The Institute of Foresters of Australia

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27 April 2011

Committee Secretary
House of Representatives Standing Committee
On Agriculture, Resources, Fisheries and Forestry
PO Box 6021
Parliament House
Canberra ACT 2600
arff.reps@aph.gov.au

Dear Secretary,

Inquiry into the Australian forest industry

The Institute of Foresters of Australia (IFA) welcomes the opportunity to provide a submission to the Inquiry.

Our submission is attached.

The Institute would be pleased to make a member available to discuss the submission and any other issues the Committee may wish to raise.

Yours faithfully

Cassandra Spencer
Chief Executive Officer

Submission to House of Representatives Standing Committee on Agriculture, Resources, Fisheries and Forestry

Inquiry into the Australian forest industry

With this submission, the Institute of Foresters of Australia (IFA) addresses the forestry science, environmental, economic and community impacts and opportunities of forestry in Australia. This submission reports against all of the Terms of Reference of the inquiry.

The IFA is a professional body of approximately 1300 members who are engaged in all branches of forest management and conservation, forest industry, academia, research and sustainable natural resource management in Australia and overseas.

The IFA is wholly reliant on fees from its member and vigorously defends its professional independence. Therefore this response to the Terms of Reference represents the collective experience and passionately held beliefs of members from all States of Australia in the future development of a vibrant and environmentally sustainable forest industry for Australia.

The Institute is strongly committed to the principles of sustainable forest management, sustainable use of biodiversity, conservation, provision of sustainable livelihoods, poverty alleviation and the management processes, systems and practices which translate these principles into ecological sustainable development and sustainability outcomes.

Australia is heading for a timber supply crisis. Most house building and internal fitting depends on a ready supply of timber at reasonable cost. Australia's population is expected to increase from 21 million in 2011 to at least 30 million by 2035. Unless urgent action is taken now to develop domestic supplies of timber for this increasing population Australia will import an increasing proportion of its timber needs. Imported timber will be at higher prices due to transport costs and competition from emerging economies, particularly in China and South East Asia. Imported timber is likely to be produced from areas which do not have the same standards of forest practice as Australia.

Relying on increasing supplies of imported timber for house building will have serious consequences for young Australians.

Australian domestic softwood timber supply is expected to remain relatively static for the next decade and beyond, based on current policies, due to the areas of plantation which produce timber for housing having increased by only around 10% over the past 15 years. Australian domestic hardwood timber supply is decreasing and expected to continue declining due to continuing transfers of State forests to National Parks or reserves.

Concrete, steel and other alternative building supplies are much more energy intensive than timber and are forecast to continue increasing in cost, so there is no easy substitute for timber in house building. Sawn timber from plantations takes at least 25 years to grow. That is why action needs to be taken now to avert this looming crisis.

New plantations need funding and suitable land. Australia now has more than adequate areas and representation of Australian native forest types held in reserves and National Parks as a result of the Regional Forest Agreements of the 1990s and State decisions since then.

Key points and background, along with important related issues, are detailed in this submission. In summary steps which need to be taken now are;

1. No more transfer of native forest from tenures which allow timber harvesting, to National Park or reserves.
2. Expand the areas of planted forests which produce sawlogs.
3. Ensure that forestry in Australia is at or exceeds world's best practice.
4. Change Australia from being a hotbed of anti-forestry activism to a country which fosters and is proud of its forestry and timber sector.

Opportunities for and constraints upon production

Australia has an outstanding competitive advantage in forestry because we are relatively forest rich - 20% of land area is forest or 7.5 ha/person. The trade deficit in timber products is currently $2.2 billion/a (2009)[1]. This is expected to increase because Australia's coniferous plantation estate is declining coupled with a rapidly increasing population and a steady per capita consumption.

The future global timber demand will be driven by emerging economies throughout Asia. Market research identifies shortfalls in the future stocking and consumption of forest products in China and India (see table 1 below). Australia and New Zealand supplies these markets with logs at a rate that exceeds its supply capacity- *Anonymous* (pers com.) and should be encouraged to facilitate new investment opportunities. And while both countries are engaged in forestation activities, forecasters suggest that their establishment rates are short of projected demands.

	Forest area – ha/person	**Timber consumption – m3/person**
Australia	7.5	1
China	0.13	0.08
India	0.08	0.06

Opportunities

Australia has a need to expand its softwood estate to provide structural timber to accommodate future domestic housing demands. A reliance on timber imports should not be considered an option thus exposing the nation to international competition for a diminishing supply and increasing foreign debt.

Institutional superannuation investment in Australian plantations is a possible source for further expansion. This is evident across the country with US companies purchasing assets from State established softwood resources and failed MIS hardwood estates. The even aged distribution of some estates has provided investors with an immediate return.

Productive native forests being harvested today could generate large volumes of residue timber for industrial applications, while still maintaining high standards of forest sustainability. At present the residue resource is left on the forest floor creating a hazard for fire and other damage agencies, and emits carbon into the atmosphere for no benefit In Western NSW large areas of densely stocked private cypress forests, documented by the NSW Natural Resources Council (NRC) in its recent report on the South-Western Cypress Assessment Report. Thinning of this resource for products including small sawlogs, vineyard posts and biomass would be a welcome economic activity for the relevant communities.

Plantation forests are being harvested for biomass in some regions. With encouragement, harvesting of biomass could be extended to all plantations.

Commercial harvesting could be used to manage natural hazards to reserved forest estates This includes some national parks where the existing forest is an artifact of human intervention, and where the growth habits of the species suggest treatment to achieve objectives. Examples are cypress and red gum forests. The US has recently changed policy in this aspect of forestry after suffering heavy losses of forest to fire and insect attack. The timber industry is now setting up thinning and sanitation harvesting in ponderosa forests in Arizona after being closed down by environmental pressure decades ago. Environmentalists are part of the decision making and are supportive of the policy *(Peter Aleshire June 2010, Dave Atkins US Forest Service April 2011)*.

Forests and plantations are a very effective means of sequestering carbon. This form of storage has potential to make a significant contribution to Australia's efforts to reduce greenhouse gas emissions. With the appropriate mechanisms, the government's carbon emissions policy could benefit managers of native forests and plantations. Any policy must recognise the reality and value of ongoing storage of carbon in processed timber products.

Engineered wood products signal an opportunity for the forest industry. When compared with solid wood structural products, they extend the use of the resource by virtue of their capacity to waste less material and use lower grades of wood fibre. Their superior strength and stability also provide significant engineering solutions and opportunities in the marketplace. Within the marketplace in Australia, there are

[1] Australia's Forests at a Glance, 2010

significant companies who have developed products from the US. BIS Shrapnel surveys indicate that there is significant growth potential for the Australian processing and manufacturing sector[2].

The IFA considers the encouragement of innovation in EWP's as an option for addressing the divide between a suitable resource and sawn products.

New technology and training result in productivity gains. These gains to Australia's timber processing, forest growing, and harvesting and haulage sectors through well trained people applying and adapting new technology. Effective training opportunities and facilities are needed to ensure adequate skills for a future vibrant forest and timber processing industry.

Plantations and multiple use native forestry should be recognised as a valid land use. Provisions in some instances are included in local government planning schemes which discourage or prevent use of land for plantations. Whilst such obstacle are within the jurisdiction of local and state governments, strategic planning principals for enhancing a forestry resource and industry could be advanced by an updated National Forest Policy. The role of state agencies, and professional land managers and planners would be essential in negotiating any such policy.

Constraints

The contention that substitute timbers are readily available for those forgone when harvesting is excluded from native forest areas is incorrect. Australia's plantation estate does not provide substitutes for timbers foregone by excluding harvesting from native forests. Ongoing demand for timber with special strength, durability or appearance features and declining supply might act as a signal for the importation of similar material from other regional sources. Often there is limited ability to apply high environmental regulatory standards in such countries. In this regard, excluding harvesting from all Australian native forests for environmental reasons, at least in part, is merely exporting a larger environmental consequence on our neighbours, which have been under severe environmental pressure for decades.

Australia now has one million hectares of hardwood plantations established rapidly over the last one and half decades. They were established to supply export chips for the Asian paper industry and hence the species planted were selected for pulping properties.

Australia imports tropical hardwood timbers from South East Asia and unfortunately a significant proportion of these imports are from illegally harvested forests. Our solution to ensuring imports are sourced legally has been to introduce legislation, that penalises importing merchants. This approach seems unfortunate given our capacity to regulate and provide sustainably harvested forest products locally.

The transfer of large areas of public native forest from multiple use management to National Park or permanent reserves by State Governments reduce a valuable resource for native forest based industries.

The assumptions used by environmentalists to support their view that harvesting should be excluded from all native forests have been extrapolated from the past. The current day context is different in many respects. These assumptions urgently need review before a policy of excluding harvesting from all native forests is applied by stealth. The IFA supports a commitment by all stakeholders to the Regional Forest Agreement (RFA) process as a mechanism for establishing sustainability.

There are divides between truth and perceptions surrounding the forest industry in the public consciousness. Societies desire to embrace sustainable living is reflected in its valuation of ecological systems over wood products. An appreciation of nature is to be applauded. However, the dynamic nature of ecosystems and time scales that the industry operates with are often overlooked in public debates.

> *Many people who consider themselves friends of the environment will eat wild fish but not farmed fish, prefer free-range eggs and chickens, and try to buy locally-grown organic vegetables and fruit, as well as local bush foods. But – strangely – when it comes to harvested wood the preference is usually for plantation-grown timber – it is "green" and timber from native forests is not. One of the greatest challenges of foresters worldwide is to disabuse the public of this ill-thought-out notion*.

[2] http://www.bis.com.au/verve/_resources/Rel_PW_OSB_2011_FINAL.pdf: Media release and extracts from BIS Shrapnel market report. The authors report on the outlook for sawn wood products also identifies opportunities for growth., which serve as an opportunity for EWP's: http://www.bis.com.au/reports/sawn_timber_au_r.html

"Rather than buy wood that comes from unmanaged forests overseas or from fossil-fuel-intensive plantations, why not use local, free-range, organic, renewable wood from native forests?"[3]

ENGO campaigns often overlook the outstanding performance of Australia's sustainable regulations and how far society and the industry has advanced in its performance. There is optimism that the emerging concerns relating to climate change and energy will become the key focus of environmental NGOs resulting in a positive recognition of the importance of commercial forestry.

This has been a feature of forestry for at least two decades and in spite of the fact that large areas of productive forest has been taken out of production in national parks there appears to be no let up in anti forest activity.

The outcome of this effort has seen large areas of production forest transferred to National Parks creating a high sovereign risk to investment in the industry. Forest industry investors can justifiably argue that continuing supply of timber from native forests is subject to changeable Government policies, despite assurances given about such supply in previous periods. This is likely to dampen investment in new developments. Decisions such as the banning the of use of native forest residues for biomass production are regressive (NSW Government policy).

Some ENGOs have expended considerable energy pressuring overseas customers to stop purchasing *legally* produced Australian timber products (especially wood chips from native forests).

Actions by Government to change the culture relating to forestry could be considered controversial. But there is merit in doing so for the benefit of current and future generations. Specific actions could include;

- Education programs through schools, universities and the community.
- Improve the dialogue between forestry and environmental interests through Government.

Engage the ACCC to assess the actions of ENGO's campaigns where bilateral agreements have been established for legitimate industry operation.

Lack of certainty about how carbon would be priced and how carbon stored by forests and plantations would be included in any future cap & trade system, severely limits investment in dedicated carbon plantations or plantations based on carbon plus other commercial values.

Kyoto agreement incorporated ambiguous rules on carbon accounting for plantations and failed to recognise the reality and value of ongoing storage of carbon in processed timber products. Carbon plantation investment is unlikely to ever be significant under prevailing circumstances. The government's carbon emissions policy should recognise the benefits that forests and plantations can make and include positive initiatives to encourage and support investment in carbon forests and plantations.

Recommendations

In the context of commercial or industrial forestry and resource management, the IFA

1. Engage in regional approaches to establishing timber resources and industries that are vertically integrated
2. Address the misconceptions regarding multiple use forestry and promote the benefits of commercial activity
3. Revisit the National Forest Policy Statement, engage with the Regional Forest Agreement system, and use other legal mechanisms to provide investment confidence for wood production.
4. Promote the inclusion of wood products as a source of carbon storage on GHG accounting.

In the context of commercial or industrial forestry and resource management, the IFA

5. Considers that wood can be sourced from plantations and/or native forests on private and public land managed according to the principles of sustainable forest management, and implemented in accordance with relevant codes of practice.
6. Believes that maximum value recovery should be sought from all trees harvested in both native and planted forests.

[3] Prof. Michael Archer: extracted from keynote presentation at The Australian Forest Growers 2010 Conference

7. Supports public policy frameworks and private sector investment to develop Australian processing industries that add value to the wood produced in Australia's native and planted forests[4].
8. Believes timber production is a renewable, low energy use industry that need not threaten biological diversity[5].
9. Advocates for enhanced government and industry initiatives to make factual information on the social, economic and environmental outcomes of forest management practices available to students, interested community groups, forest industry focused entities and the community at large
10. Advocates the ongoing development, auditing and review of Codes of Practice, and associated forest regulation, to cover all significant forest management activities, irrespective of land tenure[6].

[4] Woodchip from Australian Forests, IFA Policy 8.2. Points from this policy serve as a generic response to the use of wood for any high volume use of wood for any industry application.
[5] Timber production and biodiversity, IFA Policy 1.4,
[6] Forest Regulation and Codes of Practice, IFA Policy 2.8, preamble to points of the policy

Opportunities for diversification, value adding and product innovation

Value adding Paper & Pulp. Some 46% of our forest product export is in the form of chip used in the production of pulp for paper and packaging.[7] The value of imports of forest products is double that of exports (mainly wood chips) with paper and paperboard being the major cost of imports.

In April 2010, the Pulp and Paper Industry Strategy Group (supported by the Department of Innovation, Industry, Science and Research) tabled a review of their industry. Market research sited by the review indicates that there is significant incentive to develop. Australia has a competitive strength in our proximity to the blossoming Asian market, an availability of fibre supply, and comparatively low energy costs, stable governance and outstanding environmental regulation[8].

The industry shows a commitment to the sustainable principals surrounding plantation and native forestry resources[9]. Australia has proven to be a leader in the development and implementation of codes of practices and sustainability surrounding the management of industry and natural resources.

Biorefineries are viewed as an alternative industry for value adding chip residues. Biorefiney systems require similar resources and supply constraints as pulp and paper.

Forest residues from short rotation hardwood plantations may also be a source of feedstock for a biorefinery but alternatively could find a market as a source of bio-energy.

Industry initiated R&D in Northern NSW suggests there is merit in establishing technology on a small scale that produces electricity, oils, syngas and charcoal. The model takes advantage of the highly variable nature of the wood, dispersed plantation estate, and need to find a market for thinning.

There is merit in developing technologies and applying them on a scale that provides existing industries opportunity for diversification. Given the challenges of acquiring suitable land for establishing plantations to satisfy an industry, it is unlikely that a large scale industry could be conceived. However the introduction of a carbon price may provide incentive for this change.

Engineered wood products utilise wood more efficiently than solid timber products. Laminated beams carry greater loads in longer spans than equivalent end-sections in solid timber. They exhibit minimal lifecycle analysis (LCA) values when compared with aluminium, steel and masonry. Domestically the availability of high quality logs is declining due to the withdrawal of native forest from harvesting and the fact that the majority of hardwood plantations are managed for short rotation pulpwood.

There is a need to develop a resource and engineering solutions to satisfy markets for structural and feature solid timber products for domestic use as well as satisfying growing international demand for building products.

Cooporative Research Centres (CRC) for Wood Innovations and CRC for Forestry are making a valuable contribution to the growth and utilisation of plantation hardwoods. A collaborative approach that pursues knowledge and advances in genetics, silviculture, wood quality and innovations relating to composite products and processing technologies will be essential for maintaining traditional markets and developing new products. It is noteworthy that significant effort has focused on southern resources (i.e. *Eucalyptus nitens* and *E. globulous*) and product options. While there are several projects focusing on genetics, wood quality and adaptive technology, a similar commitment for the northern species and product possibilities will require a similar effort. Given that sub-tropical and tropical growing conditions cannot compete with the rates of growth reached in temperate regions, structural products are a more suitable market opportunity over pulp products. There is a challenge to develop a suitable market for thinnings, growing wood that has good characteristics for structural products, and developing processing and engineering solutions

Recommendations

1. Support the value adding of chip in the local manufacture of pulp and paper.
2. Supports the use of forest residues for such uses as bio-energy and bio-refineries, providing always that such uses are ecologically and environmentally acceptable.
3. Support R&D into value adding industries to suit resources and economies of scale.
4. Encourage value adding through adaptive technology for engineered wood products. This should be done through support of CRC's and other Industry research initiatives.

[7] Australia's Forests at a Glance, 2010. Estimates are derived from 2009 trade figures.
[8] Pulp & Paper Industry Strategy Group Final Report, April 2010:
[9] Pulp & Paper Industry Strategy Group: Final Report, April 2010. Page 88, Sustainability

Environmental impacts of forestry

Sustainable commercial forestry in plantations and native forest estates can provide economic, social and environmental benefits. Whilst sometimes a contentious issue, both landscapes are capable of creating and sustaining biodiversity and conservation. However, each requires a significantly different management technique to meet land management objectives and as such should be reviewed individually.

Australia has the responsibility to manage native forests and plantations in a sustainable manner. Australia further needs to reduce its reliance on imported timber and timber products, especially where these products are from land clearing or illegal sources. With this imperative in mind, considerations are:

- Ecosystems do recover from disturbance caused by professionally executed timber harvesting and prescribed fire management.
- Forestry professionals have the skills to implement management strategies to meet forest owner's objectives and community expectations regarding commercial operations and maintenance of other forest values in native forests[10] and plantations.
- Management plans for forest and woodland landscapes should recognise the important ecological role of fire and provide strategies to ensure that fire regimes are compatible with broad land management objectives and ecological characteristics, and maintain protection of life and property.
- Increased use of wood products is a practical contribution in the mitigation of global warming.
- Excluding timber production from native forests does not guarantee protection of biological diversity. Adaptive forest management taking into account biological requirements of forest dependent species provides the best potential.
- Sustainably managed plantations are an increasingly important land use in Australia.
- Plantation managers can and should work with governments and catchment management authorities to ensure that plantation development minimises adverse impacts on water quality and flows.

Regional Forest Agreements provide the basis for setting a framework for economic, social and environmental management of forests and having a comprehensive, adequate and representative reserve system. The recent signing of the "Forest Principles" in Tasmania threatens the sanctity of the Tasmanian RFA with resultant implications for investment in all native forest industry.

Impacts of plantations upon land and water availability for agriculture

Australia's plantations provide approximately two thirds of the timber production, especially the bulk commodity products of construction pine timber and fibre for paper and woodchips.

Studies show that plantations show a higher level of biodiversity than the pastures they replace and provide habitat or resources for a range of species, including a selection of bird species considered to be at conservation risk.

Multiple use forests and plantations play an important role as firebreaks. A maintained plantation with firebreaks and adequate weed control can reduce the intensity of a fire, through reduced fuel availability and improved access for fire fighters. There are cases of plantations halting advancing fire fronts. However all forests, including plantations will be burnt under extreme conditions.

The establishment of plantations in water catchments can have both positive and negative impacts on stream water quality and quantity. Reforestation of some areas of cleared agricultural land with plantations can provide substantial environmental benefits, including greater protection of streams and stream-banks, and an increase in water quality through providing a vegetation filter. Because trees use more water than annual crops and intercept more rainfall than pastures, there will be reductions in stream flows in some situations. The amount to which stream flows are affected depends on the percentage of the area of the catchment under plantation, and the effect of other land uses. In general,

[10] Timber Production in native forests: Policy 2.7

stream flows will stabilise within 10-20 years of establishment[11]. Strategically placed plantations can have a positive effect on the amelioration of dryland salinity.

Australia has plantation area to more than void it's carbon output. Australia's forests sequester more greenhouse gases from the atmosphere than they emit and thus help to offset Australia's contribution to greenhouse gas emissions. In 2005, plantations offset about 3.5% of total national greenhouse gas emissions. Sequestration of carbon occurs both in the growing forest and in the forest products produced there from in house construction and paper products.

Environmental Impacts from Native Forest Harvesting

Australia's multiple use native forests provide for biodiversity conservation, recreation, minor forest produce such as beekeeping, water production and timber production. Each of these are legitimate activities when properly regulated and conducted according to sustainability principles.

In a country with more forest area per person than 90% of other countries we utilise less of these forests than 90% of other countries[12]. The recent federal initiatives to stem the tide of illegal logging that occurs in less developed economies include a commitment to improving the local industries competitive advantage[13]. Our own regulatory framework for native forest operations provide the market with a secure chain of custody. But due to the continuing transfer of native forest to reserves the future supply is uncertain due to large scale transfer of forests into the conservation reserve system, and Australia's capacity to produce the diversity of hardwood species will be reduced in some regions[14]

Contentious at the best of times, it cannot be argued that managing Australia's forests to compliment environmental and production outcomes is an easy task. What can be said however is that by allowing native forests to be used for active and positive production allows them to be monitored and protected against invasive plants and feral animals.

The IFA recognises there are implications of timber harvesting on a range of other forest values and these need to be properly managed. A summary of the issues and management of these issues follows.

Monitoring impacts of forest land change is vital in determining short and long term benefits. With a large transfer of land into the conservation reserve system in the last decade it is time for a genuine cost/benefits analysis to be undertaken to establish the cost to the local and regional communities in terms of forgone employment opportunities as against the benefits to biodiversity conservation through reservations.

This triple bottom-line accounting is required for societal equity and may prove to be fundamental for achieving conservation objectives.

Sustainable timber harvesting can be in keeping with maintenance of biodiversity conservation across the landscape when there is a comprehensive, adequate and representative reserve system (as provided in RFAs). Professional expertise must be employed in timber harvesting to better improve biodiversity outcomes in large areas of regrowth forests originating after fire and from previous timber harvesting. It has been demonstrated that adaptive silviculture in certain regrowth forests can contribute to reducing the time forests take to develop old-growth characteristics such as large trees and hollows which are important for some species[15]..

Regrowth forests in principle use more water than mature forests, active management of these catchments can improve water yields. This has been demonstrated within Western Australia and Victoria through thinning of native forests to increase water production[16]. If water production is a primary requirement then ecological thinning should also be considered for the maintenance of forest health in forests subject to severe drought stress such as river red gum.

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[11] Parsons, M., Frakes, I. and Gerrand A. (2007) Science for Decision Makers: Plantations and water use: Bureau of Rural Science
[12] Trees That Call Australia Home by John Halkett, ISBN 9780980512502 page 79
[13] http://www.daff.gov.au/forestry/international/illegal-logging: The site outlines the initiatives taken by the Government to reduce illegally logged products reaching and impacting on the domestic market. The policy and legislation is a direct approach on imports. However, the signals may indirectly provide market opportunity for locally sourced products
[14] In Queensland, the South East Queensland Forest Agreement SEQFA will see the cessation of harvesting of wood by 2025. It is noteworthy that concessions are made of other cultural uses of the natural resources on a small scale. This suggests that the nature of the decision is based more on public interest and perceptions rather than any scientific base.
[15] http://www.dpi.vic.gov.au/CA256F310024B628/0/BE2695FA150D5FDCCA2570ED001CB618/$File/192+Loss+of+hollow-bearing+trees+2003.pdf

Forests are an important component of global carbon storage with maintenance of carbon stocks a priority. Any consideration of forest as carbon stores must also recognise their value in producing products with low carbon emissions.

Wildfire management in native forests is essential to maintain their biodiversity, timber production, water production, and carbon stocks. Prescribed burning to reduce fuel loads in forests is an important tool in management of native forests. Properly planned and implemented this will reduce potential impacts on forest values and communities of catastrophic wildfire.

Recommendations

1. Promote the environmental benefits of commercial forest operations.
2. Foster co-ordination and sharing of knowledge and skills that exist within the industry and other land managers such as conservation agencies, ENGO's and the agriculture sector.
3. Promote the realisation that actively management forests have a real capacity to reduce the carbon footprint.
4. Promote the use of f residues from certified forest operations, sawmilling and manufacturing in the production of bio-energy.
5. Review the cost/benefit and environmental benefits of managing native forests in reserves as against the commercial use and management of forests by professional foresters.

Creating a better business environment for forest industries

Successful forest industries are dependent upon large and durable resource bases.

Future resource availability is critical to the sustainable development and growth of Australia's domestic forest industries. One of the greatest challenges is to attract new investment today that will be there to meet the industry's future demands.

Whether a sawlog plantation is hardwood or softwood, they require long term investment commitments. Recent hardwood plantation investment has been directed into short rotation (10-15yrs) plantations for pulpwood export markets. What is common to both the softwood and hardwood industries is that over the last fifteen years there has been little investment in new sawlog resources.

Investment models for saw log production;

Hardwood plantations perform best and are most viable on high site quality land with an annual rainfall in excess of 1200mm. Land with these characteristics is typically located within coastal river catchments and is capable of producing a mean annual growth increment in excess of 20m3/ha/yr.

Softwood plantations (*Pinus* species) are able to perform well on moderate and high site quality land with annual rainfall in excess of 700mm. The exception is *Pinus pinaster* which can perform on as little as 500mm of annual rainfall in Western Australia.

Softwood plantation regions are now well established in Australia. There are good incentives for directing investment within these regions as they have established road and fire protection infrastructure and established wood processing markets. On Australia's eastern seaboard, it is commercially desirable to target land capable of producing a mean annual growth increment of 18m3/ha/yr or better for new softwood investments.

The importance and value of high performing trees is driven by the time cost of money. All timber plantations have high upfront establishment costs. If the plantations are being established for the first time (first rotation) there is also the cost of the land to consider.

Upfront fixed costs must be carried for the life of the investment which will typically be between 25 and 40 years. The majority of the revenue arises from sawlog sales at final harvest so, in simple terms, the quicker the plantations can be grown the shorter the rotation and the higher the return on the investment. The value of financial returns from thinnings is also critical to the economic success and attractiveness of long term sawlog regimes.

Although high quality land can deliver much better plantation performance and higher returns it also costs more and this needs to be factored in to the investment model.

For hardwood the value of land in coastal regions can be influenced by demand from people making lifestyle choices, rather than its agricultural capability. This is a major issue on the east coast of Australia where a high proportion of suitable land is located within 200km (weekend commuting distance) of city populations and or 50km of regional centres (daily commuting distance).

Being a living investment sawlog plantations are exposed to a range of environmental risks over a long period of time. These include drought, hail, fire, wind, and pests and diseases. A range of measures may be applied to mitigate these risks however they cannot be entirely avoided and as such need to be costed in to the investment model and allowed for when estimating yield.

Market uncertainty is another risk. For hardwood it is quite difficult to reliably estimate the future value of plantation sawlogs. This is due to very few plantations in Australia having reached commercial maturity and some technical uncertainties associated with the processing of fast-grown hardwood products. Hardwood plantation sawlog pricing is also affected by native forest timber pricing schedules that currently attribute a low value to small (plantation size) sawlogs. A much higher level of certainty exists for softwood sawlog prices with well established markets that are relatively easy to monitor and track.

There are a range of other factors that can influence the profitability of sawlog plantations including proximity to wood processing markets and the existence of other plantations.

The financial returns from plantations are also dependent on the availability of markets for all of the products. Softwood plantations need to be thinned at least once during the rotation to produce quality sawlogs of reasonable sizes, and the best sawlogs are produced from plantations that are thinned two or three times.

The scale of the plantation investment is important as it can directly affect the costs of management and harvesting. In general plantation forestry of any description is more viable when undertaken on a large

scale. For example, the large private and State plantation estate in the Albury Region has attracted a full range of wood using industries including world scale sawmills, a pulp mill and a newsprint mill.

The ability to control the timing of a plantation's harvest (to align with optimal market conditions) is seen as a positive over other agricultural commodities. The unique features of a forestry plantation investment can also be seen as a positive for investors seeking to diversify their investment portfolio.

Commercial investment hurdle rates for sawlog plantations should be set at a level that takes account of environmental and market uncertainties and the long term nature of the investment. For most investors, pre tax hurdle rates (IRR) of between +7.5% and +10% are considered appropriate. Unfortunately, the current rates of return for both softwood and hardwood sawlog plantations fall well short of these target rates.

New business and investment models for plantation production

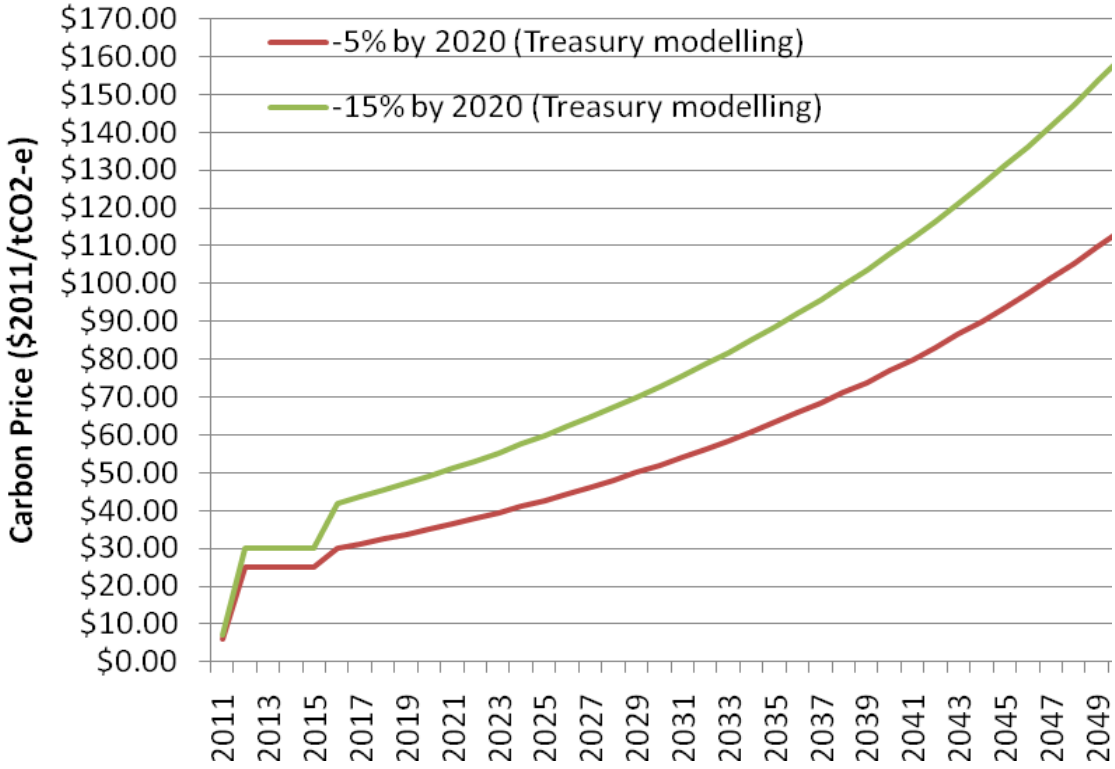
New marketable products and more supportive government policies are critical to improve the financial rates of return and commercial attractiveness of sawlog plantations.

National markets for carbon and biomass are emerging together and represent the most likely prospect for improving plantation economics. Greater recognition by Government of the practical challenges faced by plantation growers is needed however if these market benefits are to be realized.

A market for carbon sequestration is attractive as it provides a revenue stream in the early life of the plantation (years 2 to 15). This income can be used to offset upfront establishment and land costs.

Under a national scheme the price of carbon is proposed to be introduced in July 2012 and fixed for three to five years. Modelling of future carbon prices has been undertaken by the Australian Department of Treasury based on Australia's current emission reduction target of -5% of 2000 emission levels by 2020 and -60% of 2000 emission levels by 2050. Treasury has also modelled the higher target of -15% of 2000 emission levels by 2020. The Government has announced its commitment to this higher target if international agreement on emissions reduction can be reached. The modeled price projections have been replicated in the graph below and assume a real price increase of 4% per annum.

Figure 1: Australian Carbon Price Projections (based on Treasury Modelling)



Carbon Price Projection Assumptions:

- Australia achieves its 2020 and 2050 emission reduction targets;
- The Government introduces a fixed national carbon price from 2012, and;
- The Government implements a market based emissions trading scheme in 3-5 years time

The prospects for attracting investment in long rotation plantations for carbon and timber appear promising if the projected prices for carbon can be realized.

The modeled prices are however based on a suit of assumptions, many of which may not be realized. For example, the practicalities of achieving a 5% cut on 2000 level emissions by 2020 will be very challenging as 'business-as-usual' emissions must be reduced by 23% over the next 9 years (emissions are currently growing at around 2% per year).

The sensitivities of both the electorate and the big emitters to the carbon price and the willingness of the Government to accommodate these sensitivities also suggest that the price on carbon (if introduced) will be heavily constrained in the next 5 to 10 years.

If land acquisition costs are included, modeling by Forests NSW (NSW's public forest agency) indicates that a fixed price of around $40+/tonne of CO2-e will be required for new 'Kyoto-compliant' long rotation plantations to reach financial hurdle rates of between +7.5% and +10% (IRR) . If land costs are excluded then financial hurdle rates may be achieved if carbon is valued at $20+/tonne of CO2-e.

The accounting methodologies used to measure the carbon sequestered by plantations will be critical in determining the commercial attractiveness of the carbon market. At present the Government's proposed Carbon Farming Initiative (CFI) is the only national initiative with accounting provisions for carbon sequestration projects.

Under the CFI there are very few incentives for forestry to participate. Firstly, forestry projects are likely to be deemed a 'business as usual' activity which does not meet the scheme's 'additionality' requirement. Secondly, no credit is proposed to be given for storage of carbon in wood products and there is no recognition of the 'average carbon stock' accounting method. This method was previously endorsed by the Government in 2008 under its Carbon Pollution Reduction Scheme White Paper. The 'average carbon stock' accounting approach is important as it allows the sequestration and emissions associated with harvesting events to be 'averaged' out over time and does not discriminate against a small forest grower who may only have a single plantation age class.

Another significant challenge to all 'carbon sequestration farmers' is the proposed 100 year carbon maintenance (permanence) obligation. The permanence obligation requires plantation growers to commit to three successive sawlog rotations with the second and third rotations not generating any carbon income apart from that which may in future be recognized for the carbon stored in the harvested wood products. The permanence obligation is expected to be a major disincentive for the farming sector whose investment horizons fall well short of 100 years.

Further consideration of carbon accounting methodologies appropriate for plantation forestry are detailed under *'Potential Energy Production for the Forestry Sector – Carbon Sequestration'*.

Woody biomass and its emerging demand has created considerable interest within the forest industry as a renewable energy resource. The IFA is aware that processors of softwood and hardwood are cautious but enthusiastic about bioenergy.

For plantation growers, sale of woody biomass has the potential to increase merchantable yield and reduce the costs of re-establishment where forest harvesting waste is a problem. For new plantation investments however the product is likely to only have a marginal influence on the net present value.in the short and medium term

Resource size, feed stock characteristics and energy pricing are key determinants for the uptake of bioenergy use in the forest industry.

Large scale resource bases are desirable to attract new bioenergy investment. Bioenergy facilities, like other wood processing facilities, benefit enormously from economies of scale. Biomass by nature is a low value by-product that cannot be viably transported long distances by road. Economics necessitates that sustainable biomass supplies be located within close proximity of the bioenergy facilities they feed.

The energy value of woody biomass as a feedstock is affected by its density and moisture content and also the level of contamination. Ongoing research is required to assess and determine the lowest cost methods for sustainably harvesting woody biomass with minimal contamination.

The underlying domestic demand for bioenergy is currently governed by the value of Renewable Energy Certificates (RECs). Large(L) RECs are currently trading at around $40/MWhr. At this price the demand for woody biomass as bioenergy is insufficient to compete with other low value forest products like pulpwood.

As a plantation by-product, recovery of woody biomass is currently being supported by European bioenergy markets. In Albany, Western Australia biomass is recovered from the final harvest of hardwood pulpwood plantations and manufactured into wood pellets before it is exported by ship.

Bioenergy production for domestic consumption is currently unviable unless there are large quantities of biomass readily available at little or no cost (i.e. as a waste stream at a wood processing plant). Limited investment commitments to date suggest that the value of Renewable Energy Certificates (LRECs) may need to increase by $20-$30/MWhr before biomass can compete effectively with existing energy sources.

Initiatives surrounding the cost of bio diesel (pre excise) and rules regarding its use may provide incentives for small scales (>20,000m^3/y) especially where the resource is dispersed[17]. For softwood processors (where the resource is consolidated) increasing costs of electricity may signal the uptake of cogeneration. What is universal is bioenergy has the potential to reduce waste disposal and provide savings in energy use.

Superannuation investment in plantations

Forestry plantations in Australia are an investment that is compatible with superannuation funds. This includes corporate or self-managed super funds. Superannuation investments attempt to include long term growth assets with low risk and stable regular returns. Superannuation funds are also comfortable with commitments which may span many decades.

In 2010 Queensland's principal pine plantation estate was purchased for over $600 million by Hancocks, a major US superannuation company. This estate comprises over 200,000 hectares of well managed softwood and hardwood plantation with established timber markets and a relatively "normal" age distribution. This means that income will be reasonably stable with increases due to real increase in prices.

Other large superannuation funds from the US have recently purchased the plantation assets of the failed Timbercorp MIS company and the land from the failed Great Southern Plantations. These two purchases total in excess of $700 million.

More than $1.3 billion has been invested by US superannuation companies into Australian forestry plantations in the past 18 months. This is a clear demonstration of the suitability of forestry plantations, and the land they are established upon, to the superannuation industry.

US companies who have made major investments in Australian plantations may be more prepared to invest in new plantations on nearby land in order to meet growing domestic demand, to consolidate their estate (& achieve economies of scale), and or to enhance the "normality" of their estate. Such investment would be proportioned to manage the investment/income ratio of the whole project.

If market drivers (such as carbon and biomass) do not materialise in the short term other direct incentives from Government may be needed.

Incentives in the form of loans for the early years, subject to guarantees of minimum stocking and quality of the plantation would be a way of securing commitment to long rotation new plantations. In theory this could also be suitable for Australian superannuation companies managing funds for Australian workers. The Federal Government acted in a similar manner toward the states in order to establish softwood resources owned and managed by the states in the middle of last century.

Recommendations

1. Government surety for resource availability for new investments.
2. Encouragement of research and development into new business opportunities such as carbon and biomass markets. This provides prospective investors in sawlog resources with opportunities for markets for downgraded products and thinnings in early stages of the life of an investment.
3. Address National forest policy issues with the view to providing industry confidence in investing in the industry. Pursue options for local retirement funds to invest in developing sawlog plantations and value adding industries.
4. Embrace recommendations from the Pulp and Paper Industry Strategy Group in relation to resource security, investment strategies for business development and infrastructure.
5. Encourage enterprises that seek to value add all forest products.

[17] Palmer (unpublished): preliminary R&D funded by Hurfords Timber, Southern Cross University and Tech Vouchers NSW.

Social and economic benefits of forestry production

The forestry and wood products industries contribute significantly to the national and regional economies. They provide materials for home building, construction, furniture making, paper manufacturing, packaging and other industries and add to the diversity of employment opportunities, especially in rural areas. Their annual value of turnover is around $22 billion. The industries contribute 0.6% of Australia's gross domestic product and $2.3 billion of export income (ABARES 2011).

Data on employment provided by the forestry and wood products industries published by the Australian Bureau of Statistics data suggest that the industries provided 75,800 jobs in the industry employment classifications 'forestry' and 'wood, pulp and paper manufacturing (ABARES 2011). This is substantially less than an earlier industry survey conducted by Forestworks, which suggested total employment was some 120,000 people when more industry sectors were included (MIG 2008).

Various regional studies also provide data on employment in the industries. It is evident from these other sources of data that the industry employment classifications used by the ABS do not cover the forestry and wood products industries comprehensively. This means that government policy decisions might be made based on inadequate data on the potential employment effects. The IFA believes that the inquiry should consider this issue as a high priority for further investigation.

Recommendation

- Review data collection processes used by the Australian Bureau of Statistics to ensure that data on employment in the forestry and wood products industries is comprehensive and accurately portrays the industries.

References

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MIG 2008. Australia's State of the Forests Report 2008. Montreal Process Implementation Group for Australia, Bureau of Rural Sciences, Canberra.

Potential energy production from the forestry sector

Biofuels

There is the potential to harvest approx 1.95M green metric tonnes of biofuel per annum from residues remaining after clear felling of plantation forests.

There would seem to be significant potential for energy production from the 11.4M ha of Australian productive forests. However, the Australian National Carbon Accounting System (NCAS) does not allow the generation of Renewable Energy Credits by any energy generator using native forest residues. This ruling has effectively removed 9.4M ha of production native forests as a potential source of biofuel. There remains 2.0M ha of plantation forests in Australia[18] with residues as a source for biofuel.

These comprise 1.02M ha of pine plantations and 0.80M ha of short rotation eucalypt plantations, both of various species. Because of current economic conditions, biofuel from the pine plantations will come from the residue left after conventional clear-felling for sawlog and pulpwood. In harvesting this biofuel it is good practice to only harvest the stemwood. If 1.02M ha of pine plantations are managed on an average of 30 years and yield 20 green metric tonnes (gmt) of stem-wood residue per hectare, after clear-felling there is potentially **680,000 gmt** of biofuel available per year. This would be enough to generate **68 Mw** of power in wood fired power stations.

The emerging harvesting of blue gum, *E globulus*, and shining gum, *E nitens*, plantations at approx 12 years of age to produce woodchips, is a developing source of potential biofuel. These stands are often harvested using whole-tree extraction and delimbed, debarked and chipped at roadside. This leaves a stockpile of mixed bark, broken small stems, branches and leaves at roadside, a tempting source of biofuel.

Given 0.80M ha of this type of eucalypt plantation in Australia, with a 12 year rotation and approximately 19 gmt of biofuel per hectare, there is a potential to harvest 1.27M gmt of biomass from Australia's eucalypt plantations per year. This would generate approx 127 Mw if burnt in wood-fired power stations.

It appears that there is significant potential to develop relatively small local wood-fired power stations to utilise this biofuel and generate up to 195 Mw per annum.

However, collective figures of residue available for feed stock are only one aspect of the potential for an industry. Economic and technical constraints (highlighted above in TOR 2 and TOR 4) may inhibit small or large use of biomass for energy initiatives. The interaction resource size and distribution, feed stock characteristics, competition for the resource by other markets, and energy pricing will determine the uptake of energy production from forest products.

There are also silvicultural constraints associated with supplying such a market. While there is advantage in removing woody debris (carbon rich), such as small stems and branches, the retention of leaves and bark, which are rich in essential trace elements, advances the sustainability of the site for future rotations. Intensive harvesting such as this may require greater applications of nutrients, compromising the sustainability of an operation.

Biomass - World, US and Europe

When traditional biomass is included, biomass accounts for over 13% of Global energy consumption, four times that of nuclear energy and roughly on par with electricity. Source: REN21. 2010. *Renewables 2010 Global Status Report* (Paris: REN21 Secretariat).

World demand predictions indicate a substantial rise in biomass energy usage round the world. (Source IEA World Energy Outlook 2010 Presentation).

Global annual growth for wood pellets is expected to be between eight percent and 10 percent in coming years.(Bioenergy Australia).

At the end of 2009 biomass provided around 3 percent of all energy consumed in the United States. The most common form of biomass in United States is wood, representing around 50% of all biomass used in US.

[1] Data taken from **1301.0 - Year Book Australia, 2003**
[2] Smethurst, PJ & Nambiar, EKS 1990, 'EFFECTS OF SLASH AND LITTER MANAGEMENT ON FLUXES OF NITROGEN AND TREE GROWTH IN A YOUNG PINUS-RADIATA PLANTATION', *Canadian Journal of Forest Research-Revue Canadienne De Recherche Forestiere*, vol. 20, no. 9, pp. 1498-507

Biomass currently produces 14 times more renewable energy for the United States than wind and solar energy combined. Biomass in United States currently accounts for more than 300,000 green jobs. Biomass power is a $1 billion worth industry in the United States. (Source World Energy Statistics)Europe

EU mandates at least 14% bioenergy in the EU energy mix by 2020. The solid biomass industry grew more than 2% (2007-08), 696 Million m^3 are produced each year (Hetsch 2008).

In 2005, 66% of all renewable energy in the EU was from biomass of this, 82% was used for heating, 11% for electricity generation and 7% for liquid fuels. The proportion of wood-based biomass was 85% (European Biomass Association).

Electricity produced from biomass sources was estimated at 44 GW for 2005. Biomass electricity generation increased by over 100% in Germany, Hungary, the Netherlands, Poland, and Spain.

Biomass heating markets are expanding steadily, 220 GW was used for heating (in 2004 excl. cooking) in building-scale or community-scale combined-heat and-power plants (CHP).

The wood pellet market, strengthened in 2009 following a fall in shipping costs, (as much as 50% of the cost) This was accompanied by an increased demand for co-firing by Europe's coal-fired power plants.

Table 1 Supply of Biomass for energy in the European Union 27 and outlook for 2020 (Source http://www.aebiom.org)

Origin		Use	2007	2020		
			Mtoe	Surface (Mha)	Biomass (Mtoe)	Remarks
Agriculture	Energy crops	for liquid (biofuels 1G)	8	15	23	yield of energy crop for 1st generation vary today from 1 to 3 toe per ha, average 1,5
		for biogas (maize, grass, etc)	2	3	11	yield today with maize or grass 12 t DM/ha, giving 3,5 toe, reaching 4 toe in 2020
		for solid (willows, miscanthus…)	0,3	2	10	yield in 2020 of 12 t DM/ha, giving 5 toe, reaching 6 in 2030 and 8 in 2050
	By-products	solid (straw, industry residues, etc)	1		10	more residues because less land filling,
		Biogas (manure, industries, etc)	3		10	mainly manure from agriculture, also more residues because of reduced land filling
	Other (Algae, etc)			<1	<1	Innovative biomass sources like algae; high contribution expected only after 2020
Forestry	Direct (logging residues)		20		40	strong increase up to 2020, than reduced increase to keep forest sustainable
	Indirect (industry by-products)		52		65	limited increase possible because of competition from other industries
Waste	Solid (MSW)		6		12	landfill gas + combustion of MSW + biogas treatment
	Sewage sludge/biogas		3		10	increase amount and use of sewage sludge (direct combustion or biogas)
	Other wastes (pallets, paper, etc)		1		10	mainly industrial wastes
Imports			2		20	
Total			**98,3**	**20**	**220**	
The production of 200 Mtoe in Europe in 2020 is coherent with the potential as evaluated by the European Environmental Agency (see table below)						

Mtoe – Million tonnes of oil equivalent

In Sweden, biomass is now the primary energy source for the district heat sector, in addition to being used for power generation and transportation;

In 2009, for the first time, biomass's share of energy production in Sweden exceeded that of oil, 32% to 31%.

Sweden is currently the world's biggest consumer of wood pellets, producing more than 1.5 million tonnes in 2008 and importing another 300,000 tonnes (Wood Resource Quarterly)

Australian Biomass

Biomass generated 0.5% of electricity in Australia in 2007-08, much from bagasse and from co-firing with coal.

However the capacity of wood waste (distinct from biomass) to generate electricity is only 73 MW, against Bagasse 464 MW and hydro 7808 MW. ABARE's Energy in Australia 2010[19] report indicated 33% of renewable energy produced in 2007-08 in Australia came from wood and wood waste, twice as much as hydroelectricity, more than 6 times that of wind, though this figure is expected to include firewood for heating and cooking. Under-utilisation of biomass as a renewable energy source is indicated by MRET 1997-2008 annual increase of only 1.3% for wood waste against 36.3% for wind (i*bid))*

Australia has wood pellet plants with a capacity of over 0.65 Million tonnes aimed at export (World Bioenergy Association) to Europe and Asia.

11 million hectares of timber productive forest in Australia are certified as sustainably managed.

Biochar

Biochar is produced by burning biofuel in a retort with restricted oxygen supply. Approximately half of the biofuel is converted into a gas which can be used to power generating equipment with the remainder forming a charcoal-like material known as biochar. In agricultural applications this can be incorporated into the soil when sowing seed, and this enables the carbon in the biochar to be locked up in the soil for many decades, potentially up to 100 years. This would be an effective method of extracting carbon from the atmosphere.

It has been noted that biochar also has a positive effect on plant growth, by mobilising available nutrients. This makes this process attractive in agricultural and forestry applications. There may be merit in including the process as a tool for carbon sequestration. However, this will depend on the stability of the char (carbon).

It is unlikely that any significant volumes of biochar could be incorporated into the soil as part of the re-establishment of forestry plantations, because of the limited tillage involved in forest establishment. Therefore forestry's contribution to the biochar system will mainly be in the provision of woody biofuel.

Cogeneration

A benefit of sawmilling and wood manufacturing facilities is their capacity to be energy neutral, generating their own power resource from waste management systems. With most mills lucky to recover 40% of log volume, generating power using mill residue as a fuel source creates two economic solutions to what would otherwise be expenses. An expensive aspect of processing in the softwood industry is seasoning and drying, using kilns. The heat generated in cogeneration can be used to drive seasoning plants while augmenting power supplies. Such applications are commonplace for significant softwood processors. Margins are small and all optimisations are usually employed to remain competitive.

Naturally, these incentives diminish with the volume of log allocation, cost of energy and waste disposal options. The return for woody waste from particleboard manufacturers, horticulture markets and smaller niches may reduce the incentive to embark on the capital expense for small processors.

The proposed Gunns kraft pulp mill will have both a recovery boiler and co-generation using forest and mill residues which is claimed to inject up to 30 MW of power into the Tasmanian grid.

Opportunities

Very large opportunity for

- High growth potential of biomass production under sustainable forest management
- regional employment growth
- renewable energy production - electricity and 3rd generation transport biofuels
- large and growing export market for wood pellets

[19] http://www.abare.gov.au/publications_html/energy/energy_10/energyAUS2010.pdf: This report is the work of ABARE, the Department of Resources Energy and Tourism.

Constraints

- Multitude of conflicting legislation and rules – mostly all restricting sustainably produced biomass industry growth
- Feed in tariff for renewable electricity – biomass not eligible in Australia but is elsewhere in the world
    - The Renewable Energy Sub Group of the COAG Working Group on Climate Change and Water has identified including native forest wood waste as an eligible source of renewable energy as a "key design issue" (source COAG Working Group on Climate Change and Water, 2008, Design Options for the Expanded National Renewable Energy Target Scheme)
    - The National GreenPower Accreditation rules state that "Utilisation of any materials (including wastes, primary or secondary) ... native forests... are not acceptable under the National GreenPower Accreditation Scheme."
    - The Renewable Energy Target (RET) through the Small-scale Renewable Energy Scheme (SRES) & Large-scale Renewable Energy Target (LRET) are eligible to use biomass unless the primary purpose of native forest harvesting is biomass production.
    - Use of biomass from native forests is banned in several states.
    - There are no references to biomass power or native forests in the Renewable Energy (Electricity) Amendment Bill 2009.
    - Competition for resource from existing markets for residue and woody waste will limit incentive to develop such enterprises.
    - Resource fragmentation and transport cost will limit the viability of harvesting and hauling thinnings.
- Politics interfering with
    - Cohesive policy on renewable & sustainably produced biomass.
    - Utilisation of biomass in the renewables mix to combat global warming such that Australia is lagging behind the rest of the developed world in its use and technology development.

Carbon sequestration

This section focuses on the impact of a carbon price on the Australian forestry sector and the barriers to the development of markets for forest carbon.

IFA believes the main barriers and market distortions are:

1. Permanence, land use flexibility and ongoing liabilities;
2. Risk to alteration of land use suitability criteria;
3. Public perception issues;
4. Simplicity of participation; and
5. Options to incentivise long rotation plantations.

These barriers, and options to address them, are discussed below.

Permanence, land use flexibility and ongoing liability issues. Forest carbon storage is potentially reversible if a tree is harvested without replacement, or damaged due to natural disturbance. Therefore a number of rules have emerged to ensure the permanence of forest carbon offsets or permits.

Previous carbon standards and schemes implemented in Australia have required some type of guarantee in regards to the permanence of the carbon sequestration or storage. In most cases, permanence has been defined as maintaining the forest or plantation for a period of between 70 – 100 years. This usually involves legal creation of carbon rights through a land use restriction or covenant registered on land title. This can cause problems where carbon benefits are typically accrued up front, but the liability to maintain forest carbon storage is inherited by future generations, long after the financial benefits of the carbon storage have been claimed. There is a perception that such an approach will de-value land encumbered with carbon rights, due to reduced flexibility of future land use (URS, 2008). Commercial plantation

companies have also indicated that access to finance may be restricted later in the rotation, due to the lender's negative perception of the carbon liability. Should the value of carbon increase high enough, there is a risk that forest owners may decide not to harvest at all in order to avoid incurring a carbon debit. Such an outcome would have a significant impact on Australia's timber supply.

An alternative approach to address permanence issues is to credit forest carbon storage according to the 'tonne-year' approach. This approach was considered by the Intergovernmental Panel on Climate Change (IPCC) in 2000 (Noble et al, 2000). It represents a mechanism to allow forest owners to receive credits not only for the quantity of carbon storage, but also for the *duration*. The tonne-year accounting method is based on the principle that CO_2 and other greenhouse gases have a residence time in the atmosphere during which time they will exert radiative forcing (i.e. warming). If the bulk of warming caused by CO_2 occurs over a period of 100 years from the time of its emission then there is *time value* in even temporary periods of forest carbon storage. The tonne-year approach disperses crediting over a nominal (say 100 year) period, whereby the forest carbon project developer would receive a proportion of the full credit for each year the forest carbon remained in storage. Only upon maintaining the forest for 100 years would the forest carbon owner receive full credits for the carbon stored. Conversely, those forest owners not wishing to maintain their forest for the full period would not receive full credits for their carbon storage, but they would not incur a liability upon exit from the scheme.

Ultimately, the tonne-year approach was not adopted for forest carbon accounting under Article 3.3 of the Kyoto Protocol, on the grounds that it was 'too complex'. However, given the perverse outcomes and complexities arising under the current approaches to permanence, the IFA considers that it is now timely to reconsider the tonne-year approach. The IFA believes that Australia's forest monitoring processes are now at the point where a tonne-year approach to accounting could be readily verified via the NCAS model and its associated remotely sensed imagery.

Advantages of tonne-year accounting over the current approach to permanence are:

- Prevents devaluation of land used for forest carbon storage, therefore increases likelihood of landholder participation;
- Encourages long term carbon storage by rewarding landholders for each year of carbon storage;
- Rewards the 'right' sort of forest carbon projects, providing a stream of benefits for long term forest planning, rather than rewarding 'get rich quick' schemes which could leave Government with large liabilities if carbon companies become insolvent;
- Provides a similar time schedule of credits for slower growing biodiversity or sawlog plantations, as it would for rapid sequestration in fast growing plantations. This would ensure proper consideration of species selection for the specific location, rather than encouraging the planting of fast growing species which may not be adapted to the area; and
- Provides significant benefits to the Government, who could account for the carbon benefits in Australia's national accounts upfront, but could spread devolution of the credits over a period of 100 years.

The IFA believes that such a policy setting will encourage both large commercial forest products companies and small scale agroforestry developers to participate in markets for carbon offsets. Previous policies have not provided support to these groups.

Simplicity of participation. The IFA is aware of a large number of landholders who are interested in planting trees on their properties to generate carbon credits. However the current rules are simply too complex, and preclude participation of all but large corporate entities or NGOs. The IFA suggests a simplified opt-in approach to participation in carbon markets, whereby credits are generated simply by registering the forest and submitting land title documents. The IFA considers that the NCAS model and associated remotely sensed imagery permits a 'light touch' approach to forest carbon accounting. Landholders opting into the simplified system could be awarded the same quantity of credits that the Australian Government would claim for that piece of land under its Kyoto (or its successor) reporting obligations. A landholder could meet the requirements of the system simply by maintaining the forest canopy. Those wishing to improve on the NCAS estimates should retain the option to do so under the current self-funded, independent third party verification approach.[20]

[20] The following references refer throughout this TOR - URS, 2008. Market Opportunities for Victoria's Forestry and Forest Products Sector from Emissions Trading. Final Report. Prepared for the Victorian Department of Primary Industries. May 2008. Available at: http://new.dpi.vic.gov.au/__data/assets/pdf_file/0005/45977/Market-Opps-for-forestry-from-ETS.pdf

Noble, I.; Apps, M.; Houghton, R.; Lashof, D.; Makundi, W.; Murdiyarso, D.; Murray, B.; Sombroek, W.; Valentini, R.; Amano, M.; Fearnside, P.M.; Frangi, J.; Frumhoff, P.; Goldberg, D.; Higuchi, N.; Janetos, A.; Kirschbaum, M.; Lasco, R.; Nabuurs, G.J.; Persson, R.; Schlesinger, W., et al. (2000) Chapter 2. Implications of Different Definitions and Generic Issues. Land use, Land-use

Recommendations

The IFA advocates the active inclusion of the forestry and timber sectors in all Government initiatives for climate change mitigation schemes, including energy initiatives.

Clean energy initiatives must appreciate the high standard of forestry regulation in Australia as an advantage and opportunity to include residues from native forestry operations in bioenergy initiatives.

The Australian forestry industry has the opportunity to grow local and export markets in wood residues for energy

Supporting Research and Development that integrates:

- Resource assessment
- Appropriate technology, and
- Fundamental economic assessment

will provide benefit to the forest and timber industry as well as contributing to clean energy initiatives and all other climate change mitigation initiatives.

The IFA believes that:

1. Implementation of forest carbon projects should promote sustainable forest management practices;
2. forest carbon offsets should be used to supplement, not replace, efforts to reduce GHGs from burning of fossil fuels, as well as investment in renewable energy sources;
3. efforts should be made to maximise the longevity of forest carbon sequestration and avoidance projects, while recognising the even temporary emission reductions are of significant value, as they allow time for investment and development in renewable energy sources and low-emission technologies; and
4. a positive contribution to the amelioration of global warming can be made by substituting the use of wood, where appropriate, for materials such as steel and concrete.

change and Forestry: A Special Report of the Intergovernmental Panel on Climate Change. R. Watson, I. Noble, B. Bolin, N. H. Ravindranath and D. Verardo. (eds). Cambridge University Press, Cambridge

Land use competition between the forestry and agriculture sectors

The IFA supports a free market as the best mechanism for determining land use. Landowners should be free to use and trade their land as they judge best unless there are compelling reasons for community intervention (Garnaut 2011).

Implications of competing land uses for the cost and availability of timber, food and fibre

Theoretically, in areas of high land values, long rotation forestry investments are less competitive with agricultural uses such as horticulture and dairying. While forestry enterprises might seek highly productive sites, carrying the cost of the land through until the end of the rotation (when most of the return on investment is realized) is a risk that often precludes such operations from high value land.

Over the last decade rapid expansion of hardwood pulpwood plantations driven by Managed Investment Schemes coincided with escalations of rural land prices. From 1999 to 2009 in the Albany, WA region the expansion of tree plantations and vineyards saw rural land prices rise up to 300%. Much of the competition for land was between plantation managers and graziers. Given the effect of high cost of land on the discounted rate of return, IFA suggests that the inflation of land values contributed to the demise of failed MIS's.

However, there can be significant synergies between the farming enterprise and growing trees on farms, through for example, by providing employment when other seasonal work is not available.

Farm forestry, which integrates plantation forestry or native forest management into farming enterprises, has the potential to create essential forestry resources as well as providing benefits to a grazing or agricultural enterprise.

As highlighted in TOR3 in the context of environmental benefits, water yields is affected by forestry operations. It is worth acknowledging that for the majority of Australia's agricultural land, forest cover has prevailed in previous times. Over time, the removal of trees for the purpose of agriculture has resulted in a number of land degradation examples that have adversely affected the performance of the desired agricultural pursuits. The use of agroforestry systems for rehabilitation and maintenance of sustainable agriculture is a positive outcome for these communities.

Regulations affecting forestry are often more specific and comprehensive than they are for farming. For example, forestry has accepted Codes of Practice and Certified Sustainable Forest Management and Environmental Management Systems as best practice.[21]

Opportunities for farm forestry

There is a need for much wider understanding of the potential of farm forestry to enhance farming enterprises and communities. Agriculture and forestry come under the same agency in the Commonwealth government and a number of States. However, there appears to be limited integration of the agencies' approaches to agriculture and forestry.

The development of farm forestry continues to be dependent upon education of land managers in the skills of forestry. Professional forestry education is being severely challenged at present with pressures on universities to deliver shorter undergraduate degrees than is required for comprehensive forestry training. The IFA believes it is essential that there be ongoing dedicated university based forestry education in the core skills of Australian forestry.

The Master Tree Growers programme has been successful training for farmers but limited in extent. Support of expansion and acceleration of the Master Tree Growing programme potentially in collaboration with Universities should be encouraged. In the absence of owner up-skilling, business models should include initial and ongoing maintenance advice from accredited forestry practitioners to ensure successful long term outcomes.

Farm forestry is likely to be successful when supported at both the local and regional levels with the appropriate technical and professional skills..

When reviewing land use planning legislation, local and state government instrumentalities must be cognisant of the long term investment commitment which is involved in forestry.

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[21] Global environmental forest policies an international comparison Constance L. McDermott, Benjamin Cashore, and Peter Kanowski. 2010. Gives an overview of the various Codes and legislation across the states and territories of Australia. The authors recognize there is variability in the quality of regulation, but it rates well with other developed economies.

Recommendations

1. Forestry should be deemed an acceptable land use in all areas, except those specifically identified in state or local government planning schemes as being incompatible with other land use activities.
2. Plantation development should seek to complement other land uses.
3. Farm forestry can provide a useful contribution in the production of wood products, carbon sequestration and biomass energy.
4. There are synergies between farm forestry and other agricultural pursuits in terms of providing off seasonal employment, shelter for stock and a financial return from those parts of the farm which are less suited to agriculture.
5. The professional training of foresters with an emphasis on farm forestry is an essential component in achieving the optimum relationship between agriculture and forestry.

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