



## Building a bright future

BluGlass (ASX:BLG) continues to gain momentum in the development and commercialisation of its gallium nitride (GaN) lasers since launching first products to market earlier this year. With product enhancements, vertical integration progressing and several customers qualifying BLG's products within their own applications. Once qualified, BLG expects to secure recurring and larger-volume orders, and orders from new customers.

### Constantly innovating

BLG also continues to advance its product portfolio, to address gaps in the market and establish itself as an emerging partner of choice in the rapidly growing market. The company is showcasing improved GaN lasers at Europe's pre-eminent industry conference, Laser World of Photonics. BLG, with its collaboration partner the University of Santa Barbara California (UCSB), has also made significant improvements to its GaN Distributed Feedback Laser (DFB) demonstrations using its proprietary RPCVD technology for longer-wavelength demonstrations. GaN-based DFB lasers are not commercially available in visible wavelengths at this time, but BLG could potentially offer this in the future. The company will feature an updated GaN DFB white paper at Laser World.

### Fremont vertical integration is nearly complete

BLG acquired a semiconductor fabrication facility in Fremont, California, in April last year, pivoting from outsourced contract manufacturing. This move is significantly fast-tracking development and commercialisation progress. As of late June 2023, BLG has nearly completed vertical integration. Production has been transferred from four out of five contract manufacturers and the move from the final contract manufacturer is in advanced stages.

### Valuation of US\$216.2m/A\$324.9m

In light of the developments over the past few months, we reiterate our valuation of BLG at US\$219.2m or A\$324.1m at current exchange rates, using an M&A model. This equates to A\$0.20 per share. We are confident that the company can re-rate towards our target range as its sales continue to ramp up and the GaN lasers sold earlier in the year become fully qualified. Please see pages 6-7 for more on the valuation rationale and the key risks.

Share Price: A\$0.043

ASX: BLG

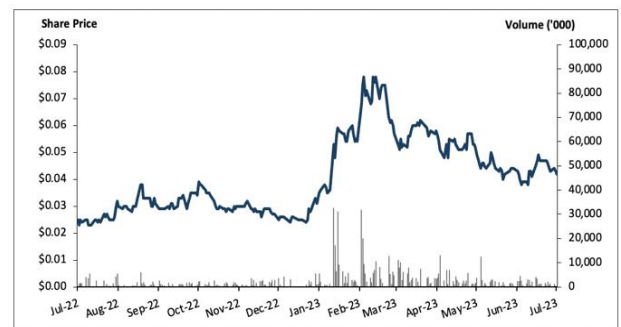
Sector: Technology

20 July 2023

Market cap. (A\$ m)	64.1
# shares outstanding (m)	1,490.7
# shares fully diluted (m)	1,671.1
Market cap ful. dil. (A\$ m)	71.9
Free float	100.0%
12-months high/low (A\$)	0.078 / 0.023
Avg. 12M daily volume ('1000)	2,674.8
Website	www.bluglass.com.au

Source: Company, Pitt Street Research

### Share price (A\$) and avg. daily volume (k, r.h.s.)



Source: Refinitiv Eikon, Pitt Street Research

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## Recap of the BLG story

**Who is BLG?** BLG is an Australian-headquartered laser diode manufacturer. After years of R&D work, the company has begun commercialisation of its inaugural products in CY23.

**What are laser diodes?** Gallium Nitride (GaN) Laser diodes are semiconductor devices that underpin advanced technology applications, including in robotics and automation, quantum sensing and computing, advanced manufacturing, electric vehicles, bio-medical devices, AR/VR displays and scientific research. This market is expected to grow by more than 23% annually to US\$2.5bn by 2025, however is currently constrained by limited suppliers and lack of flexibility in terms of new product development and laser diode form factors. Customers are facing significant unmet needs in the industry, providing a significant opportunity for a disruptive, agile supplier.

**What markets will BLG be targeting?** BLG is primarily targeting the industrial, quantum, scientific, medical, and biotech verticals, which focus on applications such as industrial cutting and welding for high tech applications (such as chip manufacturing, EV and renewable energy battery storage etc), robotics, 3D printing, quantum sensing, and medical diagnostics. These market verticals are expected to grow to US\$735m in size by 2025.

**What products does BLG offer?** BLG will initially focus on offering violet and blue laser diodes of 405-450nm wavelengths (Figure 1). At the time of commercial launch, it offered the following 6 products:

- Violet 405nm multi-mode 1W laser
- Violet 405nm single-mode 250mW laser
- Violet 420nm multi-mode 1W laser
- Violet 420nm single-mode 250nW laser
- Blue 450nm multi-mode 250mW laser
- Blue 450nm single-mode 100mW laser

*There is a large unmet need for GaN laser diodes.*

Figure 1: BluGlass' product suite



Source: Company



*BLG secured initial purchase orders in quantum and industrial segments.*

*The existing large players do not provide sufficient form factor flexibility and supply in several wavelengths is constrained.*

**How are BLG's products superior to those of its competitors?** Firstly, we note that there are very few end-to-end GaN laser diode manufacturers globally. The handful of manufacturers are larger companies and do not provide sufficient customisation and form factor flexibility, and supply in several wavelengths is constrained. Consequently, end-customers often need to undertake expensive customisation and post-purchase packaging. BLG is positioning itself to address these customer needs.

**What products does BLG have in the pipeline?** BLG will continue to expand its GaN laser portfolio, expanding its wavelength range from Ultra-Violet towards green. The company will roll out multiple products across in-demand wavelengths as well as advancing novel applications, such as its Distributed Feedback (DFB) lasers, and novel RPCVD device architectures. In the longer-term, the company plans to launch longer wavelength green laser diodes, complementing its violet and blue lasers.

## BLG has continued to make progress

2023 has been a big year for BLG. It formally launched a suite of products at Photonics West in San Francisco in January. Following this, several customers have purchased, including leading OEMs in the quantum and industrial segments, and a world-leading energy research institution. All customers are qualifying BLG's products within their own applications. Once qualified, BLG expects to secure recurring and larger-volume orders from existing customers as well as orders from new customers.

## Customers are liking BLG's products

As qualification of the initial laser orders continues, BLG has received new laser diode orders. In late April, it received two new orders from a quantum photonics pioneer and a leading medical device manufacturer. Orders spanned BLG's 405nm, 420nm and 450nm GaN laser product suite and include the first order of its early prototype higher-powered 405nm 3W multi-mode lasers in flexible form factors.

In June, BLG went to Europe's leading laser conference, Laser World of Photonics in Munich, Germany. It showcased enhanced products, as well as releasing its new 397nm ultra-violet single-mode alpha product. The company's product suite now comprises six commercial and three prototype products, which are available in a range of form factors including TO Cans of different sizes and chip-on-submounts.

## Vertical integration is nearly complete

In April 2022, BLG acquired a 19,000 square ft (~1,765 square m) commercial laser diode production facility along with manufacturing equipment in Silicon Valley for US\$2.5m - a fraction of the cost it would take to build today. BLG has historically relied on outsourced contract manufacturers but acquired its own facility with the hope that it would expand manufacturing capability, fast-track the development timelines for higher-value products at extended wavelengths and maintain end-product quality and consistency.

BLG has gradually ramped up production at the fab and bought production in-house over the past 14 months. Now, it has almost completed the process. As of late June, it has moved production from four of its five contract



**Fremont should boost the company's revenue generation capacity from US\$40m to US\$160m annually, a c.300% increase.**

manufacturers into its Silicon Valley fab. The company is in advanced stages of completing the integration of the final back-side contract manufacturer.

Once complete, the Fremont fab should substantially improve BLG's top and bottom lines compared to a situation where the company was largely reliant on contract manufacturing.

It should boost the company's revenue generation capacity from US\$40m to US\$160m annually, a c.300% increase. The annual wafer capacity is likely to increase four-fold — from c.2,500 wafers to c.10,000 wafers annually (matching the company's Silverwater epitaxy capacity perfectly). Production costs are expected to come down as well, which could boost the gross margin from 30% to as high as 45% (Figure 2).

**Figure 2: The Silicon Valley fab acquisition improves BluGlass' financials**

Contract Manufacturer Capacity		Owned-Fab Capacity	
Annual Epitaxy Wafer Capacity (Silverwater)	~10,000 wafers	Annual Epitaxy Wafer Capacity (Silverwater)	~10,000 wafers
Annual Wafer Fabrication Capacity	~2,500 wafers	Annual Wafer Fabrication Capacity	~10,000 wafers
Annual Development Iteration Capacity	~4-5 full iterations + 10's of short loops	Annual Development Iteration Capacity	Up to 48 full iterations + 100's of short loops
Annual Revenue Capacity	~US\$40M	Annual Revenue Capacity	~US\$160M
Estimated Gross Margin	~30%	Estimated Gross Margin	~45%
		Cash Flow Positive	2024/2025

Source: Company



## Our valuation of BLG

In our report, dated 20 March, we valued BLG at US\$216.2m - a deal worth A\$324.9m at prevailing exchange rates (Figure 3). This equates to a value of 20c per share.

Our valuation was derived using an M&A approach, rather than a DCF. This was because of the inherent volatilities of DCFs for semiconductor companies at the stage BLG is at and the inevitability that (if successful) they tend to get acquired before becoming multi-billion-dollar companies.

The deal used was the June 2022 acquisition of **Danish fibre laser manufacturer NKT Photonics by Hamamatsu Photonics (TSE:6965)** for US\$216.2m (A\$314m). We thought this was a comparable deal because it was one of only two M&A deals in the laser space of a company that had commercialised its technology. In light of the recent developments at BLG, we reiterate our valuation.

We are confident that the company can re-rate towards our target range as sales continue to ramp up and the GaN lasers sold earlier in the year become qualified in customer applications and development programs.

*We are confident that the company can re-rate towards our target range as its sales continue to ramp up and the GaN lasers sold earlier in the year become fully qualified.*

Figure 3: Valuation for BluGlass

Valuation	Amount
<b>M&amp;A valuation (US\$m)</b>	<b>216.2</b>
USD/AUD exchange rate	1.52
<b>Enterprise Value (A\$m)</b>	<b>324.9</b>
Net debt (cash)	(8.4)
<b>Equity value (A\$m)</b>	<b>333.3</b>
Shares outstanding (fully diluted)	1,671.1
<b>Implied price (A\$ cents)</b>	<b>0.20</b>
Current price (A\$ cents)	0.043
<i>Upside (%)</i>	<i>361.5%</i>

Estimates: Pitt Street Research



### Risks

We see the following key risks associated with our investment thesis:

**Commercialisation risk:** The company is only at the early stage of commercialisation. There is the risk that BLG may endure difficulties in advancing beyond the current stage, including the risk that its GaN lasers fail to qualify with current OEM customers.

**Regulatory risk:** There is the risk of material changes in standards or regulations relating to the company and its industry. Geopolitical tensions and techno-nationalism may limit the ability of BLG to sell its products into certain jurisdictions.

**Competition risk:** Although BLG seems to have a unique product, there is the possibility that competing companies may develop superior products to BLG. We note however that any such companies would take some time to catch up given BLG's several years of R&D and that it is now at the commercialisation stage.

**Funding risk:** BLG may need to raise further capital before it reaches profitability. That may be required, for instance, if its current development programs and technology transfer/qualification take longer than currently anticipated or multiple growth opportunities arise that require additional development capital. Future potential equity capital raises may well be priced to reflect the company's progress but will result in dilution for existing shareholders.



## Appendix I – Analysts’ Qualifications

Marc Kennis, lead analyst on this report, has been covering the Semiconductor sector as an analyst since 1997.

- Marc obtained an MSc in Economics from Tilburg University, The Netherlands, in 1996 and a post graduate degree in investment analysis in 2001.
- Since 1996, he has worked for a variety of brokers and banks in the Netherlands, including ING and Rabobank, where his main focus has been on the Technology sector, including the Semiconductor sector.
- After moving to Sydney in 2014, he worked for several Sydney-based brokers before setting up TMT Analytics Pty Ltd, an issuer-sponsored equities research firm.
- In July 2016, with Stuart Roberts, Marc co-founded Pitt Street Research Pty Ltd, which provides issuer-sponsored research on ASX-listed companies across the entire market, including semiconductor companies.

Nick Sundich is an equities research analyst at Pitt Street Research.

- Nick obtained a Bachelor of Commerce/Bachelor of Arts from the University of Sydney in 2018. He has also completed the CFA Investment Foundations program.
- He joined Pitt Street Research in January 2022. Previously, he worked as a financial journalist at Stockhead for more than three years.
- While at university, he worked for a handful of corporate advisory firms.



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