

TECHNOLOGY PRESENTATION



November 2024



WE ACKNOWLEDGE THE TRADITIONAL CUSTODIANS OF THE **LANDS & WATERS**

We pay our respects to Elders past and present.
We acknowledge the continued cultural, spiritual
and educational practices of Aboriginal and Torres
Strait Islander peoples.

We acknowledge their deep spiritual connection
to country.



WHO WE ARE & WHAT WE DO

RegenAqua is a home-grown, breakthrough, nature-based alternative to traditional capital and energy intensive wastewater treatment systems. It is **capital lite**, **chemical free** and delivers a **carbon neutral**, **circular** solution when coupled with **PlantJuice** or **biofuel production**.

Capture harmful nutrients from wastewater systems without the use of chemicals



Macroalgae is grown in controlled onshore raceways (HRAPs) designed by Pacific Bio that use sunlight to remove nitrogen and phosphorous.

Sequestration and abatement of CO₂ is needed to extract nutrients



The removal of CO₂ from both water and air enables the macroalgae to grow (sequestration) creating a carbon neutral facility.

Full Circularity - returning nutrients to the ecosystem and biofuel production

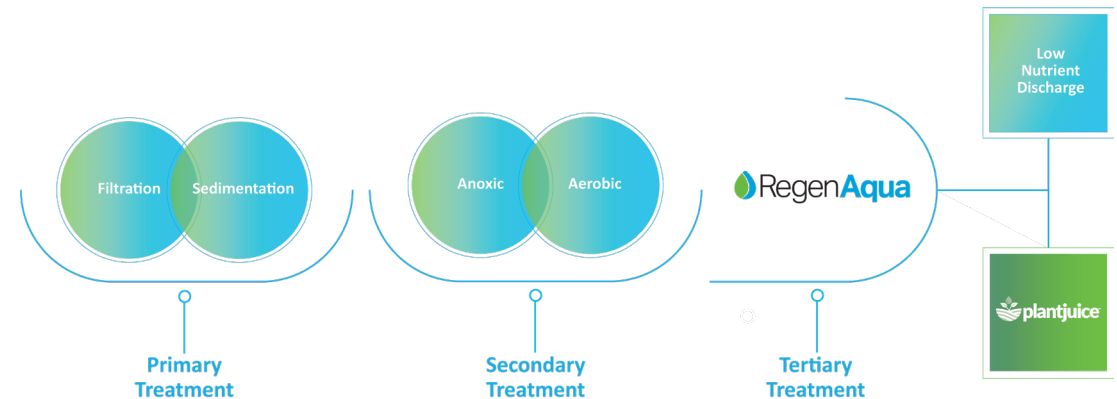


Biostimulants improve crop health and reduce reliance on traditional N,P,K fertilisers. Biofuels provide sustainable fuel sources.




ESG IMPACT


Pacific Bio's products and services deliver a positive environmental impact and touch 10 of the 17 United Nations' Sustainable Development Goals.




GREEN & EFFECTIVE TECHNOLOGY


RegenAqua is delivering outstanding nutrient reduction results in both tropical and temperate climate zones.

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Extremely efficient nitrogen, phosphorus and fecal coliform reductions.
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Macroalgae perform strongly in both tropical and temperate environments. Very resilient to operational upsets.
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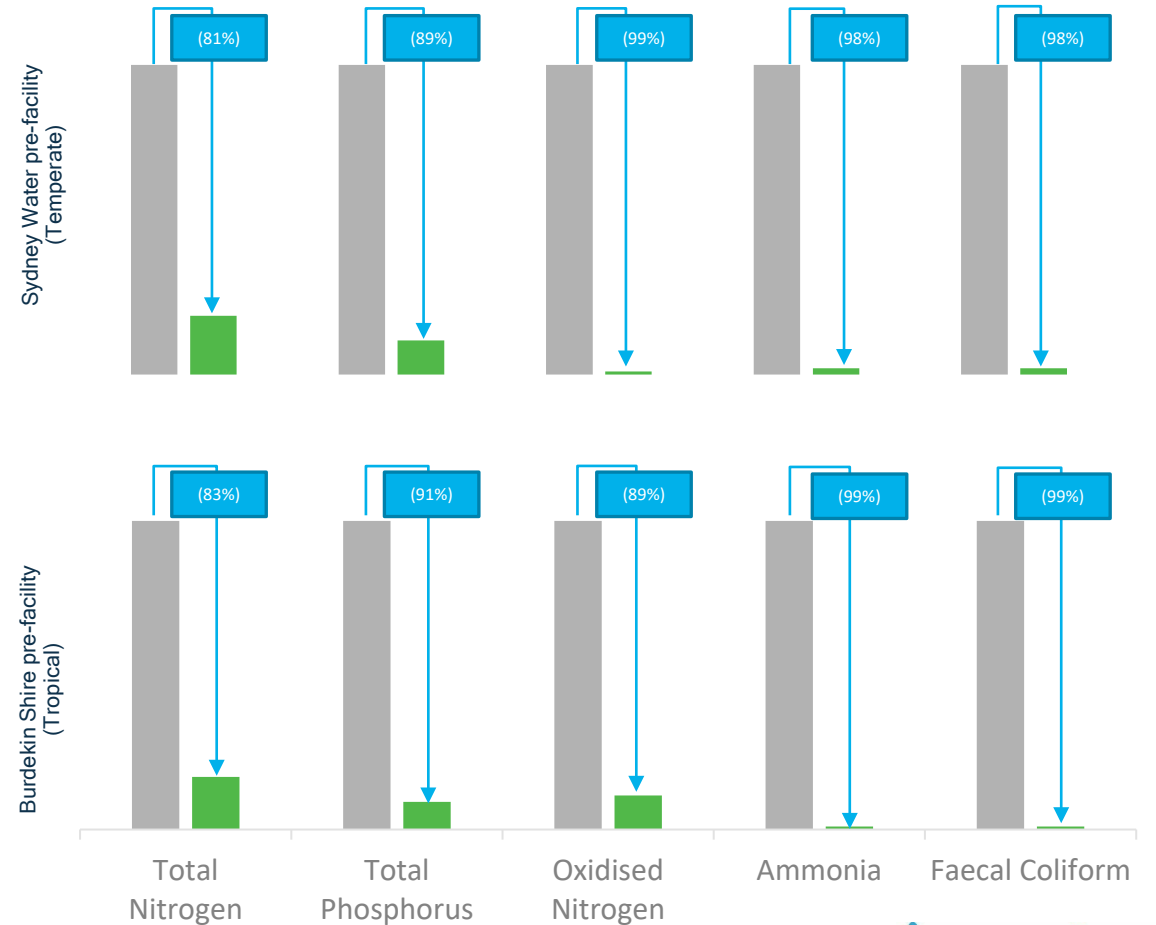
Significantly cheaper than traditional alternatives, requiring a quarter of the initial capital investment and an eighth of the energy to achieve similar results.
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RegenAqua reduces the need for chemical and energy intensive disinfectants and ozonation processes.
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Carbon neutral, non-methane generating solution providing an alternative to MBRs, ROs and constructed/floating wetlands.

Reduction in Nutrients following RegenAqua Treatment

NOTE:
 Sydney Water effluent feed around TN 6; TP 0.5 mg/l
 Burdekin effluent feed around TN 20; TP 6 mg/l



TERTIARY WASTEWATER TREATMENT KPI's

RegenAqua provides a compelling alternative to existing tertiary wastewater treatment options delivering better Capex and Opex outcomes for equivalent or better remediation performance.

Comparison Unit	RegenAqua	Constructed Wetland	Reverse Osmosis (RO)	Membrane Bioreactor (MBR)
Equivalent Nitrogen Remediation Comparison	10,000 kg N pa	10,000 kg N pa	10,000 kg N pa	10,000 kg N pa
Remediation Performance (kg N/hectare per annum)	3,000	267	20,000	40,000
Project Area for Equivalent Remediation	3.3 hectares	38 hectares	0.5 hectares	0.3 hectares
Construction cost (\$M)	\$6,000,000	\$20,000,000	\$30,000,000	\$25,000,000
OpEx (\$ pa)	\$500,000	\$400,000	\$1,600,000	\$1,100,000
Total Cost (PV Capex + Opex over 20 yrs, discount rate 7%)	\$11,000,000 (\$550,000 pa)	\$24,000,000 (\$1,200,000 pa)	\$47,000,000 (\$2,350,000 pa)	\$37,000,000 (\$1,850,000 pa)
Equivalent Nitrogen remediation rate (\$/kg Nitrogen removed pa)	\$55.00	\$120.00	\$235.00	\$185.00
Chemical Requirements	Chemical Free	Chemical Free	Alum, Caustic, CIP chemicals	Methanol, Alum, Caustic, CIP chemicals
Carbon Position	160 tonnes CO ₂ sequestered p.a.	90 tonnes CO ₂ sequestered p.a.	Carbon Emitter	Carbon Emitter

RegenAqua Differentiators



Cost effective: One quarter of the capital outlay required compared to traditional tertiary MBR technology.



Regenerative Circularity: Macroalgae converted into bio stimulant resulting in a zero-waste solution.



Environmentally Compassionate: Chemical free and carbon neutral.



Modular: Modular construction lets clients expand operations as their requirements change.

Report from SC Lennon & Associates commissioned by Burdekin Shire Council concluded a Benefit Cost Ratio of 7:1 when comparing a RegenAqua plant to an MBR plant

THE FUTURE IS NOW – CLIENTS LEADING THE WAY...

In addition to the growth opportunities in urban waste within Australia, the RegenAqua solution is also currently being applied to aquaculture.



CIRCULARITY via ALGAL DERIVATIVES

Whilst a variety of algal derivative products such as bioplastics, biochar, pet food extracts, construction materials etc. either exist or are currently being developed through a proof-of-concept phase, we believe the two products with the most commercial value are Biostimulants and Biofuels.



BIOSTIMULANTS

- Over 400,000 litres of PlantJuice (RegenAqua derived biostimulant) has been sold in the past 3 years.
- Scientifically proven to enhance plant growth. Growth trials have demonstrated superior performance to market leading kelp-based products.
- Biostimulants are in high demand by farmers. Growing at a global CAGR of 14%. Gaining traction in progressive farming techniques, helping farmers use less traditional N,P,K fertiliser.



BIOFUELS

- RegenAqua is an efficient way of producing Oedogonium - the perfect feedstock for biofuels.
- Pathways to market include:
 - Biocrude via HTL
 - Biomethane via AD
 - Bioethanol via fermentation

Cane Trial (Burdekin) May/June 2024



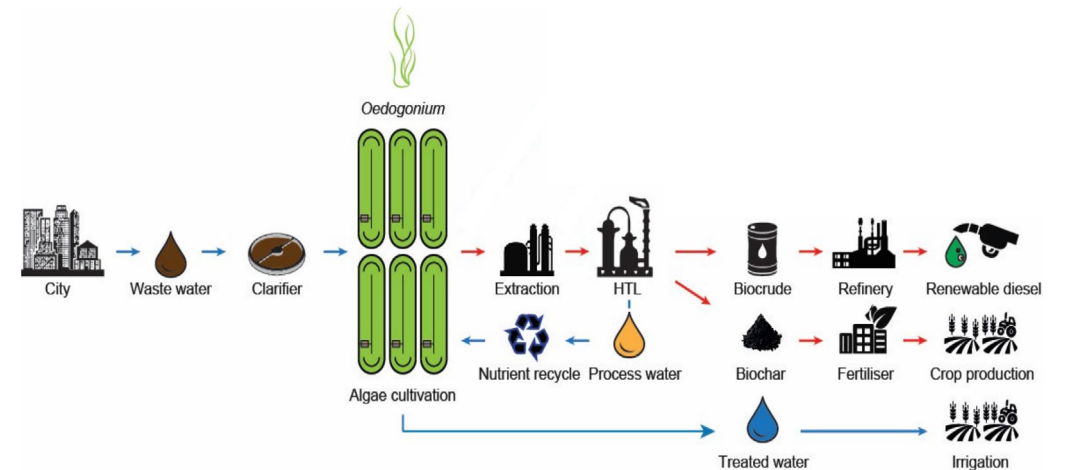
Day 20



Day 26







Day 30

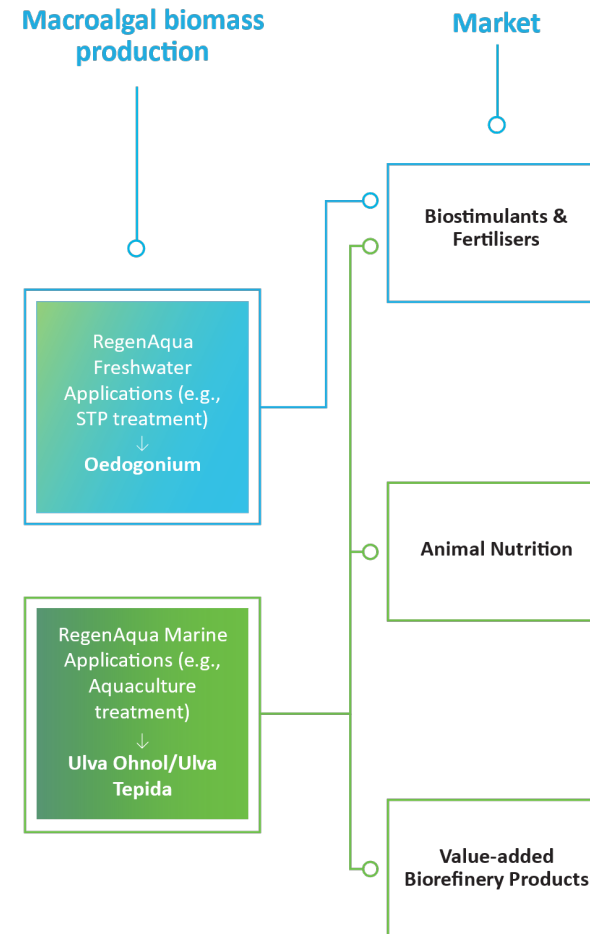


THE PLANTJUICE STORY



PlantJuice is produced from the seaweed and freshwater river weeds (macroalgae) endemic to each region harvested from RegenAqua facilities. Global biostimulant market has a CAGR c14% and are typically made from brown kelp. PlantJuice performs better and has a better environmental footprint.

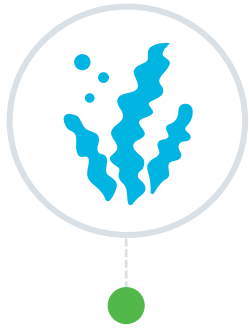
-  PlantJuice scientifically proven to enhance plant growth. The root growth trials have demonstrated superior performance to market leading kelp-based product.
-  Biostimulants are in high demand by farmers. Biostimulants are companion products that help farmers use less traditional N,P,K fertiliser.
-  Existing manufacturing centered in the Burdekin and Atherton tablelands major agricultural centers. Production plant at Alva Beach has produced c.400,000 litres.
-  Multichannel distribution strategy B2B & B2C with an eCommerce platform under development.



ENERGY EFFICIENT, CARBON POSITIVE SOLUTION

As well as reducing harmful nutrient loads, RegenAqua is carbon neutral and abates carbon when compared to traditional technologies.

SEQUESTRATION



Algae in
RegenAqua sequesters
CO₂ at 50 tCO₂ / Ha / annum



*A 4-hectare RegenAqua facility would
use 300MWh per annum
By contrast a similar capacity traditional
engineered plant would
require 2,400MWh per annum, with
a significant carbon footprint.*

ABATEMENT



Using RegenAqua rather
than a MBR enables
the abatement of CO₂ at 370
tCO₂-e / Ha / annum

Nutrient Removal: Nitrogen (TN) at a rate of 3.0 t / Ha / annum and Phosphorous (TP) at a rate of 1.0 t / Ha / annum.

Thank you

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