

Quarterly Update – 31 December 2019

During the quarter ending 31 December 2019:

- BluGlass launched Laser Diode business unit, targeting an initial US\$40-65m share of the market by 2025
- James Walker announced as BluGlass non-executive Chair
- BluGlass entered collaboration with Luminus to develop RPCVD tunnel junctions for projector applications
- Customer revenue was up on the previous quarter to \$348,000
 - year to date foundry receipts of \$477,000, of which \$123,440 was from Laser Diode foundry customers
- Costs and capex spend in-line with budget forecasts

Australian semiconductor developer, BluGlass Limited (ASX: BLG), is pleased to provide this Quarterly Update to accompany the Appendix 4C Quarterly Report for the three months ended 31 December 2019.

During the period, BluGlass launched its new direct-to-market Laser Diode (LD) business unit to exploit the company's unique tunnel junction technology in several high value, high margin LD markets. This market opportunity presents near term, significant commercial revenues for the company with an initial target market representing US\$40-65M for BluGlass by 2025.

The Company also entered a non-exclusive collaboration with projector lighting innovator, Luminus, to co-develop novel RPCVD tunnel junction applications. During the quarter, BluGlass also continued its joint development with industry leaders, AIXTRON SE and Bridgelux.

BluGlass launches Laser Diode Business Unit



In October, BluGlass launched its direct-to-market business unit to leverage the competitive advantages of RPCVD tunnel junctions for GaN Laser Diode applications. The Laser Diode market has a number of key differentiators and the direct market approach will allow BluGlass to capture more downstream value in this defined volume, high value and high margin market.

The GaN laser diode market opportunity is an emerging market expected to grow to a US\$658M addressable market for BluGlass by 2025. GaN lasers require a higher performance, lower cost technology solution to help address significant unmet needs in the industry.

BluGlass will initially focus on applications for the industrial laser diode market for welding and cutting applications, targeting a market share of 6-10% (US\$40-65M) of the addressable market by 2025.

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BluGlass is developing GaN laser diode prototypes using both MOCVD and RPCVD growth techniques and plans to deliver its first laser diode product in calendar year 2020. These new products are expected to deliver growing revenues for BluGlass from CY2021.

This business unit will directly exploit the key US Patent for buried activated p-GaN for tunnel junctions awarded to BluGlass in July last year. BluGlass through its EpiBlu subsidiary already has Laser Diode epitaxial know-how and today supplies laser diode wafers for three existing customers. The Company has received significant new industry interest since the business launch announcement.

BluGlass continues to secure the LD supply chain to capture value and control the fabrication end to end – from epitaxial growth through to testing and reliability, enabling close interaction with end-use customers. The Company plans to launch its test facility in the US in the next quarter.

BluGlass to exhibit and present RPCVD TJs for Laser Diodes paper at SPIE Photonics West 2020



BluGlass is exhibiting at the 2020 SPIE Photonics West Conference from 2-6 February, at the Moscone Centre, San Francisco, USA. Industry and investors are invited to come and see us at Booth 4783.

Our Head of Epitaxy, Dr. Josh Brown will be presenting an invited technical presentation and paper on the technical approach and advantages for high-brightness Laser Diodes, using RPCVD tunnel junction technology to reduce optical loss and drive higher performance. Dr. Brown will also present some of our recent RPCVD and LD results at the conference.

Board Changes

In December, following three years as Chair of the BluGlass Board and ten years as a Non-Executive Director, Bill Johnson announced his intention to retire.

James Walker has accepted the role of non-executive Chair of the Company, following Bill's resignation. The changes will be effective from 7 February 2020.

James has served on the BluGlass Board since July 2017 and is an experienced leader in commercialising new technologies across global markets. In taking on the Board Chair role, James will work closely with the executive team to further drive the focus on delivering near term commercial revenue and business opportunities.

Bill's impact during his tenure has been instrumental in the company's transition from pure R&D to a market focused company with a strongly differentiated technology with multiple revenue and commercialisation paths. Bill provided invaluable industry insight, guidance and support to the Board, management and technical team. The Board and BluGlass team thank Bill for his leadership and effort over his time with the company.

Advancing our collaborations with a number of industry leading partners

During the quarter BluGlass continued to advance its paid joint venture agreement with commercial lighting developer, Bridgelux. The two parties are collaborating to build on BluGlass' remote plasma chemical vapour deposition (RPCVD) tunnel junction technology, to develop cascade LEDs and establish a path to market for cascade LEDs.



In December BluGlass also announced that it had entered into a non-exclusive collaboration with California-based LED innovator, Luminus. The two companies are co-developing cascade LEDs for the rapidly growing entertainment, display and projector application markets.



Luminus is eager to exploit the performance advantages of RPCVD tunnel junctions to further improve their unique projector lighting technologies. Projectors applications require ultra-high-performance LEDs and could benefit from the smaller form factor, higher performance (intensity) and lower cost benefits that RPCVD-enabled cascade LEDs potentially offer. Projectors are also heat-sensitive devices, ideally operated at lower current densities to achieve peak efficiencies - a key benefit enabled by cascade LEDs.

Luminus is an industry leader in developing leading-edge LED technology for high performance, high value LED segments including industrial, medical, horticulture and entertainment applications. Luminus works hand-in-hand with the automotive, display and projection industries most innovative companies to illuminate everything from heads-up displays to projection systems for the next generation of vehicles and consumer technologies.

Aixtron G4 2800 Retrofit project and commercial scaling of RPCVD

The significant scaling program to retrofit the Aixtron G4 to RPCVD mode continues to make progress with all RPCVD hardware components now fully simulated and designed. These parts are now being machined by our specialist manufacturing partners locally and overseas.

Our collaboration partner, AIXTRON are currently onsite at BluGlass' Silverwater facility to complete their software installation for the RPCVD retrofit.



Operating metrics

Customer foundry revenue for the quarter was up on the previous quarter to \$348,000 with year to date receipts of \$477,000, of which \$123,440 was from Laser Diode foundry customers.

During the quarter, operational expenditure was in line with the Company's budgeted expectations.

BluGlass' cash position at the end of the quarter is \$3.6M. BluGlass expects to receive an R&D Tax Rebate of ~\$2.5M for FY2020 later in the year.

This announcement has been authorised by the board of directors of the Company.

About BluGlass

BluGlass Limited (ASX: BLG) is a global leader commercialising a breakthrough technology using Remote Plasma Chemical Vapour Deposition (RPCVD) for the manufacture of high-performance LEDs and other devices. BluGlass has invented a new process using RPCVD to grow advanced materials such as gallium nitride (GaN) and indium gallium nitride (InGaN). These materials are crucial to the production of high-efficiency devices such as power electronics and high-brightness (LEDs) used in next-generation vehicle lighting, virtual reality systems and device backlighting.

The RPCVD technology, because of its low temperature and flexible nature, offers many potential benefits over existing technologies including higher efficiency, lower cost, substrate flexibility (including GaN on silicon), and scalability.

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Appendix 4C

Quarterly report for entities subject to Listing Rule 4.7B

Introduced 31/03/00 Amended 30/09/01, 24/10/05, 17/12/10, 01/09/16

Name of entity

Bluglass Limited

ABN

20 116 825 793

Quarter ended ("current quarter")

31 December 2019

Consolidated statement of cash flows	Current quarter \$A'000	Year to date (6 months) \$A'000
1. Cash flows from operating activities		
1.1 Receipts from customers	348	477
1.2 Payments for		
(a) research and development	(577)	(1,442)
(b) product manufacturing and operating costs	-	-
(c) advertising and marketing	(12)	(23)
(d) leased assets	(126)	(199)
(e) staff costs	(922)	(1,780)
(f) administration and corporate costs	(669)	(874)
1.3 Dividends received (see note 3)	-	-
1.4 Interest received	16	26
1.5 Interest and other costs of finance paid	-	-
1.6 Income taxes paid	-	-
1.7 Government grants and tax incentives- R&D tax rebate	2,366	2,366
1.8 Other (provide details if material)	-	-
1.9 Net cash from / (used in) operating activities	424	(1,449)

2. Cash flows from investing activities		
2.1 Payments to acquire:		
(a) property, plant and equipment	(782)	(1,073)
(b) businesses (see item 10)	-	-
(c) investments	-	-

Consolidated statement of cash flows		Current quarter \$A'000	Year to date (6 months) \$A'000
	(d) intellectual property	-	-
	(e) other non-current assets	-	-
2.2	Proceeds from disposal of:		
	(a) property, plant and equipment	-	-
	(b) businesses (see item 10)	-	-
	(c) investments	-	-
	(d) intellectual property	-	-
	(e) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received (see note 3)	-	-
2.5	Other (provide details if material)	-	-
2.6	Net cash from / (used in) investing activities	(782)	(1,073)

3.	Cash flows from financing activities		
3.1	Proceeds from issues of shares	-	-
3.2	Proceeds from issue of convertible notes	-	-
3.3	Proceeds from exercise of share options	5	5
3.4	Transaction costs related to issues of shares, convertible notes or options	-	-
3.5	Proceeds from borrowings	-	-
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-
3.9	Other (provide details if material)	-	-
3.10	Net cash from / (used in) financing activities	5	5

4.	Net increase / (decrease) in cash and cash equivalents for the period		
4.1	Cash and cash equivalents at beginning of quarter/year to date	3,952	6,116
4.2	Net cash from / (used in) operating activities (item 1.9 above)	424	(1,449)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(782)	(1,073)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	5	5

Consolidated statement of cash flows		Current quarter \$A'000	Year to date (6 months) \$A'000
4.5	Effect of movement in exchange rates on cash held	-	-
4.6	Cash and cash equivalents at end of quarter	3,599	3,599

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter \$A'000	Previous quarter \$A'000
5.1	Bank balances	43	30
5.2	Call deposits	3,556	3,922
5.3	Bank overdrafts		
5.4	Other (provide details)		
5.5	Cash and cash equivalents at end of quarter (should equal item 4.6 above)	3,599	3,952

6. Payments to directors of the entity and their associates

- 6.1 Aggregate amount of payments to these parties included in item 1.2
- 6.2 Aggregate amount of cash flow from loans to these parties included in item 2.3
- 6.3 Include below any explanation necessary to understand the transactions included in items 6.1 and 6.2

**Current quarter
\$A'000**

82

-

7. Payments to related entities of the entity and their associates

- 7.1 Aggregate amount of payments to these parties included in item 1.2
- 7.2 Aggregate amount of cash flow from loans to these parties included in item 2.3
- 7.3 Include below any explanation necessary to understand the transactions included in items 7.1 and 7.2

**Current quarter
\$A'000**

-

-

8. Financing facilities available <i>Add notes as necessary for an understanding of the position</i>	Total facility amount at quarter end \$A'000	Amount drawn at quarter end \$A'000
8.1 Loan facilities	-	-
8.2 Credit standby arrangements	-	-
8.3 Other (please specify)	-	-
8.4 Include below a description of each facility above, including the lender, interest rate and whether it is secured or unsecured. If any additional facilities have been entered into or are proposed to be entered into after quarter end, include details of those facilities as well.		

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9. Estimated cash outflows for next quarter	\$A'000
9.1 Research and development	(600)
9.2 Product manufacturing and operating costs	-
9.3 Advertising and marketing	(30)
9.4 Leased assets	(80)
9.5 Staff costs	(780)
9.6 Administration and corporate costs	(100)
9.7 Other (Cashflow from investing activities- property plant and equipment)	(150)
9.8 Total estimated cash outflows	(1,740)

10. Acquisitions and disposals of business entities (items 2.1(b) and 2.2(b) above)	Acquisitions	Disposals
10.1 Name of entity	-	-
10.2 Place of incorporation or registration	-	-
10.3 Consideration for acquisition or disposal	-	-
10.4 Total net assets	-	-
10.5 Nature of business	-	-

Compliance statement

- 1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.
- 2 This statement gives a true and fair view of the matters disclosed.

Sign here:



Company secretary

Date: 30 January 2020

Print name: Emmanuel Correia

Notes

1. The quarterly report provides a basis for informing the market how the entity's activities have been financed for the past quarter and the effect on its cash position. An entity that wishes to disclose additional information is encouraged to do so, in a note or notes included in or attached to this report.
2. If this quarterly report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standard applies to this report.
3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.