Review of the Australian Automotive Manufacturing Industry Productivity Commission.

Further to Minister Ian Macfarlane indicating that he was looking for a sustainable, long term solution to assist industry in Australia to be competitive on the world market , I submit the following concept for consideration of the Commission.

Look at the three major inputs of Labour, Materials and Energy.

LABOUR : Negotiate long term contracts with employees and unions that provide incentive and security with options for employees to take up equity .....thus management can plan a stable, forward cost structure .

MATERIALS: Examine each type in terms of priority for Australian product and long term , stable, security of supply and cost. For example, with accelerating world interest in lightweight electric vehicles, Australia is well placed to supply high quality graphite as raw material for manufacture of graphene. See attached examples of mutiple use in growing new industries.

High quality graphite is a world strategic mineral with Australia having limited old and large newly discovered reserves. Eg: Eyre Peninsula of South Australia. I believe Commission should recommend a detailed stocktake of Australian reserves and initiate modeling of long term economic applications for existing and new industries that could supply the mass production of the motor car industry at a world competitive price once a high volume , long term market is secured .

ENERGY: Evaluate long term contracts to assist management budget for long term stability of their costings. Look at the historical data of assistance given to aluminium industry in Australia with long term cheap electricity . Examine potential of a sustainable, supply of renewable energy at competitive cost. Eg: A long term market contract enables a scale up in capacity at cheaper price plus renewable energy use can be leveraged to assist branding/ marketing of the motor vehicles produced in Australia.

Imagine the marketing advantage of producing a lightweight electric vehicle from secure Australian materials using renewable solar, wind and wave energy for manufacture and propulsion.....

Attachments:

1. Quickstep Technologies
2. Teijin carbon fibre thermoplastics.
3. BMW use of composites in new electric car.
4. Archer Exploration Graphite.

Note: I am a small shareholder in Quickstep Technologies.

Quickstep

Resin Spray Transfer for Automotive Manufacturing

Also in Resin Spray Transfer for Automotive Manufacturing:

RST In Detail
RST Cell Video

Resin Spray Transfer (RST) is an automated composite layup process, which works with the patented 'Quickstep Process' to rapidly cure the composite component.

The patented technology is designed to dramatically reduce manufacturing time and costs while increasing manufacturing rates and providing the all-important "Class A" automotive finish.

The automotive industry is currently undergoing a massive shift towards the use of light-weight composite components to help combat increasing fuel prices and meet pollution regulations worldwide. Quickstep is focused on a core part of this solution – weight reduction.

New regulations in the United States stipulate that all new cars from 2017 should achieve more than 36 miles per gallon. The only way to achieve this objective is through significant weight reduction - made possible by increased use of carbon fibre composites, which offer similar stiffness to steel at 60-75% lower weight.

However, a key barrier to the take-up of carbon fibre automotive parts has been the significant costs and timeframes required to achieve the necessary "Class A" exterior finish - which has traditionally seen carbon fibre only used on expensive, high performance vehicles.

Quickstep is developing the RST technology to efficiently mass produce composite parts with a Class A finish – which would make the use of carbon fibre accessible to the entire automotive industry.

In March 2011 the Company announced it had achieved its first milestone towards this objective, completing a "proof-of-concept" painted carbon fibre flat panel to Class A automotive quality using RST.

The panels have an exceptionally high quality finish for a rapid layup and curing process and exhibit material performance characteristics that are within or exceeding automotive industry standards.

The automation of the RST process has paved the way for exterior Class A automotive body panels without the need for additional expensive and labour-intensive bogging and sanding.

Quickstep's 3-year RST research and development program is expected to be completed by May 2012, with no serious technical issues encountered to date. The R&D program is being undertaken as part of the Company's Climate Ready project, which has received a $2.6 million funding grant from AusIndustry, a department under the Australian Government Ministry of Innovation, Industry, Science and Research.

Based on its early success in the development of RST, in November 2011 Quickstep was appointed to lead a joint development project supported by the German Government and leading car manufacturer Audi to develop new manufacturing solutions for composite parts for the automotive industry.

The "PRESCHE Project" is aiming to achieve cost reductions of up to 30% over existing manufacturing methods. It plans to do this by combining independent composite manufacturing technologies including RST and the Quickstep Process. The PRESCHE project commences in November 2011 and will run until October 2014.

Read our technical information about how RST works.

News

Teijin introduces Sereebo brand carbon fibre thermoplastics

15 October 2013

Carbon fibre maker Teijin Ltd has launched the Sereebo brand of carbon fibre reinforced thermoplastics.

Sereebo carbon fibre composites are made with three Teijin-developed intermediate materials that the company produces by impregnating carbon fibre with thermoplastic resin:

- U Series is a unidirectional (UD) intermediate offering very high directional strength;
- I Series is an isotropic intermediate offering a balance of shape, mouldability and multidirectional strength; and
- P Series is a long fibre thermoplastic (LFT) pellet made from high-strength carbon fibre and is suitable for injection moulding of complex parts.

Automotive composites

Teijin is currently accelerating its development of applications for carbon fibre thermoplastic composites in promising markets, including automotive.

In 2011, the company developed the three intermediate materials and technology for the high-volume production of carbon fibre thermoplastic components in a cycle time of less than 1 minute (see Teijin establishes mass production technologies for carbon fibre composite)

Teijin is currently working with General Motors and other car makers to develop carbon fibre composite technologies for the mass production of lightweight vehicles (see GM and Teijin collaborate on carbon composite automotive technology)

The Teijin Group, headquartered in Japan, aims to become a global leader in the development of products incorporating carbon fibre composites, targeting annual sales of 150-200 billion Yen (US$1.5-2 billion) by around 2020.

Also see:

- BMW trailblazing the use of composites in new i3 electric car;
- Automotive companies select their composites partners – 8 of the best;
- Carbon composites and cars – technology watch 2012.

Car makers are looking to employ composites in their vehicles to reduce weight and increase fuel efficiency. (Picture used under license from Shutterstock.com © Best3d.)

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TEIJIN

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Teijin starts up pilot plant for carbon fibre thermoplastic automotive parts
Carbon fibre manufacturer Teijin Ltd has begun operating a pilot plant for the production of carbon fibre reinforced thermoplastic automotive components at its Matsuyama Factory in Ehime Prefecture, Japan.

Teijin opens US carbon fibre composites centre
The Teijin Composites Application Center (TCAC), which will develop applications for carbon fibre reinforced thermoplastic composites, will open in Auburn Hills, Michigan, next month.

GM and Teijin collaborate on carbon composite automotive technology
North American car maker General Motors (GM) and carbon fibre producer Teijin Ltd have announced plans to co-develop carbon fibre composite technologies for potential use in high-volume GM vehicles.

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Blog

GUEST BLOG: BMW trailblazing the use of composites in new i3 electric car

By Mark Humphries, Partner at Catalyst Corporate Finance

Yesterday saw the global launch of the BMW i3, BMW's premium electric vehicle. This is not only a car which has a high level usage of composites in its design, to counterbalance battery weight, (the passenger cell of the i3 is made of carbon fibre reinforced plastic) but one which BMW has designed to be a volume-production vehicle.

At €35,000, the i3 is a significant milestone in the future development of the automotive sector. In Catalyst's recent Composites M&A report, Ian Robertson, BMW board member and Head of sales and marketing, highlighted the company's commitment to being at the forefront of developing the use of carbon fibre in automotive production.

The use of composites in higher volume car production has so far been held back by cost and slower production cycle times. For BMW, the crucial weight reduction benefits of carbon fibre has helped offset its higher cost and so made the financials work. To address production restrictions, the company has redesigned the full production chain.

To secure technology know-how and a reliable supply of raw materials, BMW established a joint venture with SGL Carbon (in which BMW has taken the usual step of acquiring a stake). Together, they have invested some $100 million in a new US-based carbon fibre manufacturing plant to produce composites exclusively for BMW.

The i3 launch will certainly boost the profile of composites ...

The i3 launch will certainly boost the profile of composites and its potential to increase fuel efficiency in the automotive sector.

Significant investment is already being made across the supply chain as OEMs and their suppliers follow a similar path to that of BMW – using JVs and partnerships to accelerate the development of the technology needed to produce composite intensive cars at high volumes.

This is also leading to M&A as raw materials manufacturers focus on securing capacity and OEMs and component manufacturers snap-up leading technology and materials. With over 20 deals in the composites sector so far this year, we could be set for another record year for M&A. ♦

Mark Humphries is a Partner at Catalyst Corporate Finance. Catalyst is an international corporate finance advisor, specialising in company sales, acquisitions, private equity and debt funded management buy-outs.

- Mark Humphries also wrote the article Demand for composites leads to £2.3b record mergers and acquisitions.

Posted 30/07/2013 by Guest bloggers

Tagged under: BMW i3 , carbon fibre , Catalyst Corporate Finance , Mark Humphries , M&A , automotive

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Areas of expertise: If you have something to say about the polymer composites industry, or issues relating to it, and would like to contribute a blog to the Reinforced Plastics website please contact the Editor, Amanda Jacob, at RP@elsevier.com. (Picture used under license from Shutterstock.com © enciktep.)

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Archer Exploration Limited (ASX:AXE) Graphene Readily Extracted From Campoona Graphite

WWW:www.archerexploration.com.au
(ABN) Company Overview

Archer Exploration Limited (ASX:AXE)

Graphene Readily Extracted From Campoona Graphite

Adelaide, Nov 19, 2013 (ABN Newswire) - Archer Exploration Limited (ASX:AXE) is pleased to announce that a wide range of graphene and graphene-related products have been readily produced from raw Campoona graphite samples as well as from medium-grade (92% C) graphite concentrates. The product development research is part of ongoing collaboration between Archer and the University of Adelaide, School of Chemical Engineering (Prof Dusan Losic Nano Research Group).

The key graphene products produced from the Campoona graphite were:

Graphene oxide sheets Graphene sheets

Graphene nanosheets with controllable size (20 nm to 1,000 nm)
- Functionalised graphene nanosheets
- Graphene powders
- Graphene films
- Graphene membranes
- Graphene electrodes
- Graphene nanocarriers

Graphene based composites
- Graphene aerogel composites
- Graphene conductive hydrogels
- Graphene/carbon nanotube aerogels
- Graphene magnetic aerogels

Intercalated graphite

Graphene has been known since the 1940s. However, it was not until 1994 that two researchers, Geim and Novoselov from the University of Manchester, were able to isolate graphene. Geim and Novoselov were awarded the Nobel Prize for Physics in 2010 in recognition of their work.

Graphene has many attributes that gives rise to multiple applications that can be applied across a range of commercial areas.

Table 1. Graphene Applications by Commercial Area.

Commercial Area	Applications
Conductive formulations and Inks	Printable electronics E-textiles Coatings
Composite Materials	Mechanical reinforcement
Energy Storage	Lithium-ion batteries Supercapacitors
Transparent Conductive Films	Organic photovoltaic cells Organic light emitting diodes Display/touchscreens
Carbon Semi Conductors	Field effect transistor Spintronics Integrated circuits
Bio-Related	Targeted drug carrier Si-RNA carrier Sensors for single molecule detection
Water treatment	Capacitance de-ionization Filtration

Archer's Managing Director Mr Gerard Anderson said "Archer's business plan is to produce the highest quality natural graphite concentrates in the world that can rival synthetic graphite in terms of grade but potentially have superior performance characteristics due to the highly crystalline nature of Campoona graphite."

Mr Anderson added "the traditional natural graphite industry will be with us for a long time however, there are enormous changes taking place brought about by the rapid emergence of research into graphene. That research has already identified numerous applications and that number will only increase over time. Many predict that graphene will revolutionize the 21st century."

"It is an imperative, given the projected very long life of the Campoona project, that Archer invests in research into developing new products and potentially new commercial applications. Archer's plan is to be a manufacturer of high value graphite and graphene products. The ongoing research tells us we are going in the right direction and quickly."

These few selected examples of new materials and processing technologies developed by the Losic Nano Research Group show the enormous potential of the Campoona graphite in the development of new highly valuable materials and devices across a broad range of applications.

The following short summary of current worldwide research highlights the myriad of potential uses for graphene. Such uses include:

- Display screens in mobile devices - graphene can replace indium-based electrodes in organic light emitting diodes (OLED).

- Faster charging Lithium-ion batteries - graphene is placed on the surface of the anode surface resulting in faster recharging than conventional lithium-ion batteries.

- High performance Ultracapacitors - the large surface of graphene enables increased electrical power that can be stored and also reducing the recharge time to minutes.

- High strength composite materials - graphene appears to bond better to polymers and could result in the manufacture of components with high strength to weight ratio for such uses as windmill blades or aircraft components.

- Storing hydrogen for fuel cell powered cars - graphene layers have been found to increase the binding energy of hydrogen to the graphene surface in a fuel tank, resulting in a higher amount of hydrogen storage. This could help in the development of practical hydrogen fueled cars.

- Lower cost fuel cells - researchers has shown that halogenated nanoplatelets could be used as a replacement for expensive platinum catalytic material in fuel cells.

- Water desalination - nanometer sized holes in graphene can be used to remove ions from water and result in lower costs of desalination.

- Lightweight containers - researchers have produced composite material using plastic and graphene nanoribbons that blocks the passage of gas molecules opening up applications ranging from drink bottles to lightweight natural gas tanks.

- More efficient solar cells - researchers have developed a honeycomb like structure of graphene in which the graphene sheets are held apart by lithium carbonate. This graphene replaces platinum in a dye sensitized solar cell to achieve improved conversion of sunlight to electricity.

- Electrodes with very high surface area and very low electrical resistance - Researchers at Rice University have developed electrodes made from carbon nanotubes grown on graphene.

- Lower cost solar cells - researchers have built a solar cell composed only of carbon which could potentially eliminate the need for higher cost materials.

- High frequency transistors - graphene can be used to make high speed transistors because electrons move faster in graphene compared with usually used silicon.

- Integrated circuits - Researchers are developing lithography techniques that can be used to fabricate integrated circuits based on graphene.

- Sensors to diagnose diseases.

- Graphene membranes - these membranes are made from sheets of graphene in which nanoscale pores have been created to greatly aid gas separation.

Archer is looking to have a mining lease application lodged by Q3 calendar 2014 and first production during 2015. Informal capital cost estimates point to around $15 million for a small size mine and about $25 million for a medium size mining enterprise.

To view pictures and tables, please visit:
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