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**To:** Bio Energy  
**Subject:** BioMass to BioEnergy & Bio-CHEMICALS  
**Attachments:** PHOTO-2022-02-09-16-44-38.jpg; PHOTO-2022-02-09-16-47-54.jpg;  
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VIDEO-2022-02-09-16-44-41.mp4; VIDEO-2022-02-09-16-44-41.mp4; IMG\_2434.jpg; IMG\_2431.jpg; IMG\_2432.jpg; IMG\_2433.jpg; bio-DICE Report - BIO-CHAR-PASTE-FUEL Analysis - Real world applications - Peaker - Established Site.pdf

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**SUBMISSION**

The Tasmanian Government has released its "Draft BIOENERGY VISION for Tasmania" Document for public consultation.

On 15/12/2021 the Premier, the Hon. Peter Gutwein & his senior Minister, Guy Barnett, invited "views" & "submissions" providing feedback, to be lodged by 14/02/2022

**1. BACKGROUND**

The Tasmanian Government is committed to the development of a BioEnergy sector that encompasses social, environmental & economic values to achieve the best outcomes for Tasmanians.

BioEnergy is differentiated from most other energy sources in that it can deliver solutions for these drivers simultaneously.

A circular economy is an economy that is structured to maximize the use & value obtained from materials & resources at every stage of the life of the product or material.

BioEnergy should foster & not prevent waste reduction, recovery, repurposing & recycling, enabling the "HIGHEST VALUE" should be sought for organic material.

BioEnergy can contribute to regional economic development through the local production of fuels.

Waste & residue streams that do not have alternative higher-value markets in the circular & bio-economies, or that reach the end of life, can be used to generate BioEnergy.

BioEnergy "supply chains" provide significant opportunities for employment, especially in rural & regional areas, where most of the feedstock tends to be located.

**2. OVERVIEW**

BioEnergy can be extracted from BioMass (& Bio-Wastes) under appropriate circumstances. This is obvious. There are a range of critical factors which will govern the desired practical & economic outcomes, significantly location of BioMass, sustainable quantities of BioMass, costs of aggregation (logistics), costs of conversion/processing/storage/supply & access to demand/markets (beneficial users).

THUS BioEnergy, may very well only be a "first step" to yield the "highest value" to the supply chain & market.

BioEnergy can & should be viewed as only a first, or, interim step in extracting value from BioMass. We urgently need to innovate & to "imagineer" & to explore new opportunities & open our eyes to new options.

**PLEASE READ ON .....**

All BioMass contains BioEnergy. It most usually also contains large quantities of water as well as possible "contaminants". These issues will impact the process (es), costs & outcomes & thus must be taken into account from both the environmental & the economic drivers.

This is essential for a viable, commercial & sustainable long term outcome to be achieved as well as delivered.

**3. IMPORTANT**

BioMass is comprised of CARBON & HYDROGEN, in the main.

HYDROCARBONS are also mainly comprised of CARBON & HYDROGEN

HYDROCARBONS are the the molecules that comprise chemicals, plastics, solvents, fuels, synthetic fibers & most of the materials that the world needs & uses in everyday life.

Thus BioEnergy should be viewed as only one step in the process of synthesizing/manufacturing Bio-Hydrocarbons from Sustainable/Renewable BioMass. The INTERIM step.

**4. The HIGHEST & BEST VALUE OUTCOMES**

Searching for & Selecting the HIGHEST VALUE that can & should be extracted from BioMass. *How ?*

PLEASE think about the market prices of energy as well as the costs involved to connect the consumer together with the supplier.

It's usually "valued" in the hundreds of dollars per tonne price range.

Obviously, each & every possible product has its own price point in the marketplace.

I have come to realize that "ball park", those products selling for under \$1,500 per tonne will not really provide a very exciting, commercial return on investment in today's market.

However, products selling for in excess of \$1,500 per tonne do become commercially attractive.

*PLEASE NOTE:* There are many Hydrocarbons that trade above \$2,500 per tonne internationally.

Bio-Hydrocarbons replacing fossil fuel based hydrocarbons are the products of the future, as well as the present!

**5. MY CHOICE PROCESS**

BioMass to BioEnergy & Bio Hydrocarbons.

I have chosen the path of "Pyrolysis"

This process is relatively simple, flexible, costs effective & can easily be applied to & adapted to a large variety of BioMass sources, including remote ones.

It's chemistry is uncomplicated. One heats up the BioMass in the absence of air, to break it down/decompose it into three phases.

Solid = Carbon (char)

Liquid = Pyrolytic liquids

Gas = BioGas

One can operate the pyrolysis plant in a variety of ways, depending upon the desired outcome(s)

Pyrolysis can also be a very kind process for contaminants mixed in with the BioMass.

The BioEnergy can be very effectively & efficiently extracted from the BioMass by this process.

Taking into account costly downstream processes of separation & purification, I have chosen to keep everything as simple & as uncomplicated as possible.

Producing only BioGas, with no BioLiquids, as the BioGas is the preferred feedstock for catalytic conversion (polymerisation) into desired high value products, which are easy to store & easy to transport to customers, both locally & internationally.

*(Please note, that BioLiquids as well as BioChars may very well be good choices of products in some circumstances)*  
In modern chemistry/chemical engineering, BioGas can also be enriched (more hydrogen) to comprise Bio Syngas, a very valuable feedstock.

## **6. HOW TO BEST & SAFEST PROCEED?**

Everyone will be aware how the conventional approach is from:

University (Research & Optimisation of chemical reaction/process) to:

Scale up/Demonstrator to:

Pilot Plant to Commercialization (?) takes a decade or more & mostly never becomes commercially viable.

### *PLEASE CONSIDER*

We have a unique opportunity here

Save a lot of time & costs!

Be commercial Be practical Be technical Be risks adverse

All simultaneously too!

We could create/encourage large new international investments to support & accelerate new Bio-Hydrocarbon manufacturing industries in Tasmania to become profitably established & fully operational within less than five years of getting started.

These could & should reflect most positively upon Australia's Balance of Trade & especially be a boon to Tasmania.

## **7. MY SUBMISSION**

Let's create a new "Public Private" entity to create/provide solutions. Details to be discussed & considered.

I would be honoured to lead this @ no cost to the entity.

We should select a few appropriate people, who are both capable & passionate & who share this vision to become involved & engaged.

We would need to identify viable BioMass resources & to bring together & match appropriate international companies who are active world leaders in the hydrocarbons products marketplace.

We would need to focus in upon a select small range of suitable & appropriate target hydrocarbons, to define the best commercial opportunities, going forward.

We would need to work closely with UTas (Chemistry/Chemical Engineering) to do the required laboratory scale work, where we would select & optimize the best & most suitable catalyst (s) & chemical process (es) to prove the yields & operating conditions. This should result in the early adoption & successful implementation of this approach.

We have Patents as well as some practical experience for this approach.

## **8. PROPOSAL**

We have a brand new pyrolysis plant with a catalytic bed Bio-Gas enricher sitting in our premises in Wynyard, awaiting assembly & commissioning.

We also have a large commercial Diesel engine, which has been converted to Bio-Gas & optimized for this feed fuel by GasTech in Melbourne.

This pyrolysis plant has been designed & fabricated to process between 50 & 100 kilograms per hour of wood wastes.

We have estimated that a budget of around \$1 million would be required to fully set up this prototype, complying with Australian safety standards & with some relevant modifications & add-ons designed to enhance its operations. This can all be achieved very quickly.

This would then create an ideal opportunity to test BioMass from a variety of sources to prove up its BioEnergy potential as well as to assist with my ideas & suggestions & recommendations in this Submission.

Please see the attachments illustrating some of our work to date.

Trusting that you might find this of value & interest.

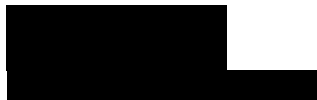
Looking forward to hearing from you

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