

Increasing Value Adding to Australian Raw Materials: Stage II Inquiry

Western Australian Government Submission to Of Material
Value?: Second Stage of Inquiry by the House of Representatives
Standing Committee on Industry, Science and Resources

October 2000

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Acknowledgments

The Western Australian Ministry of the Premier and Cabinet coordinated this whole-of-government submission to the second stage of the Inquiry. The following agencies contributed to its contents: Department of Resources Development, Agriculture Western Australia, Department of Treasury, Office of the Minister for Local Government, LandCorp, Office of the Deputy Premier, and the Department of Environmental Protection.

EXECUTIVE SUMMARY

Western Australia supports the key conclusion of the first stage of the House of Representatives Standing Committee on Industry Science and Resources Inquiry into Increasing the Value Added to Australian Raw Materials; namely, that value added processing of raw materials offers significant potential for enhancing national income and welfare and that there is much that governments can do to enhance Australia's competitive position in this area. The need for coordinated and cooperative State and Commonwealth government action to promote value adding investment is worthy of particular emphasis.

The priority areas which the Inquiry identified for government action to foster the processing of raw materials are also supported, but it is Western Australia's view that the issue of greenhouse policy and proposed abatement actions is of such singular importance that it needs to be separately identified and addressed. As well, Western Australia would like to see the Inquiry give attention to the practice of cabotage and its implications for the cost of interstate trade and hence for the competitiveness of value adding activity which relies upon interstate shipping, either for inputs or markets.

This submission considers the key issues in value adding from a State and Commonwealth policy perspective which the Western Australian Government would like to see addressed. The following recommendations have been put forward:

Recommendation 1

The Commonwealth Government must continue to address investor uncertainty arising from the present greenhouse policy vacuum by clearly enunciating its policy position on greenhouse abatement actions. The Commonwealth Cabinet decision of 21 August 2000 to protect Australian industries from a reduction in international competitiveness is therefore welcome and this principle must remain paramount in the Commonwealth Government's consideration of its Greenhouse obligations.

The policy response on greenhouse abatement must take into account implications for international competitiveness, industry structure and the costs of industry adjustment. There may need to be a compensation process for States or industries which "bear the brunt" of the costs of greenhouse abatement actions.

Recommendation 2

Current Commonwealth Government policy on the taxation treatment of major projects and the provision of investment incentives impedes Australia's ability to effectively compete for value adding projects.

Commonwealth Government policy on the taxation treatment of large, capital intensive projects and the provision of investment incentives needs to be reviewed to ensure that it enhances the international competitiveness of Australia as an investment destination for major resource processing projects and that it meets our international WTO obligations.

Recommendation 3

The Western Australian Government supports the stated policy of the Commonwealth Government to reform the system of cabotage which restricts competition on interstate shipping routes and increases industry costs. The State Government would encourage the Commonwealth to provide details of how it proposes to implement the reform of cabotage policy.

The second part of this submission provides information, in a case study format, on the impediments to and drivers for the establishment of the aluminium and magnesium metals industries in Western Australia. An overview of Western Australia's agricultural processing market and deterrents to industry is also included. Attached is the report Agriculture and the Western Australian Economy: Value Added Contribution of Agricultural Commodities released by Agriculture Western Australia in December 1997.

It is hoped that the information contained in this Western Australian Government submission is useful to the Inquiry.

KEY ISSUES IN VALUE ADDING

Commonwealth Government Policy Issues

Greenhouse

The Inquiry's First Report identified Australia's greenhouse obligation as the most pressing environmental impediment to value adding to raw materials. In particular, the report mentions that a balance needs to be found between industrial development and necessary environmental protection.

Policy Uncertainty

One of the most important considerations for value adding projects seeking to establish in Australia is the government's policy on greenhouse. The existing uncertainty both within Australia and internationally concerning greenhouse gas abatement obligations and proposed policy responses leaves many investors unsure as to the future operating environments for their projects.

For example, there is still uncertainty concerning:

- Whether the Kyoto Protocol will come into force;
- Whether Australia will ratify the Kyoto Protocol;
- What policies the Government will implement if the Protocol is ratified; and
- Whether developing countries will have emission abatement obligations imposed on them and, if so, when this will occur.

Investment decisions are being adversely affected because of uncertainty about the progression and implementation of the Kyoto Protocol. To this end, the Western Australian Government requested that the Commonwealth Government reaffirm its commitment to the maintenance of international competitiveness as a key consideration of ratification. The Commonwealth Cabinet decision of 21 August 2000 to protect Australian industries from a reduction in international competitiveness is therefore welcome and this principle must remain paramount in the Commonwealth Government's consideration of its Greenhouse obligations.

If the Commonwealth Government enforces the adoption of the Kyoto target for Australia across the board, without recognition of Western Australia's particular circumstances, then the achievement of the Kyoto target in Australia may result in:

- a curtailment of the current rate of industrial growth in Australia; and
- potential increase in greenhouse gas emissions by non-Annex I nations from carbon leakage.

Opportunities for creating wealth through value added projects in Australia arise from ready access to raw materials and energy. Deregulation of the energy sector in Western Australia has substantially reduced the price of gas. However, the gains from these initiatives could be offset if the Commonwealth Government implements policies to reduce emissions that raise the price of energy inputs.

It is clear that Australia needs to be vigilant in ensuring the right economic environment is provided (ie. in terms of government regulations and policies) just to

retain its current competitive position in raw materials industries let alone to increase the amount of value added production in Australia.

The Minister for Industry, Science and Resources on 6 September 2000 released details of the Commonwealth Government's Greenhouse commitments to Australian industry. These commitments include:

- Involving industry in greenhouse gas abatement policy;
- Working internationally to get Australia the best possible greenhouse position;
- Minimising the burden of greenhouse measures on business through cost effective actions; and
- Not discriminating against particular projects or regions in greenhouse policies and programs.

These commitments are considered a positive first step in addressing industry concerns on greenhouse issues.

Costs of Greenhouse Abatement

National Greenhouse initiatives need to be implemented in accordance with national strategic policy priorities and within the context of the Prime Minister's statements referring to protection of Australia's international competitiveness and the mining sector.

Continuing development of the resources sector, including value adding industries, is extremely important to Australia's future growth and prosperity. In this regard, it is expected that based on an annual growth rate of 4%, Gross Domestic Product (GDP) will be 219% of 1990 level by 2010. This poses a significant problem because if production grows at the same rate, and the carbon dioxide (CO₂) output in 2010 is fixed at 108% then the technology needs to exist (and be affordable) to halve the current CO₂ output for every tonne of product produced. This is an unrealistic expectation and it is unlikely that carbon sequestration will resolve this issue.

One of the difficulties in making further significant savings is that the technology to do so (even under best practice) is too expensive to maintain international competitiveness. In this regard, it should be noted that projected increases in the Western Australian resource industry's greenhouse gas emissions alone, over the period 1990 to 2010, are estimated to be 24 million tonnes CO₂-e (74% of Australia's targeted increase). Australia is already exceeding 108% of 1990 greenhouse emissions and appears unlikely to achieve the Kyoto target in 2008-12.

In view of this, any move to control greenhouse gas emissions that involves restricting expansion or development of new projects would have a major impact on the Western Australian and Australian economies.

While international emissions trading may offer an economically rational approach to reduce emissions, it also has the potential to place a significant constraint on the development of individual downstream-processing projects in Australia. Value adding projects such as HBI (Hot Briquetted Iron) / DRI (Direct Reduced Iron), where the market price is a relatively low \$130-140/tonne, are unlikely to be financially viable with a CO₂ trading impost of \$20-50/tonne. Thus new developments will potentially locate in countries that are not signatories to the Kyoto

Protocol, without any benefit to the global environment but at a real cost to the Australian economy.

In respect of costs to industry and the community, in 1997 there were 27 resource projects under consideration for development in Western Australia. The expected investment is \$34 billion, with an annual output of \$11.2 billion per annum. This would result in 20,500 jobs during construction, 11,100 employed in the operation, and 44,500 indirect jobs created. Although the impact of Australia meeting its 108% target on this investment on jobs growth is uncertain, concern is raised from ABARE's predictions that a 20-30% reduction in investment could result from an increase in costs due to actions under the Kyoto Protocol. This translates to a loss of investment of between \$6.8 billion and \$10.2 billion and a consequent reduction in employment levels of between 11,100 and 16,700 jobs.

Recommendation 1

The Commonwealth Government must continue to address investor uncertainty arising from the present greenhouse policy vacuum by clearly enunciating its policy position on greenhouse abatement actions. The Commonwealth Cabinet decision of 21 August 2000 to protect Australian industries from a reduction in international competitiveness is therefore welcome and this principle must remain paramount in the Commonwealth Government's consideration of its Greenhouse obligations.

The policy response on greenhouse abatement must take into account implications for international competitiveness, industry structure and the costs of industry adjustment. There may need to be a compensation process for States or industries which "bear the brunt" of the costs of greenhouse abatement actions.

Taxation and Investment Incentives

Western Australia agrees with the comments in the First Report that Australia needs to be vigilant in ensuring the right economic environment is provided (in terms of government regulations and policies) to not only increase the amount of value added production in Australia but also just to retain its current competitive position in raw materials industries.

Taxation

Western Australia is generally supportive of the Commonwealth Government's decision to adopt the recommendations of the Review of Business Taxation to lower the company tax rate, from 36% to 34% in 2000-01, and to 30% from 2001-02. These reductions will help make Australia a more attractive destination for global capital flows.

However, the removal of accelerated depreciation to help fund these reductions is of concern to the Western Australian Government, given the importance of accelerated depreciation in encouraging new capital-intensive projects in the resources sector, and the importance of this sector to the State economy (it accounts for around 25% of gross State product).

The removal of accelerated depreciation will significantly reduce cash flows (in net present value terms), which is likely to reduce the attractiveness of new projects to potential investors. For example, an asset with an effective life of 25 years could previously be written off in just 8 years. If that same asset was acquired after 21 September 1999, it can only be written off over 25 years.

Resources and resource processing projects are typically capital intensive. The Australian and New Zealand Minerals and Energy Council (ANZMEC) submission to the Review of Business Taxation stated that projects involving large capital expenditures, and long operating lives (around 15 years or more), and with marginal to moderate profitability, are more sensitive to the depreciation rate than to changes in company tax rate. This is explained primarily by the timing impact on the cash flows. The complete removal of accelerated depreciation and the introduction of a 30% company tax rate would make such resource projects worse off than under previous arrangements.

The large capital requirements of major value adding and resources sector projects (such as LNG projects) require appropriate taxation treatment to maintain global competitiveness. The removal of accelerated depreciation is likely to reduce the attractiveness of Australia as a destination for investment in large, long-life, capital intensive projects. It will be offset to some extent by the reduction in the corporate tax rate, but the net effect is likely to be negative for new investment in large resources projects.

New projects involving energy production and distribution that act as fundamental drivers for other strategic developments, such as smelters, refineries and petrochemical plants, could be prevented from proceeding.

A study last year by PriceWaterhouseCoopers found that the loss of accelerated depreciation in return for a 30% company tax rate results in the “tax competitiveness” of Australia’s mining industry declining from seventh to ninth out of nine major mining nations⁽¹⁾. The Australian Petroleum Production and Exploration Association (APPEA) has also expressed concern at the possible delay, or cancellation, of a number of large petroleum projects (worth up to \$25 billion) as a result of the new depreciation arrangements.

The Commonwealth Government’s decision to expand the strategic investment coordination process, including consideration of the option of targeted investment allowances, is limited consolation. This replaces the certainty of a transparent, predictable system of tax provision with the uncertainty of negotiable, project specific assistance. This would be detrimental to the attraction of mobile overseas investment for resource processing opportunities. This is particularly important for prospective projects in the early stages of development, which may not even include Australia on a “shortlist” of feasible investment locations because of uncertainty about the level of taxation and other investment incentives which are available. In the absence of accelerated depreciation these mobile, capital intensive investments could find offshore locations more attractive, to Australia’s loss.

Further, the strategic investment co-ordination process is under pressure from constraints imposed by the World Trade Organisation (WTO) restrictions on

subsidies to export companies. The Commonwealth needs to address the difficulty that certain types of assistance are likely to contravene WTO rules.

In addition, the Commonwealth needs to develop a framework for assessing applications to ensure that the worthiest projects are successful.

Investment Incentives

The Commonwealth Government's *Investing for Growth* policy document mentions that incentives for industry "could include grants, tax relief or the provision of infrastructure services". Assistance to date appears to have focused on direct financial assistance through grants or tax relief, although it is understood that the use of grants is under review. To date, the provision of infrastructure services has not been a favoured form of assistance.

Western Australia's preference is for project assistance to be provided in the form of multi-user infrastructure, rather than through direct financial assistance by any level of government.

Provision of multi-user infrastructure reduces the level of risk borne by taxpayers, while still providing significant direct assistance to individual projects. For example, a government contribution to improving infrastructure in a region will have the effect of improving the overall attractiveness of that region for investment as well as lowering costs for existing businesses. Considerable economic benefits are likely to be generated even if the original project which was the catalyst for the investment fails. This is not the case with direct, project specific financial assistance which is effectively an all or nothing bet on a single project. A further advantage is that the infrastructure is still available for use by other potential investors, whereas direct assistance would be lost with the project. The provision of multi-user infrastructure is also WTO compliant.

The Commonwealth could give further consideration to using the taxation system to encourage investment in infrastructure, for example, by way of tax effective infrastructure bonds.

Recommendation 2

In Western Australia's view, current Commonwealth Government policy on the taxation treatment of major projects and the provision of investment incentives impedes Australia's ability to effectively compete for value adding projects.

Commonwealth Government policy on the taxation treatment of large, capital intensive projects and the provision of investment incentives needs to be reviewed to ensure that it enhances the international competitiveness of Australia as an investment destination for major resource processing projects and that it meets our international WTO obligations.

Cabotage

All vessels engaging in the Australian coastal trade do so under a system of licences or permits available under certain conditions and applicable to both Australian and international operators. The *Navigation Act 1912* (Cwth) applies Australian wage standards to vessels operating with a licence in domestic trades, regardless of the nationality of the ship or the crew.

The Commonwealth Government's stated policy is to wind back cabotage - the practice of limiting access to a country's coastal trade to national ship operators or national flag vessels with national crews. Western Australia supports this position.

Cabotage in Australia is achieved by the interaction of the *Navigation Act 1912*, Customs requirements and Immigration provisions. About 90% of the Australian coastal trade is undertaken by Australian manned ships despite a significant cost disadvantage.

The Shipping Reform Group has reported to the Commonwealth Minister for Transport that reform of the cabotage system would provide substantial benefits to the Australian economy by increasing the frequency and reliability of coastal shipping services and reducing freight rates. Australian industry would also have improved prospects in both the export and import-competing sectors.

The improvement in export and import-competing sectors would largely be derived from competition on coastal trades.

As an example, the uncompetitive cost of marine transportation of petroleum products to and from Australian-based refineries, coupled with expansion of refining capacity in Asia and the Middle East, has resulted in increased product being imported from these areas. A growing number of overseas refineries with larger and more modern plants are able to produce petroleum more competitively than Australian industry which is not able to capitalise on the natural advantage of the relative closeness between producer and consumer due to the high cost of transporting product that short distance. Use of land transport is not a realistic option on commercial, environmental or safety grounds, due to the volume of product shipped.

The Sea Freight Council of Western Australia (SFCWA) believes that higher shipping costs as a result of cabotage have acted as an impediment to the further development in Australia of downstream processing.

The impediment to potential project development caused by the cost of Australian shipping is illustrated in the case of a planned petrochemical industry in the Pilbara region of Western Australia. A major chemical company has provided the following estimates of comparative shipping costs:

Table 1: Comparative Shipping Costs: Petrochemical Products

Product and Route	Australian Flag Cost \$/tonne	Foreign Flag Cost \$/tonne	Difference %
Vinyl Chloride Monomer Dampier/Geelong	67	48	28
Ammonia Dampier/Gladstone/Newcastle	80	55	31
Caustic Soda Dampier/Fremantle	55	30	45

Based on projected demand levels for these three products, the SFCWA estimates that savings in shipping costs through removal of cabotage to provide greater access to foreign flag carriers for the coastal trade would amount to \$22.5 million per annum.

BHP has also provided figures on its iron ore task relative to its competitors' position in Korea which confirm the cost disadvantage faced by Australian industry as a result of cabotage. In percentage terms using a 150,000 dwt bulk carrier, it currently costs 33% more in vessel cost terms to transport iron ore from Port Hedland to New South Wales by an Australian crewed vessel than it does to deliver iron ore to Korea in a comparable foreign flagged vessel. This is even more of a concern when it is realised that Port Kembla is around 3031 nautical miles from Port Hedland, while Korea is about 3,400 nautical miles away.

In addition, Mobil Oil has provided details of the additional costs on coastal petroleum products trade of the current cabotage system. On the basis of a tanker carrying 30,000 tonnes of petroleum products, Mobil estimates the following cost differentials:

Table 2: Comparative Shipping Costs: Petroleum Products

Route	Australian Flag Cost US\$/tonne	Foreign Flag Cost US\$/tonne	Difference %
Melbourne/Kwinana	14.13	9.80	31
Kwinana/Botany	19.35	13.41	31
Geelong/Cairns	18.73	13.00	31

Recommendation 3

The Western Australian Government supports the stated policy of the Commonwealth Government to reform the system of cabotage which restricts competition on interstate shipping routes and increases industry costs. The State Government would encourage the Commonwealth to provide details of how it proposes to implement the reform of cabotage policy.

State Government Policy Issues

Together with Commonwealth Government policy, Western Australian Government policy also influences the level of value adding undertaken in the State. A number of key State Government policy issues which impact upon raw materials processing in Western Australia are discussed below.

Responsible Economic Management

The State Government's priority is responsible economic management to ensure that Western Australia continues to be a highly competitive, stable investment environment. The benefits of deregulation and privatisation of transport, telecommunications and energy infrastructure at both the State and national levels are apparent in lower costs for consumers, including industry.

The State enjoys the highest possible credit rating, AAA, with international credit rating agencies Moody and Standard & Poor. It is the strongest growing State economy in Australia, with unemployment consistently below the national average, bolstered by labour market reforms which have introduced flexible work practices and increased investment in education to provide a labour force with the skills and flexibility required to meet the requirements of expanding resources, processing and advanced manufacturing industries.

Ongoing Energy Reform

It is the unique combination of mineral and energy resources found in Western Australia that provides the basis for the development of resource processing industries in this State. The dominant energy resource is natural gas and it can be used directly as a feedstock in industrial processes or indirectly through the use of electricity generated from natural gas.

Government energy policy has focused on creating the environment for a more competitive energy market, with the aim of bringing about lower cost, reliable energy supplies. This can only be achieved by expanding the role of the private sector and shifting the role of Government to one of facilitating and regulating the development of the industry, rather than being a direct market participant.

The size and diversity of Western Australia's natural gas supplies means there are abundant reserves to support the long term use of gas, including the export of gas as LNG to consumers in the rest of the world. The emergence of a number of gas producers has meant the development of a competitive gas market that has driven down the price of natural gas. Development of a competitive market has been accelerated by reform of the State's energy utilities, including the establishment of separate gas and electricity utilities and the privatisation of all major natural gas transmission pipelines.

The infrastructure components of energy supply, such as natural gas pipelines and electricity transmission and distribution networks, are now covered by open access regimes. Access is available to both private and publicly owned facilities on a non-discriminatory basis.

The combination of these factors means that natural gas is available on a competitive basis in the key industrial and resource rich Pilbara and Goldfields regions and to industry and major population centres in the South West of the State.

Industrial Land Availability

In order to take advantage of the emerging opportunities for the further processing of its natural resources the State must plan for the provision of land on which these activities may take place.

Through a process of long-term planning the Government, through its agencies (principally LandCorp), can establish Strategic Industrial Areas (SIAs) that meet all of the requirements for social, environmental and economic viability. Problems with heavy industry areas in other parts of the world have resulted from the failure to develop them in a long-term planning context, and without adequate buffer areas and appropriate infrastructure.

The State Government has acted to secure adequate land, including buffer areas, for SIAs. This step is taken first in the planning process to ensure that land uses and other activities incompatible with heavy industry do not preclude the development of these sites.

SIAs are being developed around sea ports as gateways, and are integrated into land based transport as hubs connected to mining or other industrial activities. Where possible, the SIAs are selected on the basis of their ability to incorporate a number of complementary industrial activities so as to provide synergies for the area as a whole and benefits to individual projects that would not otherwise be realised.

Planning and site investigation is underway for new SIAs at Oakajee (north of Geraldton), Boodarie (Port Hedland), Maitland (Dampier) and Breton Bay (north of Perth) and into the expansion of the Kemerton industrial estate north of Bunbury. These sites will be suitable for industries that will process local and regional raw materials such as iron ore, salt and gas.

Other SIAs being progressed by LandCorp in Western Australia include:

- Avon Special Industrial Estate near Northam;
- Canning Vale General Industrial Park in Perth;
- Enterprise Park – General Industrial Estate in Wangara;
- Henderson Marine Industrial Estate (Special);
- Jervoise Bay Special Industrial Estate south of Fremantle;
- Kemerton Heavy Industrial Estate near Bunbury;
- Mirambeena Special Industrial Estate in Albany;
- Mungari Heavy Industrial Park in Kalgoorlie; and
- Narngulu Heavy Industrial Park inland from Geraldton.

All areas selected for investigation as possible sites have their suitability assessed by multiple criteria including environmental acceptability, technical feasibility and economic viability.

An important ingredient in the management of SIAs is the process through which project operators and the community in proximity to an SIA can raise issues and concerns about the operation of the area and see them addressed. For this purpose advisory boards and community consultation committees have been established and given an active role in the planning and management of SIAs.

Impediments to Land Availability

A number of major impediments to the provision of land for industry have been identified. These include the conflict with the community over perceived impacts, environmental constraints that add time and cost to development, and land tenure issues including Native Title and reservation of land for environmental protection.

Achieving a balance between the competing interests to ensure the economic and social benefits of industry can be achieved is a complex and time-consuming process. LandCorp, as part of Government and possessing project management skills, is able to negotiate many of these issues on behalf of industry.

Infrastructure Availability

Western Australia already has well developed industrial infrastructure, much of it established to support the State's resources sector.

The establishment of new SIAs requires the development of substantial new infrastructure, particularly deepwater ports. By their nature, the SIAs lend themselves to the development of multi-user infrastructure, thereby lowering overall costs for individual users.

The private sector is being encouraged to play a greater role in the provision of infrastructure to users. It is nevertheless recognised that the time horizon for private sector returns from infrastructure provision may be shorter than that of the Government. In this circumstance some Government contribution to the provision of infrastructure may be justified.

In the development of SIAs, the Western Australian Government will look to provide basic infrastructure in the form of roads, drainage and other infrastructure that will be in common use. It is the Government's intention to recoup the cost of providing this basic infrastructure from the sale or lease of the serviced industrial land.

For any additional infrastructure the Government will look to the private sector as the supplier of first choice, with the expectation that private sector providers will recover their outlays from user charges to industry within a commercially acceptable time frame.

The Government recognises that there will be circumstances in which private sector infrastructure providers (and commercialised Government trading enterprises) will

find the provision of some multi-user infrastructure uncommercial because of the time frame over which a return would be received. In this situation, and if there are long term benefits to the State, the Government will consider means to make the provision of such infrastructure commercially attractive to developers or undertake to provide the infrastructure itself.

Conclusion

The above discussion highlights that with its strong and competitive economic environment and expanding infrastructure base, Western Australia offers enormous potential for increased raw materials value adding projects.

The second part of this submission provides a case study analysis of the impediments to and drivers for the establishment of the aluminium and magnesium metals industries in Western Australia. An overview of Western Australia's agricultural processing market and deterrents to industry is also included.

CASE STUDY ANALYSIS

Aluminium

Western Australia's Alumina Industry

The mining of bauxite is a major value adding industry in Western Australia.

The Darling Range bauxite deposits, in the State's South West, were discovered in 1957 by the then Western Mining Corporation (now WMC Ltd). A jointly owned unlisted company Alcoa of Australia Limited, owned by Western Mining and the Aluminium Company of America (Alcoa), was formed in 1961 to develop the deposits.

The ratification of a State Agreement (the *Alumina Refinery Agreement Act 1961*) between the Western Australian Government and Alcoa in 1961 granted Alcoa bauxite mining rights to all Crown land within an area of 12,619km², known as Mining Lease 1SA (SA for Special Agreement). The area of land held by Alcoa under 1SA was significantly reduced when the Company relinquished land in 1994.

Development of a bauxite mine at Jarrahdale and an alumina refinery at Kwinana was begun in 1961. The mine and refinery were commissioned in 1963 with an initial capacity of 200,000 tonnes per annum (tpa). The Kwinana refinery has since gone through a series of expansions to its now present capacity of 1.9 million tpa (Mtpa) of alumina.

In 1969, work commenced on Alcoa's Pinjarra refinery and associated mine at Del Park-Huntly. The Pinjarra refinery's initial capacity of 210,000tpa of alumina has been subsequently expanded to 3.3Mtpa.

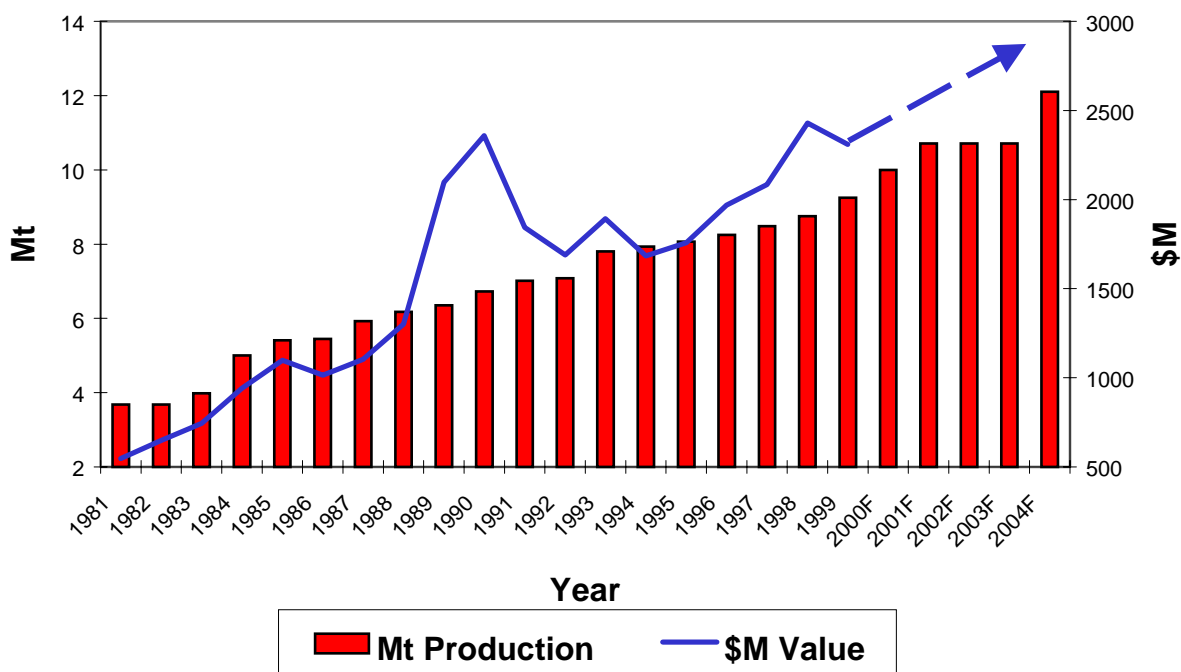
At the same time Alwest, a subsidiary company of News Ltd, entered into a State Agreement with the Western Australian Government. The *Alumina Refinery (Worsley) Agreement Act* was subsequently ratified by Parliament in 1973 with what had become the Worsley Joint Venture consisting of Reynolds of the USA, the Shell Company of Australia and a consortium of Japanese companies. The State Agreement granted the joint venturers the right to mine bauxite within Mining Lease 258SA, an area of 10,500km² located to the east of the Alcoa deposits. Worsley has since voluntarily relinquished more than 75% of this area, so that the current size of 258SA is 2,366km². After the Worsley State Agreement was ratified, however, economic conditions intervened delaying the Worsley development until 1980.

The eventual development of Worsley coincided with the development of Alcoa's third mine and refinery at Wagerup. Commissioning of the Wagerup and Worsley refineries commenced in 1984. Both of these refineries have since gone through a series of expansions. Wagerup now has a capacity of 2.2Mtpa, after the 400,000tpa expansion completed in 1999. At a cost of nearly A\$1.2 billion, the Worsley refinery is now commissioning a third alumina train, lifting capacity at the site from 1.8Mtpa to 3.1Mtpa.

Western Australia is now the world's largest alumina producer with a total production in 1999 of approximately 9 million tonnes and an associated value of

A\$2.3 billion. The recent expansions should see annual production rising to 10.7Mtpa in 2001 (see Figure 1).

Figure 1: WA Alumina Production and Forecasts (1981-2004)



Source: DME, DRD Forecasts

Western Australia's Competitive Advantage

Western Australia's alumina refineries are amongst the lowest cost alumina producers in the world. International resources analyst James F King estimates that Worsley's refinery ranks (in costs of production per tonne of alumina produced) as the second most cost-efficient in the world at US\$102/t, followed by Alcoa's Pinjarra and Wagerup refineries at US\$111/t. Worsley's 1.22Mtpa expansion now nearing completion is expected to position it as the lowest cost alumina producer in the world.

The Western Australian alumina industry's competitive advantage is based on:

- extensive bauxite resources which although low in alumina content (32% Al_2O_3) are amenable to low temperature large scale processing in the Bayer Process;
- expertise in the processing of local ore through the Bayer Process and the establishment of Research & Development facilities (both Government and company funded) to support the alumina industry;
- the refineries are located close to the bauxite deposits and other existing industrial infrastructure suitable for the efficient transport of raw materials and export of bulk commodities;
- being close to social infrastructure with a ready access to labour and services; and

- the availability of skilled engineering and other services with experience built up servicing the alumina industry in the State over the last forty years.

Potential for Value Adding to Western Australia's Alumina Industry

It would be easy to believe that the expansion of the alumina industry has proceeded at a steady, assured pace over the last four decades. The reality is, however, quite different.

Expansion of the Western Australian alumina industry competes against expansions elsewhere and is dependent on the economic conditions prevalent at any period in time. Clearly, a number of important factors come into play and must be favourable for a positive investment decision to be made. The following three instances highlight this:

1. It took 14 years from when the initial planning for Worsley began to the first production of alumina which occurred in 1984.
2. Alcoa has been planning a major expansion of its Wagerup refinery for over six years. The foundations for the expansion were built in 1994-95. Final commitment for the expansion is yet to be made.
3. The mid-1980's heralded a period of economic growth in the world and with it strengthening demand for alumina. Alumina production in Western Australia grew strongly in this period. It was assisted by the supply of natural gas through the Dampier to Bunbury Natural Gas Pipeline. Alcoa was one of the foundation customers for the pipeline and remains its largest customer purchasing on average 40% (200TJ/day) of its throughput.

Expansion of the Alumina Industry

Bauxite reserves held by Alcoa and the Worsley Joint Venture in the South West of the State are close to 3,000 million tonnes and are conservatively estimated at sufficient for a life of 100 years at current production levels. There are also extensive bauxite reserves (in the region of 600 million tonnes) in the Mitchell Plateau in the Kimberley region. The Mitchell Plateau reserves are extremely remote and are considered to be uneconomic at this time.

There are clearly sufficient reserves in the South West to support further expansions to the existing refineries and to support a new refinery in the region. Alcoa has environmental approval to expand its Wagerup refinery by a further 1Mtpa. Worsley has approval to expand its refinery by a further 400,000tpa, bringing its final capacity to 3.5Mtpa.

The timing of these expansions are uncertain. In forecasting the expansion capability of the Western Australian alumina industry over the next few years (detailed in Figure 1), the Department of Resources Development assumed the expansions to be in place by 2004.

Alumina is a low value commodity. Recent prices on the alumina spot market have been strong, however, the long-term alumina price has averaged between US\$150-\$200/t. The majority of alumina sales (>90%) are based on contract. Further expansions will only go ahead if Western Australia maintains its position as a low cost producer of alumina relative to other locations in the world.

Aluminium Smelting

The Western Australian Government has sought to encourage the development of an aluminium smelting industry in the State at every opportunity.

Aluminium smelting is extremely power intensive with modern smelters using approximately 14MWh/t of aluminium metal produced. Table 3 demonstrates the degree of value adding to be obtained in the further processing of bauxite.

Table 3: Value Adding of Bauxite

Product	Price	Value Added Coefficient
Bauxite	A\$20/t (estimate)	
Bauxite to Alumina	A\$300/t of alumina	4.28
Alumina to Aluminium	A\$2,500/t of aluminium	4.17
<i>Bauxite to Aluminium</i>		<i>17.8</i>

Multiplier Impacts of Value Adding: Alumina to Aluminium

The benefits from value adding to aluminium are considerable. A 250,000tpa aluminium smelter development would require a capital investment in the region of A\$1.5 billion and provide permanent direct employment of 500 jobs. Export revenue would be in the region of A\$625 million per annum. With the economic multipliers applied the full impact on the economy is much greater (see Table 4).

In summary, a 250,000tpa aluminium smelter could generate up to A\$1.59 billion worth of economic activity in the State per annum and provide total employment for 3,990 people with an annual income of A\$109 million.

With the development of a smelter, further downstream opportunities exist in the aluminium industry. Value added activities that are considered to be most viable in Western Australia are the production of aluminium alloys and die castings for the automobile industry.

Table 4: Economic Impact of Value Adding to Aluminium

	Direct Effects	Indirect Effects Type I ¹	Indirect Effects Type II ²	Total Impact
Output Multiplier		2.05	2.55	
Income Multiplier		3.16	4.64	
Employment Multiplier		4.18	7.99	
Output	A\$625M	A\$656M	A\$312M	A\$1,593M
Incomes	A\$23.5M	A\$51M	A\$35M	A\$109M
Employment	500 jobs	1,590 jobs	1,900jobs	3,990jobs

[Notes to Table 4: The economic modelling was carried out by the Department of Resources Development's Project Analysis System using Western Australian Industry Wide Multipliers. The actual multipliers are for non-ferrous base metal production.

¹Type I multipliers includes all production and services contracted by the project but excludes consumption flow-ons.

²Type II multipliers includes all production and consumption flow-ons.]

Raw Materials for an Aluminium Smelter

A 250,000tpa aluminium smelter would require the following inputs:

- 490,000tpa of alumina
- 95,000tpa of calcined petroleum coke
- 25,000tpa of pitch
- 4,500tpa of aluminium fluoride
- 3,500 GWhr of electricity
- 1-2 GL of water
- Labour approximately 500 jobs

Of the above inputs, the supply of competitively priced power for a smelter poses the greatest challenge for the State. A 250,000tpa smelter would require in the region of 450MW of base load electricity. This would require new power generating facilities. Fuel used could be either coal or natural gas. New generating facilities could be expected to use the best available and most efficient technology based on gasification plants if coal or combined cycle/cogeneration plants if gas. Depending on the location of a smelter, new transmission lines and other electricity transmission line infrastructure could be required.

The logical location for an aluminium smelter is in the South West of the State, near the alumina supply. Previous studies have identified the Kemerton Industrial Park, 20kms north of Bunbury, as a suitable location for an aluminium smelter. The Kemerton Industrial Park is a zoned buffered heavy industrial estate which was established in the late 1980's. The State Government recently announced plans to expand the Park making it even more suitable for industries of this type.

Kemerton is well located in regard to the alumina refineries. Alumina trains from Wagerup and Worsley pass the estate on its eastern side travelling to the port at Bunbury. To link the estate to the main railway will require a 9km railway spur from the State railway line. This link has been planned together with an upgrade of the rail line to the Port of Bunbury to accommodate more industry at Kemerton.

There are a number of other sites in the South West which could be suitable for an aluminium smelter. One possibility is a site at Collie, approximately 30km to the north east of Bunbury. This site would be close to coal deposits for electricity generation and the Worsley alumina refinery.

Other raw materials such as coke, pitch and aluminium fluoride could be imported most likely through the port of Bunbury and transported to the smelter by road or rail.

Alternatively, industries could be established to service the plant and the export market. There are plans for an aluminium fluoride plant to be developed at Kwinana, just south of Perth. The establishment of an aluminium smelter would improve the prospects for a Western Australian aluminium fluoride plant.

Aluminium product would be transported from the smelter by road or rail to the port at Bunbury for shipment by break bulk or by container. This would be dependent to an extent on the degree of value adding carried out by the smelter. Production of aluminium ingots could be handled by break bulk cargo. Break bulk cargo is a term used for material that can be strapped on to pallets and transported by ship without the need for containers.

Further processing of the aluminium, such as to die casting, would almost certainly have to be containerised. At this time, the only container terminal operating in Western Australia is at Fremantle. Bunbury Port can currently only handle bulk cargo although it has plans to develop container-handling facilities in the future. Bunbury Port is a major exporter of alumina, mineral sands and woodchips.

Impediments to Expansion of the Aluminium Industry

A number of impediments to the expansion of the aluminium industry in Western Australia have been identified.

Energy Prices and the Impact of Greenhouse Gas Policies

Aluminium smelters require large amounts of electricity and are significant energy users. The availability of competitive and secure energy supplies is very important to the future of alumina production and aluminium processing in Western Australia. Energy deregulation is now providing opportunities for sustained competitive energy prices which could make an aluminium smelter viable.

The State is addressing the issue of cheaper power for aluminium smelting through the reform of the energy sector to make power generation and distribution more efficient and competitive. Key initiatives by the State Government include the

privatisation of commercial services, including the Alintagas distribution system and the Dampier to Bunbury Natural Gas Pipeline, as well as the freeing up of the electricity generation and distribution markets. Competitive access to natural gas pipelines is promoted through the National Pipelines Access Code arrangements.

The issue of greenhouse is of significant importance to the future of alumina and aluminium processing in the State. The introduction of policies such as carbon/energy taxes and emissions trading permits in Australia, without an equitable system being introduced worldwide, would have a serious impact on the industry's international competitiveness. Western Australian alumina companies are already involved in the Commonwealth Government's Greenhouse Challenge program.

Access to Industrial Infrastructure

Export orientated industries need to have access to modern infrastructure. The State Government is working towards the timely provision of infrastructure, dedicated water supply, improved roads, transport, ports and electricity. Dedicated industrial areas are being planned close to infrastructure in the Pilbara (Boodarie and Maitland), Mid West (Oakajee), Perth (Kwinana and Breton Bay) and the South West (Kemerton) regions.

A vital infrastructure issue for an aluminium smelter is the supply of electricity. Depending on the location of the smelter, new or upgraded electricity infrastructure (including generating facilities and transmission lines) could be required to ensure that the delivered cost of electricity is competitive.

Access to Resources

Access to the bauxite resource is very important. The South West bauxite deposits are spread over a wide area, mainly in the State's forests. Western Australian alumina companies have an excellent environmental reputation for rehabilitation that has been earned over the last 20 years. According to the Western Australian Department of Environmental Protection, the State's bauxite mining industry fully complies with the *Environmental Protection Act 1986* (WA) and is an industry leader in environmental performance.

There are competing land uses and environmental regulations which can reduce the access of Alcoa and Worsley to bauxite held on their leases. In recent times Alcoa has given up areas of land due to the Regional Forest Agreement Process. It is important that Commonwealth and State Governments' processes recognise the impact of policies which act to reduce the access of resource companies to mineral deposits held.

Microeconomic Reform

- Rail

Westrail, the State-owned railway company, currently transports:

- bauxite from Pinjarra to the Kwinana alumina refinery;

- caustic soda (Western Australia imports 1.2Mtpa of caustic per year for use in the alumina industry) from Kwinana to Pinjarra and from Bunbury to Worsley, Wagerup and Pinjarra; and
- the finished alumina product from the refineries to Kwinana and Bunbury ports for shipment.

Reform to the State’s rail system is continuing with the State Government seeking to sell the Freight Division of Westrail. The Freight Division of Westrail has improved its performance over recent years. It is important that rail continues to improve its performance for the further development of alumina in the State.

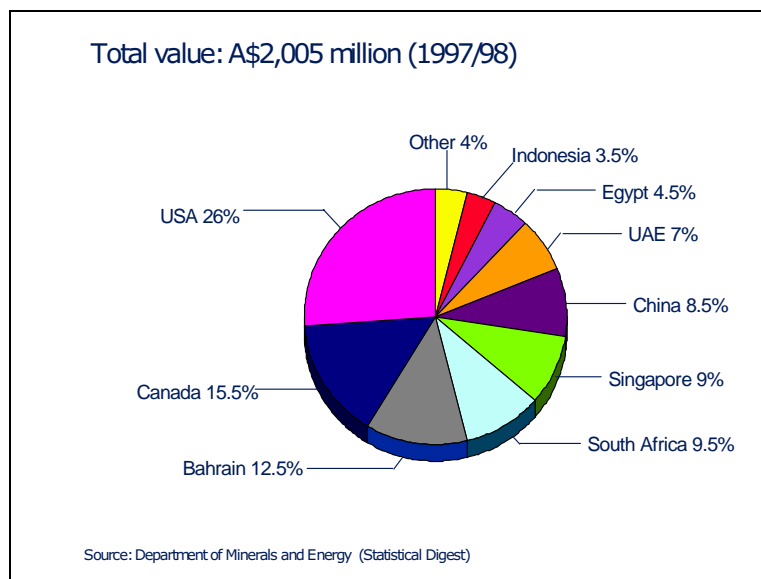
- Shipping

To a large extent, Western Australia’s ports are competitive in the shipping of bulk commodities overseas. The development of an aluminium industry would require other shipping forms such as break bulk or containerised transport. The competitiveness of the State in this area is less as the volume of shipping services can effect the costs. In addition, Fremantle has the only container port in the State.

- Market Access

The ability to access overseas markets is a fundamental issue for any industry reliant on exports. The Western Australian alumina industry is relatively well positioned in this respect as it exports an intermediate product to countries such as the United Arab Emirates, South Africa and the United States. A breakdown of the State’s alumina industry export destinations is detailed in Figure 2.

Figure 2: Alumina Industry Export Destinations



A Western Australian aluminium smelter would seek to access markets predominantly in Asia. The Asian region is not a large producer of aluminium. Only China (2Mtpa) and India (600,000tpa) have large aluminium industries, whilst Indonesia has a small smelter (100,000tpa). The aluminium industries in these countries hardly satisfy domestic demand, with China needing to import some 500,000tpa. The remaining Asian countries are completely reliant on imports. The major suppliers to Asia are the old Soviet Union countries, the Middle East, South Africa and Australia/New Zealand.

Despite this some tariff and non-tariff barriers exist, particularly in downstream aluminium products.

- Investment Attraction

The aluminium industry is largely controlled by a small number of international companies. These companies are prepared to go to any location where they perceive that a sustainable competitive advantage can be obtained. Typically, these companies will establish aluminium smelters where low cost electricity is available and/or industry incentives such as state supplied infrastructure, high depreciation allowances and tax incentives are available.

The introduction of the Goods and Services Tax (GST) and the lowering of the corporate tax rate will enhance the attractiveness of Australia for such projects. These changes have, however, been offset by the abolition of accelerated depreciation allowances for large projects.

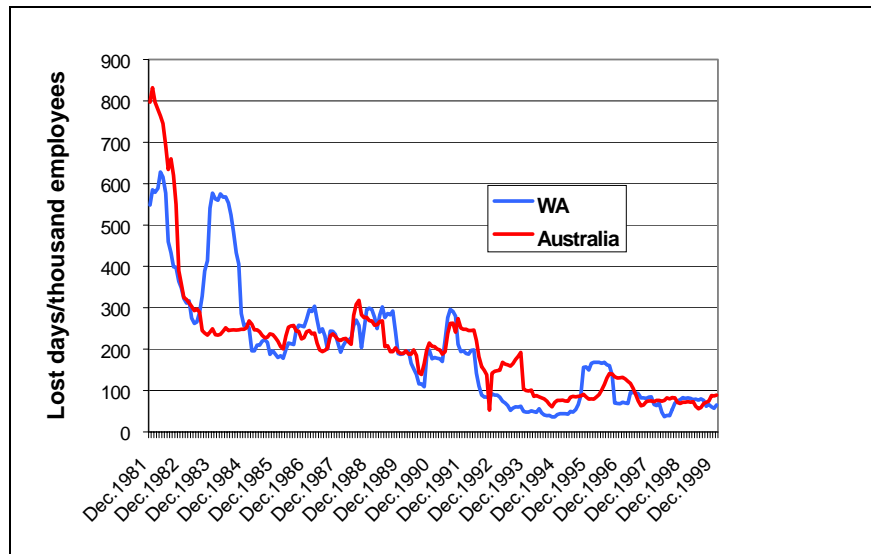
- Construction Costs

Western Australia, and certainly other regions in Australia, is perceived as having high construction costs and being prone to lost time due to industrial action. Part of the reason for this is the size of the country and the remoteness of many of the construction locations. The cost of construction labour is another factor.

Western Australia's industrial climate has improved significantly over the last 20 years. Statistics show that lost time for industrial action has been falling since the late 1980's. The trend in Western Australia closely follows the national trend, as exhibited in Figure 3.

Workplace Agreements and Individual Contracts, while not universal, have largely been well accepted by the Western Australian mining and mineral processing industries. By and large, industrial relations in operating industries in the State are very good. However, industrial relations in the construction industry remain difficult at times. This reflects the highly vulnerable nature of large projects in the construction phase. The larger and the more remote the project being constructed, the greater the potential problem.

Figure 3: Industrial Action 1981-1999



Source: Australian Bureau of Statistics

Magnesium

Western Australia's Magnesium Industry Potential

The drivers for, and impediments to, the development of a magnesium industry in Western Australia are very similar to those for aluminium, so the analysis for aluminium applies in general to the magnesium industry, although the specifics may vary.

Western Australia does not currently have a magnesium industry, but the potential exists for magnesium production from two sources:

1. Bitterns from solar salt production (carnallite = $\text{KCl} \times \text{MgCl}_2 \times 6 \text{H}_2\text{O}$).
2. Magnesite (magnesium carbonate = MgCO_3) deposits in the Goldfields and near Esperance.

Magnesium from Bitterns

A magnesium-from-bitterns plant would ideally locate near a solar salt producer and close to cheap gas for power generation. There is one immediately available site that meets these criteria, Maitland Industrial Park next to Dampier Salt, and two sites that could potentially be used at Onslow and Port Hedland.

Capital Cost

Building a magnesium-from-bitterns facility at a Pilbara site would attract a higher construction cost than building near capital cities around Australia which themselves have a 5% higher project development cost than the Gulf Coast of the United States of America. The Pilbara region attracts a construction penalty of around 15% in comparison to Kwinana.⁽²⁾

Infrastructure

A 50,000tpa magnesium-from-bitterns plant as proposed by HCC/Multiplex Joint Venture partners would need a container loading facility at Dampier, Port Hedland or Onslow. There would also be other infrastructure requirements such as access to electric power, gas, water and transport infrastructure to move the magnesium metal ingots from the processing location to the port for export.

Energy Cost

Electrolytic magnesium production demands between 10-18kWh of electricity per kilogram of metal (depending on technology). Due to the proximity of abundant gas resources at sites near the Burrup Peninsula and Onslow, gas for power generation (if the company decides to generate its own electricity) and syngas production for conversion of chlorine into hydrogen chloride if the non-chlorine route is chosen

(most likely scenario) could be available at a lower cost than elsewhere in the State. This could offset, at least partially, the higher construction cost in the long run.

The Department of Resources Development, using some input figures provided by SIEMENS Australia Ltd., has looked into the power cost issue at various sites in Western Australia. It was found that an electricity price of A\$0.03/kWh could be achieved under some assumptions.⁽³⁾ At this electricity price the project could be viable.

Cost of Living and Labour Costs

Cost of living in Karratha and Port Hedland is around 14% higher than in Perth due to higher housing, food, clothing costs etc. Labour costs in the North are around 15% higher than in metropolitan Perth, but the gap is expected to narrow as the population grows and infrastructure and community services expand.^(2, 4)

Magnesium from Magnesite

Anaconda Nickel has announced plans⁽⁵⁾ to mine magnesite (magnesium carbonate) deposits near Lawlers in the Goldfields. The mineral would be refined locally to produce magnesium oxide (magnesia). Part of it would be used in the nickel refining process at Murrin Murrin in the north eastern Goldfields. The intended magnesium metal output would be around 100,000tpa.

Energy Cost

Magnesium production is very sensitive to power prices since up to 50% of the metal's costs are for electricity. Power prices in the Goldfields region are still relatively high due to its remoteness and the cost of gas transport to the region so Anaconda propose that the bulk of the magnesia would be transported to an industrial site near Geraldton (probably Oakajee) for magnesium metal production. Here a power price of around A\$0.03-0.035/kWh⁽⁵⁾ could be achieved, which would make magnesium metal production a viable option, provided the transport costs do not prove to counterbalance the energy savings.

Western Australia's Agricultural Industry

Western Australia's Comparative Advantage

With its favourable factor endowments, Western Australia enjoys a comparative advantage in agricultural production and exports. The State grows a wide range of agricultural commodities including the export-oriented broadacre crops (predominantly wheat), wool, sheep, cattle and other livestock.

In 1998-99, the gross value of agricultural production in Western Australia stood at \$4.9 billion, which is about 15 percent of national production. During the past two decades, the agricultural sector in Western Australia grew at an average rate of over 6 percent per annum.

Potential for Value Adding to Western Australia's Agricultural Industries

Although Western Australia is a major producer of agricultural commodities, and has a wealth of natural advantages including a clear environment as well as a stable and strong economy, not much agriculture-based processing takes place in the State. For example, Western Australia accounts for only 7 percent of food manufacturing in Australia.⁽⁶⁾

As downstream processing is felt to be important for ensuring a continued growth in agricultural production in Western Australia, for a long time an important policy objective has been to expand the local processing of primary products in the State before export.

Impediments to Expansion of Agricultural Industries

Unfortunately, not much is known as to why Western Australia has failed to keep pace in agricultural processing. Several past attempts to establish processing plants in Western Australia (such as pig processing) were not successful. Currently, several processing projects are under consideration, for example, an Ultra-High Temperature milk processing plant.

Whether or not private producers engage in agricultural processing obviously depends on its profitability. Therefore, it is important to investigate the factors that make processing unattractive to the private sector.

Do the impediments stem from distortions of input markets for labour and for transport services, or are they associated with regulations affecting output markets? From a public policy perspective, are the social benefits derived from agricultural processing greater than the private benefits generated? If yes, then processing is economically sensible from the viewpoint of society as a whole, and there is a case for government policies to encourage further processing.

A related issue is the extent to which downstream processing would stimulate rural and regional Western Australia by providing additional direct employment as well as the provision of support services.

Progress in the Potential of Agricultural Industries

Since 1995, Agriculture Western Australia has made substantial progress in generating information on the contribution and potential of value adding from local processing of primary products.

In 1996 a project was undertaken to develop 'value chain' computer spreadsheet models for 19 major agricultural commodities produced in Western Australia. The purpose of the project was to estimate value added components of major agricultural commodities, identify commodities and industries with potential for value adding through local processing of primary products, and to determine their relative importance to the State economy.

With the 1994-95 inputs and outputs data on production, processing and marketing value added components for wheat, barley, oats, canola, lupins, beef-cattle, sheep-meat, pigs, chicken, eggs, apples, bananas, carrots, cauliflowers, cutflowers, potatoes, wine, dairy, and wool were estimated and reported (see Agriculture and the Western Australian Economy: Value Added Contribution of Agricultural Commodities (1997); attached). Some of the included computer spreadsheet models may be useful for the Inquiry's industry case studies.

Recently, Agriculture Western Australia in collaboration with the Economic Research Centre developed a research proposal on the issues of downstream processing and applied for the Australian Research Council Strategic Partnerships with Industry Research and Training Scheme (ARC-SPIRTS) research grants.

One of the objectives of the proposed research product is to "identify the deterrents to agricultural processing in Western Australia, and to quantify the effects of additional processing activities". The flow-on effects to the rest of the economy from new processing activities will be estimated and the role of market distortions in inhibiting these activities will be investigated.

Agriculture Western Australia has been undertaking a considerable amount of work related to the terms of reference of the House of Representatives Inquiry. For further input into the federal analysis, contact Mr Graeme Wilson, Director, Policy and Planning, Agriculture Western Australia on (08) 9368 3663.

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