

Questions for consideration

Vision and objectives

1. What should the vision be for the forest products sector in the coming decades?

The vision for the forest industry needs to be more than simply forest products, and should recognise the increasing importance of forest services (agistment, recreation, environmental services) that can help defray the cost of producing timber and other forest products (including honey, oils, etc). The remit to consider “coming decades” is a big challenge, because a decade is a long time in terms of technological and social change (e.g., only a decade from Sputnik to the Apollo Moon landing, and more recently, a decade from brick phone to iphone). Thus it is insufficient for the forest products sector to look internally when formulating a vision, and critical to consider broader societal changes. Several commentators have observed that autonomous vehicles and emerging robotics may make half our present workforce redundant, especially in transport and in repetitive manual tasks. Such a change in the workforce may lead to a shorter working week, more generous annual leave, and earlier retirement, all of which will change recreation patterns, possibly stimulating demand for forest-based recreation and for woodcraft timbers. As the health benefits (and potential for pharmaceutical savings) of forest-based exercise are recognised, green exercise (and forest bathing) may contribute to forest income and influence forest management. Increasing concern about carbon emissions will tend to favour wood for its environmental credentials, and will stimulate biofuel production. Concerns about the impacts of climate change are likely to stimulate renewed ‘landcare’ efforts to promote trees on farms, and to create connecting corridors for wildlife. Collectively these social changes will have a major effect on forest management, and hence on the forest industry and on forest products.

I envisage that the currently-common distinction between planted and natural forests, and between production and protection forests, will become much more fluid, as more and more of our forests are managed for multiple products and for multiple services. The rise of environmental service payments will make it more attractive to reforest, stimulating the creation and management of small private forests on non-arable lands within farming systems.

The vision for the forest products industry needs to embrace all these challenges and possibilities, and explicitly acknowledge the full spectrum of forests, from industrial monocultures to near-natural, from small-scale farm woodlots to extensive estates, and from timber production to multiple-use. The vision needs to reach beyond the wood industries canvassed in the issues paper, and to recognize that environmental services may become an essential financial and social component of all forest systems. Put simply, the vision must be to foster diverse forests, in diverse situations, for diverse goods and services, by diverse forest owners.

The three decades from “The Fight for the Forests” (1974) to the “Gunns 20” (2004) were not halcyon years for forestry, and in part, reflect problems of a production focus that neglected social licence. Our vision needs to encompass diversity, and must look beyond present-day wood products to a wider range of goods and services, and must look beyond our customers to the wider community of interest.

This is not simply a question of consulting with stakeholders, or of evangelising wood (e.g., PlanetArk’s ‘Make it Wood’), but also of commissioning the underlying research from independent providers. Many well-intentioned people hold misconceptions about the consequences of timber harvesting (and alternatives), and it seems strategic to offer better information to informed any debate.

2. What specific objectives should underpin this vision?

As an efficient producer of commodity products, the forest plantation industry warrants recognition as a legitimate and environmentally-friendly land use that should be supported by efficient legislation (simultaneously as free as possible and as strict as necessary). It is tempting to compare forest plantations with agricultural crops, but the long timeframe required for sawlogs suggests a right to harvest that is less necessary for annual crops, and the lack of an annual harvest (cf. horticultural tree nut crops) adds to the financial challenges. Thus the plantation sawlog industry warrants some legislative surety.

Australia also has vast areas of natural and 'semi-natural' forest (regrowth, uneven-aged, or mixed-species plantings) that warrant management, for fire if not for other objectives. Efficient fire management (both hazard reduction and wildfire suppression) requires skilled people familiar with the locality and adequate resources (equipment, funding, roads, etc), all of which are easier to provide when a forest derives an income stream from goods and services. In many forests, the potential revenue stream from wood production is insufficient (too small and erratic) to defray the cost of fire management, and forest managers need to consider other income streams including agistment, apiary sites, recreation and environmental services including carbon and biodiversity.

In the decades ahead, we can expect more concern about fossil carbon emissions, and forests offer a partial solution. Solar and wind energy will play a part in reducing fossil emissions, but the energy density of diesel and avgas means that the only viable substitute for aviation and heavy freight is biofuel, preferably derived from crop residues. Globally, the annual release and uptake of plant carbon is ten times the fossil emissions, so efficient conversion to biofuel of just ten percent of the existing plant harvest could potentially eliminate the need for fossil fuels. The potential of biomass-to-liquid conversion is so compelling that our vision for the future should embrace a specific biofuel objective.

With the decline of the MIS plantings, the future supply of plantation timber is jeopardised and it is appropriate to consider how to stimulate the future supply. Small plantings on private land represent an opportunity, because many landholders have underutilized non-arable land that could supplement existing wood supplies, particularly since much such land is highly productive and close to existing processing facilities. One objective should be to examine how such plantings can be stimulated and coordinated to contribute usefully to future wood supplies.

The quick payback accruing to wood processing research sometimes eclipses the benefits of research and development earlier in the value chain, but past successes in genetics and silviculture of *Pinus caribaea*, *P. elliottii* and *P. radiata* testify to the benefits of continuing research efforts across the whole value chain.

Specifically with regard to hardwood plantings, it would be desirable to:

- Provide an environment that promotes investment by demonstrating profitability and technical feasibility;
- Demonstrate systems that integrate agriculture and wood production to gain access to quality land;
- Prove that the value of forested land is comparable to that of pastoral land (and urban development);
- Develop schemes that compensate land holders for environmental services provided by farm forests;
- Build public confidence in forested land management and promote knowledge of the range of benefits.

Issue 1: Market trends and pressures

3. What forest products does Australia have a local and/or international competitive advantage in producing?

The global forest industry is highly competitive and it is difficult to demonstrate a clear comparative advantage to Australia. Australia leads with some non-wood forest products including honey and some speciality oils (e.g., methyl cinnamate from *Eucalyptus olida* as a flavour enhancer). Perhaps one of our greatest strengths is our ability to innovate and to adapt rapidly to new markets.

It may be that in the future, people will have more leisure time, and many may be interested in wildlife-based recreation (to see our unique marsupials and colourful birds). While it may be impossible to create an experience to surpass an African safari, our unique fauna may attract significant numbers of wealthy visitors to forests. Whilst income from such recreation services may not surpass the earnings from traditional forest products, revenue from recreation and biodiversity services may nonetheless form a useful financial supplement.

Opportunities exist, both domestically and internationally, for products that exploit the desirable mechanical properties of our hardwoods and their natural chemical-free durability. Very high value joinery timbers represent an additional opportunity that remains unexploited.

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4. What is the potential demand for forest products in the coming decades?

I am optimistic about future demand, because I anticipate a greater appreciation for carbon-friendly building products, for natural furnishing materials, and for the favourable weight-to-strength ratio of timber (important in earthquake-prone regions). In addition, demand for biofuel (biomass-to-liquid) is likely to increase, and environmental and food concerns are likely to drive demand for biofuels derived from wood residues. Collectively, a useful concept is of forested landscapes that provide both speciality and commodity products from forested parts of the land-use matrix, whilst maintaining a holistic view that embraces a wide range of income-generating environmental services.

In recent times, many forest owners and investors have been misled about the potential of carbon credits, and it is my view that carbon credits will have a diminishing value. However, there appears to be great long-term potential in biodiversity credits and in biofuels derived from biomass residues.

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5. How can Australia best position itself for this demand, both nationally and internationally?

Efficient use of resources requires security of supply, both of volumes and of characteristics, to support the development of efficient processing systems. This is largely a matter of legislation and social licence, and to a lesser extent, infrastructure.

The development of products for existing markets prepares the industry to capitalize on new opportunities and to stimulate new markets. Investment in new products should consider the whole value chain, and should take into account silviculture and product specifications (There are some lessons to be learned from New Zealand, where trees were widely-spaced in pursuit of high growth rates without realizing that such stems would fail strength tests).

6. What are the other drivers or disruptions that will potentially affect supply and/or demand?

We should anticipate that robotics will trigger a major perturbation in employment, but the impact will depend very much on how governments deal with this development. Increased leisure time may lead to a demand for specialist hobby materials, for home handyman renovations, and for recreational use of forests.

During the past few decades, there has been a major shift in all states from an integrated approach to forested lands (e.g., a single government agency with oversight of the entire spectrum from conservation to production) to a fragmented approach (e.g., outsourcing plantation management, separating responsibility for production and regulation), apparently to avoid a possible conflict of interest. It is a sad reflection on the state of forestry that the advertising industry continues to self-regulate, whilst forestry needs close independent scrutiny. It seems possible that concerns for better coordination of fire-fighting, and of off-reserve conservation, may lead to a re-examination of some of these roles. It seems prudent to gather data to allow an informed decision.

At present, there is some emphasis on sequestering carbon in the biosphere to mitigate climate change, but there will be a realization that biomass sequesters carbon for hundreds of years (give or take an order of magnitude), whereas undisturbed fossil carbon is sequestered for hundreds of *millions* of years (give or take an order of magnitude) – there is a rather important difference, with a major legacy for our grandchildren. The future will see a move away from fossil fuels and away from biosequestration towards biofuels.

Issue 2: Emerging uses and markets

7. Which emerging forest products have the greatest potential for Australia?

Biofuels made from forest and mill residues. Australia is heavily dependent on liquid fuels for mining, cropping and long-distance freight (as well as for aviation), and biomass-to-liquid pathways offer scope to provide an environmental and financially-viable alternative to fossil fuel.

Australia has many durable high-strength hardwoods that may find a niche in the global marketplace, particularly as alternative supplies become scarce. In particular, engineered composites of high strength hardwood elements have great potential.

8. What are some of the barriers to the development and/or uptake of these emerging forest products in Australia?

Perhaps the greatest barrier is lack of confidence, especially regarding resource security, which translates into a reluctance to take risks, to invest and to innovate. Contributing factors include uncertainty regarding resource availability, a lack of innovation in manufacturing, and stagnation of domestic knowledge and expertise.

9. What opportunities exist to better utilise wood resources?

Opportunities exist to stimulate innovation, increase skill levels, and to promote research and development into production, harvesting and manufacturing. One challenge is to find ways to utilise efficiently the relatively small regional resources of young hardwood.

Improved methods for characterising quality of softwood stands would inform trade, and assist the efficient development of genetics and silviculture.

Perhaps the greatest opportunity is not technological, but social, and can be leveraged by enhancing social licence through stronger community engagement and stimulating a better understanding of forestry, its impacts and benefits.

Issue 3: Forest resources

10. What is required to ensure the plantation estate is able to meet future demand for forest products?

Confidence in harvest security provisions is the key to an effective plantation estate. I am aware of a number of situations where, despite harvest security legislation, the species choice made by growers was influenced more by harvest security than by the potential growth rates and market possibilities.

Efficient production requires good soils with good rainfall, with sufficient scale, in close proximity to market, and collectively these are a challenge for Australia. The best approach to attain this is to foster trees on farms, so that more landholders grow trees on the non-arable (steep or rocky land; as stream buffers, windbreaks and visual screens that hide roads and other infrastructure) as part of their business plan. Such plantings may not be financially attractive at present, but a stewardship scheme that rewards the provision of environmental services could encourage widespread plantings with a wide range of environmental and wood supply benefits.

11. What is required to ensure the native forest estate is able to meet future demand for forest products?

The issue with native forests is primarily one of social licence. An emphasis on farm trees for dual environmental and production purposes should offer several benefits, including direct environmental benefits and an income from forest products and services, but should also eventually lead to a better understanding that production and conservation can co-exist. In the short term, this will create a new resource on private land, and in the longer term, may overcome community reluctance for native forest harvesting.

In Australia, wildfire is the wildcard that intercepts all other plans whether for conservation or production, so the first priority in land husbandry in Australia is to maintain the ability for efficient fire suppression, which in turn requires knowledgeable staff and efficient access. It is difficult to ensure fire suppression when the land use priority is “fence and forget”, and I envisage that our future will involve more “wildlife friendly forestry” to maintain the knowledge base, the road access and the income stream required for basic firefighting. While the concept of wildlife-friendly forestry may be challenging for some at present, it is a valid concept that can be demonstrated with research and demonstration.

12. What opportunities are there to increase wood supply from farm forestry, private native forestry and Indigenous owned and managed lands?

In the past, many farmers have been disillusioned by poor advice and by experience with plantings that were unsaleable once mature. Given recent experience of legislation and markets, few farmers are likely to make a major investment in timber plantations (or in better husbandry of native forests) without substantial support and encouragement. Extension officers have been effective in the past, and despite the current fashion to outsource this role to private enterprise, extension services may well offer an effective solution. An alternative to offer guidance similar to the WA Forest Products Commission's *Action Plan for Tree Farming* which denoted 'cells' that prioritized species and products for each cell, and to guarantee a market for these specified products and locations.

An alternative is to offer stewardship payments for forested land, and to structure payments to favour the dual production of timber and environmental services in a scheme similar to that outlined by the Southern Cross Group in 2006 (<http://jkv.50megs.com/SCG.pdf>). Modest annual payments for demonstrated environmental outcomes could revolutionize the way land holders regard trees and consider them in their farm planning.

Issue 4: Innovation, research and development

13. What are the future research and development needs for Australia's forest products sector, and which of these needs are specific to strengths and opportunities in the Australian context?

Our greatest need concerns forest stewardship and involves strengthening social licence. Incentives such as those advocated by the Southern Cross Group should be trialled and alternatives researched: all the evidence is that 'duty of care' has not delivered the outcomes that the community desires, and that we need to further incentivise land holders to improve their land stewardship (including environmental services). I envisage that such a scheme would deliver a range of environmental benefits including more forest, plus the opportunity to harvest timber from these forests.

Biofuels will become inevitable at some time in the future, and we need research to prepare for that eventuality. Several processes for biomass-to-liquid are well established, but most of this research has been done with northern European and north American species that have lower density and fewer extractives. Australia needs to stimulate the research that enables us to adapt northern hemisphere research to our own situation.

There is a revival overseas in wooden buildings – several countries are showing renewed interest in wooden buildings: for instance, New Zealand highlights the benefits of wooden construction for earthquake resilience and repair, Norway illustrates the opportunities for rapid construction of high-rise (the 14-storey Treet building), and elsewhere there is a growing awareness of the health benefits of wooden fittings. There is an opportunity for Australia to redefine its distinctive wooden housing with innovative materials and modern technology, and potentially to export relevant components to the world.

Greater concern for carbon emissions is inevitable, and in the fullness of time will lead to a carbon price (either emissions trading or carbon taxes), and it is important for the forest industry to understand the impacts, both challenging and beneficial. It is likely that a carbon price will favour timber, but it is important for future investment that the industry understands the aspects of the industry that will benefit and those that will be challenged.

14. What are the current inhibitors to private sector investment in research, development and extension and what role, if any, does the Australian Government potentially have in addressing these?

There is some evidence that Australian forest industries have been reluctant to invest in research; anecdotes suggest that their political influence enables them to leverage government investment. Australian forest research investment, especially in recent times, has been directed towards processing technology and timber promotion, because of the relative certainty and short payback times. This does appear to be inefficient: it seems reasonable that the industry should invest in processing technology because of the certainty and payback, and that government investment should focus on the longer-term, 'blue sky', environmental and silvicultural research.

15. How can the framework for coordinating Australian forestry research and development be strengthened?

In a buoyant environment, there may little need for formal R&D coordination because collegiate and professional networks in forestry serve this role. Unfortunately, this is not the current situation in the forestry sector where R&D is suffering, and efforts are needed to strengthen coordination and to minimize the loss of core skills. Some assistance to stimulate coordination and networking is particularly desirable at the present time.

For several decades, the Australian Standing Committee on Forestry supported a series of Research Working Groups (RWGs) that were effective and efficient in sharing information, mentoring early career researchers, and in coordinating research. In addition to their coordination and mentoring role, these RWGs left useful 'footprints' in the formal scientific literature (e.g., Regulation and usage of insecticides in Australian forestry, 1992, *Australian Forestry* 55: 48-64; Terminology for Forest Mensuration and Management in Australia, 1993, *Australian Forestry* 56:391-393; Harmonisation of methods for the assessment and reporting of forest health in Australia, 2003, *Australian Forestry* 66:233-246; plus many more). These RWGs were low-cost, relying on volunteers and peer support, but changes in the workplace has contributed to the demise of these networks. A modest investment to empower such networks, not necessarily in an identical format, could be an efficient investment.

More broadly, the International Union of Forest Research Organizations (IUFRO, <http://www.iufro.org/iufro/>) is the global peak body for forest research, now in its 123rd year, and its principal role is research coordination, communication and mentoring. IUFRO offers an efficient way to maintain and mentor forest research skills during our current nadir. I have personally benefited greatly from IUFRO, and have learned more of my specialist research knowledge via IUFRO than from formal University training. At various times in the past, Australia has been more active in IUFRO, but present activity is modest, despite the potential benefits, apparently because a lack of employer support for participation in workshops and conferences. Support for early-career forest researchers to engage with IUFRO could be an effective investment. [I should declare a conflict of interest: I am the Australian representative on IUFRO International Council, am Chair of the Congress Scientific Congress for the 25th International Congress in Brazil in 2019, and in that capacity, sit on the IUFRO Management Committee].

Issue 5: Consumer and community engagement

16. How can domestic and international consumers be better engaged on the environmental, economic and social credentials of Australian forest products?

There is no short-cut to community engagement, and some forces work against us (e.g., membership drives by some environmental groups), but in the long run the truth will win. Thus it is important to research the whole-of-life cycle aspects of forest harvesting, regenerating and the biodiversity implications, favourable or not. We also need the full story about environmental footprints (carbon, but also other aspects, such as pests and diseases that hitchhike on imports) of timber and alternatives. These analyses need to be published in refereed journals to gain credibility, but also followed up in popular outlets where they will reach the broader community (especially teachers).

17. How important are consumer awareness programs to the future prosperity of the sector?

Consumer awareness is critical, but awareness campaigns need to be done with care. Many consumers have become sceptical of marketing, so consumer awareness needs to be approached with respect and with credible facts.

18. Can forest certification be better leveraged to achieve stronger demand and better prices for Australian forest products and, if so, how?

All the evidence suggests that certification contributes to market share, but offers no price advantage. Whilst there is a small niche market for premium timber, much of the market concerns construction commodities where timber competes alongside substitutes, often on a price basis, so the scope to raise prices through certification is limited. Timber would enjoy an advantage in the presence of a carbon price either via emissions trading or a carbon tax, but neither seems unlikely under the present government.

Issue 6: Strengthened regional approaches

19. How could forestry hubs better utilise resources and promote greater efficiencies and innovation?

Integrated manufacturing situated close to raw materials remains one of the key characteristics of profitable industry, particularly with regard to energy and residue use, and the forest products industry is no exception. Streamlining of material movements, and to a lesser extent of the specifications of traded materials, contributes much of this success. There are sufficient examples of the benefits of integrated processing that the scope for up-stream and down-stream collaboration should be self-evident to industry.

20. What have been the barriers to the establishment and efficient operation of forestry hubs to date, and what might be the role of the Australian Government in addressing these?

Existing hubs have evolved in localities with substantial forest resources that have fostered the economies of scale needed for successful industrial processing. One legacy of the Softwood Agreement of the 1960s has been the concept of regional sufficiency, and the large number of small plantings scattered along the east coast of Australia. Had the architects of this scheme envisaged the economies of scale required in 40 years when these plantations matured, they would undoubtedly have located plantations more strategically. It is unclear what a government could then have done, or should now do, but it highlights one

the challenges of dealing with a long-term proposition such as plantation forestry for sawnwood production. I have already mentioned (at #12) the WA Action Plan, and it may be sufficient for a government to facilitate a debate that identifies potential locations for a resource and hub, and to guarantee support for the necessary infrastructure conditional on other players achieving the required resource.

21. If additional forestry hubs are to be established, where would they best be located?

The past decade of MIS exuberance tested many of the possibilities for forestry, in terms of land acquisition, tree growth rates, and access to markets, and the success and failure of these plantings should provide a good insight into some of the possibilities.

Issue 7: Infrastructure

22. What infrastructure will be required to respond to future demand for Australian forest products?

The challenge with most forest products is that they are thinly spread, and that the transport cost is relatively high, so that scale of operation is critical, and value adding needs to be done close to source. Small private plantings far too from processing facilities that are unsaleable attest to this need for scale and proximity to processing. In about 2002, the Forest Products Commission of WA published an *Action Plan for Tree Farming* that offered an elegant solution by denoting 'cells' that prioritized species and products, encouraging growers to contribute to scale. Such leadership that encourages a concentration of a uniform resource may eliminate the need for infrastructure, because sufficient resource attracts its own infrastructure.

23. What can be done to ensure better recognition and understanding of the sector's infrastructure needs?

Confidence, rather than physical infrastructure, appears to be one of the major handicaps in the forest sector. Any action to minimize sovereign risk to resource supply will be helpful.

Two challenges interact to confound infrastructure planning: considerable volumes are generally necessary, but the long lead time for tree plantations to mature means that initial volumes are often insufficient for financial viability. New infrastructure for annual crops may reach target volume in its second year, but the long lead time for trees means that development of a stable industry may take a decade. An alternative to large infrastructure is to focus on smaller, relocatable processing facilities, but experience with mallee in Western Australia indicates that considerable challenges remain. The solution may be to facilitate forward selling to build confidence in future markets,

Issue 8: Industry skills and training

24. What are the skills and training needs of the sector over the coming decades, and where are the current gaps?

The major gap at present is a shortage of trainees, both from within the industry seeking upskilling, and from new entrants seeking to become involved in the sector. This reflects a lack of confidence in the industry and poses a challenge for industry and government alike to restore and strengthen confidence.

25. Are Vocational Education and Training and university training providers well-positioned to meet the future skills and training needs of the sector?

Australia currently has adequate training capability in both the VET and tertiary sectors, but these are presently at risk because of modest student demand. In the longer term, this demand is likely to increase in response to the demand for biofuels and carbon farming, but in short term, Australia's skill base is at risk, despite an increasing international demand for our expertise.

26. What improvements are required at an enterprise level to support the recruitment, development and retention of the sector's current and future workforce?

My view (from outside the enterprise level) is that relatively few in the industry are willing to invest in innovation for the future, and that it may be desirable to create some modest short-term incentives to encourage investment and then to gradually wean industry to become responsible for its own future.
