

This response was submitted to the consultation held by the Nuffield Council on Bioethics on *New approaches to biofuels* between December 2009 and March 2010. The views expressed are solely those of the respondent(s) and not those of the Council.

Gasification Australia

## **QUESTIONS ANSWERED:**

### **Question 1**

#### **ANSWER:**

Moving to a low carbon economy will lead to greater uptake of terrestrial carbon options away from fossil carbon. This will lead to a more Malthus reality where ecological impacts will be more directly felt. This closer bond with our direct natural resources will put pressures particularly on populations to be appropriate in size. Economies of the future will be more self reliant to their regions. Economies will need to adapt from a past based on growth patterns that fossil energies help support. This greater stake to our terrestrial biosphere will lead to unprecedented understanding of our place on the globe

### **Question 2**

#### **ANSWER:**

Incorporation of holistic landscape planning that creates win-win scenarios for food, water, energy [now a modern necessity] and biodiversity. Biofuels challenge how we dealt with past landscapes and their functions. Simplistic agrarian outlooks based on individual land units will not create the broad outcomes needed from a landscape to provide particularly in biological flux scenarios that climate change predicts. Bio energy will challenge planners because of a single factor - scale.

### **Question 3**

#### **ANSWER:**

Yes. Gasification Australia. Consultation, Engineering and Resource management of 2nd generation bioenergy with an emphasis on integration of bioenergy technology to appropriate resources bases. Operating for 5 years, we have consciously fashioned a company that is tied equally to our engineering as we are to the land

### **Question 4**

#### **ANSWER:**

Shift of capital and expertise of coal and petro chemical industries [fossil biomass] to grown biomass. Landscape planning and reform that reconfigures areas to properly create and maximize multiple outcomes. Biodiversity gains particularly through addressing connectivity [fragmentation]

### **Question 5**

#### **ANSWER:**

2nd generation bio-energy technologies that are non species or form dependent. Technologies that are carbon negative with bio-char linked to food production outcomes New approaches that lead to simplistic agrarian outcomes. [i.e 1st generation bio-energy outcomes]

### **Question 6**

#### **ANSWER:**

In bio-energy terms energy security is directly linked to resource base security. If a resource base fails then that will impact on consistency of supply. This has a greater impact than perceived output advantages. It is better to have a secure resource base that is lower in output than a higher output option that is not consistent. In many part of the world resource bases will need to deal with climates getting hotter, more unpredictable and creating severe scenarios like fire, flooding and storms. Due to scale

constraints to meet demand [pressured by increasing populations] there will be limited options to stockpile. Bio-fuels options most likely to succeed are one where local ecologies and species are utilized. Where forests once stood forestry options will play an important role. Options that supplant simple agrarian outlooks and outcomes that negatively effect the environment at a landscape scale need to fail. Our outlook does not necessarily say that any practice or resource [even negative] should not operate in a landscape but it does say where and at what scale it can be incorporated.

### **Question 13**

#### **ANSWER:**

Bio-fuels utilising 2nd generation technologies are inherently species independent and form independent. This generalisation of biomass as a feedstock gives opportunity to better tailor resources and the format these resources are utilised. This gives opportunity to create resource bases that better resonate with the landscape. As an example we have developed a paper called the Emerald Plan. MRIILD = Multi Role Integrated Indigenous Landscape Design. We took that paper to the world AgroForestry Congress to discuss integrating bio-energy with biodiversity gain. There are clear synergies between biodiversity outcomes, climate outcomes and energy outcomes - singularly these problems typically need trees - how these landscapes are designed is the key. From services that span from purely environmental through to production outcomes a landscape can be designed and/or be retrofit to create win-win landscape outcomes that can benefit the environment and linked societies.

### **Question 15**

#### **ANSWER:**

If there is a environmental benefit expressed as biodiversity.

### **Question 16**

#### **ANSWER:**

By linking bio-energy outcomes to landscape reform that focuses particularly on reforestation for connectivity for biodiversity gains. If native forestry takes place, it shows that reforestation of those ecologies in either a modified or unmodified format is possible to combine with output. Production orientation of domesticated species also has a clear role to play in regards to edge effect buffering of core environmental areas. Domesticated single species production areas have the ability to have diverse and vibrant middle and ground stories important to biodiversity. Reforestation of indigenous forest ecologies [even modified] have clear benefits as they are resilient to many factors, self evolving to climate flux futures and able to independently regenerate. Qualities of security of supply and the other valuations of eco-services have the ability to challenge and/or better tailor landscapes [even within plantations] to create better sustainability options.

### **Question 17**

#### **ANSWER:**

Yes and no. New viewpoints to landscape will challenge utilisation - for better or worse. Food production to urban centres will come in the future from intensive systems like greenhouses that are less space dependant but very much energy dependant. Bio energy systems running carbon negatively will impact significantly on soil profiles that will be orientated to agriculture outcomes. Again - key to successful outcomes is landscape planning for multiple outcomes.

### **Question 24**

#### **ANSWER:**

Bio-energies future environmental credentials will be tied to biodiversity. Human population scales will

become the singular barrier to future societies development.