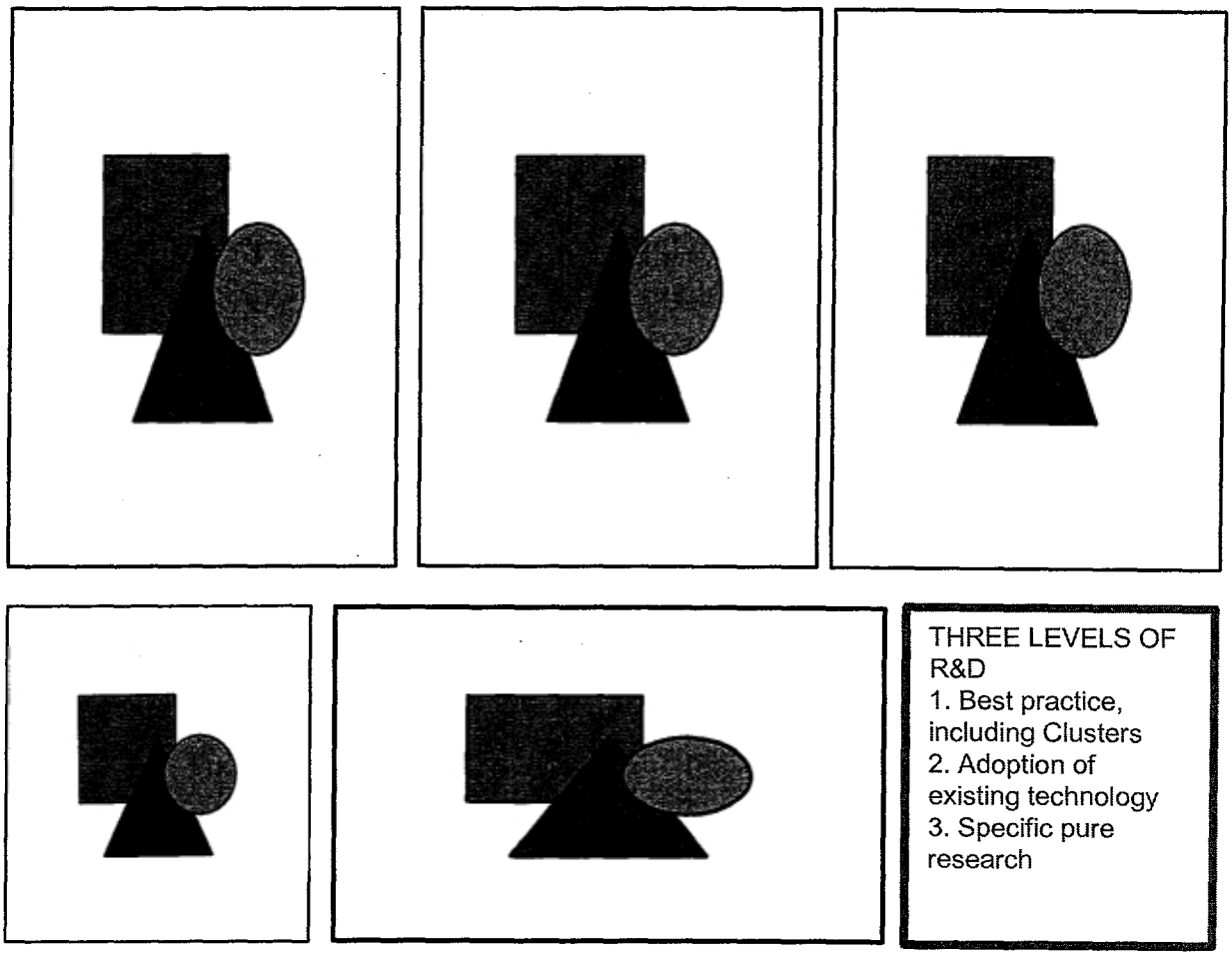
Inquiry into Business Commitment to Research & Development



Submission by

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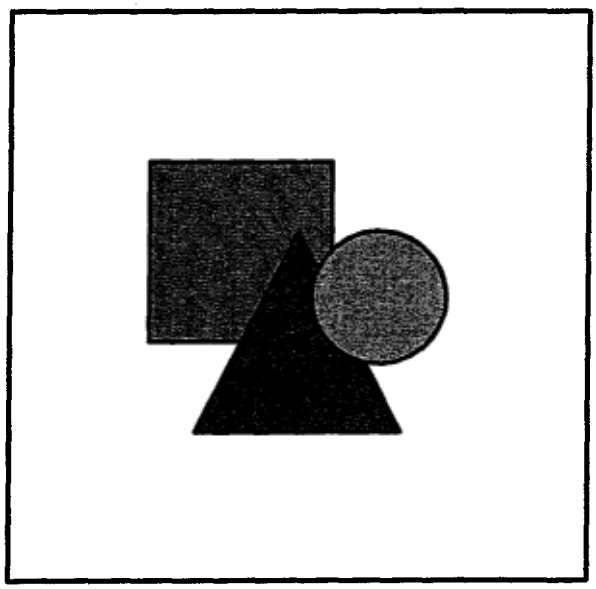


September 2002

SUBMISSION TO THE INQUIRY INTO

BUSINESS COMMITMENT TO RESEARCH AND DEVELOPMENT

BY THE

NSW FOREST PRODUCTS ASSOCIATION

INTRODUCTION

This is a submission about forest industries. In preparing this paper, we needed to see how research and development impacted on forestry. We needed to understand the type of R&D that is wanted by participants in the industry. Our experience was driven by the changes that have affected the forestry industry over the past years where forestry operations throughout Australia have been, and are still being, subject to restructure. In fact, the threats posed by restructure have become the opportunities for forestry to adopt R&D processes at three levels - adoption of best practice, use of new and emerging technology and specific solution-based R&D for specific purposes.

Those companies and organisations that have failed to understand how dissatisfaction levels produced by 'threat' can be the catalyst for change have probably fallen by the wayside or been given business exit assistance. Those who have seen that greater collaboration with like businesses while continuing to be competitive in the marketplace have engaged in the spirit of 'co-opetition'. Their future is more assured through the steps they have and will take, including the three levels of R&D mentioned above.

- **What would be the economic benefit for Australia from a greater private sector investment in R&D**

There are considerable economic benefits for Australia from a greater private sector investment in R&D/Innovation, but only through a change in the culture of how R&D/Innovation are approached. The forest industry has a long way to go to catch up with the forest industries of some other countries, and with this Inquiry, the timing is right for changes in thinking about R&D across the spectrum of all Australian industries.

Better education - focused on gaining skills that will be more appropriate in an increasingly competitive world. In forestry, the challenge is to 'sell' the industry as a worthwhile, long term, rewarding career. Better skilled school-leavers going into higher value jobs provide an economic benefit. How much market development R&D has been expended by Australia, and by the private forestry sector, on this topic. One example is *The Workboot Series: TIMBER*, supported by the NSW Forest Products Association and Blundstone Footwear, and produced by the Kondinin agricultural information group of WA. Do teachers use it? What effect does it have?

> **"Learn to Earn",**
> (1)Sue Remton, Chief Executive of the Consultancy, Mirasons, BRW May 1999

Research and development is the key to providing Australia with a competitive advantage. The NSW Forest Products Association is working with local communities to improve local economies and give local industries an edge in exports. Strategies are in place to apply R&D actions locally to act globally.

> *Paradoxically the enduring* ***competitive advantage*** *in a global* ***economy lies increasingly in local changes*** *– knowledge relationships,* ***and motivation that distant rivals cannot match.***
>
> (2) Clusters and the New Economics of Competition, Michael Porter Harvard Business Review

The transfer of knowledge is a part of a strategy propounded by the Institute of Chartered Accountants in Australia in conjunction with the NSW Shires Association. As a general rule, the sooner Australian industries catch up with continuing improvements in knowledge industry best practice, the better. Industries that fail to catch up are doomed.

How do we apply this to fully benefit from knowledge-industry? Probably little, but the solution is not difficult. It can be most easily applied by the transformation of industry 'clumps' into 'clusters', a process that requires knowledge transfer and innovation within a process leading to institutionalisation.

> *Strategy has never been more important. We are in the transition from the industrial economy to the* ***knowledge*** *based economy.*
>
> (3) US Theorist David Norton, BRW May 1999
>
> *Norton says companies looking to 'globalise' by disaggregating their operations and concentrating only by being the best in the world in a narrow area need a new way of measuring business.*

Enlightened organisations and individuals have identified branding as an essential ingredient of market development. In some instances, where a multiplicity of brands occur, co-branding is necessary - for example, the NSW and Queensland white and black cypress industry has identified 'cypress' as a co-brand. Individual companies - Logan Cypress, Gulargambone Cypress, Ramien's Timber, etc, have the opportunity to use their own brand in tandem with this generic brand.

Greater support is given to the concepts of co-branding and regional branding in some other countries than in Australia. When the New Horizons project in the south-east corner of Australia (incorporating the Eden Native Forest Management Area and the East Gippsland forestry region) was completed, one of its agreed actions agendas to build capacity was for research and development of a regional co-branding strategy. An application for funding support through the Commonwealth's Regional Assistance program did not even get the support of the local Area Consultative Committee. This organisation saw more relevance in seed funding mini-worm farms than in supporting an initiative that would have built in brand awareness of a wide range of rural commodities and value-added agrifood products, as well as of regional forest industry products within a vast area.

The other side of this coin is that the collaboration needed for initiatives such as branding, involve business relationships, particularly networks. Joint R&D projects involving best practice, new and emerging technologies and specific applied research can more easily be achieved, from research right through to development, by first working out the research objective as a collaborative need, before jointly investing in the total R&D process.

> *The shift from tangible wealth creation – where buildings, land, plant & equipment were the key indications of value to* ***intangible wealth creation, where intellectual property brand names and business relationships are central,*** *is unmistakable*
>
> *The economic benefits that stem from a greater private investment in R&D into industries in which there is a competitive advantage is* ***wealth.*** *As knowledge transfers into innovation* ***growth*** *can be anticipated.*
>
> (4)Venture Capitalist Bob Beaumont, BRW May 1999

- **What are the impediments to business investment in R&D?**

We can only hope that one of the objectives of the Inquiry into Business Commitment to Research and Development is to examine the culture of R&D. This should include 'what's in it for business', and how R&D funding is handed out.

The Forest and Wood Products Research and Development Corporation has to be held accountable for:

- The process to obtain funds, and the management of the process.
- The direction of funds, ie to Government and research providers, not to industry.
- Leveraging of further industry funds.
- Outcomes and benefits.
- Research versus Development.

> *The Harvard Economist Michael Porter has argued that the great success stories of the 1980s (continuing into the '90s) have been in "competitive advantage", where nations with no history of competitive advantage have exploited niche markets against ferocious competition.*
>
> ***Our business leaders find great difficulty in getting their heads around this concept. The problem is the culture.*** *We see wealth essentially as something dug up from the soil, or built on it. Ideas? Innovation? That's something we import, or – like gene shears – we sell off for someone else to develop.*
>
> ***National leaders, in business and government cannot grasp the idea of "information" as an alternative source of wealth, or to see that information competition will be central to creating a better, more cohesive, more transparent society.***
>
> (5)Barry Jones – Speech to Australian Institute of Company Directors in Perth

To understand this we need to understand in the context of the Australian scene how successful global businesses grow.

McKinsey's book, *The Alchemy of Growth* – says that as a company's businesses and revenue streams mature, it must have others ready to take its place.

If continual growth is the goal, the pace of replenishment must foster the pace of decline. To sustain growth there must be a continuous pipeline of new businesses that represents new sources of profit.

The authors define three "Horizons for Growth" - each with different measures.

- Horizon One is the **extending and defending of existing business.**

  Management's primary challenge in Horizon 1 is to shore up competitive positions and capture what potential remains in the core businesses.

- ***Market Research & Development; and***
- ***Best Practice Research & Development***

  are the R&D efforts required in Horizon 1.

  By the time a business matures into Horizon 1, the initial strategic insight will have been long recognised by competitors, and early positional advantages may well be eroding.

  Survival depends on superior execution. Great discipline is required in an operation's planning and budgeting.

- Horizon Two is the **building of new business.**

  Horizon 2 comprises businesses on the rise; fast money, entrepreneurial ventures in which a concept is taking root or growth is accelerating.

  As emerging stars, these businesses are attracting investors' attention. Though substantial profits may be four or five years away, they have fast growing customer bases and revenues and may already generate some profit. More importantly, in time they are expected to become as profitable as Horizon 1 businesses.

  Horizon 2 activities are usually characterised by a single-minded drive to increase revenue and market share. They need continuing investment to finance rollouts or otherwise accelerate the expansion of the business. In a few years Horizon 2 initiatives should complement or replace a company's core business.

  The challenge for business is to take advantage of an insight before competitors do. The focus shifts to building the business quickly and establishing positional advantage. The pace becomes frenetic due to increased risk taking. Rapid judgment calls and larger investments become necessary.

- ***Application of New and Evolving (or Emerging) Technology***

is the Research and Development requirement of Horizon 2 culture.

- Horizon Three is the **creation of viable options for future business.**

Horizon 3 contains the seeds of tomorrow's business

- Options on future opportunities. Although embryonic Horizon 3 options are more than ideas.
- They are real activities and investments, however small. They are research projects, market pilots, alliances and minority stakes that mark the first steps towards actual business. They may not produce profits for a decade, if ever.

Building successful businesses means seeding numerous options. Some will fail for internal reasons; others will fall victim to shifting industry winds. Given these odds, a great deal of Horizons 3 activity is needed.

- ***Application of Specific Applied Research and Development***

is a requirement of Horizon 3 culture.

> *"Companies that are able to grow typically consider all three horizons. The reason so few companies succeed is that it really requires three types of companies. Most companies use only Horizon one and see that as excellence. So they kill Horizon two and three culture"*
> (6)David White "The Alchemy of Growth" McKinsey & Company

It follows that the primary impediment to business investment in R&D is the failure of business and government to grasp the realities facing business in the global economy.

To address this 'cultural' problem we need to identify the issues that are the perceived impediments to business investment in R&D.

Impediment / Problem

- **'Busy-ness'**

Business today is overwhelmed with a multitude of issues, strategies and activities. Covey's work or time management provides a process to categorise actions.

Category 1 Important/Urgent

This category is where most businesses spend most of their time. Most SMEs operate in survival mode on a day-to-day basis.

Category 2 Important/Not Urgent

These are the issues that are important but not urgent and because of the lack of urgency fall to the bottom of the *To Do* List. Issues such as; planning, training, product development, innovation, R&D, etc, often appear on the category 2 list.

Category 3 Not Important/Urgent

This is often the category devoted to considerable efforts with no rewards.

Category 4 Not Important/Not Urgent

These are the time wasters that are prevalent in many businesses.

By listing the actions into these categories it is found that the most strategically important fall into the Category 2 box.

This process can best be implemented by the preparation of a strategic plan for the business. The plan will identify the issues, strategies and actions.

- **Change Culture**
  Most businesses operate in Horizon One.

  Most businesses use only Horizon 1 and see that as excellence. So they kill horizon two and three cultures.

  They do not see the benefits of Horizon 2 and 3 cultures, and accordingly do not realise their change potential.

- **Cost of R&D**
  The funding of R&D can be seen as a cost and there is little consideration given to the future benefits of R&D.

- **Access to R&D**
  SMEs make up the greatest proportion of Australian owned business. Many do not have the knowledge or networks to participate in R&D.

- **Centralisation**
  A feature of R&D in Australia is that generally it has been clustered around universities. The increase in the number of Access Centres has created opportunities to widen the distribution of R&D.

- **Funding**
  There is a general lack of awareness of Government programs to fund R&D.

- **Lack of Strategy**
  Most SMEs in Australia have not developed a business plan and focus on day-to-day operations.

- **Skills/Education/Training**
  Few SMEs have the skills and training required to implement an innovative strategy involving R&D. There is a need for trained facilitators.

- **Pay Off/ What's in it for me**
  Businesses need to be able to identify and if possible quantify the benefits from R&D expenditure.

- **Network/Linkages**
  Many SMEs operate in isolation, with limited contact with other people in business. They join industry associations, chambers of commerce, etc, but they have little or no exposure to new business practices.

As a general rule the sooner Australian Industries catch up with continuing improvements in knowledge industry best practice the better. Industries that fail to catch up are doomed.

- **What Steps need to be taken to better demonstrate to business the benefits of higher private sector investment in R&D**

  - **Putting the 'D' back into R&D**

  Development drives the Research. There must be a pay- off.

  Definitions:
  - Development
    1. the act, process or result of developing
    2. a developed state, form or product
    3. evolution, growth, expansion
       Macquarie Dictionary.

  - Research
    Diligent and systematic inquiry or investigation into a subject in order to discover facts or principles.
    Macquarie Dictionary.

  The subject must have a practical application

  If business is to embrace an R&D culture it must be seen to have ownership and to drive the process.

  There is a perception that an elitist group remote from the coalface of day-to-day business operations controls the R&D process. The perception is that cooperative research centres (CRCs) and/or universities control it. These institutions have developed mechanisms/processes to secure government funding that becomes part of their recurrent funding.

The Forest and Wood Products Research and Development Corporation (FWPRDC), the R&D arm of forest industries, provides an interesting case study.

FWPRDC is well funded by compulsory levies on industry. Levies for the 2000-2001 year were $3.862 million with total revenue of $7.155 million including $2.666 million in Commonwealth funds. From July 2000, government contribution is $1 for $1 (up from $1 for $2). FWPRDC is corporatised with a clearly defined structure for governance. The website would indicate world's best practice in R&D.

The question is - does it deliver development to the point of commercialisation?

The forest industries have their roots in regional Australia. In spite of the millions of dollars spent on research during the Regional Forest Agreements (RFA) process, a number of areas are now found to have unsustainable logging volumes. This research was carried out by the same institutions that are now funded by FWPRDC. These regional areas are now facing a continuation of the uncertainty that existed during the RFA process.

At the base level of harvesting and haulage, the industry is in crisis.

Following an article - *Contractors in Crisis* - in *The Forest Logger and Sawmiller* last year, a Contractors' Forum was held in Melbourne in September 2002 to see if some resolution could be found in the crisis facing many logging contractors around Australia. A viable contracting sector is the foundation of a viable timber industry. There are research projects that have been commenced in this sector that have never reached the point of commercialisation as forest owners are aware that research will point to the need for increased rates. In NSW this is manifesting itself in log supply problems as the new log merchandising operations fail to deliver.

Experienced contractors are leaving the bush. Operator skills have hence diminished as contractors seek other, higher paid, less stressful work. This sector is not represented well on FWPRDC and has been neglected by those that are represented.

As is the case with many regional industries, the controlling bodies are city centric. Governance, administration, and in this case, research, are predominantly based in city locations. The interface between the organisation and the grass roots is remote and there is a case to say that research is not directed at the development requirements of the industry, especially the SMEs that make up the critical mass of the industry. Dominant players who are well connected being forest owners and large sawmillers, command the ear of those with influence.

> *The divergence of employment rates between Australia's regions is now too great to be countered by a policy of moving the people to the jobs. Jobs have moved to the people.*
>
> Enterprise Zones Study, ICAA

A system needs to be put in place, whereby the grass roots SMEs have access to the facilities of the FWPRDC. Details are provided in the Appendix of two FWPRDC projects that raise some anomolies that have disputed facts.

- **Co-operative Research Centres**

What light do Porter's frameworks shed on the Australian industry scene? One insight, possibly surprising, is that two of the more conspicuous Australian efforts to build clusters – the failed multifunction polis in South Australia and the cooperative research centres (CRCs) are not the right approach

"The theory is strongly opposed to creating clusters from scratch," Porter says. "I always argue that you need to have pre-existing conditions. One of is a pool of companies that are in the field passing the market test – companies that actually exist. Perhaps (it is important to have) a pre-existing base of support of industries that can turn their attention to a new field. What you do is try to take existing or emerging clusters and put your energy into upgrading particular skills and technological capabilities, and then you find is that the new clusters tend to 'morph' off existing clusters.

"The Japanese didn't get into VCRs and fax machines by targeting that cluster from scratch," he says. "They started out making transistor radios after World War II. Then they moved into TV sets and then to color (TVs). So all of a sudden we have a TV set business. From there, VCRs were a possibility. But if you started going from scratch to VCRs you would be stretching the credibility that you could create a competitive advantage".

Porter says the one exception is "raw technological investment". If a university invests for five or 10 years in mechanical engineering or life sciences, it can create the pre-conditions for a cluster. A cluster will not appear for a long time, but some of the specialised technological capabilities that can give rise to a cluster may be created. "A good example of that would be the San Diego story, where the biosciences-biotech-parma cluster started with a series of research institutes that were basically doing research," he says.

"The CRC effort of trying to start clusters from scratch, I would say, would not pass the test of the theory. The theory would say: find the existing or emerging clusters that you already have and put your resources behind improving the environment in those areas."

Porter cites the wine industry as the best example of cluster development in Australia. "It is a case where it appears that there were a group of wineries", he says. "They existed, initially making the sweet wines, the ports or fortified wines, and then over quite a period of time they moved into table wines. Over the past decade there has been quite a systematic cluster-development effort, in which a lot of institutions have been created. There was a strategy, and the Government had a role, but it was heavily driven by the private sector.

"I think that is a great example of what cluster development looks like, and it is quite successful. Australia has come from being basically nowhere to being one of the world's leading exporters of wine. They have gone from making imitation port and sherry to making really high-quality wines that are renowned.

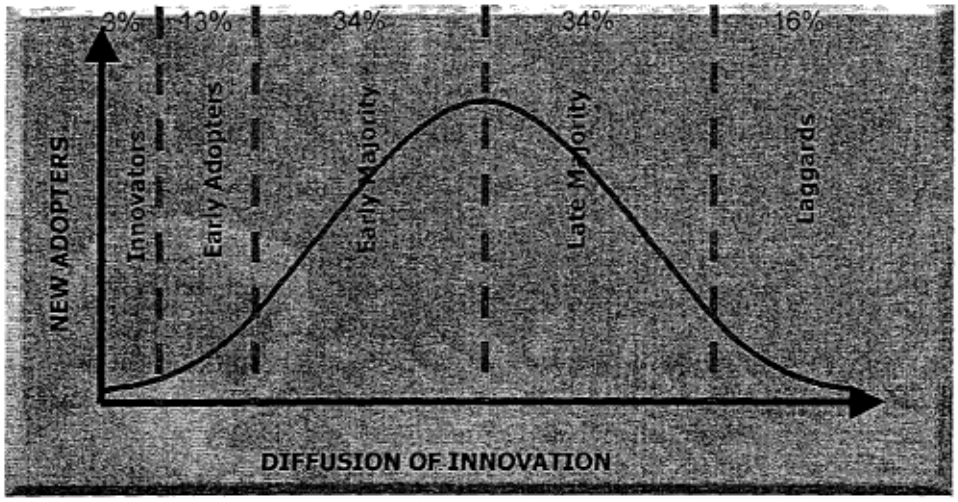
"It is an agricultural good, so it starts out as a natural-resource-intensive industry, but the real hallmark of the Australian cluster as we understand it is the willingness to apply new technology, and to source technology from all over the world. The theory says natural-resource industries aren't bad. You don't want to divest yourself of all your natural-resource industries; what you want to do is upgrade them, you want to make them more advanced."

Cover Story BRW, March 28-April 3, 2002 - How to kick Global Goals.

This suggests that CRCs were doomed to failure. Successful research and development can be to source technology from all over the world and apply that technology to existing industries. This, whilst not research in the pure sense, is a cost effective and practical application of R&D. It is cost effective in two dimensions. Adopting practical applications of successful research and adopting it in a cluster where it is leveraged over a number of companies.

❑ Targeting R&D

▪ Diffusion of Innovation



The Diffusion of Innovation identifies 50% of business as likely to adopt R&D.

The **Innovators** are about 3% of the R&D market.
They are the risk takers that act on ideas.

The **Early Adopters** are the next 13%.
They are the thinkers. They also like innovation but it must be commercial.

The **Early Majority** is the first big group, 34% in all.
They usually follow the early adopters, sometimes a year or two behind. They are more cautious.

This 50% represents the target audience.

▪ Filters

These target groups can be reached in a cost -effective manner.

- list of CEOs
- business magazines for entrepreneurs
- business papers
- employer groups
- professional associations

Trade associations can provide a forum for the exchange of ideas and a focal point for collective action in overcoming obstacles to productivity and growth. Associations can take the lead in such activities as training and R&D activities.

- **Government Program Awareness**

A sustainable R&D program needs to generate payoffs and benefits for the risk takers of R&D initiatives. Government programs can assist in the risk taking by allocation of incentives in accordance with risk and rewards.

We previously identified the Three Horizons for Growth each with their own R&D requirements. We also identified that for sustained growth the Three Horizons must all be in place.

Horizon 1 R&D: *Market Research & Development and Best Practice Research & Development*

This is the low hanging fruit of R&D that would provide benefits to most levels of business. Funding for this level could be by way of funding for facilitation, and implementation of, Best Practice measures including adoption of Key Performance Indicators by industry and individual business through industry associations. This is entry level R&D that provides almost immediate benefits and an introduction to the R&D processes.

A model of the application of Best Practice R&D is the Terra Timbers project in East Gippsland, Victoria.

> *"The Victorian Eastern Development Association (VEDA), is a private sector not for profit, economic development organisation in East Gippsland. VEDA formed a network of eight small sawmills in 1998. The network developed into a trading entity, TERRA Timbers (TT) in 2000. The participating sawmills are located in East Gippsland and collectively account for approximately 25% of the hardwood sawlog output in the region. In 2002, TT began operating a $3m joint processing facility in Bairnsdale that processes and value adds the timber from the members for domestic and international markets. It is anticipated 47,000m3 of processed timber will be the output. TT is also working with RMIT to find higher value uses for lower grade timbers."*
>
> ***New Horizons: Forestry - Action Agendas to Build Capacity: Sunrise Consortium, 2001***

$3.2m East Gippsland factory challenges traditional ideas on hardwood processing

A $3.2 million timber processing complex developed by network sawmilling group, Terra Timbers, is set to change the face of traditional hardwood processing and marketing in Australia. Opened by Minister for Forestry & Conservation, Senator Ian Macdonald, the massive factory provides a tangible example of what is possible when people work together.

The facility is major step forward in adding value to East Gippsland's timber resources from green low value timber used to develop kiln dried, machines and engineered wood products.

Terra Timbers is very much a partnership, between the local directors and the local community as well as organisations such as VEDA, the Gippsland ACC and state and federal governments.

Australian Timberman, May 2002

Of considerable and growing importance to this rural regional, timber-dependent community, Terra Timbers is an example of how an **industry cluster** has emerged using Best Practice R&D.

The project will be presented during the Forestry Session at the 5th Global Conference of The Competitiveness Institute (TCI) in Cairns, 9-11 October 2002. TCI is the international body that promotes local economic development through clusters.

R&D is among the key issues for TCI.

Horizon 2 R&D: *Application of New and Emerging Technology*

Funding for this level would be for desk research, attendance at conferences, establishing networks and travel. Funding of industry associations/clusters would be an effective way to advance this level of R&D. This is the next level of R&D that has the capacity to increase efficiency, quality and capacity.

Scottish Enterprise is the national body that is responsible for the restructure of Scotland's economy. In concert with the Forest Industries Development Council, it has developed the Scottish Forest Industries Cluster.

The Scottish Forest Industries Cluster (SFIC) exemplifies the application of new and emerging technology. This is also a model to a degree of excellence and best practice that can be used for best practice by Australian forest industry businesses, such as the emerging Pilliga-Goonoo Cypress and Ironbark Cluster in western NSW.

> The vision, or preferred future, for the cypress and ironbark cluster developed at the Cluster Navigators workshop is:
> **To double the value of the timber industry in the Pilliga-Goonoo region in five years by increased value adding for export and domestic markets, utilisation of waste products and silviculture of forests.**
> The cluster comprises eight cypress sawmills at Gwabegar, Baradine, Narrabri (2), Gunnedah, Gulargambone, Narromine and Dubbo. They produce 60 per cent of the NSW cypress industry's output. The cluster also includes two ironbark mills, at Baradine and Mendooran.
>
> *Robin Owen & Associates: Strategic Business Plan for the Pilliga-Goonoo Regional Development Forum, September 2002*

SFIC has developed a strategic framework for action comprising the promotion of innovation, market and business development, and infrastructure development. While the industry may be considered small compared to the Australian forestry industry, it supports the employment of 44,000 people and contributes £1.3 billion in terms of sales to the Scottish economy. Targets set by the cluster over the next five years include:

- The creation of more than 1000 jobs.

- The stimulation of an extra £100 million of investment in processing capability.
- An increase in market penetration from 9% to 15%.

As a part of the development of its strategy, SFIC invested in Horizon One Market Research & Development. Eight countries/regions were benchmarked for comparison and learning: Chile, New Zealand, British Columbia, Ireland, Germany, Finland, Sweden and south-east USA. This allowed SFIC to build a competitive response, the most important part of which has been to change how R&D had traditionally occurred - using other countries' best practice, which although important, does not always deliver maximum potential. In fact, it is suggested that without taking on Best Practice R&D first, it is unlikely that New and Emerging Technology R&D can succeed.

Previously, R&D had been disconnected from Scottish industry and was inadequate for processing and new product development. Areas for action have now been identified and the wheels are turning for SFIC to achieve its goals using R&D as R&D/Innovation through new and emerging technology as a key focus. The full extent of this is available through the SFIC website and *Roots for Growth*, which is available in hard copy or pdf format.

Horizon 3: ***This is innovation breaking new ground and requires application of Specific Applied Research in the traditional sense.***

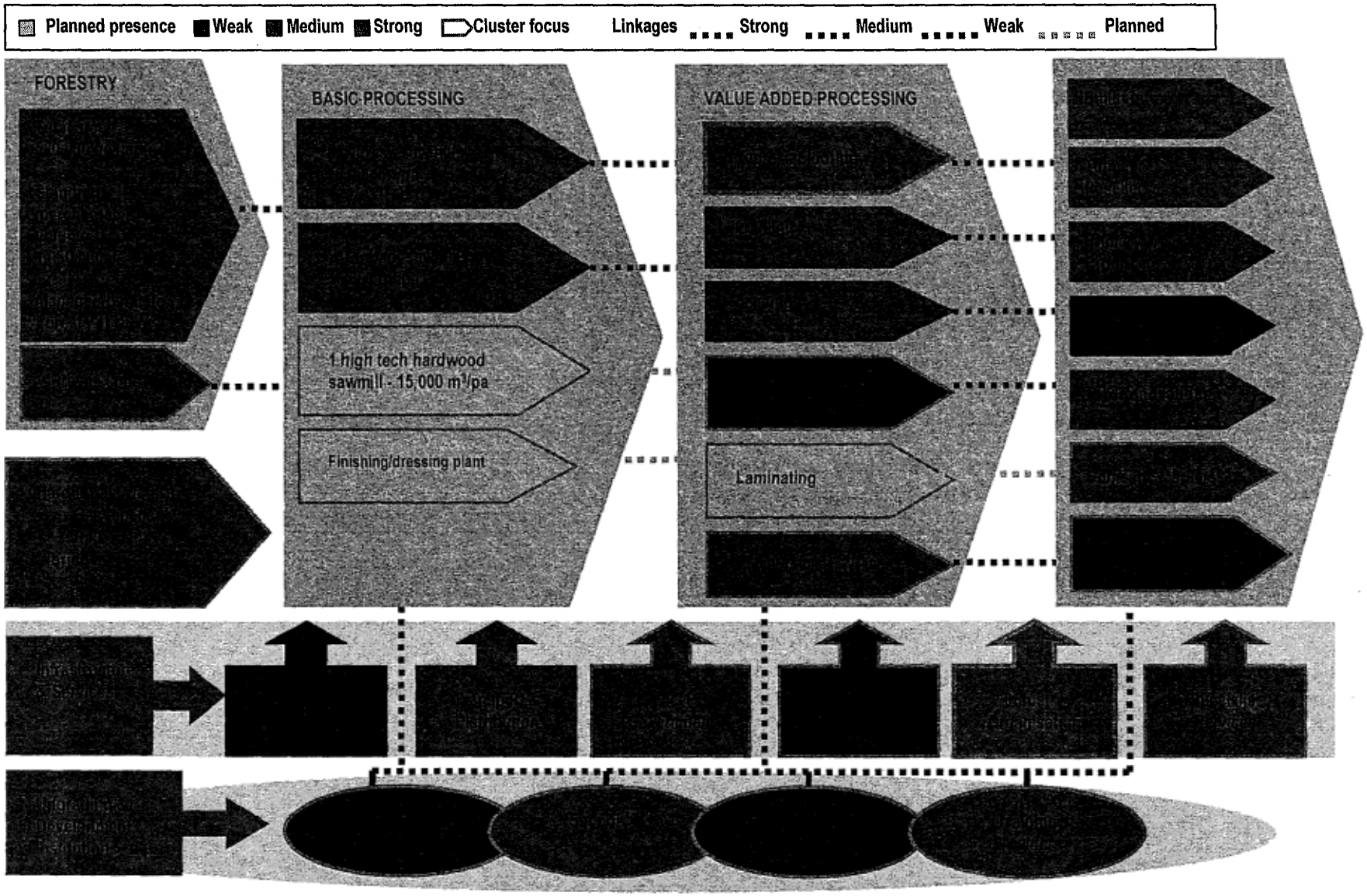
This level of R&D provides specific solutions to specific problems and can provide a level of competitive advantage. It requires a different approach to funding.

An example of this is the extraction of oil from Australian white cypress. This timber is sought after by export markets, principally Japan and the USA, for the termite resistant property of its oil. The extraction of cypress oil was researched specifically by the Queensland Institute of Forestry Research and can now be extracted from sawdust waste after processing at a commercially viable price.

The research completed, the next stage is development - of cost-effective and capacity-effective extraction plant, of markets and of alternative applications. For example, one Australian sawmill possessing a modest extraction plant has been approached by an American paint company for term supply of cypress oil as a paint additive. Is this its best use? Westmead Hospital in conjunction with the University of Sydney, on the other hand, is assessing the potential of the oil for its efficacy against cancer and AIDS, following representations by Christine Lord, a member of the Pilliga-Goonoo Regional Development Forum.

This is also an example of the D in R&D being 'neglected'. A total research and development strategy for the cypress industry would be more appropriate. This will now be addressed through the emerging Pilliga-Goonoo Cypress & Ironbark Cluster, and hopefully also through the NSW Cypress Industry Strategic Plan.

THE PILLIGA-GOONOO CYPRESS & IRONBARK CLUSTER



- **Wholesale Funding**

  Trade Associations and Clusters provide an efficient partnership mechanism for support and tertiary institutions to link with SMEs.

  A cost effective 'wholesale' relationship is established, rather than the more intensive one on one retail relationship. Working at the higher level also has further benefit; a neutral corner is provided that brings firms together for specific purposes.

A Strategic Approach

It is important that business takes ownership of the benefits of higher private sector investment in R&D.

Incentive funds should be allocated on the basis of a proven commitment and capacity to undertake R&D.

We were recently involved in the Forest Structural Adjustment Package Industry Development Assistance Program. The program involved a two- stage application.

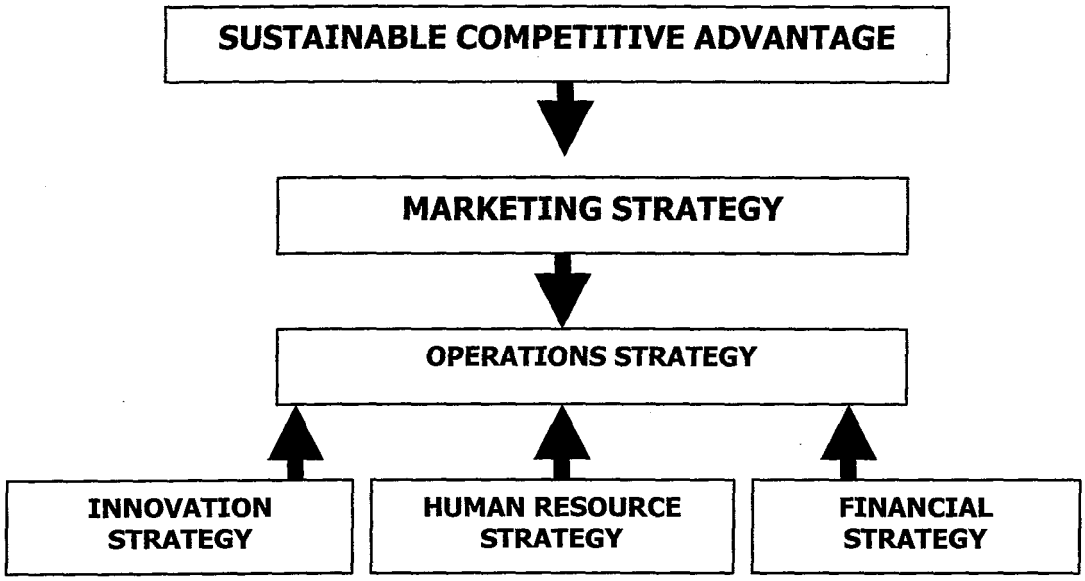
Stage A
An expression of interest by way of proforma application outlining the detail, costs and milestones of the investments that were considered to be of strategic importance to the industry. This required a minimal investment of time and research to prepare.

Stage B
The invitation to participate in the Stage B application required that a Business Plan and Financial Projections be prepared accompanied by Financial Statements and evidence of capacity and skills to participate. The business plan was funded 50% by the program.

The development of the business plan had dual benefits. First, the applicant business is required to go through a process that draws out and documents the Now, Where and How of the business. The payment towards the preparation of the plan establishes the bone fides of the business as being serious.

The Government funding body, through the use of an independent assessment of the business plan, is able to reduce the risk of failure of the business and make a long term investment in future tax streams. After assessment of the business plan, an independent committee allocates funds on the basis of a review.

Set out below is a strategic planning model.



The Strategic Planning Model operates on developing a SUSTAINABLE COMPETITIVE ADVANTAGE that drives the MARKETING STRATEGY, which in turn drives the OPERATIONS STRATEGY.

The INNOVATION STRATEGY, HUMAN RESOURCE STRATEGY and FINANCIAL STRATEGY are then tailored to the OPERATIONS STRATEGY.

This model links the various documents of the Business Plan in the way at which a business operates.

Sustainable Competitive Advantage
The sustainable competitive advantage drives the marketing strategies.

Michael Porter has proposed three genuine business strategies by which an organisation can position itself favorably for business growth and gain long term sustainable competitive advantage. These are:

- Cost leadership
- Differentiation; and
- Focus

Marketing Strategy
The marketing strategy provides the business with the numbers that make up the production of goods and services.

Operations Strategy
This sets out the processes by which the business delivers goods and services.

Innovation Strategy

This sets out the actions and processes required to deliver the Three Horizons of Growth and should address the following:

- changes to operations, products, processes and services
- the record of achievement of the business in innovation
- training requirements and business capital requirements to deliver innovation
- the linkages of the business to other firms and/or research establishment
- a rating of the innovativeness of the products and services of the business
- importance of customer input to the new product/service development
- the processes in place to follow technology outside of the business operations
- importance the business attributes to having an export marketing strategy
- the awareness of government programs that support innovation.

Human Resource Strategy

This will incorporate the training and human capital requirements that form part of the innovation strategy.

The Financial Strategy

This will incorporate the cashflows arising from the innovation strategy.

Key Performance Measures

Each of the strategies has its own key performance measures to monitor progress.

The structure of the plan is such that benefits of R&D are set out in the Innovation Strategy and progress is measured in relation to the Innovation Strategy and how it flows through the operations into sales.

Clearly the benefits of R&D are survival and growth in a world competitive environment.

Features of R& D Investment	**Benefits**
Changes in business operations, products, processes or services	Increased competitiveness Increased profits Improved efficiency Reduction in waste
Developed relationships with other firms/research establishments to introduce best practice	Opportunity for growth Collaboration Increased competitiveness Improved efficiency Reduction in waste On time every time Increased profits
Application of new and evolving technology	Increased production/efficiency Reduction in waste Increasing competitiveness Opportunity for growth Increased profit

Application of specified research and development to specific problems	New competitive advantage Reduction in waste Increased production Increased profits Opportunity for growth
Awareness of Government programs that support innovation	Financial support for R&D Development of R&D skills Process for implementation of R&D
Customer input into new products/service development	Customer satisfaction Opportunity for growth Increased competitiveness Ideas for innovation
Training programs to up-skill workers to innovation	Career paths, labour retention Increased motivation Less rework Increased efficiency/production Development of innovative culture
Development of growth strategy market research • Market Penetration Existing Products/Existing Markets • Market Expansion Existing Products/ New Markets • Product Expansion New Products/Existing Markets • Diversification New Products/New Markets	Growth Spread of fixed costs Increased profits Growth Export opportunity Spread of fixed costs Increased profits Export opportunity Growth Spread of fixed costs Increased profits Export opportunity Growth Spread of fixed costs Increased profits

Leveraging R&D Funding

Clustering provides an efficient partnership mechanism for support and tertiary institutions to link with SMEs. A cost-effective 'wholesale' relationship is established, rather than the more intensive one-on-one retail relationship.

What is a Cluster?

Clusters are geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. They include, for example, suppliers of specialised inputs such

as components, machinery, and services, and providers of specialised infrastructure. Clusters also often extend downstream to channels and customers and laterally to manufacturers of complementary products and to companies in industries related by skills, technologies, or common inputs. Finally, many clusters include governmental and other institutions – such as universities, standards-setting agencies, think-tanks, vocational training providers and trade associations – that provide specialised training, education, information, research and technical support.

> "The biggest reason to expect **more clustering** is that it **works ... success** tends to cluster."
>
> *The Economist*, May 1996

Clusters promote both competition and cooperation - known as 'co-opetition'. Rivals compete intensely to win and retain customers. Without vigorous competition, a cluster will fail. Yet there is also cooperation, much of it vertical, involving companies in related industries and local institutions. Competition can coexist with cooperation because they occur on different dimensions and among different players.

> *"Collaborate or Die: Cooperate to Compete.*
> *Export is the driver for acting local, thinking global."*
> ***Ifor Ffowcs-Williams, President, The Competitiveness Institute, Gilgandra, June 2002***

Clusters represent a kind of new spatial organisational form in between arms-length markets on the one hand and hierarchies, or vertical integration on the other. A cluster, then, is an alternative way of organising the value chain. Compared with market transactions among dispersed and random buyers and sellers, the proximity of companies and institutions in one location – and the repeated exchanges among them – fosters better coordination and trust. Thus clusters mitigate the problems inherent in arms-length relationships without impairing the inflexibilities of vertical integration or the management challenges of creating and maintaining formal linkages such as networks, alliances, and partnerships.

A cluster of independent and internally linked companies and institutions represents a robust organisational form that offers advantages in efficiency, effectiveness and flexibility.

> *"We believe that clusters are not a passing phenomenon. The emerging network economy leads towards more tightly coupled, more intense, more persistent and more intimate relations among firms and between firms and government organisations.*
> *"The cluster concept ... helps us to understand it in a coherent band systematic way."*
>
> *Dutch Ministry of Economic Affairs*

Many clusters are critical to competition.

Modern competition depends on productivity, not the access to inputs or the scale of individual enterprises. Productivity rests on *how* companies compete, not on the particular fields in which they compete. Companies can be highly productive in any

industry – shoes, agriculture or semiconductors – if they employ sophisticated methods, use advanced technology, and offer unique products and services. All industries can employ advanced technology; all industries can be knowledge intensive.

The sophistication with which companies compete in a particular location, however, is strongly influenced by the quality of the local business environment. Companies cannot employ advanced logistical techniques, for example, without a high quality transportation infrastructure. Nor can companies effectively compete on sophisticated service without well-educated employees. Businesses cannot operate efficiently under onerous regulatory red tape or under a court system that fails to resolve disputes quickly and fairly. Some aspects of the business environment, such as the legal system, for example, or corporate tax rates, affect all industries. In advanced economies, however, the more decisive aspects of the business environment are often cluster specific; these constitute some of the most important microeconomic foundations for competition.

Clusters affect competition in three broad ways: first, by increasing the productivity of companies based in the area; second, by driving the direction and pace of innovation, which underpins future productivity growth; and third, by stimulating the formation of new businesses, which expands and strengthens the cluster itself. A cluster allows each member to benefit *as if* it had a greater scale or *as if* it had joined with others formally – without requiring it to sacrifice its flexibility.

Implications for Companies

In the new economics of competition, what matters most is not inputs and scale, but productivity – and that is true in all industries. The term *high tech* - normally used to refer to fields such as information technology and biotechnology, has distorted thinking about competition, creating the misconception that only a handful of businesses compete in sophisticated ways.

In fact, there is no such thing as a low-tech industry. There are only low-tech companies – that is, companies that fail to use world-class technology and practices to enhance productivity and innovation. A vibrant cluster can help any company in any industry compete in the most sophisticated ways, using the most advanced, relevant skills and technologies.

Thus executives must extend their thinking beyond what goes on inside their own organisations and within their own industries. Strategy must also address what goes on outside. Extensive vertical integration may once have been appropriate, but companies today must forge close linkages with buyers, supplier, and other institutions.

Porter cites the wine industry as the best example of cluster development in Australia. As stated earlier in this submission:

> *"It is a case where it appears that there were a group of wineries," he says. "They existed, initially making the sweet wines, the ports or fortified wines, and then over quite a period of time they moved into table wines. Over the past decade there has been quite a systematic cluster-development effort, in which a*

lot of institutions have been created. There was a strategy, and the government had a role, but it was heavily driven by the private sector.

"I think it is a great example of what cluster development looks like, and it is quite successful. Australia has come from being basically nowhere to being one of the world's leading exporters of wine. They have gone from making imitation port and sherry to making really high-quality wines that are renowned.

"It is an agricultural good, so it starts out as a natural-resource-intensive industry, but the real hallmark of the Australian cluster as we understand it is the willingness to apply new technology, and to source technology from all over the world. The theory says natural-resource industries aren't bad. You don't want to divest yourself of all your natural-resource industries; what you want to do is upgrade them, you want to make them more advanced."

Porter's view of global competition suggests that the rise of domestic oligopolies in Australia is likely to impede the country's embrace of globalisation. His arguments do not sit well with the Business Council of Australia's claim that more domestic mergers should be allowed so that Australian enterprises have the scale to compete globally.

Benefits to Business from Clustering

Concentration, or clustering, gives business an advantage over more isolated competitors. It provides access to more suppliers and customised support services, to experienced and skilled labour pools and to the inevitable transfer of knowledge that occurs where people casually meet and talk business. Clustering enables companies to focus on what they know and do best; they need not do things they do not do well. Firms also benefit from synergy. Companies able to operate more or less as a system can use their resources more efficiently and collectively produce more than the sum of their individual outputs.

Among all of the advantages of clustering, none is as important as access to innovation, knowledge and know-how. In the New Economy – defined by knowledge-intensive traditional and emerging industries – companies look for their main competitive advantages in access to ideas and talent, which requires geographic proximity to professional colleagues, cutting edge suppliers, discriminating customers, highly skilled labour pools, research and development facilities, and industry leaders. Industry-specific knowledge and know how accumulate and disperse through entrepreneurial areas and innovative companies. Clustering gives firms quicker information about advances in technologies and changes in customer or consumer preferences. Not incidentally, it reduces transaction costs.

Hard and Soft Benefits from Clustering

These advantages can be separated into 'hard' benefits and 'soft' benefits. Hard benefits are gained from more efficient business transactions, wiser investments, and reduced expenditures that produce profits and jobs. Soft benefits are derived from the learning,

benchmarking, and sharing that expands knowledge and leads to innovation, imitation and improvement.

The most quickly recognised and easily measured advantages to firms are those resulting from the concentration of the resources necessary to do business. Clustered firms can choose from a greater number of more tailored services. These services include bankers and accountants who understand their technologies and markets, trusted consultants who can solve specific problems, marketing and advertising companies that know their customers, and the small business centre that can assess their procedures and give advice. Moreover, local firms can purchase these resources faster and at a lower cost than their more distant competitors.

Among the most important hard benefits is access to a knowledgeable and experienced workforce, particularly the mid-skilled workers who are deeply rooted in the region and who typically have attended the local vocational schools and community and technical colleges. Except for the small number of jobs that are telecommutable, such as back office workers in Asia, these skills cannot be purchased over the Internet and delivered overnight.

The presence of potential local suppliers is an advantage, but mainly in industries where significant knowledge is embedded in the product. In today's economy, overnight deliveries and Internet communications reduce the importance of proximity for standardised parts and supplies. Companies increasingly use electronic auctions for parts and proximity matters most for critical components or supplies that are knowledge-intensive and depend on interactive research and design or special support in assembly or utilisation. Supply chains are advantageous, but less so today than in the 20th century.

The soft benefits of clustering are the intangible assets that are not so directly transferred to a profit and loss statement but potentially have an even greater impact on the bottom line than the hard externalities.

The advantages of these assets are derived from a mobile workforce and the flow of knowledge among firms through formal and informal discussions with peers, suppliers and customers. Innovation is a collective and iterative process and an environment that encourages people to share and play off one another's ideas promotes innovations in technologies, products and processes.

Advantage also comes from the more efficient acquisition of tacit knowledge – sometimes called knowhow – that is carried in the heads of individuals and in the routines of organisation and is not published or otherwise formally recorded. Transfer of this knowledge requires the face to face contact that occurs in business to business interactions and social, professional and trade meetings. The greatest advantage of social capital and trust is derived from planned collaboration and network formation.

The precursors of programs to develop clusters typically were state programs designed to form networks among groups of firms. These programs were about addressing business needs collectively and achieving economies of scale. In retrospect, states

emphasis on networks put the cart before the horse, because networks naturally develop out of the relationship that exist in strong clusters. Although the terms 'network' and 'cluster' are sometimes used interchangeably, there are critical differences. Networks create economies of scale by deliberately sharing resources, expertise, or information. There is nothing necessarily deliberate about the naturally occurring efficiencies that are part of the cluster's business environment.

Finally, there are benefits from removing the city centric R&D into the areas of need.

> *The exit of school levers. There is an urgent need to create high value jobs, so the focus for economic developments needs to be well beyond building the tourism and retirement clusters.*
>
> Ifor Ffowcs-Williams, Cluster Navigators, Eden Clusters workshop for New Horizons for Primary Industries project, November 2001

Focused education and locally based R&D will contribute to higher value jobs in regional Australia, particularly where industry developments are planned around clusters.

> *The **Key Issues** within Operations include:*
> ***1. Government Intervention and Controls Creating Uncertainty and Cynicism***
> *The traditional....*
> ***2. Employment Prospects***
> *The Survey conducted by the Forum provided the following results*
> ***Survey Question:*** *If you have children in your family how well do you rate their ability to get a job within reasonable travelling distance from home?*
> ***Response:***
>
> | | ***Eden*** | ***Bombala*** |
> |---|---|---|
> | ***Easy*** | *3.54%* | *3.92%* |
> | ***Difficult*** | *27.95%* | *28.57%* |
> | ***Almost Impossible*** | *68.51%* | *67.53%* |
>
> *The consistent response is indicative of the low level of confidence in the area and that there is already a significant migration of rural youth to the cities. This will severely prejudice future development of the region.*
>
> **Extract from South East Regional Strategic Planning Forum BUSINESS PLAN**
> *January 1998* Authors: Barclay & Donaldson Services Pty Ltd - Mindshop Australia

This issue is common throughout rural regional Australia. So many city-based, rural educated young people would like to return to their roots. Many of them are skilled researchers and/or work in primary industry science fields. It is no good complaining about the ineffectiveness of governments' approaches to decentralisation and hoping that miracles might happen.

3.2.1 R&D

This is the first of the two priorities for development of the proposed Cheese Cluster.

The Dairy Research & Development Corporation (DRDC) funded by the Australian dairy industry (R&D levy) and the Federal Government, works on behalf of the dairy industry in the areas of Farm, Manufacturing, Strategic R&D Management and Communication. It undertakes specific projects on request, but not necessarily within the time limitations of industry.

There is a specific need at Bega Cheese to be able to act quickly on initiatives identified by management and the board that would enable Bega Cheese to fulfil its vision 'to continue

to be the number one selling cheese brand in Australia and to ***expand our range of dairy products and take them to the dynamic, broader export markets of the world'.***

The requirements for product development in the past include the successful introduction of string cheese, a highly popular children's novelty snack, to Australia. There is an ongoing requirement for the development of specific tastes for cheeses for export, eg pepper cheeses.

The ideal for Bega Cheese would be to have both the DRDC service and a local R&D component to handle immediate requirements. In a cluster environment, R&D is one of the essential elements of the tier of Soft Supporting Infrastructure.

Cluster Navigators advises that clusters can develop around an R&D facility.

3.2.2 Education

This is the second of the two priorities for development of the proposed Cheese Cluster.

At the tertiary level and as stated elsewhere it is essential is that a university campus undertakes to become involved in the Cheese Cluster, with courses that will assist not only the cheese industry but also across other local industries.

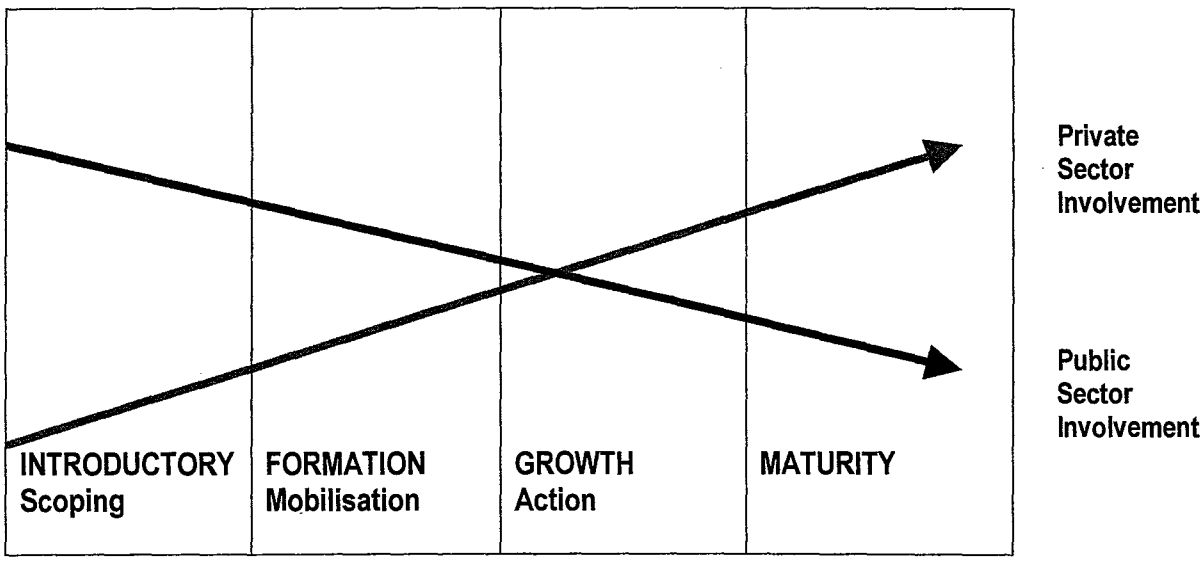
After assessing needs with Bega Cheese, an approach needs to be made to relevant universities. Further, research of universities and clusters internationally may assist in identifying a model for dairying industries.

At the secondary level, discussions need to be held initially with the two Bega schools in relation to the future of students graduating and seeking careers. The thrust could be on the need for local young people to either stay in the area after completing their education or on developing degrees and skills elsewhere that would allow them to return to the Bega Valley at a later time of their own choosing. The development of the Cheese Cluster would provide diverse opportunities for their future in the Bega Valley.

Extract from Bega Cheese Cluster Proposal; Robin Owen & Associates, 2002

A focused approach, targeting industries that already exist in regional Australia, will lead to the development of higher value jobs for Australia's young people, including those involved in research and in development and in a total, commercially-oriented R&D package.

Governments' Role in Cluster Development



In the early stages of development the government's role is to facilitate the development of the cluster. At this stage the private sector will not necessarily divert themselves from 'normal business to develop the cluster.

As mobilisation progresses the business sector will take up an increasing role in the management and resourcing of the cluster.

This is exactly what is happening with the five Pilliga-Goonoo forestry region clusters (Cypress & Ironbark; Apiary; Astronomy; Tourism; Distribution - Grains). Critical mass is developing through four local government areas - Gilgandra, Coonamble, Coonabarabran and Narrabri - together leading facilitation of the clusters. This has set the scene for involvement of State and Commonwealth funding programs to continue the scoping process, thus more easily enabling mobilisation of the clusters. The Cypress and Ironbark team has responded by putting time and funds aside at the mobilisation stage, but still requires Government support to accelerate growth and build capacity.

Now that the region's communities have put their hands up to work in partnership with government, the LGAs and industry look towards State and Commonwealth to support the initiatives proposed by the Forum.

Parallel

If Australia put the same resources into R&D for business as it does for sport ...

- best practice
- new and emerging technology
- applied research
- coaching & training

... a culture of winners would evolve that would take Australia to the forefront of innovation.

By example:

The Canadian Government has prepared an Innovation White Paper (March 2002). The backdrop is the need to improve Canada's productivity performance, where innovation is seen as the key. The aim is to turn knowledge-intensive industry clusters to competitive economic advantage. There are three policy priorities to address innovation gaps:

- *Knowledge Performance Challenge – includes national targets by 2010 including government to double R&D investment, raising venture capital investment per capita to US levels.*
- *Skills challenge – increasing the supply of highly qualified people who create and use knowledge.*
- *Innovation Environment Challenge – facilitation of partnerships, realisation that sources of competitive advantage are localized. Targets include 10 internationally-recognized technology clusters by 2010. $C110 million over 3 years to expand NRC's regional innovation initiative.*

The Clustering Alliance, Clusters Asia Pacific, May 2002

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