Industrial SRC Policy

John Gifford and Brian Cox,

Forest Research
Bioenergy Association of NZ

1. INTRODUCTION

In 2002 around 30% of New Zealand's consumer energy was from renewable sources. In primary energy terms hydro accounted for 35%, geothermal for 44% and wind, biomass and wastes make up the balance of 21%. Biomass (mainly as woody biomass) contributes around 50PJ on a primary basis and this provides about 41PJ of consumer energy. Based on estimates of energy consumption within the wood processing industries around 86% (35PJ) was used within this sector. The pulp and paper industry uses approximately 24PJ largely for heat, panel and veneer industries used 5 PJ and the sawmilling industry used around 5PJ for timber drying. Electricity generation from co-generation facilities amounted to around 1PJ. Of the energy consumed using biomass, 50% was sourced directly from the use of solid woody biomass fuels derived from wood processing, the remainder was from black liquor in the pulp and paper industry.

New Zealand use of bioenergy is underpinned by a significant forest industry with the current planted area for plantation pine being around 1.6 million (M) ha and an annual harvest of 20 Mm^3 roundwood. The harvest is expected to increase to about 30Mm^3 by 2010. Most of the harvest is used within the sawmilling and peeler industries, for pulp and paper production and also exported as unprocessed logs. The rapid increase in harvest of production forest will give rise to a large potential forestry derived source of woody biomass. Something in the order of half of the available wood processing residues, available for energy production, are actually used. The balance is either used for other purposes or disposed into landfills.

New Zealand has well-established short rotation eucalypt plantation forests used for pulpwood production. There have also been attempts to establish eucalypt firewood and bioenergy ventures. The current eucalypt plantation resource in New Zealand is approximately 40,000 ha. In recent years *E. nitens* has been the species most commonly planted.

Hardwoods, in particular eucalypts, are preferred as biomass species for purpose grown energy crops because of their fast initial growth rate and higher wood density compared with pine. These attributes provide substantially higher biomass production figures at an early age. Other papers presented at the workshop have addressed the nature of New Zealand's short rotation forests and their potential use for bioenergy.

2. INDUSTRIAL RISK MANAGEMENT

New Zealand industry has to be internationally competitive which necessitates strategies for minimizing input resource costs. Energy is a key input cost to industry yet has to date been

neglected because of its relative low level and ease of availability. This is changing as energy costs increase and resource availability becomes constrained. For many industries, they are for the first time having to take note of energy costs and manage their forward exposure. They also have to look at alternative energy sources such as bioenergy and think about total energy use, rather than just electricity which has been their traditional focus.

Although short rotation crops (SRC) are not currently seen as a short to medium term resource for bioenergy in New Zealand, largely due to the cheaper availability of large volumes of pine plantation forest residue resources (EECA 2001), it is envisaged that SRC material may become strategically important over time to address issues such as:

- Mitigation of fuel supply risks relating to the long term availability of pine residues
- Integration of land use with energy production
- The use of short rotation crops for other amenity values such as waste disposal, sound barriers, recreational areas etc.
- Enhance the availability of biomass resources in areas where pine plantations have not been established due to land, topographical, or infrastructrual constraints.
- Provide an energy source that is fully controllable by industry themselves.

The role of bioenergy is likely to evolve over time from generally an already constrained on-site supply, to an initial focus on the use of pine residues for forestry industries, expansion of pine residues into other energy markets (e.g. pellet fuels for domestic, commercial and light industrial applications), and further out, higher demand for biomass resources for cogeneration and possibility stand-alone electricity. To ensure that biomass resources are available to support this development, it is important that attention is given to the development of appropriate policies for the forestry, energy and applied industries sectors. Such policy development must have a medium to long term focus and consider appropriate transition measures. This paper considers what polices should be considered and how the process can be managed and evaluated to ensure that progress is being made and that future objectives related to implementing bioenergy can be achieved.

3. BARRIERS TO SRC AS AN INDUSTRIAL ENERGY SOURCE

The most significant barrier is its current perceived lack of relevance. It is perceived as being too expensive as a fuel source. Yet in reality we have little knowledge of its current cost. There is little recent work that has been done on SRC costs in New Zealand and there is no champion to bring it to the attention of decision makers and in particular investors.

SRC appears to have been promoted by researchers and foresters without reference or involvement of potential users or investors. A need for the resource must be established before scarce Government or other funding can be secured.

SRC has been promoted for wholesale electricity generation yet this is unlikely to be the rational for its uptake. It is more likely that SRC is grown as a fuel for heat production or embedded electricity generation in industrial applications. For these uses the avoided cost would be significantly higher than the wholesale cost of electricity.

The information barrier is very high. There is no readily available sources of cost available to industry that can be used in investment decision making. Information needed includes:

- Growing costs
- Alternative harvesting costs
- Transport costs
- Processing costs

While some research work has been done on some of these aspects the information is difficult to find and hard to understand. It needs to be put into a handbook so that it is available to potential users.

Investment risk management will be a barrier to implementation of purpose built energy facilities which again indicates the reason why SRC will initially be used for industrial applications. Investment risks include;

- The need to confirm a contract delivery price for the energy plant before planting,
- The confidence that the crop will be harvestable at a fixed price.

There is a lack of transfer of international knowledge and experience to NZ. This conference is an attempt to address this issue.

4. FUTURE ROLE OF SRC AS AN INDUSTRIAL ENERGY SUPPLY

It needs to be remembered that in general and initially the need for SRC will be driven by industrial requirements. Only far later is it likely to be for electricity generation per se.

With the length of growing cycle and predictions that energy costs will have increased significantly by the end of the decade there is probably value in moving to first plantings occurring within the next few years. To do that requires us to prepare for the future.

Things that will need to be addressed include:

- Research – development of cost effective methods for developing stocks (transgenetics/ cuttings/, year round supply, development of infrastructure,
- Transition (muliple use, land management, firewood, land application of wastes, oils, oil mallee, sound barriers, ground water protection, etc)
- Long term planning (integration of land use, biomass supply, energy use)

5. POLICY MIX

At present because there is no recognised champion of SRC and there is no engagement with Government and industry there is a need for development of a strategy aiming for first cropping say in 2015. This will require an integration of government and industry policies (energy, renewables, GHG mitigation, waste disposal/recycling, sustainability.

There are also regulatory issues that may need to be addressed – RMA, air emissions, land application guidelines, air emissions,

There is a need to focus on scientific aspects;

- Choice of crops/promotion of alternative crops/non-food crops
- Pest control/biosecurity/diversification

- Competition for land – conversion of crop lands for energy,
- Certification – need to have this in place to support "Green markets"
- Use of alternative species / linked to timber production.
- Change in land use – increasing carbon density
- Social issues – access to labour and resources/fuel sources for remote areas.
- Encouragement of local industries
- Pricing of externalities
- Protection of plant variety rights
- Shift to mixed fuel sources.

Because of the lead time for SRC the bioenergy industry needs to engage with Government to establish a programme of activities so that an end of the decade first uptake on a commercial basis timing is not missed.