

The Manager Companies - ASX Limited
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ALPHA SAPPHIRE UPDATE



Alpha **SAPPHIRE**

SAPPHIRE MARKETING

- **Adoption of GaN-on-sapphire semiconductors accelerating**
- **GaN-on-sapphire qualification commenced in October 2024**
- **Scale adoption of mini and micro-LED display technologies delayed**
- **Wide format (8") sapphire growth remains a key technology advantage**
- **Sapphire optics sales commenced**
- **High 'ESG' sapphire demand confirmed**
- **Sapphire boules issued for processing for semi-conductor end-users**

PHASE B FEASIBILITY

- **Engineering layouts complete**
- **Sapphire growth under optimisation**
- **Robust cost model based on 8" sapphire wafer demand confirmed**
- **FID on Phase B held over until 1H CY2025**

FINANCING

- **Availability of \$30M QIC facility extended to 30 September 2025**
- **Subject to reaching FID by 30 June 2025**

Alpha's Managing Director, Rimas Kairaitis said, "Alpha is particularly encouraged by the emergence of wide-format sapphire wafer demand from the semi-conductor sector with a particular focus on secure supply jurisdictions. With the completion of feasibility for the next expansion phase deferred until next year, we are pleased to advise a time extension to the finance facility from the QIC."

Alpha HPA Limited (**Alpha** or **the Company**) (ASX: A4N) is pleased to provide an update on project activities on Alpha Sapphire.

Alpha Sapphire Pty Ltd (**Alpha Sapphire**), is a wholly owned subsidiary of Alpha HPA, that is commercialising the conversion of Alpha's high purity alumina (HPA) feedstock into higher value, monocrystalline, synthetic sapphire using the Ebner-Fametec McSAP sapphire growth technology.

The McSAP technology has been optimised for wide format (8") sapphire growth along the sapphire C-axis, providing for enhanced utilisation in the manufacture of C-plane sapphire wafers.

SAPPHIRE MARKETING

Alpha Sapphire has been engaging with the synthetic sapphire end-use market since establishing maiden sapphire growth in May 2024.

Marketing has been focused on the following end-use markets:

- **Optics** – being sapphire glass utilisation in medical devices, watches and consumer electronics
- **LED's** – Which uses wafered sapphire material, in either 6" or 8" sizes, as substrate to layer light emitting circuits. In particular, Alpha placed a focus on the emerging microLED sector, which requires wide format (8" or 200mm) sapphire wafer substrates for commercial scale adoption.

During the period of market engagement, Alpha Sapphire has been inbounded with new sector demand from a number of large semiconductor counterparties developing next generation Gallium-Nitride (**GaN**) **-on-sapphire semiconductor** platforms. GaN-on-sapphire, is an emerging semiconductor technology for high power and high-frequency devices. Strong demand signals from this end-use was a positive surprise, and not anticipated at the commencement of the Alpha Sapphire project.

Marketing findings to date:

Semiconductor

- Positive demand trends from major semiconductor OEM's for building GaN-on-Sapphire as a platform for power-semiconductors, driven by high cost of silicon-carbide (SiC)
- Alpha Sapphire engaging directly with 4 semiconductor end-users
- Wafering and qualification commenced with 2 semiconductor end-users
- Suppliers from "ex-jurisdictions of concern" a pre-requisite for supply

LED

- Large volume 8" (200mm) wafer demand from microLED is delayed with major end-user adoption deferred
- Alternative micro-LED consumer displays are small volumes only at this stage
- Promising technology trends from auto sector, including head-up-displays (HUD)
- Base-load LED supply chain is based on 4" and 6" sapphire substrates, which is well supplied with high level of cost competition

Optics

- Confirmed demand for 'ESG' sourced sapphire, no ESG premium yet identified
- Qualification complete and maiden sales in place with first optics end-user

Summary Sapphire marketing findings to date	
Unexpected 8" wafer demand from semiconductor sector	●
Strong ESG sapphire optics demand but no ESG pricing premium	●
Large scale 8" wafer demand for microLEDs deferred	●

PHASE B FEASIBILITY

Phase B of the Alpha Sapphire Project represents the expansion of the existing 2 sapphire growth units (Phase A) to up to 48 additional sapphire growth units. Phase B feasibility assumes a new project site with access to renewable electricity

Alpha Sapphire has made substantial progress on the Phase B feasibility study, noting:

- Detailed engineering of the Phase B development of the McSAP growing units is complete, and a value engineering process is underway to finalise CapEx estimate
- A detailed, but preliminary Phase B Project cost model has been built showing robust financial returns built on dominant sales of 8" sapphire wafer to the GaN-on-sapphire sector and conditional on improved sapphire growth pass rates.
- A suitable Phase B/C site has been identified, but yet to be secured – driven by FID delay.
- Sapphire growth from the existing Phase A growth machines are under optimisation.

Accordingly, Alpha Sapphire now expects Phase B FID to be delayed to the 1H CY2025.

Summary Phase B Feasibility	
Detailed engineering complete CapEx estimates underway	●
Sapphire growth pass rates improving, but still below expectations	●
Robust cost model based on 8" sapphire wafer demand confirmed	●



Successful sapphire boule growth from Phase A sapphire growth units

QIC FINANCING

Alpha Sapphire is pleased to note it has agreed key terms with the trustee of the QIC Critical Minerals and Battery Technology Fund (**QCMBTF**) to extend the availability period of the QCMBTF Alpha Sapphire Funding Facility to reflect the revised project timeline.

Summary of Key Changes to the QCMBTF Alpha Sapphire Funding Facility:

The QCMBTF Alpha Sapphire Funding Facility shall remain available until **30 September 2025**, subject to certain conditions precedent including the following:

- by **30 June 2025**, Alpha Sapphire's Board reaching FID on Phase B of the Alpha Sapphire project, and the parties agreeing changes to the Alpha Sapphire Funding Facility in relation to repayments, each in a form and substance satisfactory to QCMBTF;
- by **30 September 2025**, Alpha Sapphire receiving a utilisation under Tranche B of the Alpha Sapphire Funding Facility on the terms and conditions of the facility (i.e. 2nd financial close); and
- the Company providing an undertaking in respect of Alpha Sapphire's obligations to QCMBTF in connection with the extension.

If the conditions are not met, Alpha Sapphire will be obliged to repay the \$3 million already drawn under the QCMBTF Alpha Sapphire Funding Facility, plus interest of 10% p.a. from the date of drawdown, and the facility would be cancelled.

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About Alpha Sapphire

Alpha Sapphire is a 100% owned Alpha HPA subsidiary dedicated to the commercialisation of the growth, processing and sale of high value synthetic sapphire glass utilising Alpha's high purity alumina feedstock.

Synthetic sapphire glass is the pure crystalline form of high purity alumina, or Al_2O_3 , grown under controlled conditions as a single monolithic crystal. Synthetic sapphire glass has unique physical properties related to its purity, crystal matrix and hardness, that makes it a critical, high value input into LED lighting substrates and various optical applications including consumer electronics, medical application and defence.

In March 2023, Alpha entered agreements with Austria based technology provider Ebner-Fametec, to provide for the staged entry by Alpha into the production and sale of synthetic sapphire glass utilising Ebner-Fametec sapphire growth technology and utilising Alpha's custom HPA tablets as feedstock.

Alpha has a Letter of Intent (LOI) with Ebner-Fametec to purchase and roll-out sapphire growth units in the following phases:

- **Phase A:** Purchase and installation of an initial 2 synthetic sapphire growth units: **In place**
- **Phase B:** Purchase and installation of a further 48 synthetic sapphire growth units: **Total 50**
- **Phase C:** Purchase and installation of a further 50 synthetic sapphire growth units: **Total 100**

In June 2023, the agreement between Alpha and Ebner-Fametec was expanded to include a LOI to work co-operatively on sapphire marketing and to target an additional, large-scale expansion of the Australia based sapphire growth installation, to be referred to as the '**Nova Phase**'. The Nova Phase will contemplate the purchase, construction, installation and operation of up to an additional 1,000 synthetic sapphire growth units.

In September 2023, Alpha Sapphire has secured up to \$30 million project funding from Queensland Critical Minerals and Battery Technology Fund (QCMETF) and has secured matching equity funding from a strategic placement in November 2023.

Alpha is currently completing the technical and commercial feasibility of Phase B.