



Paradigm Fuels[®]

Powering Clean Energy

Paradigm Fuels Pty Ltd
(08) 9364 5788
17 Ogilvie Road, Mt Pleasant
Western Australia 6153

sales@sat.com.au
www.paradigmfuels.com.au
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INTRODUCING PARADIGM FUELS

Paradigm Fuels is a ground-breaking engineering model focused on achieving a prosperous and sustainable future for Australia. With over three decades of experience in industry-leading technology development, the Paradigm Fuels strategic group proposes a solution to transform the biofuel industry in Australia.

Paradigm Fuels offers a smart solution and unique farming model for the northern regions of Australia that is an innovative bio-renewable fuel process and is:

- commercially viable with high internal rates of return for farms ranging from small 90-hectare greenfield sites to very large farm holdings,
- requires little supporting infrastructure ideal for the remote areas of Northern Australia,
- provides amazing employment opportunities,
- able to exceed Australia's 2030 Kyoto targets, and is
- an opportunity to reinvent Australia's manufacturing and fuel refinery industries.

With Paradigm Fuels, we believe that with the right understanding and technological edge we can re-shape Australia's future for good.

HIGHLIGHTS

HECTARES

3M

PRODUCE AUSTRALIA'S DIESEL
REQUIREMENT

37,900ML

SKILLED AND UNSKILLED JOBS

60K

FUEL COST

22c/L

If 3 million hectares of feedstock were placed under cultivation, then Australia would be self-sufficient in diesel fuel thereby offsetting its reliance on imported fuels, far exceed Australia's 2030 Kyoto targets, produce renewable diesel at approximately 22c/L, allow the industry to continue unimpeded and maintain a consistent fuel price to provide a stable and internationally competitive economy.

Paradigm Fuels' Bio Synthetic Diesel model underpins Australia's manufacturing industry by providing a requirement for 130,000 storage containers, tanks and stills, 35,000 gensets and 17 million SCADA Devices. The model would provide approximately 60,000 skilled and unskilled jobs.

It could be a national strategy.



INNOVATION POTENTIAL

- Paradigm Fuels' biofuel model provides a strategy for Australia to reduce reliance on fossil fuels by providing technology that enables the opening up of a small portion of the available 70 million hectares of land in the northern regions of Australia.
- The model provides a greenhouse gas emissions strategy that would assist Australia to exceed its 2030 Kyoto target.
- The benefit is not only to the transport and mining sectors but across all industries.
- The model utilises unique and novel engineering systems for efficient processing.
- The method will produce Renewable Diesel at 22c/L.



"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

- United Nations, the World Commission on Environment and Development:
Our common future.

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ABOUT

A National Strategy

Paradigm Fuels aims to be a leading provider of an innovative bio-renewable fuel process whereby:

The proposed farming method is suited for the use of sweet sorghum as a primary feedstock and which can be comfortably grown in the 45 million hectares of low rainfall (0.8m to 1.2m) and in the 25 million hectares of higher rainfall regions in the northern parts of Australia.



Revenue from the farming method is estimated to be \$19,000 per hectare and offers favourable internal rates of return.

Paradigm Fuels' biofuel model can be successfully promoted in the northern regions of Australia as it can operate on farmlets as small as 90 hectares or on extensive regions. Due to its high carbon dioxide uptake, it is 4 times more efficient than fast-growing Blue Gum plantations currently favoured for “carbon credits.”

Paradigm Fuels offers a model to significantly reduce current imports of petroleum. Therefore, it is ideally suited to meet a cornerstone requirement of the 2020 Federal Liberal Party's Environment Policy and will far exceed Australia's 2030 Kyoto target.



SUSTAINABILITY

Environmental Impact

- Paradigm Fuels' biofuel model provides a strategy for Australia to reduce reliance on fossil fuels by providing technology that enables the opening up of a small portion of the available 70 million hectares of land in Northern Australia.
- The model allows a crop to be grown where there is no mill or infrastructure. This allows new areas in the northern parts of Australia to be opened up without being reliant on a consortium provided mill with its associated infrastructure.
- As a de-centralised model, Paradigm Fuels optimises the logistics and keeps the silage in the field. Alternate models are based on centralised sugar processing whereby these models produce a nutrient-rich milling by-product called “mill mud,” which is then purchased back by the farmers for use as an alternate fertiliser. Paradigm Fuels has clearly a better model.
- The product not only sequesters 82 tonnes of carbon dioxide per hectare of crop, but the process also produces 70 tonnes of oxygen per equivalent hectare.

Production Outcomes

It is possible through this model to produce a saleable product from each hectare:

- 11.1 tonnes of Renewable Diesel, and
- 12.7 Tonnes of oxygen as trapped from the algae system.

Biodiversity

Cane and sweet sorghum provide a natural lush habitat for biodiverse wildlife. The harvest season for the method's feedstock will use an allotment harvesting approach to optimise plant utilisation and should extend from the end of the wet season, over the entire dry season, and into the beginning of the wet. This will not only optimise the fermentation processes but provide continuity of habitat for wildlife.

Bio-friendly

Renewable Diesel is essentially a paraffinic oil without aromatic components (such as benzene rings) that are found in mineral diesel. Renewable Diesel's cetane number is approximately 50% higher than mineral diesel, which makes it a very quick burner and therefore reduces the emissions of air toxins, carcinogens and unburnt fuel. It furthermore has approximately 1/10 the sulphur content of mineral diesel and as a consequence, is required in many countries to be blended with mineral oil to improve the quality of their diesel.

Land/Water Impact/Social Impact

Australia's fuel requirement would be self-sustaining if only 3 million of the 70 million available hectares were placed under cultivation and therefore only represents 4% of the high rainfall landmass of Northern Australia. The 3 million hectare model creates direct employment for approximately 60,000 workers, thus populating Australia's northern regions.



FARMING / PRODUCTION METHOD



Paradigm Fuels' biofuel model is not perceived to be a farming application but is clearly an engineering design and solution.

Paradigm Fuels' proposed method is distinguished in the technical features of its product, its novel process, and its commercial service.

Paradigm Fuels' biofuel model is technically novel and utilises unique engineering systems to deliver:

- 01 Distributed Processing
- 02 Renewable Diesel Production
Cost of 22c/L
- 03 Modular & Scalable Process
- 04 3 million Hectare Scale Exceeds
Australia's 2030 Kyoto Target for
Greenhouse Gas Emissions
Strategy
- 05 Low Water Usage
- 06 Comparable Low Fertiliser
Requirement
- 07 Stable Environment for Fauna
(reptiles and birds)
- 08 Increase Employment >
60,000 people, based on
calculations
- 09 Minimised Logistics &
Transport
- 10 Modular & Affordable Plant
- 11 Eco-friendly - Sweet Sorghum
& Sugar Cane
- 12 Australia Can Substantially
Offset its Reliance on
Imported Fuels.
- 13 Low External Infrastructure
Requirement
- 14 Recycled Fertilisation
- 15 Enables Small Communities to
become Economically
Sustainable
- 16 Further Utilise Equipment to
Drought-Proof Australia

THE PRODUCT

Quoted Yields

Paradigm Fuels' proposed method will produce Renewable Diesel at 22c/L.

Talk to us about the rationalisation of quoted yields (as calculated in the sections below), regarding:

- Tonnage of Bio-Product Produced from 1 Hectare
- Greenhouse Gas Balance for Green Credits
- Energy Efficiency of the Proposed Biofuel Farming Model



The target product (assuming an industry average of two crops per year to produce 160 tonnes of sweet sorghum per hectare and with a process operating at approximately 75% efficiency):

11.1

**TONNES OF
RENEWABLE
DIESEL PER
HECTARE**

12.7

**TONNES OF O2 AS
A TRAPPABLE
BY-PRODUCT**

The “bio-viability” net balance per hectare calculated on the above production of sweet sorghum provides infield values of:

82.1

TONNES PER
HECTARE OF
CARBON DIOXIDE
CONSUMED

70

TONNES PER
HECTARE OF
OXYGEN
PRODUCED

These carbon credits compare well with Blue Gum plantations which return green credits of circa 19 tonnes of carbon dioxide per hectare and for which there is currently 250,000 hectares under cultivation in the South West of Western Australia.





A NATIONAL STRATEGY

If Australia implemented a strategy to put 3 million hectares of sweet sorghum under crop it would:

- Far exceed Australia's 2030 Kyoto target.
- Will eliminate Australia's reliance on imported diesel.
- Require a patchwork of farms in the northern regions of Australia (to enable 3 million hectares of crop).
- Require low external infrastructure (such as roads, port facilities and power).
- Create significant employment.
- Enables small communities in Northern Australia to be economically sustainable.

The model introduces scales of economy, but circa:

- 5,800 Closed Algae Systems (a patent-pending protected invention) will need to be manufactured and maintained by skilled tradesmen. This will reinvent the manufacturing industry with boutique polyethylene manufacturing and even ethylene manufacturing.
 - Pumps, valves, and sensors will need to be manufactured and maintained, in quantities that are an order above the numbers of the Closed Algae Systems.
- 
- 4,000 large tractors, 2,000 harvesters and 6,000 crushers will be required for in-field operations and which will reinvent Australia's manufacturing assembly lines with boutique manufacturing. These will need to be maintained by skilled tradesmen and will also inject much-needed vibrancy into our manufacturing industry.
 - 6,000 furnaces for on-site molasses production, each supported by a production shed that produces electricity, and
 - houses the crusher and
 - distillation systems and
 - ultrafiltration systems and
 - reverse osmosis water purification and
 - generates CO2 for the algae systems and
 - supports the heat exchanges used for the hydroprocessing system.
 - Paradigm Fuels enables a Renewable Diesel strategy using very low cost “vegetable oil” (algal lipid) feedstock. Renewable Diesel is a biosynthetic diesel that has similar molecular structures and performance qualities to that of mineral diesel.

- A SCADA (Supervisory Control and Data Acquisition) communications system (probably 4G/5G mobile systems) will need to be installed and operated, thus establishing mobile (LTE) phone systems across the entire northern region of Australia.
- Sufficient numbers of semi-trailers and cranes with added employment opportunities to fit out 6,000 processing sites with significant items of equipment.
- Significant numbers of cane wagons (4,000), distillation vats (6,000) and furnace evaporators all need to be manufactured in workable tranches and end of life replacement that supports a boutique manufacturing industry.





CONTACT US

Let's talk in detail

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30/17 Ogilvie Road, Mount Pleasant,
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PO Box 1084, Canning Bridge, Applecross
Western Australia 6153

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