



Facilitating Innovation in the Forest Sector

Remarks by David Brand, CEO of New Forests

CSIRO-IFA Workshop – Creating our future: Facilitating innovation in the forest sector
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Thanks to the Organisers, CSIRO, and the Institute of Foresters of Australia for the invitation to be here to speak to you today.

And also let me congratulate the Institute of Foresters on their 80th Anniversary, which is a reflection of the long and successful history of forestry in Australia.

Forestry has been through some tough times in Australia over the past few years. The rise and then collapse of the MIS sector, the global financial crisis, the struggle to remain competitive with a high Australian dollar, a volatile housing market, and the associated financial decline of many long term players in the industry has meant that the forestry sector has lacked energy.

Today, however, those tough times are largely behind us and we are nearly through a recapitalisation of the industry, the Australian dollar has moderated, and housing is at record levels. The industry is making money again and is able to reinvest and look to the future.

So that is a great base from which to discuss innovation.

I would like to talk today about what I see as some of the fundamentals of a successful innovation culture, some of the key innovation opportunities in the forestry sector, and what investment models might be most effective to increase the rate of innovation in Australia.

First in terms of what makes an innovative organisation, I would say that there are four or five key things.

The first is an orientation towards curiosity. People who enter into conversations or listen to presentations from a perspective of whether it fits their existing beliefs or frame of reference will systematically miss opportunities for innovation. When I meet someone I try to ask questions and think about where they are coming from and what they believe and why. That is the source of ideas, especially when you are talking to someone from a different discipline or background.

We recently were in a process to partner with an indigenous community who wanted to acquire several thousand hectares of their traditional lands, but needed an investment partner to acquire the forestry plantations on that land. We were up against another investment firm, and each of us had to have dinner with representatives from the community. We won the bid, and I believe we succeeded because we had spent most of the dinner asking them about how they are organised, how they manage their assets on behalf of the community, how they deliver education and healthcare benefits, etc, and trying to understand how we could build a partnership that encompassed their needs and aspirations. That new investment is likely to lead to us being able to expand to tens of thousands of hectares of new timber plantation investment.

A second aspect of an innovation culture is having a mix between what I would call an execution orientation and a 'how to do things better' orientation. I would say that most of us spend the bulk of our working week getting things done and attending regular meetings, reporting on progress and so on. It is easy to get captured in process and routine. But innovation is about regularly taking the time to step back and reflect on how we are doing things and whether there are ways to do things better.

For example, we have a process each year to review the assets that we manage. We ask our operations team to look at ways we could reduce costs, increase revenues or reduce risks. As a rule of thumb, if you save \$1 million per annum in costs or add \$1 million in revenue, you add \$10 million to the valuation of the asset if you have a 10% nominal discount rate. So you can make lists of small changes that potentially add millions to asset value with modest effort.

The third area to spur innovation is to take a long-term view, rather than a quarter-to-quarter view. As an investment manager we are focussed on ways to increase asset value, strengthen cash yield or reduce risk. As we look at the total risk-adjusted return, all three of these things are equally valuable. If, however, you are only focussed on short term cash yield you will inevitably ignore opportunities to invest in asset value or reduction in risk. This has been a big problem for the forestry sector, as many companies have been in financial difficulty, and have lived hand to mouth. That does not support innovation. We are fortunate today that over half of the Australian timber plantations are now owned by institutional investors, with little or no debt, and focussed on long term returns. That means we should be seeing a lot more investment in research and innovation.

The fourth area is around the joint benefits of workplace diversity and an external focus. Solutions to problems come from drawing on a wide range of perspectives. We can do that internally within our organisations by creating a diverse workforce. However, we can also augment our internal diversity with a range of external partnerships and relationships.

I think forestry has generally suffered from a lack of diversity. I remember going to a forestry conference in Melbourne a couple of years ago, and there was one woman in an audience of 100 people and not even one female speaker. So this is a challenge and an opportunity.

Our company is about 50:50 in gender balance. We also have people with a wide range of educational backgrounds and have skills across 11 languages. We encourage our staff to be engaged in external activities whether it is contributing to the board of an NGO, engaging in policy work, or touring overseas forestry operations. Our personal networks are often the source of ideas and innovation. That is especially important for forestry in Australia, because we are effectively only about 1.5% of the global timber industry and so we will likely import over 95% of our innovations.

Finally, one of the most significant changes happening in the world of forestry is the increasing participation of, and competition among, institutional investors. There are now 30 or 40 investment managers, REITs, TIMOs, and large direct investors around the world seeking to acquire and manage timber plantation assets on behalf of pension funds, super funds, insurance companies, foundations and endowments. That is a far cry from the old days where State Governments operated most forest plantation businesses, corporates relied on government timber, and there was very little exposure to the 'creative destruction' of the competitive marketplace. Even in the MIS era it seems like the primary emphasis was on selling tax deductions, and the quality of the forestry plantations was not the point of competition between firms.

Australia, alongside the USA and New Zealand, has significant institutional investor ownership—probably approaching 60%. That means companies like ours actively compete against several other investment managers and need to demonstrate the ability to systematically add value to the assets we acquire. We need to focus on the fundamentals, and as I noted earlier, continuously look for ways to be more efficient, more profitable, or more resilient than our competitors. To the institutional investors who provide the capital, performance is increasingly

transparent, and those who fail to actively add value or who end up in stakeholder or community battles will find it harder and harder to raise capital for future investments. That really focusses the business on performance.

I would like to turn now to some of the areas where I see opportunities for technological innovation.

I think that there are three broad areas of innovation with a promise for transforming the forestry sector. These are in plant biological sciences and genomics, information science including information systems as well as sensor technology and control systems and thirdly in materials sciences.

You might say these technologies will transform how we grow the trees, how we manage them, and what we use them for.

As an industry our primary goals are to be commercially successful, to be competitive with other plantation regions like Chile or Brazil, and to operate in a way that benefits the communities where we operate.

The principal areas of bio-sciences that are important to plantations relate to productivity enhancement and pest control. Genetic improvement is of course central to productivity and wood or fibre quality, but the pest control area is also important, especially in hardwood plantations. It has been suggested that one of the biggest factors affecting our competitiveness in eucalyptus plantation performance is a loss of up to 40% of net primary productivity to insect herbivory, fungi, and rusts. At the same time, there is increasing resistance to synthetic chemicals in the community.

As an example, I recently had a call with the CEO of a US start-up company that operates in the ag-tech space. They are one of a number of firms seeking to disrupt the conventional synthetic chemical pesticide industry. They have screened 25,000 naturally occurring bacteria and fungi for potential insect control or fungal control agents. They have patented their first product for use as a fungicide on ornamental trees. In our discussion they noted that they are now looking at the genetic variability within *Bacillus thuringensis*, which is a long-term agent for controlling spruce budworm infestations in Canada and which is approved for use on fruit trees in Australia. They were of the view that if we could develop genetic markers for particularly effective BT strains for problematic insect pests in our hardwood plantations, we could register a cocktail of BT strains that could be a broad spectrum bio-control agent as an alternative to alpha cypermethrin, which is currently only allowable under the FSC with an increasingly difficult to get derogation. Their view was that they could develop this at a cost in the 'single digit millions'.

At a more basic level, understanding soil nutrient dynamics, moisture retention, and other eco-physiological factors can also drive productivity. Ultimately improvements in silviculture, genetics and pest control are more than additive when combined together. When we look at analogous systems, like the Iowa corn crop, or the loblolly pine plantations in the US South it appears reasonable to expect about 1.5% per annum of productivity enhancement over long periods of time—even 50 years or more. That means that every 15 year rotation of eucalypts should be 25% more productive than the previous rotation, and every 30 year rotation of pine should be over 50% more productive than its predecessor, all other things being equal.

With regard to information sciences, the goal is to increase information to reduce costs, better target capital allocation, or produce more value. Examples of this would be using LIDAR to reduce inventory costs, using aerial drones to continuously monitor for insect infestations, or using harvest sensors to detect wood properties at the time of harvest.

As another example, two logs of the same size may have different wood properties. One might make structural grades of lumber worth \$500-600 per cubic metre, and the other just make utility grade lumber worth \$250 per cubic metre. We currently sell those two logs to the sawmill

at the same price. If we had a capacity to sort by wood quality, the mill could pay significantly more for the timber while making a higher profit.

Finally the area of materials science is also evolving quickly. We are all familiar with the growing role of Cross Laminated Timber and other multi-story building systems, but there are also a range of developments in bio-fibres, biochemistry, energy, and composite materials. If we see real progress on the bio-economy, then that will be transformative to the forestry sector, and we will need to rethink our ability to grow and produce biomass as a commodity.

In our recent Timberland Investment Outlook we considered what would be a realistic increase in global plantation production by 2050, and we estimated that we could keep up with traditional timber demand growth, by expanding total plantation production by 1.5 to 2.5% per annum. However, if we saw a shift to substitute wood for concrete and steel, or biomass for fossil fuels and fossil energy, or bio-chemicals for petrochemicals, there would need to be completely new systems introduced like high-yield plantations or even species like bamboo with two or three year harvest cycles at 100 tonnes per hectare per annum productivity.

It is interesting to speculate on the various technologies that may emerge, but no one can really predict the future. So the key area to consider is what the framework to support innovation should be.

I would argue that the past approach to innovation doesn't really reflect the current nature of the industry. Governments are a declining participant in the forestry sector, and the remaining State Governments holding forestry plantations have all signalled an interest in exiting from those assets. With recent difficulties faced by the forestry sector and the inability of the industry to contribute to research, it is not unexpected that the Federal and State Governments have significantly reduced investment in forestry research as well.

If private investors now hold most of the forestry assets, they need to also lead the innovation process. Forestry investors now hold \$5 or \$6 billion of timber plantation assets in Australia, and it should be very apparent that investments in productivity enhancements, adoption of new technologies, and support for research have positive payback.

Governments have a role to support this private sector investment, either via direct funding of basic research, industry innovation grants, co-funding mechanisms, or research tax credits. Government support can be argued as supporting Australian competitiveness in areas like agriculture, forestry, fisheries, or renewable energy that provide substantial benefits to the rural economy. But if the industry is not prepared to invest, why should the Government?

There has been a lot of discussion lately about venture capital funds and the need to spur innovation in Australia by the Turnbull government. There is a rising agri-tech VC community in the USA and other parts of the world. I recently met with the sponsor of one of these agri-tech funds, and the start-up companies were largely emerging from Universities and often jointly funded by agribusiness, venture capital firms, and even organisations like the Gates Foundation. New Forests has even toyed with the idea of setting up a forestry tech fund that could finance breakthrough technologies in plantation forestry, using our assets as an incubator or source of feedstock. There have been past proposals for government co-investment in those types of funds.

Finally, one of our challenges to innovation is the fragmentation of plantation ownership across multiple investment managers and then the further fragmentation of property management into a number of investor-owned subsidiaries and private firms. Where we need multi-million dollar investments it is often hard for all these businesses that are competing with each other to come together and drive a common agenda. We also have an array of tree breeding cooperatives, seed orchards, and genetic technologies that compete with each other or compartmentalise genetic material. We have the FWPA, which is a small fund to start with and only invests about 36% of its funding in research, including both forestry and wood processing. I would estimate that the total spend on R&D in the forestry sector is less than \$10 million per annum.

The plantation estate of Australia is worth about \$8 billion. So we invest about one-eighth of one percent of asset value on research. I would suggest we need to get to about 1%, or \$80 million, per annum. The current FRA proposal would add another \$3 or 4 million to research funding, which is a start, but not really enough to turn the dial. The AFPA proposal, seeking a \$40 commitment over four or five years from the Federal Government to forest sector research, should be a target with a minimum of a matching contribution from industry.

In any event, innovation is not just about funding, but about mindset, and that is the primary challenge.

As I said at the outset, the recapitalised forestry sector in Australia has emerged from tough times and has had a huge rebuilding job including capex investment, addressing a backlog of silviculture, and re-building the contractor base. For our business alone, investments have probably been over \$50 million in capex and silviculture works to date just to get our forestry and processing investments back on their feet.

At the core of the forestry sector we have talented, experienced people with a lot of enthusiasm, including all of you here today.

The next step is to build a competitive and profitable industry for the future, and innovation is central to that process.

Thank you.

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