



## Q2 2021 Quarterly Activities Report

21 July 2021

Shaun Verner – Managing Director & CEO



**SYRAH** RESOURCES

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# Syrah's Value Proposition



## Electric Vehicles require graphite

- Electric Vehicle ("EV") adoption is gaining momentum
- Anodes in lithium-ion batteries used in EVs are made of graphite



## Graphite is a strategic critical mineral

- Global anode supply chain is currently 100% reliant on China
- Graphite is designated as a strategic critical mineral in USA, EU, Japan & Australia



## Balama Graphite Operation: A Tier 1 asset

- Long life (>50 years<sup>1</sup>) and high grade (16% TGC<sup>2</sup>)
- Largest integrated natural graphite mine and processing operation globally
- Significant vanadium resource at Balama is a valuable option<sup>3</sup>



## Vertical Integration in USA

- Balama to be vertically integrated with AAM<sup>4</sup> facility at Vidalia, USA
- Large scale ex-Asia AAM supply option that is ESG verifiable

Syrah's vision is to be the world's leading supplier of superior quality graphite and anode material products, working closely with customers and the supply chain to add value in battery and industrial markets

1. Life of mine based on current 108Mt Graphite Ore Reserves being depleted at 2Mt throughput per annum. Refer to 2020 Annual Report released to ASX 29 March 2021 for Reserve as at 31 December 2020. All material assumptions underpinning the Reserves and Resource statement in this announcement continue to apply, other than as updated in subsequent ASX releases.

2. TGC = Total Graphitic Carbon.

3. Scoping study on potential to refine vanadium as per ASX release 30 July 2014.

4. AAM = Active Anode Material.

# Syrah's positive ESG profile



## Leading health and safety standards

- ✓ ISO:45001 and ISO:14001 certification at Balama
- ✓ ISO:9001 certification at Vidalia
- ✓ Vidalia expansion project being developed in line with best practice health, safety and environmental standards
- ✓ Critical Risk Management Framework embedded across the Group



## Best practice sustainability frameworks

- ✓ Sustainability frameworks guided by:
  - Global Reporting Initiative (GRI)
  - United Nations Sustainable Development Goals
  - International Council on Mining and Metals
- ✓ Robust Community Development and Stakeholder Engagement Strategy



## Low carbon footprint

- ✓ Lower carbon emissions footprint (life cycle) of natural versus synthetic graphite<sup>1</sup>
- ✓ Undertaking independent life cycle assessment
- ✓ Implementing initiatives to lower carbon footprint further



## Auditable back to source

- ✓ Fully integrated by Syrah from mine to customer
- ✓ Vidalia products will have a single chain of custody back to the source

1. Benchmark Minerals Intelligence

## Q2 2021 Quarter: Highlights

Health and Safety	<ul style="list-style-type: none"> <li>Balama and Vidalia quarter end Total Recordable Injury Frequency Rate (“TRIFR”) was 0.0</li> <li>No positive COVID-19 cases have been reported at Balama</li> </ul>
Market	<ul style="list-style-type: none"> <li>Continued strong EV sales, with 165%<sup>1</sup> growth in H1 2021, versus H1 2020, to over 2.3 million units</li> <li>Forecast global EV sales of 4.9 million units in 2021<sup>2</sup></li> <li>Battery capacity commitments and vertical integration of the EV supply chain is accelerating in the USA</li> </ul>
Balama Graphite Operation	<ul style="list-style-type: none"> <li>First full quarter following restart – tracking ahead of plan with strong operational performance</li> <li>29kt natural graphite produced during the quarter</li> <li>C1 cash costs (FOB Nacala) of US\$537/t at ~10kt per month average production rate</li> <li>On track to achieve target cash costs of US\$430–460/t (FOB Nacala) at 15kt per month production rate</li> <li>15kt sold and shipped, and practically all of 20kt finished product inventory contracted to customers, demonstrating strong demand</li> <li>Disruption in container shipping market currently impacting ability to match Balama production and sales with customer demand</li> <li>Weighted average sales price of US\$474/t (CIF) reflecting volume directed to re-establishing China fines shipments</li> </ul>
Vidalia AAM Facility	<ul style="list-style-type: none"> <li>Fully integrated production of on-specification natural graphite Active Anode Material (“AAM”) at Vidalia, USA</li> <li>Product qualification progressing with more than 10 target customers</li> <li>Transitioned to detailed engineering and procurement with Worley awarded services contract<sup>3</sup></li> <li>Advancing towards customer and financing commitments for Vidalia expansion</li> </ul>
Corporate	<ul style="list-style-type: none"> <li>Elected to issue Series 3 Convertible Note<sup>4</sup></li> <li>Quarter end cash balance of US\$85 million</li> </ul>

1. Based on actual EV sales data from MarkLines up to and including May 2021. June 2021 based on actual EV sales from MarkLines for key countries (including China, USA, Germany, Norway and Sweden) and Syrah estimate for the rest of the world.

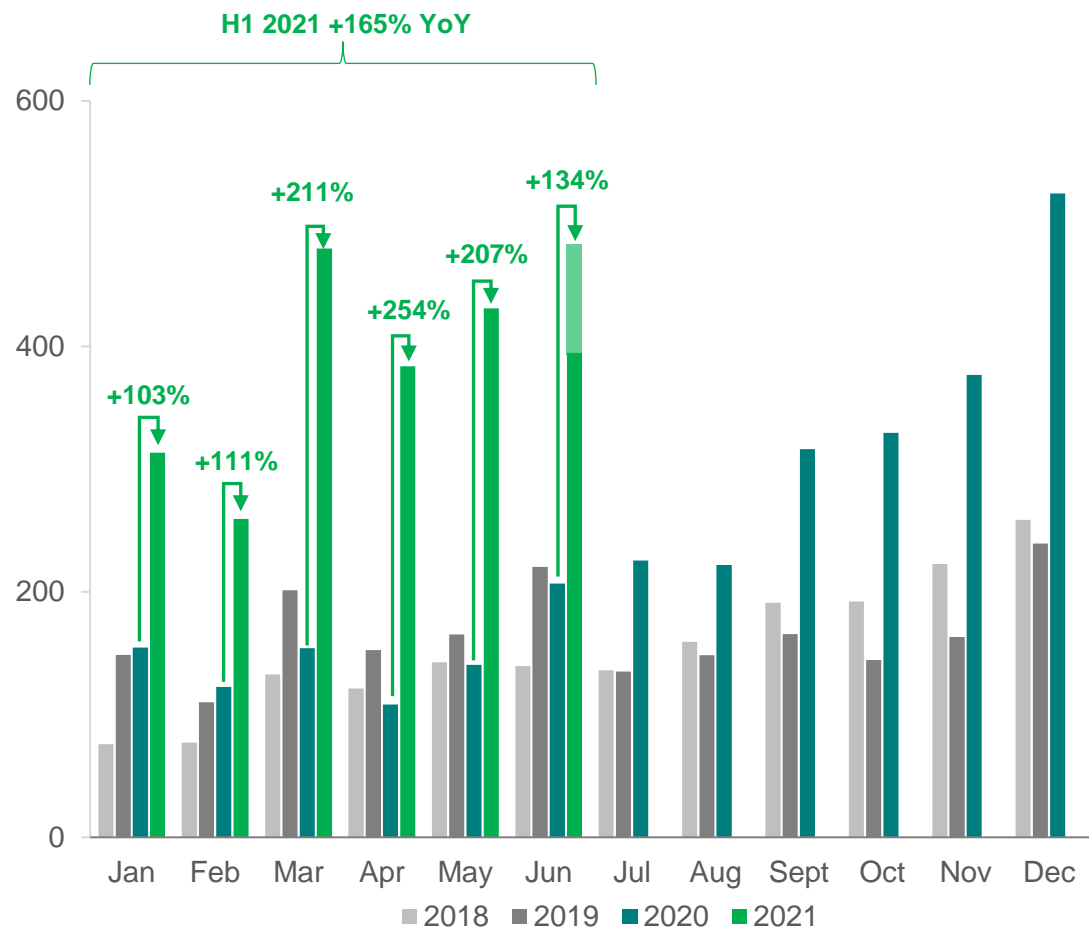
2. Source: Rho Motion.

3. Refer ASX release 29 June 2021.

4. Refer ASX release 11 June 2021.

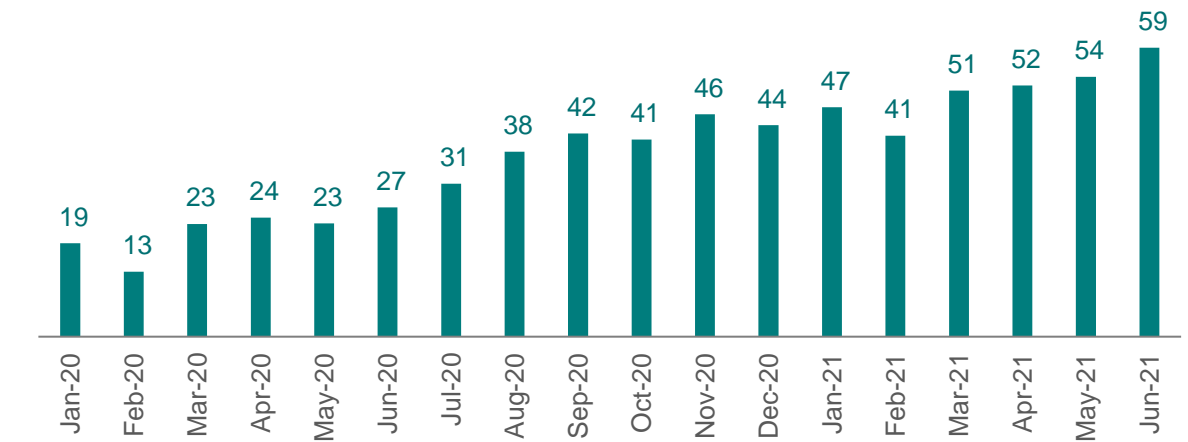
# EV sales and anode material volumes rebalancing the natural graphite market

Global EV Sales ('000 Units)



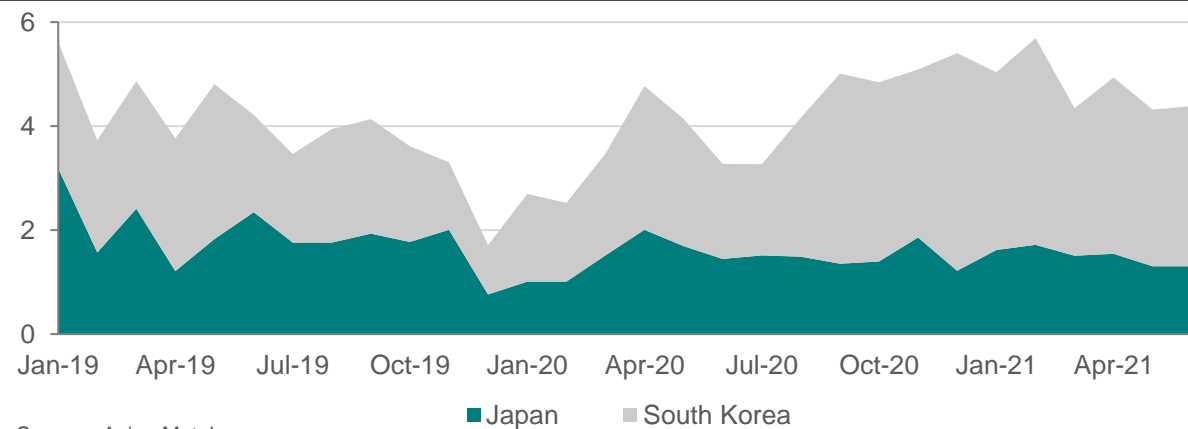
Source: Actual EV sales up to and including May 2021 from MarkLines. June 2021 EV sales based on actual EV sales for key countries (including China, USA, Germany, Norway and Sweden) from MarkLines and Syrah estimate for EV sales in the rest of the world (shown in lighter shade).

Chinese Anode Production (kt)



Source: ICCSino.

Chinese Purified Spherical Graphite Exports (kt)



Source: Asian Metal.



# Q2 2021: Balama

## Operations and Production

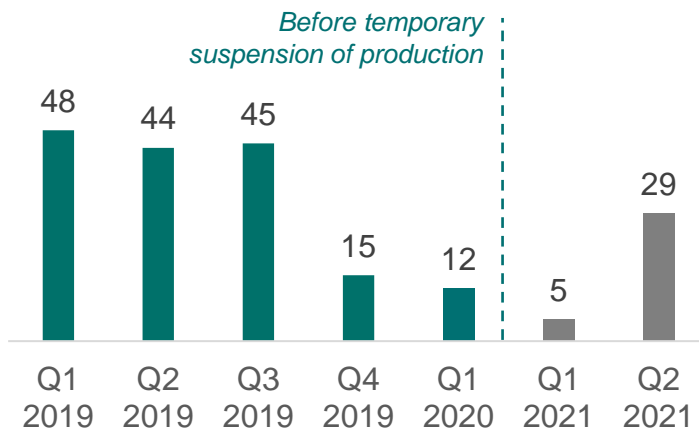
- Ramping up ahead of plan
- Produced 29kt natural graphite
- Plant recovery was above 80% in June 2021 and is expected to benefit from improvement projects
- Product quality matched the best performance during 2019 with better control over grade and recovery
- C1 cash costs (FOB Nacala) of US\$537/t at ~10kt per month average production rate
- On track to achieve target C1 cash costs (FOB Nacala) of US\$430-460/t at a 15kt per month production rate
- More than 90% of planned labour contingent reinstated



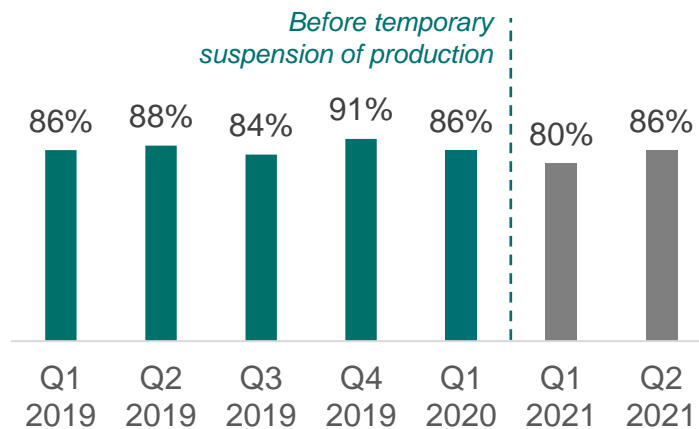


# Q2 2021: Balama

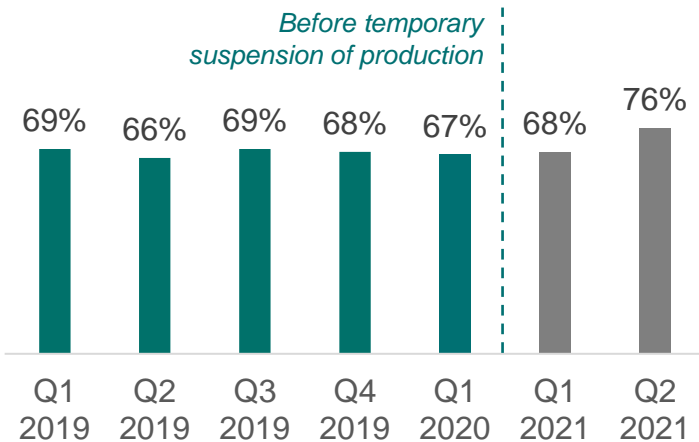
## Natural Graphite Production (kt)



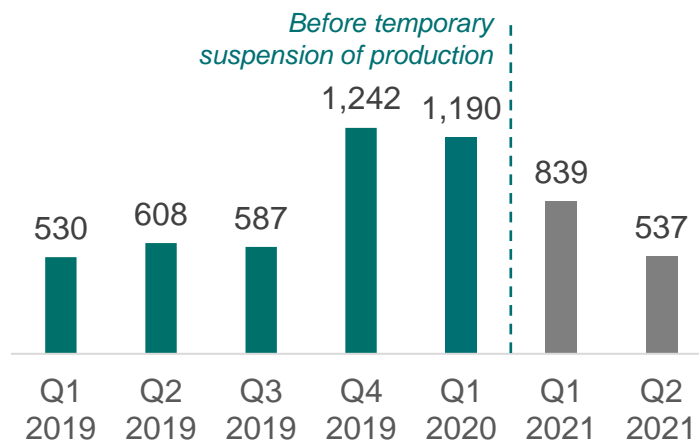
## Product Mix (% Fines)



## Plant Recovery



## C1 Costs (US\$/t)





# Q2 2021: Balama

## Sales and Marketing

- Market re-entry is well progressed
- Sold and shipped 15kt natural graphite and practically all of 20kt finished product inventory contracted to customers
- Positive demand conditions with additional end-user customers, higher contract volumes and longer tenor contracting
- Disruption in global container shipping market currently impacting ability to match Balama production and sales with customer demand
- Weighted average sales price of US\$474 per tonne (CIF)
- Stable coarse flake pricing and supportive fines conditions
- Focus on re-establishing fines shipments to the Chinese battery supply chain with fines sales accounting for 90% of overall sales impacting basket price

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## Vanadium Opportunity

- Recommended engagement with potential partners to advance Balama's vanadium opportunity



# Balama is the largest natural graphite mining/processing operation globally

## Asset Overview

Location	Southern Cabo Delgado Province, Mozambique
Reserve & Resource <sup>1</sup>	108Mt (16% TGC) Graphite Ore Reserve 1,422Mt (10% TGC) Graphite Mineral Resource
Life of Mine <sup>2</sup>	~50 years
Mining	Simple open pit mining, low strip ratio
Processing	Conventional – includes crushing, grinding, flotation, filtration, drying, screening and bagging
Plant Capacity	2Mtpa ore throughput yielding ~350ktpa; 274kt produced since 2018
Product	94% to 98% fixed carbon graphite concentrate
C1 Cost <sup>3</sup>	Forecast ~US\$330/t at full capacity

## Key Dates

Mar 2021	Production recommenced at Balama
Mar 2020	Temporary suspension of production at Balama
Sep 2019	In response to drop in flake graphite prices, production moderated
Mar 2019	Graphite Mineral Resources and Ore Reserves updated
Jan 2019	Commercial production declared, with quarterly production of 33kt
Dec 2018	Balama produced >100kt in 2018
Sep 2018	Mining Agreement finalised with Government of Mozambique
Jan 2018	Balama transitions to operations, global sales commenced
Nov 2017	First production of natural graphite
Jul 2016	Balama process plant construction commenced
May 2015	Feasibility study completed

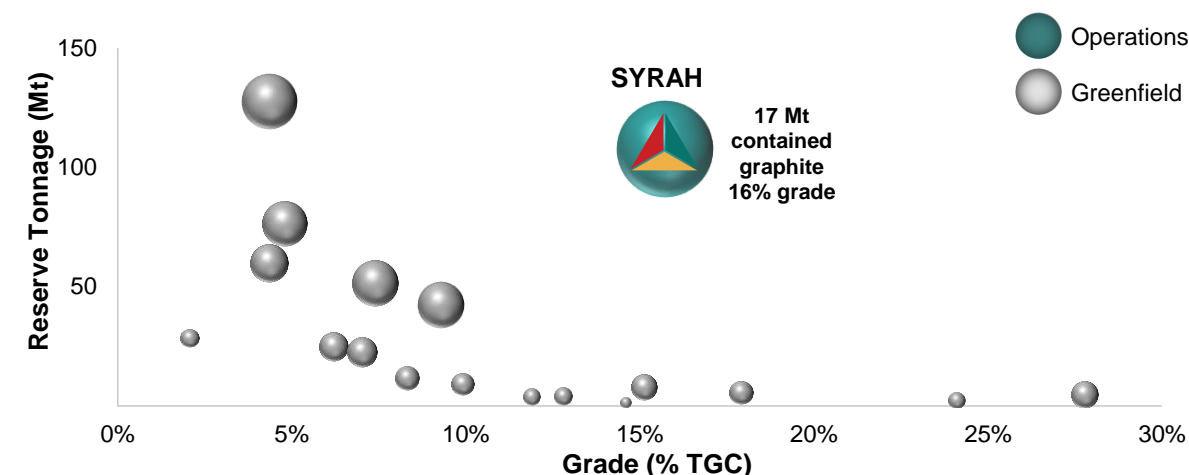
1. As at 31 December 2020.

2. Life of Mine based on Ore Reserves being depleted at 2Mt per annum of mill throughput.

3. Cash operating cost Free on Board (FOB) Nacala, excluding government royalties and taxes. ~50% of C1 costs are fixed at ~50% capacity utilisation.

4. Source: Company filings; Notes: Selected ASX/TSX-listed graphite projects with declared Reserves only and excludes Chinese producers. Bubble size reflects contained graphite reserves.

## Ex-China Natural Graphite Reserves<sup>4</sup>



## Balama Graphite Operation





# Q2 2021: Vidalia

## Operations and Production

- Fully integrated production of on-specification AAM from the furnace line<sup>1</sup>
- Integrated spherical, purification and furnace operation is producing 16-micron and 12-micron AAM for qualification using Balama natural graphite
- New organisational structure implemented with Anne Duncan commencing as Vice President of USA Processing Operations

## Product Development

- Base 16-micron AAM and premium 12-micron AAM
- Prompt turnaround and iteration from Vidalia operational capability
- R&D for future products that achieve quality/performance, cost and sustainability objectives
- Partnering with customers, industry, laboratories and universities on development

## Customer Engagement and Product Qualification

- Engaged with more than 10 target battery manufacturer and auto OEM customers on product qualification and advanced testing programs underway with key target customers
- Half cell testing of integrated AAM confirmed electrochemical performance is consistent with toll treated AAM
- Continuing full cell testing of toll treated and integrated AAM in Q3 2021

1. Refer ASX release 17 May 2021.

# Q2 2021: Vidalia

## Expansion Project

- Transitioned to detailed engineering and procurement for expansion of production capacity to 10ktpa AAM
- Worley awarded services contract for detailed engineering and procurement<sup>1</sup>
- Proceeding with procurement and fabrication of selected long-lead, critical path items to maintain the project schedule

## Construction Funding

- Advancing processes to secure customer, strategic partners and financing commitments for the construction of a 10ktpa AAM facility
- Final investment decision planned for H2 2021, subject to customer and financing commitments

## Market

- US Government mandate to urgently develop a domestic lithium-ion battery supply chain including upstream critical minerals extraction and processing
- Auto OEMs committing to transformational electrification strategies and joint ventures with battery makers
- Pipeline of battery capacity in the USA is rapidly accelerating - 10kt AAM equates to 3% of total graphite AAM required for 2025 forecast battery capacity in the USA<sup>2</sup>

1. Refer ASX release 29 June 2021.

2. Source: Benchmark Minerals Battery Megafactory Assessment, July 2021 and Flake Graphite Forecast, Q2 2021.  
Based on 2025 forecast USA battery capacity of 253GWh, 95% graphite anode market share and 1.2 kg/kWh intensity of graphite in anode.





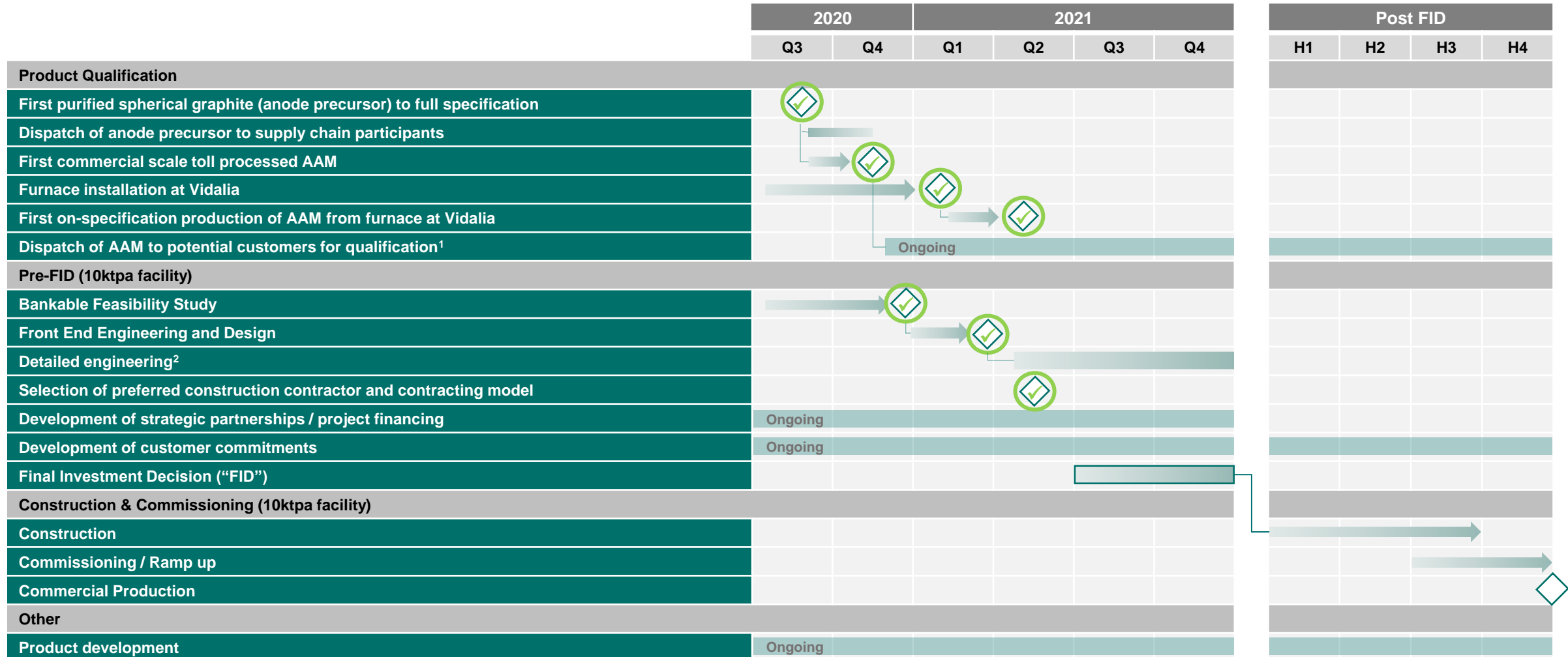
# De-risking Vidalia expansion

Date	Key Milestones
Jun 2021	✓ Worley awarded engineering and procurement services contract
Jun 2021	✓ Transitioned to detailed engineering for 10ktpa AAM facility
Jun 2021	✓ Integrated AAM dispatched to potential customers for qualification
May 2021	✓ First fully integrated production of AAM from Vidalia
Mar 2021	Transition to initial detailed design for 10ktpa AAM facility
Mar 2021	Installation and commissioning of furnace
Dec 2020	BFS confirms robust economics for large scale AAM production
Nov 2020	Dispatched AAM (toll treated) for product qualification by customers
Oct 2020	First production of AAM (toll treated) using anode precursor from Vidalia
Jul 2020	First production of purified spherical graphite to battery specification from Vidalia
Dec 2018	First production of unpurified spherical graphite at Vidalia
Sep 2018	Phase 1 study completed for large-scale AAM production at Vidalia
Aug 2018	Vidalia site purchase completed
Mar 2018	Benchmarking of AAM produced from Balama graphite completed
Nov 2016	Syrah announces plans to establish commercial scale facility in Louisiana
Apr 2016	Pilot test work program initiated in China (milling and purification)

**Q2 2021  
Milestones  
Achieved**



# Progressing Vidalia to become an integrated natural graphite AAM producer



1. Evaluation by potential customers is an iterative process of product quality and performance assurance. Production of AAM samples will be ongoing post initial production volumes to support this process.
2. Project development pathway beyond detailed engineering to be informed by customer and financing commitments.

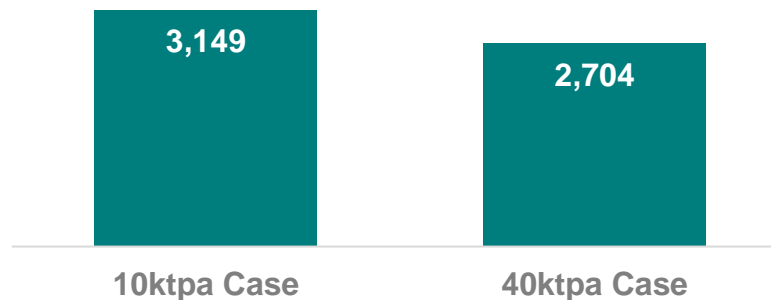
# Vidalia BFS confirms attractive margins at current AAM prices

## BFS key outcomes

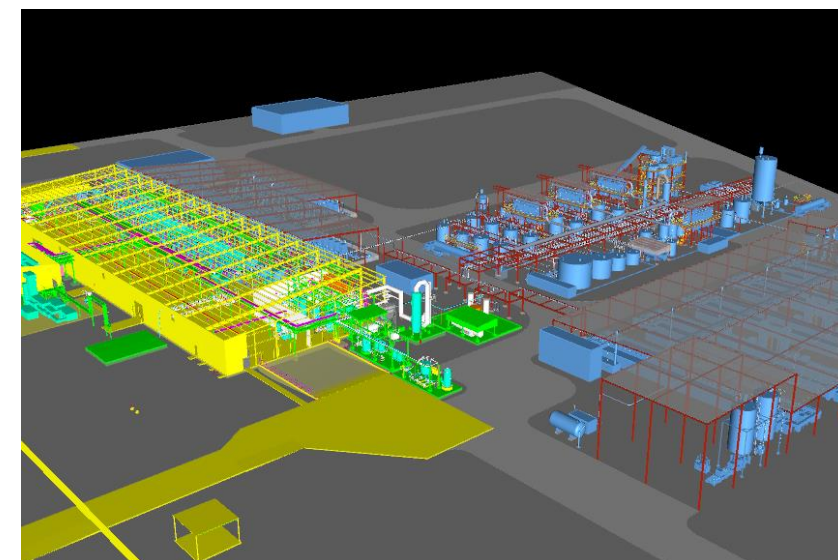
Metric	Units	10ktpa Facility	40 ktpa Facility
Annual processed graphite	ktpa	18	73
AAM production	ktpa	10	40
By-product production	ktpa	8	33
By-product price	US\$/t	250	250
Capital cost estimate <sup>(1)(2)</sup>	US\$m	138	477
Operating cost estimate (all-in) <sup>(2)(3)</sup>	US\$/t AAM	3,149	2,704

## Operating cost – US\$/t AAM

Observable natural graphite spot AAM price<sup>4</sup>:  
US\$5,400/t



## 3D BFS model (10ktpa facility)

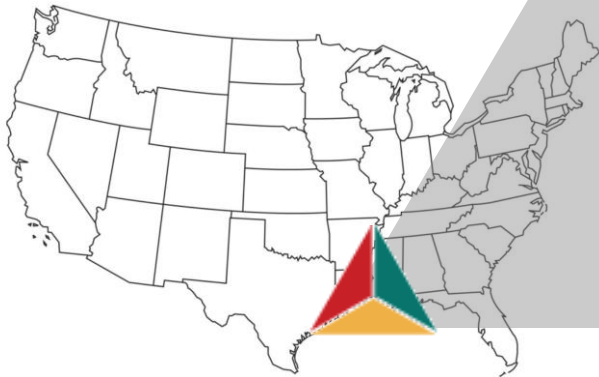


1. Exclusive of: owners' costs associated with the expansion to 10ktpa, estimated at approx. US\$4m to first production for 10ktpa facility; working capital; and, ongoing cost associated with product qualification and technical product development activities.
2. Capital and operating cost estimates to accuracy of ±15% and ±30% for 10ktpa and 40ktpa, respectively.
3. The operating cost is an estimate delivered all-in cost. The operating cost estimates assume natural graphite cost of US\$400/t (FOB Nacala), which reflects an approximate all-in cost of production at Balama at full plant utilisation. All-in cost of Balama production (FOB Nacala) is an approximation based on next 30 years of the mine plan at Balama and full utilisation of the processing plant at design capacity.
4. Price is the midpoint of "domestic/mid-range" natural graphite anode material price reported by China Industrial Association of Power Sources as of 12 July 2021 - <http://www.ciaps.org.cn/>. Prices converted at 6.66 USDCNY.



# Vidalia is well located for large-scale AAM production

- ✓ Proximity to potential customers
- ✓ Access to key utilities
- ✓ Options to expand facility size
- ✓ Direct barge/port access to Mississippi river
- ✓ Supportive government relations
- ✓ Access to key consumables (HF, HCL, Caustic)
- ✓ Capable workforce



Images clockwise from left: Overview of Syrah's Vidalia property and surrounds; Syrah's Vidalia facility Northeast looking southwest; Syrah's Vidalia facility south looking north



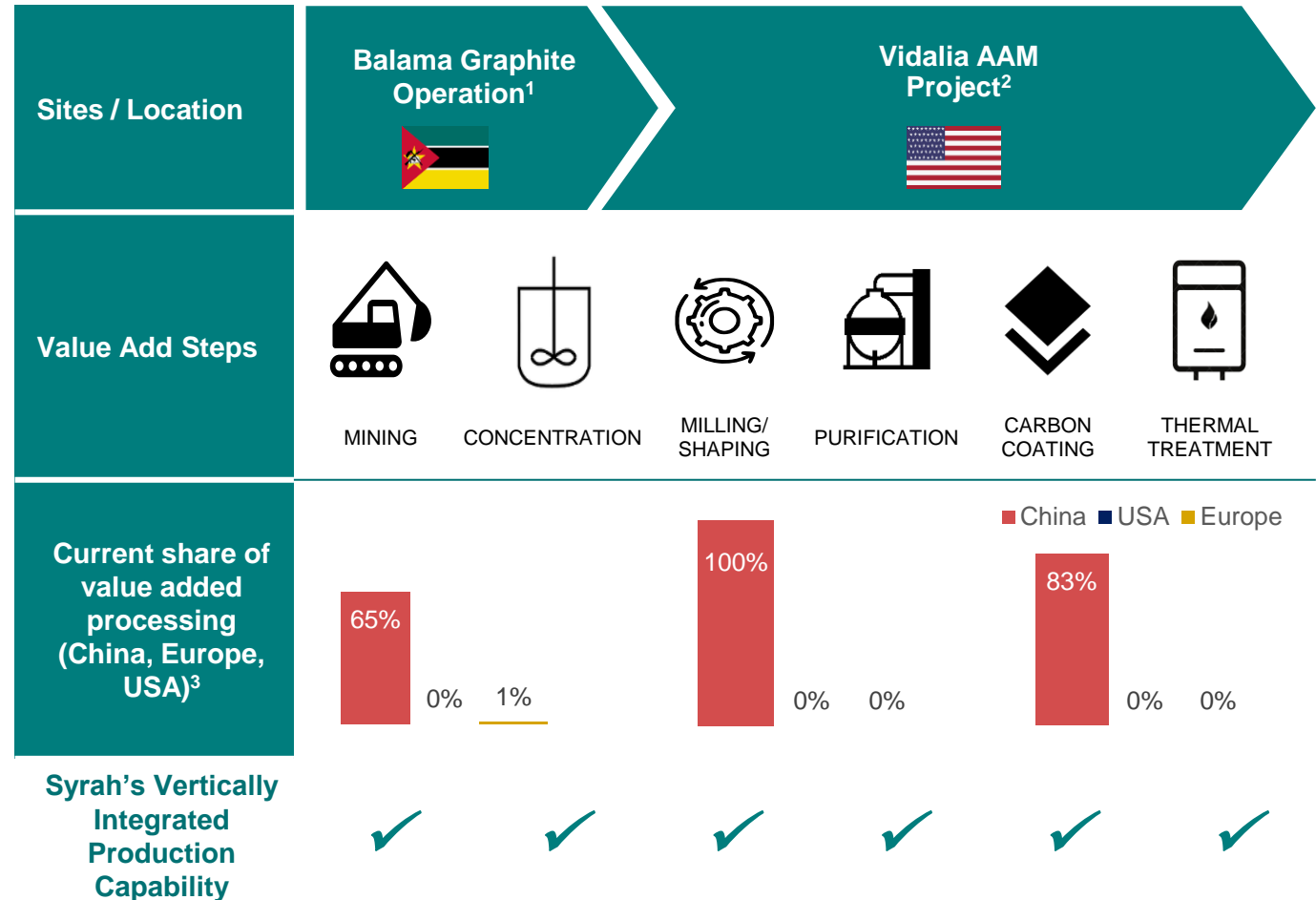
# Vertical integration through to AAM in USA will be a key differentiator for Syrah as the market matures

## Benefits of vertical integration to Syrah:

- Margin capture / cost protection
- Attractive financial returns
- Enhanced channel to market and customer diversity

## Benefits of vertical integration to battery makers / auto OEMs:

- Security of supply
- Optimisation of supply chain management
- Single chain of custody / full ESG auditability



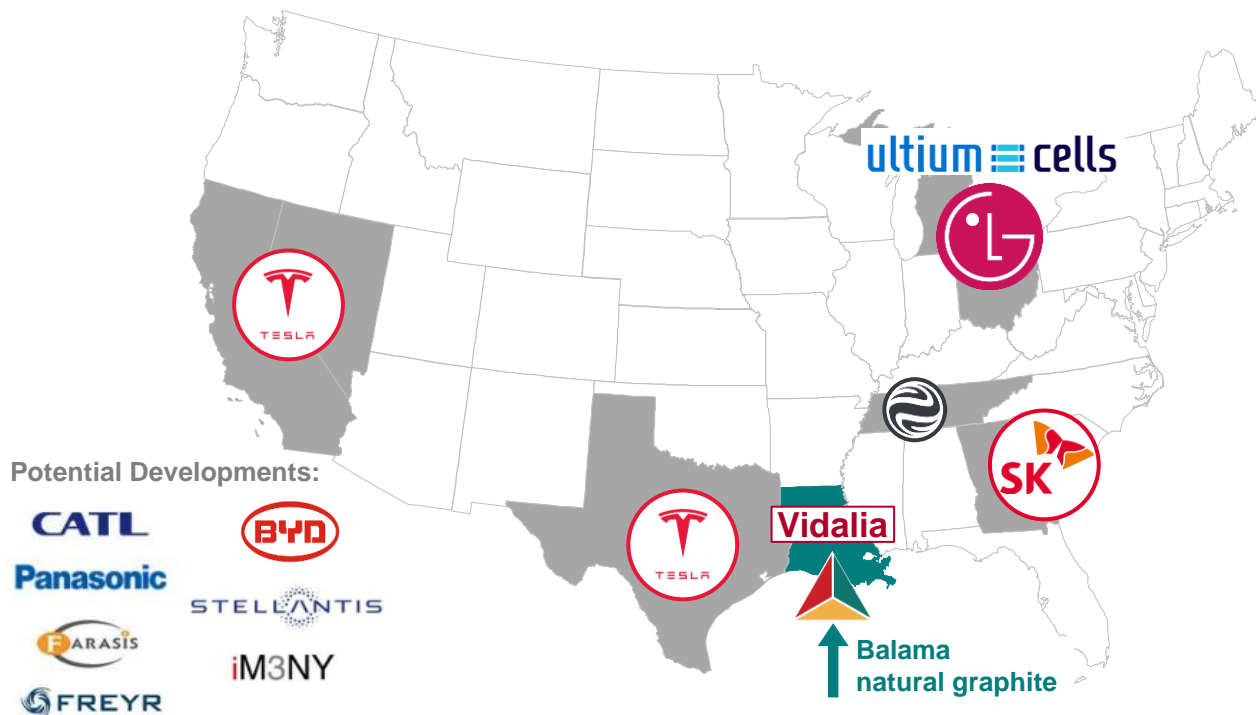
1. Balama has capacity to produce 350ktpa natural graphite. Syrah has the option to use 3rd party natural graphite concentrate for toll feed at Vidalia subject to feed being appropriately qualified.

2. With the installation of the furnace, Vidalia has capacity to produce AAM on-site for ongoing product qualification. Bankable Feasibility Study (ASX release dated 1 December 2020) assessed options to expand the AAM facility to 10ktpa and 40ktpa AAM production capability.

3. Syrah Resources analysis, data from Benchmark Minerals Intelligence.

# Vertically integrated anode production, co-located with planned USA battery factories

## Location of Planned Battery Capacity in USA



- Battery manufacturers/OEMs are constructing and have committed to significant new capacity in the USA – USA capacity is forecast to grow to ~253GWh by 2025 and ~487GWh by 2030
- 10kt AAM equates to 3% of total graphite AAM required for 2025 forecast USA capacity<sup>1</sup>

## Planned Battery Capacity in USA

Company	Size (GWh)	Location	Status / Start
Panasonic (PENA)	49	NV	Construction / 2022 (35 GWh operating)
Tesla	10	CA	Pilot / Operating
Tesla	95	TX	Under construction / 2022
LG	5	MI	Operating
LG (Green Field Project)	75	MI / TBC	Planning / From 2025
GM / LG (Ultium Cells 1)	35	OH	Under construction / 2022
GM / LG (Ultium Cells 2)	35	TN	Planning / 2023
SKI	~10 + ~12	GA	Under construction / 2022
Ford / SKI (BlueOvalSK)	60	TBC	Planning / From 2025
AESC Envision	10	TN	Planned / 2025 (3 GWh operating)
iM3NY	5	NY	Planned / 2025 (1 GWh operating)
Saft	1	FL	Operating
Farasis	8-16	TBC	Planning / 2023-4
Microvast	2	TN	Planning / 2022
AKASOL	2	MI	Planning / 2023

Source: Benchmark Minerals Battery Megafactory Assessment, July 2021 and Flake Graphite Forecast, Q2 2021

1. Based on 2025 forecast USA battery capacity of 253GWh, 95% graphite anode market share and 1.2 kg/kWh intensity of graphite in anode.

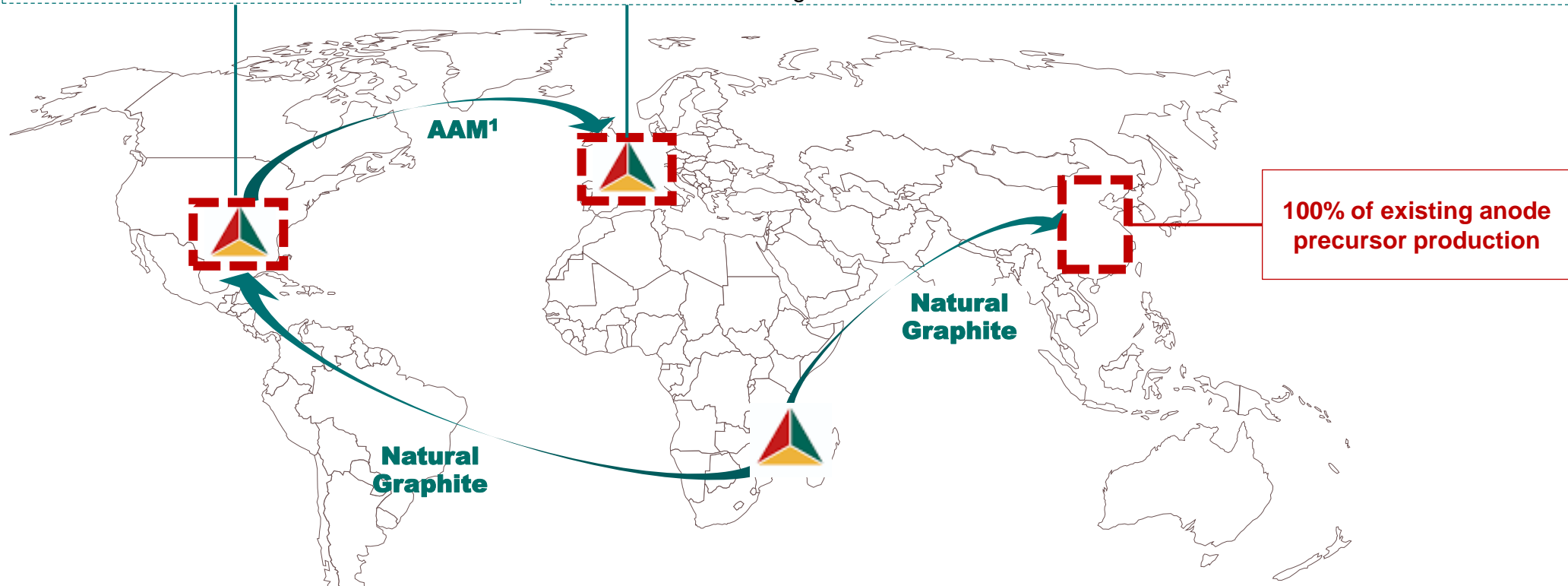
# Syrah is a near-term AAM supply option for USA and European markets

## Vidalia Battery Anode Material Project

- Establishing USA-based AAM production vertically integrated with Balama

## Export Markets

- Potential for Syrah to export from USA to ex-USA markets
- Potential to provide ex-China supply chains with alternate and complimentary source of AAM versus existing sources



1. AAM: Active Anode Material.

## H2 2021 outlook

EV sales growth and constructive demand environment for anode material is balancing the natural graphite market

Increasing Balama production towards at least 15kt per month with consideration of market demand and forward customer contracting

Progressing to FID for expansion of production capacity to 10ktpa AAM at Vidalia to become a vertically integrated producer of natural graphite AAM to supply ex-Asia markets

Maintaining liquidity for Balama operations under various market scenarios and to advance Vidalia to FID

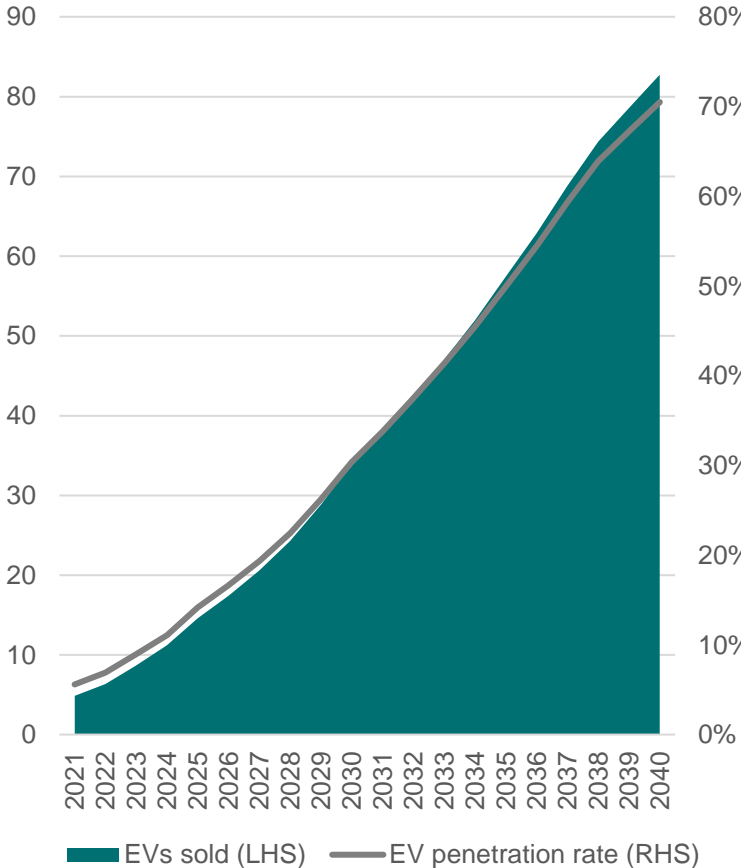




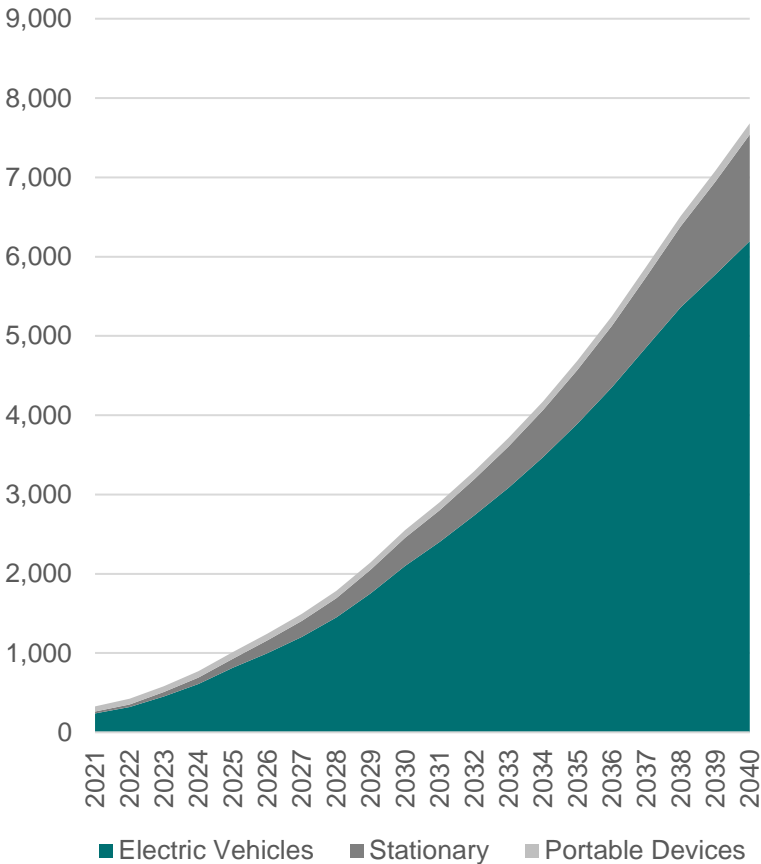
# APPENDIX

# Battery and natural graphite fines (-100mesh) demand in early stages of growth – driven by EV adoption

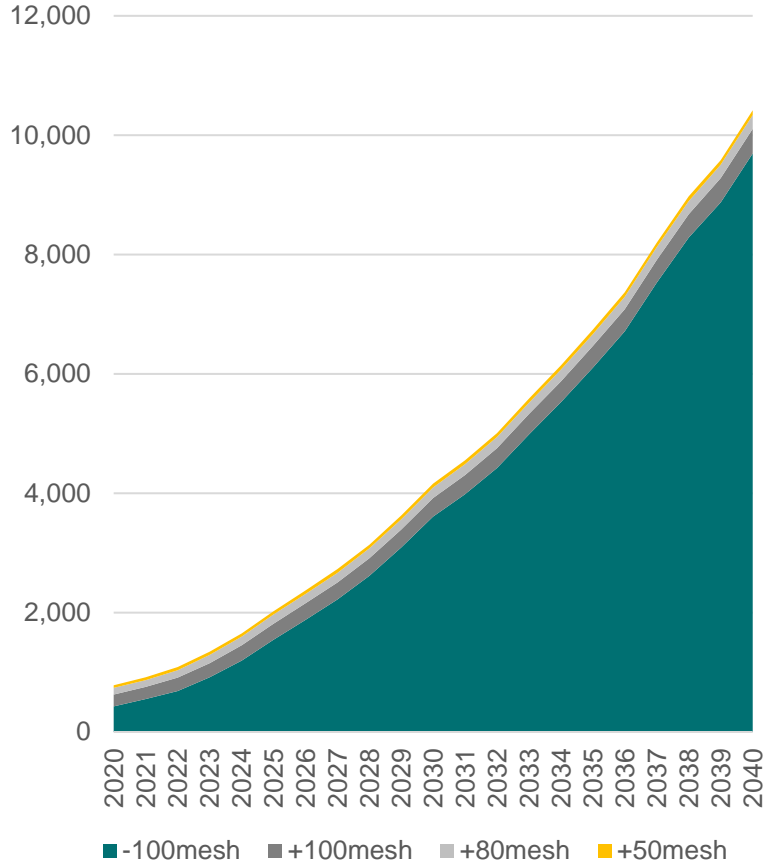
Global EV Sales (Millions)



Lithium-ion Battery Capacity (GWh)



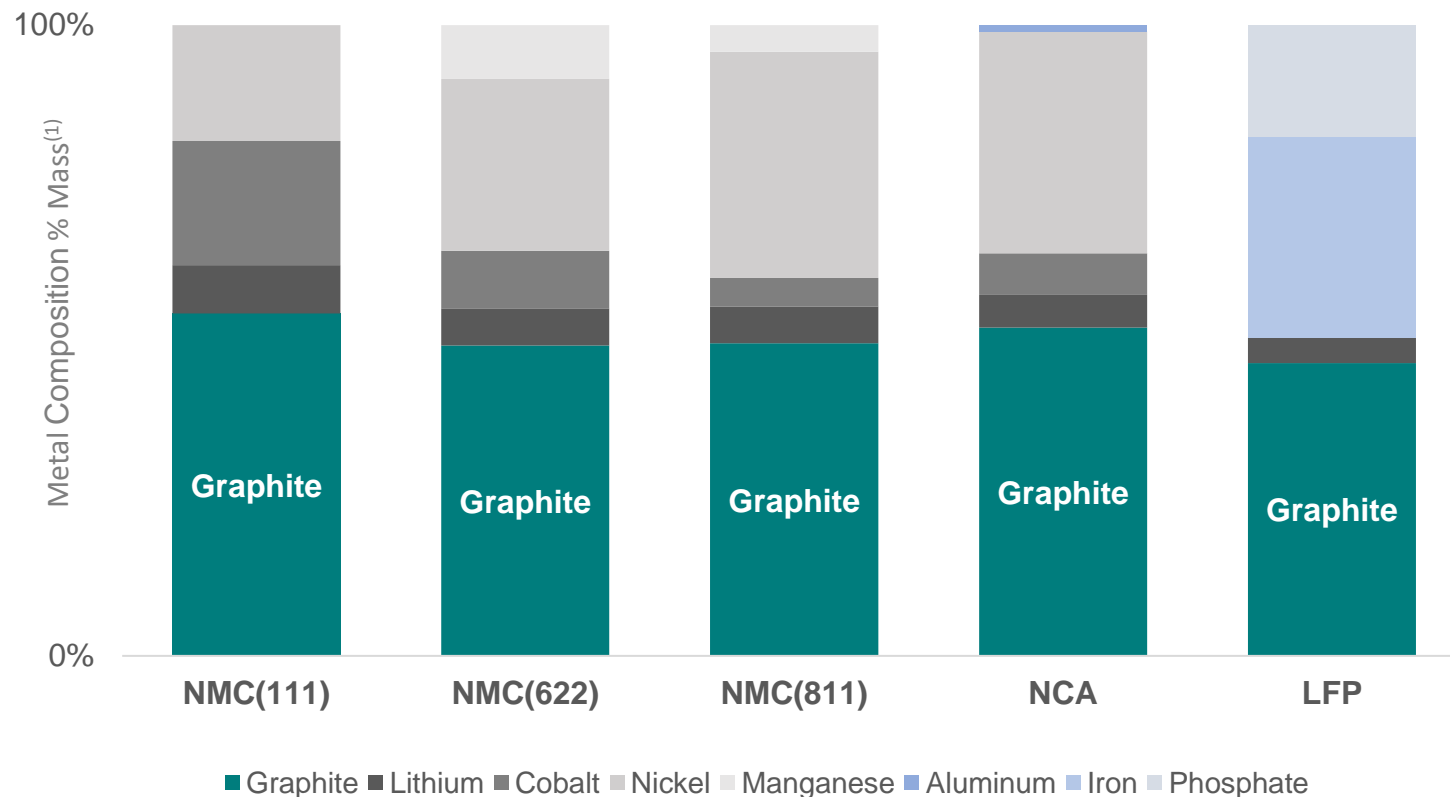
Natural Graphite Demand (kt)



Source: Benchmark Minerals Intelligence Flake Graphite Forecast, Q2 2021.

# Graphite is a high intensity material in EV batteries – costs/emissions expected to drive shift towards natural graphite

**Battery Mineral Composition of Batteries**



Source: Syrah Resources analysis, data from Gaines, L., Richa, K., & Spangenberg, J. (2018) Key issues for Li-ion battery recycling (excludes oxygen), Benchmark Minerals Intelligence.

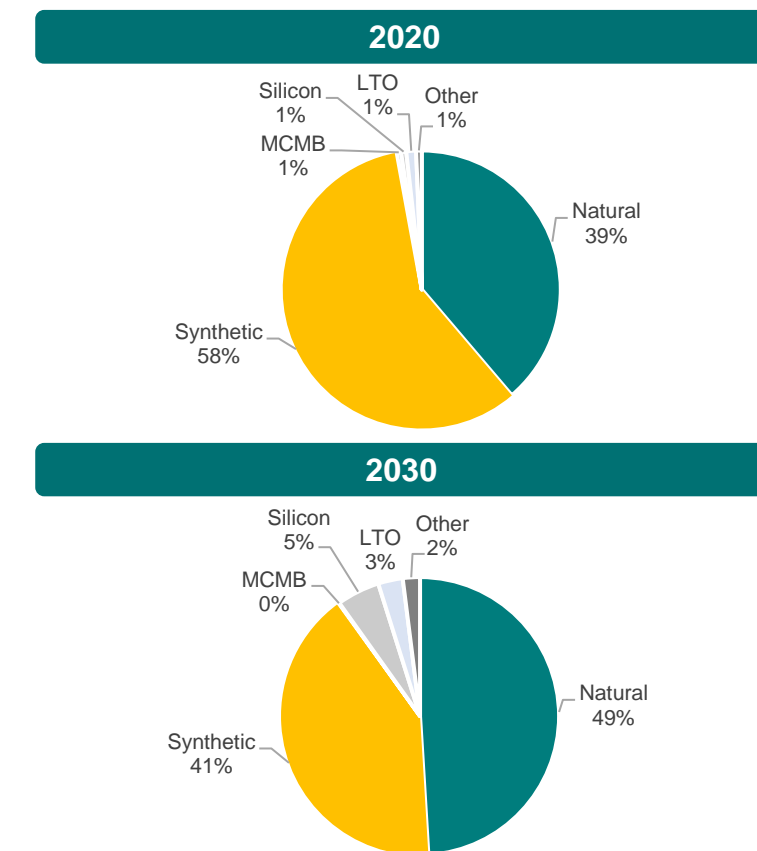
NMC: Lithium nickel manganese cobalt oxide battery.

NCA: Lithium nickel cobalt aluminium oxide battery.

LFP: Lithium iron phosphate battery.

1. Shown as percent of the total sum by elemental mass featured in the analysis for each battery chemistry, excludes oxygen (cathode).

**Natural Graphite Demand for Batteries**



Source: Source: Benchmark Minerals Intelligence Flake Graphite Forecast, Q2 2021.

# EV makers committed to LiB technology for expansion – advances required for commercial transition to solid state

EV  
Manufacturers



Current  
Battery  
Supplier



Future  
Battery  
Supplier



Targeting partnerships in Europe for 240GWh by 2030



Targeting partnerships in US for 70GWh by 2025



Targeting partnerships in Europe 60GWh by 2025



Targeting supply arrangements and partnerships in US and Europe for 260GWh by 2030

Transition  
Plan





# Syrah's global business to supply growing battery anode demand

