

Pro Green Biofuels

Integrated Biofuels Facilities

Background

- ▶ Pro Green Biofuels P/L was established to explore the process of delivering sustainable biodiesel.
- ▶ Early 2001 Pro Green commissioned a high performance engine test facility at the RMIT Bundoora Campus Mechanical Engineering Department in Melbourne where they explored the application of biofuels.
- ▶ Over the last 16 years Pro Green has developed a strong understanding the production, storage and the application of biofuels and is now recognised as one of the countries leaders in specialised power generation using biodiesel as the predominant fuel.
- ▶ Through its specialist delivery partners Grove Peak P/L (GP) and Renewable Energy & Biofuels Ltd (REBL) Pro Green has developed a unique feed stock supply chain model.
- ▶ Through other specialist delivery partners Pro Green has developed a modular “Integrated Biofuels Facility Model” that brings 3 biofuel pathways together in one facility in a symbiotic relationship.
- ▶ Through its specialist delivery partner Renewable Baseload Generators (RBG) Pro Green can deliver added value to the biofuels produced by direct supply to onsite or local dispatchable power generation.

Vision

- ▶ Is to help Australia realise its potential to produce home grown and produced biofuels through closed loop waste stream management and sustainable energy farming practices.

Goal

- ▶ To become an industry leader in sustainable biofuels and build a strong business while contributing to Australia`s fuel and energy security.

Objective

- ▶ To deliver the processes, plant and equipment that will deliver Sustainable Biofuels through Integrated Biofuels Facilities (IBF) in a symbiotic relationship.

Abstract

The biofuels industry in Australia is currently based on an old centralised model where a few large refineries designed to use 1st generation feedstocks producing specific biofuels in large volumes for direct sale to the oil majors.

This model has proven to be unsustainable and continues to struggle with rising costs low crude mineral oil prices and ethics pressuring the use of traditional feedstocks.

Pro Green has introduced a unique and novel model to produce biofuels in regional locations using Micro Biofuels Facilities (MBF) where these facilities can be established close to the feedstock supplier which in many cases will be the end user/consumer reducing the cost of transport logistics.

To ensure these MBF`s are cost competitive Pro Green has adopted a symbiotic model to better share costs and repurpose associated waste streams.

Pro Green has also developed a unique bio-oil supply chain model incorporating closed loop waste cooking oil and rotational energy farming models serviced by a dedicated network of unmanned refuelling stations along designated supply corridors to provide a two way means to transport feedstocks and or finished product.

Providing these unmanned refuelling stations along critical food transport corridors also underpins the potential for local biofuel production to contribute to the National Fuel Security Program.

The People

- ▶ Danny Williams is the founding driver of Pro Green Biofuels Pty Ltd, Green Power Solutions Pty Ltd, Renewable Energy and Biofuels Pty Ltd and has been involved in the biofuels industry for some 20 years and has become an industry pioneer and key driver for sustainable biofuels in Australia.
- ▶ Jennifer Labour Patterson is the Managing Director for the Frontier Impact Group and for 30 years has been pioneering solutions to combat climate change and to improve the prospects for future generations. She has been involved in the electricity generation sector, electricity trading and in senior finance roles. She transacted one of the first renewable energy trades in the electricity market while playing an active role in the establishment of Australia's renewable energy markets.
- ▶ David Vinson is a chemical engineer and has been a pioneer of the biodiesel industry in Australia. David was responsible for the design and construction of the Victor Smorgon Group biodiesel facility "Biomax" and is now the Chief Operating Officer of Territory Biofuels Limited which owns the Darwin based 140 million litre per annum biodiesel and glycerine refinery. David has worked as a close adviser to Pro Green now for some years and is keen to further develop the company's unique sustainable biofuels business model.
- ▶ Mike Jureidini BSc MBA (Sust Bus) has worked with a number of Australian key biodiesel producers including as plant manager of the Australian Renewable Fuels Ltd biodiesel refinery at Larges Bay in South Australia. He has specialised as a biofuels scientist and has been working with the Pro Green Biofuels to help develop new and novel production pathways for the biodiesel industry.

The Process

► Sustainable Feed Stocks :

Energy Crops - Where feedstock's will be sourced from specific crops grown in rotation with food crops where the energy crops are used for soil amelioration or biological controls that will enhance food production while producing by-products that can be used for biofuels production. These crops will also be grown using a soil carbon platform helping to monetise the benefits of selective crop selection.

Waste Streams - Where Used Cooking Oil (UCO) or waste Fats Oils and Grease`s (FOGs) are used as a feed stock to the biodiesel process and waste sugars or starches are used for the ethanol process using final waste streams from both process to provide feed stock for the Anaerobic Digestion (AD) to create biogas.

► Biofuel Pathways:

Bioethanol - Uses sugars and starches sourced from local industry waste streams or dedicated energy crops to produce ethanol which can be used as a fuel extender or stand alone fuel and will provide the alcohol component required to manufacture biodiesel.

Biodiesel - Uses waste UCO, FOG`s or oil derived from dedicated energy crops to produce an ethyl ester (Biodiesel) a 100% renewable fuel that can be used in the transport or power generation industry. The glycerol waste stream can be used as a production enhancer in the AD process.

Biogas - Produced from the digestion of local green waste streams using the glycerol waste from the biodiesel process where the biogas produced can be used to fuel the boilers required for the bioethanol or biodiesel process or can be used as a fuel in direct power generation.

► Processing

Micro Processing Plant - Where the processing plant for each biofuel pathway is small and modular and can be scaled up subject to demand, the system is energy self sufficient, carbon neutral and has no waste outputs.

Labour - The symbiotic production system uses the same operational staff and management across the 3 disciplines to reduce the overheads.

Consumables - Most consumable's can be purchased through common providers to the 3 process further reducing costs through improved purchasing power.

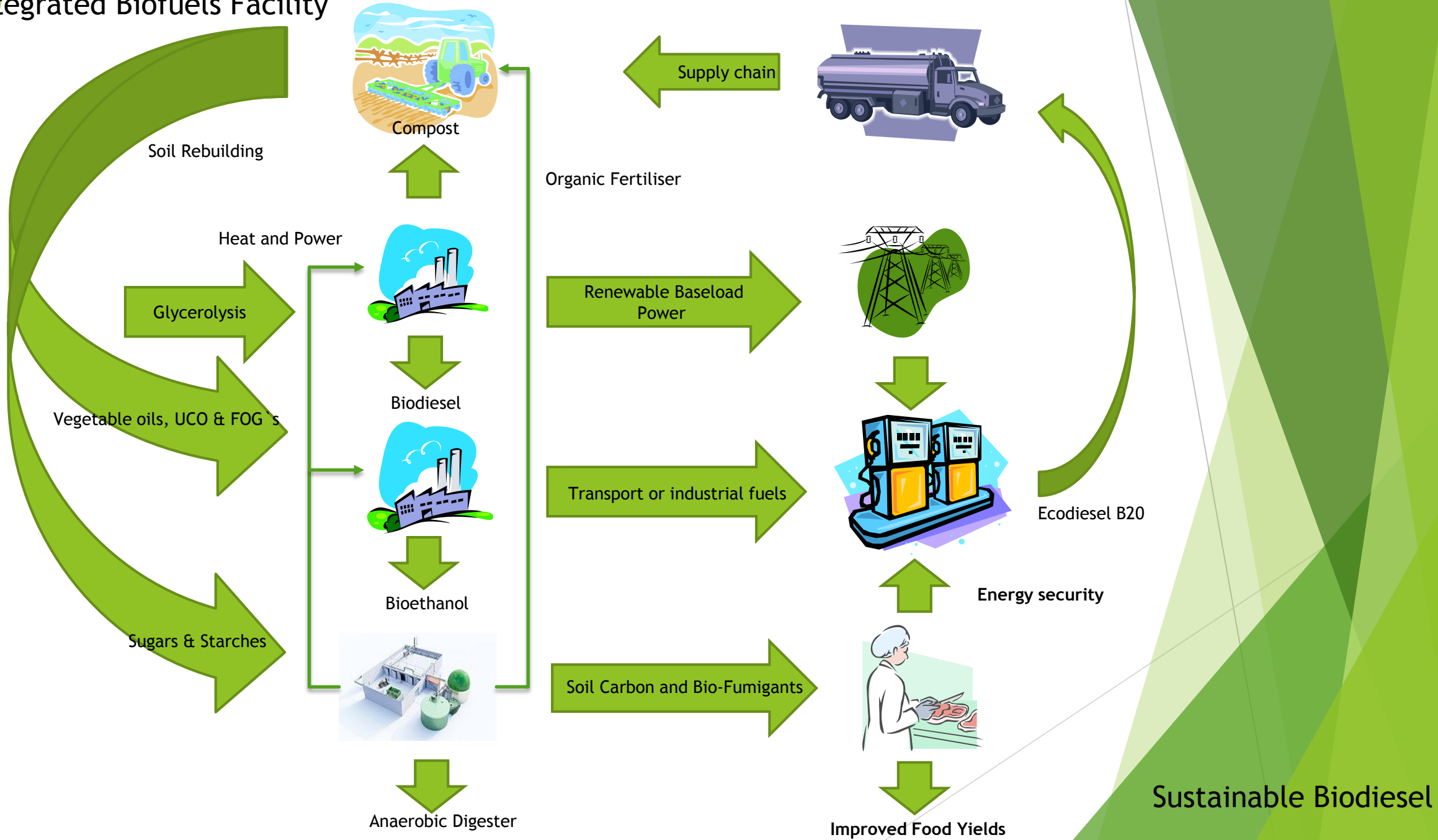
► Quality Control and Compliance:

This can be provided through a central provider amortising this over a number of facilities further reducing the operational costs of each facility.

Unmanned Refuelling Station



An Integrated Biofuels Facility



Soil Rebuilding delivering energy crops for Biofuels production.

Marginal Farming Land Soil Regeneration

- REBL leases land for a 5 year rebuilding program
- Soil rebuilding using compost and organic fertilisers
- Raise the organic carbon levels in the soils to push weeds back
- Y2,3 ,4 & 5 plant energy crops on a JV with land owner
- Y5 hand back to farmer to continue food production with higher yields

Rotational Energy Crops

- Plant energy crops with soil benefits between food crop cycles
- These energy crops are grown under a JV with farmers

Commercially Share Soil Regeneration Programs with Farming Groups

- Select energy crops for a specific soil enhancement purpose
- Off-take arrangements for all energy crops
- Provide back discounted biofuels
- Farmer benefits from carbon credits



Supply chain



Biofuels



Following food crops
yields increased
through better soil
condition

Biofuels Production



Biofuels for Renewable Base Load Power Generation

- Grid Support
- Capped Contracts
- Off grid applications

Sustainable Biodiesel