light (photodetectors). It is a completed assembly that can be incorporated as a component in multiple other devices, such as transceivers.

Optical transceiver - an optical engine plus all the required analog and digital electronics and the housing that attach to a data center switch, along with a means to attach optical fibers.

Data center switch – a high-speed chip and other electronics able to read and direct packet data flowing through the data center into an optical transceiver for delivery to its destination.

Multiplexer and Demultiplexer - multiplexer combines colors of light onto a single fiber and demultiplexer separates the colors of light. Each color can contain a different stream of data making a single fiber able to carry more data.

Fiber optics - the use of glass fiber instead of copper to transmit and receive signal, which can carry more data at a lower cost and with much lower energy usage.

Waveguide – a major part of the optical interposer through which light moves and can be guided to other devices or into and out of the optical fibers. Lowering the loss of light and power through a waveguide is key for efficient transmission and reception of light.

Laser - converts electronic signals to light signals for transmission over fiber.

TOSA/ROSA - TOSA packages lasers, lenses and fibers into a usable form to place in a transceiver or system. ROSA packages the photodetectors, lenses, and fibers into a usable form to place into a transceiver or system. The T is for transmit and the R is for receive.

Wafer-level – Performing the entire fabrication, assembly and testing process required for building hundreds or thousands of devices at the same time on a single 8” or 12” diameter wafer, rather than building each device one at a time.

FINANCIALS

Q1 2020

In its first full quarter without DenseLight, POET spent $3.3 million versus $1.8 million the year before. While sales, marketing and administration only increased $184,000 year over year, R&D expense rose $1.2 million as costs were reallocated to POET’s operation from DenseLight. As the company adds more staff to support development of new products and opens its Pennsylvania lab, we expect expenses to increase. In Q1 2020, the company paid $216,000 in interest expense, resulting in a net loss of $3.5 million for the quarter versus $2.7 million a year ago. This resulted in a loss per share of $0.01 per share, flat with last year. Shares outstanding increased 0.5% to 289.4 million.

2019

POET finally completed the sale of its Singapore DenseLight fab on November 9, 2020. It had been accounted for as a discontinued operation for all of 2019 and it was an 18+-month process to sell it and another six months to be fully paid. As a result, the company presented earnings and cash flows separating out its continuing operations and discontinued operations for the year and the quarters of 2019. Looking at the company using its current accounting it looks like the remaining business had booked no revenues to date and is in start up mode, when in reality it generated $2.5 million in revenues in 2019 from non-recurring engineering (NRE) fees paid by potential partners and customers to develop its products. The surviving business was not allowed to claim those revenues as part of continuing operations because they were invoiced and collected by DenseLight.

On a continuing operations basis POET reported no revenues and operating expenses of $11.7 million. Included in those expenses is a $1.7 million one-time impairment loss. Negative cash flow from continuing operations was $6.2 million and free cash flow was $6.7 million.

Balance Sheet

The new POET Technologies ended the March quarter with $12.3 million in cash and $2.7 million in convertible debentures. Working capital was then $13.3 million. The company received its final payment on July 3 and in a recent filing accepted $2.5 million less than the original agreed upon amount, and will recognize a write-off of receivables in Q3 2020. The company also reported that it had restructured its relationship with DenseLight in order to bring it more in line with its current supply needs. If the company burns $2.5 million per quarter, that should get it twelve months of runway even without any revenues, or almost July of next year. Any revenue from NREs will get it even further.

POET is also expecting that the outstanding warrants and options that are already in the money to add $31.8 million in cash. As of today, there are 57.0 million warrants outstanding and 44.4 million are already in the money. Warrants already in the money could raise $17.1 million dollars. There are also 52.8 million options outstanding of which, 50.0 million are in the money and could raise $14.6 million. So that is a total of $31.8 million. Recently POET extended the expiration date of 12,545,350 warrants granted to investors in connection with its March 2018 public offering to September 30, 2020. They are exercisable at C$0.75 per share. The expiration date of these warrants was previously extended from March 23, 2020 to July 23, 2020. All other terms and conditions remain unchanged.

Warrant and Option Stack
as of July 17, 2020

Expiration	Type	Holder	Ave. Strike Price		Number	Value	
			CAD	USD		CAD	USD
2021	Options	Employee	$ 0.58	$ 0.44	175,000	$ 101,500	$ 76,125
2022	Options	Employee	$ 0.23	$ 0.17	75,000	$ 17,250	$ 12,938
2024	Options	Employee	$ 0.32	$ 0.24	300,000	$ 96,000	$ 72,000
2026	Options	Employee	$ 0.77	$ 0.58	2,621,875	$ 2,018,844	$ 1,514,133
2027	Options	Employee	$ 0.32	$ 0.24	11,575,625	$ 3,704,200	$ 2,778,150
2028	Options	Employee	$ 0.44	$ 0.33	11,668,709	$ 5,134,232	$ 3,850,674
2029	Options	Employee	$ 0.36	$ 0.27	17,154,420	$ 6,175,591	$ 4,631,693
2030	Options	Employee	$ 0.47	$ 0.35	9,250,326	$ 4,347,653	$ 3,260,740
2021	Warrants	Debenture	$ 0.50	$ 0.38	12,470,732	$ 6,235,366	$ 4,676,525
11/2/21	Warrants	Public Offering	$ 0.52	$ 0.39	31,969,500	$ 16,624,140	$ 12,468,105
7/20/20	Warants	Public Offering	$ 0.75	$ 0.56	12,545,350	$ 9,409,013	$ 7,056,759
					109,806,537	$ 53,863,789	**$ 40,397,841**

Type	Holder	Number	Value	
			CAD	USD
Total options		52,820,955	21,595,270	16,196,453
In the money options		50,024,080	19,474,926	14,606,195
Total warrants		56,985,582	32,268,519	24,201,389
In the money warrants		44,440,232	22,859,506	17,144,630
Total in the money		94,464,312	42,334,432	31,750,824
Total options and warrants		109,806,537	53,863,789	40,397,841

Using the treasury stock method, POET has 325.2 million fully diluted shares outstanding. Since POET already qualifies (other than stock price) to uplist to NASDAQ, we believe it may uplist and reverse split sometime in the future when it has hit more milestones and certainly should it need to raise any capital. We do not believe this would happen in 2020 or any time before products are ready to go into large-scale production.

2020

POET expects that it will book approximately a million NRE revenues in 2020. We do not expect any revenues in Q1 or Q2, but they could restart in Q3 and grow sequentially. It is uncertain how these revenues will be accounted for with the two choices being milestone payments or flat monthly fees over the contract duration. These contracts should be from six to twelve months in length each, but until they are signed there is no way to know. Investors should be informed on some details when these deals are booked seeing how any revenues for a company starting with no revenues would be material, but by contrast to the US, Canadian rules state it must reveal any information that could move the stock, which makes disclosure an art, not a science. We do not expect any revenues from product sales this year, nor until possible the later part of 2021. Until we see any announcements of NRE contracts, we are conservatively looking for $550,000 in sales this year and a loss of $14 million or $0.05 per share. This is compared to no revenues and a loss of $6.2 million from continuing operations or $0.04 per share.

2021

In 2021 we expect several million dollars in NREs and the start of production revenues near the tail end of the year. We are starting with what could be a conservative estimate of $5 million, which could increase as we see contracts announced and progress on production. We are looking for a loss of approximately $15 million or $0.06 per share.

VALUATION

POET's business model would make it similar to fabless semiconductor companies. Third parties would provide the production of its devices and we expect it would have margins similar to those companies below. They trade at an average of 7.8xs enterprise value to estimated 2021 revenues. Currently POET trades at an enterprise value of $130 million using a fully diluted share count. We need to look further out to where we think revenues would be by 2025. If we say the joint venture is able to reach $200 million in revenues by then and the rest of the business can ramp to $100 million that would be $200 million in revenues for POET in 2025. Using 7.8xs gives us a valuation of $1.56 billion or $4.70 per share US or CN$6.38 per share by 2024 using today's fully diluted share count.

Fabless Semiconductors

		Cal. Revenue				Enterprise Value / Sales			EV/EBITDA	
Company	Ticker	2021E	2020E	LTM	EBITDA	2021E	2020E	LTM		Ent. Value
AMD	AMD	$10,220	$8,410	$7,250	1,010	6.4x	7.8x	9.0x	64.8x	65,400
Broadcom	AVGO	NA	$23,800	$22,890	10,110	NA	6.6x	6.8x	15.5x	156,300
Cirrus Logic	CRUS	NA	$1,179	$1,240	238	NA	3.0x	2.9x	14.9x	3,560
Dialog	DLG.DE	$1,320	$1,450	$1,520	424	1.6x	1.4x	1.4x	4.9x	2,090
Inphi	IPHI	$714	$608	$423	54	5.6x	6.5x	9.4x	73.5x	3,970
Lightwave Logic	LWLG	NA	NA	$0	(6)	NA	NA	NM	-11.5x	67
Marvell	MRVL	$3,480	$3,000	$2,730	407	7.5x	8.6x	9.5x	63.7x	25,930
MediaTek	2454.TW	NA	NA	$254,360	32,960	NA	NA	3.6x	27.7x	912,490
Monolithic Power Sys	MPWR	$818	$696	$652	127	12.7x	15.0x	16.0x	82.4x	10,430
Novatek	3034.TW	NA	NA	$66,320	10,880	NA	NA	2.2x	13.1x	142,660
NVIDIA	NVDA	$17,200	$14,640	$11,780	3,860	14.1x	16.6x	20.6x	62.8x	242,540
Qualcomm	QCOM	NA	$22,400	$24,740	9,690.0	NA	4.9x	4.4x	11.3x	109,650
Realtek	2379.TW	NA	NA	$63,840	7,700.0	NA	NA	2.4x	20.1x	155,000
Xilinx	XLNX	NA	$2,951	$3,160	982.0	6.4x	6.4x	6.0x	19.3x	18,990
Average						**7.8x**	**7.7x**	**7.2x**	**38.5x**	**154,090**

RISKS

- POET is using a startup and has no customers. It may not be able to close customers if its technology does not work or work within needed parameters. It has no revenues and was it to use up its current cash without generating revenues and reaching cash breakeven, to would need to raise new capital from investors, which could dilute current shareholders.
- Many potential customers may be hesitant to so business with a small, money losing start up, making market penetration even more difficult.
- Many of the employees work in states that have shut down businesses and travel and have had to work from home. They have been unable to go to its lab to continue to research and much of marketing efforts have been hindered by the inability to travel. It is not known when California, Pennsylvania, or New Jersey will lift their restrictions.
- The joint venture agreement is far from finalized and may not materialize or take longer to complete and ramp than shareholders expect.

PATENTS

POET Technologies has the rights to, or owns 70 granted patents and another 11 pending and three provisional in process, almost entirely in the US. The earlier ones are from The University of Connecticut and mostly pertain to VCSELs in gallium arsenide, a technology the company is no longer pursuing. The company may look for an opportunity to sell these particular patents. Two patents are from work by BB Photonics and the latest ones are assigned to POET Technologies. The primary patents related to its platform are shown in the following table.

US10551561B2 Filing Date: 7/16/2018	**Optical Dielectric Waveguide Structures** An optical subassembly includes a planar dielectric waveguide structure that is deposited at temperatures below 400 C. The waveguide provides low film stress and low optical signal loss. Optical and electrical devices mounted onto the subassembly are aligned to planar optical waveguides using alignment marks and stops. Optical signals are delivered to the submount assembly via optical fibers. The dielectric stack structure used to fabricate the waveguide provides cavity walls that produce a cavity, within which optical, optoelectronic, and electronic devices can be mounted. The dielectric stack is deposited on an interconnect layer on a substrate, and the intermetal dielectric can contain thermally conductive dielectric layers to provide pathways for heat dissipation from heat generating optoelectronic devices such as lasers.
US20190227234A1 Filing Date: 7/16/2018 Pending	**Methods for Optical Dielectric Waveguide Structures**
US20190243078A1 Filed: 7/16/2018	**Optical Dielectric Waveguide Subassembly Structures**
US20190227232A1 Filed: 7/16/2018 Pending	**Methods for Optical Dielectric Waveguide Subassembly Structures**
US20190271810A1 Filed: 1/25/2019 Pending	**Optical Dielectric Planar Waveguide Process** A method for depositing silicon oxynitride film structures is provided that is used to form planar waveguides. These film structures are deposited on substrates and the combination of the substrate and the planar waveguide is used in the formation of optical interposers and subassemblies. The silicon oxynitride film structures are deposited using low thermal budget processes and hydrogen-free oxygen and hydrogen-free nitrogen precursors to produce planar waveguides that exhibit low losses for optical signals transmitted through the waveguide of 1 dB/cm or less. The silicon oxynitride film structures and substrate exhibit low stress levels of less than 20 MPa.

OWNERSHIP

POET Technologies has no institutional holdings or ownership by management and directors of its common shares. It has no owners with more than five percent of the stock and we believe the largest shareholder has about 2% and is based in Canada. 100% of the stock is in the float and is held by retail investors with the grand majority in Canada.

MANAGEMENT

Suresh Venkatesan
Chairman and CEO

Suresh joined POET Technologies from GLOBALFOUNDRIES in 2015 where he was the SVP of Technology Development and was responsible for R&D. Suresh joined GLOBALFOUNDRIES in 2009 and led the development and ramp of the 28nm node and was instrumental in the technology transfer and qualification of 14nm. In addition, he was responsible for the qualification and ramp up of multiple mainstream value added technology nodes. Suresh is an industry veteran with over 22 years of experience in semiconductor

technology development. Prior to joining GLOBALFOUNDRIES, he held various leadership positions with Freescale Semiconductor in Austin. Dr. Venkatesan holds over 25 US patents, and has co-authored over 50 technical papers. He holds a Bachelor of Technology degree in Electrical Engineering from the Indian Institute of Technology, and MS and PhD degrees in Electrical Engineering from Purdue University.

Vivek Rajgarhia
President & General Manager

Prior to Joining POET in late 2019, Vivek was SVP & General Manager of the Lightwave Business Unit of MACOM (NASDAQ: MTSI). Vivek joined MACOM through the acquisition of Optomai Inc., where he was the Co-Founder and CEO, to start MACOM's first optical business. He was then instrumental in identifying and leading several strategic acquisitions to build an extensive portfolio of optical and photonic businesses, which formed MACOM's Lightwave Business Unit. Vivek has held several senior management positions during his 30 years in the optical communications industry. He was Director of Sales & Marketing (Asia) for Lucent Technologies; VP of Product Marketing and Business Development for OpNext (formerly Hitachi's Fiber Optics Division); Director of Product Management & Marketing for JDS Uniphase, and VP of Global Sales for GigOptix. Vivek has been a successful entrepreneur, founding two optical companies, and has held international assignments in Hong Kong, Germany and India. He earned a Bachelor of Engineering (Electrical) degree from Stevens Institute of Technology.

Thomas Mika
Executive Vice President and Chief Financial Officer

Tom joined POET in November 2016. He previously served as the Chairman of the Board of Rennova Health, the successor company to CollabRx, and its predecessor, Tegal Corporation, a semiconductor capital equipment company. He was on the Board of Directors of Tegal from when it spun-out from Motorola in 1989, and assumed the roles of CFO in 2002, CEO in 2005, and Chairman & CEO in 2006, positions that he held until 2015. In 2015, Tegal merged with Rennova Health with Tom retaining the position of Chairman. Previously, he co-founded IMTEC, a boutique investment and consulting firm, serving clients in the U.S., Europe and Japan over a period of 20 years, taking on the role of CEO in several ventures. Earlier in his career, Tom was a managing consultant with Cresap, McCormick & Paget, and a policy analyst for the National Science Foundation. He holds a BS in Microbiology from the University of Illinois at Urbana-Champaign and a MBA from the Harvard Graduate School of Business.

Edward Cornejo
Vice President of Product Marketing & Business Development

Ed was most recently the Senior Director of Service Provider Solutions at MACOM Technologies where he worked with end customers to design, develop and manufacture optical solutions for data center applications utilizing internal device, component and integration capabilities. Prior to that, he served in various individual contributor and senior management roles at Google Fiber, Opnext (now Lumentum), Lucent Technologies, and Lytel (later became Tyco). Ed has 30+ years of experience in optoelectronics integrated designs and bringing those designs to mass production. He earned a Bachelor of Engineering in electrical engineering and Master's degree in Management from the New Jersey Institute of Technology.

Dan Meerovich
Vice President – Product Engineering

Dan has 30+ years of experience in developing and manufacturing innovative photonics products at MACOM, Apogee (now Broadcom), Oclaro, Multiplex (now Hisense), and JDS Uniphase. As the Director of Product Engineering for MACOM's Lightwave Business Unit, he led the test, product and process engineering for

lasers, photodetectors, AWG waveguides, optical engines and silicon photonic PICs. Dan developed the low-cost and scalable process of laser integration onto silicon photonic integrated circuits. Dan has set up wafer fabrication facilities, run manufacturing operations at Multiplex and Xtellus (acquired by Oclaro) and built and managed a China-based manufacturing subsidiary acquired by Hisense. In addition, he set up and managed contract manufacturers to scale production of both high performance and low-cost optical modules. Earlier in his career, Dan led the development of photonic engines incorporating high-speed lasers and EMLs, including the first uncooled EML module in a low cost TO platform. The company, Apogee, was later acquired by Cyoptics, which was then acquired by Broadcom. Dan holds BSEE and MBA degrees from Rutgers University.

BOARD OF DIRECTORS

Suresh Venkatesan
Chairman & Chief Executive Officer, POET Technologies

Peter Charbonneau
Partner, Skypoint Capital Corp.

Peter was a general partner at Skypoint Capital Corporation for almost 15 years, where he was jointly responsible for the placement of $100 million of capital in early-stage telecommunications and data communication companies. Charbonneau currently serves on the board of directors of Teradici Corporation, a collaboration solutions Company and the creator of PCoIP protocol technology and Cloud Access Software. He recently served on the Board of Mitel Networks Corporation, a leading global provider of cloud and on-site business communications until November 2018 when it was sold to a private equity firm. He served as Lead Director, Chair of the Nominating and Governance Committee, and Chair of the Audit Committee. He previously served as Chairman of the Board of Trustees for the CBC Pension Board and a director on the board of the Canadian Broadcasting Corporation as well as many technology and networking companies, including March Networks Corporation, TELUS Corporation, Breconridge Corporation and Dragonwave Incorporated.

David E. Lazovsky
Founder & CEO, Inorganic Intelligence

David Lazovsky is the founder and CEO of Inorganic Intelligence, Inc., an optical neural network systems company. Previously, he was a Venture Partner at Khosla Ventures. Prior to Khosla, he was the founder of Intermolecular, Inc. (NASDAQ: IMI), serving as the company's President and Chief Executive Officer and as a member of the Board of Directors from September 2004 to October 2014. Mr. Lazovsky has an in-depth knowledge of the semiconductor industry, technology, and markets. Prior to founding Intermolecular, Mr. Lazovsky held several senior management positions at Applied Materials Inc. (NASDAQ: AMAT). From 1996 through July 2004, he held management positions in the Metal Deposition and Thin Films Product Business Group where he was responsible for managing more than $1 billion in Applied Materials' semiconductor manufacturing equipment business. Mr. Lazovsky served as Executive Chairman of the Board of POET from 2016 to 2019. Mr. Lazovsky holds a B.S. in mechanical engineering from Ohio University and, as of March 31, 2014, held 41 pending or issued U.S. patents.

Don Listwin
CEO RapidAI, Inc.

Don is currently President & CEO RapidAI Inc., a diagnostic and decision support system for physicians treating stroke patients. He has over 30 years of technology investing and management experience, highlighted by a decade at Cisco Systems, where he served as its executive vice president. During his tenure at Cisco, he built several multi-billion-dollar lines of business, including the company's Service Provider line of business that underpins much of today's global Internet infrastructure. More recently, Don served as chief executive officer of both Sana Security and Openwave Systems. In addition, he founded and holds the role of, CEO of the Canary Foundation, a non-profit research organization focused on the early detection of cancer. Don also serves as a director on the boards of AwareX, Calix, Robin Systems, and Teradici. Previously, he also served on the boards or was an advisor to JDS Uniphase, PLUMgrid, Redback Networks, E-TEK Dynamics, the Cellular Telecommunications & Internet Association (CTIA), and the Business Development Bank of Canada (BDC).

Jean-Louis Malinge
Partner, ARCH Venture Partners

Jean-Louis serves as partner with ARCH Venture Partners, an early-stage venture capital firm with nearly $2 billion under management. Additionally, he serves a managing director for YADAIS, a leading consulting firm in the photonics and telecommunications industries, and is a board member of Aeponyx, EGIDE SA, and CAILabs. EGIDE SA is a public French company which designs, manufactures, and sells hermetic packages for the protection and interconnection of several types of electronic and photonic chips. CAIlabs is a venture-backed French innovative start-up founded in 2013, which has developed a unique spatial multiplexing platform. Aeponyx is a venture-backed Canadian start-up, which has developed a platform combining Silicon Nitride waveguides with planar MEMS for photonics components. From 2004 to 2013 Jean-Louis was President and CEO of Kotura, a Silicon Photonics pioneer that was acquired in 2013 by Mellanox Technologies. Prior to Kotura, he was an executive with Corning Inc for 15 years. He holds an Executive M.B.A. from MIT Sloan School in Boston, Massachusetts, and an engineering degree from the Institut National des Sciences Appliquées in Rennes, France.

Chris Tsiofas

Chris Tsiofas, CA, CPA, earned a Bachelor's of Commerce Degree from the University of Toronto and is a member of the Chartered Professional Accountants of Canada and the Canadian Tax Foundation. He has been on the Board of Directors since August of 2012. He is the president of MTN Chartered Professional Accountant Professional Corporation, a public accountancy firm.

Mohandas Warrior
Angel Investor

Mohan has been an Angel Investor for early stage technology companies since Jan 2017 and serves as an Adviser to many of them. He was President and CEO of Alfalight Inc. from February 2004 to September 2016. Alfalight is a GaAs based high power diode laser manufacturing company with headquarters in Madison, Wisconsin serving military, telecom, and industrial customers. Mohandas established Alfalight as a leading provider of high-powered laser diode solutions in both commercial and defense segments. Alfalight was sold to Gooch and Housego in 2016. Prior to joining Alfalight, his career included 15 years at Motorola Semiconductors (now Freescale) where he led the test and assembly operations, a group of 3,500 employees, in the US, Scotland and Korea. Mohandas earned his Bachelor's degree in Chemical Engineering from Indian Institute of Technology, Delhi, an MS in Chemical Engineering from Syracuse University, New York, and an MBA from the Kellogg School of Management at Northwestern University.

INCOME STATEMENT

	Q1 19	Q2 19	Q3 19	Q4 19	Q1 20	Q2 20E	Q3 20E	Q4 20E	Restated 2018	2019	2020E	2021E
Revenue	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 50,000**	**$ 500,000**	**$ 0**	**$ 0**	**$ 550,000**	**$ 5,000,000**
Cost of revenue	0	0	0	0	0	0	0	0	0	0	0	0
Gross margin	0	0	0	0	0	0	50,000	500,000	0	0	550,000	5,000,000
Gross margin %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Operating expenses												
Selling, marketing and administration	1,524,873	1,484,440	1,738,310	1,949,764	1,708,872	1,740,000	1,740,000	1,740,000	6,173,875	6,697,387	6,928,872	10,000,000
Research and development	302,254	497,023	450,297	834,241	1,543,571	1,610,000	1,610,000	1,610,000	2,262,476	2,083,815	6,373,571	4,500,000
Other income, including interest	0	(1,579)	(40)	(8,921)	(1,362)	(37,069)	(30,000)	(23,000)	(14,234)	(10,540)	(91,431)	(27,000)
Operating expenses	1,823,883	2,279,325	2,633,883	4,990,281	3,251,081	3,312,931	3,320,000	3,327,000	8,422,117	11,727,372	13,211,012	14,473,000
Operating income	(1,823,883)	(2,279,325)	(2,633,883)	(4,990,281)	(3,251,081)	(3,312,931)	(3,270,000)	(2,827,000)	(8,422,117)	(11,727,372)	(12,661,012)	(9,473,000)
Interest expense	0	0	0	0	216,684	200,000	180,000	160,000	0	0	756,684	400,000
Loss from continuing operations	(1,823,883)	(2,279,325)	(2,633,883)	(4,990,281)	(3,467,765)	(3,312,931)	(3,320,000)	(3,327,000)	(8,422,117)	(11,727,372)	(13,967,696)	(14,873,000)
Loss from discontinued operations	(858,659)	(1,500,553)	(310,332)	8,151,301	0	0	0	0	(7,900,662)	5,481,757	0	0
Pretax loss from operations	**(2,682,542)**	**(3,779,878)**	**(2,944,215)**	**3,161,020**	**(3,467,765)**	**(3,312,931)**	**(3,320,000)**	**(3,327,000)**	**(16,322,779)**	**(6,245,615)**	**(13,967,696)**	**(14,873,000)**
Income tax recovery	0	0	0	(292,740)	0	0	0	0	(297,940)	(292,740)	0	0
Profit before joint venture	(2,682,542)	(3,779,878)	(2,944,215)	3,161,020	(3,467,765)	(3,312,931)	(3,320,000)	(3,327,000)	(16,322,779)	(6,245,615)	(13,967,696)	(14,873,000)
Income from joint venture	0	0	0	0	0	0	0	(100,000)	0	0	(100,000)	(1,500,000)
Net loss	(2,682,542)	(3,779,878)	(2,944,215)	3,161,020	(3,467,765)	(3,312,931)	(3,320,000)	(3,427,000)	(16,322,779)	(6,245,615)	(14,067,696)	(16,373,000)
Basic and diluted net loss per share	$ (0.01)	$ (0.01)	$ (0.01)	$ 0.01	$ (0.01)	$ (0.01)	$ (0.01)	$ (0.01)	$ (0.06)	$ (0.02)	$ (0.05)	$ (0.06)
Loss per share from cont. operations	$ (0.01)	$ (0.01)	$ (0.01)	$ (0.02)	$ (0.01)	$ (0.01)	$ (0.01)	$ (0.01)	$ (0.03)	$ (0.04)	$ (0.05)	$ (0.06)
Yr-to-yr growth					89.3%	44.3%	25.3%	-33.7%	NM	36.3%	19.2%	16.4%
Share outstanding (millions)	288.1	288.1	288.3	288.3	289.4	290.1	290.1	290.1	282.1	288.2	289.9	290.0
Yr-to-yr growth					0.5%	0.7%	0.6%	0.6%		2.2%	0.6%	0.0%

BALANCE SHEET

	Mar. 31, 2020	Dec. 31, 2019	Qtr-Qtr % Growth	Mar. 31, 2019	Yr-Yr % Growth
Current					
Cash and cash equivalents	**$ 12,327,555**	**$ 1,428,129**	763%	**$ 955,250**	1191%
Accounts receivable	5,000,000	18,000,000	-72%	0	NM
Prepaids and other current assets	228,433	831,265	-73%	150,404	52%
Inventory	0	0	0%	0	0%
Non-current assets held for sale	0	0	0%	20,901,110	-100%
Current Assets	17,555,988	20,259,394	-13%	22,006,764	-20%
Property and equipment	3,027,727	3,143,060	-4%	142,543	2024%
Patents and licenses	435,335	452,384	-4%	433,545	0%
Right of use asset	187,763	222,517	-16%	0	NM
Intangible assets	0	0	0%	714,000	-100%
Goodwill	0	0	0%	1,050,459	-100%
Total Assets	21,206,813	24,077,355	-12%	24,347,311	-13%
Liabilities					
Accounts payable and accrued liabilities	1,439,060	1,725,708	-17%	630,196	128%
Lease liability	87,245	90,504	-4%	0	NM
Convertible debentures	**2,728,846**	**3,089,033**	-12%	**0**	NM
Disposal group liabilities	0	0	0%	4,086,905	-100%
Current Liabilities	4,255,151	4,905,245	-13%	4,717,101	-10%
Lease liability	103,450	133,254	-22%	292,740	-65%
	4,358,601	5,038,499	-13%	5,009,841	-13%
Shareholders' Equity					
Share capital	112,649,918	112,144,172	0%	112,028,194	1%
Equity component of loan payable	576,223	627,511	-8%	0	NM
Warrants & comp options	8,167,622	8,525,358	-4%	8,303,738	-2%
Contributed surplus	39,878,032	38,799,337	3%	36,875,187	8%
Accumulated other comprehensive loss	(1,807,011)	(1,908,715)	-5%	(1,991,175)	-9%
Deficit	(142,616,572)	(139,148,807)	2%	(135,878,474)	5%
Shareholder's Equity	16,848,212	19,038,856	-12%	19,337,470	-13%
Tot Liabilities and Share. Equity	$ 21,206,813	$ 24,077,355	-12%	$ 24,347,311	-13%
Cash	$ 12,327,555	$ 1,428,129	763%	$ 955,250	1191%
Cash per share	0.04	0.00	760%	0.00	1185%
Current ratio	4.1	4.1	0%	4.7	-12%
Working capital	13,300,837	15,354,149	-13%	17,289,663	-23%
Debt	2,728,846	3,089,033	-12%	0	NM
Debt/total assets	12.9%	12.8%	0%	0.0%	NM

CASH FLOWS

US Dollars	Mar. 31, 2019	Jun. 30, 2019	Sep. 30, 2019	Dec. 31, 2019	2019	Mar. 31, 2020
OPERATING ACTIVITIES						
Net loss	$ (2,682,542)	$ (3,779,878)	$ (2,944,215)	$ 3,453,760	$ (5,952,875)	$ (3,467,765)
Discontinued operations, net	858,659	1,500,553	310,332	(8,151,301)	(5,481,757)	0
Net loss, continuing operations	(1,823,883)	(2,279,325)	(2,633,883)	(4,697,541)	(11,434,632)	(3,467,765)
Adjustments for:						
Depreciation of property and equipment	33,513	19,358	18,309	95,162	166,342	134,088
Amortization of patents and licenses	14,705	15,438	23,439	8,089	61,671	17,049
Amortization of debt issuance costs	0	101,901	124,522	145,917	372,340	0
Amortization of right of use assets	0	0	0	15,683	15,683	23,180
Accretion of debt discount on converts & int.	0	0	0	0	0	108,831
Amortization of debt discount	0	62,483	109,977	108,369	280,829	0
Impairment loss	0	0	0	1,764,459	1,764,459	0
Stock-based compensation	722,327	684,861	837,638	643,315	2,888,141	776,783
Income tax recovery	0	0	0	(292,740)	(292,740)	0
Net change in non-cash working capital accounts:						
Prepaid and other current assets	28,730	23,881	6,273	(744,551)	(685,667)	586,983
Accounts payable and accrued liabilities	108,814	192,972	559,544	(440,873)	420,457	(194,610)
Cash flows from continuing operating activities	(915,794)	(1,178,431)	(954,181)	(3,394,711)	(6,443,117)	(2,015,461)
Cash flows from discontinued operating activities	(553,920)	(1,721,069)	(387,340)	(288,775)	(2,951,104)	0
INVESTING ACTIVITIES						
Receivable form sale of discont. operations	0	0	0	0	0	13,000,000
Purchase of property and equipment	0	0	0	(445,678)	(445,678)	(188,082)
Purchase of patents and licenses	0	(40,035)	(7,899)	(17,872)	(65,806)	0
Cash flows from investing activities, continuing	0	(40,035)	(7,899)	(463,550)	(511,484)	12,811,918
Cash flows from investing activities, discontinued	(153,192)	(1,280,085)	(225,160)	7,567,060	5,908,623	0
FINANCING ACTIVITIES						
Proceed from convertible debentures, net	0	2,979,779	376,639	(3,569)	3,352,849	0
Proceeds from loan payable, net	0	2,462,923	990,000	547,077	4,000,000	0
Repayment of loan payable	0	0	0	(4,000,000)	(4,000,000)	0
Issue of common shares for cash, net	0	0	60,028	0	60,028	0
Exercise of warrants and options	0	0	0	0	0	162,258
Payment of lease liability	0	0	0	(19,162)	(19,162)	(28,325)
Cash flows from financing, continuing activities	0	5,442,702	1,426,667	(3,475,654)	3,393,715	133,933
Cash flows from financing, discontinued activities	(46,439)	(98,568)	(83,046)	(30,407)	(258,460)	0
EFFECT OF EXCHANGE RATE CHANGES ON CASH, Continuing	56,076	8,406	(182,919)	(145,465)	(263,902)	(30,964)
EFFECT OF EXCHANGE RATE CHANGES ON CASH, Discontinued	651	535	(27,608)	12,412	(14,010)	0
NET CHANGE IN CASH, Continuing	(859,718)	4,232,642	281,668	(7,479,380)	(3,824,788)	10,899,426
NET CHANGE IN CASH, Discontinued	(752,900)	(3,099,187)	(675,220)	7,212,356	2,685,049	0
CASH AND CASH EQUIVALENTS, beginning	2,567,868	955,250	2,088,705	1,695,153	2,567,868	1,428,129
CASH AND CASH EQUIVALENTS, end	955,250	2,088,705	1,695,153	1,428,129	1,428,129	12,327,555
Cash flow	$ (1,911,997)	$ (2,895,837)	$ (1,830,330)	$ 5,942,014	$ (696,150)	$ (2,407,834)
Free cash flow	$ (1,911,997)	$ (2,935,872)	$ (1,838,229)	$ 5,478,464	$ (1,207,634)	$ (2,407,834)

HISTORICAL STOCK PRICE

PTK.V

In Canadian Dollars



Source: Zacks Investment Research

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