

AXT

A Material Science Company

Needham Growth Conference

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axt

Legal Disclosure



SEE ADDITIONAL RISK FACTORS ON FORM 10-Q AND FORM 10-K

During this presentation we may make forward-looking statements about the Company's business, operations, financial outlook, sales, customers, gross margins, the relocation of our production line, customer quals, life cycles of our products and applications, expense levels, our partially owned raw material companies and other matters. Forward-looking statements are subject to risks and uncertainties and our actual results could differ materially from what is described. In addition to the risks associated with developing complex technology, our future results will depend on factors including: the timing and receipt of significant orders; the cancellation of orders and return of product; emerging applications using chips from our substrates; end-user acceptance of products containing chips using our substrates; our ability to bring new products to market; product announcements by our competitors; the ability to control costs and improve efficiency; the ability to utilize our manufacturing capacity; the relocation of manufacturing lines and other factors. For further discussion of risks and uncertainties please see the Company's most recent Form 10-K and Form 10-Q filings.

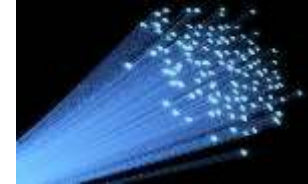


AXT Snapshot



- **History:** Founded in 1986; IPO in 1998
- **Products:** Alternative wafers when silicon will not work
- **Process Technology:** Pioneered Vertical Gradient Freeze (VGF) crystal growth; substantial process technology
- **Facility:** Headquarters in Fremont, CA. Manufacturing in China,
 - achieving relocation milestones
- **Operations:** Sophisticated supply chain model with ownership interest in 10 raw material companies

Key Products / Applications



Optoelectronics
& Photonic ICs

Indium
Phosphide (InP)



Switches for Wireless
Power Amplifiers
VCSELs, LEDs
& Lasers

Gallium
Arsenide (GaAs)



Satellites &
Solar Cells

Germanium (Ge)

AXT is a material science company
Diverse set of compound semiconductor applications



AXT's Business



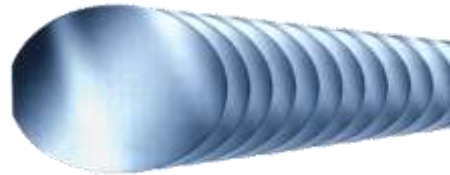
- Grow single crystal ingots from III-V earth materials
 - Pioneered Vertical Gradient Freeze (VGF) process
 - Successfully applied VGF to GaAs, InP and Ge
- Convert to wafers
- Utilize significant proprietary process technology
- Sell to epitaxial foundries or chip fabrication companies
 - Diverse customer base
 - Specialized chip or optical device then used in a product



Complex Process Technology



- Crystal growth demands strict technical specs
 - Today's GaAs dramatically different than 10 years ago
 - InP equally complex, and grown under high pressure
- Conversion to wafers sensitive to wafer handling
 - Wafer process technology proprietary to AXT
- Deep expertise in material science is required to support increasingly complex requirements





Indium Phosphide (InP) Market



- **Growth engine ignited in 2014**
- **Applications using InP are expanding**
- **We expect a long product life cycle—mirroring GaAs**

Key Applications

- Data center connectivity (Silicon Photonics)
- Passive Optical Networks (PONs)
- 5G telecommunications infrastructure
- Upside- emerging market for medical sensors
- Upside- 5G mobile devices
- Upside- Driverless cars

Market Dynamics

- Strong barriers to entry
 - Crystal growth very difficult due to two key variables
 - Customer spec.-driven market
- Three leading suppliers
 - AXT, Sumitomo, and Japan Energy
- AXT is strategically adding capacity



Gallium Arsenide (GaAs) Market



- Our first strong growth engine, even before our IPO in 1998
- A long product life cycle populated with new applications
- Pacesetter in developing crystal & wafer process technology

Key Applications

- LED lighting
- Industrial lasers
- Printer heads
- Power amplifiers
- 3-D sensing
- Micro LEDs

Market Dynamics

- Strong growth until 2011
- SOI cannibalized TAM 2012
- Market stabilized; we righted the ship
- GaAs not going away
- High-end LED showing strength
- New opportunities developing



Germanium (Ge) Market



- A single element wafer
- Applications are for satellites
 - Multi-junction solar cells
 - Weather, environmental, communication
- Market Dynamics:
 - Satellites increasingly in the news
 - Satellite solar cell market increasing
 - Difficult to make house calls
 - Difficult for customer to change supplier
 - AXT has strong relationships with multiple leading customers





Sophisticated Supply Chain



- Ownership interest in ten raw material companies in China
- Direct visibility and influence in these markets
- Favorable cost/pricing
- A risk minimization strategy if supply shortages occur
- On the Board of all ten
- AXT is uniquely positioned for key materials



AXT's Beijing facility



Relocation Background



- GaAs manufacturing lines driven to relocate from TongZhou district of Beijing, China
- And 3,000 other companies!
- Relocation imposed by Beijing Government
- Redevelopment of TongZhou district
- Relocation of thousands of government employees to TongZhou district



Relocation Status



- In previous years we considered relocation a risk
- Now it is an advantage and opportunity!
- Crystal growth first phase 100% complete
- Wafer processing mechanics completed
- Customer qualifications active in Q1
- Project has gone well



Key Financials



(\$ in M)	<u>2019</u>			<u>2018</u>	<u>2017</u>
	<u>Q3</u>	<u>Q2</u>	<u>Q1</u>	<u>Totals</u>	<u>Totals</u>
Revenue	\$19.8	\$24.8	\$20.2	\$102.4	\$98.7
Gross Margin	29.0%	34.3%	33.1%	36.2%	34.9%
Op Expense	\$6.2	\$6.2	\$6.1	\$24.9	\$21.8
Net Profit	(\$0.9)	\$1.5	(\$1.1)	\$9.7	\$10.1



AXT Market Opportunity



- New facilities, equipment and capacity
- Selling into major long-term technology trends: data center expansion, 5G, LED lighting, laser-based sensing, and more
- Limited competitive landscape
- Market leading InP technology with high barriers to entry
- Proprietary process technology, barriers to entry
- U.S. capital, U.S. quality standards; China cost structure
- The only player to have a position in raw materials
- Markets and business fundamentals look good



Thank You