Environmental issues in the pulp and paper sector – implications for New Zealand

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As we move towards the close of the twentieth century, how can we best manage our natural resources, both renewable and non-renewable? What benefits should a pulp and paper company pursue on behalf of its stakeholders? What objectives should we set for ourselves? Above all else, how can we in the pulp and paper industry work with other forest and forest product sector industries to achieve long-term sustainability?

The pulp and paper business

Before outlining some of the major environmental and resource management issues we face, let me briefly give you a picture of the dynamic world of pulp and paper, and the challenges we face in our markets. In the end, the value we can extract from our pulp and paper markets is reflected in the overall value created in the forest products sector for New Zealand.

At Tasman we manufacture 200,000 tonnes of wood pulp for the market annually, the majority of which is exported or for our own use in papermaking. The annual Tasman newsprint production rate is 400,000 tonnes.

No one needs reminding that we are in the ‘information age’. Information is only useful if it can be communicated, on screen or on paper, and Tasman is in the communication papers business. Our markets are strongly linked to business cycles; despite the predictions of some that the end of paper-based communication is in sight, I am convinced that paper will play a central role in the way we communicate over the next few decades. What is much less certain is exactly what this role will be, and thus the type of paper that will be in demand and what we will need to produce.

Anticipating the types and quantities of paper product that will be in demand over the next decade is one of the major challenges for our industry. We do know that there will be less value in our current basic newsprint product. What will be in demand, and hence of greater value? A few general directions are fairly certain.

The types of paper used for mass communication will continue to move up the paper quality spectrum. To sell, communication paper products will need to be brighter and more printable than they are now, in part a result of printers responding to advertisers’ demands for more colour as they compete with alternative media. Most certainly, we will have to produce an increasingly diverse array of products if we are to stay in business.

These business challenges of the pulp and paper industry are reflected in some of the forestry, fibre and environment issues we face in the near future.

Recent environmental issues for pulp and paper

The pulp and paper industry has been at the cutting edge of environmental issues management over the last decade. There have been a number of major drivers for improvement over this time. Let me review these issues and our progress before we look into the future. The three most prominent environmental issues for us have been:

- the management of forest resources,
- discharges from pulp and paper mills, and
- the recycling or disposal of used paper waste.

The issue of management of forest resources is the main theme of the Greening the NZ Forest Industry conference. We have all heard of the fundamental broadening of the way the industry views its operations, and the emerging consensus that forest resources must be managed for long-term sustainability, even if the concept of sustainable forest management, and what it means, is still being worked on. The complexity of the issue of sustainability is reflected in the current debate on forest certification. I will go into more details on this issue shortly but, in looking at recent past developments, I draw your attention to two aspects of recent forest environmental issues directly relevant to the pulp and paper industry.

A fundamental long-term competitive advantage for the New Zealand pulp and paper industry is that our harvested forest resource is plantation-based. No New Zealand made pulp and paper comes from native forests. Most of the public seem unaware of this fact. We can be cynical about press ignorance or duplicity, but in the end this lack of public awareness is our fault. We should ensure the facts of our plantation-based industry are more widely communicated. This is a long-term competitive advantage, and we have also made a big step towards sustainable management of our forest resources.

Our New Zealand news media regularly report debates on native forest use from overseas, particularly Australia, Canada and the US. Almost always they fail to note that this is not an issue in New Zealand, happily letting the reader/viewer assume that, if it’s an issue overseas then it must be an issue here (as they say, why let facts get in the way of a good story).

The second point of our forest management is that I think we should highlight the efficiency of our resource utilisation in the industry. The pulp and paper industry has a critical role in ensuring maximum value is created from our forest resources. A fundamental tenet of sustainable management is that harvested value of the resource must be maximised. A higher value resource creates more options for sustainable management. The enhanced forest value achieved through pulp and paper production is a significant forest value contribution, expanding the scope of our options.

New Zealand maximises the use of its forest products. Thinnings from the forest, top logs which are not good for lumber, and the waste from sawmills are all converted into products of value. Building products, packaging materials, wood pulp and paper all rely on these ‘so-called’ residuals from lumber production. Too often, people are not aware of this industry symbiosis which maximises our resource use efficiency.

Moving on to the second main issue of discharges from pulp and paper production, for a while this debate was at the forefront of environmental issues worldwide. New Zealand was no exception.

As scientific investigations uncovered the environmental impact of some of the dioxin compounds, generated in minute quantities from the use of elemental chlorine as a pulp bleaching agent, action was called for. And the industry did act. In one of the biggest industry-wide, environmen-
Establishing a plantation eucalypt resource

Tasman Forest Industries Limited (TFIL), a subsidiary of Tasman Pulp and Paper Limited, (TPPL) was formed to establish a plantation eucalypt resource for the company. The objective is to make Tasman Pulp and Paper self-sufficient in short fibre pulp, increase pulp mill productivity and secure new business in short fibre markets.

Since its plantation programme started in 1994, Tasman Forest Industries staff have established over 3000 hectares of eucalypt plantations in the Central North Island region and intend adding to this at the rate of 2000 hectares per year. The eventual planned estate is more than 20,000 hectares.

Some of the plantings have been on company-owned lands, and the balance has been established under forestry right agreements with local landowners.

The company is keen to extend plantings under forestry right agreements and would welcome enquiries from land owners who may be considering income diversification through the growing of trees. Eucalypt plantations located close to Kawerau pulp mill could appeal to potential investors with returns after 12 years, compared to 25-28 years for P. radiata crops.

TFIL staff are pursuing an aggressive genetic improvement programme, with the aims of boosting volume growth and fibre quality. In addition to a high standard of land management practice, the company is resolute in creating renewable and sustainable plantation resources.
tally-driven capital investment programmes ever undertaken, the pulp and paper industry has reduced such discharges 90%, and is steadily eliminating elemental chlorine from its bleaching operations.

By 1997 most of the world’s pulp production will be bleached using elemental-chlorine-free (ECF) techniques. This ECF technology is considered by the US EPA to be the ‘best available technology economically achievable’. Some mills in Europe and a few in the US and Canada, have the capability to produce TCF pulp (totally chlorine free). Despite this capability, not that many currently produce TCF pulp because it costs more to produce, pulp yields are lower and of poorer quality (and hence forest resources not so well used), and no environmental benefit has been observed (compared with ECF). These factors have led to the market for TCF pulp being comparatively static over recent time.

Here again, reviewing this debate in New Zealand, we have experienced a ‘received issue’ on this from overseas, often conducted in the absence of facts about the local pulp and paper industry. At Tasman we are proud that our discharges of dioxins have been extremely low by world standards. Due to the steady introduction of alternative bleaching techniques, our discharges have been below the level of detectability for some years.

We are currently planning for introduction of ECF bleaching technology in 1997.

Again referring to our experience at Tasman, the other main issues relate to the discharges of colour to the Tarawera River, the odour from the mill, and the discharges of particulates to air. On all fronts, through capital investment programmes and improved operational procedures, we have been continually improving our environmental performance. The colour of our discharges continues to decrease, as does the odour from the mill, and we have seen an almost-total elimination of particulate discharges.

We have also been moving proactively to better understand the effects of our operations. Over the last year, with the help of independent researchers, we have established a mesocosm study to detect and monitor any low-level effects of our discharges on aquatic life and, in a separate study, computer simulations of local meteorological conditions are helping us better understand the transport and diffusion of odours from the mill.

Our record on the third of these recent environmental issues, recycling, is one we as an industry can be most proud of. Worldwide, the pulp and paper industry has one of the highest recycling rates of any industry. In the Australasian region rates are typically 50%, in the US the current 40% recycle rate is expected to reach 50% by the year 2000, and in Europe rates in excess of 60% are now being achieved and are fast approaching estimated maximum achievable rates of about 70%. The drivers for this recycling success were twofold: increased pressure on urban landfills to which much used paper was dumped, and the industries’ growing expertise in reusing fibre from the ‘urban forest’. Utilisation of recycled fibre has become as important to the industry as use of virgin fibre direct from the forests.

As an aside, I note that the long, strong fibres that are typically produced from New Zealand forests of radiata pine are particularly suited to reuse, and survive the recycling process well.

Environmental issues for pulp and paper over the next decade

I’d now like to look forward and review what we see as the environment-related issues the New Zealand Pulp and Paper industry will be facing over the next decade.

Areas of high priority for us will be:

- Developing sustainable forestry management practices
- Continuing to improve our environmental performance
- Making more efficient use of energy
- Recycling
- Regulatory impacts on international competitiveness.

Taking these in turn, let me identify some of the issues and opportunities we see.

Sustainable forestry

I would like to highlight one particular aspect of sustainable forestry driven by the anticipated demands for increasing paper diversity. Increasing paper product diversity means a demand for an increased diversity of fibre characteristics that paper makers use. A diverse fibre supply is not something we currently have in New Zealand. Our extensive expertise and investment in radiata pine has served us well, and Tasman remains committed to this as our base fibre source over the next decades. However, this collective focus on radiata may have distracted us from some additional, smaller-scale but diverse fibre-growing opportunities.

Tasman has recently commenced development of eucalypt plantations to diversify its sources of fibre. We are also experimenting with other fibre sources of opportunity. Over the next decade I anticipate that we will see a small-scale but steady diversification in the plantation species of New Zealand, in part as a result of the needs of the pulp and paper industry. Radiata will no doubt continue to be the dominant plantation species here, but by the middle of the next decade we should see increasing diversity of forest plantations. Increased diversity is one key aspect of a sustainable forest industry, although management and harvesting economics are likely to continue to encourage monoculture within individual plantations.

The issue of forest environmental certification is currently ‘hot’. Through the ISO Technical Committee process, Canada and Australia have proposed application of the ISO 14001 (environmental management) standard to the forestry sector. The Nordic Forest Certification Project sponsored by industry groups has just recently recommended that the forest industries in Finland, Norway, and Sweden commit to a certification process, presumably along the lines of the proposal to the ISO Committee.

I understand New Zealand forestry groups still have some reservations about certification. It would be unwise to enter any certification regime until the implications for New Zealand industry are fully assessed, but some form of forest environmental certification seems inevitable in the end.

From our perspective, forest certification demands can eventually be anticipated to arise through risk management assurances to investors and company managers, consumer/market driven demands, regulator pressure, and the emerging ‘life cycle analysis’ approach to environmental issues. Whatever the reason, in the end we need to have some agreed guidelines on what constitutes sustainable forestry, and the certification process may be an effective way to achieve this.

I might also briefly mention one aspect of sustainability often ignored. That is, we must maintain sustainable levels of industry profitability if we are ever to be able to achieve an overall level of sustainability. Sustainable forest management inextricably links the environment to a healthy profitable forest industry.

Environmental management and performance

Approaches to environmental management are maturing worldwide. Government-led, command and control environmental management is steadily being replaced by more flexible, self-regulated, but much broader management regimes. Corporate and personal accountability has increased greatly. Management of environmental risks through processes of demonstrable due diligence is becoming the standard approach in industry. The ISO 14000 Interim Standard on Environmental Management Systems was
recently issued in New Zealand and Australia. This standard effectively sets the benchmark good practice in environmental management. Anticipating this release, last year Tasman commenced development of its own Environmental Management System, modelled on the emerging 14000 series.

Partly as a result of environmental management systems being implemented, over the next few years the pulp and paper industry will further build on its improving environmental performance. Emerging new technologies will also contribute to the industry’s environmental performance improvement.

The holy grail for the industry is clearly achieving closed-cycle operations (this term generally encompasses all water-related issues). At present, technology is not up to the task. However emerging capabilities on the technology horizon show some promise. Like the holy grail, we may not get there over the next few decades, but much will be achieved along the way.

Here in New Zealand the first significant steps towards this goal are being taken. At Tasman one of our key environmental objectives is to continue to reduce our water use, along with reduction in the level of colour and BOD (biochemical oxygen demand) we discharge after treatment to the Tarawera River. We have been able to reduce our water throughput by 25% over the last two years, and hope for similar gains in the next few. Reducing water use is an essential step in waste minimisation.

The pulp and paper industry in New Zealand have also combined to fund research into the characterisation of inorganic loads present within the circulating kraft pulp-mill water; a two-year investigation programme was commenced last year at PAPRO.

A knowledge of these loads is an essential step to understanding what we will need to be doing as water systems are tightened. Within a decade, I’m sure we will have made significant progress toward the goal of closed-cycle operations.

The diversity of opportunity in ways to improve environmental performance continues to expand, and goes well beyond the conventional end-of-pipe treatment approach commonly adopted some years ago. Two areas of development will be the more extensive use of process-specific ‘kidney’ treatment plants in mills, and the increasing role that biotechnology will play in our industry at every level.

Biotechnology has the potential to revolutionise our business. Genetic engineering of low-lignin trees could significantly reduce chemical pulping costs and effluent treatment loads. Biopulping organisms could see much of the pulping process undertaken at little or no chemical or energy cost, with chemical pulping simply being used for a final ‘polish’. At Tasman we already use enzymes in our bleaching processes to reduce our chemical costs and effluent discharges, and elsewhere enzymes are playing an increasing role in achieving more effective recycling. Also on the horizon is the possibility of ‘designing’ fibre to suit its end use, leading to even more effective forest resource utilisation.

Energy efficiency
Typical of much of the pulp and paper industry, burning biofuels supplies 40% of Tasman’s total energy requirements. Purchased energy in the form of electricity, geothermal steam, natural gas and fuel oil makes up the balance of our requirements at a total cost of about $60 million per annum.

Such a high annual cost strongly motivates Tasman to utilise energy efficiently so as to minimise the cost of purchased energy. Our co-generation plant supplies about 20% of the mill’s electricity needs, and the best available technology (including heat recovery systems, high efficiency motors, variable speed drives, high efficiency lighting) is utilised wherever practicable. Because energy efficiency is largely determined by installed plant, the selection and design of all new and replacement equipment is subject to an energy efficiency policy and checklist.

Recycling
As I mentioned previously, the area of recycling is one in which the pulp and paper industry already leads the world. Rates of recycling are currently very high and are likely to continue to increase up to maximum achievable levels. The processes of paper and cardboard recovery have become much more efficient over the last decade. Consumers have become much more conscious of the need to recycle, leading to much greater recovery rates. And, very importantly, the technologies of recycled fibre separation, de-inking and sorting have improved markedly over the last few years so that much higher-value products can be manufactured from recycled fibre.

Many of you will be aware that, early last year, Tasman received Board approval to build a recycled fibre plant at Kawerau. This project has since been put on indefinite hold, largely, and ironically, because of the very success that the pulp and paper industry has had with the development of its recycling technologies, and the consequent development of markets for recycled paper-based products. The availability and price of old newspapers increased dramatically last year, making the venture at Kawerau uneconomic.

Regulatory impacts on international competitiveness
For an export-oriented industry like ours, international competitiveness is one of the most critical issues. We need to ensure that our Government is thoroughly and directly briefed by industry on the implications of its international commitments in the environmental area.

For example, the current attempt to translate New Zealand’s ‘issue-leading’ international position on climate change into an effective set of national policies is fraught with difficulties. There exists the potential to create national economic distortions which penalise our export industries, while doing nothing to reduce emissions of greenhouse gases. Also, the Government’s international position on plantation forestry offsets for CO2 emissions is laudable, but it is very difficult to translate into any fiscal arrangement for national management purposes.

Possible carbon-taxes in New Zealand, currently being considered, are being described as a low-level ‘signalling device’ to consumers moving away from fossil fuel use. At the same time carbon-tax advocates acknowledge that they do not expect to change consumption patterns because of the low level of carbon tax for individuals, and the inelasticity of their fossil fuel demand. What they generally choose to ignore is the large costs that a carbon tax could impose on some of our major industries, again for little environmental benefit accruing. Would it be too cynical to suggest that some Governments see carbon taxes as little more than a good excuse to raise revenue?

We have also seen mention of the possibility of ‘tradeable permits’ being introduced in New Zealand. This approach to emission reduction can have economic and environmental benefits, but for success it critically depends on the existence of a true market for the emission permits. The small size of the New Zealand economy means that this prerequisite market to achieve effective permit trading is never likely to exist here.

Along with other industries, Tasman is committed to reducing net emissions of greenhouse gases. We have been actively participating in an industry/government dialogue on the implementation of ‘voluntary agreements’ to reduce emissions. To date, this approach has been very effective. With goodwill and common purpose it is likely to achieve equal or better the emission reduction compared with what we could expect to achieve through the application of economic instruments.
Meeting voluntary agreements will still add costs to our industries, but the timing and manner of emission reduction can be done in ways that industry finds most effective to control costs.

Value in the pulp and paper industry

Given this audience of foresters discussing environmental issues, I’d like to make a final observation on value creation. At core, all environmental issues are about differing priorities and values and, taking account of these, how we might maximise benefit from resource use in a sustainable way.

The concept of ‘value’ is integral to this type of assessment, and it is important to recognise where value is created in the ‘value chain’, and at what rate. This knowledge is important input to the processes we use in managing our financial, physical and natural resources.

The sale of high value ($/tonne) lumber and round logs creates high value for New Zealand, but that value comes through the growth of trees over decades. Conversion of residual forest wood to pulp and paper products adds similar levels of value over a matter of hours, substantially adding to the overall value of our forest resource.

That is, the rate of value-adding contribution from the pulp and paper industry is the highest within the forests and forest products sector. This rate of value creation can only be achieved through major capital investment by the pulp and paper industry.

This capital intensity makes our industry very cost sensitive and financially vulnerable to factors such as the cost of resources, processing and technology efficiencies, and the country’s overall international competitiveness. Our overall approach to environmental management impacts all these factors affecting our business success. This only strengthens our industry’s long-term interest in the way we, as a community, choose to manage our natural resources and, within our industry, reinforces our commitment to continuous environmental performance improvement.

Conclusion

The pulp and paper industry is one of New Zealand’s major industries. Almost all New Zealanders benefit directly or indirectly from its presence. We all have a vested interest in achieving a sustainable forest industry. Our children should benefit from our actions as we have benefited from the foresight shown by our forebears.

The New Zealand Resource Management Act provides an appropriate regulatory framework to develop a sustainable forests and forest products sector. The Act is founded on the premise that the best way to manage natural and physical resources is for resource users and the community to agree on the terms of resource use.

We hope that communities and interest groups will constructively contribute to the terms upon which forest resources are developed and used. It is very much in our interests to ensure they understand the benefits of having a profitable, sustainable forest and forest products sector in the New Zealand economy. The industry should continue to make every effort to maintain an open dialogue and ensure we all work from a common understanding of the issues for New Zealand.

Given our success in responding to the issues of the last decade, and our record of continuing environmental performance improvement, I am confident that the New Zealand pulp and paper industry can contribute to the development of a truly sustainable forest industry.

The New Zealand Government’s response to international environmental issues

Don Wijewardana*

Background

Not so long ago forestry environmental issues were seen as somewhat distant and largely confined to tropical countries. That view has changed since the UN Conference on Environment and Development (UNCED) in 1992. Environmental issues have become an integral part of forest management and trade at an international level. A number of factors are responsible for this transformation:

- Two years of hard negotiations leading up to the UNCED Earth Summit, involving almost all developed and developing countries, which produced a generally acceptable and comprehensive package covering all major environmental issues.
- Endorsement of the UNCED outcomes by the vast majority of countries. The enthusiasm and commitment to the new deal was evident by the largest ever gathering of Heads of State at the Earth Summit in Rio.
- The recognition that environment and development are not separate but two sides of the same issue, which led to a readiness to accept the need for sustainable management of resources.

The Commission on Sustainable Development (CSD) was established as a follow-up mechanism to UNCED. Its mandate covered overseeing the progress on all fronts, not only forestry issues. However, the 500 page UNCED Outcome document (parts of which are compulsory reading for all foresters) could have gathered dust in book shelves a little longer if for a number of developments:

- the efforts of bodies such as the International Tropical Timber Organisation (ITTO) which were already working with countries to implement measures for sustainable management of forests;
- the feeling of frustration that two years after the UNCED no significant progress had been made in promoting sustainable management or even reducing the rate of deforestation;
- the concern created among major forestry export countries by the actions of some European nations, notably Austria, legislating for an eco-labelling scheme on tropical timber entering their markets.

These factors, along with a genuine desire by countries to live up to the expectations of UNCED, led, early last year, to the establishment of the International Panel on Forestry (IPF). It focused entirely on forestry with a short deadline to report back on a whole range of forestry issues.

The Austrian legislation was ill-conceived: pressure from tropical timber