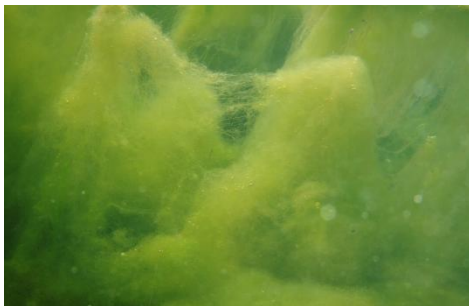


Capture and conversion of CO₂ emissions for the sustainable production of valuable commodities



- The information in this presentation has been prepared by MBD Energy Limited (MBD) from a variety of internal sources, which MBD, to the best of its knowledge and belief, considers accurate.
- The information in this presentation is general information only and is not intended to provide investment information. The information is intended only to provide a brief overview of MBD's core activities, strategies and processes.
- You should seek further information with respect to any proposed investment in MBD, including advice from a financial adviser or stockbroker if necessary.
- MBD excludes all liability arising out of any inaccuracies in this presentation, except where liability is made non-excludable by legislation.
- Calculated values are approximate values only and may be subject to change.

Algae What is it? Algal Bio-products



Carbon Constrained Economy

Carbon Pollution Reduction Scheme

Carbon Credits

Nitrogen Credits

Peak Phosphorous

Algal biomass and bio-products

High productivity on non-arable land



Microalgae (unicellular) (microns)

Macroalgae (multicellular) (mm – meters)

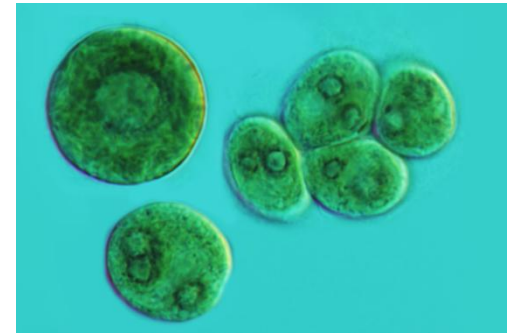
High growth rates

High productivity

High biodiversity

Broad environmental tolerance

Sequestration of CO₂ and nitrogen



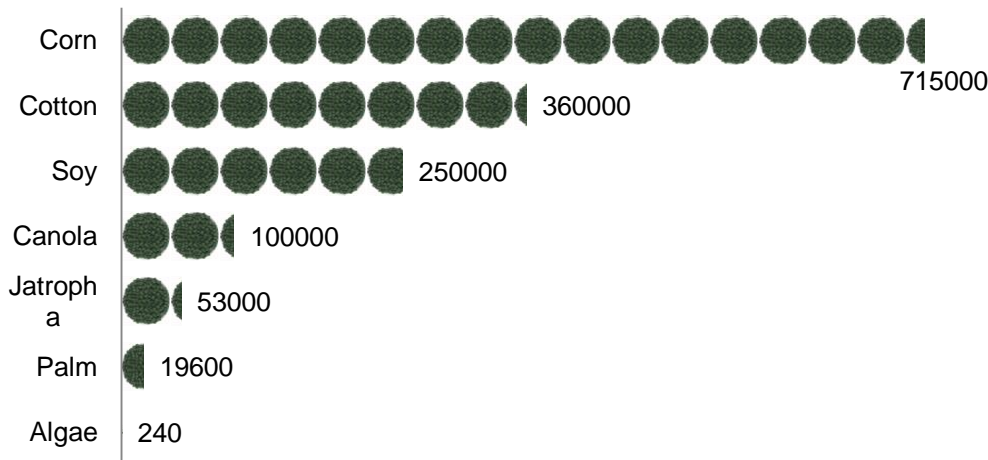
Chlamydomonas sp.



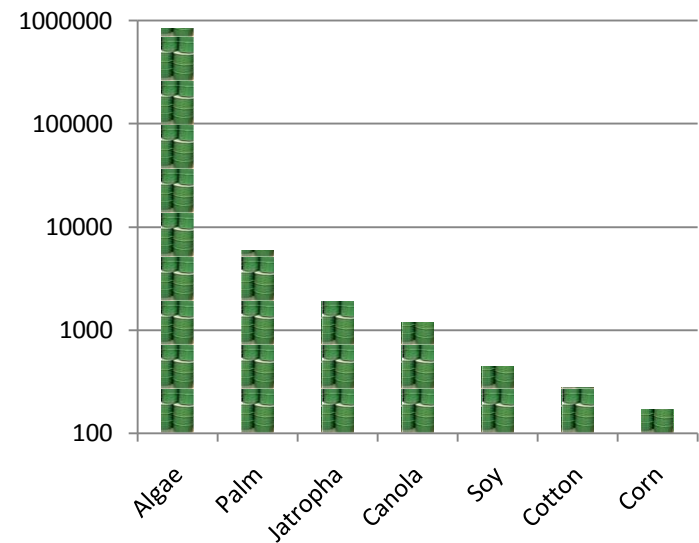
Cladophora coelothrix

Land space requirements MBD CO₂ Synthesizer Compared with other oil Crops

Land Use - Number of Ha required to produce 100,000 tonnes of oil



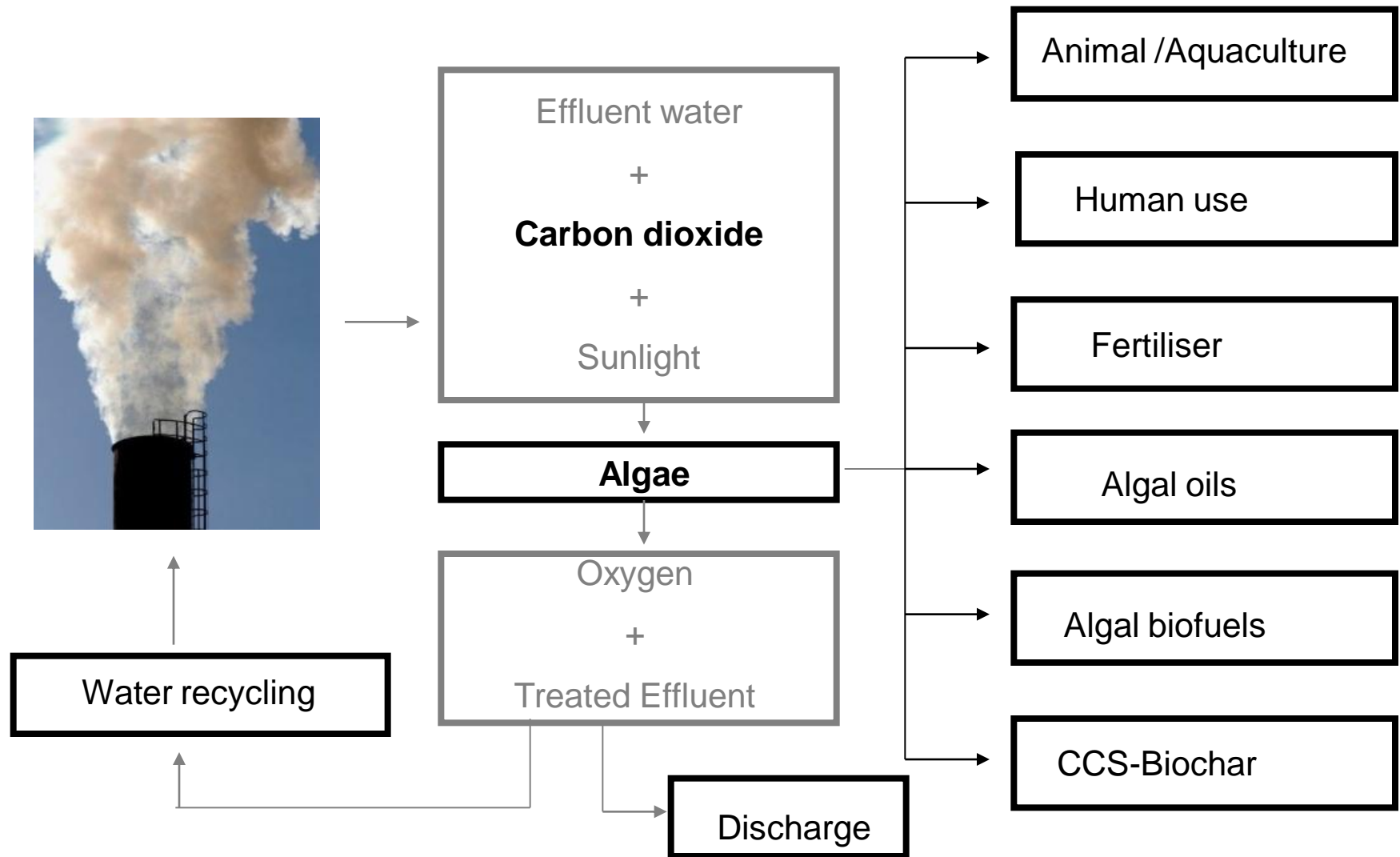
Productivity on 1000 Ha of land per year (tpa)



The table top left graphically illustrates the negligible land space requirements of an MBD CO₂ fuel synthesiser to produce 100,000 tonnes of oil compared with biofuel crops. Not only is the land 'foot-print' small, the oil yield of an MBD CO₂ fuel synthesiser is much higher than biofuel crops – as shown top right.

Australia's major power stations have significant low value land buffers surrounding them. Depending on the size of the power station the land required to sequestrate its CO₂ emissions (50% - daylight hours and up to 80% if artificial light is used) will be in excess of 1000 ha. [Note: To date MBD has only explored growth of algae under sunlight.]

Algal sequestration of CO₂ emissions



Macroalgae – macroscopic multicellular plants

- Efficient growth (up to 20% per day)
- High density culture (5 g.L⁻¹)
- Extremely diverse (freshwater to hypersaline)

Rigorous scientific development (aquaculture)
Source of bio-products (food, phycocolloids)

Existing Seaweed aquaculture,
15 million tonnes biomass, \$6.3 billion
production



Microalgae – microscopic single cell plants

Highly efficient growth (up to 4 doublings per day)

Extremely diverse (freshwater, saltwater, hypersaline)

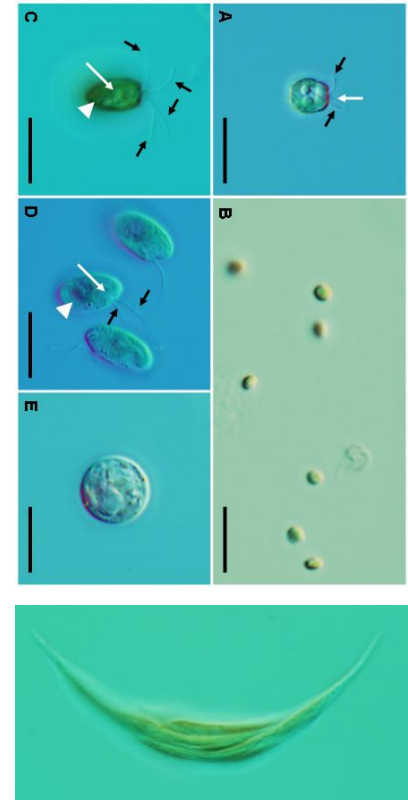
Rigorous scientific development (aquaculture)

Source of natural oils (energy and lipid profile)

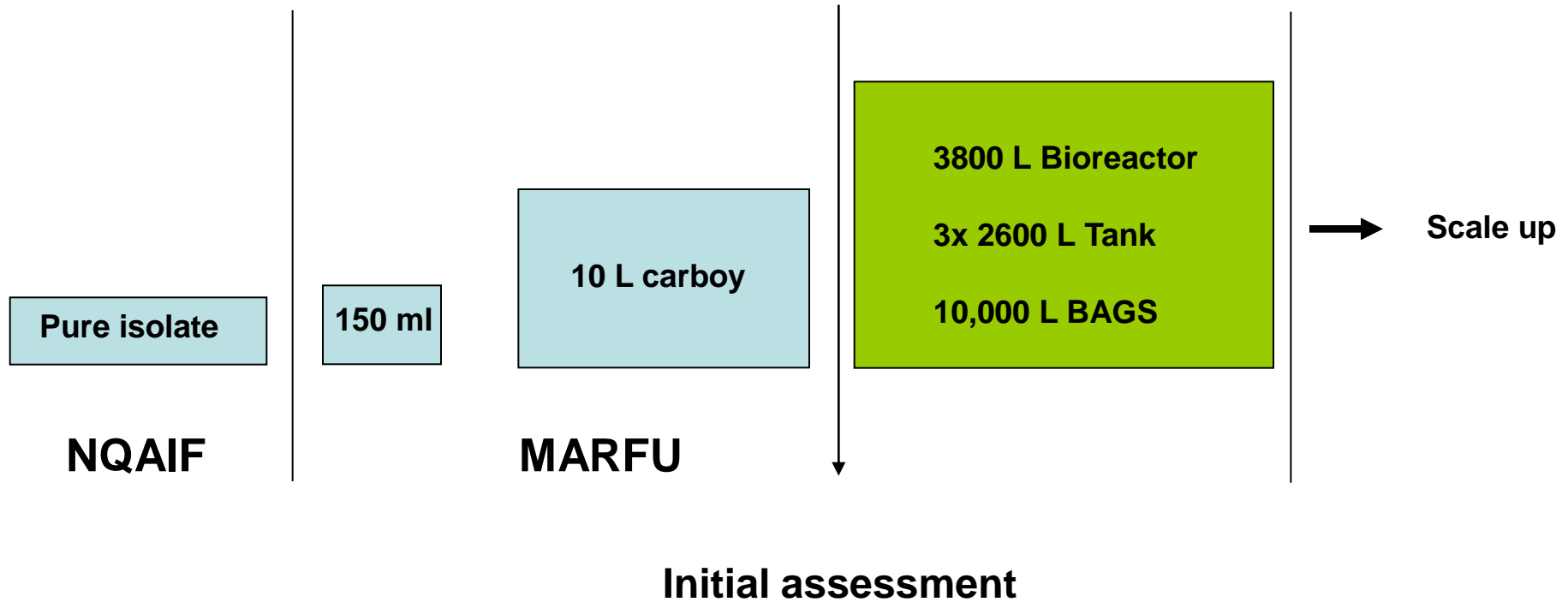
Aquaculture and Microalgae

Ankistrodesmus sp.

JCU – NQAIF (International Centre of Excellence)



Proof-of-concept – Microalgae for oil and meal



3-Stage Development Process



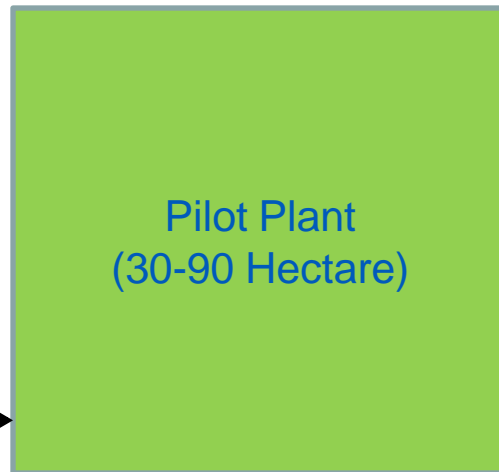
JCU Research Facility
(5,000 sqm.)



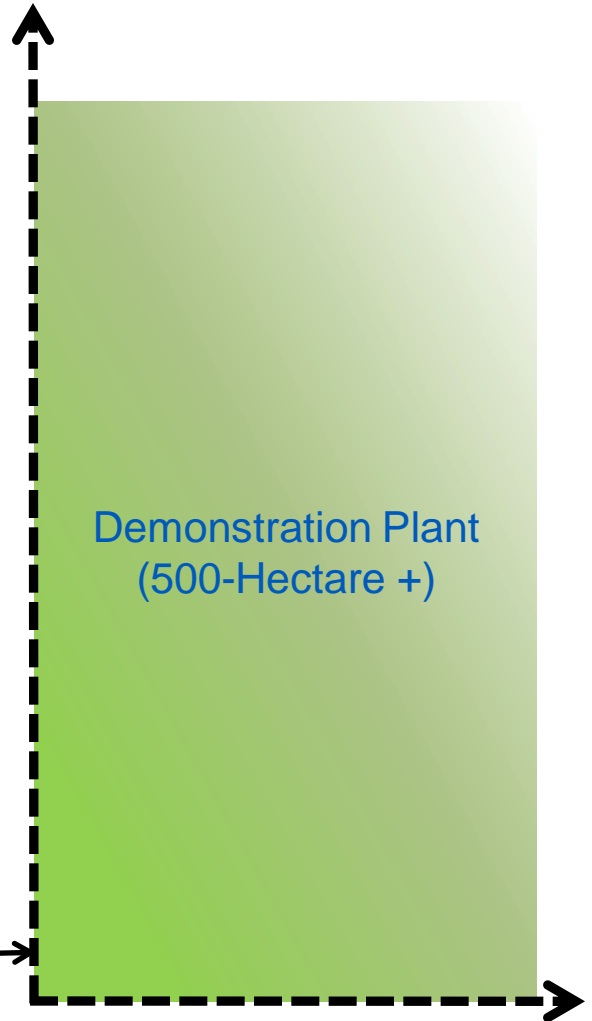
Display Plant
(1-Hectare)



Pilot Plant
(30-90 Hectare)



Demonstration Plant
(500-Hectare +)



Algal cake

Animal feed

Algal oil

Biodiesel

Bioplastics

Edible oil

Pure oils

ω -3, ω -6 polyunsaturated fatty acids

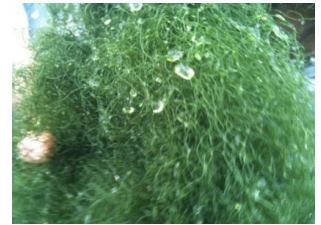


Species	Lipid.100g ⁻¹	Protein.100g ⁻¹	Carbohydrate.100g ⁻¹
<i>Nannochloropsis</i>	29.7	29.7	38.2
<i>Picochlorum</i> sp. *	9.7	50	32
Soy Meal	19.9	36.5	30.2



* Produces 3x the biomass compared to *Nannochloropsis oculata*

MBD – JCU Research and Development



Projects



MBD's CO₂ to energy Process Summary



CO₂ Emitter

Greenhouse gases from emitter collected at the base of the flue gas chimney and piped to MBD Algae Farm.

(CO₂ NO_x SO_x)

- e.g.
- Power Plant ,
- Gas Plant & Refineries,
- Cement Kiln,
- LNG Facility,
- Coal Seam Gas Production,
- Other processes...

Sunlight



Waste Nutrient

N, P, K, S



- Sewerage
- Waste from feedlot
- Waste water
- *Supplemented with*
- Commercial fertilizer



Algae Synthesiser Farm

Land (low value buffer)
Each million tonnes of CO₂ e sequestered produces the following outputs:

- 550,000 tonnes of algae:
 - 180,000 tpa algae oil
 - 370,000 tpa nutritious livestock feed



Algae Oil 35% Oil Options Include

- Biodiesel Production
- Plastic Production
- Jet fuel, other fuels



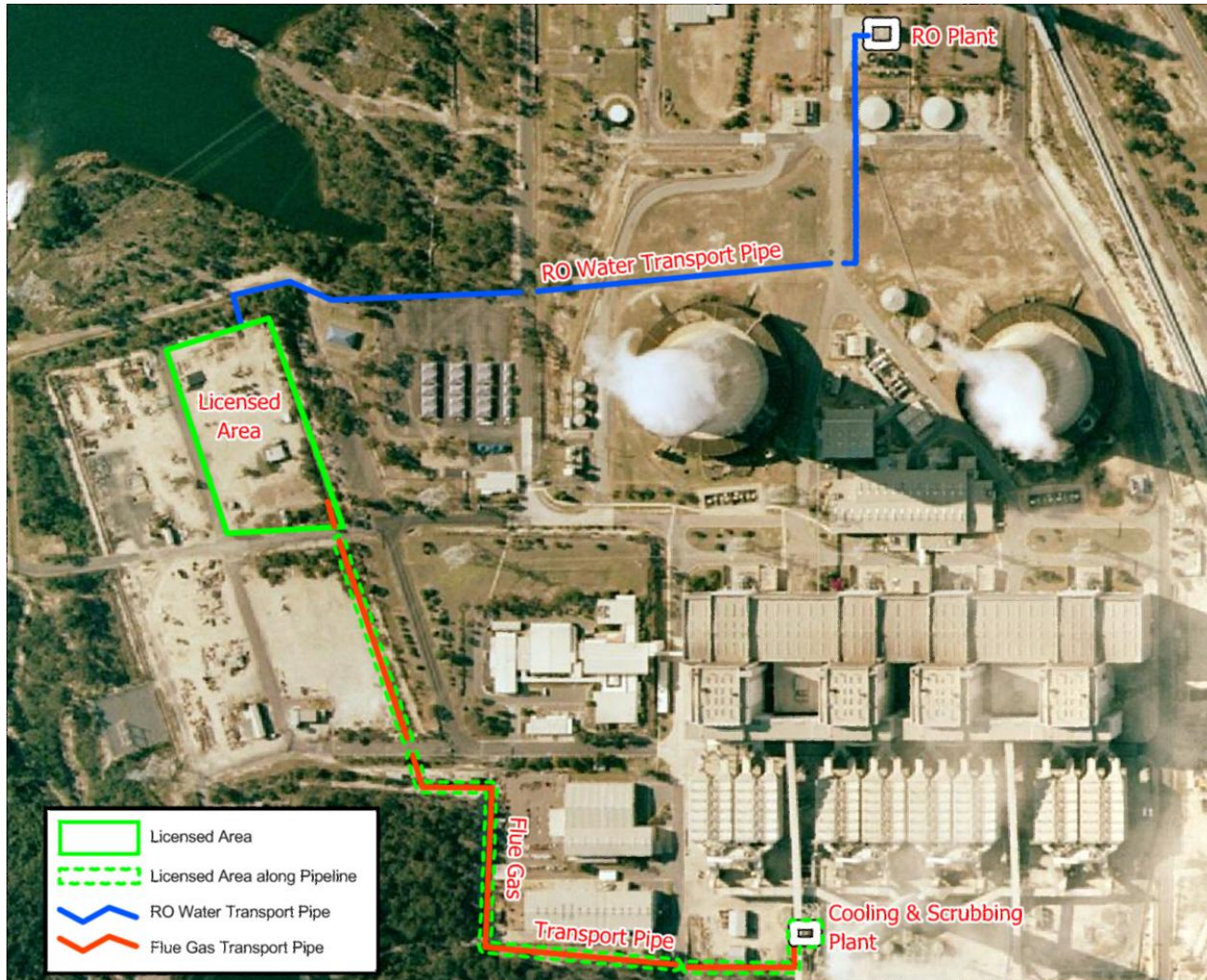
Algae Meal 65% Meal Options Include

- Feed for livestock industry
- Feed for fertilizer
- Biomass for bio-plastic production
- Biomass for electricity production

Key consumption / output rates

- 100% of algae used as value added product
- Typically, 1 ton CO₂ emitted per MWhr generated
- Require ~2 tons of CO₂ per 1 ton of algae grown
- Require ~1000+ Ha Land per 1 M tons of CO₂

Tarong Display Project



Tarong Display Plant Program

August - December 2010

Bund and construct all civil engineer works to supply utilities to the Display site and prepare the banded display site for the project equipment and structures

January 2011

12 x 3.0m high growth-columns to grow a local algae strain at Tarong
-Tarong Flue-gases

Key Deliverables:

Process will provide inoculation columns for larger Display project
Grow local Tarong region algae, with flue gas from power plant
Scale levels of biomass for bag inoculation

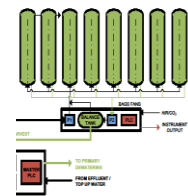


April 2011

- 4 x 10m BAGS (Inoculation & Scale-up)
- 8 x 50m BAGS (Full-module) and complete external servicing for Biomass for meal / oil-trials

Key Deliverables:

Meal and oil for local feed trials and fuel production
High level water treatment to grow a full scale module (8*50m bags) – meal suitable for 3 month accreditation trials
Heat and climate conditions monitored
Gas scrubbing increased to capacity for system



Tarong Display Plant Program

April – September 2011

Completion of Water Treatment Trials & Installation of remaining 24 x 50m BAGS, with consideration for the following water treatment scenarios

- Ash-dam / blow-down cooling-tower – no treatment required,
- Recycle high-% of water,
- Full water treatment (as per the 8xBAGS system delivered in March), and
- Macro algae Water treatment (for use as an auxiliary fuel).

Notes:

A critical assessment will be made of the most economical / least sterile treatment of the Ash Dam and Blow Down Water. This will be used for the large scale expansion.

The macro algae trial has the potential to provide additional sequestration and produce biomass for production of briquettes. The briquettes can then be used as coal replacement creating an offset product for energy production.

Tarong Display Plant Program

September 2011

Commissioning of 32 x 50m BAGS.

Following assessment of water treatment solutions the Display plant will be fully commissioned and operated through summer and winter to assess the operation and provide “proof of concept”.

Key Deliverables:

Full scale operation of Tarong Display plant.

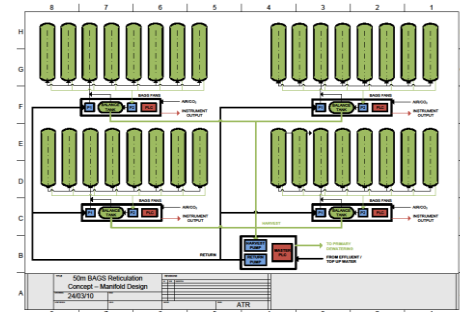
“Proof of Concept” sequestration as the basis for a commercial solution to large scale use of flue gases and production of oil and meal products.

Assessment trial for Tarong and MBD to enable modification and fine tuning over the trial period and provide Tarong Energy with confidence to commit to scaling the project up to commercial scale with MBD.

Notes:

Following the running of the system at full scale for a further 6 months both Tarong and MBD will be in a position to confirm operation parameters and look to the best approach for the expansion of the project.

Tarong Display Plant
- “Proof of Concept”
- 1 Ha
- 32 BAG System

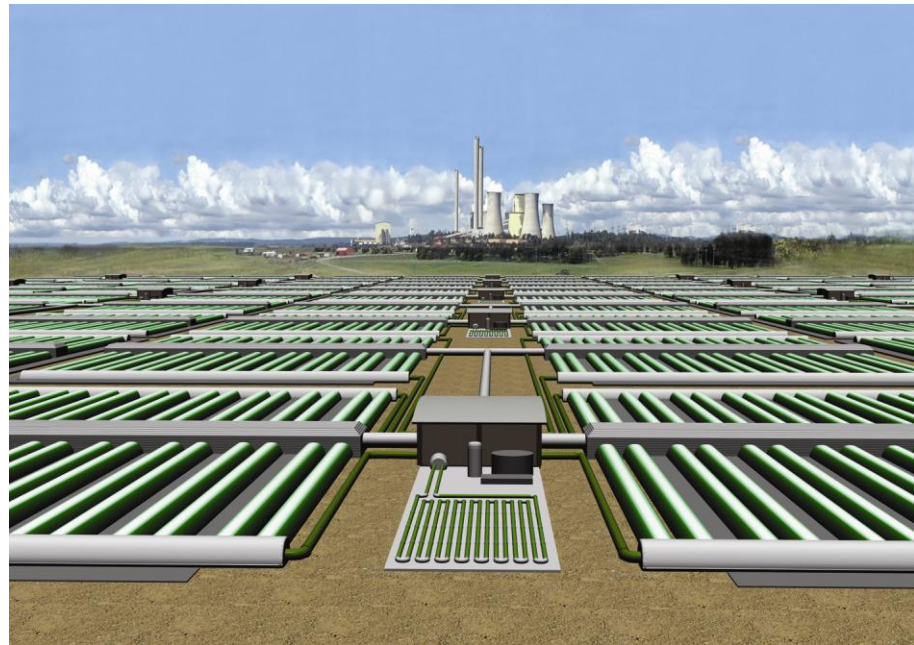


Tarong Display Plant Program

2012/13

Following the running of the system at full scale for a further 6 - 12 months both Tarong and MBD will be in a position to confirm operation parameters and look to the best approach for the expansion of the project.

Tarong Pilot Plant
- “Commercial Project”
-80 Ha
-4000 BAG System



Drawing of Power Station with Commercial Scale expansion

Eraring Algae Projects

Establish 2 projects at Eraring's
Lake Macquarie Site

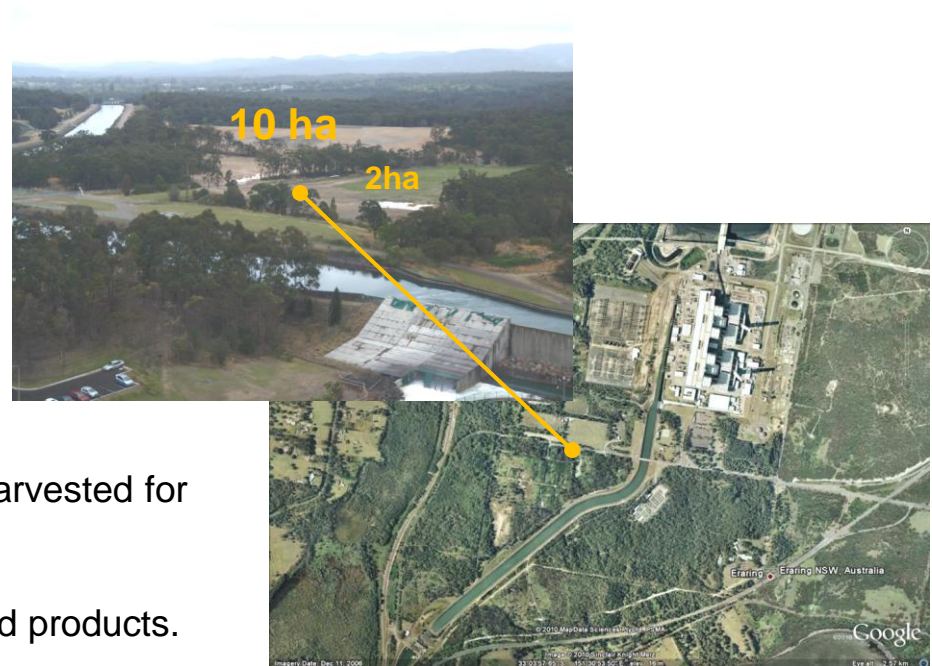
10 Ha Macro Algae Project

Macro Algae grown from waste flue gases and harvested for
briquette production
Briquettes used in power station's boilers as a
replacement for coal or biomass for feed and food products.

2 Ha Micro Algae Project

Growth of higher value algae strains for production of ω -3, ω -6 or
similar.

(project scope under development 3&4Q 2010)



Loy Yang Basic Outline

(project scope under development 3Q 2010)

Establish 2 projects at
Loy Yang A

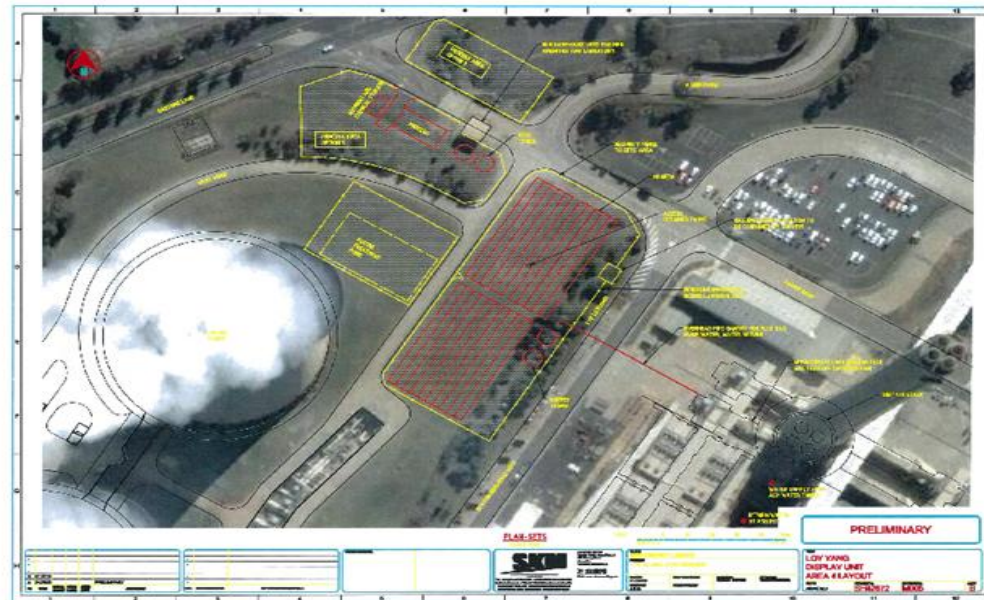
- 5 Ha Macro Algae project
- 1 Ha Micro algae project
 - (1 module of 5 modules 5Ha)

Micro Algae Project

Growth of micro algae for oil and meal

- Oil for biodiesel production
- Meal for dairy feed

Part 1 (1 Ha Display Project) / Part 2 5 Ha Demonstration project.



Discussion

Questions?
