



ALGAE.TEC



# ALGAE ENERGY

**A Renewable, Sustainable  
and Emerging Profitable  
Business**

# Disclaimer

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This presentation has been prepared by Algae.Tec Limited. This presentation contains a number of forward-looking statements that are subject to risks, contingencies and uncertainties. Such statements involved known and unknown risks and certain assumptions that may cause the actual results, performance or achievements of the Company to be materially different from the statements in this presentation.

Actual results could differ depending on factors including, but not limited to, the availability of resources, testing of the Company's technology on a commercial scale, timing and effects of regulatory actions, liquidity of the Company's shares and the Company's commercial partners.



# Corporate Overview

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Corporate Snapshot	
ASX Code	AEB
Shares on Issue	339,879,095
Share Price Range (12 months)	\$0.050 - \$0.070
Market Capitalisation as at 12 July 2016	\$23,791,536
Unlisted Options <sup>1</sup>	46,195,444
Major Shareholders	
Teco Bio LLC (Earl McConchie)	51.49%
Reliance Industrial Investments (India's largest private company)	13.32%
<small>Note 1</small> 28,728,607 options - Reliance Group (exercisable at 16.36 cents) 1,000,000 options exercisable at \$0.20 on or before 1 March 2018 – Cross Border Ventures 16,000,000 options exercisable at \$0.09 on or before 30 June 2019 – Employees options 262,755 options exercisable at \$0.10 on or before 29 January 2017 – Professional services 204,082 options exercisable at \$0.10 on or before 21 April 2017 – Professional services	

# Company Objectives

**To be the global leader in diversified quality algae products.**

This is being achieved by:

- ✓ Commercializing proprietary technology for the production of algae through the capture of solar energy and sequestration of carbon dioxide.
- ✓ Targeting key markets for the substitution of fossil fuels with sustainable algae-based biofuels, including renewable kerosene (jet fuel), biodiesel and bioethanol.
- ✓ Producing high quality specialty algae products for nutraceutical, food and specialty markets.
- ✓ Implementing commercial plants for the production of algae and its biofuels with strong economic viability.
- ✓ Focusing on quality products and services, building strategic partnerships to accelerate commercialisation and creating long-term shareholder value.

Algae.Tec currently has a demonstration plant in India in conjunction with the Reliance Group for biofuel evaluation which will be commissioned over the next few months. Algae.Tec has also recently started up and commissioned a small plant in Atlanta to produce algae for nutraceutical products.

# Board of Directors

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## **Managing Director and Company Secretary: Peter Hatfull ACA**

- Peter has over 30 years' experience in a range of senior executive positions with Australian and International companies. He has an extensive skill-set in the areas of business optimisation, capital raising and company restructuring.
- Prior to joining Algae. Tec, Peter held senior financial and Board positions in Australia, Africa and the UK. He has particular experience in revitalising business plans, attracting investor funding, and implementing profitable strategies..
- Peter graduated as a Chartered Accountant in the United Kingdom, where he worked for Coopers and Lybrand (now PriceWaterhouseCoopers ), and subsequently moved to Africa, where he spent 8 years in Malawi, where he was CFO of the Malawi operation of international trading group, Guthrie Limited. Peter moved to Perth in 1988.



## **Executive Director: Garnet Earl McConchie BSc ME(Chem) RPE AICE**

- Has over 35 years of experience over a broad field of chemistry and associated technologies, including global markets, bulk chemicals and plastics, differentiated commodities and intermediates, specialty chemicals, polymers and interaction with environmental sectors.
- Was employed with Dow Chemical Company for 25 years where he served as Global Director for chemicals and plastics
- Currently, the founding director and controlling shareholder of Teco.Bio LLC. He is based in Atlanta, Georgia to co-ordinated the microalgae development.

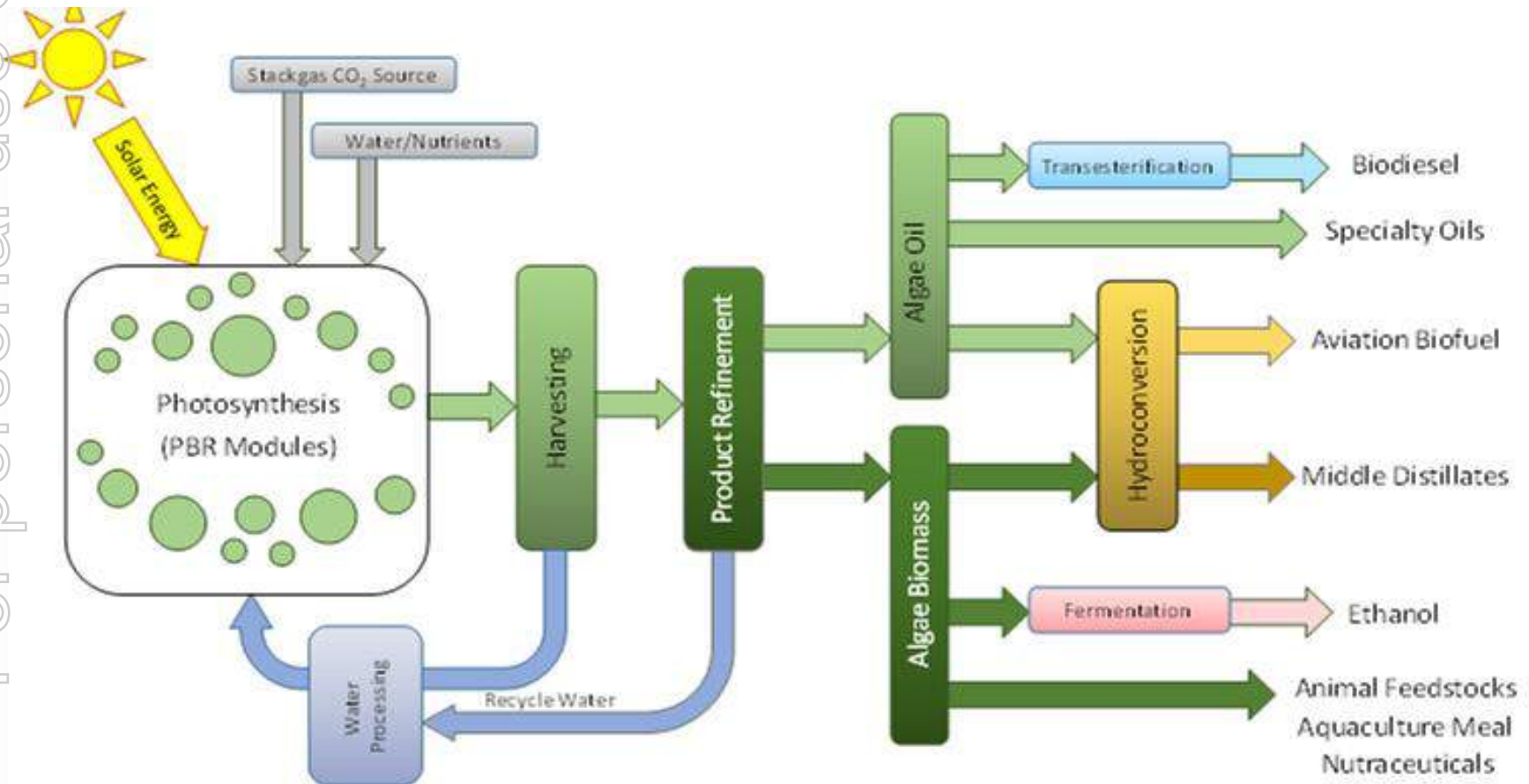


## **Non - Executive Chairman: Malcolm Raymond James BBus, FAICD, AAustIMM**

- Has over 30 years of experience in a finance, project development and public company management.
- Involved in over \$2 billion in capital and debt raisings and was the inaugural CEO of the Australian Employment Covenant.
- Currently, principal of MRJ Advisors, a boutique investment, advisory and project development organization.
- Currently non-executive chairman of Anova Metals Ltd.

# Technology Overview

The innovative system consists of a modular bio-reactor in which minute plants, called microalgae, are grown (through the controlled supply of light, water, carbon dioxide gas (CO<sub>2</sub>) and nutrients), and related infrastructure used for harvesting and refining into algae products



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# Benefits of Microalgae

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- Nature's oldest and most efficient process for capture of solar energy and atmospheric CO<sub>2</sub>
- Produces orders of magnitude more oils and hydrocarbons per land mass
- A sustainable source for renewable kerosene (jet fuel), biodiesel and bioethanol
- Provides direct environmental solutions for air/water and end-use emissions
- Source of high nutritional value (Super Food) including omega 3, protein, β-carotene, selenium, zinc, vitamins B-12, C and E.

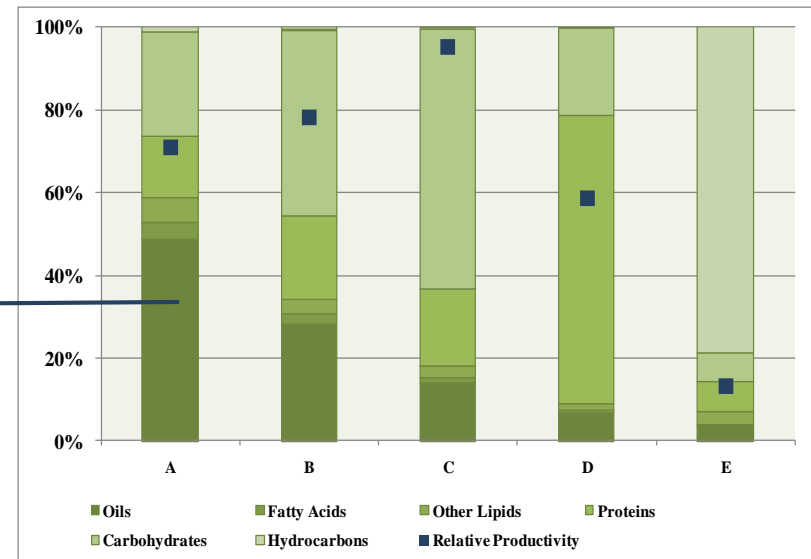


# Performance

- Algae.Tec has evaluated productivity and product yields for over 50 microalgae species for biofuels production, representing a broad range of microalgae compositions of lipids/oils, carbohydrates, proteins and hydrocarbons with carbon contents ranging from 45% to >75%.
- Overall technical and economic performance of the photo-reactor modules, harvesting system and product refinement operations are dependent on the specific algae species and its optimum cultivating conditions to maximize productivity and product yields to desired products.

## High Lipid/Oil Algae

- *Harvesting & refinement of algae provides approximately 50% yield to algae oil product with high purity product quality, targeting production of algae-biodiesel.*
- *Algae biomass contains high carbohydrate and protein contents of up to 80% for animal food supplements or conversion to bio-ethanol or renewable distillates.*
- *Algae production of 250 metric tons of microalgae per year per module and upon conversion equivalent to 55,000 gallons of end-use sustainable biofuels per year per module.*



Select algal species A-E with product distributions based on inorganic and moisture-free weight basis



# Nutraceutical Markets

- A wide variety of algae are commercially produced for use in human health and food supplement applications with the 2015 global market estimated at US\$800m and growth rates of 5% to over 15%, dependent on algal species.
- More than 40 different algal species have been identified/developed for various nutraceutical applications. There are 6 algal species which represent over 95% of today's market: Arthrospira (Spirulina), Chlorella, Dunaliella, Nannochloropsis, Haematococcus and Schizochytrium.
- The current production base is dominated by Asian suppliers at 71% (China, Taiwan, S. Korea and India) with 11% US, 7% EU, 5% Israel, 3% Australia/New Zealand and 3% Latin America.
- Bulk market prices range from US\$15 to over US\$100 per kilogram, dependent on algal species, product form (algae biomass, algae oil or extracts thereof) , product quality and nutritional value.
- More than 90% of the total nutraceutical algae production worldwide is based on open cultivation systems with substantial product quality and consistency limitations.

# Nutraceutical Algae Plant

- The initial plant for the commercial nutraceutical market has now been commissioned in Cumming, Atlanta at Algae.Tec's main research and development facility.
- The nutraceutical plant features capabilities for multiple microalgal species, high productivity photo-bioreactors, efficient harvesting and product refinement technologies within an environmentally-controlled process for production of sustainable quality products.
- The plant will initially generate up to 50 tonnes per annum of algae-based nutraceutical products, representing well over US\$2m of profitable revenue per year.
- The Company has partnered with Gencor Pacific, one of America's largest suppliers of nutraceutical additives to the pharmaceutical industry, for product sales to the market and continued development of algae-based nutraceuticals.
- The nutraceutical plant will be scaled up to 1,000 tonnes per year for production of multiple algal species and products thereof, utilizing AT's unique technology platform and facility infrastructure.

# Algae-Based Nutraceuticals

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Algal Species	Description	Characterization	Nutraceutical Applications
Arthrospira (Spirulina)	Filamentous blue-green, fresh water microalgae	>65% proteins with 5% lipids (rich source of essential fatty acids, vitamins and minerals)	High protein food supplement (weight loss, diabetes, cardiovascular diseases, cancers and mental health)
Chlorella	Unicellular green, fresh water microalgae	50-60% proteins with up to 20% lipids (rich source of chlorophyll, essential fatty acids, vitamins and minerals)	High protein food supplement (hypertension, cholesterol, immune system, fibromyalgia and colitis)
Dunaliella	Unicellular green (red) bi-flagellate, marine microalgae	30% proteins with 10% lipids (rich source of beta-carotene, essential fatty acids and minerals)	Potent free-radical antioxidant (cancers, immune system, neoplasms and liver lesions)



# Algae-Based Nutraceuticals

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Algal Species	Description	Characterization	Nutraceutical Applications
Haematococcus	Unicellular green (red) flagellate, fresh water microalgae	30% proteins with 20-30% lipids (rich source of astaxanthin and essential fatty acids)	Potent free-radical antioxidant (vision, hypertension, immune system, nervous system diseases)
Nannochloropsis	Unicellular green, marine water microalgae	40% proteins with up to 40% lipids (rich source of EPA, vital amino acids, vitamins and minerals)	High EPA Omega-3 algae oil (memory, weight loss, neural disorders, vision, immune system and cardiovascular )
Schizochytrium	Unicellular	20% proteins with up to 60% lipids (rich source of DHA	High DHA Omega-3 algae oil ((memory, neural disorders, vision, immune system and cardiovascular )



# Nutraceutical Algae Plant

## GENCOR PACIFIC

- Algae.tec has recently signed an exclusive supply and distribution agreement with Gencor Pacific
- Gencor has a client base that includes some of the world's largest nutraceutical and pharmaceutical companies
- This agreement states that Gencor will buy all of Algae.Tec's production worldwide of nutraceutical algae products
- The signing of the supply agreement was followed with an investment of US\$1 million into Algae.Tec
- This investment will accelerate the development of and increase the capacity of the small nutraceutical algae plant in Cumming
- These agreements and investment are a tremendous endorsement of Algae.Tec's technology and capability
- Algae.Tec and Gencor are currently in discussions regarding new product development.

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# Nutraceutical Algae Tested Products

## CHLORELLA

Product Name	Alganics® – C
Process	Unicellular, phototrophic, green algae (2-4 µm spherical shape), cultivated in fresh water media via environmentally-controlled process.
Product Type	Green powder (>98% cells ruptured)
Properties	45-65% proteins, 5% chlorophyll, 10-20% carbohydrates, 10-30% lipids/oils, 10-20% dietary fibers and numerous vitamins and minerals.

Chlorella is the highest-known source of chlorophyll contains essential fatty acids, including Omega-3 EPA and DHA, Omega-6 ARA, beta-carotene and is a large producer of lutein. Minerals and vitamins include a broad spectrum of Vitamin B complexes and vital minerals for human health.

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# Nutraceutical Algae Tested Products

## DUNALIELLA

Product Name

Alganics® – D

Process

Unicellular, bi-flagellate, phototrophic, green (transition to red under stress) algae (10-20 µm oval and ellipsoidal shape), cultivated in marine water media via environmentally-controlled process.

Product Type

Red powder and Beta-Carotene extracts

Properties

20-30% proteins, 2% chlorophyll, 30-40% carbohydrates, 10% lipids/oils and numerous vitamins and minerals. Beta-carotene contents ranging from 6% to >10%.

Dunaliella is the highest-known source of beta-carotene and contains essential fatty acids, including Omega-3 EPA and DHA fatty acids and Omega-6 ARA. Minerals and vitamins include a broad spectrum of Vitamin B complexes, glycerols and vital minerals for human health.

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# Nutraceutical Algae Tested Products

## HEAEMATOCOCCUS

Product Name	Alganics® – H
Process	Unicellular, flagellate-motile, phototrophic, green (transition to red under stress) algae (10-20 µm oval and spherical shape), cultivated in fresh water media via environmentally-controlled process.
Product Type	Red powder and Astaxanthin extracts
Properties	20-30% proteins, 1.5% red and green chlorophylls, 35-45% carbohydrates, 20-30% lipids/oils and numerous vitamins and minerals with Astaxanthin contents up to 4%.

Haematococcus is the highest-known source of astaxanthin and contains essential fatty acids, including Omega-3 EPA and DHA and Omega-6 ARA fatty acids. Minerals and vitamins include a broad spectrum of Vitamin B complexes and vital minerals for human health.

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# Nutraceutical Algae Tested Products

## NANNOCHLOROPSIS

Product Name	Alganics® – N
Process	Unicellular, phototrophic, green Algae (2-4 µm spherical shape), cultivated in marine water media via environmentally-controlled process.
Product Type	Green powder (>98% cell ruptured) and Green Algae Oil extracts
Properties	30-40% proteins, 1% chlorophyll, 20-30% carbohydrates, 20-40% lipids/oils and numerous vitamins and minerals with Omega-3 EPA contents of 20% to more than 25% in Algae Oil.

Nannochloropsis is a concentrated source of essential fatty acids, including Omega-3 EPA and Omega-7 fatty acids, with a balance of key carotenoids (astaxanthin and zeaxanthin) and vital amino acids. Minerals and vitamins include a broad spectrum of Vitamin B complexes and high levels of vital minerals.

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# Nutraceutical Algae Tested Products

## SCHIZOCHYTRIUM

Product Name	Alganics® – S
Process	Unicellular, heterotrophic, brown microalgae (10 µm oval shape with clusters), cultivated in marine water media via environmentally-controlled process.
Product Type	Algae Oil extracts
Properties	Algae biomass contains 50-60% lipids/oils with Omega-3 DHA contents >30% in Algae Oil.

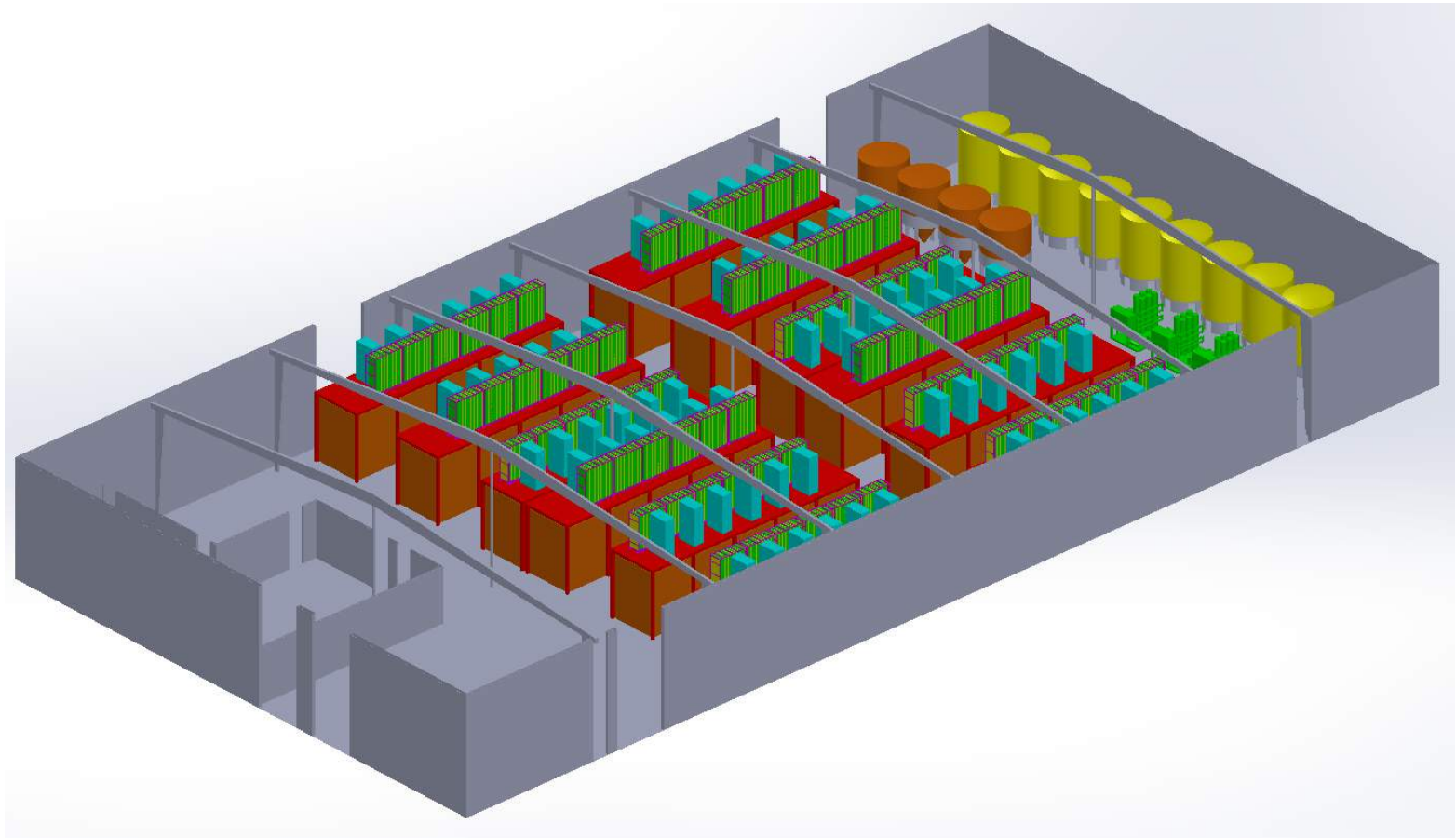
Schizochytrium is a concentrated source of essential fatty acids, including Omega-3 DHA fatty acids for human health applications.

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# Nutraceutical Algae Plant

## Increased Nutraceutical Plant Layout



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# Algae Based Biofuels – Reliance Industries

## **Reliance Industries is India's largest company And is Algae.Tec's major strategic partner**

- The initial contract with Reliance was signed in May 2013 with a value over \$5m
- The contract was for equity participation in Algae.Tec by Reliance and for Algae.Tec to complete agreed operational objectives
- Reliance currently holds 13.32% of the Company
- Algae.Tec is contracted to evaluate certain algae for fuel products, to build a pilot plant in Jamnagar, India, and, following successful trials, to build a full size commercial plant.
- Reliance owns the world's largest refinery situated in Jamnagar producing thousands of tonnes of CO<sub>2</sub> which will be the site of the major commercial plant
- The evaluation of specific algae has been successfully completed
- Equipment including photobioreactors has been dispatched and is on site in Jamnagar
- Plant to be commissioned late CY16



# Other Initiatives

- Algae.Tec has a collaboration agreement with Lufthansa
- Algae.Tec is in continuing discussions with a number of other major international airlines regarding investments to reduce down their carbon footprints
- Algae.Tec has signed a mutual collaboration agreement with Larimar Energy SRL, a company based in the Dominican Republic, to provide an algae plant for capturing the CO2 from a new coal fired power station.
- Algae.Tec has a binding agreement to provide an algae solution for the CO2 emissions from a proposed waste to energy plant being built in WA. The waste to energy plant should have financial close during the first quarter 2016
- The Company is in discussions with various other parties regarding carbon capture and usage initiatives

# Nutraceutical Algae Plant

Algae produced in Atlanta



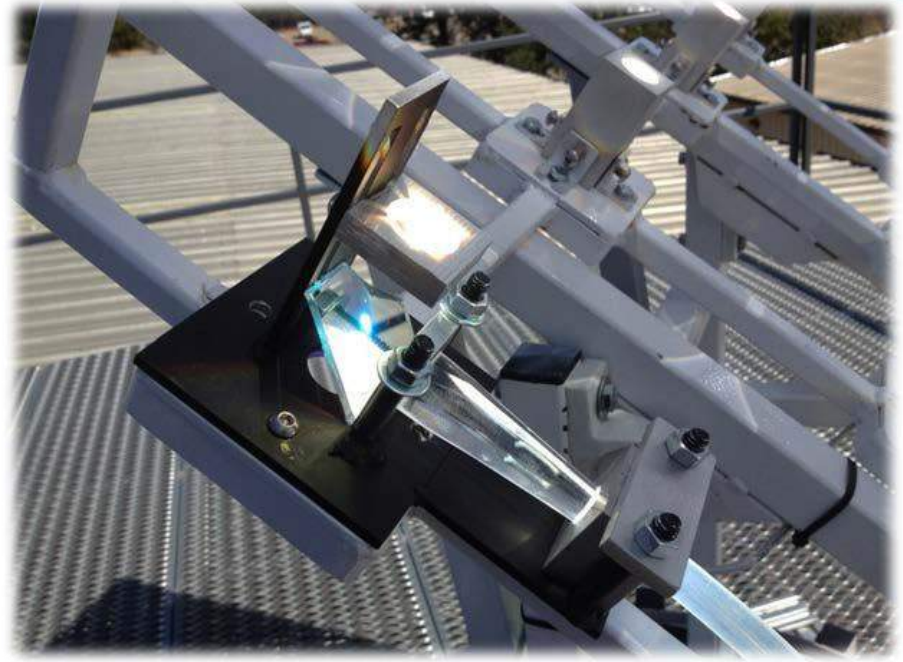
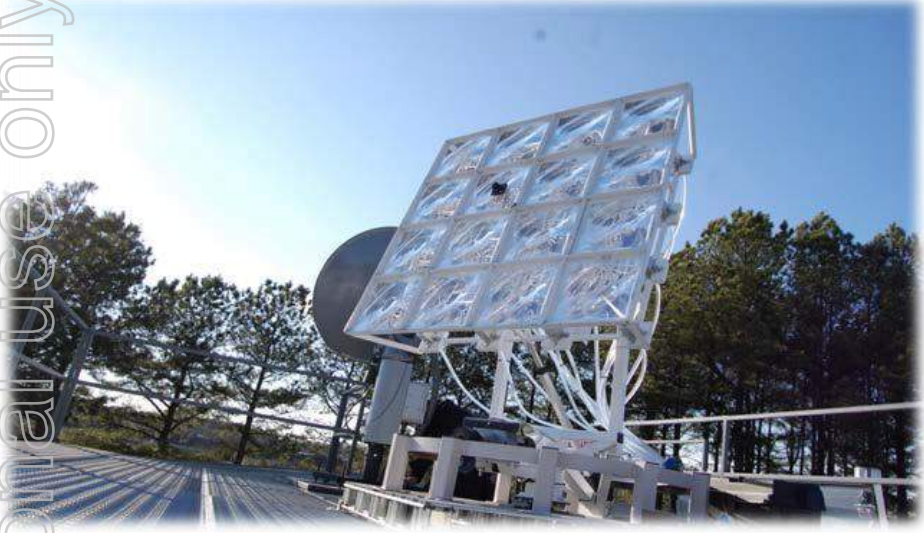
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# Direct Solar Light Energy

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## Algae.Tec's proprietary light system in Atlanta

- Direct Visible Light Energy Solar Collector System
- Proprietary 2-axis flat-plate Fresnel technology.
- Fiber optics transmission to PBR Module



# Indirect Solar Light Energy



## Indirect Light Energy Solar Collector System in Atlanta

- Proprietary 2-axis flat-plate photovoltaic technology.
- PBR Module light panels with optimal intensity and wavelengths

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# Contact Details

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## Registered Office

**Unit 2  
100 Railway Rd  
Subiaco Perth  
Western Australia 6008**

**+61 8 9380 6790**

## Managing Director

**Peter Hatfull  
+61 419 920 272**

## USA Office

**2560 Industrial Pk Blvd  
Cumming  
GA 30041**

**+1 678 679 7370**

