



ENGINEERING CLEAN ENERGY

Business Update

ASX: EGR
FSE: FMK

February 2021

www.ecograf.com.au

Disclaimer



Securities Disclaimer

This presentation is for informational purposes only and does not constitute an offer to sell, or solicit to purchase, any securities. Such offer can be made only through proper subscription documentation and only to investors meeting strict suitability requirements. Any failure to comply with these restrictions may constitute a violation of applicable securities laws.

Forward looking statements

Various statements in this document constitute statements relating to intentions, future acts and events. Such statements are generally classified as “forward looking statements” and involve known and unknown risks, uncertainties and other important factors that could cause those future acts, events and circumstances to differ materially from what is presented or implicitly portrayed herein. The Company gives no assurances that the anticipated results, performance or achievements expressed or implied in these forward-looking statements will be achieved.

Production targets and financial information

Information in relation to the feasibility study conducted on the production of battery graphite using the Company’s EcoGraf technology, including production targets and forecast financial information derived from the production targets, included in this document is extracted from an ASX announcement dated 5 December 2017 “Battery Graphite Pilot Plant”, as updated on 17 April 2019 “EcoGraf Delivers Downstream Development” and 5 November 2020 “Completion of EcoGraf™ Processing Facility Development Report”, available at www.ecograf.com.au and www.asx.com.au. The Company confirms that all material assumptions underpinning the production targets and forecast financial information derived from the production targets set out in the announcement released on 5 December 2017, as updated on 17 April 2019 and 5 November 2020 continue to apply and have not materially changed.

Information in this document relating to the Bankable Feasibility Study conducted on the Epanko Graphite Project, including production targets and forecast financial information derived from the production targets, included in this document is extracted from an ASX announcement dated 21 June 2017 “Updated Bankable Feasibility Study” available at www.ecograf.com.au and www.asx.com.au. The Company confirms that all material assumptions underpinning the production targets and forecast financial information derived from the production targets set out in the announcement released on 21 June 2017 continue to apply and have not materially changed.

Competent persons

Any information in this document that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr Andrew Spinks, who is a Member of the Australasian Institute of Mining and Metallurgy included in a list promulgated by the ASX from time to time. Andrew Spinks is a director of EcoGraf Limited and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Andrew Spinks consents to the inclusion in this document of the matters based on his information in the form and context in which it appears.

Information in this document that relates to Mineral Resources is based on information compiled by Mr David Williams, a Competent Person, who is a Member of the Australasian Institute of Mining and Metallurgy. David Williams is employed by CSA Global Pty Ltd, an independent consulting company and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. David Williams consents to the inclusion in this document of the matters based on his information in the form and context in which it appears.

Information in this document that relates to Ore Reserves has been compiled by Mr Steve O’Grady, who is a Member of the Australasian Institute of Mining and Metallurgy. Steve O’Grady is a full-time employee of Intermine Engineering and produced the Mining Reserve estimate based on data and geological information supplied by Mr Williams. Mr O’Grady has sufficient experience which is relevant to the estimation, assessment and evaluation of the economic extraction of the Ore Reserve that he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Steve O’Grady consents to the inclusion in this document of the matters based on his information in the form and context in which it appears.



Vertically integrated **HFfree™ battery anode material business** supporting the global transition to clean energy and e-mobility



BATTERY PRODUCTS

**Western Australia
development ready
20,000tpa processing facility**

RECYCLING

**Recovery of battery
anode materials from
lithium-ion batteries**

NATURAL GRAPHITE

**Scalable mining projects
for long-term supply of
graphite products**

HFfree™ = Purification process eliminates Hydrofluoric (HF) Acid

Valuation proposition



Battery Graphite Manufacturing Australia

- ✓ 20,000tpa Battery Graphite
 - ✓ US\$35m Annual EBITDA
 - ✓ 42.4% Internal Rate of Return
 - ✓ US\$642m Pre-tax project NPV₈
 - ✓ US\$448m Pre-tax¹ equity NPV₈
- Payback ~3.3yrs

Vertically integrated battery anode material business positioned for the global transition to clean energy

TANZGraphite

Epanko Graphite Project Tanzania

- ✓ 60,000tpa Natural Flake Graphite
- ✓ US\$44.5m Annual EBITDA
- ✓ 38.9% Internal Rate of Return
- ✓ US\$211m Pre-tax equity NPV₁₀
- ✓ US\$3B Forecast Contribution to Tanzania

Development ready businesses forecast to generate US\$80m EBITDA per annum

ECOGRAF LOCATIONS



Recycling – Recovery of Battery Anode Materials

- ✓ Significant results achieved
- ✓ Production waste – large market
- ✓ Lower battery cost and emissions
- ✓ Blended anode material - opportunity
- ✓ Engineering design for pilot plant commenced

Proprietary EcoGraf™ purification technology provides sector leading ESG credentials with application to battery recycling industry

#1: Post-tax equity NPV₈ is US\$317m (refer ASX Announcement *Completion of EcoGraf™ Processing Facility Development Report* 5 November 2020)

Corporate summary



Board and Executive Management



Chairman
Robert Pett



Managing Director
Andrew Spinks



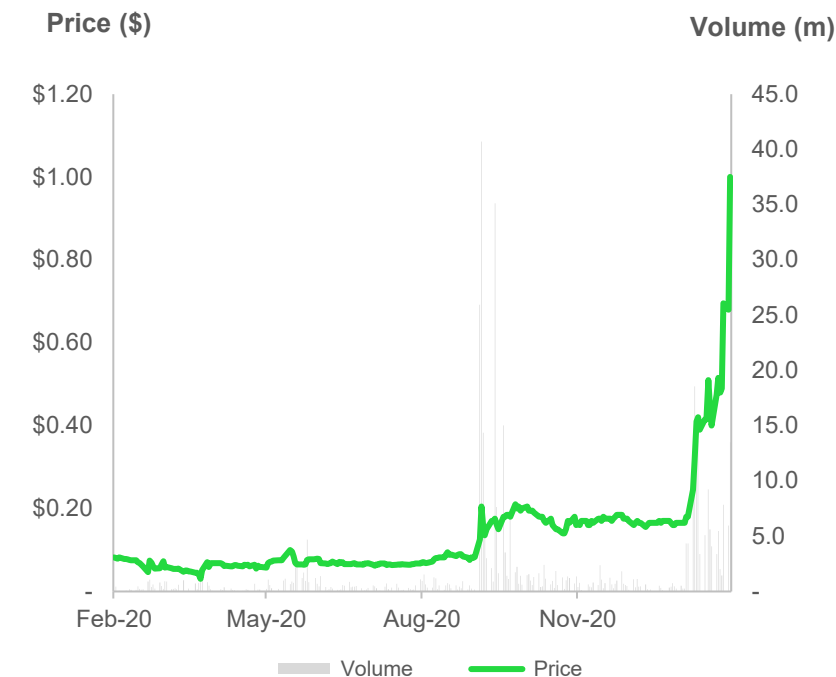
Director
John Conidi



Chief Financial Officer
Howard Rae



Share Price Performance

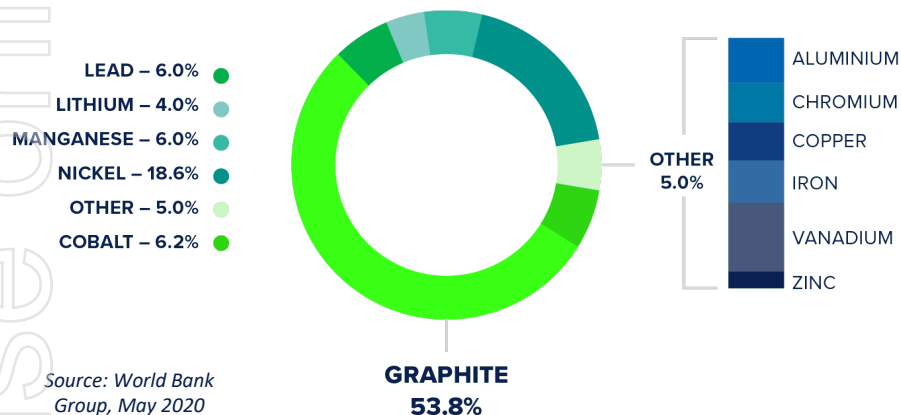



Capital structure	Major shareholders	ASX : EGR Börse Frankfurt : FMK
Ordinary fully-paid shares 363,986,768	JP Morgan Nominees 19.6% Mitsubishi UFJ Group 12% Board & Management 10%	Share price (9 Feb) A\$1.00 Market capitalisation A\$363m

Compelling lithium-ion battery market opportunity



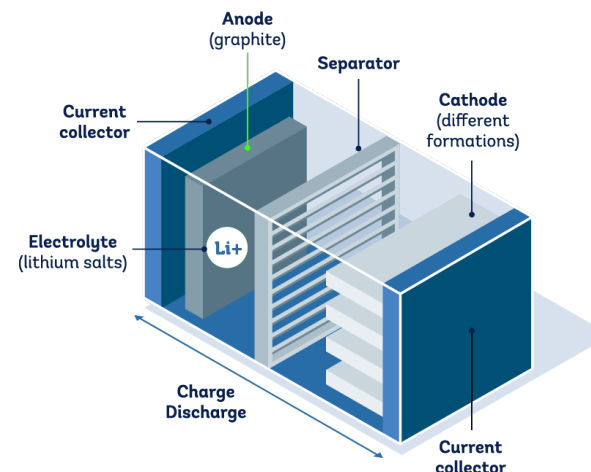
Graphite forecast to dominate battery mineral demand to 2050



 **27kg** Purified natural graphite per EV
Requires 50-55kg of flake graphite

Battery graphite is processed from natural flake graphite into a +99.95% high purity product suitable for anode manufacturing

EV market forecast to drive +700% growth in natural graphite demand by 2025 Roskill



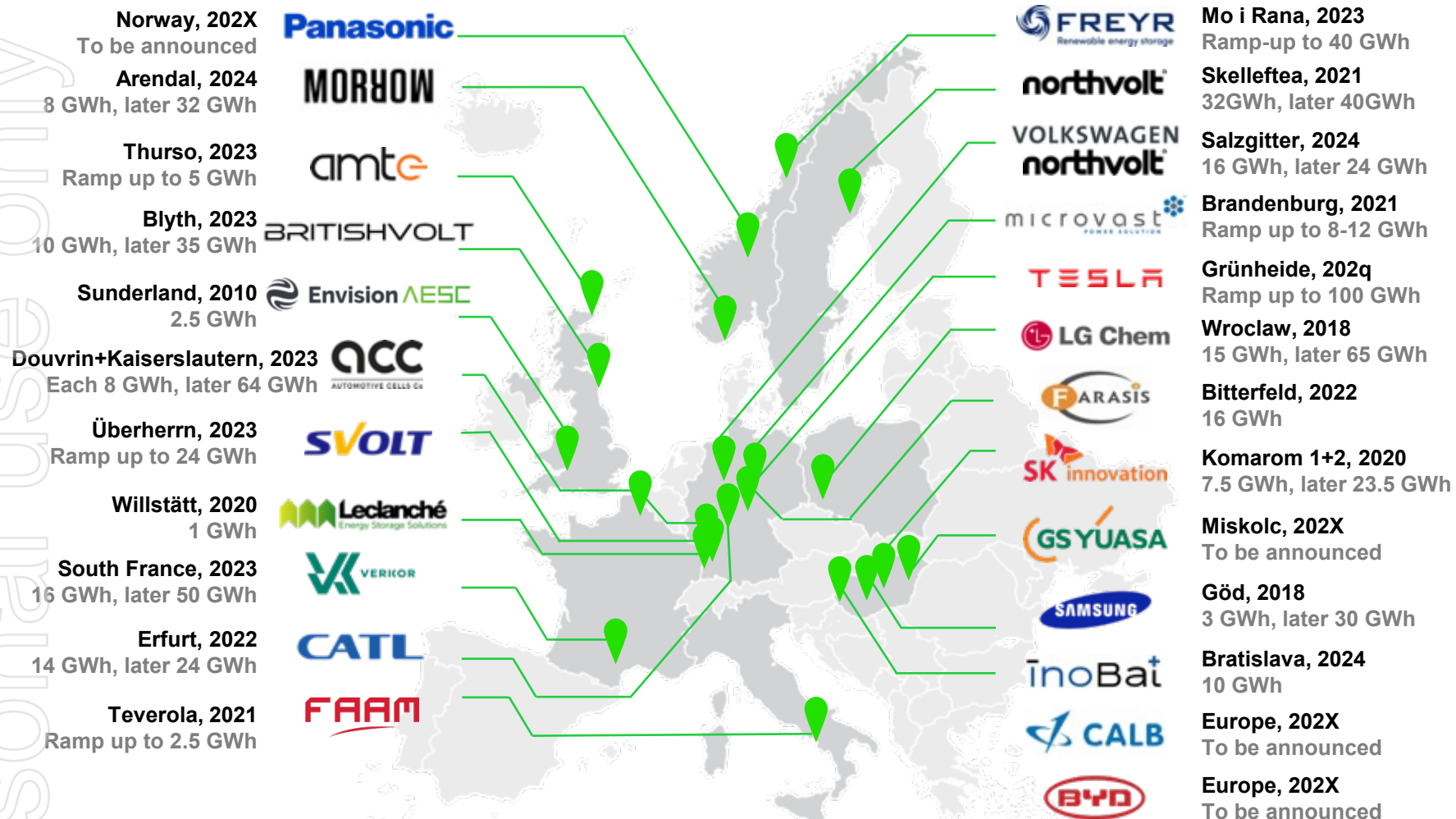
Source: World Bank Group, May 2020



EcoGraf™ provides a high quality, cost competitive alternative to existing battery graphite produced using toxic hydrofluoric acid

Unprecedented investment in new European battery capacity

24 Gigafactories announced with 600 GWh total annual production capacity
= 9-10 million electric vehicles per year



Source: Roland Zenn Jan 2021

- ✓ EU Fastest Growing Market in the World
- ✓ Demand Requires New Supply
- ✓ Increasing Requirement for Low Carbon Supply Chains Coupled With Greater Recycling
- ✓ Exposure to European Supply Chains from Strong Partnership with thyssenkrupp AG



EU Commission's battery regulation

NEW MEASURES ANNOUNCED IN DECEMBER 2020:

Maroš Šefčovič's – European Commission VP: *"We need to diversify supply and make better use of the resources within the European Union, where we would apply the highest environmental and social standards to that effect."*



Responsible sourcing. New mandatory procedures to ensure sustainable and ethical sourcing of raw materials such as graphite.



Carbon (CO₂) footprint, performance and durability labelling. All batteries sold in Europe must declare their carbon footprint.



Traceability. All raw materials used in batteries to be procured according to OECD recognised guidelines for sustainable sourcing. Thanks to blockchain technology, each battery will have a digital passport tracking all upstream components.



Recycling and establishing a circular economy. A minimum proportion of battery content to be made up of recycled materials. To close the loop and retain valuable materials used in batteries - such as cobalt, lithium, nickel and graphite - for as long as possible, the Commission proposes to establish new requirements and targets on the collection, treatment and recycling of batteries.



Raw Materials & European Raw Materials Alliance



European Battery Alliance



EIB new energy lending policy supporting projects relating to the supply of critical raw materials

Battery graphite business summary



Establishing the world's first commercial battery graphite purification facility outside of China

Initial commercial production plant commencing at 5,000tpa, expanding to 20,000tpa

- ✓ EcoGraf™ **HFFree™** proprietary purification process eliminates use of toxic hydrofluoric acid
- ✓ Feasibility, engineering design and costing studies completed by GR Engineering Services
- ✓ Four years of pilot plant test work undertaken in Germany:
 - ✓ Successful application of EcoGraf™ purification process to a range of global feedstock supplies
 - ✓ Long-term feedstock agreement with leading German trading group TECHNOGRAFIT GmbH
- ✓ Extensive product testing completed and long-term sales via thyssenkrupp AG
- ✓ Financing with Australian Government for US\$35 million debt facility
- ✓ Finalising construction, operations and maintenance arrangements



EcoGraf first facility to meet the growing global demand



Capital investment

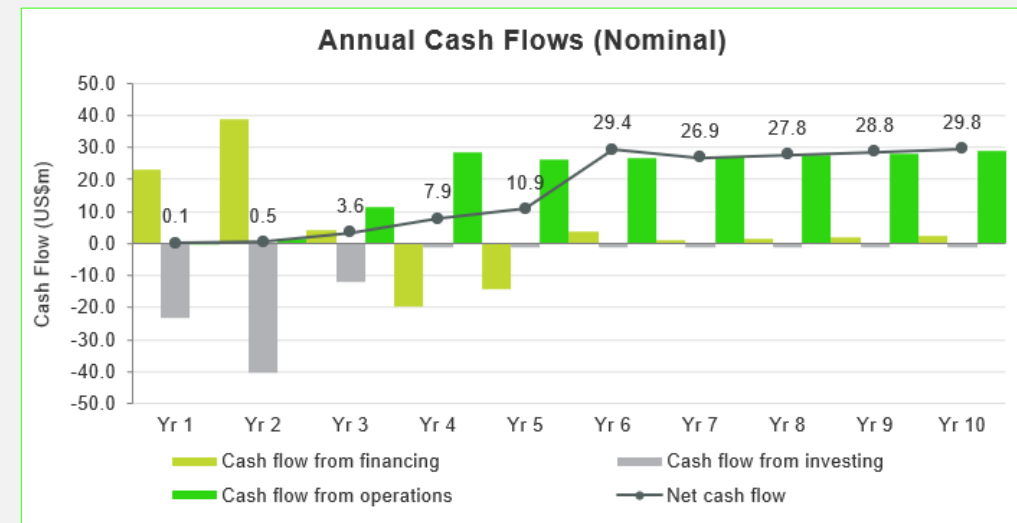
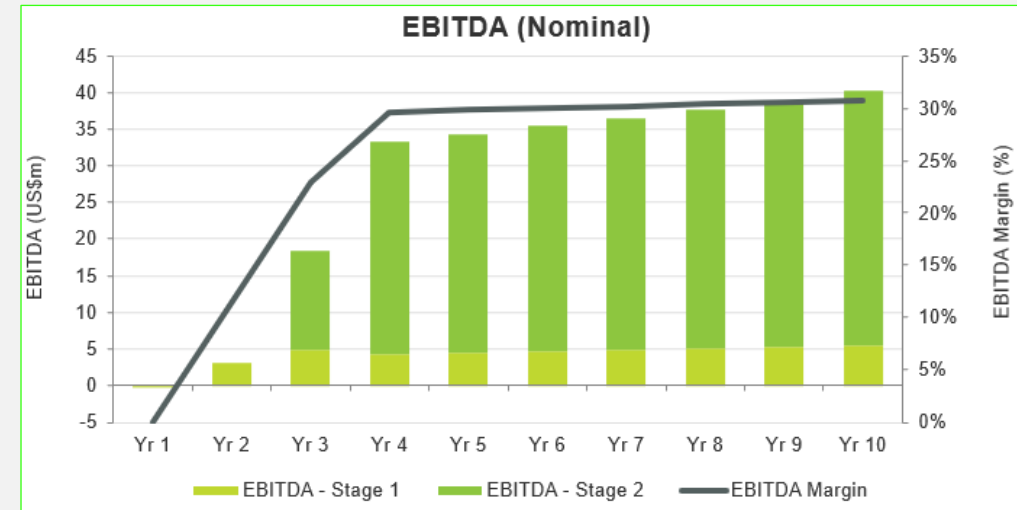
Financial returns @ 20,000tpa

Initial 5,000tpa	15,000tpa Expansion	Pre-tax project NPV ₈	Pre-tax equity NPV ₈	Annual EBITDA	IRR
US\$22.8m	US\$49.2m	US\$642m	US\$448m	US\$35m	42.4%

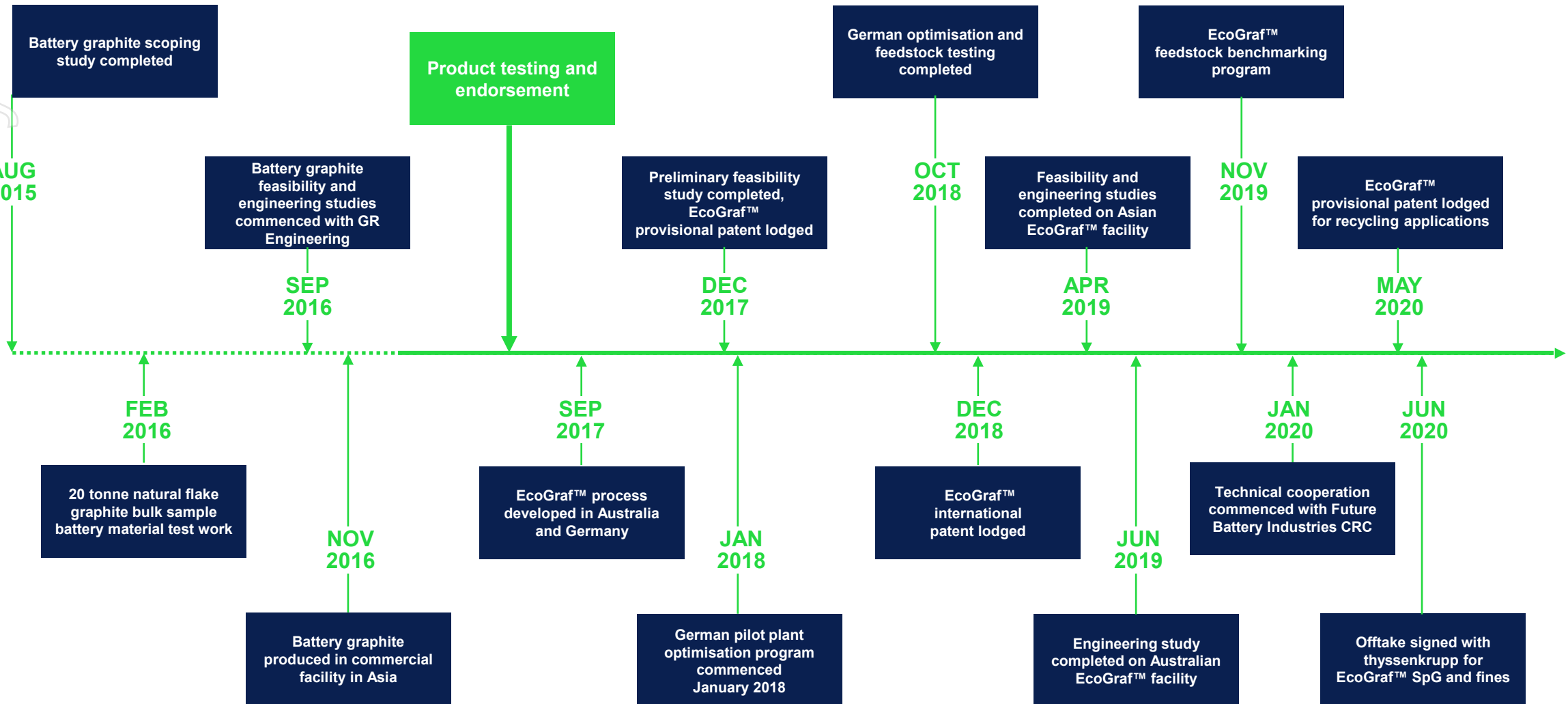
Strong economic returns

- World's first purified spherical graphite processing facility outside of China at a time when electric vehicle, battery and anode producers are actively seeking to diversify battery mineral supply chains.

Demand for spherical graphite forecast to grow 31.5% per annum over the next decade and reach 1.2 million tonnes per annum by 2030



EcoGraf™ development timeline



Initial battery graphite facility to be constructed in Western Australia



Staged expansion from 5,000tpa to 20,000tpa



Flexibility via scalable modular design



[PLAY MOVIE](#)

WA Kwinana-Rockingham Industrial Zone (KRIA)

Downstream value-added manufacturing and scientific research for the lithium-ion battery market



FBI CRC, Cooperative Research Centre at Curtin University

CSIRO, National Scientific Organisation

Albemarle, Lithium/Bromine/Catalyst Solutions, *Producer*

EcoGraf, Battery Graphite, *Engineering works for Construction*

BHP Nickel West, Nickel Refinery, *Producer*

FYI Resources, HPA Manufacturing, *Under Planning*

Hazer, Hydrogen/Synthetic Graphite, *Pilot Plant*

Mineral Resources, Lithium, *Producer*

BP Australia, Oil Refinery, *Producer*

Covalent Lithium, Lithium, *Under Planning*

Tianqi Lithium, Lithium, *Under Construction*

BASF, Chemical Manufacturer

Independence Group, Nickel/Copper/Cobalt, *Producer*

Coogee Chemicals, Chemical Manufacturer

Alcoa of Australia, Alumina Refinery, *Producer*



WA Government's \$4.7B Westport development in Kwinana highlights the transformation expected.



"Global uptake of electric vehicles presents significant opportunities for industry in Western Australia. We have among the world's largest reserves for all the critical battery minerals and we have the skills, infrastructure and standards to become a key player in the global battery value chain."

2020 STATE ELECTRIC VEHICLE STRATEGY FOR WESTERN AUSTRALIA



South Metropolitan TAFE

Murdoch University, Rockingham Campus Innovation Hub, Focus on Global Energy Transformation

KRIA is positioned to transform into a globally leading location for lithium-ion battery materials

Australian Government support

Federal and State Government support for new technology and value added manufacturing

- Australian Government funding support and debt financing in progress
- Lead Agency role managed by Western Australian Government Department of Jobs, Tourism, Science and Innovation
- 6.7ha industrial site located in the Kwinana Strategic Industrial Area
- Advance approval granted by AusIndustry for research and development programs totaling A\$8m
- EcoGraf invited to join WA Ministerial Battery Taskforce



PLAY VIDEO - ECOGRAF BATTERY GRAPHITE MANUFACTURING FACILITY SITE LOCATION

<https://youtu.be/Jb0xlhFSdsU>



PLAY VIDEO – AUSTRALIAN GOVERNMENT MAKE IT HAPPEN ECOGRAF CASE STUDY

<https://youtu.be/1fiWmYrd3WM>



Government of Western Australia
Department of Jobs, Tourism, Science and Innovation



Kwinana expected to become a major global battery mineral processing centre



WA's State Premier Mr Mark McGowan, Minister for Energy Mr Bill Johnston and DevelopmentWA Chief Executive Mr Frank Marra with EcoGraf's Robert Pett, Howard Rae and Andrew Spinks

Western Australian advantages

- ✓ Australia's strong reputation as a reliable supplier of high-quality industrial products
- ✓ Emerging industrial zone for value added processing of battery materials
- ✓ Direct port access and readily available infrastructure
- ✓ High transparency over ethical raw material production supply chain
- ✓ Protection of intellectual property rights for further downstream processing activities, including battery recycling

Flake graphite business summary



Long life Epanko Graphite Mine to supply industrial and battery markets

Defined, de-risked and ready for construction

- ✓ Bankable Feasibility Study completed by GR Engineering Services
- ✓ Bank appointed Independent Engineer's Review completed by SRK Consulting
- ✓ Supporting Tanzania's industrialisation strategy
- ✓ Granted Mining Licence



Sector leading ESG credentials

- Equator Principles development model, satisfying:
- ✓ International Finance Corporation Performance Standards
 - ✓ World Bank Group Environmental, Health & Safety Guidelines



Scalable production plant

60,000tpa initial development with low cost expansion to meet market demand

Sales agreements with major international customers

thyssenkrupp (Germany) and Sojitz Corporation (Japan)



Capital investment

Financial returns @ 60,000tpa

60,000tpa

Pre-tax NPV₁₀

Annual EBITDA

IRR

US\$89m

US\$211m

US\$44.5m

38.9%

Bankable feasibility study (BFS) key highlights



- 50% increase in production to 60,000tpa positions Epanko to be a major baseload supplier of high value graphite products to traditional and emerging graphite markets
- Low pre-production capital of US\$88.9m
- C1 operating costs FOB Dar es Salaam of US\$500/t
- BFS delivers a high returning project:
 - Pre-tax NPV₁₀ of US\$211m
 - Internal rate of return:38.9%
 - Annual EBITDA of US\$44.5m
- Economics do not include sales into the high-growth lithium-ion battery market
- **Metallurgical test work demonstrates potential to produce 99% carbon concentrate from fresh ore with no additional milling or cleaning stages**
- Executed marketing strategy with strong alignment to German industry and the battery supply chain in Japan, Korea and Taiwan
- 44ktpa - binding sales and offtake agreements in place covering initial production
- 16ktpa - under negotiation with existing partners and leading European carbon groups
- Debt financing program with Germany's KfW IPEX-Bank
- Manufacturing of EcoGraf™ battery grade graphite to add further value



99% carbon purity provides a long-term supply of high quality feedstock for the manufacture of battery graphite



High carbon purity will reduce EcoGraf™ battery graphite purification costs





Rigorous 60,000tpa BFS and strong economic returns positions Epanko for development

- Robust technical and financial BFS completed, conforming with IFC standards
 - Average production of 60,000tpa graphite concentrate
 - High proportion of >150 micron concentrate at carbon grades demanded by the market
 - Potential to produce a 99% carbon concentrate from <150 micron flake to supply high growth battery anode market
- BFS utilised industry leading consultants
 - Including GR Engineering, Knight Piesold, CSA Global and IMO Metallurgy
 - Technical due diligence completed by independent bank appointed engineer SRK
- BFS economics are based on sale into refractory and other established markets
 - Significant upside potential through access to high value markets, including spherical and expandable graphite

Epanko bankable feasibility study outcomes

Development period	(months)	19
Average annual throughput	(tonnes)	695,000
Strip ratio	(waste to ore)	0.4:1
Average feed grade	(% TGC)	8.3
Graphite recovery	(%)	94.7
Average product carbon grade	(%)	96
Graphite production	(tonnes per year)	60,000
Mining cost	(US\$/t processed)	7.93
Processing cost	(US\$/t processed)	19.61
General & administration cost	(US\$/t processed)	4.75
Transport and port charges	(US\$/t sold)	107
C1 FOB cost	(US\$/t sold)	500
All in Sustaining cost ¹	(US\$/t sold)	572
Pre-production capital cost	(US\$ million)	88.9

¹: Includes royalties (US\$39/t), sustaining capital (US\$15/t), off-site corporate functions (US\$10/t) and rehabilitation (US\$8/t)

EcoGraf provides mine-to-market ESG supply chain assurance



- EcoGraf's Epanko mine development satisfies Equator Principles social and environmental planning standards
- Long-life, high quality supply of natural flake graphite for industrial and battery markets
- Ideally located to support European customers' supply chain management under the Paris Agreement on climate change
- German and Australian Government funding support
- US\$60m debt funding proposal developed in conjunction with Germany's KfW IPEX-Bank and presented to the Government of Tanzania with the aim of simplifying and fast-tracking the financing process
- Subject to the agreement of the Government of Tanzania, EcoGraf and KfW IPEX-Bank are ready to proceed to prepare formal loan documentation to enable the financing arrangements to be implemented.

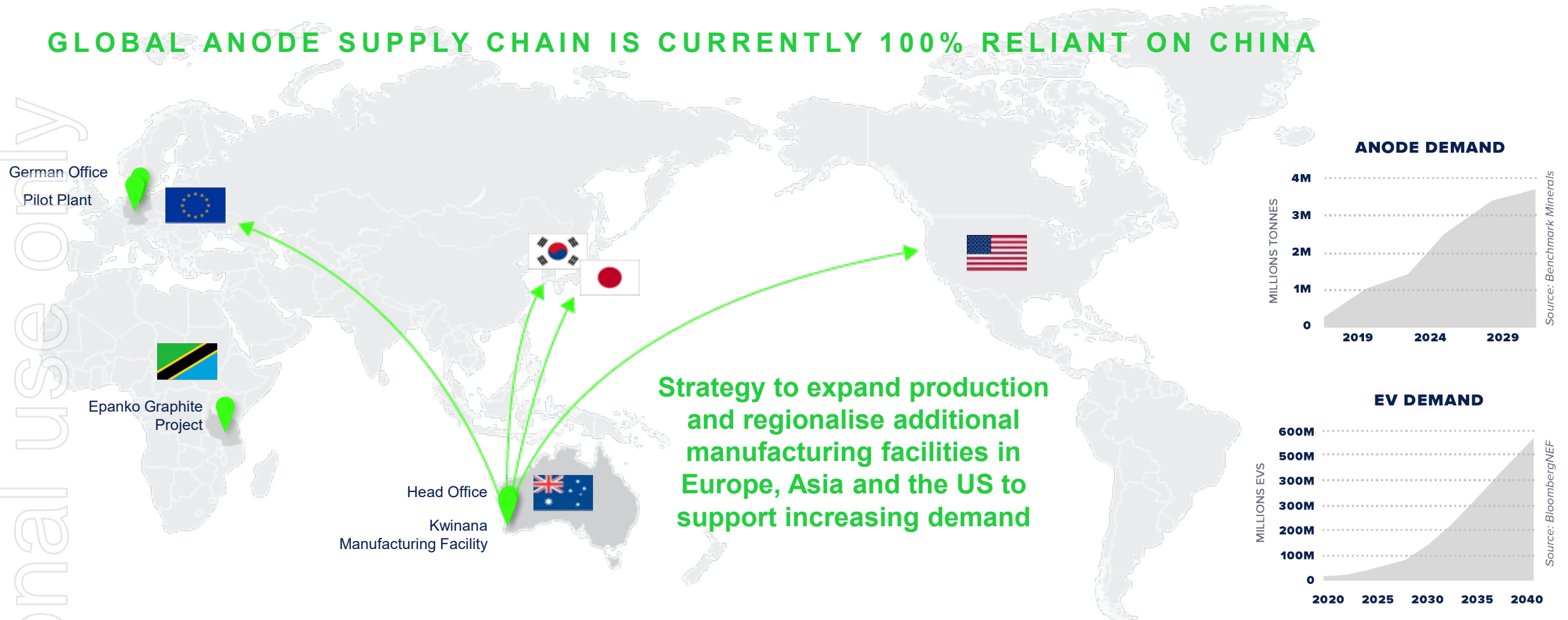
Epanko to transform the regional economy, operating for over 40 years and contributing over US\$3 billion to Tanzanian economic and social development



Strategic position



GLOBAL ANODE SUPPLY CHAIN IS CURRENTLY 100% RELIANT ON CHINA



EcoGraf's sector leading ESG credentials are matched to support the global transition to clean energy

Battery and EV OEM joint ventures provide significant supply chains



Source: After Roland Zenn (Europe)

Battery recycling

Market Overview

- Recycling efforts have focused on cathode metals
- Carbon anode materials are currently not recovered

PRODUCTION SCRAP

Carbon material which is a waste product generated from each stage of battery anode manufacturing, cell manufacturing and battery testing

BLACK MASS

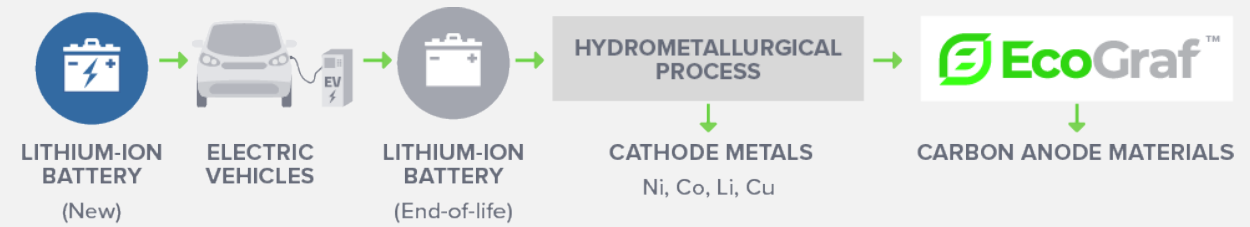
Carbon material remaining after hydrometallurgical processes have recovered the high value cathode metals from end-of-life lithium-ion batteries

Benefits and Opportunity

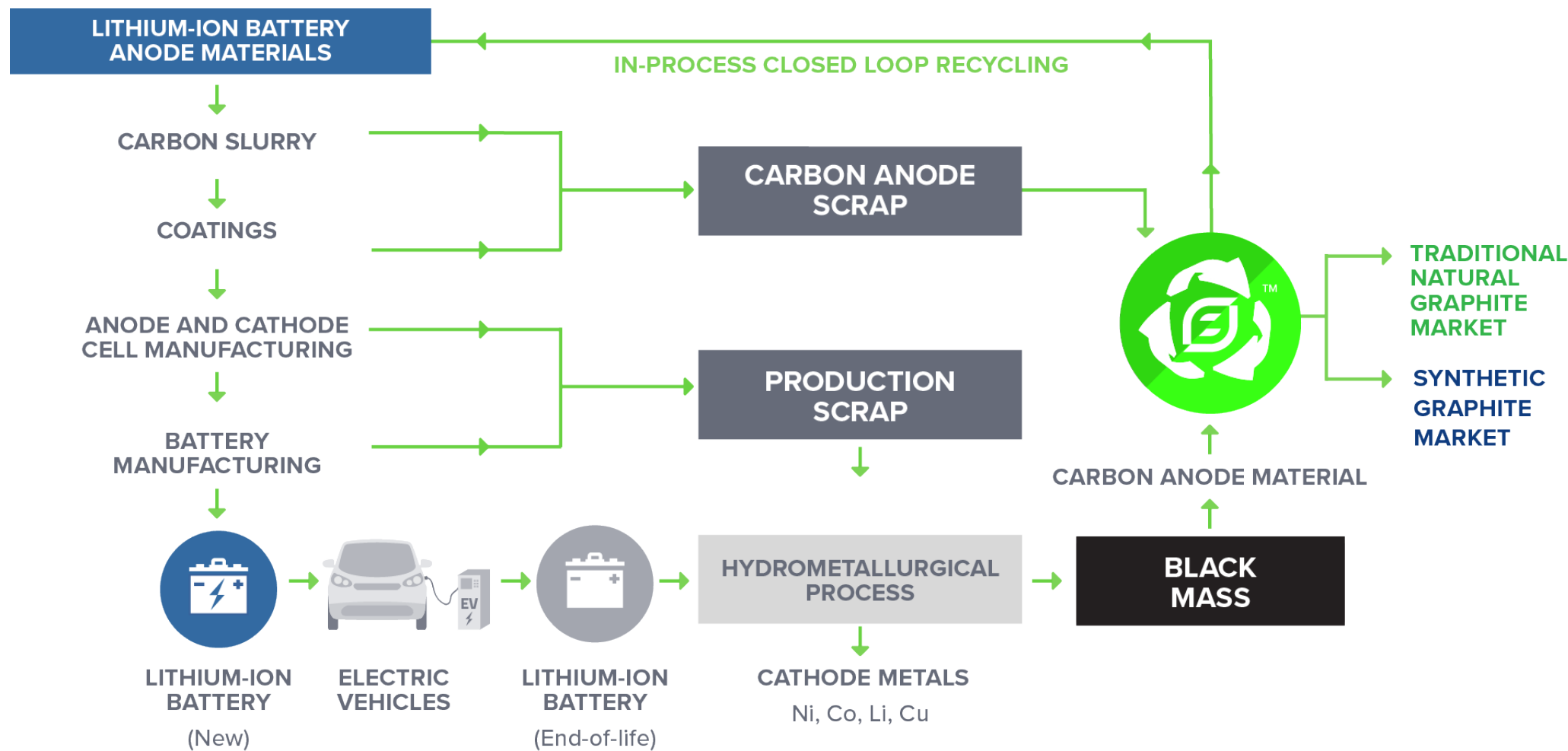
- Lowering the EV carbon footprint
- Reducing battery production costs



EU legislation announced in December 2020 requires more battery recycling and greater transparency in the raw materials supply chain...



EcoGraf's strategy to recover and reuse carbon anode material



Cost effective purification process to recover carbon anode material



Recovery of carbon anode material
uses the standard proprietary
EcoGraf™ purification process

International patent
pending for chemical
purification process



Multi-stage chemical
purification, washing and
filtration process that
eliminates the requirement
for hydrofluoric acid



- ✓ Eco-friendly
- ✓ Cost-effective
- ✓ High quality

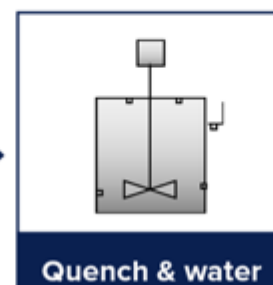


EcoGraf™ Proprietary Purification

Reagent addition



Bake



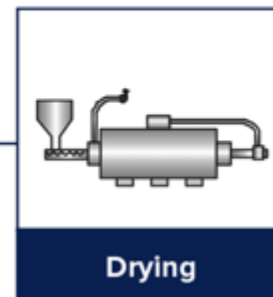
Quench & water



Filter wash



Bagging



Drying

Positive EcoGraf™ purification results



The EcoGraf™ proprietary purification process has now been **successfully** applied to **recycling** of both 'production scrap' and 'black mass' materials

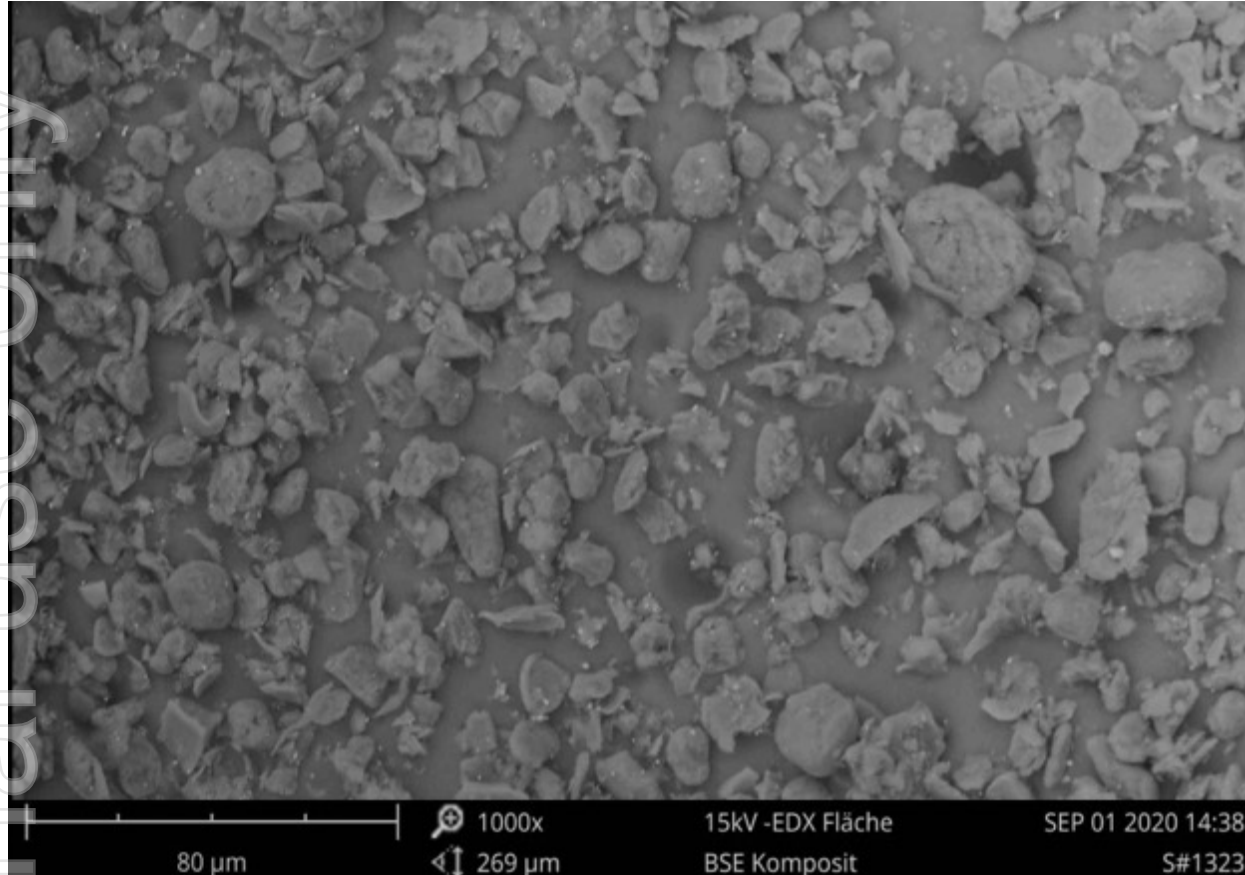
Anode recycling program for major EV manufacturer achieved >99.95% carbon purity from battery production scrap material



	PRODUCTION SCRAP (%C)	BLACK MASS (%C)
Product Sample (before)	98-99.85%	30-50%
EcoGraf™ Purification (after)	98.6% - >99.95%	98.0 - 99.83%

Carbon (%C) grades determined by Loss on Ignition (LOI) method.

EcoGraf™ recovered high purity carbon anode material

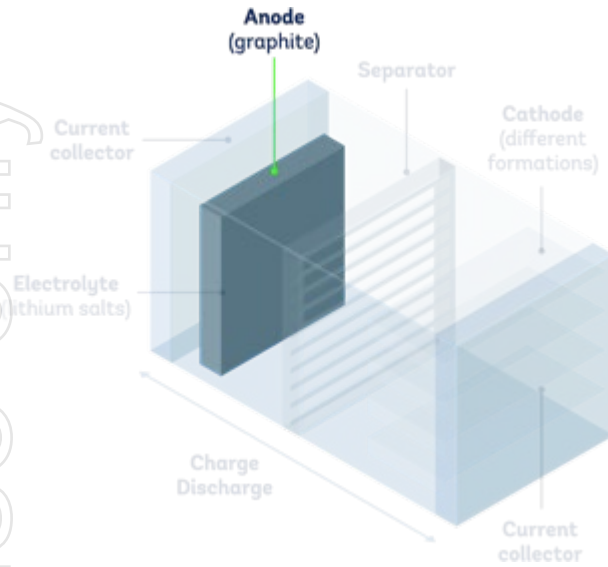


Microscopic image: Recovered carbon anode material showing particle shapes. Oval shaped particles (spheronised natural graphite) and plate shapes (synthetic graphite)

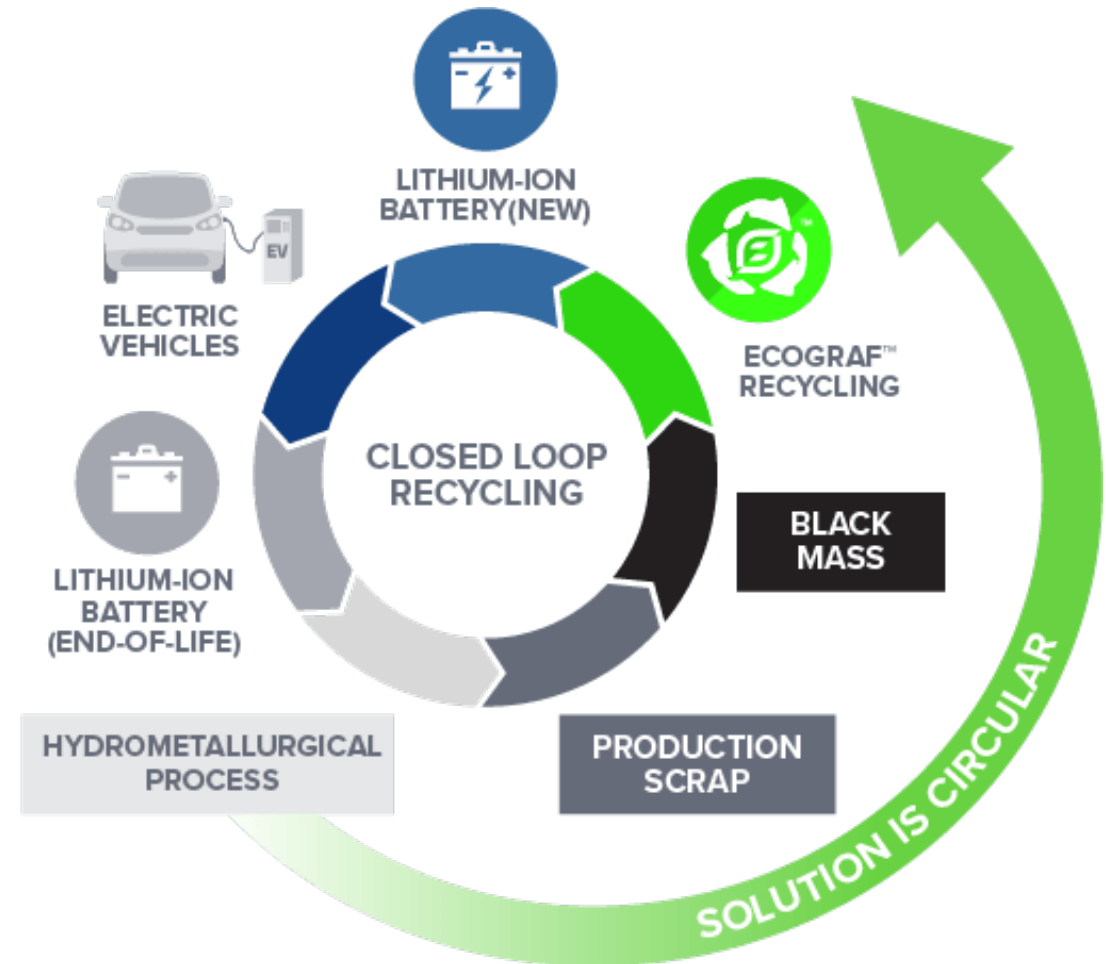
EcoGraf™ process retains particle shape for reuse in battery applications



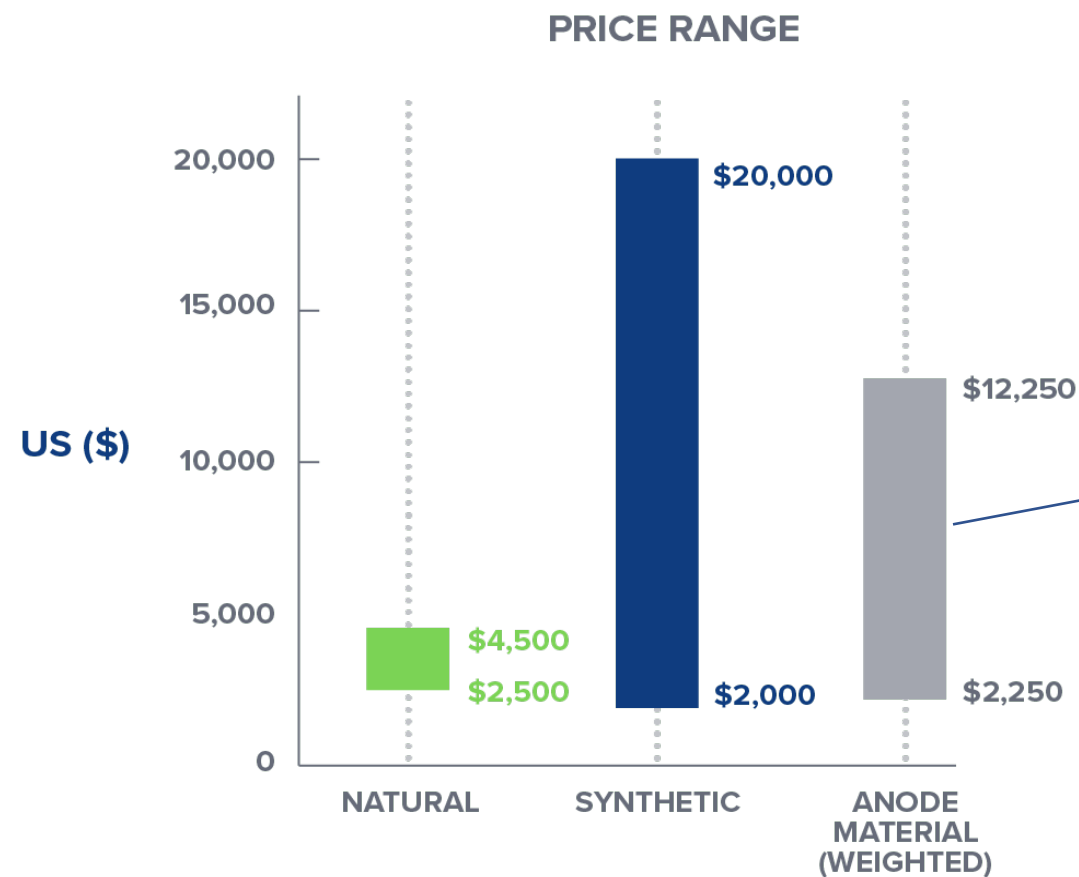
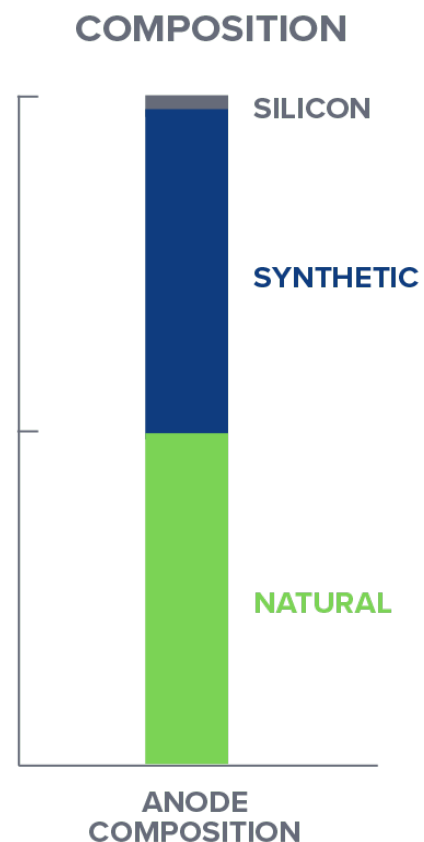
EcoGraf positioned to recover and reuse carbon anode material



Agreement signed with South Korea's largest lithium-ion battery recycling group SungEel HiTech



Carbon anode material composition and pricing

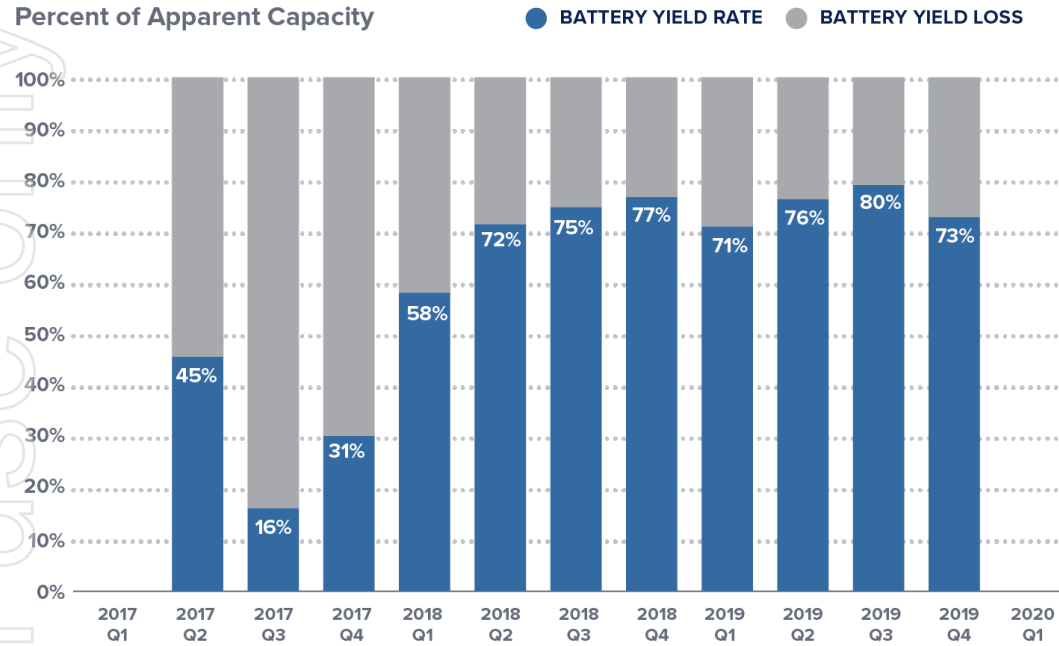


Attractive value uplift from the reuse of blended Carbon Anode Materials

Source Benchmark Minerals and market sources

Battery production scrap opportunity

Battery Cell Production

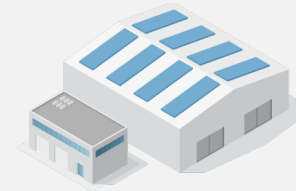


Source: Panasonic Investor Presentation , Tesla company reports

Production losses during cell manufacture are significant

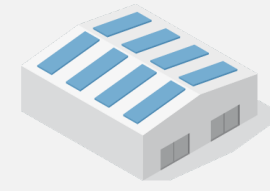
Estimated production losses during battery cell manufacturing and product testing:

Potential Market Size as % of Battery Production



Early Production

>30%



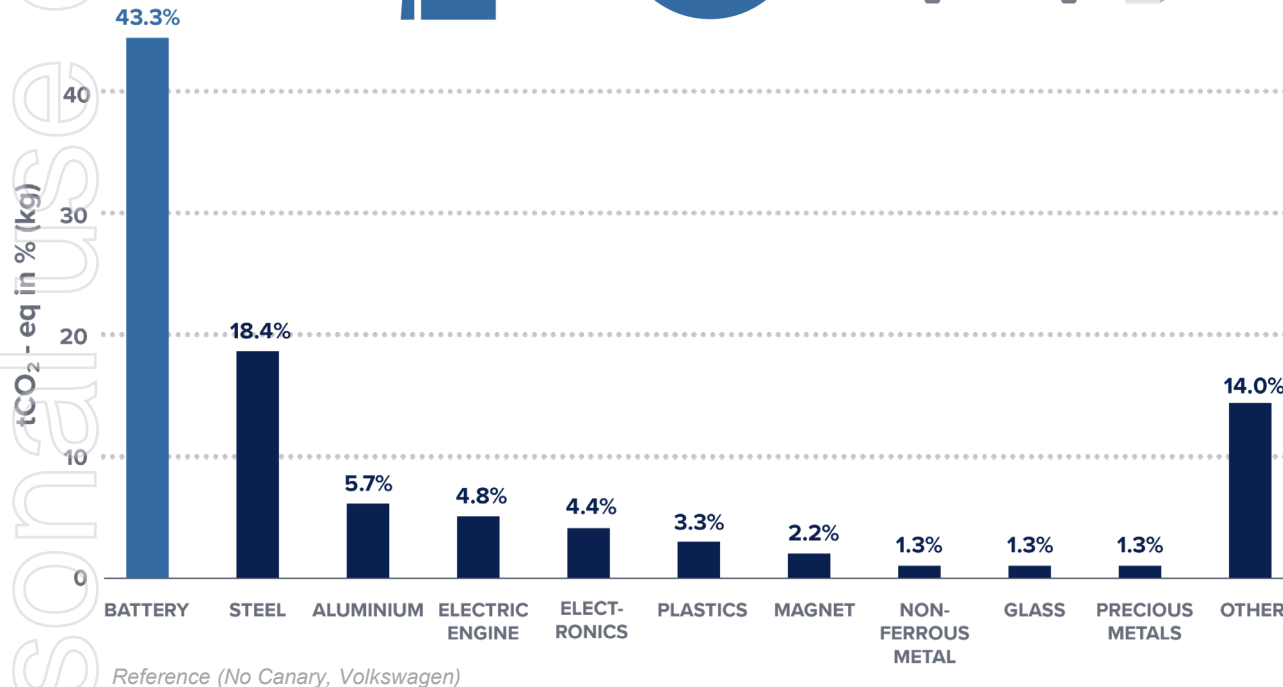
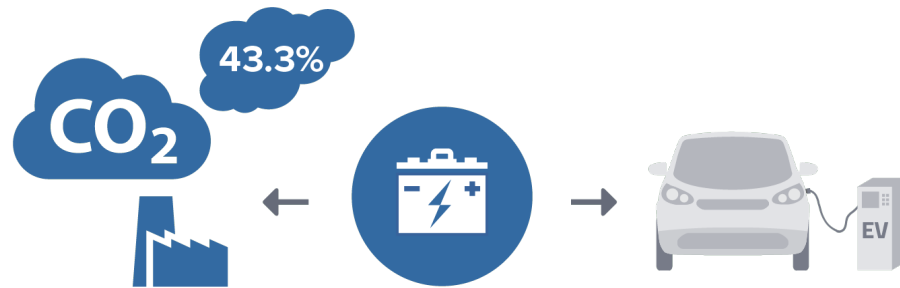
Target

~10%

EcoGraf recycling - lowering EV production carbon emission footprint



Battery represents over 40% of total carbon (CO₂) emission footprint from EV manufacturing



PRODUCTION SCRAP

- Estimated 10% to 30% production loss during cell manufacturing and battery testing
- **Solution:** Develop 'In-Process' recovery of production scrap (slurries and coatings waste)
- Reuse would eliminate 13.5kg of CO₂ per kWh

Reference (No Canary)

BLACK MASS

- **Solution:** Recover and reuse carbon anode material in high purity carbon markets and battery supply chains

Recycling of carbon anode material has an important role in reducing CO₂ emissions

Blended battery anode material opportunity



Lower battery production cost



Lower carbon emissions

BLENDING ANODE MATERIAL PRODUCTS

Blending EcoGraf's high purity 'Battery Graphite' with 'Recovered Carbon Anode Materials' provides an attractive opportunity to support the transition to clean energy



**Battery
Spherical
Graphite
(99.98% C)**

+



**Recovered
Carbon
Anode
Material**

=



**Battery Cell
Manufacturers Carbon
Grade Specification
(99.95% C)**

Modular recycling pilot plant



TAILORED SOLUTION

EcoGraf™ proprietary purification has the potential to provide a tailored solution to increase recycling of recovered battery anode material

- Engineering design commenced for a containerised pilot plant
- Funding for the pilot plant to be supplemented through the Company's R&D programs and collaboration with potential customers
- Pilot plant to provide recovered carbon anode material for product qualification process, focused on the reuse of graphite in lithium-ion batteries and specialised industrial carbon products



Key advantages

- ✓ Over 8 years of technical work programs and extensive product qualification with a range of potential customers
- ✓ Bank due diligence processes undertaken with rigorous reviews of technical and engineering studies
- ✓ Product sales and collaboration with market leading counterparties
- ✓ Production levels matched to market demand with engineering designs to allow rapid expansion
- ✓ Downstream processing strategy centered on producing uncoated purified spherical graphite for a market forecast to grow 15x over the next decade
- ✓ Vertically integrated battery anode materials business positioned to support recent EU legislative changes on sustainability

- ✓ Lithium-ion battery recycling business provides the opportunity to lower battery production costs and reduce carbon emissions from EV manufacturing
- ✓ Blended battery anode material provides a unique eco-friendly product
- ✓ Strategy to expand production and regionalise additional facilities in Europe, Asia and the US to support increasing demand
- ✓ Planning initiated on 2nd plant in Europe with significant capital savings
- ✓ On-going research and innovation to identify further value adding opportunities using the EcoGraf™ purification process

Vertically integrated

HFfree™

***battery anode
material business***
*supporting the global
transition to clean
energy and e-mobility*



Outlook



BATTERY PRODUCTS

- Finalise EPC arrangements and complete engineering programs with GR Engineering for the construction of the initial 5,000tpa EcoGraf™ processing facility in Western Australia
- Arrange US\$35m debt financing with the Australian Government for the expansion of the West Australian facility to 20,000tpa
- Advance works for a 2nd plant site in Europe
- Continue to build strategic partnerships with key battery industry participants

NATURAL GRAPHITE PROJECT

- Advance the US\$60 million debt financing proposal submitted with KfW IPEX-Bank to the Government of Tanzania to enable construction of the new Epanko Graphite Mine

BATTERY RECYCLING

- Undertake engineering and construction of a containerised pilot plant to provide recovered carbon anode material for product qualification processes
- Continue testwork with EV and battery manufacturers
- Develop strategic partnerships in key markets

CORPORATE

- US listing to support growing international investor demand
- Secure on-going Government support for research, innovation and advanced manufacturing programs



BATTERY PRODUCTS

**Western Australia
development ready
20,000tpa processing facility**



NATURAL GRAPHITE

**Scalable mining projects
for long-term supply of
graphite products**



RECYCLING

**Recovery of battery
anode materials from
lithium-ion batteries**

The future is **electric.**



BATTERY PRODUCTS



RECYCLING



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