EDISON

Alabama Graphite

Initiation of coverage

Proven battery graphite for the US and beyond

Metals & mining

10 July 2017

Price **C$0.14**

Market cap **C$20m**

Alabama Graphite is seeking to position itself as one of the preferred suppliers of natural, battery-ready graphite to the burgeoning electric vehicle and defence industries of the US. The company's Coosa project is the only graphite project in the contiguous US and has proven its coated spherical purified graphite product to be suitable for use in lithium-ion battery (LiB) manufacturing. Coosa's US location is also aligned with the Trump administration's broad domestic policy to "Buy American".

Year end	Revenue (C$m)	PBT* (C$m)	EPS* (c)	DPS (c)	P/E (x)	Yield (%)
08/15	0.0	(2.2)	(1.8)	0.0	N/A	N/A
08/16	0.0	(1.8)	(1.5)	0.0	N/A	N/A
08/17e	0.0	(3.3)	(2.2)	0.0	N/A	N/A
08/18e	0.0	(1.8)	(0.6)	0.0	N/A	N/A

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

End-products proved viable for battery use

Coosa will produce two main types of refined graphite product to service the highest-growth graphite market (ie battery manufacturing): a coated spherical purified graphite (CSPG) and a purified micronized graphite (PMG), and potentially a silicon-oxide enhanced CSPG and delaminated expanded graphite (DEXDG) conductivity enhancement products for LiB cathode applications. Coosa CSPG samples have already been proven to be superior to synthetic equivalents in independent electrochemical testing and also, additional testing of Coosa graphite deems it suitable for the highest purity requirements (eg US defence applications).

Alabama's CSPG to be sold direct to battery makers

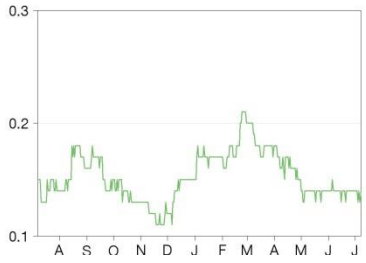
The year-on-year 2015 growth rate in the global electric vehicle market was >70%. A lower rate of 60% per year is required for European countries to achieve their various greenhouse-gas emission targets by 2020 as legislated by the COP21 Paris climate accord. With the decrease in battery costs and increases in battery energy density, a positive future for graphite is clear. The value-add that comes with delivering battery-ready graphite (US$9,000/t) to end-users allows Alabama to compete directly with synthetic graphite (US$20,000/t) suppliers at a lower price.

Valuation: Price discounts only 14% of Phase 2 value

Coosa's PEA contemplates a two-phased development approach, allowing Alabama to tailor its output to the requirements of prevailing CSPG graphite market growth rates. This is critical when the size of the electric vehicle market is still relatively minuscule compared to its fossil fuel counterparts. Phase 1 of Coosa's development (starting, pending capital raisings, in FY19) produces 5ktpa, and valuing this cash flow stream results in a fully diluted value of C$0.56/share. Valuing cash flows across the total life of mine (LOM) of 27 years, with Phase 2 developed via internal cashflows, results in a value of C$1.01/share. Both values use a CSPG price of US$9,000/t, a PMG price of US$2,000/t and a 10% discount rate to reflect general equity risk.

Net cash (C$m) at 28 February 2017 (prior to May 2017 equity raise of C$1.3m)	0.4
Shares in issue	145.3m
Free float	96%
Code	CSPG
Primary exchange	TSX-V
Secondary exchange	OTCQB/Frankfurt

Share price performance



%	1m	3m	12m
Abs	(3.5)	(12.5)	(6.7)
Rel (local)	(1.2)	(8.8)	(12.2)
52-week high/low		C$0.21	C$0.11

Business description

Alabama Graphite is positioning itself as a major sourced-and-made-in-US natural flake battery graphite producer for the LiB supply chain. Its main project, Coosa, is strategically located in Alabama, US. The company will not sell any traditional graphite concentrate, which is the core business model for all other graphite development companies presently.

Next events

BFS	End 2017/early 2018

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Edison profile page

Alabama Graphite is a research client of Edison Investment Research Limited

Investment summary

Company description: Made and sourced in the US

Alabama's Coosa graphite project is located in Coosa county, Alabama, US, one hour south of Birmingham. The Coosa project is situated within an area known as the "Alabama Graphite Belt", an historic graphite-producing region that last operated in the 1950s. The graphite is hosted in a quartz-mica schist, where the upper 50 to 75ft is heavily oxidised and weathered resulting in a soft, diggable rock. This latter point will mean that the mined section of the resource is extractable without the use of explosives, lowering mining costs.

Valuation: Fully diluted and adjusted for graphite pricing

Early-stage PEA assessments of mining projects use partial resource data and cost inputs derived from industry peers. PEAs are therefore high-level and need significant work undertaken at ground level to provide a bankable level of confidence. However, we have based our fully diluted valuation on the Coosa PEA given that it is the only currently available data assessment. As such, we forecast first production to occur FY19 (late CY18), following C$59m (US$43m) capex spend over FY19. To maintain maximum corporate financial leverage (net debt/[net debt+equity]) below 60%, we assume that Alabama will have to raise no less than C$23m in equity at the prevailing share price (equating to 51% dilution). Assuming this to be the case, our base case valuation, using a CSPG price of US$9,000/t and a PMG price of US$2,000/t and a 10% discount rate, is 1.01c/share. Note: all our valuations assume commercial binding offtake agreements are in place (page 8 onwards).

Sensitivities: PEA stage for project, de-risked for CSPG

The main top-level, qualitative risks to our valuation are as follows:

- **Technical issues:** natural graphite development geared to LiB manufacture is highly technical. Alabama has proved its graphite to be applicable to this industry and, in terms of energy density and loss on charging/discharging, superior to its synthetic equivalent which is a petroleum by-product. Natural battery-ready (CSPG) graphite is also far cheaper (synthetic prices can easily be double the US$9,000/t price we use to value Alabama's natural CSPG).
- **Regulatory issues:** Alabama's Coosa property will be permitted at state level, therefore avoiding any of the onerous permitting steps required at the national, federal level.
- **Proprietary technology**: while laboratory test results confirm the high-purity levels achieved by Alabama's proprietary purification secondary process technology across all flake size categories, the fact that it is as yet untested at full scale still presents a risk, though one that should diminish once the company completes its CSPG pilot plant, to be commenced in tandem with the feasibility studies.

For a quantitative assessment of how our valuation changes given variations in certain valuation assumptions (ie price, opex, dilution analysis), please see page 8.

Financials: Funding needed to complete feasibility

Alabama's interim results for the six months to end February 2017 were announced on 1 May 2017 and indicate that the company had cash on hand of C$0.4m. Post-balance sheet date, the company has raised C$1.3m via a non-brokered private placement announced 10 May 2017. Therefore, Alabama should have enough working capital to sufficiently cover its running costs for the next year. According to management, it would require a further C$2m to complete its Coosa feasibility study and concurrently undertake a secondary CSPG pilot plant programme.

Alabama Graphite

Alabama was incorporated in British Columbia, Canada on 13 April 2006. It commenced trading under the ticker ALP on 31 August 2012 on the CSE and graduated to the TSX venture exchange on 5 May 2014. Alabama subsequently changed its stock ticker to CSPG. The company also trades its shares under the ticker 1AG.F on the Frankfurt Stock Exchange, and on the OTCQB venture-stage marketplace under the symbol CSPGF

Electric vehicles (EVs) driving the graphite market

Graphite market growth supported via environmental pressures/incentivisation

Currently, the dominant Chinese graphite market easily satisfies global demand. The main investment driver for graphite relies on the anticipated growth in electric vehicle demand. For 2015, year-on-year growth in the global electric vehicle stock was >70% (source IEA Global EV Outlook 2016). Obviously, such high growth rates are a result of the very low numbers of electric vehicles currently in circulation (EVs currently only represent 0.1% penetration of the overall automotive market, source: IEA Global EV Outlook 2016). Forecasting 2015 growth rates ad infinitum would not accurately reflect real-world demand as numerous challenges face the EV market (eg the removal of central government incentive schemes). Nevertheless, the future for graphite demand can easily be seen in current electric vehicle market trends. Combustion engine exhaust fumes account for around 18% of global greenhouse emissions (IEA data). To make a start in addressing this problem, the COP21 Paris climate accord has now been ratified (notwithstanding the USA's recent departure from the deal) and the legal framework contained therein positively supports the adoption of electric vehicles en masse.

Electric vehicle market growth

According to the International Energy Agency's Global EV Outlook 2016, the worldwide stock of electric vehicles rose to 1.26m in 2015, a hundred-fold increase over 2010. Further, the global electric vehicle stock rose by >70% between 2014 and 2015 (IEA data) with 550,000 electric vehicles sold in 2015 representing market penetration of 0.1% compared with the total global stock of cars, regardless of type.

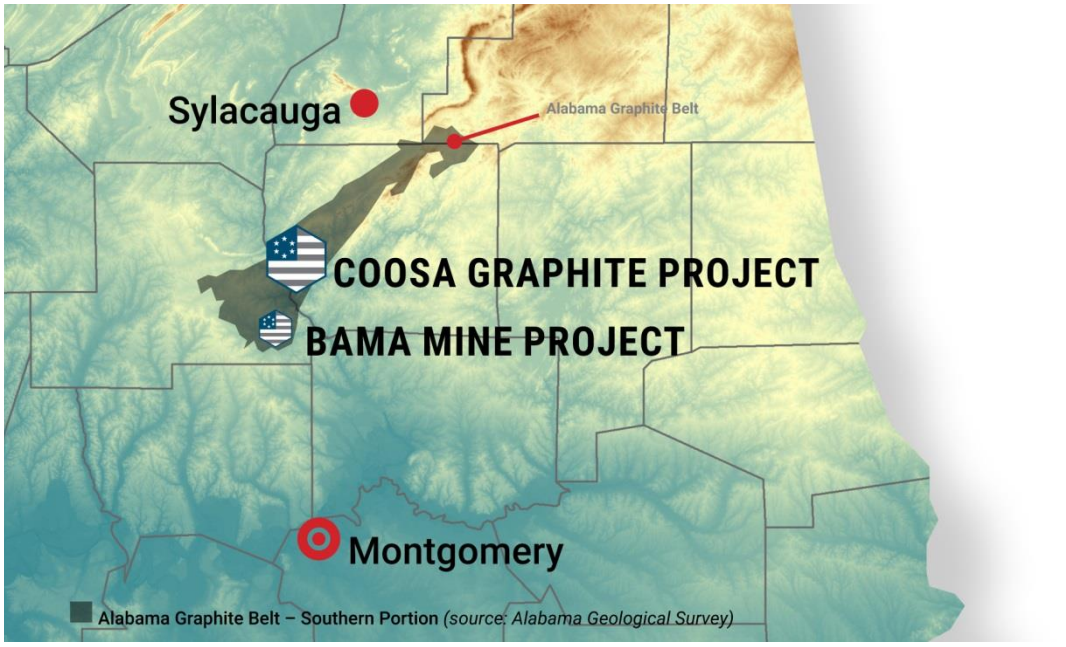
This small market penetration is of course expected to grow as mass adoption of electric vehicles is achieved through the lowering of electric vehicle car prices, as well as the installation of required infrastructure and the optimisation and refinement of existing electric vehicle technologies to drive confidence in consumer appetite. A negative acting against the rise of electric vehicles is the acceptance of autonomous vehicle car sharing schemes such as those being developed by Google and Uber. Notwithstanding research and development achieving varying levels of success and the legal framework required for the implementation of such services remaining undefined, this potential threat to electric vehicles is worth noting, albeit it is still resigned to research and development for now.

Alabama's Coosa: Focused on refined products

Alabama's Coosa graphite project is unlike the majority of its graphite peers in that it is focused on producing natural graphite in a form required for batteries rather than simply producing a graphite concentrate that would be sold to third parties for secondary processing. Alabama's process involves purification, micronization, spheronization and surface treatment to produce a battery-

ready graphite product. This is a key differentiator for Alabama which, in combination with its location in the US, means it is very well positioned to serve the country's nascent but high-growth electric car market and battery manufacturers, including US Department of Defense battery manufacturers and contractors. In fact, Coosa's graphite has been proven to yield battery-grade material that exceeds the standards required by battery manufacturers currently (see pages 6-7).

Exhibit 1: Coosa and Bama Mine project locations in Alabama, US



Source: Alabama Graphite

Coosa products proven more than viable for batteries

Successful graphite mine development is most sensitive to the outcomes of metallurgical and process test works. Alabama's management team has considerable experience in graphite development (see our March 2017 note Perfectly located for US electric car market for management's background) and has sought to provide the market with a considerable amount of high-quality independent test data confirming that Coosa graphite either meets or exceeds battery or even nuclear application requirements. In the following sections we show that laboratory test results confirm the high purity levels across all flake size categories. We also comment on the company's recent announcement concerning the production from Coosa graphite material of a superior battery-ready end product – silicon-oxide-enhanced CSPG. These very high purity levels are achieved via a single-pass through Alabama's proprietary secondary process circuit. Alabama has also been successful in proving that its Coosa graphite can generate a CSPG and PMG product that exceeds not only lithium-ion battery-grade requirements, but also the purity levels and physical and electrical characteristics of its synthetic CSPG or PMG equivalents, albeit at future product prices that are considerably lower.

Lab works achieve positive 99.99% purity across all flake sizes

In 2016, Alabama sent graphite concentrate samples from Coosa, created by SGS Laboratories in Lakefield, Ontario, to an undisclosed (which is not unusual for this type of commodity) North American laboratory for initial purification testing. The flotation samples purified by the undisclosed laboratory are stated to be representative of the entire resource. To be clear, this test work is a step beyond the typical primary flotation testing performed by the majority of graphite peers. The

laboratory performed a non-toxic, conventional, low-temperature thermal purification process, which we believe is crucial to expedite regulatory approval processes. A graphitic carbon (CG) purity of 99.99% was achieved across all flake sizes, further demonstrating that potential processing purity, ahead of flake size, is the critical path factor in determining graphite resource suitability for the lithium battery manufacturing purposes. Further, the purification process achieved the 99.99% purity level without any need to optimise the method used, demonstrating the ease with which Coosa's graphite purifies.

Exhibit 2: Backscattered electron micrograph showing 99.99 wt% C purity Coosa graphite

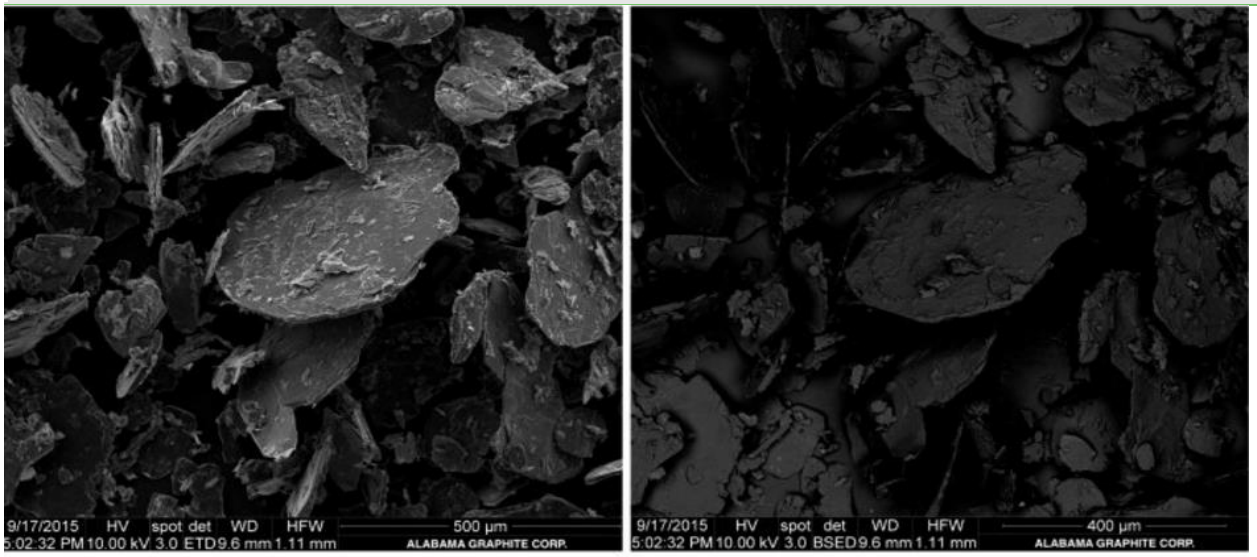


Image 1a Image 1b

Source: Alabama Graphite

Si-CSPG – a new norm for lithium-ion battery anodes

On May 29 Alabama announced its successful production of silicon oxide-enhanced coated spherical purified graphite (Si-CSPG) from Coosa derived graphite material. Development of this different type of graphite anode material has taken Alabama over a year, working alongside its technical consultants. The production of this Si-CSPG end product is important as its electrochemical characteristics exceed that of stock standard CSPG (ie non-silicon-enhanced CSPG) or synthetic graphite anode material currently used in lithium-ion battery manufacturing. Si-CSPG's higher charge and discharge characteristics make it a very attractive alternative to synthetic graphite. The results below are from a small test programme performed by Alabama's technical team, and the process method has not yet been optimised. The results of process optimisation and repeatability across the Coosa deposit will need to be confirmed in the company's CSPG pilot plant and feasibility works.

The technical results announced are as follows:

Exhibit 3: Silicon-oxide enhanced CSPG lab test results, 29 May 2017

	Reversible Capacity (mAh/g)	Irreversible Capacity (mAh/g)
AGC's Si-CSPG (Silicon-enhanced CSPG)	405.03	439.49
D50 = 25µm		
AGC CSPG (Non-silicon-enhanced CSPG)	367.21	386.89
D50 = 18.3µm		
Commercial synthetic anode graphite (Control)	347.20	369.59
D50 = 15.8µm		

Source: Alabama Graphite

To understand the above results, consider that the maximum theoretical specific capacity for lithium ion abode graphite is 372mAh/g (milliamp-hours per gram). Alabama has already proven its non-

silicon enhanced CSPG can be produced close to this theoretical maximum (see following paragraph). So the results of these silicon-enhanced CSPG test works displaying a higher than the theoretical maximum allows lithium-ion battery manufacturers to pack more energy into the same unit of volume – key to enhancing the range of electric vehicles while keeping weight low. Alabama's Si-CSPG is 33mAh/g higher than the maximum theoretical specific capacity for Li-ion anode graphite.

Optimising these results for full-scale production and confirming they can be repeated across the Coosa graphite resource will be critical. Once confirmed we believe this will only serve to strengthen Alabama's hand in selling its material to battery manufacturers in the US, and beyond. No mention was made as to the additional cost of producing Si-CSPG, and we await this further detail. However, given that the production of Si-CSPG was achieved simply by the addition of 4% silicon oxide to the CSPG manufacturing process, we do not envisage any considerable increase to production costs.

Close to the theoretical maximum for reversible capacity

Reversible capacity refers to a material's capacity to hold charge consistently and reversibly achieved on cycling (ie charging and discharging of a battery over its lifetime). This is a critical path factor in determining the suitability of natural graphite for use in lithium battery manufacturing. Note that Alabama's results (Exhibit 4) are close to the theoretical maximum. The following results were achieved prior to the superior Si-CSPG results outlined above.

Exhibit 4: Alabama's reversible capacity data

CR2016 Li-ion battery anode	Reversible capacity (energy density)	Irreversible capacity loss	BET* surface area
AGC's Natural CSPG Graphite D50 = 18.3µm	367.21mAh/g	5.09% (94.61% efficient)	0.62m²/g
Commercial Lithium-ion Synthetic D50 = 15.8µm	347.20mAh/g	6.06% (93.94% efficient)	1.15m²/g

Source: Alabama Graphite. Note: *The Brunauer–Emmett–Teller (BET) theory aims to explain the physical adsorption of gas molecules onto a solid surface and serves as the basis for an analytical technique for the measurement of the specific surface area of materials.

Test results exceed nuclear grade requirements

On 17 February 2017 Alabama announced test results demonstrating that Coosa graphite can achieve 99.99997% graphite purity via the company's proprietary low-temperature, thermal purification process. This exceeds the requirements for graphite used in nuclear applications, such as pebble bed reactors. Alabama's proprietary technology does not use hydrofluoric acid (as is used in the manufacture of Chinese graphite products) or sulphuric or nitric acids. Further, the process does not use alkali roasting or caustic soda roasting methods. Alabama states that its proprietary processing methods do not need excessive amounts of clean water or energy-intensive, high-temperature thermal upgrading. Among other things, this should bode well for Coosa's development.

5N carbon purity attained via single-pass green purification method

Alabama achieved 99.999% (5N category) carbon total percentage weight purity from secondary processing of its Coosa graphite material. Significantly, this level of ultra-high purity graphite was achieved via a single pass of Coosa graphite through Alabama's proprietary environmentally sustainable purification process. The 99.999% purity material is the feedstock for Alabama to use in the production of CSPG.

This ultra-high purity graphite feedstock was also noted to have very low levels of contaminant materials, which are undesirable when manufacturing lithium-ion batteries. Elements tested for included, *inter alia*, iron, cadmium, nickel and zinc. For impurities that are implicated in the

manufacture of advanced alkaline batteries, the elements tested for were, *inter alia*, molybdenum, arsenic, vanadium and copper. All elemental levels tested were well below the threshold limits required in lithium-ion and alkaline battery manufacturing.

The 99.999% purity figure was achieved by sending a multi-kilogram sample of this secondary processed ultra-high purity material to a third-party, US-based laboratory that performs glow discharge mass spectrometry. It was not achieved in house by Alabama.

Alabama's management states that battery manufacturers often have trouble achieving the required levels of purity needed without the use of acid. Although Alabama's proprietary purification process is needed for Coosa graphite material, management states that the technology is agnostic and amenable to most-flake graphite sources.

Stockpiling graphite for end-user qualification

Alabama produced an inventory of more than 150kg of its US-sourced-and-manufactured battery-ready graphite for end user qualification. This reinforces its strategy to ensure that its Coosa battery-grade CSPG graphite is suitable for end-users and that the company will have enough evaluation material to convey to potential customers.

End-user qualification is a critical-path development factor, and is crucial to the company securing offtake agreements on commercial terms for its products. Hence, undertaking this in advance of completion of the feasibility study is prudent if Alabama is to achieve timely execution of the Coosa project.

The 150kg stockpile will comprise 120kg of CSPG material and more than 35kg of PMG material for end-user qualification.

A 150kg stockpile of refined graphite end-product is a significant amount. Most end-user requirements for high-tech metal applications can be satisfied via the supply of a few hundred grams of material (as is the case for rare earth element resource development). The requirement for much larger volumes appears particular to the electric vehicle market, where uniformity of battery is essential. A guarantee of battery life will be critical to electric vehicle sellers to provide customer assurances. A thorough assessment of the uniformity of supply of raw materials used in the battery making is therefore crucial and may be a key reason why much larger volumes are being requested. Alabama stands out among its peers as the only North American graphite development capable of supplying the required volumes for end-user qualification.

Alabama's proprietary processing technology – benign cf industry norms

In mining, the term 'proprietary processing technology' is usually a red light to most investors, with risks relating to its use deemed unnecessary when existing technologies allow for a far lower-risk approach to resource development. However, in terms of developing such commodities as rare earth elements, and graphite in this case, such technology would be better characterised as an integral part of the company's ability to prove its deposit as economically viable. Rare earths and graphite both have conventional process techniques involved (eg milling, flotation), but the nuanced nature of the processes behind graphite formation in situ (eg temperature/pressure, *inter alia*) limit the efficacy of off-the-shelf processing equipment, and refinements are needed.

A further consideration is the environmental damage that can be done by certain existing processing methods that involve harmful concentrated acids. Graphite processing and, in particular, graphite purification technologies, typically involve an acid of some sort. Chinese graphite manufacturers utilise hydrofluoric and sulphuric acids, along with thermal purification techniques, to remove impurities and achieve the required purity levels for graphite use in battery technologies. Alabama's proprietary purification technology stands apart in being relatively benign. The process

method is termed low-temperature thermal desorption, whereby impurities are gassed off as chlorides and then precipitated out and disposed of safely. The most harmful reagent used, chlorine, is never vented and is always recycled in a closed-loop system within a furnace. The effectiveness of this method in purifying Coosa graphite to battery standard is evident from the test results on which we commented in the preceding section. Note: this type of recycling in a closed-loop system, while a new addition to graphite processing technology, is not unusual. This should prove favourable to regulators involved in the Coosa mine approval process.

Coosa's resource – large enough for purpose

Alabama's code-compliant resource estimate is presented in Exhibit 5 below. While Coosa's is a relatively low grade in terms of raw graphitic carbon content, it should not be dismissed as marginal or uneconomic for this reason – indeed the results of Alabama's metallurgical test results are far more important to end-users than the grade of an in-situ graphite resource. Alabama is yet to produce a full feasibility study on Coosa. In the meantime, the company's Coosa project is located in a well-known historical graphite-producing region and, while mining and processing techniques would have been primitive during the 19th and early 20th century, this past production is at least indicative of potential economic viability for mining Coosa again. Indeed, the soft and shallow depths seen over Alabama's graphite resource bode very well for free-digging a significant portion of the resource, which should translate into lower mining costs and help offset the lower graphite grades present. Coosa's strip ratio is a very low 0.11:1 (waste to ore), primarily as a function of its 'free dig' characteristics. Further, over its 27 year life-of-mine (as per the PEA below) could potentially, initially only take place over 10% of the resource within the highly weathered and soft oxide zone.

Exhibit 5: Coosa mineral resource

Resource category	Tonnage (tons)	Metric tonnes	Graphitic carbon (%)	In situ/contained graphite (tons)	In situ/contained graphite (tonnes)
Indicated	78,488,000	71,203,136	2.39	1,876,000	1,702,000
Inferred	79,433,000	72,060,426	2.56	2,034,000	1,845,000

Source: Alabama Graphite

Assumptions and base case valuation

Alabama completed and published the findings of its preliminary economic analysis (PEA) into Coosa in November 2015. Whereas PEA-level data reflect only the author's opinion of cost assumptions based on industry norms and peer data, we understand from management the current relevant 2015 published Coosa PEA is more accurate in terms of costings than many mining PEAs currently available in the graphite space. This is because the level of graphite mining and end-product development and sales experience on Alabama's board is considerable. As with all mining projects however, the level of accuracy required by mine financiers to fund a project is usually +/- 10% (an accuracy level that is required for the completion of definitive feasibility studies), to which end Alabama is currently working towards financing a DFS.

We have taken the view that mining could potentially start, following a sixth-month build out of the small plant and mine site, in FY19 (late CY18). This reflects the need for financing to complete a feasibility study and a start date to mining being highly dependent on this factor, as well as obtaining key product offtake agreements and securing all the relevant regulatory approvals and mine financing. This is a relatively short-lead to production, but one we believe could be achieved considering the high-level of technical de-risking already undertaken by Alabama's management to produce a saleable high-quality product.

Assumptions used in base case valuation

The key assumptions we have used to value Alabama's shares are taken from the 2015 Coosa PEA, *inter alia*, and are provided in the following exhibit:

Exhibit 6: Base case assumptions

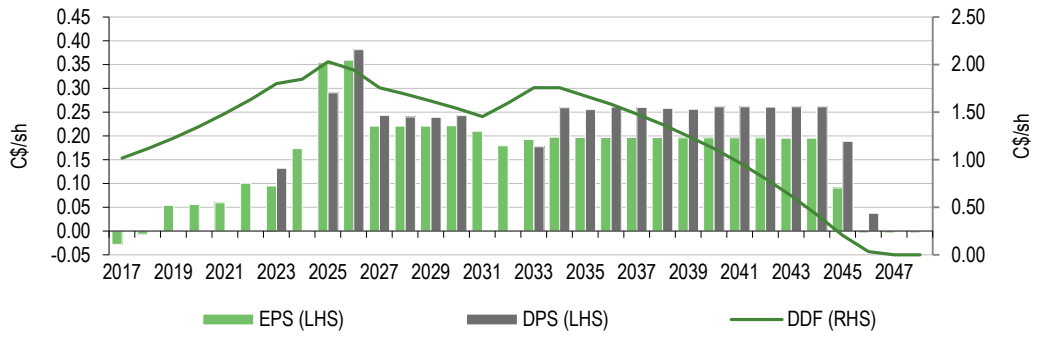
Parameter	unit	value
Mine construction	year	2018
Phase 1 mine start-up	year	Q32018
Phase 1 annual mill feed	tonnes per annum	173,000
Phase 1 grade	% total graphitic carbon (TGC)	3.3
Phase 1 CSPG annual tonnage	tonnes per annum	3,716
Phase 1 PMG annual tonnage	tonnes per annum	1,239
Phase 1 capex	US$m	43
Phase 2 ramp-up year	year	2027
Phase 2 mine start-up	year	2028
Phase 2 annual mill feed	tonnes per annum (avg. over LOM)	612,000
Phase 2 grade	%	2.8
Phase 2 CSPG annual tonnage	tonnes per annum	11,141
Phase 2 PMG annual tonnage	tonnes per annum	3,714
Phase 2 capex	US$m	74
Current end of mining activities	year	2048
Life of mine graphite recovery	%	92%
Moisture content	%	15%
Transit Losses	%	0.5%
CSPG (15 microns)	US$/tonne	9,000
Micronized (5 microns >80%)	US$/tonne	2,000
Royalty 1	% of revenue	2.0
Royalty 2	% of revenue	0.5
Creditor days	no. days	30
Debtor days	no. days	30
Federal tax rate	%	35
Alabama state tax	%	3.5

Source: Edison Investment Research, Alabama Graphite 2015 Coosa PEA

Base case valuation – Phase 1 priced in, Phase 2 in for free

On the basis that Alabama executes the Coosa graphite project as detailed in its 2015 PEA, adjusted for our assumptions on the mine's start-up date and financing (see Financials section for further details), we estimate that the company will generate future earnings and dividends as displayed in Exhibit 7, below. The associated net present value of this potential dividend flow to shareholders (using a 10% discount rate) is displayed in the form of the DDF (discounted dividend flow) line.

Exhibit 7: Edison estimate of future theoretical EPS, DPS and dividend discount flow (DDF)



Source: Edison Investment Research

As can be seen in the above exhibit, positive earnings for Alabama are first generated in 2019, after which a theoretical maiden dividend could then be paid in 2023 and its first sustainable dividend in 2025, following both Phase 1 and Phase 2 ramp-ups. At a 10% discount rate, we calculate the net present value of the life of mine stream of maximum potential dividends payable to shareholders to be C$1.01 (fully diluted). In the event that the project is restricted (for whatever reason) to just Phase 1, with Phase 2 never undertaken, we calculate the net present value of the (reduced) life of mine stream of maximum potential dividends payable to shareholders to be C$0.56/share at the same 10% pa discount rate.

Sensitivities

Aside from the qualitative risks to development discussed throughout this report (ie financing, natural CSPG market growth, Coosa's positive metallurgical results, competition from synthetic sources, regulatory approvals etc), we have highlighted a selection of quantitative sensitivity analyses and the effects each has on our base case valuation.

Exhibit 8: Sensitivity to CSPG price

Change in CSPG selling price (US$/t)	7,500	8,000	8,500	9,000	9,500	10,000	10,500
NPV10	0.73	0.83	0.92	1.01	1.11	1.20	1.3
% change from base case	-28.4%	-18.6%	-9.8%	0.0%	8.8%	17.6%	27.5%

Source: Edison Investment Research. Note: PMG price kept at US$2,000/t.

Exhibit 9: Sensitivity to discount rate

Change in discount rate	0	5	7.5	10	12.5	15	28
NPV10	5.03	2.11	1.44	1.01	0.73	0.54	0.15
% change from base case	393.1%	106.9%	41.2%	0.0%	-28.4%	-47.1%	-85.3%

Source: Edison Investment Research

Exhibit 10: Sensitivity to federal tax rate

Tax rate	15	20	25	30	35	40	45
NPV10	1.26	1.20	1.14	1.08	1.01	0.95	0.89
% change from base case	23.5%	17.6%	11.8%	5.9%	0.0%	-6.9%	-12.7%

Source: Edison Investment Research. Note: Alabama state tax stays unchanged at 3.5%.

PEA data will change

PEAs use cost input data that are derived from industry standard datasets (where available), peer data and industry experience of the authors. As such, not all data used are based on empirical findings, and cost input values will change as the accuracy levels required by pre-feasibility (usually +/-25%), and then bankable level studies (usually +/-10%) are satisfied.

Financials

Alabama's interim results to end February 2017 were announced on 1 May 2017 and indicate that the company had cash on hand of C$0.4m. Post-balance sheet date the company has raised C$2.2m and announced a non-brokered private placement for gross proceeds of a further C$1.1m. Alabama announced on 5 May 2017 that it had closed the first tranche of this placement totalling C$0.85m and on May 10 the second tranche totalling US$1.3m. This US$1.3m raise was increased from the initial US$1.1m. The total placement involved the issue of 12.0m ordinary shares at a price of C$0.15 each, and carrying one ordinary share purchase warrant, exercisable at C$0.20 per share for a period of 36 months following the date of issue. Accordingly, Alabama should have enough working capital to sufficiently cover its running costs for the next year. According to management, it would require a further C$3m to complete its Coosa feasibility study and concurrently undertake a secondary CSPG pilot plant programme.

The company had 7.1m options outstanding at end 31 August 2016, to which should be added a further 7.3m in connection with the above private share placement, for a total of 14.4m. All options are exercisable between C$0.20 and C$0.36 per share.

At end February 2017, the company had no debt and accounts payable of C$209,067, a reduction of 60% ytd. Accounts receivable rose to C$148,757, from C$37,601.

Coosa financing assumption

We base our mining, revenue, cost and capex numbers on Alabama's November 2015 PEA. We forecast first production to occur in FY19 (Q318), following C$59m (US$43m) capex spend over H2 FY18. To maintain maximum corporate financial leverage (net debt/[net debt+equity]) below 60%, we assume that Alabama will have to raise no less than C$23m in equity over H1 FY18 at the prevailing share price (equating to 51% dilution).

Exhibit 11: Financial summary

Accounts: IFRS; year end: August; C$000s		2015	2016	2017e	2018e	2019e	2020e
PROFIT & LOSS							
Total revenues		0	0	0	(205)	48,072	48,077
Cost of sales		0	0	0	0	(14,845)	(14,846)
Gross profit		0	0	0	(205)	33,228	33,231
SG&A (expenses)		(1,869)	(1,752)	(2,343)	(1,655)	(1,655)	(1,655)
R&D costs		0	0	0	0	0	0
Other income/(expense)		0	0	0	0	0	0
Exceptionals and adjustments	Exceptionals	0	0	0	0	0	0
Depreciation and amortisation		(2)	(1)	(918)	(17)	(2,264)	(2,265)
Reported EBIT		(1,871)	(1,753)	(3,260)	(1,877)	29,308	29,310
Finance income/(expense)		3	0	1	33	(3,426)	(2,549)
Other income/(expense)		153	24	0	0	0	0
Exceptionals and adjustments	Exceptionals	(482)	0	0	0	0	0
Reported PBT		(2,198)	(1,729)	(3,260)	(1,844)	25,883	26,761
Income tax expense (includes exceptionals)		0	0	0	0	(9,965)	(10,303)
Reported net income		(2,198)	(1,729)	(3,260)	(1,844)	15,918	16,458
Basic average number of shares, m		97	117	145	295	295	295
Basic EPS (C$)		(0.02)	(0.01)	(0.02)	(0.01)	0.05	0.06
Normalised EPS (C$)		(0.02)	(0.01)	(0.02)	(0.01)	0.05	0.06
BALANCE SHEET							
Property, plant and equipment		4	3	3	58,977	58,436	56,220
Goodwill		0	0	0	0	0	0
Intangible assets		5,568	6,867	7,341	7,324	7,308	7,291
Other non-current assets		26	0	0	0	0	0
Total non-current assets		5,599	6,870	7,344	66,301	65,744	63,510
Cash and equivalents		2,086	96	1,631	1,631	1,631	1,631
Inventories		0	0	0	0	4,006	4,006
Trade and other receivables		40	38	0	0	3,951	3,951
Other current assets		229	182	122	122	122	122
Total current assets		2,355	315	1,752	1,752	9,709	9,710
Non-current loans and borrowings		0	0	0	39,693	29,955	11,264
Other non-current liabilities		0	0	0	0	0	0
Total non-current liabilities		0	0	0	39,693	29,955	11,264
Trade and other payables		424	521	0	0	1,220	1,220
Current loans and borrowings		0	0	0	0	0	0
Other current liabilities		0	0	0	0	0	0
Total current liabilities		424	521	0	0	1,220	1,220
Equity attributable to company		7,529	6,663	9,096	28,360	44,278	60,736
Non-controlling interest		0	0	0	0	0	0
CASH FLOW STATEMENT							
Profit for the year		(2,198)	(1,729)	(3,260)	(1,844)	15,918	16,458
Taxation expenses		0	0	0	0	0	0
Profit before tax		0	0	0	0	0	0
Net finance expenses		0	0	0	0	0	0
EBIT		0	0	0	0	0	0
Depreciation and amortisation		2	1	17	17	2,264	2,265
Share based payments		664	222	0	0	0	0
Other adjustments		482	0	0	0	0	0
Movements in working capital		(273)	330	(484)	0	(6,737)	(1)
Interest paid / received		0	0	0	0	0	0
Income taxes paid		0	0	0	0	9,965	10,303
Cash from operations (CFO)		(1,323)	(1,176)	(3,727)	(1,827)	11,445	18,723
Capex		(1,826)	(1,395)	(491)	(58,974)	(1,707)	(32)
Acquisitions & disposals net		0	0	0	0	0	0
Other investing activities		(5)	(60)	0	0	0	0
Cash used in investing activities (CFIA)		(1,831)	(1,455)	(491)	(58,974)	(1,707)	(32)
Net proceeds from issue of shares		4,211	641	5,692	21,108	0	0
Movements in debt		(258)	0	60	39,693	(9,738)	(18,691)
Other financing activities		0	0	0	0	0	0
Cash from financing activities (CFF)		3,953	641	5,752	60,801	(9,738)	(18,691)
Currency translation differences and other		0	0	0	0	0	0
Increase/(decrease) in cash and equivalents		799	(1,990)	1,535	0	0	(0)
Currency translation differences and other		0	0	0	0	0	0
Cash and equivalents at end of period		2,086	96	1,631	1,631	1,631	1,631
Net (debt) cash		2,086	96	1,631	(38,063)	(28,324)	(9,634)
Movement in net (debt) cash over period		2,086	(1,990)	1,535	(39,693)	9,738	18,691

Source: Company accounts, Edison Investment Research

Contact details	Revenue by geography
First Canadian Place 100 King Street West, Suite 5700 Toronto – M5X 1CV Canada +1 416.309.8641 www.alabamagraphite.com	N/A

Management team

CEO: Don Baxter	Executive VP: Tyler Dinwoodie
Mr Baxter, formerly president and COO at Focus Graphite, has over 25 years of specialist graphite industry experience, from mining, exploration and development through to sales, marketing and business development.	Mr Dinwoodie has experience in both the graphite sector and marketing in the mineral commodities space. Most recently, he has served as a marketing and communications consultant for Alabama Graphite, having previously served as senior VP of marketing for Focus Graphite.
CFO & Company Secretary: Douglas C Bolton	**VP Investor Relations: Ann-Marie M Pamplin**
Douglas Bolton has more than three decades of public accounting experience, providing audit, accounting, tax and consulting services to a wide variety of clientele. Mr Bolton is a former CFO for Romios Gold Resources and former director and treasurer of the Tony Stacey Centre for Veterans Care, a not-for-profit, long-term care facility based in Toronto.	An active member of the Canadian Investor Relations Institute (CIRI), the US-based National Investor Relations Institute (NIRI) and the Ontario College of Teachers (OCT), Ms Pamplin holds an honours bachelor of arts degree from McMaster University.

Principal shareholders	(%)
Donald Baxter	2.08
Tyler W P Dinwoodie	1.06
Jean Depatie	0.43
Jesse Edmondson	0.13
Ann-Marie M Pamplin	0.10
Daniel P Goffaux	0.08
Douglas Bolton	0.07

Companies named in this report

N/A

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