HD **CNN: CUSTOMERS INCLUDE SOME OF THE WORLD'S LARGEST CONSUMER GOODS COMPANIES, TESTIMONY TO THE EAGERNESS WITH WHICH CARDIA'S LOW CO2 AND FULLY COMPOSTABLE PACKAGING MADE FROM RENEWABLE MATERIALS IS SOUGHT**

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It has been a long road for Cardia Bioplastics since it listed on November 21 1996 (as a miner), soon after changing its focus to eco friendly products.

Cardia in its early years developed low carbon, biodegradable alternative technologies for various sectors - including mining, timber, manufacturing, agricultural pesticides and others.

By 2002 Cardia had narrowed its focus to the manufacture of bioplastics resins and finished products derived from renewable resources.

It holds several patents on products that reduce the carbon footprint of petro chemical plastic packaging by up to 50% (for biohybrids) or that are fully compostable - and with comparable performance to petrochemical plastic products.

The IPCC report last Monday has lent new urgency to the need to reduce carbon in the atmosphere and reduce pollution if the rise in global temperatures - seen as irreversible - is to be limited to 2 degrees higher - which will be damaging, but not as disastrous as temperatures rising above those levels will be.

And while rising temperatures threaten all the natural world, and many species on land are set to disappear, warming temperatures, increasingly acidic oceans and pollution threaten to overwhelm large areas of the earth and decimate sea creatures, including all species fished for food.

The rise and rise of pollution in the oceans from plastic packaging

One such report in the US in 2011 stated between 100 and 200 **billion** pounds of plastic is manufactured annually. An estimated 10% of plastic ends up in the oceans every year. About 20% comes from ships and platforms in the sea. The remaining 80% comes from the land – garbage that travels through storm drains or watersheds and accumulates in streams, rivers, and bays. Eventually this plastic garbage finds its way to into the oceans.

The oceans consist of complex networks of currents that circulate water around the world. Large systems of these currents, coupled with wind and the earth’s rotation, create “gyres” — massive, slow rotating whirlpools in which plastic trash can accumulate.

The North Pacific Subtropical Gyre is a slow moving, clock-wise spiral of currents created by a high-pressure system of air currents. It is an area that traditionally supported plankton and small sea life, but now the plastic in some parts of this Gyre outweighs the plankton by a ratio of six to one.

This Gyre is the home of two massive ocean garbage collections – the Western and Eastern Pacific Garbage Patches. The Western Garbage Patch circulates between California and Hawaii and, according to an article in the LA Times, is estimated to be twice the size of Texas. The Eastern Garbage Patch circulates between Hawaii and Japan.

Known collectively as the Great Pacific Garbage Patch, it was discovered in 1997 by Captain Charles Moore, who founded the nonprofit Algalita Marine Research Foundation in Long Beach, CA.

Other major gyres exist in the South Pacific, North and South Atlantic, and Indian Oceans. Smaller gyres have been discovered near Alaska and Antarctica. Moore estimates that bits of plastic now outnumber plankton in many parts of world's seas.

According to the National Geographic website, a team of Japanese scientists found that plastic breaks down at cooler temperatures than expected within a year of the trash hitting the water.

The team collected samples in waters from around the world according to lead researcher Katsuhiko Saido, a chemist with the College of Pharmacy at Nihon University in Japan.

“All the water samples were found to contain derivatives of polystyrene, a common plastic used in disposable cutlery, Styrofoam, and DVD cases, among other things,” said Saido, who presented the findings at a meeting of the American Chemical Society in Washington, D.C in August 2009.

Roughly 44% of all seabird species, 22% of cetaceans, all species of sea turtles and many species of fish have been documented with plastic in or wrapped around their bodies.

Sealife cannot distinguish plastic from food – and ingesting debris that blocks the digestive tract can harm the smallest to the largest creatures. This non-nutritive bulk eventually starves birds, mammals, and fish.

Genetic altering chemicals have been shown to impede the ability of fish to reproduce and as debris absorbs heat from the sun, it warms sea water making it unsuitable for sea life. Many fisheries and ultimately the world’s food supply is threatened by ocean plastic pollution.

There are other deeply concerning, potential human health impacts from these toxic chemicals that enter the marine food chain through plastic ingestion. Ongoing research explores whether they work their way up the food chain to become increasingly concentrated and enter our bodies through the seafood we consume.

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Size of the potential bioplastics market in the European Union alone (from Wikipedia)

COPA (Committee of Agricultural Organisation in the European Union) and COGEGA (General Committee for the Agricultural Cooperation in the European Union) have made an assessment of the potential of bioplastics in different sectors of the European economy:

Catering products: 450,000 tonnes per year

Organic waste bags: 100,000 tonnes per year

Biodegradable mulch foils: 130,000 tonnes per year

Biodegradable foils for diapers 80,000 tonnes per year

Diapers, 100% biodegradable: 240,000 tonnes per year

Foil packaging: 400,000 tonnes per year

Vegetable packaging: 400,000 tonnes per year

Tyre components: 200,000 tonnes per year

Total: 2,000,000 tonnes per year

*Sustainable and renewable Bioplastics packaging is currently estimated to be 1% of the $200 **billion** per annum plastics packaging market, with exponential growth expected.

*Bans on conventional plastic bags (from Cardia's presentation on April 1)

The US, Europe, Latin America, Australia, Japan, India, **China**, Middle-Eastern governments have legislated or supported bans on conventional plastic bags in an effort to reduce waste and their carbon footprint.

Compostable products - international standards

The EN 13432 industrial standard is arguably the most international in scope and compliance with this standard is required to claim that a product is compostable in the European marketplace. In summary, it requires biodegradation of 90% of the materials in a lab within 180 days.

The ASTM 6400 standard is the regulatory framework for the United States and sets a less stringent threshold of 60% biodegradation within 180 days, unless it is a homopolymer, then it would need to be 90%, again within industrial composting conditions, where the facility is at or above 140F. Municipal compost facilities do not see above 130F.

Many starch based plastics, PLA based plastics and certain aliphatic-aromatic co-polyester compounds such as succinates and adipates, have obtained these certificates. Additive based plastics **sold** as photodegradable or Oxo Biodegradable do not comply with these standards in their current form.

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Cardia owns a strong intellectual **property** portfolio of 11 patent families with 12 patents so far granted in key markets, invented by Cardia's R&D team.

The **company** already has ample resin manufacturing capacity in Nanjing, near Shanghai and its film and bag making capacity is currently being doubled, as well as film and bag manufacturing factories under contract in other countries.

Cardia Bioplastics customers include Procter & Gamble, Kimberly-Clark, Nestle, Colgate-Palmolive, Henkel, Breville, McDonalds, Toyota, Jusco, Johnson&Johnson, 7-Eleven and KFC as well as Councils in **China** - and the Brisbane Council for its carrier bags, waste management and packaging productss - apart from several other smaller customers.

Cardia has **business** development and sales offices in Australia, **China**, Malaysia USA and Brazil.

The **company** was awarded the IAIR Green Excellence Award, one of the world's leading prizes for excellence in global economy and sustainability, in February this year.

Management is tenacious, knowledgeable and energetic and while achieving critical mass is seen as the first step towards profitability, management is clearly focused on achieving profitability as soon as possible - after which a consolidation of shares would be recommendable.

Cardia is currently raising funds via a non underwritten non renounceable rights issue to its shareholders at $0.003 to raise approximately $2.7 **million** before costs as well as a placement of potential short fall to professional and sophisticated investors.

Both rights issue and placement of short fall have free attaching options on a 1 for 3 basis exercisable at $0.006c on or before December 31 2014.

Ex date for the share issue was March 12.

CARDIA BIOPLASTICS LTD - A SNAPSHOT

Cardia listed on November 21 1996 as Cardia Mining, with Pat Volpe (who resigned as Chairman and non exec director last year but remains a major shareholder) having been its guiding light since foundation.

Cardia's focus had begun to change to environmentally friendly technologies in 1998, and by 2002 Cardia's focus had changed wholly to environmentally friendly technologies for sectors from mining to cosmetics, later focusing entirely on bioplastic resins and packaging products, developing its own intellectual **property** of 11 patent families protecting formulation, production, processing and application of its Bioplastic resins and packaging products.

In 2007 Cardia established its manufacturing and product development facility in Nanjing, **China**.

The first **commercial** outcome was in 2008, when Cardia supplied its bioplastic carry bags and waste management products to the Beijing Olympics.

The global head office and application development center is in Melbourne. Cardia manufactures its proprietary resins and films and bags in its own 7,200 tonne capacity plant in Nanjing. Its film and bag making capacity is currently being expanded and will be doubled again in June/July.

*Cardia manufactures its proprietary products from starch based plastics, derived from industrial starch.

Starch possesses the characteristic of being able to absorb humidity, and is thus being used for the production of drug capsules in the pharmaceutical sector. Flexibiliser and plasticiser such as sorbitol and

glycerine are added so the starch can also be processed thermo-plastically. By varying the amounts of these additives, the characteristic of the material can be tailored to specific needs (also called "thermo-plastic starch"). Industrially, starch based bioplastics are often blended with biodegradable polyesters.

Starch-based plastics constitute about 50% of the bioplastics market.

*Cardia has found it far more profitable to manufacture product in its own operation, selling it through its own sales force in Australia, **China**, Brazil, US and Malaysia - selling to local governments, retailers, **brand** owners and packaging companies.

Since it is not practical to export finished films and bags to some countries such as Brazil because of high import duties, the **company** has manufacturing partners in Brazil that manufacture films and bags using Cardia resins manufactured in Nanjing.

Among its customers in Australia, **China** and elsewhere Cardia also numbers **commercial** relationships with some of the world's leading packaging manufacturers that have adapted Cardia's Compostable and Biohybrid resins for their **commercial** packaging applications.

These include Sealed Air, Mondi, Valgroup, Amcor, Jockey, Wipack, VIP, Alto, RPC, Norcan and Mabesa.

In the 2014 year Cardia has signed several strategic supply agreements including Ricoy Supermercados & Drogaria Araujo in Brazil ($A1.4 **million** per annum sales forecast), Nanjing Jiainye and Qixia Districts, **China** ($A1.4 **million** p.a. sales forecast), EcNow Tech in the US ($400,000 p.a. sales forecast) as well as Pacific Springs, Yukon Spring & Norcan Flexible Packaging- Canada, Ecoriginals - Australia, So Delicious **Dairy** Free USA and Truly Green - the Maldives.

Most recently, on April 3 Cardia Bioplastics Ltd announced a leading American manufacturer of personal hygiene and diaper products has doubled its orders of Cardia Biohybrid film to $1 **million** per annum forecast, expanding the use of Cardia Biohybrid hygiene film across different product lines with further potential to increase its use. The manufacturer, who cannot be named due to **commercial** sensitivity designs, develops and manufactures its own proprietary range of personal hygiene products and diapers as well as US retailer private label brands.

Cardia and the manufacturer had established a supply relationship for Biohybrid film two years ago.

CNN managing director Dr Frank Glatz said in the report diaper and personal hygiene companies globally are placing orders in response to customer demand. "In addition, our products are inherently soft touch and fully food contact compliant, making them a natural choice for films in direct body contact".

The competition

While there are local and global competitors with bioplastic products the market is vast, and growing.

Cardia Ltd financials

Code: CNN

Last Traded price 0.3c.

Shares Issued 2,814m.

Options on Issue 300m.

Market Cap $8.4m.

*Cardia is currently raising funds via a placement at $0.003 to professional and sophisticated investors as well as a non underwritten non renounceable rights issue to raise approximately $2.7 **million** before costs.

Both placement and rights issue have free attaching options on a 1 for 3 basis exercisable at $0.006c on or before December 31 2014.

Ex date for the share issue was March 12.

Directors:

Richard Tegoni, Non-Executive Chairman

Richard is Chairman of Cardia Bioplastic Ltd and was first appointed as Non-Executive Director of the **Company** on 21st December 2012. He holds a Masters of **Business** Administration with the Australian

Graduate School of Management (AGSM), Diploma in Mortgage Broking and a Diploma in Financial Markets with the Securities Institute of Australia (SIA).

Richard has a background in finance, banking and sales & marketing. His experience includes senior marketing and strategy management positions with Optus Communication, Chief Operating officer and **Company** Secretary of Melbourne University Publishing Ltd together with senior **business** advisory & consulting roles with various small to medium sized companies.

Frank Glatz, Managing Director

Frank has overall responsibility for the **business** and the strategic direction of the **company**, with particular focus on international commercialisation and **business** development. Prior to joining Cardia Bioplastics, Frank was employed by Plantic Technologies to establish their European operations and to commercialise their technology internationally. Before joining the bioplastics industry, Frank worked for more than ten years in the plastics and packaging industries in general management, **commercial** and technical roles with ICI Australia, Qenos and Orica. Prior to this, Frank conducted polymer research in Germany and Japan. He holds MSc, PhD and MBA qualifications.

Steve Bendel, Non-Executive Director

Steve is currently the sole proprietor of accountancy practice Bendel Partners Pty Ltd. Bendel Partners have a diverse range of clientele ranging from small and medium sized **business**, single and multi-tenanted **commercial property** investors & syndicates. Bendel Partners are actively involved in **property** syndications, **property** development, lease negotiations, sourcing and negotiating finance with major lending institutions.

Steve's qualifications include a Bachelor of Education from Victoria College Rusden with a Graduate of Diploma (Accounting) from Monash University. He is also a member of CPA Australia.

Gideon Meltzer, Non-Executive Director

Gid has significant Capital Markets and Corporate and **Commercial** experience having served as General Counsel and **Company** Secretary at an ASX S&P 200 **company** and smaller capped listed companies where he advised the boards on a range of corporate **transactions** and governance. He has held a number of senior positions at legal firms and prior to establishing GM Legal & Corporate Advisory of which he is principal, Gid was a partner in the Corporate Practice **Group** of Cornwall Stodart.

Gid's qualifications include Bachelor of Economics and Bachelor of Law along with a Graduate Diploma in Taxation Law from Monash University.

Management:

Rekha Bhambhani, Financial Controller/**Company** Secretary

Rekha has been Chief Financial Officer of Cardia for last 7 years and has also worked as an assistant with the previous **Company** Secretary- Mr John Wilson on **company** secretarial matters. Prior to that, she worked in accounting and finance positions in India for more than 8 years.

Rekha holds a **B**.Com, ACIS, ASA, ACA (ICAI), DISA (ICAI).

Chen (Jacky) Yi, General Manager **China**

An experienced packaging specialist Jacky has commercialised a number of bioplastics technologies. Based at the **company**'s Nanjing facility, as General Manager he is responsible for the Cardia Bioplastics**business** in **China**. Jacky was instrumental in Biograde winning the exclusive supply of certified biodegradable packaging to the 2008 Beijing Olympics and Paralympics. He is a graduate of the University of Science & Technology, Beijing, and has a Diploma of International Trading from the Management College of **China** in Beijing. He also holds a Bachelor of Science from Upper Iowa University, USA. He is a regular speaker at bioplastics conferences in Asia.

James Beck, Managing Director, North America

Canadian educated, James has 28 years' packaging experience as a senior manager in sales, marketing and product development. He was Division Manager with Price Daxion (now Unisource), General Manager of United Shipping Supplies, was founding President of Dove Sales and Marketing packaging distribution, and was a founding consultant of Enviro Smart Packaging promoting biodegradable plastic technologies in Europe, the Middle East and Africa.

Joao Paulo Mignot, Managing Director, Latin America

Joao Paulo has many years of international experience in the plastics, packaging and logistics industries. Joao Paulo was the former Managing Director of Tecno Ambiental and participated in the Brazilian Government Council that enacted new waste management laws for landfills, hospitals and the veterinary industry. He also was the Operations Director for Fedco in Miami/USA with responsibility for supply chain, logistics and Latin American **Business** development.

Joao Paulo has been engaged in sustainable packaging and Bioplastics for more than 5 years, leading many initiatives in the Brazilian market. He holds a Bachelor degree in **Business** Administration.

Iqbal Huq, Managing Director, Malaysia

Iqbal has many years experience in **business** managment and logistics. He worked in senior management roles in sales, marketing, **business** development and distribution. Iqbal has been engaged in sustainable packaging for several years, leading many initiatives in the Malaysian market.

Li (Brian) Jun, Vice General Manager **China**

With many years experience in international supply chain management and sales, as Vice General Manager **China** Brian is responsible for managing Cardia Bioplastics export **business** and leads the **China** sales team. Brian has in-depth experience and excels in an international and export oriented customer environment.

Markus Leufgens, Technical Manager, based in Melbourne

With a sound background in polymer engineering, Markus is responsible for global application development and technical support. He has more than 20 years' experience in the plastics and packaging industry in Europe and Australia with global companies, such as Dow Chemical and Amcor Packaging. His roles included research and development, technical service, manufacturing, plant engineering and product development. Prior to joining Cardia Bioplastics, Markus worked for 5 years with Plantic Technologies in application and product development where he complemented his technical expertise with an in-depth knowledge of bioplastics.

Chen, Changping, Technical Director, **China**

An excellent polymer scientist with more than 20 years experience in the field of bioplastics product development, Mr Chen invented our product technology. Based at the **company**'s Nanjing facility, he is responsible for the Cardia Bioplastics global product development and manufacturing.

Major shareholders

Polarity **B** Pty Ltd (Pat Volpe) 8.5%

Richard Rodger Tegoni and Mrs Debra Marisa Tegoni 8.185

Dentost Pty Ltd 5.78%

Vermar Pty Ltd 5.02%.

The Top 20 hold 44.82% of Cardia

This is our third Week's Special on Cardia. The second was dated January 4 2002. Cardia was trading at 15.5c.

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