BLUGLASS CLOSES CALENDAR YEAR WITH NEW TECHNOLOGY BREAKTHROUGH, EXPANSION OF MANUFACTURING CAPACITY, CONTINUING COMMERCIAL NEGOTIATIONS

Sydney, 18 December 2018: Australian technology leader BluGlass Limited (ASX: BLG) has closed out the calendar year with market announcements that cover breakthrough technology development, expansion of its Silverwater facility, and an update on its continuing negotiations with global LED manufacturer Lumileds.

Giles Bourne, Managing Director and CEO of BluGlass, said, “This breakthrough development of our technology is very exciting. These results confirm the potential of our patented RPCVD technology to solve a number of the manufacturing challenges associated with the industry’s incumbent processes, and importantly allows us to start discussions with a range of potential high-value partners in high-brightness LED and other semiconductor market segments.

“Having made significant and intensive investment and development over a number of years, and with 62 global patents to protect our IP, we now plan to take these results to market to capitalise on the broader applications for our technology, and deliver the best-possible return on shareholder investment.”

BluGlass demonstrates technology breakthrough to resolve complex manufacturing challenges - to improve LED efficiency, create smaller devices and reduce manufacturing costs and complexity

BluGlass has today announced that its unique manufacturing process, Remote Plasma Chemical Vapour Deposition (RPCVD) has successfully demonstrated functioning tunnel junctions to enable high-brightness, cascaded LEDs, in a world first for gallium nitride (GaN) semiconductors.

(High-brightness LEDs are very different from the low-cost commodity LEDs to be found on Christmas trees at this time of year. High-brightness LEDs are used in specialised applications that include vehicle lighting, UV LEDs in water purification, and high-power laser diodes used in industrial machine applications.)

A cascaded LED is a device where two or more LEDs are grown in a continuous vertical stack using what’s called a tunnel junction to interconnect the multiple LEDs in a single chip. Cascaded LEDs address a fundamental constraint inherent in high-brightness LEDs, called ‘efficiency droop’, where the efficiency of the light output drops as the driving current increases.

(LEDs operate by passing an electric current through specialised semiconductor material: the current energises the semiconductor material which then emits light - essentially the reverse process to that used in photovoltaic solar cells in which sunlight is converted into electrical current.)

A simple solution to combat efficiency droop is to replace a single LED chip with two or more LED chips side by side: light can then be generated by driving each LED at a lower current matched to their peak efficiency. However, the use of multiple LED chips in this way increases cost and the space required to accommodate multiple chips. In today’s markets the demand for increasingly smaller devices is growing, including in the automotive industry, where there are strict limits on physical device dimensions.A better solution is to use cascaded LEDs - a single chip that has two or more LEDs stacked vertically in a single chip. This enables more light output, but without efficiency droop. Efficiency droop is reduced because multiple LEDs are working together to create light output, and power is increased by stacking voltage, not current, with no additional space required. The vertical solution also increases the number of devices than can be made from a single wafer – further reducing manufacturing costs.

This is a significant breakthrough for BluGlass, as a successful cascaded LED is not yet commercially available, and is not easily achieved by the incumbent manufacturing technology, Metal-Organic Chemical Vapour Deposition (MOCVD). Cascaded LEDs could enable smaller, cheaper and higher performing LEDs.

The RPCVD process is uniquely able to produce these critical enabling tunnel junctions in the LED device by capitalising on its inherent competitive

advantages. RPCVD operates at several hundred degrees cooler than the incumbent technology, and replaces expensive and toxic ammonia (which also introduces unwanted hydrogen into the process) with an inert nitrogen plasma. It is also able to achieve the required activation needed for a working cascaded LED during growth. MOCVD relies on complicated and time-consuming additional processing to achieve the required activation.

New equipment at BluGlass manufacturing facility

BluGlass has taken delivery of the first of two new specialised manufacturing platforms, an Aixtron AIX 2800 G4 commercial scale MOCVD platform that BluGlass will retrofit with its RPCVD manufacturing technology. With the second platform expected in January 2019, these will add capacity for industry collaborations around the use of RPCVD for tunnel junction-enabled cascaded LEDs, microLEDs, and power electronics devices. The supporting clean-room build and fit out underwritten by its capital raise from mid-year is nearing completion.

Continuing commercial negotiations with Lumileds

Separately, BluGlass remains in active negotiations with global LED manufacturer Lumileds to extend the collaboration and to potentially enter a commercial agreement to licence BluGlass' RPCVD technology, as notified to the market at the BluGlass AGM held on 19 November 2018.

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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 light emitting diodes (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.BluGlass was spun off from Macquarie University in 2005 and listed in 2006.Media Contacts:
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