The Parliament of the Commonwealth of Australia

Of material value?

Inquiry into increasing the value added to Australian raw materials

First report

House of Representatives
Standing Committee on Industry, Science and Resources

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Canberra

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Foreword

On 20 April 1999 the Minister for Industry, Science and Resources asked the Committee to inquire into the prospects of increasing the value added to Australian raw materials. The terms of reference for the inquiry specified that it should commence with "an evaluation of the current state of value-adding in Australia, and how that compares internationally". This first report of the inquiry concludes that evaluation, and provides a base to examine the more detailed issues listed in the terms of reference.

The Committee has so far received mixed signals on how successfully Australia is adding value to its raw materials. We are pleased to note that Australia's exports of processed raw materials – especially elaborately transformed manufactures – have been increasing at a rate well in excess of industry output. However, growth in the raw materials processing industries (on average, 1.2 per cent a year in the decade to 1998-99) has not kept up with the country's increasing raw materials output over the same period. Although some processing industries have performed better than others, it appears that Australia has had increasing opportunities to develop these industries and has not fully realised the potential benefits.

While decisions to encourage certain industries must not divert national resources from where they can most efficiently be used, the Committee believes that there is much that governments and industry can do to enhance Australia's prospects of adding further value to our raw materials.

The Committee will now undertake case studies of the aluminium, magnesium, wine, dairy and grains industries. We will use those case studies to better identify the drivers of successful value-adding in Australia, and the measures needed to overcome any impediments. We are now seeking further public input on these matters.

At this early stage of the inquiry, our intention is to record the Committee's impressions of the current state of value-adding in Australia and to stimulate further discussion. We therefore have not made formal recommendations to the

government in this first report. Such recommendations will, however, be made in our final report.

As noted in Chapter 6 of this report, issues debated in the inquiry to date include business taxation, the provision of infrastructure in rural and regional Australia, transport systems, government policies in support of research and development, environmental legislation, Australia's greenhouse obligations, protectionist trade policies in overseas markets, marketing efforts, assistance to local companies in identifying export and investment opportunities, distribution chains, resource licensing and permit arrangements, and the ongoing reforms in the energy sector.

As the Committee's Chairman I thank Deputy Chair Mr Allan Morris MP and our fellow members for their assistance during this first stage of the inquiry.
I particularly thank my colleague Mr Jim Lloyd MP, who in my absence chaired the Committee during the public hearings and the early drafting of this report. On behalf of the Committee I also extend our gratitude to our adviser from the Department of Industry, Science and Resources, Mr Paul Bellchambers.
Mr Bellchambers' expertise was invaluable in the preparation of this report and the timely conduct of the first stage of the inquiry.

The Committee is, of course, particularly grateful to those organisations and individuals who have made submissions to the inquiry and appeared as witnesses at public hearings. The Committee looks forward to further public input during the forthcoming case studies.

Geoff Prosser MP
Chairman

Membership of the Committee

Chairman The Hon Geoff Prosser MP

Deputy Chair Mr Allan Morris MP

Members

The Hon Bruce Baird MP (to 21/6/99)

Mr Mal Brough MP (from 21/6/99 to 8/3/00)

Mr Michael Hatton MP

Mr Tony Lawler MP

Mr Jim Lloyd MP (Chair from 2/9/99 to 17/2/00)

Mr Gary Nairn MP

Ms Nicola Roxon MP

Mr Cameron Thompson MP (from 8/3/00)

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Terms of reference

On 20 April 1999 the Minister for Industry, Science and Resources asked the Committee to inquire into and report on:

> the prospects of increasing value-adding to Australian raw materials. The Committee will start with an evaluation of the current state of value adding in Australia, and how that compares internationally. This will provide a base from which to evaluate the following topics:
>
> - incentives and impediments to investment;
> - intellectual property rights;
> - national / international marketing factors which may encourage or hinder Australian value-adding;
> - government intervention, both nationally and internationally;
> - the location of value-adding industries and projects in regional Australia;
> - resource licensing / permit arrangements;
> - the impact of vertical integration within particular industries; and
> - the Australian skills base and any associated impediments.

List of abbreviations

AATSE	Australian Academy of Technological Sciences and Engineering
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
AFFA	Department of Agriculture, Fisheries and Forestry – Australia
AMEC	Association of Mining and Exploration Companies
ANZMEC	Australian and New Zealand Minerals and Energy Council
APEC	Asia Pacific Economic Cooperation
CIE	Centre for International Economics
CMEWA	Chamber of Minerals and Energy of Western Australia Inc
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DFAT	Department of Foreign Affairs and Trade
DPIE	Department of Primary Industries and Energy
EPAC	Economic Planning Advisory Council
ESAA	Electricity Supply Association of Australia
ETMs	Elaborately Transformed Manufactures

EU	European Union
GDP	Gross Domestic Product
HBI	Hot Briquetted Iron
ISR	Department of Industry, Science and Resources
MERCOSUR	The Southern Common Market comprising Argentina, Paraguay, Uruguay and Brazil
MOU	Memorandum of Understanding
OECD	Organisation for Economic Co-operation and Development
PECA	Process Engineers and Constructors Association
PPPs	Processed Primary Products
R&D	Research and Development
RFA	Regional Forest Agreement
Stars	Statistical analysis and retrieval system
STMs	Simply Transformed Manufactures
TCF	Textiles, clothing and footwear
TREC	Trade Export Classification
UN	United Nations
UPPs	Unprocessed Primary Products
USA	United States of America
WAPIS	Wood and Paper Industry Strategy

Executive summary

This summary briefly outlines the issues considered by the Committee in each section of its first report on increasing the value added to Australian raw materials. It provides a precis of the main questions examined by the Committee and of the reasons for its principal findings. The Committee's main observations have been highlighted.

Chapter 1: Introduction

The report has been prepared following a request from the Minister for Industry, Science and Resources for a two-part assessment of the value-adding issue starting with an evaluation of the current state of play in Australia, and how that compares internationally. It has been prepared following the completion of this first stage of the inquiry.

The evidence the Committee has received to date clearly indicates that its examination of the state of value-adding in Australia is timely. There appears to be strong potential for enhanced value-adding in Australia.

Given that it believes the fundamental aim of its work should be to enhance national income and living standards, the Committee has approached its evaluation of this question from a broad national perspective.

Chapter 2: The importance of raw materials processing in Australia

While Australia has a history of dependence on its raw materials base, the economy has moved well beyond a reliance on its primary industries and it is now undertaking significant raw materials value-adding activity.

Raw materials processing in Australia accounted for some $45.2 billion of industry value-added in 1998-99. This equates to around 9.2 per cent of total industry output in that year or slightly more than the combined value-added of the agriculture, forestry and fishing and mining sectors.

The average growth in the raw materials processing industries of 1.2 per cent a year in the decade to 1998-99, however, suggests that the growth in processing has not kept up with the country's increasing raw materials output. The agriculture, forestry and fishing and mining sectors achieved average real growth of 3.5 per cent and 4.8 per cent growth a year respectively over the same period.

Although some areas of raw materials processing industries have performed better than others, it appears that Australia has had increasing opportunities to develop its raw materials processing industries and has not fully realised these potential benefits.

The raw materials processing industries, however, are responsible for a significant proportion of Australia's current industry employment. These industries contributed some 566,100 jobs in 1998-99 or 6.6 per cent of the workforce, which is again more than the agriculture, forestry and fishing and mining sectors.

It is notable that the level of employment provided by all these sectors has been declining over the last decade. Employment in the raw materials processing industries, for example, declined by an average 0.8 per cent a year in the ten years to 1998-99.

One positive aspect of this situation is these industries appear to have been increasing their labour productivity. This trend has been confirmed by a number of recent studies into this issue which indicate that the growth in multifactor productivity in Australia's market sector has increased during the 1990s.

The processing of raw materials has provided a clear and robust benefit for Australia through a growth in exports. Australia's exports of processed raw materials have been increasing at a rate well in excess of industry output. The strongest growth in exports has been in elaborately transformed manufactures.

Chapter 3: International comparisons

From the international data examined by the Committee, it is clear that the Australian economy relies more heavily on its primary industries than do some other similarly developed economies around the world. The mining and quarrying sector accounts for a more substantial part of the Australian economy than in most of the other OECD countries examined and the agriculture, hunting, forestry and fishing sector in Australia is also relatively important compared to these countries.

The manufacturing sector in Australia, on the other hand, provides a relatively small part of the nation's gross value-added when compared to the contribution provided by the same sector in the other OECD countries examined. The main

reason for this difference is Australia's relatively limited involvement in producing machinery and equipment.

The services and mining sectors in Australia increased in relative importance over the decade to 1995, while the relative size of the agriculture, hunting, forestry and fishing sector and the manufacturing sector declined. This trend, however, is not unique to Australia. Although the growth in the relative size of the mining sector in Australia has not been reflected in the other countries examined, the trends in the other Australian sectors are broadly similar to those in the other countries.

While the basis on which the data is collected prevents an international comparison of the trends in exports of unprocessed and processed raw materials, Australia is performing strongly in manufactures, particularly elaborately transformed manufactures (ETMs). Australia's average rate of growth in ETMs of some 14.5 per cent a year between 1990 and 1997 was significantly higher than the other developed countries examined. Indeed, Australia compared relatively favourably with some of the fastest growing export oriented manufacturing economies in East Asia.

Despite this strong performance, the total contribution of ETMs to Australia's overall export performance lags considerably behind many other countries.

Chapter 4: Industry trends

The Committee also examined some of the industry level data available on the value-adding activity being undertaken in Australia to enhance its understanding of the current nature and trends in raw materials processing.

It is clear that Australia's metal industries undertake a large number of activities in which Australia has an apparent competitive advantage. Australia is a major player on the world scene in the metals area, both in terms of the mining of raw metals and in the processing of some of these materials.

Australia is the major producer of alumina, bauxite, diamonds, titanium minerals and zircon and ranks second in the world in iron ore, mined lead and uranium. It is also a significant producer of gold, mined zinc, mined nickel, refined nickel and mined tin.

The level of local processing of Australian raw materials, however, varies considerably from commodity to commodity. While the percentage of bauxite, copper, mined lead and gold processed in Australia has been historically relatively high, the level of processing of alumina, iron ore and titanium has been less significant.

Although Australia's overall performance in processing its minerals has not generally matched its ability to produce raw minerals, the growth in some of the lesser performing products is likely to receive a significant boost from the substantial investment that has occurred in new processing capacity over the past few years.

The Committee also received a range of evidence on the level of value-adding in various agricultural, fishery and forestry industries. For most of these products, only relatively modest amounts of value-adding activity are being undertaken.

Only a small proportion of the dairy industry's output, for example, is processed beyond the basic milk stage. It is encouraging to see, however, that most of the output of higher value-added products has grown at an even faster rate than the relatively healthy 5.2 per cent a year average growth in milk output achieved over the five years to 1997. The value of Australia's exports of dairy products has almost doubled over the past seven years and is expected to have reached around $2 billion in 1998-99. The principal export products are skim milk powder and cheese.

Around 80 per cent of Australia's wheat crop is exported in bulk form, although there have been significant advances in adding value to this product in recent years through, for example, better quality assurance and the segregation of varieties suited to particular end products. There have also been some modest exports of flour (around $75 million in 1998-99) and gluten ($60-80 million).

While Australia is the world's largest producer and exporter of apparel wool, only limited processing is undertaken. Although early stage production has increased from around 20.4 per cent of wool production in 1980 to about 38.9 per cent in 1997, there has only been limited processing in the significantly higher value-adding activities beyond this stage. It appears that most of the other leading producers of wool have similar value-adding profiles.

Chapter 5: Factors underlying the success of value-adding activity

There is little doubt that Australia's significant raw materials base provides it with a strong prospect of enhancing its national welfare through the processing of its resources.

The country's potential success in translating its world efficient processes in these industries further up the production chain, however, is dependent on a much broader range of factors than its access to raw materials. To be successful in this area, Australia also needs access to a wider range of factors of production at competitive prices.

In examining Australia's prospects, the Committee received significant evidence from a variety of witnesses indicating that Australia has a number of underlying advantages that can contribute to its competitiveness as a location for raw materials processing. In particular, processing in Australia can benefit from the country's relatively low energy costs, the generally capital intensive nature of these industries, its mature infrastructure and its stable social and political environment.

Whether these underlying advantages warrant the active pursuit of further value-adding in Australia, however, is another question. Although the Australian economy can clearly realise substantial advantages from additional raw materials processing, a number of potential problems can also arise if additional processing is pursued at any cost.

Raising the value of a product through further processing is in itself not necessarily synonymous with increased value-adding. Any action by governments to encourage further raw materials processing should be directed at industries that have a comparative advantage and should primarily focus on ensuring there are no policy or institutional impediments hindering their development.

While this approach appears to limit the range of options available to government in encouraging value-adding activity, there is evidence that Australia can still benefit from increased raw materials processing and that much can still be done to encourage this development.

Chapter 6: Encouragement of raw materials processing

The Committee received substantial evidence on measures that could be implemented to help realise Australia's full raw materials processing potential. **The options available for fostering this activity include:**

- Providing a **sound macroeconomic environment** that is conducive to business and facilitates change. It is important for Australia to provide a favourable economic environment that offers factors such as competitive interest rates, a stable exchange rate, low inflation, a healthy capital market and a well-developed competition policy to ensure it is seen as an attractive place to invest;
- Delivering a **business taxation regime** that gives appropriate recognition to Australia's technological and economic development and to the needs of companies considering investment in Australia;

- Continuing with **microeconomic reform** aimed at lowering input costs, increasing productivity and increasing competition in supplier industries. Any underlying comparative advantage in raw materials processing will only be fully realised if industries have access to inputs at world competitive prices;
- Providing **an open and efficient regulatory framework and transparent and consistent ground rules**. While there are good reasons for planning, access and environmental controls, a balanced and consistent approach is needed to help promote investment in Australia;
- Seizing all the opportunities available to Australia in its endeavours to **reduce all the barriers to free and open trade**, including through multilateral negotiations, regional forums and bilateral relations;
- Assisting local companies to **identify export and investment opportunities** and to establish themselves in overseas markets;
- Recognising the vital role that **research and development** can play in promoting the development of raw materials processing;
- Encouraging **productive labour relations** and the continuing development of **workforce skills**; and
- Working to **remove the range of impediments** that act to discourage investment in raw materials processing, such as :

  ⇒ **Environmental regulations** which do not achieve the appropriate balance between the needs of business and the necessary environmental protection;

  ⇒ **Resource security and land access** concerns;

  ⇒ Some impacts of **globalisation**;

  ⇒ Inappropriate and inefficient **Government regulations**; and

  ⇒ Inadequate access to efficient **infrastructure**, particularly in rural areas.

Chapter 7: Conclusion

In concluding the first stage of its inquiry into the prospect of increasing value-adding to Australian raw materials, the Committee agrees that the issue offers significant potential for enhancing national income and welfare.

There is much that governments and industry can do to enhance Australia's competitive position in this area. Witnesses to this inquiry identified a range of possible actions that can be used to encourage competitive, outwardly-oriented processing industries in Australia.

While the Committee does not necessarily agree with all these suggestions, it agrees that there is a need for sound and robust action in many of these areas and will use the opportunity provided by the next stage of its inquiry to investigate these suggestions in more detail.

Any further encouragement of raw materials processing should take account of the broad economic and social context.

1

Introduction

1.1 This inquiry has been undertaken following a request from the Minister for Industry, Science and Resources on 20 April 1999 asking the Committee to inquire into and report on the prospects of increasing value-adding to Australian raw materials.

1.2 The request from the Minister proposed a two-part assessment of this issue starting with an evaluation of the current state of value-adding in Australia, and how that compares internationally (see the terms of reference for further details). It was proposed that this work could then be used as a basis for providing an evaluation of a range of topics pertinent to this issue.

1.3 This report has been prepared following the Committee's completion of the first stage of the inquiry and details its findings on the question of the state of value-adding in Australia. It provides a broad evaluation of the amount and importance of value-adding of raw materials currently being undertaken in Australia (Chapter 2) and how this compares with other countries (Chapter 3). It also provides some indication of the trends occurring at the industry specific level, for a range of Australia's more important metals and agricultural industries (Chapter 4).

1.4 The report then discusses the factors underlying the success of value-adding activity in Australia (Chapter 5). This includes a discussion of the prospects for enhancing national welfare through the further processing of raw materials and of the dangers and benefits that could arise from encouraging this activity.

1.5 The report concludes with a discussion of the selection of possible measures which witnesses to the inquiry suggested could be adopted with a view to fostering further value-adding activity in Australia (Chapters 6 and 7). These include general measures such as providing a conducive

economic climate through to the removal of a series of impediments to industry development.

1.6 The Committee will examine a number of these proposals in more detail during the next stage of its inquiry. This stage will involve the examination of case studies covering the wine, dairy, grains, magnesium and aluminium industries. It will focus on considering how the issues identified in this report impact on the industries.

1.7 The Committee will use its case study findings to draw together a set of more general recommendations for the Government's consideration. The Committee is therefore also seeking comment on the observations made in this first report and any further general suggestions or commentary on the encouragement of raw material processing in Australia.

The need for an examination of value-adding in Australia

1.8 The evidence received to date clearly indicates that this examination of the state of value-adding in Australia is timely.

1.9 A range of witnesses noted the clear potential of enhanced value-adding to Australia. The Western Australian Department of Resources Development, for example, suggested in its submission that:

> The development of technologically sophisticated and competitive resource processing projects in Western Australia will ensure higher levels of investment, provide increased employment opportunities, create a highly skilled workforce and guarantee a strong economic foundation for future generations. The resources and resource processing industries, often located in remote, regional areas, have been a driving force behind regional development in Western Australia over the past three decades.[1]

1.10 The Tasmanian Government added that:

> Increasing value adding is an important element of the Tasmanian Government's objectives to increase employment; increase the range and level of skills; to diversify the economy; and to increase exports and replace imports.[2]

1.11 The importance of this question is also reflected in the number of reports that have been produced either specifically on the question of value-adding or on closely related issues. The Department of Industry,

1 Western Australian Department of Resources Development, submission no. 37, p. 1.

2 Tasmanian Government, submission no. 36, p. 3.

Science and Resources (ISR), for example, listed a selection of some 21 reports relating to adding value to minerals, which have been published since 1979 (this list is reproduced in Appendix E)[3].

1.12 While the existence of such a wide selection of reports appears to raise the question of the worth of revisiting this issue, the Committee agrees with the ISR assessment of this question:

> While the issue of further value adding to Australia's raw materials has been the subject of a number of directly (and indirectly) related reports over the past decade or two, most of these reports are now somewhat dated and it is timely to revisit the issue, and to examine the progress made since then.[4]

1.13 Given the importance of value-adding to the future of the Australian economy and the time that has evolved since these reports, the Committee agrees that it is timely to revisit this issue and explore the progress made since these earlier reviews.

What is value-adding?

1.14 Before embarking on this review the Committee considered it important to first clarify its interpretation of the term 'value-adding'. In the Committee's experience, this term is used in a number of contrasting ways by different parties and it believes any study of this issue needs to be based on a clear understanding of how this expression has been interpreted.

1.15 In its submission to the inquiry, the Department of Agriculture, Fisheries and Forestry – Australia (AFFA) elaborated on the potential confusion that can be associated with the term 'value-adding':

> There is no single accepted definition of the term 'value-adding'. It has been variously defined and is often misunderstood. The most common and enduring misconception is that value-adding is processing. The two terms are often, incorrectly, used interchangeably. Value-adding is much more than just processing.
>
> AFFA and the former DPIE have maintained that value-adding encompasses any activity that adds to or enhances the value of products to customers.[5]

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3 ISR, submission no. 28, p. 29.

4 ibid, p. 3.

5 AFFA, submission no. 34, p. 6.

1.16 While the Committee agrees with this broad interpretation of value-adding, it believes it is necessary to develop this concept further. As indicated by the Centre for International Economics (CIE):

> Value adding is a concept that applies to both the individual firm and to national income accounting.
>
> - For the individual firm, value added is the difference between the gross value of production and the cost of materials and services purchased. That is, it is the return to the firm's 'primary factors of production' – the labour, capital, natural resources and enterprise from which wages, interest and profits are met.
> - Value added is a national income concept because the sum of the value added of all firms makes up Australia's GDP.
>
> Achieving more value adding is, therefore, very important. The more value adding Australia can achieve in aggregate, the higher our national income and living standards.[6]

1.17 While the difference in these usages may not be readily apparent, the ISR submission well illustrates the potential impact of this distinction:

> At any point in time, value added at the macroeconomic (or economy wide) level is essentially the sum of the value added accruing in each industry.
>
> Although these two concepts therefore appear to be essentially the same in a static state, there is a critical difference when any change is introduced into the system… While a particular action may lead to an increase in the value added in an industry… this action does not necessarily lead to an equivalent change in value at the national level because of the impact of the introduced change on other industries. It may for example lead to an increase in the cost of the factors of production in those industries which compete for the same inputs and a subsequent decline in their profitability or a reduction in their throughput.[7]

1.18 The Committee believes that the fundamental aim of its work should be to enhance national income and living standards. It has therefore approached this inquiry into the prospects of increasing value-adding to Australian raw materials from the broader national perspective.

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6 Centre for International Economics, exhibit no. 7, p. 3.

7 ISR, submission no. 28, p. 10.

1.19 While accepting that a range of potential measures aimed at encouraging further raw materials processing can lead to increased value-added in particular industries, the Committee believes governments should also take account of the broader impact of these measures. In particular, governments need to take account of the impact of the various options on Australia's overall economic output and living standards, before they are pursued in any meaningful manner.

1.20 In making this assessment, the Government would need to take account of the full range of factors including:

- the potential impact on consumers and other industries,
- estimated revenues, royalties and taxes,
- the direct and indirect employment effects,
- the need for training and additional infrastructure,
- the need for imported inputs; and
- the effect on Australia's current account and foreign debt.

1.21 The Committee notes that differences between industries in the measurement of "value added" mean that comparisons should be made with some caution. For example, measures such as gross product to income ratios (see Table 4) tend to produce higher values for primary sectors when compared with other sectors. This issue is further examined in Chapter 2.

2

The importance of raw materials processing in Australia

2.1 There appears to have been a general perception throughout Australia's history that its very existence was heavily dependent on its raw materials base. During much of its early years Australia was perceived as riding on the sheep's back. More recently it has been seen by some as being a quarry to the world.[1]

2.2 These perceptions were largely driven by Australia's long history as a successful and significant producer and exporter of raw materials. As indicated by the Department of Agriculture, Fisheries and Forestry – Australia:

> Traditionally Australia's agricultural, fisheries and forestry industries have been exporters of commodity products and have been very successful in this. Limited value-adding was undertaken in Australia beyond meeting the demands of the domestic market. Some products destined for export were value-added, but this was usually confined to small scale, early stage processing. The vast bulk of Australia's agricultural, fisheries and forestry exports were in raw form, with a proportion used as inputs for further processing overseas.[2]

2.3 While there is little doubt that Australia's success in producing raw materials has contributed to its overall growth and prosperity, the Australia economy today appears to be much more broad-based.

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1 See the Chamber of Minerals and Energy Western Australia, submission no. 11, p. 2.

2 AFFA, submission no. 34, p. 8.

2.4 The Committee received significant evidence that the economy has moved well beyond a reliance on its strong raw materials base and that it is now undertaking significant raw materials value-adding activity.

2.5 The Chamber of Minerals and Energy of Western Australia, for example, stated:

> In Western Australia, further processing currently occurs across a wide range of minerals including iron ore, bauxite, nickel, mineral sands and gold. There are also a number of proposals in the pipeline in areas such as petrochemicals and iron and steel.
>
> …An extremely conservative estimate would be that at least 50% of those in WA manufacturing jobs are in fact engaged in further processing. Therefore there is more employment in further mineral processing than in actual mining in Western Australia.[3]

2.6 The CSIRO also provided a list of examples of current minerals and energy value-adding activity taking place in Australia, ranging from the production of coke and the distillation of oil through to the development of various techniques to add value to iron ore.[4]

2.7 In addition, witnesses such as the Australian Aluminium Council and Iluka Resources outlined the success of their industries' value-adding activities. The Aluminium Council, for example, stated:

> Australia is a major player in the upstream sectors of bauxite, alumina and aluminium and a significant producer of semifabricated and fabricated products.
>
> Some simple facts will illustrate Australia's place in the global structures of these industries.
>
> Australia is:
>
> - The largest producer and second largest exporter of bauxite.
> - The largest producer and exporter of alumina…
> - The fifth largest producer of aluminium.[5]

2.8 Iluka Resources claimed:

> Iluka Resources is one of the world's major titanium minerals production and processing companies...the company has developed a significant value-adding business which makes an important contribution to the company's earnings. In addition,

3 CMEWA, submission no. 11, p 2.

4 CSIRO, submission no. 22, p. 5.

5 Australian Aluminium Council, submission no 31.

> downstream processing operations generate major community economic and employment benefits.[6]

2.9 There was therefore broad anecdotal evidence that Australia has significant processing activity well established in a number of industries.

2.10 A full evaluation of the state of value-adding in Australia, however, required a much more detailed and thorough examination of this question along the lines outlined below. The Committee has examined the existing statistical data on industry activity to establish just how widespread value-adding activity is, how Australian businesses have been performing in this area and how the Australian experience compares with the rest of the world.

The extent of raw materials processing in Australia

2.11 To estimate the current magnitude of value-adding activity in Australia, the Committee drew on Australian Bureau of Statistics' National Accounts data. This information provides a useful indication of the relative size of the various broad sectors of the Australian economy and an indication of their respective growth rates.

2.12 As shown in Table 1, for example, the raw materials sectors of *agriculture, forestry and fishing*, and *mining* accounted for some $18.8 billion and $25.2 billion of value-added in Australia in 1998-99. This represented 3.8 per cent and 5.1 per cent respectively of total industry output in that year.

2.13 While the overall level of raw material value-adding in Australia is less clear from the data, there is strong evidence of this activity taking place. Metal products, for example, accounted for $13.4 billion in value-added in 1998-99 or 2.7 per cent of total industry value-added. In addition, food, beverage and tobacco was responsible for some 2.7 per cent of industry value-added in that year.

2.14 An overall assessment of the level of raw materials value-adding in Australia depends to a large extent on the interpretation of what industries fall into this category. The term "raw materials value-adding" can refer to just those industries involved in the basic processing of raw materials or can be interpreted as extending to all industries that use or produce products derived from raw materials.

6 Iluka Resources Ltd, submission no. 33.

Table 1 Industry gross value-added, 1998-99

	Value-added 1998-99	Average real[a] annual growth 1988-89 to 1998-99	Share of value-added 1998-99
	($million)	*(per cent)*	*(per cent)*
Agriculture, forestry and fishing	18 817	3.45	3.81
Mining	25 245	4.80	5.11
Manufacturing	72 926	0.94	14.77
Food, beverage and tobacco	*13 196*	*1.79*	*2.67*
Textile, clothing, footwear and leather	3 576	-2.67	0.72
Wood and paper products	*5 081*	*-0.45*	*1.03*
Printing, publishing and recorded media	6 659	0.87	1.35
Petroleum, coal, chemical, etc	*9 501*	*1.47*	*1.92*
Non-metallic mineral products	*4 048*	*0.63*	*0.82*
Metal products	*13 422*	*1.22*	*2.72*
Machinery and equipment	14 948	1.42	3.03
Other manufacturing	2 493	-0.79	0.50
Services	376 801	3.61	76.31
Total All industries[b]	493 789	3.21	100.00

Note: **a** Values are in real terms based on the ABS chain volume measure with reference year 1997-98. **b** The total gross value added for all industries does not equate with GDP. GDP includes additional items such as ownership of dwellings and taxes (less subsidies on products).

Source ABS 5206. Updated from a table provided by ISR, submission no. 28, p. 4.

2.15 In considering this issue, the Department of Industry, Science and Resources suggested that a number of proxies could be used for this purpose. It indicated that a useful proxy can be derived, for example, by adding together the production in the sub-divisions of the manufacturing sector that appear to have a large component of raw materials processing.

2.16 For the purposes of this inquiry, it suggested that the sum of production in the sub-divisions of food, beverage and tobacco; wood and paper products; petroleum, coal and chemicals; non-metallic mineral products; and metal products would provide a useful indicator.

2.17 The Department noted in this regard:

> While this proxy does not provide a precise guide to the level of raw materials processing activity in Australia (for example, it does not include wool scouring and includes production of fabricated

metal products such as firearms), it does serve to provide a useful illustration of the order of magnitude of this activity in Australia.[7]

2.18 Based on this proxy and the information in Table 1, raw materials processing in Australia accounted for some $45.2 billion of industry value-added in 1998-99. This equates to around 9.2 per cent of total industry output in that year or slightly more than the combined value-added of the agriculture, forestry and fishing and mining sectors.

2.19 The other issue that is given prominence by the data in Table 1 is the relative importance of the services sector. This sector accounts for some 76 per cent of industry value-added and dominates Australia's industry output.

2.20 Given its relative size, the services sector is also responsible for much of the growth that the Australian economy has achieved in recent times. With average real growth of 3.6 per cent a year over the ten years to 1998-99, the sector has been a major contributor, particularly in absolute terms, to Australia's healthy overall growth rate. It is clear, however, that part of this growth has been driven by trends such as the increasing propensity for businesses to contract-out their property and business services.

2.21 Australia's raw materials producing sectors, however, have also performed relatively well. As indicated in Table 1, the agriculture, forestry and fishing, and mining sectors achieved average real growth of 3.5 per cent and 4.8 per cent growth respectively in the decade to 1998-99.

2.22 While this appears to indicate that Australia has had increasing opportunities to develop its raw materials processing industries, the country does not seem to have fully realised this potential. The average growth in the raw materials processing industries (as defined above) of 1.2 per cent a year[8] suggests that the growth in processing has not kept up with the increasing raw materials output.

2.23 Some raw materials processing industries, however, have performed better than others. The food, beverage and tobacco and petroleum, coal and chemicals industries, for example, had higher growth rates than the other raw materials processing areas with average annual growth of 1.8 per cent and 1.5 per cent during the ten year period examined.

2.24 On the other hand, raw materials processing industries such as wood and paper products and non-metallic mineral products have achieved relatively disappointing growth. The output of the wood and paper

7 ISR, submission no. 28, p. 5.

8 This is a weighted average of the growth in these industries.

products industry declined by an average of 0.4 per cent a year over the decade to 1998-99 and non-metallic mineral products increased by an average of only 0.6 per cent a year over the same period.

Employment

2.25 The primary reason there has been so much focus in recent years on raw materials processing in Australia relates to the economic benefits it generates, with one of the most frequently cited benefits being the level of employment creation (both directly and indirectly) throughout the economy.

2.26 To put this issue in perspective and to assess the current impact of raw materials processing in Australia, the Committee examined the direct employment benefits that are currently flowing from the local processing industries. This analysis is based on the ABS industry employment data in Table 2.

2.27 This indicates that the primary industry sectors and the raw materials processing industries are both responsible for a significant proportion of Australia's current industry employment. The *agriculture, forestry and fishing* and *mining* sectors, for example, accounted for employment of some 421,800 and 79,600 persons in 1998-99 or for 4.9 per cent and 0.9 per cent respectively of the total Australian industry workforce.

2.28 On the other hand, the raw materials processing industries, based on the definition used above, contributed some 566,100 jobs in 1998-99 or 6.6 per cent of the workforce in that year. This again is more that the combined contribution of the raw materials producing industries.

2.29 It is notable, however, that the level of employment provided by all these sectors has been declining over the last decade. Employment in the agriculture, forestry and fishing sector declined by 0.3 per cent a year and employment in the mining sector declined by 2.0 per cent a year over the decade to 1998-99.

2.30 Over the same period, employment in the raw materials processing industries declined by an average 0.8 per cent a year, with the most significant decline occurring in the wood and paper products industry for which employment fell by an average 2.1 per cent a year over the decade examined.

Table 2 Industry employment 1998-99

	Average employment 1998-99	Average annual growth 1988-89 to 1998-99	Share of total employment 1998-99
	('000)	*(per cent)*	*(per cent)*
Agriculture, forestry and fishing	421.8	-0.3	4.9
Mining	79.6	-2.0	0.9
Manufacturing	1 082.5	-1.0	12.5
Food, beverage and tobacco	*176.5*	*0.0*	*2.0*
Textile, clothing, footwear and leather	92.6	-2.6	1.1
Wood and paper products	*65.1*	*-2.1*	*0.8*
Printing, publishing and recorded media	110.8	0.3	1.3
Petroleum, coal, chemical, etc	*103.7*	*-0.1*	*1.2*
Non-metallic mineral products	*48.4*	*-1.0*	*0.6*
Metal products	*172.6*	*-1.3*	*2.0*
Machinery and equipment	221.3	-2.2	2.6
Other manufacturing	91.7	1.0	1.1
Services	7 054.4	2.0	81.7
Total All industries	8 638.3	1.4	100.0

Source ABS 6203. Updated from a table provided by ISR, submission no. 28, p. 6.

2.31 Indeed, the only sector that has contributed to employment growth in Australia over the last decade has been the services sector. While some industries within the other sectors (such as printing, publishing and recorded media; and other manufacturing) have provided some contribution to Australia's employment growth, the overall growth in employment in Australia is clearly being primarily driven by services.

Industry performance

2.32 While the industry value-added and employment figures discussed above help show recent trends in industry growth, they provide only limited help in deciding whether Australia has been achieving its full potential in adding value to its raw materials. Although there is no definitive mechanism for measuring the country's performance in this area, a number of relatively simple ratios have been used in recent years.

2.33 For example, the relatively healthy output growth rates in Australia's primary and raw materials processing industries and the more modest employment outcomes discussed above indicate that output per person employed has been increasing. This in turn is likely to have contributed to the competitiveness of these industries on world markets and to their successful continuing operation in Australia.

2.34 These trends are illustrated in Table 3.

Table 3 Industry gross value-added per person employed[a] 1988-89 and 1998-99

	1988-89	1998-99
	($'000)	*($'000)*
Agriculture, forestry and fishing	30.8	44.6
Mining	161.4	317.0
Manufacturing	55.3	67.4
Food, beverage and tobacco	*62.7*	*74.8*
Textile, clothing, footwear and leather	38.8	38.6
Wood and paper products	*65.9*	*78.0*
Printing, publishing and recorded media	56.6	60.1
Petroleum, coal, chemical, etc	*78.1*	*91.7*
Non-metallic mineral products	*71.1*	*83.7*
Metal products	*60.2*	*77.8*
Machinery and equipment	47.0	67.6
Other manufacturing	32.5	27.2
Services	45.6	53.4
Total All industries	47.8	57.2

Note: **a** Calculated by dividing real industry gross value-added (chain volume measure reference year 1997-98) by employment in the industry.

Source ABS 5206 and 6203.

2.35 It appears from this table that most Australian industries have been achieving increasing real output per person employed, with the agriculture, mining, manufacturing and services sectors all improving their performance in the decade to 1998-99.

2.36 The mining sector in particular achieved outstanding growth in this area with its average value-added per employee increasing in real terms from $161,400 per employee in 1988-89 to $317,000 per employee in 1998-99. That sector also achieved by far the largest output per employee of the sectors examined.[9]

2.37 While this measure does not necessarily provide a useful guide to the relative efficiency of an industry (different industries typically have varying capital and labour intensities), the agriculture, forestry and fishing sector was at the other end of the spectrum and achieved a relatively modest level of output per employee. The sector's output, however, also increased over the period in real terms, rising from an average $30,800 in 1988-89 to $44,600 in 1998-99.

2.38 The raw materials processing industries, on the other hand, all produced above average output per employee and all achieved relatively healthy growth in the decade to 1998-99. While some of the other manufacturing industries experienced declining output per employee during the period, the raw materials processing industries (as defined above) all achieved relatively strong growth, with average value-added per employee rising from $65,700 per employee in 1988-89 to $79,900 in 1998-99.

2.39 The relatively healthy productivity growth in Australian industry in recent years has also been confirmed in a number of recent studies into this issue. The Productivity Commission, for example, found that multifactor productivity (a combined labour and capital productivity measure) in Australia's market sector grew at an average 2.4 per cent a year from 1993-94 to 1997-98, compared with an average 1.2 per cent a year from 1964-65 to 1993-94.[10]

2.40 An alternative industry performance measure that helps indicate the relative importance of the opportunities that may be available to Australian raw materials processors is the relative value-added to sales ratios of the various industry sectors.

2.41 This ratio is of interest because it is sometimes contended that, since manufacturing (or raw materials processing) is a relatively high value-added activity, it is more important than relatively low-value added activities because it has a better capacity to sustain a higher living standard.[11] The corollary of this argument is that it is a worthwhile activity to encourage.

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9 See CIE, exhibit no. 7, p. 6 for further discussion of this issue.

10 Productivity Commission, *Microeconomic Reforms and Australian Productivity: Exploring the Links*, November 1999, p. xvii.

11 See Productivity Commission, *The Changing of Australian Manufacturing*, December 1996, p. 67.

Table 4 Industry gross product to total income 1996-97

Industry	
	(per cent)
Agriculture	33.2
Services to agriculture; hunting and trapping	30.7
Forestry and logging	40.1
Commercial fishing	44.5
Agriculture, forestry and fishing	**33.8**
Coal mining	44.8
Oil and gas extraction	73.1
Metal ore mining	42.9
Other mining	39.7
Services to mining	28.4
Mining	**49.4**
Food, beverage and tobacco	24.9
Textile, clothing, footwear and leather	31.3
Wood and paper products	35.1
Printing, publishing and recorded media	42.5
Petroleum, coal, chemical and associated products	23.6
Non-Metallic mineral product manufacturing	34.6
Metal product manufacturing	31.0
Machinery and equipment	28.9
Other manufacturing	33.4
Manufacturing	**29.3**
Services[a]	**26.4**
Total All industries	**28.2**

Note: **a** Excludes the Finance and Insurance division, as industry gross product is not seen as being relevant to these industries.

Source ABS 8140.0. Taken from ISR, submission no. 28, p. 13.

2.42 To test the validity of this suggestion the Department of Industry, Science and Resources produced the data in Table 4, which expresses industry gross product[12] as a proportion of the total income for each of the major industry categories.

2.43 These figures do not appear to lend much support to the argument outlined above. While the total industry gross product represented some 28.2 per cent of total industry income in 1996-97, the ratio for the manufacturing sector was only slightly higher at 29.3 per cent.

2.44 On the basis of this data, however, it appears that there are some grounds for pursuing the argument with respect to the services sector. The services sector had a value-added to income ratio of only 26.4 per cent in 1996-97 and the ratio for manufacturing does compare favourably with that figure.

2.45 Care needs to be taken, however, in suggesting that manufacturing therefore should in some way be favoured over the services industries. As noted above, the services sector is providing much of the economic growth and essentially all the employment growth that is occurring in Australia currently. Any measure to favour another sector over services would therefore need to be based on a very solid foundation, as such action could hold back the development of the major growth sector of the economy.

2.46 It is also notable in this context that the mining and agriculture sectors appear to have relatively higher gross product to income ratios than manufacturing. The mining sector's value-added represents 49.4 per cent of the sector's income and the ratio for the agriculture sector, at 33.8 per cent, was also well above the national average.

2.47 Any encouragement based on the above argument would therefore need to be directed at these sectors rather than materials processing.

2.48 It should be noted, however, that this finding also needs to be approached with some caution. As indicated by the Productivity Commission,[13] measures such as that used in Table 4 will generally result in lower values for downstream industries than will be the case for industries involved in processing raw materials. This occurs because primary industries, by their nature, tend to have fewer variable inputs into their production processes. In addition, a number of inputs such as the value of the minerals in the ground are not generally viewed as an input cost for the purposes of calculating value added. They are therefore included in the value added of these industries.

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12 Industry gross product is a value-added type measure. It estimates the unduplicated gross product of a business defined as gross output minus intermediate inputs.

13 See Productivity Commission, *The Changing of Australian Manufacturing,* December 1996, p. 69.

2.49 In examining the figures in Table 4, ISR also noted that the ratios for some value-adding industries were significantly higher than for others:

> The figures for the manufacturing sector as a whole, therefore, do not suggest that manufacturing is a comparatively "high value-added" sector when compared to the industries providing its raw material inputs. Some parts of the sector, however, have ratios significantly higher than the sector average. These include industries such as wood and paper products (35.1 per cent) and non-metallic mineral product manufacturing (34.6 per cent), which could be described as raw materials processing industries. On the other hand, other of these, including petroleum, coal, chemical and associated products (23.6 per cent) and food, beverage and tobacco (24.9 per cent), have relatively low industry gross product to income percentages.[14]

2.50 It appears that, at best, only some raw materials processing industries have relatively high value-added to income ratios.

2.51 The CIE attempted an alternative approach to assessing this question using Australian Bureau of Statistics input-output data and came to a similar conclusion.[15] While the level of value-added per dollar of production was relatively higher for the services industry using this approach (possibly because the services industries draw much of their inputs from other services), the ratios for the other sectors showed the same relativities.

2.52 The value-added to production ratios for the mining and agriculture sectors were both significantly higher than for manufacturing, with, for example, the ratio for mining being about double that for the manufacturing sector.

2.53 ISR also reported on some work undertaken by the Economic Planning Advisory Council,[16] which had taken yet another approach to examining this issue, estimating the additional value-added provided to specific raw materials at each stage of processing. ISR suggested in this context:

> While there was considerable variation in the coefficients estimated in this work, a number of them (particularly for zirconia and heavy rare earth metals) were very high, indicating that these

14 ISR, submission no. 28, pp. 13-14.

15 CIE, exhibit no. 7, p. 5.

16 See EPAC, *Raw Materials Processing: Its Contribution to Structural Adjustment*, April 1988, Appendix 1.

> processing industries, if they can be successfully undertaken in Australia, could provide significant benefits.[17]

2.54 Although the range of statistics and measures discussed above provide some guidance on evaluating the performance of Australia's industry in undertaking raw materials processing and on the opportunities that may be available to local producers, the Committee believes these questions warrant further examination. It would therefore be interested in hearing from witnesses on any other useful work that may have been undertaken in this area and other indicators for measuring value-adding.

Trade performance

2.55 One area where the processing of raw materials has provided a clear and robust benefit for Australia is through a growth in exports. A healthy growth in exports of processed raw materials in recent years has significantly contributed to Australia's industry growth. It has also worked to improve the country's balance of payments outcome and the value of the Australian currency.

2.56 As indicated by the Department of Foreign Affairs and Trade:

> Over the past 15 years, Australia's export growth has been considerably stronger than economic growth. Exports of goods and services accounted for 14 per cent of GDP in 1983, but represented about 20 per cent of GDP in 1998 (in current price terms). One of the most notable features of Australia's trade profile is its specialisation in resource-based goods, which account for the bulk of Australia's export items. Another notable feature is the strong trading links with developing countries, particularly those in the Asia-Pacific region. Australia's fast growing export sector reflects in part Australia's proximity to expanding markets in the Asia-Pacific region and the relationship between the resource-intensive nature of Australia's exports and the Asia-Pacific region's imports.[18]

2.57 A number of these features are demonstrated in Table 5. It is, for example, clear from this table that Australia's exports of processed raw materials have been increasing at a rate well in excess of industry output.

17 ISR, submission no. 28, p. 14.

18 DFAT, submission no. 32, p. 4.

2.58 In particular, the growth in exports of petroleum, coal and chemicals and non-metallic mineral products, with average annual real growth rates of 9.4 per cent and 9.0 per cent a year respectively in the decade to 1998-99, have been very strong. Exports of metal products, with average growth of 8.4 per cent a year have also been relatively healthy.

2.59 Although the growth in exports of wood and paper products (with average real growth of 5.6 per cent a year) and food, beverage and tobacco (4.1 per cent) have been more modest, these growth rates are also well in excess of the growth in outputs from these industries.

2.60 These growth rates have also outstripped the growth in exports of the raw material products from which they are derived. As indicated in Table 5, exports of agricultural, forestry and fishing products only increased by an average 1.1 per cent a year in real terms over the decade while mining exports increased by an average 6.3 per cent over the same period.

2.61 The other feature demonstrated by the data in this table is the strong increase in the number of imports coming into Australia over the past decade. Mining imports, for example, have been increasing by an average 9.3 per cent a year in real terms over the decade and manufacturing products by 7.6 per cent.

2.62 While, on the surface, this would appear to give some support to the prospect of using further raw materials processing to displace some of these imports, the composition of Australia's imports raises some questions in this area.[19]

2.63 As indicated in Table 5, over half of Australia's merchandise imports are comprised of machinery and equipment that would not be displaced by further raw materials processing. Indeed, further processing may even work to increase the demand for these products.

2.64 Some other merchandise imports, however, could offer better prospects. For example, Australia appears to have a sizeable dependence on imports of petroleum, coal and chemicals and on imports of metal products, some of which could potentially be replaced through further processing.

2.65 The other issue that needs to be taken into account in considering this potential is the strong growth that is already taking place in processed exports. As indicated by DFAT:

> There has also been a trend towards higher levels of processing in Australia's export composition…the contribution of unprocessed exports to Australia's overall merchandise export composition has

19 As indeed does the fact that much of Australia's imports are services and are not included in these figures.

fallen steadily over the past decade. This decline in relative importance has been achieved despite the strong export performance in many areas of unprocessed primary products, such as unprocessed fuels, minerals and foods.[20]

Table 5 Merchandise trade by industry (current prices[a])

	Imports		Exports	
	1998-99	Average growth 1988-89 to 1998-99[b]	1998-99	Average growth 1988-89 to 1998-99[b]
	$ million	*(per cent)*	*$ million*	*(per cent)*
Total agriculture	**815**	**0.7**	**10 056**	**1.1[c]**
Agriculture	717	..	9 367	..
Forestry & fishing	98	..	689	..
Total mining	**3 963**	**9.3**	**20 228**	**6.3**
Coal mining	19	..	9 284	..
Oil & gas extraction	3 672	..	3 323	..
Metal ore mining	100	..	7 424	..
Other mining	173	..	197	..
Total manufacturing	**92 450**	**7.6**	**51 894**	**8.4[c]**
Food, beverage & tobacco	4 231	5.6	11 679	4.1[c]
TCF & leather	6 354	4.2	2 531	5.3
Wood & paper products	3 018	1.1	1 186	5.6
Printing & recorded media etc	2 137	7.4	488	11.6
Petroleum, coal, chemical etc	14 974	6.9	5 577	9.4
Non-metallic mineral product	1 297	2.4	302	9.0
Metal product	7 653	7.8	17 215	8.4
Machinery & equipment	49 984	9.1	12 170	14.8
Other manufacturing	2 803	5.7	745	3.3
Other industries[d]	**396**	**..**	**3 822**	**..**
Total	**97 623**	**..**	**86 000**	**..**

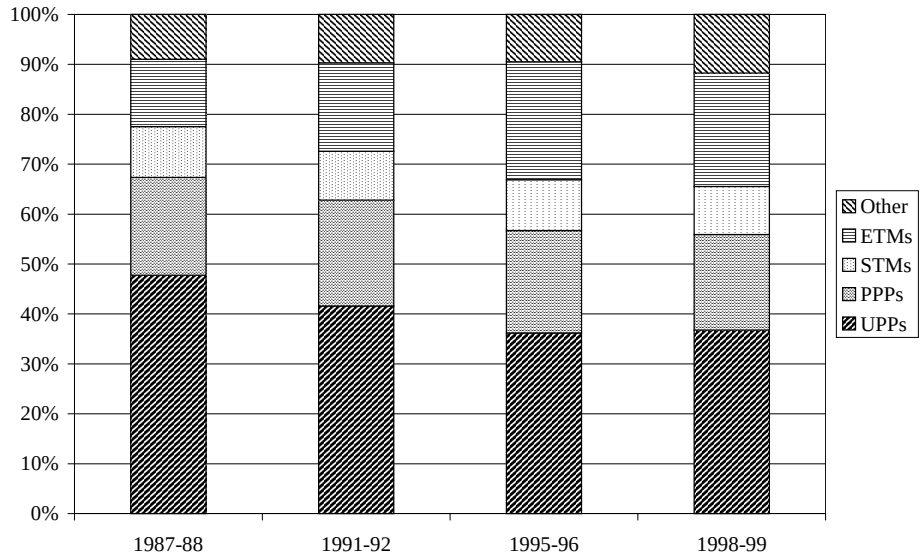
Note: **a** Levels in current prices and growth in constant prices. **b** In constant prices. The growth rates have only been calculated where trade deflators are available. **c** Average growth for the ten years to 1998 (as deflators are not available for the first quarters of 1999). **d** "Other" is comprised of miscellaneous and confidential items. Fluctuations in the make-up of these items can have a significant impact on the size of a range of industries in this table and on their growth rates.

Source *DFAT International Trade Database and ABS implicit price deflators. Updated from ISR submission no. 28, p. 7.*

20 DFAT, submission no.32, p. 5.

2.66 DFAT used Figure 1, which demonstrates the change in processed and unprocessed export shares between 1987-88 and 1998-99, to illustrate this trend.

Figure 1 Processed and unprocessed export shares 1987-88 to 1998-99



Note: This figure covers Unprocessed Primary Products (UPPs); Processed Primary Products (PPPs); Simply Transformed Manufactures (STMs); and Elaborately Transformed Manufactures (ETMs).

Source ABS Data on UN Stars Database. From DFAT, submission no. 32, p. 5.

2.67 It is clear from this figure that there is already a strong trend in Australia towards processed merchandise exports. This has resulted in a decline in the importance of unprocessed primary products (which includes items such as ores and concentrates of iron and copper as well as coal and petroleum). In the period 1987-88 to 1998-99, the contribution of unprocessed foods, fuels, minerals and other primary products declined from 48 per cent to 39 per cent of Australia's total merchandise exports.

2.68 DFAT suggests that:

> Based on growth rates over the past decade, the relative decline in the contribution of unprocessed primary products can be expected to continue for some time.[21]

2.69 The Department also noted that exports of processed raw materials have grown at widely varying rates, both at the category level and in terms of individual products. The strongest growth at the category level has been exports of elaborately transformed manufactures (including minerals

21 ibid, p. 5.

manufactures and metals, chemical and engineering products) which have enjoyed average growth of 14.1 per cent a year[22] in the decade to 1998-99.

2.70 The growth in simply transformed manufactures and processed primary products, while healthy, have been a relatively more modest 5.7 per cent and 6.2 per cent a year respectively. Unprocessed primary products have shown the lowest growth at an average 4.9 per cent a year.

2.71 DFAT suggests these figures provide strong evidence that the trend in Australia's trade has been skewed towards the export of processed raw materials with higher levels of value-adding.

2.72 The Department also provided some figures to illustrate the different growth rates that have been achieved at the product level. These figures, which highlight some of the better performing processed raw material exports, are outlined in Table 6.

2.73 DFAT suggests:

> The key point emerging from this table is that some of the fastest export growth is now occurring in industries with a higher level of value adding. For example, exports of alumina, a by-product of bauxite, are slower than exports of higher value added bauxite by-products such as worked aluminium alloys.[23]

2.74 The Department goes on to note that the aluminium example provides a useful case study demonstrating the opportunities available in value-adding in energy-intensive industries:

> For some time aluminium producers have chosen to locate new production facilities in countries with low cost energy and have placed less emphasis on proximity to final markets. In some cases, such as Japan in the early 1980s, production facilities have been closed down and replaced offshore in countries such as Australia and Canada.
>
> Consumption in the major markets of Europe, Japan and the United States - which constitute around 70 per cent of the world's consumption - have continued to expand over recent decades. Imports, rather than domestic production, have supplied the increased consumption of aluminium. The global specialisation of the industry has led to a number of exporters emerging, where the major proportion of production is destined for foreign markets.[24]

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22 These growth rates are in current price terms and cannot be compared to the constant price growth rates used earlier.

23 DFAT, submission no. 32, p. 7.

24 ibid, pp. 7-8.

Table 6 Trends in exports of value-added raw materials products: 1987-88 to 1998-99 (Australian produce)

	Value in 1998-99	Trend growth[a] 1987-88 to 98-99
	($'000)	*(per cent)*
Processed primary products		
Automotive spirit	263 695	20.6
Alumina	2 843 130	1.2
Simply transformed manufactures		
Ingots, puddled bars & pilings of iron and steel	28 830	56.4
Nickel and nickel alloys (unworked)	449 828	6.9
Aluminium unworked (including alloys)	2 858 077	2.9
Base metals (unworked)	80 770	19.5
Blooms and billets (excluding high carbon steel)	368 264	18.3
Elaborately transformed manufactures		
Glass	150 267	12.3
Wire rod (not high carbon or alloy steel)	60 814	19.8
Bars and rods of iron or steel	44 027	12.4
Angles, shapes and sections of iron or steel	63 320	25.5
Universals, plates and sheets of iron or steel	500 445	7.1
Iron or steel wire (not wire rod) not insulated	31 083	16.1
Tubes, pipes and fittings of iron or steel	99 862	14.2
Iron and steel casings, forgings & stampings	100 150	15
Copper bars and rods (including wire rod)	124 073	24.2
Copper plates, sheets and strip	100 873	12.5
Aluminium and aluminium alloys, worked	437 241	9.4

Note: **a** Average compound growth of trend line (fitted using regression techniques).

Source TREC data on DFAT database. From DFAT, submission no. 32, p. 7.

3

International comparisons

3.1 A comprehensive evaluation of the state of value-adding in Australia also requires the close examination of how the Australian experience compares with the rest of the world. Such a comparison can highlight the strengths and weaknesses of the Australian performance and provide an indication of where it may be possible to improve this performance.

3.2 Some care needs to be taken, however, in interpreting such a comparison. While an exercise of this nature can identify differences, it generally provides little information on the reasons for those differences. The variations in structure can highlight areas of under (or over) performance or may be merely driven by the various countries' relative comparative advantages in producing particular types of product.

3.3 It does, however, serve to demonstrate the differing industry emphasis in the various economies.

Output comparison

3.4 It is clear from the comparative data in Table 7 that the Australian economy relies more heavily on its primary industries than do some other similarly developed economies around the world.

3.5 The mining and quarrying sector accounted for some 4.8 per cent of Australian output and represented a more substantial part of the Australian economy in 1995 than it did in most of the other selected OECD countries. The only exception was Canada with 4.9 per cent of its output attributed to mining and quarrying.

Table 7 Contribution to gross value-added, by industry and country, 1995 (per cent)

Industry	Australia	Canada	France	Germany	Japan	United Kingdom[a]	United States[a]
Agriculture, hunting, forestry and fishing	2.9	2.9	4.1	1.9	2.2	2.1	2.3
Mining and quarrying	4.8	4.9	0.6	..	0.2	3.6	2.1
Manufacturing	14.0	22.1	25.9	30.8	28.7	24.0	20.3
Services	78.3	70.1	69.4	67.3	68.9	70.3	75.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: **a** 1994 data used for the United Kingdom and United States due to data availability.
Source *OECD International Sectoral Database.*

3.6 The agriculture, hunting, forestry and fishing sector was also relatively more important in Australia. This sector, with 2.9 per cent of gross value-added, was responsible for a larger proportion of economic output in all the selected countries other than France (4.1 per cent). The French result, however, is likely to have been affected by the high levels of assistance provided to the sector in countries that are members of the Economic Union.

3.7 The other aspects shown by this table are the relatively small size of the manufacturing sector in Australia and the marked importance of services.

3.8 The services sector, with 78.3 per cent of national value-added in 1995, provided a greater proportion of national output in Australia than in any of the other countries examined. The country closest to Australia was the United States, with services accounting for 75.4 per cent of that nation's industry output.

3.9 The manufacturing sector in Australia (the sector undertaking raw materials processing), on the other hand, provided a relatively small part of the nation's gross value-added when compared to the contribution of the same sector in the other OECD countries examined. The 14 per cent share in Australia was particularly low compared with Germany (30.8 per cent) and Japan (28.7 per cent).

3.10 Some understanding of the reasons for the difference in the relative size of this sector can be obtained from an examination of the components that make up this sector.

3.11 The data in Table 8 have been compiled to provide such a comparison, although care needs to be taken in interpreting the results because the Australian information is from a different source and is not strictly comparable. It does, however, provide a useful guide to the relative

importance of the various parts of the manufacturing industry in Australia.

Table 8 Contribution to gross value-added, by manufacturing industry and country, 1995 (per cent)

Industry	Australia	Canada	France	Japan	United Kingdom[a]	United States[a]
Food, beverage and tobacco	2.8	3.1	3.5	2.9	3.5	2.0
Textile, clothing, footwear and leather	0.9	1.0	1.4	0.5	1.3	1.0
Wood, paper products and printing	2.6	4.3	2.7	0.7	3.1	3.0
Chemicals, coal and petroleum	2.0	2.9	5.1	3.4	5.1	3.5
Non-metallic mineral products	0.8	0.6	1.1	1.0	0.8	0.5
Basic metal products	2.9	1.4	1.2	2.2	2.3	0.9
Machinery and equipment	3.3	8.1	10.4	14.2	7.5	9.1
Other manufacturing	0.6	0.6	0.4	3.8	0.5	0.4
Total manufacturing	15.9	22.1	25.9	28.7	24.0	20.3

Note: **a** 1994 data used for the United Kingdom and United States due to a lack of data availability.
Source *ABS 5206. OECD International Sectoral Database.*

3.12 As indicated by this table, the major reason for the relatively small manufacturing sector in Australia was its relatively limited involvement in producing machinery and equipment. All the other countries examined had developed substantially bigger machinery and equipment industries (relative to the size of their economies), with the industry, for example, accounting for 14.2 per cent of national output in Japan and 10.4 per cent of output in France.

3.13 The other areas where Australia appeared to have fallen significantly behind were the chemicals, coal and petroleum industry and the textiles clothing and footwear industries. The chemicals, coal and petroleum industry, for example, accounted for only 2.0 per cent of economic activity in Australia compared to 5.1 per cent in both France and the United Kingdom.

3.14 While Australia was also a little behind the average in industries such as food, beverage and tobacco and wood, paper products and printing, it was by no means the smallest player in these areas.[1]

3.15 Australia also performed relatively well in non-metallic mineral products and basic metal products. Indeed, the basic metal products industry in Australia accounted for a larger proportion of the nation's output (2.9 per cent) than in any of the other countries. This may reflect the ready access Australia has to the mineral inputs to this industry.

3.16 From an overall perspective, it appears that Australia performed relatively well in most areas of raw materials processing, particularly those industries involved in minerals processing. The only materials processing area where Australia was significantly behind the other nations was the chemicals, coal and petroleum industry.

Trend in output contributions

3.17 Another issue that can be usefully addressed as part of an international comparison is how the recent changes in the sectoral shares in Australia compare with those in the other countries. Table 9 compares the sectoral shares in 1985 and 1995 with those in a range of OECD countries.

Table 9 Contribution to gross value-added, by industry and country, 1985 and 1995 (per cent)

Industry	Australia		Canada		France		Japan		United Kingdom		United States	
	1985	*1995*	*1985*	*1995*	*1985*	*1995*	*1985*	*1995*	*1985*	*1994*	*1985*	*1994*
Agriculture, hunting, forestry and fishing	3.4	2.9	3.1	2.9	4.6	4.1	3.3	2.2	2.4	2.1	2.1	2.3
Mining and quarrying	4.6	4.8	4.9	4.9	0.8	0.6	0.3	0.2	4.2	3.6	2.4	2.1
Manufacturing	15.6	14.0	23.5	22.1	28.0	25.9	30.0	28.7	26.9	24.0	21.1	20.3
Services	76.4	78.3	68.5	70.1	66.6	69.4	66.4	68.9	66.5	70.3	74.4	75.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source *OECD, International Sectoral Database.*

1 AFFA included some slightly earlier data in its submission that provided similar results, see AFFA submission no. 34, p. 30.

3.18 For Australia, it appears that two of the economic sectors increased in relative importance while two declined over the decade to 1995. The services sector has shown the largest growth in relative size with its share of economic output increasing from 76.4 per cent to 78.3 per cent over the decade. The mining sector, however, has also achieved a slight increase, from 4.6 per cent of output to 4.8 per cent in 1995.

3.19 These increases were achieved at the expense of the agriculture, hunting, forestry and fishing sector (the sector's share declined from 3.4 per cent to 2.9 per cent) and manufacturing (which fell from 15.6 per cent to 14.0 per cent). While these two sectors continued to experience output growth during this period, their relatively slow growth (compared to that of the other sectors) resulted in them providing a dwindling share of overall gross value-added.

3.20 The other issue demonstrated by this table is that most of the trends in Australia are by no means unique. All the other countries examined have seen their services sector's share of output increase and their manufacturing sector's share decline. In most of them (with the exception of the United States) there has also been a decline in the relative importance of the agriculture sector.

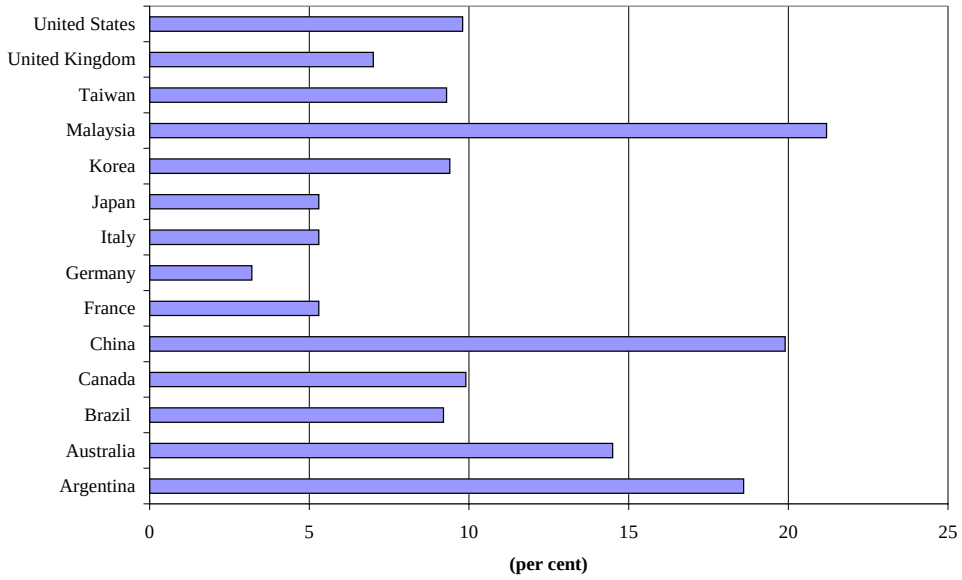
3.21 It appears that Australia's experience in the mining and quarrying sector, however, is a little different. All the other countries saw their mining sector decline in relative importance (albeit a minor decline in the case of Canada – which is not apparent in the rounded figures).

Comparison of trade performance

3.22 The Department of Foreign Affairs and Trade provided a comparison of Australia's trade performance with a number of other countries. While its international data base does not allow it to distinguish between exports of unprocessed and processed raw materials, the Department claims that it is clear that Australia is performing strongly in manufactures, particularly elaborately transformed manufactures (ETMs).

3.23 As indicated by the international comparisons of the rate of growth in exports of ETMs provided in Figure 2, Australian exports in this area grew by an average rate of some 14.5 per cent between 1990 and 1997. This was significantly higher than the rate in other developed countries represented, including countries such as Japan, the United States, the United Kingdom and Germany.

Figure 2 Rate of growth in ETMs exports, 1990 to 1997



Source DFAT UN Stars Database

3.24 The comparison also demonstrates that the growth in Australia's exports of ETMs over this period compared relatively favourably with some of the fastest growing export-oriented manufacturing economies in East Asia.

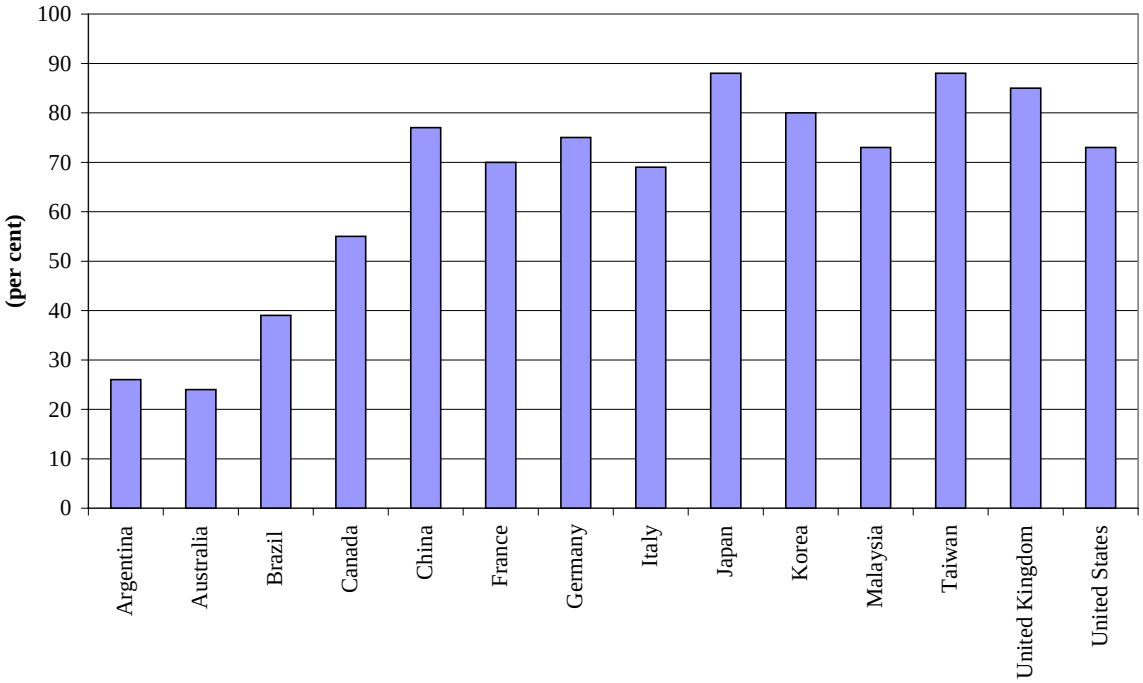
3.25 DFAT noted that, despite this strong performance, the total contribution of ETMs to overall export performance lags considerably behind many other countries (Figure 3).

3.26 The Department suggested:

> This is because Australian ETMs exports are growing quickly compared to other countries, but from a lower base. The lower overall contribution of ETMs to Australia's exports reflects Australia's natural advantage in agricultural and resource exports. It also reflects the fact that a considerable amount of global ETMs trade comprises trade between near neighbours such as the United States and Canada, between the members of the EU and between some East Asian countries.[2]

2 DFAT, submission no. 32, p. 10.

Figure 3 Exports of ETMs as a percentage of merchandise exports, 1997



Source DFAT, submission no. 32, p. 11. The data are from the DFAT UN Stars Database.

4

Industry trends

4.1 In addition to the more general data discussed above on value-adding activity in Australia, the Committee received substantial industry-level data. This was of considerable benefit to the Committee in understanding the nature and trends in raw materials processing currently being undertaken.

4.2 Much of the information provided in these submissions is too detailed to reproduce for the purposes of this report; however, a summary of the data is presented in this chapter to provide an overview of some of the more important findings. This discussion is in two parts - the metals industries and the agricultural, fishery and forestry industries.

4.3 While this discussion does not canvass all of the industries for which evidence was provided to the inquiry, further information is available in the submissions from ISR, ABARE and AFFA.[1] The Committee did not receive substantial evidence concerning a number of other industries but these may be covered in the case studies.

Value-adding in Australia's metal industries

4.4 The information the Committee received on industries in the mining sector was largely confined to the major metals industries. Although this may not provide a representative sample of the trends in the sector more generally, it does provide useful detail on developments in a major area of the sector.

4.5 The metals industries contain a large number of raw materials based activities in which Australia has an apparent competitive advantage and which appear to offer substantial value–adding potential. Indeed, as

1 ISR, submission no. 28, ABARE, submission no. 42 and AFFA submissions nos. 34 and 34.1.

suggested by the Australian Bureau of Agricultural and Resource Economics (ABARE),[2] it is likely that these industries have significantly greater potential for additional basic processing before export than is available from many other parts of the sector.

Table 10 Australia's world ranking in metals, 1998

Commodity	Production rank	Share of world production	Export rank
		(per cent)	
Alumina	1	33	1
Aluminium	5	8	3
Bauxite	1	35	
Copper, mined	5	5	4
Copper, refined	15	2	11
Diamonds[c]	1	37	1
Gold	3	13	2[b]
Iron Ore (Fe content basis)	2	18[a]	2
Steel	20	1	>20
Lead, mined	2	20	1
Lead, refined	10	3	1
Manganese, mined	5[a]	9[a]	
Nickel, mined	3	12	
Nickel, refined	4	8	
Silver, mined	5[a]	7[a]	
Tin, mined	4	9	
Tin, refined		0.3	
Titanium minerals	1	~22	
Titanium dioxide	6[b]	~4	
Uranium	2[a]	18[a]	
Zinc, mined	3	13	1
Zinc, metal	9	4	6
Zircon	1[a]	42[a]	1[a]

Note: **a** 1997. **b** Estimated. **c** While not metal, diamonds are included for interest.
Source *ISR, submission no. 28, p. 30.*

2 ABARE, submission no. 42, p. 2.

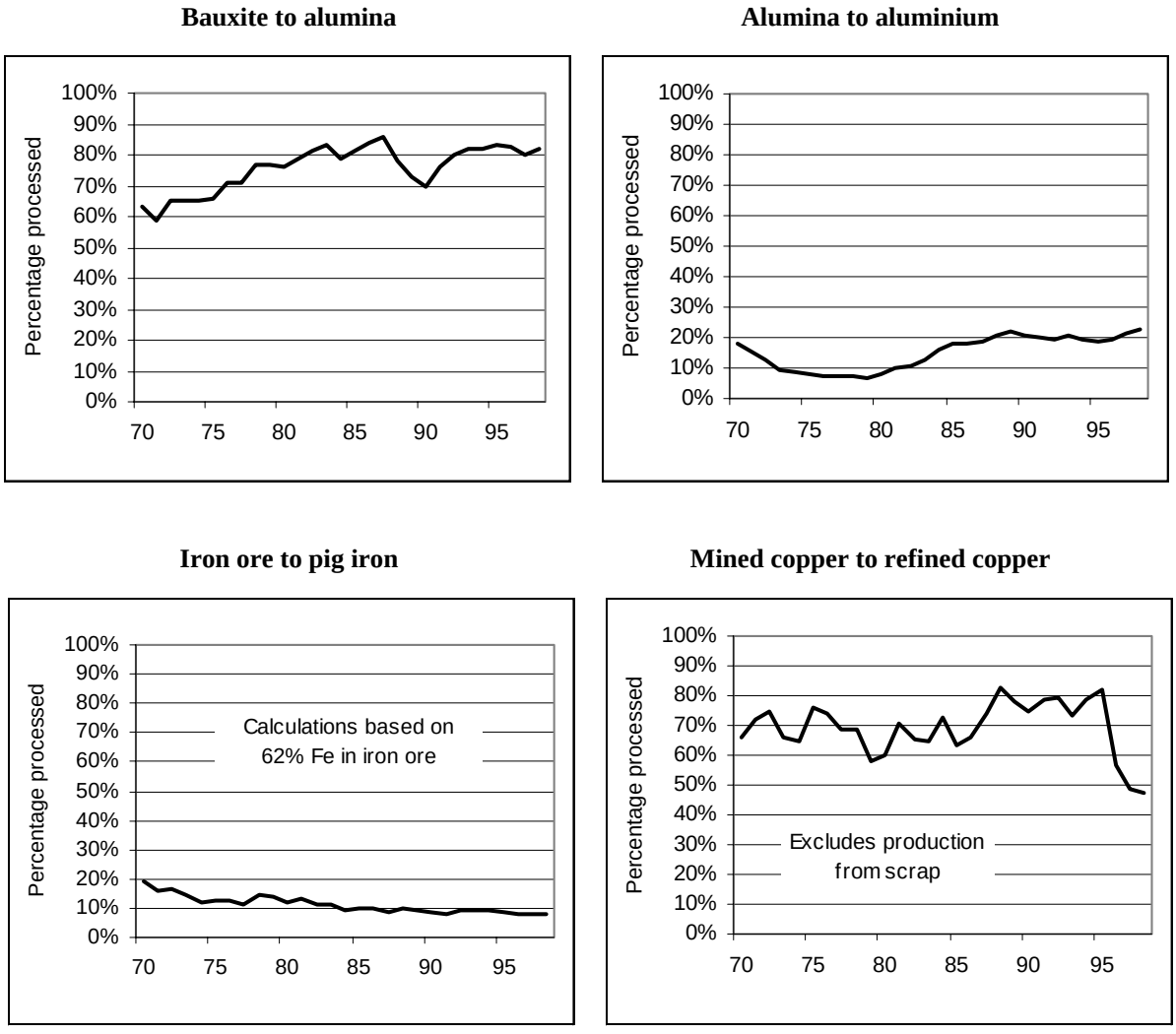
4.6 As indicated in Table 10, Australia is a major player in the metals area, both in terms of the mining of raw metals and in the processing of some of these materials.

4.7 In terms of world production, Australia is the major producer of alumina, bauxite, diamonds, titanium minerals and zircon and ranks second in iron ore, mined lead and uranium. It is also a significant producer of gold, mined zinc, mined nickel, refined nickel and mined tin.

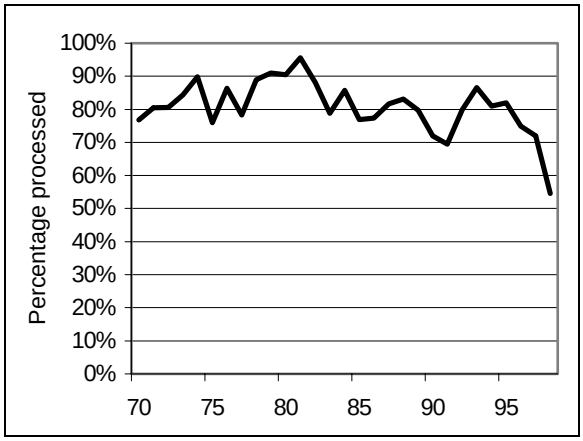
4.8 In many cases, this output also represents a substantial part of world production, with, for example, 42 per cent of world output of zircon produced in Australia together with 37 per cent of diamonds, 35 per cent of bauxite and 33 per cent of alumina.

4.9 The level of local processing of Australian raw materials varies considerably from commodity to commodity. The Department of Industry, Science and Resources provided the information in Figure 4 to illustrate the trend in the processing of a number of selected ores and intermediate products.

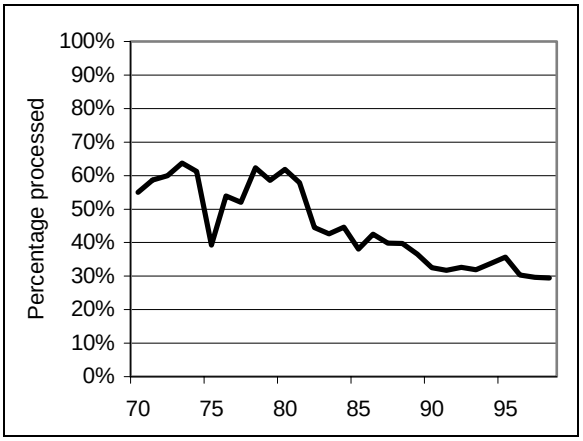
Figure 4 Percentage of domestic commodities processed in Australia, 1960 to 1998



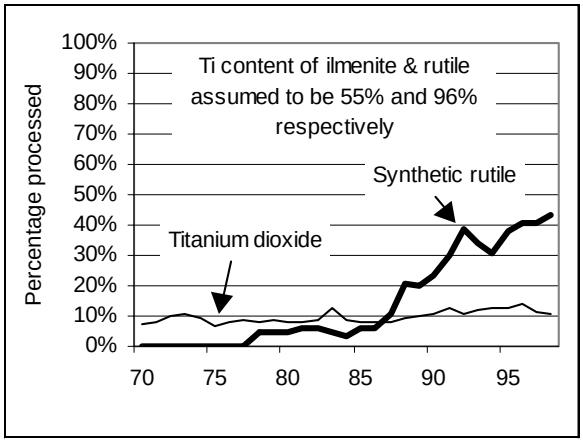
Mined lead to bullion or refined



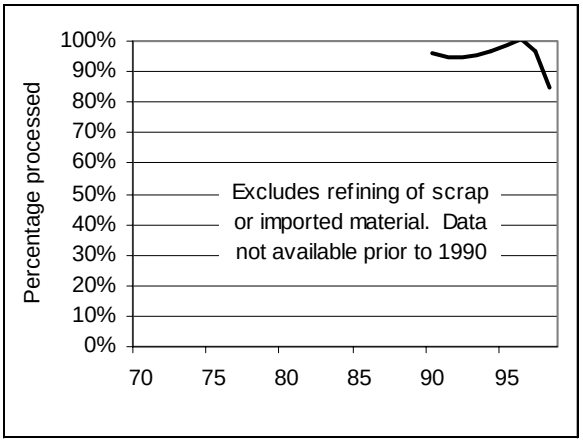
Mined zinc to metal



Titanium minerals processing



Mined gold to refined gold



Source *ISR, submission no. 28, p. 38.*

4.10 As indicated in Figure 4, the percentage of bauxite, copper, mined lead and gold processed in Australia has been historically relatively high while the level of processing of alumina, iron ore and titanium has been less significant.

4.11 The trend in these commodities also shows different traits with, for example, the level of processing of synthetic rutile increasing dramatically in recent years, the level of alumina processing remaining relatively static and the proportion of copper that is refined declining significantly. ISR provided the following explanation for these trends:[3]

- For **bauxite to alumina**, the percentage processed is high and has been steady over the last few years with expansions of refinery capacity matching increased production of bauxite.

3 ISR, submission no. 28, p. 37.

- In the case of **alumina to aluminium** the level of processing is relatively low but has increased in the last few years with the expansion of Boyne Island smelter and smaller expansions at Bell Bay and Tomago. The cessation of production cutbacks resulting from the former MOU between major aluminium producing nations has also helped.
- For **iron ore** processing, the level of processing is low and is trending down. The closure of the Newcastle steelworks in September 1999 will see the proportion of iron ore processed to pig iron fall but this will be compensated by the processing of iron ore to hot briquetted iron (HBI) following the commissioning of BHP's plant in early 1999.
- For **copper**, the level of processing has traditionally been moderately high but has fallen sharply in recent years following a dramatic increase in mine production and the closure of the Southern Copper smelter in the mid 1990s.
- In the case of **lead**, brownfield (or existing mine) expansions have not kept pace with new mine production. When the Century mine comes on stream the percentage processed is expected to fall further.
- **Zinc** mine expansions have outpaced brownfield smelter and refinery expansions which has caused the percentage processed to fall below 30 per cent.
- In recent years, Australia has been refining significant amounts of **gold** from other nations. If this material and secondary[4] gold production is included, the ratio of refined production to mined production was 131 per cent in 1998.

4.12 The Department of Industry, Science and Resources also provided significant data comparing Australia's performance in the processing of a number of selected ores and intermediate products with that of the other major producers of these products.[5] While this information is too detailed to reproduce for the purposes of this report, ABARE provided a useful summary of these comparisons and this is outlined in Table 11.

4.13 It is clear from this table that Australia's performance in producing raw metals is not matched by its processing performance. Australia is a major producer of both bauxite and its processed product, alumina. The country's ranking in processing most of the other commodities listed, however, falls well behind its ranking for the initial production of these commodities.

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4 Secondary gold is gold produced by recycling of scrap. Primary gold is that produced from ore.

5 ISR, submission no. 28, pp. 39-43.

Table 11 International comparison of selected ores and intermediate products processing[a]

	Mine/ intermediate production	Production world rank	Processed production	Percentage processed	Processed world rank
	('000 tonnes)		('000 tonnes)	(per cent)	
Iron ore to steel	165 700	2	8 900	9	8
Bauxite to alumina	44 700	1	13 500	82	1
Alumina to aluminium	13 500	1	1 600	23	7
Mined copper to refined	600	5	290	47	8
Miner lead to refined	617	2	206	45	6
Mined nickel to refined	136	3	79	58	4
Mined zinc to refined	1 005	3	300	30	11

Note: ***a*** *Based on 1997 or 1998 data.*
Source *ABARE, submission no. 42, p. 14. Derived from information from ISR, submission no. 28, pp. 39-42.*

4.14 For example, although Australia ranks first in producing alumina, it ranks seventh in processing this commodity into aluminium. In addition, its ranking as the second largest producer of iron ore compares to a ranking of eight for steel.

4.15 This outcome, however, is not totally unexpected. It is unlikely that Australia's comparative advantage in the production of raw materials will always be matched by a similar advantage in the processing of these materials.

4.16 It also needs to be recognised that the result does not indicate that value-adding of Australia's minerals is declining. As indicated in Chapter 2, the overall output of the raw materials processing industries has been increasing by 1.2 per cent a year in real terms over the last decade. This growth, however, has not matched the growth in the agriculture (3.5 per cent a year) or mining (4.8 per cent) sectors and this has impacted on the overall proportion of raw materials processed in Australia.

4.17 To demonstrate this further, Table 12 has been compiled to illustrate the solid growth that has been occurring in the processing of a number of the metals discussed above.

4.18 As indicated in this table, the growth in refined gold production increased by a very healthy 10.5 per cent a year over the decade to 1998, steel increased by 4.5 per cent a year, refined nickel by 4.4 per cent and refined copper by 3.8 per cent. Commodities such as refined lead and zinc, however, have not achieved this growth rate, with, for example, the

output of refined lead declining by an average 1.1 per cent a year over the period.

Table 12 Industry production of selected metal products ('000 tonnes)

	1988	1998	Average growth 1988-89
Alumina	10 518	13 559	2.6
Aluminium	1 150	1 618	3.5
Copper, refined	196	285	3.8
Gold, refined	0.2	0.4	10.5
Steel	5 730	8 941	4.5
Lead, refined	193	173	-1.1
Nickel, refined	5 923	9 114	4.4
Zinc metal	302	312	0.3

Source *Compiled from data provided by ISR. Charts of the growth in these commodities can be found in ISR, submission no. 28, p. 52.*

4.19 These growth rates should not be seen as being fixed and will continue to fluctuate, depending on the level of investment in both extraction and processing facilities. The growth in some of the lesser performing products in Table 12, for example, is likely to receive a significant boost from the substantial investment that has occurred in new processing capacity over the past few years.

4.20 As indicated by ABARE, these developments, for the most part, are yet to reach full capacity and the full effect of the new and expanded capacity will not be reflected in the statistics until around 2000-01. Examples of this investment include[6]:

- Three major **copper** processing developments were completed in the past twelve months – WMC's Olympic Dam expansion; MIM's smelter and refinery expansions at Mount Isa and Townsville; and Western Metals' expansion of its facilities at its Mount Gordon mine site. In addition, the reconstructed Port Kembla copper smelter-refinery is expected to be commissioned in early 2000. Collectively, these developments will add over 300,000 tonnes of new copper capacity a year.

6 See ABARE, submission no. 42, pp. 105-106 for further detail and Appendixes E and F of this report for a list of minerals processing projects recently commissioned and of projects that are committed or planned.

- The new Sun Metals' **zinc** refinery in Townsville, with a capacity of 170,000 tonnes a year, will raise zinc smelting capacity in Australia by over 50 per cent. (This, however, is only expected to have a small impact on the proportion of zinc exported in processed form, because of the impending development of the new Century zinc mine.) It is also possible that a commitment to double the capacity of the Sun Metals facility could be made in the next few years.
- Currently there are several proposals to expand both **alumina** and **aluminium** capacity over the medium term. The two at the advanced planning stage are both proposals to increase alumina refining capacity – at Worsley and Pinjarra in Western Australia.

4.21 While there are many factors that determine the extent of minerals processing in a country,[7] ABARE suggests that aggregate domestic consumption (that is, the size of the domestic market) is likely to play a significant part. The Bureau claimed:

> Large local markets, which tend to be naturally protected by transport costs and other business advantages, represent relatively secure operating platforms through the business cycle. Compared with major diversified mining countries such as Canada, the United States and China, Australia's domestic consumption of metals is relatively low, reflecting the relative size and diversity of domestic economies.[8]

4.22 ABARE went on to demonstrate that the degree of minerals processing in Australia more than satisfies domestic requirements, even for those commodities where the extent of processing in Australia is low by international standards.[9]

4.23 The Bureau also provided substantial evidence on how minerals value-adding has impacted on Australia's export performance. Its submission provides relatively detailed assessments of eight major non-energy minerals, covering historical data as well as a discussion of likely future developments.[10]

7 The full range of factors that impact on the extent of raw materials processing are discussed in more detail in Chapter 5.

8 ABARE, submission no. 42, p. 14.

9 ibid, pp. 14-15.

10 ibid, pp. 25-103.

Agricultural, fishery and forestry industry value-adding

4.24 There was also a range of evidence provided on the level of value-adding in various agricultural, fishery and forestry industries. A broad cross-section of this material is outlined below.[11]

Dairy

4.25 All dairy products that are sold to consumers or are exported have been value-added to some degree because of the highly perishable nature of milk. Apart from milk, a significant range of other milk based, value-added products are also produced. Table 13 provides an indication of the relative amounts of the main outputs from this industry.

Table 13 Production of selected milk products ('000 tonnes)[a]

	1992	1993	1994	1995	1996	1997
Cows milk	7 550	8 320	8 451	8 977	9 307	9 723
Butter	124.3	132.9	141.1	131	153.8	153.5
	(1.65%)	(1.60%)	(1.71%)	(1.46%)	(1.65%)	(1.58%)
Cheese	206.3	213.7	226.8	259.6	274.6	301.6
	(2.73%)	(2.57%)	(2.68%)	(2.89%)	(2.95%)	(3.10%)
Whole milk powder	75.4	90.2	113.7	102.7	127.2	123.5
	(1.00%)	(1.08%)	(1.35%)	(1.14%)	(1.37%)	(1.27%)
Skim milk powder	169.9	202.1	228.2	208.6	226.7	234.0
	(2.25%)	(2.43%)	(2.70%)	(2.32%)	(2.44%)	(2.41%)
Total of selected categories	**575.9**	**638.9**	**712.8**	**701.0**	**782.3**	**812.6**
	(7.63%)	**(7.68%)**	**(8.43%)**	**(7.89%)**	**(8.41%)**	**(8.395)**

Note: **a** the percentage figures reflect the proportion of milk (measured by weight) processed into these products.

Source *AFFA, submission no. 34, p. 12. Data from ADC 1998*

4.26 While milk production in Australia has grown by a relatively healthy 5.2 per cent a year on average over the five years to 1997, most of the higher value-added products have grown at an even faster rate. For example, the production of whole milk powder has increased by an average 10.4 per cent a year over the period and cheese has increased by an average 7.9 per cent a year.

4.27 The only value-added product that has not kept up with milk production is butter, which has grown at a more modest 4.3 per cent a year.

11 A broader discussion on these products and a number of others is provided in AFFA, submission no. 34, pp. 11-34.

4.28 A significant reason for the growth in the production of these products appears to have been the rationalisation that has been occurring in this industry. As indicated by AFFA:

> The process of rationalisation has been facilitated by improvements in transport, storage and handling processes, which have reduced the need for the production and processing of milk close to markets and has led to some factory closures, investment in new plant and equipment and a greater concentration of ownership. As a consequence, manufacturers have been better able to take advantage of opportunities in domestic and international markets.[12]

4.29 The value of Australia's exports of dairy products has almost doubled over the past seven years and is expected to have grown to around $2 billion in 1998-99. Australia currently exports around 65 per cent of its manufactured dairy products. The principal export products are skim milk powder and cheese, with butter and wholemilk powder also major contributors.[13]

4.30 In 1997, Australia ranked as the third largest exporter of dairy products, with 12 per cent of world trade.

Meat

4.31 Australia is traditionally a major producer and exporter of meat. The industry is predominantly based on red meat (beef and sheepmeat); however, there are also small but expanding white meat (pork and chicken) and game industries.

4.32 While most meat is processed to some degree, it is mostly processed into raw meat. For beef and sheepmeat, for example, it is estimated that only 100,000 to 200,000 tonnes per annum (or less than one per cent of total industry production) are processed into higher value-added products.

4.33 AFFA suggests this should not be taken as an indication that the industry is ignoring the potential of value-adding:

> This should not be seen as an indication that value-adding is not seriously pursued in the beef and sheepmeat industries. While opportunities to increase value-adding in these industries do exist, it should be remembered that Australia has comparative

12 ibid, p. 13.

13 ibid, p. 12.

> advantages in the production and export of red meat and has successfully met customer demand.[14]

4.34 Value-adding in pork is more extensive. Apart from basic processing at the abattoir, pigmeat is processed into ham, smallgoods and other products. The Australian Pork Corporation estimates that approximately 60-65 per cent of Australian pork is processed.[15] Most of Australia's production is consumed domestically.

4.35 The chicken meat industry has also undertaken significant value-adding activity in recent years with the growth of highly processed products, prepared meals and new products utilising offal and previously discarded pieces. In the domestic market, the fast food and pre-cooked sector is responsible for 20 per cent of all chicken sales and is growing at an annual rate of 25 per cent.

4.36 ABARE estimates the production of chicken meat in 1999-00 will be 630,000 tonnes (603,000 tonnes in 1998-99). The estimated value of the industry, including takeaways, is $2.25 billion. Exports are estimated at 18,500 tonnes and are forecast to rise to 21,900 tonnes by 1999-00, valued at around $27 million.[16]

Wheat

4.37 Around 80 per cent of Australia's wheat crop is exported in bulk form, however, as indicated by AFFA, there have been significant advances in adding value to Australia's wheat crop in recent years:

> As well as processing, value has been added to Australian wheat through a range of services and other activities. In recent years the Australian Wheat Board (AWB) and its successor AWB Ltd, have added value to bulk wheat through better quality assurance (protein, moisture, residue levels etc), development and segregation of varieties suited to particular end products, especially noodles, training in milling and baking programs for buyers of Australian wheat, and joint ventures with research bodies to develop wheats suited to customer requirements.[17]

4.38 There has also been some export of value-added products in the form of flour and gluten. Exports of flour have risen from 107,000 tonnes in 1996-97 to around 180,000 tonnes in 1998-99, valued at $65 million.

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14 ibid, p. 13.

15 ibid, p. 14, taken from Australian Pork Corporation 1999, *Pig Stats 1998.*

16 ibid, p. 15, taken from ABARE 1999, *Australian Commodities Forecasts and Issues June Quarter 1999.*

17 ibid, p. 18.

Exports of gluten have remained steady at around 40,000 tonnes (worth $60-$80m) or 50 per cent of output.[18]

Wool

4.39 Australia is the world's largest producer and exporter of apparel wool. Although the product has substantial value-adding potential (up to 40 times the value of greasy wool), only limited processing is undertaken in Australia.

4.40 The wool processing options range from early-stage processing (such as scouring which adds about 10 per cent to the value), and top-making (which adds about 50 per cent) through to high-quality fabric and clothing production.

4.41 Table 14 provides an indication of the extent of activity undertaken in these areas in Australia in recent years.

Table 14 Production of processed wool ('000 tonnes)

	1980	1985	1990	1995	1996	1997
Shorn wool	642.4	752.7	1 033.0	682.5	645.9	661.0
Clean wool equivalent	404.3	483.3	679.6	440.9	425.0	425.2
Scoured wool	70.1	83.5	85.7	142.3	138.9	144.8
Carbonised wool	12.4	14.7	19.3	23.0	19.4	20.5
Total early stage prod'n	82.5	98.2	105.0	165.3	158.3	165.3
Wooltop production	19.9	22.6	19.5	44.9	54.0	57.4
Woollen yarn	4.0	3.1	2.0	2.5	1.8	1.7
Worsted yarn	5.3	5.0	3.7	3.5	2.9	3.1

Source AFFA, submission no. 34, p. 24. Derived from ABS and Woolmark statistics.

4.42 While the quantity of shorn wool production fluctuated during the period 1980 to 1997, the output at the end of the period (661,000 tonnes) is at much the same level as it was in 1980. At the same time, however, early stage production has grown at an average four per cent a year, increasing from around 20.4 per cent of wool production to about 38.9 per cent in 1997.

18 ibid, p. 18.

4.43 Despite this growth, there appears to have been only limited processing beyond this early stage. There has been growing activity in topmaking (which has grown over the period by an average 6.4 per cent a year) due in part to a government assistance program but very little processing beyond that point. Most of the processing beyond topmaking is for domestic consumption.

4.44 A large proportion of Australian production of wool and wool products is exported. In 1997 exports of greasy wool (clean equivalent) amounted to 322,300 tonnes, scoured and carbonised exports totalled 112,900 tonnes and top exports 57,300 tonnes.

4.45 AFFA suggests Australia is competitive in early stage wool processing but this advantage is not enjoyed in the higher value-added areas:

> Australia is competitive in early stage wool processing, which is capital intensive, but is generally uncompetitive at the more labour intensive middle and later stages other than for small niche markets. This is due to the high wage structure and the labour-intensive nature of the operations, particularly at the making-up final stage where the value of the product is typically doubled. [19]

4.46 Most of the other leading producers (New Zealand, Uruguay, Argentina and South Africa) have similar value-adding profiles. While New Zealand scours a higher proportion of its product and Uruguay (which enjoys preferential access to MERCOSUR countries) largely exports at the tops stage, later stage production in these countries is generally for domestic consumption.

Fish

4.47 Australian fisheries production in Australia had a gross value of some $1.86 billion in 1997-98. The major products included prawns ($378 million), rock lobster ($373 million), abalone ($176 million), tuna ($111 million), and other finfish. The value of aquaculture was $491 million in that year.[20]

4.48 A large proportion of Australia's fish and seafood products are exported, with exports in 1997-98 totalling $1.49 billion.[21] Exports comprise mainly high value, low volume perishable products such as rock lobster, prawns, pearls, abalone, finfish and scallops.

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19 ibid, p. 25.

20 ibid, p. 26.

21 ibid, p. 27.

4.49 By far the majority of fisheries catch (90 per cent) is sold in a fresh or frozen form. There is little value-adding through the processing of fisheries product in Australia, although the knowledge and technologies are available. In this regard, AFFA suggests:

> There is a widespread feeling in the industry that processing is more closely related to 'cost adding' than to 'value adding'. With few exceptions the motivation for investment and innovation in processing activity is lacking. The reasons for this include the:
>
> - Difficulty in guaranteeing volume and continuity of supply of raw material,
> - Perceived market preference for whole or minimally processed fish, and
> - Comparatively high cost of Australian product and labour, making processing uneconomic.[22]

4.50 The Department considers that to encourage significant interest in further processing, it is necessary to demonstrate that profitable market opportunities exist and for the necessary technical backup to be available.

4.51 Opportunities are also available for enhancing Australia's prospects in exporting live and fresh fish through the adoption of innovative marketing techniques and quality management systems.

Forestry

4.52 Australia's forest and wood industries (forestry, sawmilling, wood and paper processing) had an annual turnover greater than $11 billion in 1996-97. In the same year, Australia exported around $97 million of round and sawn wood products, $516 million of woodchips, $370 million of paper and paper products and $64 million of other forest products.[23]

4.53 AFFA suggests that much of Australia's exports of forestry products are of relatively low value-added products:

> Australia's lack of manufacturing capacity has seen us exporting relatively low value unprocessed wood while importing high value processed paper products. It is expected Australia's trade deficit will continue to increase unless there is substantial new investment in pulp and paper manufacturing capacity. Over recent years, uncertainty about access to forest resources and the high environmental standards expected in pulp mills have

22 ibid, p. 27.

23 ibid, p. 28.

> discouraged investment in value-adding operations such as pulp mills.[24]

4.54 The Department indicated, however, that an emerging shortfall in the world's supply of wood and a number of recent initiatives offers hope for the future of this industry:

> Through Regional Forest Agreements (RFAs), Governments will provide secure access to wood resources and create an environment which encourages investment in value-adding manufacturing. A Wood and Paper Industry Strategy (WAPIS) commenced in 1996. The strategy comprises a four year Commonwealth initiative to encourage investment and value-adding in the forest industries. The strategy details Government actions to promote development in industry skills and resources with a focus on regional development.[25]

24 ibid, p. 29.

25 ibid, p. 29.

5

Factors underlying the success of value-adding activity

5.1 The changing world economy has been creating a number of new challenges for Australia in its efforts to maximise its economic and social welfare. In particular, developments such as the reducing trade barriers around the world, the globalisation of business enterprises and the shift towards the increasing use of knowledge and technology across industry have all affected the environment facing Australian businesses.

5.2 If Australia is to take up this challenge and realise the opportunities presented, it will need to adopt policies that allow it to maximise the benefits from all its available options, including potentially highly prospective activities such as intensified processing of its raw materials.

Prospects for successful value-adding

5.3 There is little doubt that Australia's significant raw materials base provides it with a strong prospect of enhancing its national welfare through the processing of its resources. As indicated by the Department of Industry, Science and Resources:

> Australia has a long history as a major producer and exporter of raw materials, largely reflecting the fact that it is well endowed with an abundance of naturally occurring mineral producing ores and with other important factors of production such as land.[1]

5.4 Whether or not Australia adds sufficient value to its primary products before exporting them, however, has been the subject of much conjecture. As suggested by the Department of Agriculture, Fisheries and Forestry –

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1 ISR, submission no. 28, p. 4.

Australia, there are many who argue Australia could raise its national welfare by adding more value to these products:

> Critics have argued that exporting Australian commodities for value-adding overseas, while importing large quantities of value-added food, fibre, timber and paper products, some of which was produced using Australian raw products, amounted to exporting jobs. The heart of this argument was that by increasing value-adding in Australia new and diverse employment opportunities would be created, especially in rural areas and a greater share of the wealth to be derived from value-adding would be retained in Australia. Additionally, value-adding in Australia was also seen as having an import replacement effect.[2]

5.5 On the surface, there certainly appears to be substance to the argument that further wealth would be generated from further raw materials processing in Australia. Australia's strong raw materials base provides it with a number of the necessary underlying factors for it to be successful in this area and, if it can successfully harness this opportunity, it is likely that increased employment and national income would be generated.

5.6 The country's potential success in enhancing its raw materials processing base, however, is dependent on a much broader range of factors than its access to raw materials. The underlying question is whether Australia can translate its world-efficient processes in producing raw materials further up the production chain and produce value-added goods that are competitive on world markets. This ability to produce goods or services more cheaply (at the prevailing exchange rate) than is possible in other countries is commonly known as comparative advantage. It is the primary factor that enables trade to be successfully undertaken between nations.[3]

5.7 It is important to recognise that just because a country could efficiently produce a good it does not necessarily follow that it should. For example, it may not be wise to divert resources from other industries in which the country has an even greater absolute advantage in production.

5.8 The concept of comparative advantage establishes that countries can be better off concentrating on producing and exporting those goods in which they have the greatest production advantage, and importing the other goods they need. These gains from trade depend, of course, upon the existence of open and efficiently operating world markets.

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2 AFFA, submission no. 34, p. 8.

3 For a more comprehensive discussion of the notion of comparative advantage, see CIE, exhibit 23, Ch. 2.

5.9 The Economic Planning Advisory Council (EPAC) has argued that the likelihood of Australia retaining its comparative advantage further up the production chain, depends essentially on two considerations:

> The first is the balance of advantage in locating processing facilities close to the source of supply of the raw materials rather than close to the market for the processed product; the second is the relative abundance, accessibility and quality of the additional resources (such as energy) which need to be employed in order to conduct the processing activity.[4]

5.10 After applying this hypothesis to the Australian situation, EPAC claimed that Australia appears to have a number of advantages as a location for early-stage processing of its raw materials. It suggested, for example:

> Almost all basic processing activity involves a reduction in volume and/or weight of the raw material and, therefore, provides the opportunity for a saving in international transport costs when product is exported. For example, in the conversion of bauxite to aluminium, the weight reduction is between 3 and 4 tonnes per tonne of metal produced….In some instances, the advantage of this concentration of raw material is so overwhelming that it is carried out as a matter of course immediately after mining or harvesting (as in the cases of iron ore concentration and the initial processing of sugar cane).[5]

5.11 EPAC went on to suggest that Australia also has access to a number of the other factors of production that can contribute to successful value-adding activity. In particular, it suggested that the viability of resource processing in Australia can benefit from the country's relatively low energy costs, the generally capital-intensive nature of these industries and lower environmental costs (because of the size of Australia's land mass relative to its population). EPAC also claimed that other advantages enjoyed by Australia relative to developing countries include a mature infrastructure, a stable social and political environment, and consequent lower capital risks.

5.12 These advantages are already reflected in the export performance of a range of Australian industries. The Centre for International Economics (CIE), for example, has estimated that a number of Australian products

4 Economic Planning Advisory Council, *Raw Materials Processing: Its Contribution to Structural Adjustment*, April 1988, p 5.

5 ibid, p 5.

have relatively high 'revealed comparative advantages'[6] based on 1998 trade data. While these advantages can be expected to change over time, the CIE list includes processed products such as uranium and thorium ores and concentrates, aluminium ores (including alumina), lead, non-monetary gold, nickel, butter, margarine and cheese.

5.13 The Committee also received significant evidence indicating that Australia has a number of underlying advantages that make it a competitive location for raw materials processing. Esso Australia, for example, suggested:

> There are a number of positive conditions that already exist that contribute to such activities. Australia is a democratic country with strong free-market and judicial institutions, which foster investment. The education system has proven capable of producing high quality professionals that are the key to innovation, critical to successful value adding activities.[7]

5.14 The Electricity Supply Association of Australia added:

> Australian businesses have access to one of the cheapest sources of electric power in the developed world.
>
> With electricity making up on average 20 per cent of business input costs in important industrial sectors, the provision of reliable, low-cost electricity is a major element in driving greater business competitiveness.[8]

5.15 As discussed in Chapter 4, advantages such as these have been reflected in a substantial level of investment in new processing capacity in Australia over the past few years. ABARE, for example, provided lists of non-energy minerals processing facilities commissioned from 1993-99 and of projects that are expected to come to fruition over the next few years[9] (these lists are reproduced in Appendices F and G of this report), all of which would have required access to competitive inputs for the investment to be undertaken.

5.16 The Committee agrees that Australian industry has access to a number of factors of production that provide it with a comparative advantage in a broad range of raw materials processing areas. The main issues centred on whether these underlying advantages warrant the active pursuit of

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6 'Revealed comparative advantage' essentially measures Australia's export performance in a particular product compared to that of the rest of the world. For further discussion of this concept and the above findings see CIE, exhibit 23, pp. 38-39 and Appendix A.

7 Esso Australia Ltd, submission no. 7, p. 1.

8 ESAA, submission no. 30, p. 3.

9 See ABARE, submission no. 42, pp. 18-24.

further value-adding in Australia and whether the Australian economy as a whole could be expected to gain from such activity.

The benefits of encouraging increased value-adding in Australia

5.17 A broad range of arguments are typically used to support the proposition that Australia should pursue the further processing of its raw materials. The Centre for International Economics' paper submitted by the Minerals Council provides a useful summary of these arguments:

> The idea of adding more value to our minerals and agricultural products by further processing is often advanced. Value adding is seen as a way of:
>
> - increasing employment – through jobs in processing;
> - improving our net export performance – through exporting higher value products;
> - reducing Australia's exposure to price fluctuations for raw materials; and
> - improving regional or national income.[10]

5.18 The Industry Commission has also elaborated on some of these issues, suggesting:

> In recent years there has been a growing recognition that Australia's reliance on export income from primary production leaves it exposed to the vagaries of, at times, quite volatile commodity markets. As a result, there have been increasing calls to further process raw materials into manufactures which trade at less variable prices, at the same time adding value within Australia. Advocates of this strategy note that proportionally more value is added in subsequent processing operations, holding out the prospect of greatly increasing the value to Australia of its natural resources.[11]

5.19 The Committee broadly accepts that the Australian economy can realise substantial advantages from additional raw materials processing, although value-adding should not be pursued at any cost. While not

10 Paper prepared by the Centre for International Economics for the Minerals Council, exhibit no. 7, p. 3.

11 Industry Commission, *Mining and Minerals Processing in Australia*, February 1991, Volume 1, p. 135.

questioning the advantages available from further processing, several witnesses drew attention to the potential costs that could be associated with the vigorous pursuit of these ventures.

5.20 The Department of Industry, Science and Resources, for example, suggested:

> While recognising there is prima facie evidence that Australia should be competitive in many areas of raw materials processing and that there is little doubt increased value added can lead to higher living standards, arguments supporting the outright pursuit of this objective need to be examined carefully.
>
> Australia does have a competitive advantage in a number of areas of resource processing and, as noted above, it is already undertaking such activity in a broad range of areas. Any attempt to induce local producers into providing further value adding in this area, however, may simply be counter productive and needs to recognise the wider implications of such action.[12]

5.21 The Department added that Australia's comparative advantage in the mining and agricultural sectors is not sufficient reason to expect the country to have healthy and competitive processing industries covering the full spectrum of its raw materials production:

> The processing of raw materials involves a range of additional factors (such as an efficient local transport system - coastal shipping etc - and access to know-how and technology) with Australia's ability to efficiently produce primary products not necessarily reflecting a comparative advantage further down the value chain.
>
> As such, any attempt to artificially move away from this market mechanism by encouraging value adding activity in areas that can be served more cheaply by imports is unlikely to produce a positive outcome for Australia and may ultimately translate into falling living standards.[13]

5.22 The Minerals Council argued that raising the value of a product through further processing is not synonymous with increased value-adding[14] and submitted a report contending:

> Adding value to commodities by further processing them is an appealing concept. But policies to encourage value adding should

12 ISR, submission no. 28, p. 12.

13 ibid, p. 12.

14 Minerals Council of Australia, submission no. 13, p.1

> be approached with caution. Any country can have a comparative advantage in transforming only some of the commodities it produces, and only to a limited extent along the processing chain….
>
> For further processing to maximise national income it must be encouraged in a way which does not detract from the performance of other sectors of the economy. This rules out those government policies that provide assistance – through tariffs, subsidies and other forms of special treatment – to particular industries. These policies cannot increase total value added. This is because the assistance they provide is 'paid for' by reduced competitiveness and ability to generate value added in other industries. Policies to *add* value to particular activities can *subtract* value from the total economy if resources are diverted to activities in which Australia does not have a comparative advantage.[15]

5.23 Others such as the Department of Agriculture, Fisheries and Forestry – Australia (AFFA) and the Australian Aluminium Council emphasised the need to rely on market mechanisms. AFFA, for example, suggested that market forces should determine whether or not a particular value-adding activity should take place, provided there are no policy or institutional impediments hindering its development.[16]

5.24 The Australian Aluminium Council noted:

> The (aluminium) industry has succeeded where many others have failed because it has built on Australia's competitive advantages, especially in raw materials and competitive supplies of energy.[17]

5.25 The Committee broadly supports these suggestions. While Australia has well demonstrated that it can successfully develop world competitive raw materials processing plants in Australia, market forces should primarily drive the development of such projects.

5.26 Further processing in Australia must be encouraged in a way that does not negatively impact on other sectors of the economy but rather works to maximise overall national income. This means that any action by governments to encourage further raw materials processing should be directed at industries that have a comparative advantage and should primarily focus on ensuring there is no policy or institutional impediments hindering their development.

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15 Centre for International Economics, exhibit no. 7, p. 8.

16 AFFA, submission no. 34, pp. 9-10.

17 Australian Aluminium Council, submission no. 31.

5.27 No country can expect to have a comparative advantage across the full spectrum of raw materials processing areas. Australia will maximise the benefits it receives from raw materials processing if it concentrates on those areas in which it can compete on world markets.

5.28 Any action by governments aimed at encouraging further raw materials processing in Australia should focus on encouraging industries that have a comparative advantage in their field.

5.29 While this approach appears to limit the range of options available to government in encouraging value-adding activity, there is evidence that Australia can still benefit from increased raw materials processing and that much can still be done to encourage this development.

5.30 The Australian Academy of Technological Sciences and Engineering, for example, provided evidence of the potential that is available in this area. In its report on the competitiveness of the Australian minerals industry[18], the Academy lists a number of areas where it believes Australia has potential to successfully add further value.

5.31 The Tasmanian[19] and Queensland[20] Governments also provided lists of opportunities that they have identified in their States. (For Tasmania these opportunities include magnesium, steel, agriculture, food and beverage, timber and furniture, and tourism and for Queensland they cover light, base and precious metals, energy and industrial minerals.)

5.32 In addition, evidence is available from the Industry Commission's last review of the minerals processing industry in Australia. In that report the Commission indicated that the full potential of this industry had not been realised:

> After receiving a great deal of material addressing key inquiry issues and as a result of its own research, the Commission is convinced that the potential for mineral resource based industries – in terms of the contribution they could make to the Australian economy – has yet to be realised. This is despite the fact that activities under reference already account for almost a tenth of gross domestic product, half of merchandise exports and commonly upwards of a fifth of annual investment spending.[21]

18 AATSE, exhibit no. 5, pp. 49-51.

19 Tasmanian Government, submission no. 36, p. 3.

20 Queensland Government, submission no. 43, pp. 7-8.

21 Industry Commission, *Mining and Minerals Processing in Australia*, February 1991, Volume 1, p. 169.

5.33 The Commission suggested that the main reason for this under-performance was that mining and early stage mineral processing activities were hindered by numerous impediments.

5.34 Witnesses at this inquiry also identified a range of impediments that were said to be holding back the development of raw materials processing and these are discussed in the next chapter of this report.

5.35 While the Committee intends to further investigate these issues during the next phase of its inquiry, there is a strong likelihood that concerted Government action in this area could work to attract further value-adding activity.

5.36 By focussing on removing impediments and on ensuring the Australian economy operates in an efficient and effective manner, the Government can do much to reduce business costs. This in turn can work to ensure that enterprises are encouraged to draw on the economy's underlying advantages and to undertake further investment in resource processing, potentially adding to the community's overall value added.

5.37 It also needs to be recognised that comparative advantage is not a static state. With the ever-changing worldwide demand and supply conditions, a nation's relative advantages are changing constantly. As indicated by AFFA:

> It is important to recognise that the comparative advantage of nations shift over time and that whole industries relocate from one country to another as these factors change. The second-half of the twentieth century has seen some industries, particularly those involved in manufacturing, regularly relocating their processing plants to countries with cheaper labour and other input costs.[22]

5.38 As countries around the world become more trade-focussed and work to enhance the efficiency of their industries, Australia may need to be more vigilant in providing the right economic environment and in removing impediments just to retain its current position. Without such action its current hard won gains may be lost, with investment increasingly attracted elsewhere.

5.39 The changing nature of the world environment, however, can also work to Australia's advantage. As indicated by the example of the growth of the local aluminium industry discussed in Chapter 2, Australia can benefit from relative changes in input costs (such as access to cheap energy) and whole new local industries can come to fruition on the back of such changes.

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22 AFFA, submission no 34, p.10.

5.40 The changes that are constantly taking place in processing techniques and technology can also lead to the development of new industries and new opportunities for Australia. For example, the processing of magnesium appears to offer strong future prospects for Australia.[23]

5.41 The realisation of these opportunities requires essentially the same action. Australia will only reach its full potential in these areas, and maximise its national welfare, if it has an efficient economy free from impediments and if it has the industry and economic policies in place that provide an environment conducive to investment.

23 For a discussion of the potential of this industry see CSIRO, submission no. 22, p. 4.

6

Encouragement of raw materials processing

6.1 Australia has a number of underlying advantages that should assist it to draw on its strong raw materials base to enhance its productive capacity. It is unlikely this potential will be fully realised, however, unless there are policies in place which foster value-adding activity.

6.2 As indicated by ABARE:

> The location of mining and mineral processing activities is influenced by decision making in both the private and public sectors. Mining and mineral processing companies locate activities to maximise profit over time, taking into account the various costs and risks associated with different sites. Government policies may influence location decisions by altering the industry assessments of the economic viability of particular projects.[1]

6.3 A number of witnesses identified a range of possible actions that could be adopted by both government and industry to foster this activity. These actions are discussed in this chapter and range from providing a conducive economic environment and enhanced labour skills through to the removal of a series of impediments.

6.4 In the next stage of the inquiry, the Committee will undertake industry case studies to solicit further evidence on these and other actions to encourage value-adding.

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1 ABARE, submission no. 42, p. 5.

Conducive economic environment

6.5 A number of witnesses suggested that the realisation of Australia's full raw materials processing potential requires a sound macroeconomic environment that is conducive to business and facilitates change. The Department of Industry, Science and Resources, for example, suggested:

> Raw materials processing tends to involve large scale, capital intensive investments which have long effective lives and relatively long gestation periods. It is therefore essential to have an efficient, vibrant, competitive, predictable and stable economy if Australia is to attract such investment and to ensure that its existing industry remains viable.
>
> While many raw materials processing projects will benefit from being located close to the source of supply of raw materials, many are less dependent on this factor and indeed have a wide range of choice as to where they locate. To attract these plants (and indeed to assist the viability of those that benefit from location close to the source of supply), Australia needs to ensure that it maintains sound monetary and fiscal policies so that its economic environment is conducive to these businesses.[2]

6.6 The Committee agrees with this assessment. Sound monetary and fiscal policies are necessary prerequisites to encourage investment in any industry in Australia.

6.7 As discussed in Chapter 5, a stable and efficient economic environment is an important attribute in making Australia an attractive place to invest. It can play a very important part in enhancing the viability of local industry and in contributing to a competitive advantage for Australian industry in world markets.

6.8 It is therefore important for Australia to have a favourable environment which offers factors such as competitive interest rates, a stable exchange rate, low inflation, a healthy capital market with ready access to foreign capital and a well-developed competition policy.

2 ISR, submission no. 28, p. 15.

Microeconomic reform

6.9 Many witnesses advocated on-going microeconomic reform, suggesting that any underlying comparative advantage in raw materials processing will only be fully realised if industries have access to inputs at world competitive prices. The Minerals Council, for example, claimed:

> Sound macroeconomic management and a vigorous and continuous program of microeconomic reform is the key to encouraging further processing of minerals in Australia. For example, tariff reforms, both at home and abroad, and transport, energy and industrial relations reforms, increase opportunities for further processing in Australia by improving the economic viability of such activity which is inherently risky given the high volatility of prices of refined metals.[3]

6.10 In supporting this thesis, others such as the Western Australian Government and DFAT noted the positive impact that such reform was already having on raw materials processing activity. The Western Australian Department of Resources Development suggested:

> The Western Australian Government's commitment to microeconomic reform in the energy, labour and transport sectors, coupled with rapid advancements in technology, provide increasing potential for more processing industries in Western Australia. Recently completed and planned value-adding projects will greatly increase the level of downstream processing of the State's rich supply of raw materials over the next decade.[4]

6.11 DFAT claimed:

> Wide-ranging microeconomic reforms have also fundamentally changed the structure of the Australian economy and made many sectors more efficient, flexible and productive. Obvious areas of improvement include the labour market, banking, finance, transport, public utilities, provision of many government services and the waterfront. These reforms have reduced the costs and increased the productivity of our manufacturers and enabled many of them to compete more effectively in export markets. The result has been a strong increase in manufacturing exports.[5]

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3 Minerals Council, submission no. 13, p. 2.

4 Western Australian Department of Resources Development, submission no. 37, p. 1.

5 DFAT, submission no. 32, p. 12.

6.12 The Committee acknowledges the important part that microeconomic reform has played in enhancing the efficiency of Australian industry, and agrees that the prospects of Australia's raw material processing industries will be improved through well-focussed continuing reform.

6.13 The future of these industries in Australia will be highly dependent on access to competitively priced inputs, such as electricity, gas, rail and sea transport. Microeconomic reform helps to achieve this by lowering input costs, increasing productivity and increasing competition in supplier industries.

6.14 The vital importance of this reform is well demonstrated in a number of reports. For example, the Industry Commission has noted that minerals processing is usually energy intensive, with energy costs of some processors constituting up to 40 per cent of variable operating costs.[6]

6.15 The Centre for International Economics has developed this theme further, suggesting:

> The importance of microeconomic reform in enhancing prospects for further processing is illustrated by the dramatic falls in energy costs …the deregulation of the gas market in the Western Australian Pilbara region is providing a strong stimulus to further processing of minerals.[7]

Sovereign risk

6.16 Another issue that has an important bearing on the attractiveness of Australia as an investment location, particularly for investment in mineral-related activities, is the question of sovereign risk. The submission from the Association of Mining and Exploration Companies outlines this concern:

> The term 'sovereign risk' refers to the likelihood that the Government (State and / or Federal) with jurisdiction over the project will change the operating environment or 'rules', midway through the project development process.
>
> It is not difficult to understand why sovereign risk represents such a significant factor in company decisions to invest large capital sums. To invest what are often enormous sums of money in resources projects, company directors with responsibility for

6 Industry Commission, *Mining and Minerals Processing in Australia*, February 1991, Volume 1, p. 141.

7 Centre for International Economics, exhibit no. 7, p. 7.

> shareholders funds must be confident that the legislative and regulatory environment, as administered by the relevant government(s), will not undergo dramatic change resulting in unexpected time delays, increased company compliance costs and possible permit withdrawals.[8]

6.17 ISR added:

> Industry argues that it needs to be confident in government policy and decision making processes if it is to risk its capital on long term investments in Australia. Among the issues affecting investment decisions in these areas are resource access and environmental constraints, including greenhouse gas emissions policy.
>
> Industry is looking for a consistent, long term policy approach to its activities, under which investment can be made in a timely manner and with a minimum of administrative process. It believes, in particular, that the minimisation of the delays associated with granting access and gaining approvals will greatly assist investment activity in this area.[9]

6.18 While the Committee agrees that an open and efficient regulatory framework will help promote investment in Australia, it also recognises the need for a balanced approach in this area. There are often good reasons for planning, access and environmental controls and it is therefore necessary to strike an appropriate balance between these issues and the broader goal of encouraging raw materials processing.

6.19 The application of these policies, however, should be undertaken in a consistent manner so that industry is well aware of the ground rules. Industry will only be willing to risk the often substantial sums involved in raw materials processing projects if the rules and regulations are clear and if it has confidence that they will not be significantly changed during the life of a project.

Trade issues

6.20 Trade barriers can also play a major part in influencing industry viability. The potential impact of tariffs on minerals processing in Australia was raised, among others, by the Centre for International Economics:

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8 AMEC, submission no. 25, p.24.

9 ISR, submission no. 28, p. 16.

> Tariff policies in Australia and other countries can considerably influence further processing. In Australia, tariffs against manufactured imports restrict competition, increase inefficiencies, add to the economy's costs and reduce the international competitiveness of mining and minerals processing. Trade barriers overseas also influence prospects for further processing of minerals in Australia.[10]

6.21 The Department of Industry, Science and Resources discussed the potential impact of a wider range of trade barriers in its submission to the Committee:

> Trade barriers of different types can also work to harm the competitiveness of existing and potential raw materials processing industries. While the tariffs on early stage processed products are generally relatively low, as noted by EPAC,[11] this can still confer a significant level of effective protection when the level of value adding is only modest, as indeed can non-tariff barriers. Furthermore developing and newly-industrialising nations often assist the development of their export processing industries in a variety of other ways, including the underpricing of energy and various substantial tax advantages and incentives. Trade in processed food is also still constrained by the agricultural policies of the industrialised countries.
>
> Given that all these measures can significantly reduce the opportunities to further export value added product, countries such as Australia, that appear to have significant advantages in raw material processing, need to take continuing and meaningful action against these measures.[12]

6.22 The need to take action in these areas was also reinforced by the evidence the Committee received on the level of 'tariff escalation' in some of Australia's trading partners.[13] It appears many countries apply higher tariffs to processed goods than raw products and this works to further discourage trade in value-added products.

6.23 In view of the impact that these measures are having on Australia's value-adding potential, the Committee strongly supports the suggestion that Australia needs to take robust action against them. If raw materials processing is to be progressed, Australia needs to continue to work for the reduction of all the barriers to free and open trade.

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10 CIE, exhibit no. 7, p.7.

11 EPAC, *Raw Materials Processing; Its Contribution to Structural Adjustment*, April 1988, p. 27.

12 ISR, submission no. 28, p. 18.

13 See, for example, DFAT, submission no. 32, pp. 13-14.

6.24 The Department of Foreign Affairs and Trade outlined the range of approaches being used by the Government to realise this objective.[14] These include multilateral negotiations through the World Trade Organisation, regional approaches through forums such as Asia Pacific Economic Cooperation (APEC) and bilateral negotiations with individual countries.

6.25 Significant gains in access has been achieved, for example, through the Uruguay Round of multilateral trade negotiations (including reduced tariffs on industrial products) and from the commitment by APEC nations to free and open trade and investment in the Asia-Pacific by 2010 (2020 for developing countries).

6.26 Australia's efforts in all these areas should continue unabated, with the broad aim of quickly reducing all tariff and non-tariff barriers to Australia's exports of processed raw materials.

6.27 At the same time, Australia will need to continue to assist its companies to enter new markets and to expand their presence in existing markets. This assistance, which is usually provided through the Austrade worldwide network, can involve both helping local companies to identify export opportunities in overseas markets and in realising these opportunities. This can include helping with the establishment of appropriate contacts and distribution networks and with the marketing of goods and services.

6.28 The Committee invites comment on the effectiveness of the assistance that has been provided in developing new markets and on alternative methods of assistance.

Research and development

6.29 Another issue that can have a significant impact on competitiveness at the industry level is research and development. As suggested by the Process Engineers and Constructors Association:

> In the mining sector, the need for innovation to maintain a competitive industry is critical. R&D is ensuring that new deposits are discovered and new technologies are making the development of more projects economic to undertake. New and innovative approaches to mining have made many mineral deposits economically viable.[15]

14 DFAT, submission no. 32, pp. 16-19.

15 PECA, submission no. 16, p. 4.

6.30 Goodman Fielder noted the importance of research and development for the success of the food processing industry:

> Product innovation in mature industries such as food processing is as important as innovation in high technology or telecommunications industries. Indeed it can create sustainable competitive advantages and new industries.
>
> Successful product innovation however requires a strong commitment to long term research and development.[16]

6.31 The Queensland Government suggested that countries with a positive balance of trade in high growth industries are those which make substantial investment in research and development.[17]

6.32 The Committee agrees that research and development can play an important part in the development of raw materials processing. Indeed research and development is often the very key to investment in these industries.

6.33 By its nature, raw materials processing is usually a technology-based business. Product and process innovation can be critical to the development of these industries in Australia and can be the very issue that beings them to fruition and makes them competitive on the world scene.

6.34 In addition, process innovation in itself can provide a strong basis for Australian exports and additional income for Australian companies. The intellectual 'know how' associated with research and development is becoming an increasingly important source of industry income, as was noted by the Association of Mining and Exploration Companies:

> By 2005, it is estimated that Australian mining intellectual property or 'know how' will be Australia's fifth largest mineral export behind coal, gold, aluminium and iron ore, and it will be level-pegging with the wool, wheat and beef industries. Furthermore, according to one forecast cited by Mr Cribb,[18] Australia will be world dominant in this field by 2020.[19]

16 Goodman Fielder, submission no. 3, p. 6.

17 Queensland Government, submission no 43, p. 12.

18 Julian Cribb, Director of the CSIRO's National Awareness Program, in an address to the first Australian Minerals and Energy Environment Foundation Innovation Conference, March 1999.

19 AMEC, submission no. 25, p. 20.

Labour and skill issues

6.35 The Committee also received significant evidence on the importance of labour and labour-related issues for the future of raw materials processing in Australia. This evidence broadly covered two general themes: the need for effective and productive employee relations; and the need to have ready access to a highly skilled workforce.

6.36 The Australian Academy of Technological Sciences and Engineering provided a report to the Committee that included some comments on the first of these issues.[20] Noting that Australia's future competitors in the minerals industry are likely to have labour costs below Australia's, and that there is nothing it can or would want to do to alter this position, the Academy drew attention to the following comments from the Industry Commission:

> Mining and minerals processing are generally capital intensive, employing labour that is relatively highly skilled and remunerated. In such cases, it is work practices, rather than labour cost levels which are important for unit labour costs. For example, it is typically important to have flexible working arrangements that allow equipment to be used more intensively and permit productivity based pay.[21]

6.37 The Department of Industry, Science and Resources added:

> The labour issues of significance include such matters as downsizing (including the retrenchment process and redundancy payments), shift roster issues, annual leave provisions for continuous shift employees, performance management, workers' compensation issues, immigration provisions and issues relating to wages and conditions (particularly for new operations). The creation of flexibility within the industrial relations system is seen as the key to settling such issues with minimal industrial disputation.[22]

6.38 On the need to have ready access to a highly skilled workforce, ACTED suggested:

> The high profile and respected US based Michael Porter undertook a major survey of world industries and identified role models for government in Australia.[23] While disparaging of attempts by

20 AATSE, exhibit no. 5, p. 34.

21 Industry Commission, *Australian Direct Investment Abroad*, draft report, May 1996, p. 141.

22 ISR, submission no. 28, p. 18.

23 Porter, M.E. *The Competitive Advantage of Countries*, Macmillan Press Limited 1998

> Government to directly promote industry, important roles were nevertheless identified. A key role was to promote the *quality* of education and training that Porter showed to underpin successful industries overseas some of whom lacked our natural resources. In countries such as Switzerland, Germany, Taiwan, the USA, education centres closely cooperate with industry to develop a robust industry that is less sensitive to exchange rates and economic cycles. A key role for Government should therefore be to help shape a skill base to promote excellence in chemical technologies with some remarkable precedents for success.[24]

6.39 While acknowledging that there is likely to be on-going debate about the appropriate government response to these issues, the Committee agrees that productive labour relations and a skilled workforce can make an important contribution to attracting investment to Australia. Both issues can significantly contribute to an industry's competitiveness and can help it to fully realise its underlying comparative advantages.

Impediments to investment in raw materials processing

6.40 The option for encouraging competitive raw materials processing industries that received most attention in the evidence was the removal of impediments to investment.

6.41 Although many of these impediments relate to the broad policy issues discussed earlier in this chapter, they are both wide-ranging and diverse, and in some cases put another perspective on these issues.

6.42 The main impediments identified are therefore outlined below. It should be noted, however, that the Committee did not necessarily agree with all the actions proposed by witnesses. The Committee will further develop its views on some of these questions during the next stage of its inquiry.

Environmental issues

6.43 Perhaps the most common theme in the evidence related to government environmental controls. While some of this concern was directed at the interface between Commonwealth and State and Territory regulations, and in particular an alleged duplication of the environmental impact assessment processes,[25] most of the comments were directed at the greenhouse issue.

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24 A.C.T.E.D. Consultants, submission no 29, p.5.

25 See, for example, AMEC, submission no. 25, p. 18.

6.44 In particular, a number of witnesses expressed considerable disquiet about the impact on business of the Kyoto Protocol to the UN Framework Convention on Climate Change. While generally acknowledging the greenhouse issue warrants a serious commitment by Australia, it was suggested the implementation of greenhouse controls has a very real potential to stifle value-adding to Australian raw materials.

6.45 The Australian Academy of Technological Sciences and Engineering, for example, claimed:

> Assuming that full ratification of the Kyoto protocol proceeds, if Australia is to continue to increase its minerals processing capacity for products ultimately used by other nations, some way of offsetting the associated increase in emissions will have to be found… The matter is particularly vital for Australia, as if the matter is not resolved satisfactorily, value-adding opportunities could be lost by Australia, to nations not signatories to the protocol. Because the developing countries might well use less-efficient processes and fuels not as efficient or greenhouse-friendly as Australia's, the net global greenhouse effect could well increase.[26]

6.46 A range of other witnesses endorsed this view including the Australian Aluminium Council, which indicated:

> Of these challenges it is greenhouse that poses the greatest threat to future investment and the maintenance of prosperity of this industry in Australia. If the response to the greenhouse targets agreed at Kyoto is to substantially increase energy prices to the Australian aluminium industry then the value added sectors will become uncompetitive and the industry will be forced back to exporting basically the raw material. This is unlikely to have any global greenhouse benefit as the investment in the aluminium industry will go mainly to countries not covered by the Kyoto targets. In many cases these countries will use coal to generate their energy needs for such industries and in some cases may even base this on imports of Australian coal.[27]

6.47 Although the Committee recognises that it is prudent for governments to introduce measures aimed at encouraging energy efficiency and minimising industry's environmental impact, it agrees that care needs to be taken in implementing such controls. Measures of this nature need to be implemented in a way that takes appropriate account of the broad range of government responsibilities, including the need to encourage

26 AATSE, submission no. 4.

27 Australian Aluminium Council, submission no. 31.

industrial development as well as the need to protect the environment for future generations.

6.48 The Committee is pleased to note that it received evidence on a future option that may contribute to this endeavour. The Fuel Ethanol Association of Australia provided a submission[28] outlining the prospects for a biofuels industry in Australia which could potentially provide substantial environmental, employment and wider social benefits.

6.49 Governments at all levels should be encouraging the development of environmentally sensitive options which can potentially contribute to the achievement of Australia's long term environmental objectives while also helping the development of regional areas.

Access to resources

6.50 Another common theme running through much of the evidence was that uncertainty about resource access has been creating impediments to the development of significant raw materials processing projects.

6.51 Most of this evidence was confined to two specific questions; the issue of resource security for the timber industry and the land access concerns flowing from the native title question.

6.52 The timber industry's concerns relate to its need to have adequate access and control over the supply, quantity and quality of raw timber. While the Regional Forest Agreement (RFA) processes were designed to address this issue, the industry believes progress has been too slow.

6.53 The National Association of Forest Industries, for example, suggested:

> …at this time only four RFAs have been completed and there are a further eight outstanding. The timetable for completion of the RFAs has been revised many times with continual slippage in deadlines as a result of delays in completing technical work, additional requirements for stakeholder consultation and political expediency particularly the accommodation of election timetables….
>
> To date neither the Commonwealth or the states (except Tasmania) have provided legislative support to the RFAs and made commitments in relation to compensation which provide industry with a level of confidence required to encourage investment in further processing. [29]

28 Fuel Ethanol Association of Australia, submission no. 35.

29 National Association of Forest Industries Ltd, submission no. 10, pp. 2-3.

6.54 Comments made to the Committee on the native title question related to the uncertainty the mining sector believes it faces in getting access to resources. For instance, the Western Australian Department of Resources Development suggested:

> There remains considerable uncertainty at both the State and national levels over the passage and implementation of native title legislation. Until such time as these issues are resolved, doubts over security in relation to land access will act as a disincentive to potential investors in resource processing and other industries.[30]

6.55 The Association of Mining and Exploration Companies added:

> The realisation of state native title regimes has in practice however, proved fraught with difficulty due to the Federal Minister's approval of state regimes being subject to Federal Parliamentary disallowance….
>
> Currently, over 12,000 Western Australian prospecting, exploration, mining and mining infrastructure tenement applications are stalled in the State's Department of Minerals and Energy system awaiting grant due to difficulties associated with native title. Furthermore, a considerable proportion of the 12,000 tenement applications referred to were lodged up to 4 years ago.[31]

Taxation

6.56 The issue of taxation also attracted considerable attention in the evidence received. These comments were generally centred on the claim that competitive fiscal regimes are required to compete internationally and to attract investment to Australia.

6.57 The Process Engineers and Constructors Association (PECA), for example, suggested:

> The Government also has a role to play in providing a competitive tax system. The Australian tax system, currently the focus of debate, is not competitive and hinders the global competitiveness of Australian firms. By way of example, our current direct taxation system is high by international standards, and therefore remains an impediment to global investment in the country.
>
> In order to achieve a more efficient and competitive taxation system, PECA supports a rigorous and comprehensive review of the Australian taxation system with the aim of creating a more

30 Western Australian Department of Resources Development, submission no. 37, p.7.

31 AMEC, submission no. 25, pp. 8-9.

> dynamic, internationally competitive and equitable system that will support investment, growth and job creation.[32]

6.58 Industry, however, was generally supportive of the direction of tax reform in Australia in recent years including the overall outcome of the recent business tax review. However, some, particularly those from the mining sector, expressed concern at the elimination of accelerated depreciation during this process. AMEC suggested that:

> We believe that government has, in its business reform package, done as well as one could have expected it to have done with such a broad-ranging inquiry and we are, except in the case of one issue, very satisfied with the fairness of the package. The one issue which we are quite concerned about, because it goes to something dear to our heart which is business investment, is the rather muddled way that accelerated depreciation has been treated.[33]

6.59 While understanding the mining industry's concern over the removal of accelerated depreciation, the Committee notes that this is more of a concern for some companies than others. As suggested by the Minerals Council of Australia in response to a question on whether the package will assist value-adding:

> It is a project by project evaluation of different investment decisions. The lowering of the company tax rate will obviously make it more attractive for some companies to invest here. On the other hand, in regional Australia where up to 50 per cent of a project development cost is in infrastructure, it may work against that in terms of the removal of accelerated depreciation….But, overall, we think it is a pragmatic outcome. We think that the balance that has been struck will still encourage investment here in Australia.[34]

6.60 Other tax related issues that received significant attention during the Committee's inquiry include the R&D taxation concession and the investment allowance.

6.61 On the issue of the R&D tax concession, the concerns expressed centred on the 1996 reduction in the allowance from 150 to 125 per cent and on the impact on the concession of the recent decision to reduce the company tax rate. With regard to the first of these issues, the Association of Mining and Exploration Companies claimed:

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32 PECA, submission no. 16, p. 2.

33 Mr Savell, Association of Mining and Exploration Companies, transcript of evidence, p. 108.

34 Mr Wells, Minerals Council of Australia, transcript of evidence, p. 35.

> The Australian mining industry is at the technological forefront in world terms. Despite comprising a relatively high cost country in which to operate, Australian technical expertise, coupled with a previously robust R&D taxation deduction, provided a means for many Australian mining companies to significantly expand their domestic mineral exploration and mining related research and activities. The 1996 reduction in the R&D tax concession has however, removed a substantial incentive to further expand industry activities in Australia.[35]

6.62 On the question of the impact of the reduced company tax rate, the Chamber of Minerals and Energy of Western Australia suggested:

> In discussions with the government prior to the government's response to the tax package being released, we made representations to at least maintain in real terms the 125 per cent R&D concession. Of course, moving to a 30 per cent tax rate lowers in real terms the 125 per cent. So we thought the government had listened well - there were heads nodding – but it did not translate to the package, unfortunately, so there is further erosion of the R&D tax concession.[36]

6.63 The reduction in the company tax rate undoubtedly increases the attractiveness of investing in Australia. However, the cut in the R&D tax concession – from 150 per cent to 125 per cent – may well have reduced the attractiveness of investing in R&D compared with other forms of investment. Taking the company tax rate reduction as a given, the Committee accepts that investment in research into raw materials processing would be higher with a 150 per cent R&D tax concession than with a 125 per cent concession.

6.64 Further discussion of the recent developments in the R&D tax concession is provided in the Committee's August 1999 report on *The Effect of Certain Public Policy Changes on Australia's R&D*.

6.65 The concerns expressed about investment incentives during the inquiry centred on the claim that other countries offer attractive incentives to encourage new or expanded industries, while Australian industry receives comparatively little support. The Process Engineers and Constructors Association, for instance, suggested:

> In the competition for investment funds, Australia is competing against many countries that have strong investment incentives. In

35 AMEC, submission no. 25, p.17.

36 Mr Satchwell, Chamber of Minerals and Energy of Western Australia, transcript of evidence, p.150.

> particular, many countries in Asia, against whom we compete directly, offer tax concessions for new investments….
>
> These incentives are very attractive to capital intensive industries, and compensate in part for the large capital outlays required upfront. In return for these incentives, these large projects create not only direct output and employment, but a whole chain of secondary effects in support industry development, the generation of export earnings and taxation revenue.[37]

6.66 While accepting that the incentives offered by these countries could divert investment in raw materials processing away from Australia, the Committee notes that the Commonwealth and State Governments also offer some incentives for potential projects.

6.67 The Commonwealth Government, for example, recently announced as part of its business tax reform package that it would consider the provision of investment incentives to strategic investment projects in limited and special circumstances. These incentives will be considered on a case by case basis where the project would generate significant economic and employment benefits for Australia and could include grants, tax relief or the provision of infrastructure services.

6.68 The Committee will further consider the issue of an appropriate tax regime during the next stage of its inquiry and it therefore invites additional comment on this matter.

Impact of globalisation

6.69 The Committee also received a range of evidence on the impact of globalisation on value-adding activity in Australia, covering both positive and negative aspects of this development.

6.70 From the positive perspective, there was substantial evidence that globalisation has brought advantages to Australia in terms of market competition, the returns from Australian companies investing overseas, the availability of foreign capital and access to new technology, management skills and markets. The Minerals Council of Australia suggested:

> To the extent that there is access to foreign markets as well, it is sometimes garnered. Take Japan, for example. There is a perception of security of supply that comes from Japanese companies participating in our market. The quid pro quo is a sense of security in terms of access to markets in difficult times by

37 PECA, submission no. 16, p. 6.

> having Japanese partners. It is a classic structure that you see all around the world.[38]

6.71 There was, however, also evidence that foreign company control of technology, demand or Australian resources can have a negative impact on the development of value-adding industries. The CSIRO, for example, indicated:

> The strength of large multinational companies in plant gene technologies is beginning to affect Australian agriculture. Outside the USA, Australia is the first country to commit to large-scale commercial planting of transgenic crops and this trend is expected to accelerate rapidly. However, it is the intellectual property holdings of these companies that are beginning to limit the operation of the Australian research providers for Australian agriculture….The consequence, now becoming evident, is that in many cases, these large companies are not willing to grant licences for their enabling technologies. In some cases this is because of litigation concerns….in other cases because they are still in the process of building their global business system strategies. Apart from the delay, it is unlikely that Australia will be able to feature as a significant player in most of these crops unless we invest in research programs that target complementary or competitive traits. [39]

6.72 On the question of potential conflicts with customers, Iluka Resources indicated:

> Mineral producers are the logical targets for policies to encourage downstream processing because the miners have access to resources. However, the options for mining companies can be complicated by the risk of competing with important customers. Most miners work hard to build up good relationships with their customers. These relationships will be strained if the miner wants to sell both raw materials and processed minerals to the customers' major markets. This problem underlines the need for commercial savoir-faire in adopting value-adding strategies.[40]

6.73 The evidence was more mixed on the question of foreign ownership of local resources and the impact this has on investment in raw materials processing in Australia. While there are clear examples of foreign investors taking their raw materials to their existing overseas plants for processing, some witnesses claimed that it is competitiveness that largely

38 Mr Wells, Minerals Council of Australia, transcript of evidence, p. 42.

39 CSIRO, supplementary submission no. 22.1.

40 Iluka Resources, submission no. 33.

drives investment in new plant. A useful summary of this debate was provided by the Department of Agriculture, Fisheries and Forestry – Australia:

> The mention you made of the possibility of multinational companies having an impact on this is something that comes up from time to time. As far as we can see, there are stories that go both ways. There is the issue of decisions being made about exports by large multinationals overseas that may disadvantage Australia. That is true, I suspect. Equally, though, we hear that those companies are quite ruthless about where they have things produced. If Australia can produce a commodity or a product more cheaply than that same company in another country, then that decision will be made to produce it in Australia. It cuts both ways.[41]

Regulatory issues

6.74 Inappropriate or inefficient government regulation was also put forward by a number of witnesses as a potential inhibitor to investment in value-adding activity. In addition to the questions discussed earlier in this chapter, the issues raised in this context generally covered two broad areas: the inconsistent regulations in different parts of Australia; and the regulations imposed on the production or marketing of various commodities.

6.75 The issue of inconsistency was discussed by the Minerals Council of Australia during the Committee's public hearings:

> It does cause some confusion. We look for national consistency, not uniformity. We respect the role of the states and the state legislation which governs a lot of our projects - state mining legislation and so on. To give you an example, we have been driving hard to get some consistency in the principles that are applied to the management of safety in the industry across Australia. We have had varying systems and philosophies governing this which has caused some confusion. Through the ANZMEC ministers, we are working very hard to try to get national consistency. That is one small area.[42]

41 Mr Wilson, AFFA, transcript of evidence, p. 63.

42 Mr Wells, Minerals Council of Australia, transcript of evidence, p. 35.

6.76 A number of criticisms were made regarding the regulations imposed on various commodities, including on electricity generation, aquaculture, wood, oil and gas, sugar and grains. For example, Goodman Fielder suggested:

> In terms of contestability we believe that it is erroneous for statutory marketing authorities to seek a retention of single desk grain marketing arrangements based on a "community welfare" benefit from export activities. This argument largely ignores the implications of regulation on value adding industries within Australia (regional and urban). Further, a true assessment of contestability becomes subjective in the absence of the opportunity to have any effective competition against such marketing arrangements.
>
> In this case we would contend the definition of community value has been confined to grain producers rather than the broader economy.[43]

6.77 While it is not within the scope of this inquiry to analyse all the regulations that potentially influence the competitiveness of value-adding industries across Australia, these comments highlight the need to ensure government regulations are imposed in an efficient and appropriate manner.

6.78 There are valid reasons for imposing government regulations, but it also needs to be recognised that regulations can impose costs on industry and can work to inhibit investment and profitability.

6.79 Regulations should therefore only be imposed after a thorough study of all the implications, including the impact on industry at all levels. They should also be periodically examined to gauge the overall impact they are having on the community and to ensure that they still represent the most appropriate option for addressing the perceived problem.

6.80 Governments need to continue to work for greater uniformity of regulation across State and Territory boundaries. Inconsistent regulations can only work to increase industry costs and make investment in Australia, including in raw material processing projects, less competitive on the world scene.

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43 Goodman Fielder, submission to the Productivity Commission inquiry into the Impact of Competition Policy Reforms on Rural and Regional Australia, attached to submission no. 3.

Infrastructure

6.81 Another impediment to investment relates to the question of infrastructure. Given that inadequate or inefficient infrastructure can have a significant impact on an industry's comparative advantage, several witnesses stressed the need for improved infrastructure in some areas, particularly in remote locations.

6.82 The importance of infrastructure to some mining entities was highlighted by the Minerals Council of Australia:

> There is another distinguishing feature for our industry, and I mentioned it earlier. If you take a project like Murrin Murrin in Western Australia and the new laterite nickel project, about 50 per cent of their cost is actually in the infrastructure. It is in providing power, water, roads and rail.[44]

6.83 The Minerals Council used this example to illustrate the need for considerate depreciation rates and to suggest that there is a case for using public funds in this area:

> …in the remotest parts of Australia there is very little inducement. Certainly, there has been a tendency - and it is probably one of the few justifications for use of public funds to remove impediments - to provide infrastructure that would otherwise be provided by the public purse.[45]

6.84 There was also significant focus during the inquiry on the need to have efficient and competitive infrastructure inputs, including in areas such as roads, energy, transport, communications and port facilities. While the provision of these services has been the subject of on-going microeconomic reform in recent times, and many of the services have been privatised, some witnesses believed further improvement was required.

6.85 The Horticultural Research and Development Corporation, for example, suggested:

> Infrastructure issues such as inadequacies in the current domestic transport and international shipping systems are a current limitation to international competitiveness in the value-adding of Australian horticultural products. Continued waterfront reform and rationalisation of domestic transport are required if Australian industries are to become competitive in international markets.[46]

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44 Mr Wells, Minerals Council of Australia, transcript of evidence, p. 39.

45 ibid.

46 The Horticultural Research and Development Corporation, submission no. 24, p. 2.

6.86 Given the important part infrastructure plays in the competitiveness of raw materials processing industries, every effort needs to be made to ensure industry has access to efficient and effective infrastructure inputs.

6.87 The Committee notes that the House of Representatives Standing Committee on Primary Industries and Regional Services recently released the report of its inquiry into infrastructure and the development of Australia's regional areas, *Time Running Out: Shaping Regional Australia's Future*. The Committee will take the findings of this report into account during the next stage of its inquiry.

6.88 Much can be done to further encourage raw materials processing in Australia. While not every available mechanism will necessarily result in better economic and social outcomes for Australia, there are a range of options available to governments that are likely to help realise this objective.

6.89 The Committee believes that the Government should encourage raw materials processing in Australia by providing an environment that is conducive to investment and by working to remove impediments to this investment, including through:

- Providing a sound economic environment that is conducive to business investment and facilitates change;
- Well-focused microeconomic reform;
- Providing an efficient, consistent and balanced regulatory framework that recognises both the needs of industry and the wider social objectives;
- Continuing with efforts to reduce the tariff and non-tariff barriers to trade with other nations;
- Assisting local companies to identify export and investment opportunities and to establish themselves in overseas markets;
- Encouraging research and development of new methods and techniques for undertaking raw materials processing; and
- Encouraging productive labour relations and the continuing development of a skilled workforce.

6.90 The Committee would welcome further advice on these and other means of encouraging value-adding. The Committee will examine these issues in more detail during the next stage of the inquiry.

7

Conclusion

7.1 In concluding the first stage of its inquiry into the prospect of increasing value-adding to Australian raw materials, the Committee considers that a further study of this issue is timely. It offers significant potential for enhancing national income and welfare.

7.2 There is already strong evidence that value-adding of raw materials has been contributing significantly to this objective. It appears that raw materials processing in Australia accounted for some $45.2 billion of industry value-added in 1998-99, which is slightly more than the combined outputs of the agriculture, forestry and fishing and the mining sectors.

7.3 Raw materials processing was also responsible for the employment of some 6.6 per cent of the workforce in 1998-99 (again more than the two primary sectors combined) and for export growth significantly greater than for the primary products that form the basis of this processing. Exports of processed raw materials have also been increasing at a rate well in excess of industry output and there is a strong trend towards processed merchandise exports (particularly elaborately transformed manufactures).

7.4 When compared to other countries, it is clear that the Australian economy relies more heavily on its primary industries than do some similarly developed economies and that it does not have the same emphasis on manufacturing industry. This result, however, is not altogether surprising given Australia's strong resource base and sizeable landmass.

7.5 Despite the relatively modest performance of the manufacturing sector generally in Australia, a comparison of the relative size of the industries that make up the sector reveals that most of them have performed comparatively well. The relatively small size of Australia's manufacturing sector is primarily due to Australia's limited involvement in producing machinery and equipment. Australia's relatively small chemicals, coal

and petroleum, and textiles, clothing and footwear industries have also influenced this result.

7.6 Australia, on the other hand, appears to be performing relatively well in most areas of raw materials processing, particularly those areas involved in the processing of minerals. Indeed, the basic metals products industry accounts for a larger proportion of the nation's output than in any of the other countries examined.

7.7 There is little doubt that much of the success Australia has achieved in areas such as this is due to its strong raw materials base. A number of other factors, however, can also play an important part in contributing to Australia's relative competitiveness in this area. A strong primary industry base does not of itself ensure that Australia's comparative advantage in the production of raw materials will carry through to the processed products.

7.8 To successfully process its abundant raw material inputs, Australia also needs access to a range of other inputs, such as keenly priced energy, appropriate infrastructure and a skilled workforce. It can also benefit from factors such as a stable political environment and an effective economic system and investment climate.

7.9 There is strong evidence to suggest that Australia has many of these strengths and that it is likely to be a competitive processor of a range of raw materials, if the right economic environment is provided to encourage this investment. Indeed, Australia's success in this area to date already provides evidence of this potential.

7.10 While there is a range of actions the country can take to encourage further investment in this area, with the aim of enhancing the country's national welfare, these options are not without their risks. Measures aimed at encouraging growth in specific industries, for example, can often have wider national implications that more than offset the benefits of encouraging these industries.

7.11 Further value-adding is not necessarily synonymous with enhanced national welfare. In an extreme case, the value-adding activity can cost the producer more than the additional price achieved. In other cases, the assistance required to ensure the investment takes place can incur costs in other parts of the economy which exceed the additional value derived.

7.12 To overcome these concerns, the Committee suggests that any Government action aimed at encouraging further raw materials processing in Australia should focus on encouraging industries that have a comparative advantage in their field. Market forces should primarily drive the development of such projects.

7.13 To do otherwise will mean that resources may be attracted away from competitive industries into areas where they will be less productive.

7.14 A country cannot expect to process all its raw materials. It will not have a comparative advantage across the full spectrum of raw materials processing areas and will maximise its national income if it concentrates on those things that it can do best.

7.15 Although this approach appears to limit the options open to the Government in encouraging further value-adding, there is evidence that there is still much that it can do. When the Industry Commission last reviewed the potential of the minerals processing industry, for example, it indicated that the full potential of the industry had not been realised.[1]

7.16 The Commission suggested that the main reason for this under-performance was that mining and early-stage mineral processing activity in Australia was hindered by numerous impediments.

7.17 By focussing on removing impediments and on ensuring the Australian economy operates in an efficient and effective manner, the Government can do much to reduce business costs. This in turn can encourage enterprises to draw on the economy's underlying advantages and to undertake further investment in resource processing, potentially adding to the community's overall welfare.

7.18 The evidence to this inquiry identified a range of possible actions that can be used to encourage competitive, outwardly oriented processing industries in Australia. As discussed in Chapter 6, these actions range from providing a conducive economic environment, minimising sovereign risk and freeing up the movement in international trade through to the removal of a series of specific impediments.

7.19 The realisation of Australia's full raw materials processing potential, for example, requires a sound macroeconomic environment that is conducive to business and facilitates change. A stable and efficient economic environment can play a very important part in enhancing the viability of local industry and in contributing to a competitive advantage that allows Australian industry to successfully compete on world markets.

7.20 Another factor that can work to enhance the competitiveness of Australian industry is access to competitive inputs. To this end, well-focussed microeconomic reform can enhance the economic viability of potential developments as can enhanced research and development activity, productive labour relations and greater access to a skilled workforce.

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1 Industry Commission, *Mining and Minerals Processing in Australia*, February 1991, p. 169.

7.21 Significant gains can also be achieved through strong action aimed at lowering world trade barriers and through providing a consistent and balanced regulatory framework.

7.22 The option that received the most attention during the inquiry, however, is the removal of a range of impediments to investment in raw materials processing. The main impediments identified include:

- The environmental regulations placed on business;
- Resource security and land access concerns;
- An insufficiently competitive fiscal regime;
- Some impacts of globalisation;
- Inappropriate and inefficient Government regulations; and
- Inadequate access to efficient infrastructure.

7.23 While the Committee did not necessarily agree with all the suggestions proposed by witnesses to overcome these difficulties, it agrees that there is a need for sound and robust action in many of these areas if Australia is to maximise the benefits it receives from a fully developed raw materials processing industry.

7.24 The Committee will therefore use the opportunity provided by the next stage of its inquiry to investigate these and any other suggestions in more detail.

A

Appendix A – Conduct of the inquiry

Terms of reference

On 20 April 1999 the Minister for Industry, Science and Resources, Senator the Hon Nick Minchin, wrote to the then Chairman of the Committee, the Hon Geoff Prosser MP, asking the Committee to inquire into and report on the prospects of increasing value-adding to Australian raw materials. The specific terms of reference for the inquiry have been included in this report at page xi.

Advertising the inquiry

The inquiry was advertised in a number of national newspapers during the period 22 to 24 May 1999. The Committee wrote to the relevant Commonwealth Ministers and to the State and Territory Governments. In addition, over 400 potential stakeholders, including industry associations, received invitations to make submissions to the inquiry.

Evidence to the inquiry

The Committee received 54 submissions from 45 parties of which all but three were authorised for publication. These submissions are listed in Appendix B.

The Committee also received 46 exhibits to the inquiry which were provided as attachments to written submissions, offered during the public hearings or sent to the Committee by other parties. These are listed in Appendix C.

The Committee took evidence at public hearings in both Canberra and Perth. The Committee called 40 witnesses to give evidence at public hearings and 213 pages of evidence were reported by Hansard. Details of the hearings and witnesses appearing are in Appendix D.

The transcript of evidence taken at public hearings and copies of all written submissions on public record will be made available for inspection at the Committee Office of the House of Representatives and at the National Library of Australia. The transcripts and most of the submissions are also available on the inquiry website at www.aph.gov.au/house/committee/isr/Val_Add.

B

Appendix B – List of submissions

Submission no.	Individual/Organisation
1	Cooperative Research Centre for Black Coal Utilisation
2	Grains Research and Development Corporation
3	Goodman Fielder Limited
4	Australian Academy of Technological Sciences and Engineering
5	Pine Australia Limited
6	Tate & Lyle Bundaberg Ltd
7	Esso Australia Limited
8	ACT Government
9	ARISA Limited
10	National Association of Forest Industries Ltd
11	Chamber of Minerals and Energy of WA Inc
12	Heathgate Resources Pty Ltd
13	Minerals Council of Australia
14	Dr Charles Lawson
15	Fisheries Research & Development Corporation
16	Process Engineers and Constructors Association
17	Pulp and Paper Manufacturers Federation of Australia
18	Centre for Value Chain Studies, Macquarie University
19	Cooperative Research Centres Association Inc.

Submission no.	Individual/Organisation
20	Sugar Research and Development Corporation
21	Woodside Energy Ltd
22	CSIRO
22.1	CSIRO
23	Timor Sea Petroleum NL
24	Horticultural Research and Development Corporation
25	Association of Mining and Exploration Companies
26	Cotton Australia
27	Mr Jim Stewart
28	Department of Industry, Science and Resources
28.1	Department of Industry, Science and Resources
28.2	Department of Industry, Science and Resources
28.3	Confidential
29	A.C.T.E.D. Consultants
29.1	A.C.T.E.D. Consultants
29.2	A.C.T.E.D. Consultants
30	Electricity Supply Association of Australia
31	Australian Aluminium Council
31.1	Australian Aluminium Council
32	Department of Foreign Affairs and Trade
32.1	Department of Foreign Affairs and Trade
33	Iluka Resources Ltd
34	Department of Agriculture, Fisheries and Forestry - Australia
34.1	Department of Agriculture, Fisheries and Forestry - Australia
35	Fuel Ethanol Association of Australia
36	Tasmanian Government
37	Western Australian Department of Resources Development

Submission no.	Individual/Organisation
38	Active Pharmaceutical Ingredient Manufacturers' Association of Australia
39	Australian Institute of Marine Science
40	Cooperative Research Centre for Premium Quality Wool
41	Confidential
42	Australian Bureau of Agricultural and Resource Economics
43	Queensland Government
44	Australian Greenhouse Office
45	Confidential

C

Appendix C – List of exhibits

No	From	Exhibit title
1	Dr Ye Qiang	How Different is Mining from Mineral Processing? - A general equilibrium analysis of new resources projects in WA.
2	Plastics and Chemicals Industries Association	Chemical Industry Investment Study, Canberra, May 1998. Prepared by Access Economics.
3	Confidential	
4	Australian Academy of Technological Sciences and Engineering	The Competitiveness of Australian Industry - Report No.1, The Processed Food Industry, June 1994.
5	Australian Academy of Technological Sciences and Engineering	The Competitiveness of Australian Industry - Report No.3, The Minerals Industry, July 1997.
6	Australian Academy of Technological Sciences and Engineering	Water and the Australian Economy, April 1999. A joint study project of the AATSE and the Institution of Engineers, Australia.
7	Minerals Council of Australia	Value Adding in the Minerals Sector. A paper by the Centre for International Economics.
8	Fisheries Research & Development Corporation	Investing for Tomorrow's Catch. FRDC Research and Development Plan, 1996 to 2001.
9	Fisheries Research & Development Corporation	Extract from FRDC Annual Report 1997-98. Industry Development Projects (pp75-81).

No	From	Exhibit title
10	Fisheries Research & Development Corporation	From Antarctica to the Tropics: A Snapshot of the Australian Fishing Industry.
11	Fisheries Research & Development Corporation	Bibliography.
12	Fisheries Research & Development Corporation	FRDC Annual Reports extracts and Cost benefit analysis of Grow-Out of Southern Bluefin Tuna project.
13	Cooperative Research Centres Association Inc.	CRC Association Information Pack.
14	CSIRO	Recent Outcomes of CSIRO Research for Australia.
15	CSIRO	CSIRO Strategic Research Plan.
16	CSIRO	Beyond Science – Managing Projects for Success.
17	CSIRO	Commitment, Collaboration and Impact: CSIRO Minerals and Energy Research, Part 1 - Overview.
18	CSIRO	Commitment, Collaboration and Impact: CSIRO Minerals and Energy Research, Part 2 - Case Studies.
19	Association of Mining and Exploration Companies	Yes - There is a Workable Solution to the Current Unemployment Levels Experienced by Geoscientists. A Submission to Hon. Warren Entsch.
20	Association of Mining and Exploration Companies	Submission to the Review of Business Taxation.
21	Association of Mining and Exploration Companies	The Importance to Australia of Implementing a Mineral Exploration Incentive Scheme. Submission to the Prime Minister.
22	Department of Industry, Science and Resources	1999 Industry Outcomes & Outlook Statement.
23	Department of Industry, Science and Resources	What Drives Australia's Effective Advantage?
24	Department of Industry, Science and Resources	Action Agenda background papers.

No	From	Exhibit title
25	Department of Agriculture, Fisheries and Forestry – Australia	Chains of Success: Case Studies on International and Aust. Food Businesses Cooperating to Compete in the Global Market, 1998.
26	Department of Agriculture, Fisheries and Forestry - Australia	AFFA, Supermarket to Asia Delicatessen Program: Developing Successful Niche Agribusiness Exports, May 1999.
27	Department of Agriculture, Fisheries and Forestry - Australia	New Industries Development Programme: Assisting Australian Agribusiness Commercialise New Products, Services and Technology.
28	CSIRO	Australian Biotechnology Report 1999, Department of Industry, Science & Resources, Ernst & Young.
29	CSIRO	Agri-food Biotechnology - Towards an Australian Strategy, September 1999, Department of Agriculture, Fisheries and Forestry – Australia.
30	CSIRO	Developing Australia's Biotechnology Future - Discussion Paper, Biotechnology Australia.
31	Western Australian Department of Resources Development	In Agreement - How major developers obtain project security through State Agreement Acts, August 1997.
32	Western Australian Department of Resources Development	A Background Paper for a State Heavy Industry Policy - A submission to Government. Prepared by Dover consultants.
33	Western Australian Department of Resource Development	Downstream Processing - An overview of resource processing in Western Australia - May 1998, Department of Resources Development.
34	Electricity Supply Association of Australia	Market Regulation Task Force Report, Regulation of Australian Electricity Supply Businesses, 6 November 1998.
35	Woodside Energy Ltd	Slides on North West Shelf Gas.
36	A.C.T.E.D. Consultants	Green Competitiveness by Michael Porter, New York Times, 5 April 1991, ad excerpted from April 1991 Scientific American.
37	Association of Mining and Exploration Companies	AMEC – Briefing Note No. 2 on The Native Title Act 1993: A Crippling Burden on Industry, 4 Industry Case Studies, March 1998.

No	From	Exhibit title
38	Cooperative Research Centres Association Inc.	Adding Value in Hydrometallurgy, by Professor Ian Ritchie, 1995.
39	Australian Aluminium Council	Aluminium Industry (map).
40	Department of Foreign Affairs and Trade	Australia and Climate Change Negotiations: An issues paper, September 1997.
41	Department of Foreign Affairs and Trade	Foreign Direct Investment: The Benefits for Australia, 1999.
42	Department of Foreign Affairs and Trade	Trade Liberalisation: Opportunities for Australia, 1997.
43	Department of Foreign Affairs and Trade	Tradewinds, The Transformation of World Trade: Changing Patterns of Global Import Demand and Australia's Response, October 1999.
44	Department of Foreign Affairs and Trade	Exports of Primary and Manufactured Products Australia 1998, August 1999.
45	A.C.T.E.D. Consultants	Asia's Chemical Industry & Role of Government (draft), 30 November 1999.
46	Confidential	

D

Appendix D – List of hearings & witnesses

Thursday, 23 September 1999 - Canberra

Department of Industry, Science and Resources

Mr Paul Bellchambers, Manager, Industry Outlook Section

Dr Peter Ferber, Assistant Manager, Mineral Industries Section

Mr Barry Jones, Acting Head of Division, Industry Policy Division

Mr Paul Kay, Acting General Manager, Petroleum Industry Branch

Ms Therese McDonald, Manager, Mineral Industries Section, Minerals Development Branch, Coal and Mineral Industries Division

Mr Donald Smale, General Manager, Minerals Development Branch, Coal and Mineral Industries Division

Thursday, 30 September 1999 - Canberra

Process Engineers and Constructors Association

Mr Christopher Rodwell, Executive Officer

Ms Elizabeth Toussaint, Economic Consultant

Monday, 18 October 1999 - Canberra

CSIRO

Mr Denis Daly, Principal Policy Adviser

Dr Roderick Hill, Chief of Division, Minerals

Dr John Oakeshott, Program Leader, Biotechnology

Mr Howard Upstill, Principal Adviser, Planning

Department of Agriculture, Fisheries and Forestry - Australia

Dr Simon Hearn, First Assistant Secretary, Portfolio Policy & International

Ms Paulette Quang, Assistant Secretary, Economic Policy Branch

Mr Michael Wilson, Assistant Secretary, Food & Agribusiness Policy Branch

Electricity Supply Association of Australia

Mr Keith Orchison, Managing Director

Minerals Council of Australia

Mr Damian Dwyer, Senior Policy Adviser, Economics

Mr Richard Wells, Executive Director

Pulp and Paper Manufacturers Federation of Australia

Mr Bridson Cribb, Executive Director

Thursday, 21 October 1999 - Canberra

National Association of Forest Industries Ltd

Mr Richard Stanton, Director, Economic & Resource Policy

Monday, 25 October 1999 - Perth

A.C.T.E.D. Consultants

Mr Ronald Van Santen, Director

Association of Mining and Exploration Companies (AMEC)

Dr Anthony Bagshaw, Member, Exploration & Technical Committee

Mr George Savell, Chief Executive Officer

Mrs Tamara Stevens, Assistant Director

Chamber of Minerals and Energy of WA Inc

Mr Charles Crouch, Executive Officer, Economic Affairs

Mr Mark Eames, Manager, Commercial Gold, WMC Resources

Mr Ian Satchwell, Chief Executive Officer

Iluka Resources Ltd

Mr Malcolm Macpherson, Managing Director

Woodside Energy Ltd

Mr Akos Gyarmathy, General Manager, North West Shelf Gas

Mr Steven Gerhardy, Commonwealth Approvals Coordinator

Ms Erica Smyth, Manager, External Affairs

Monday, 22 November 1999 - Canberra

Fuel Ethanol Association of Australia

Mr Robert Gordon, Executive Director

Thursday, 25 November 1999 - Canberra

Australian Aluminium Council

Mr David Coutts, Executive Director

Cooperative Research Centres Association

Dr Barry Harrowfield, Former Program Manager, Cooperative Research Centre for Premium Quality Wool

Professor Ian Ritchie, Chief Executive Officer, A J Parker Cooperative Research Centre for Hydrometallurgy

Department of Foreign Affairs and Trade

Mr Neil Batty, Director, Market Information & Analysis Unit, Trade Development Branch, Market Development Division

Mr Michael Carney, Director, WTO Industrials & Market Access Section, Trade Negotiations Division

Mr Matthew Hyndes, Executive Officer, Trade & Economic Analysis Branch

Mr Michael Mugliston, Assistant Secretary, Trade & Economic Analysis Branch

Ms Catherine Raper, Executive Officer, Climate Change Section

E

Appendix E – Reports and studies into adding value to minerals

Year	Author	Title
1979	Crawford Study Group on Structural Adjustment	Study Group on Structural Adjustment
1980	Various Government Departments	Potential for Raw Materials Processing in Australia
1981	Commonwealth State Study Group on Raw Material Processing	Government Approvals Required for Raw Material Processing Projects
1981	Commonwealth State Study Group on Raw Material Processing	National Benefits Arising from Raw Materials Processing in Australia
1984	Commonwealth State Study Group on Raw Material Processing	Policy Initiatives for Raw Material Processing in Australia
1984	Commonwealth State Study Group on Raw Material Processing	Tariff Barriers to Trade – Australian Exports of Selected Minerals and Metals
1986	Basic Metals Industry Council	Industry Strategy
1987	Basic Metals Industry Council	The Role of R&D in Company Strategy and Performance
1987	Bureau of Resource Economics	Processing Australia's Mineral Exports: An Overview

Year	Author	Title
1987	Bureau of Resource Economics	Minerals Processing in Australia: Potential for Growth in the Mineral Sands, Manganese and Silica Processing Industries
1988	EPAC	Raw Materials Processing : Its Contribution to Structural Adjustment
1989	Basic Metals & Minerals Processing Industry Council	Location Determinants of Minerals Processing Plants and Facilities
1990	Basic Metals & Minerals Processing Industry Council	The Basic Metals and Mineral Processing Industry and the Environment
1990	Basic Metals & Minerals Processing Industry Council	Accessing Technology and Markets for Minerals Processing to Differentiated Products
1990	Garnaut	Australia and the North East Asian Ascendancy
1990	Australian Manufacturing Council	The Global Challenge
1990	Prime Minister's Science Council	Value Adding in the Australian Minerals Industry
1991	IC	Mining and Minerals Processing in Australia
1993	DITARD	Review of Mineral Processing Research in Australia
1997	Australian Academy of Technological Sciences and Engineering	The Competitiveness of Australian Industry – The Minerals Industry
1997	Parliamentary Committee Inquiring into the Steel Industry	The Australian Iron and Steel Industry

Source *ISR, submission no. 28, p. 29.*

F

Appendix F – Australian non-energy minerals processing facilities commissioned, 1993-1999

Project	Company	Location	Startup	New capacity	Capital expend
Alumina					
Wagerup expansion	Alcoa World Alumina	Darling Ranges, WA	1993	900 kt	na
Gladstone expansion	Comalco	Gladstone, Qld	1997	300 kt	na
Worsley expansion	Worsley Alumina	Darling Ranges, WA	1997	150 kt	$80m
Wagerup expansion	Alcoa World Alumina	Darling Ranges, WA	1999	440 kt	$258m
Aluminium					
Tomago expansion	Tomago Smelters	Hunter Valley, NSW	1993	140 kt	$600m
Bell Bay expansion	Comalco	Bell Bay, Tas	1994	18 kt	na
Boyne Island expansion	Comalco	Gladstone, Qld	1998	230 kt	$1 billion
Tomago expansion	Tomago Smelters	Hunter Valley, NSW	1999	40 kt	$160m

Project	Company	Location	Startup	New capacity	Capital expend
Copper					
Mount Isa copper smelter expansion	MIM	Mount Isa, Qld	late 1998	75 kt Cu anode	$285m
Townsville refinery expansion	MIM	Townsville, Qld	late 1998	45 kt Cu cathode	$50m
Olympic Dam expansion	WMC	Roxby Downs, SA	late 1998	115 kt Cu 3 kt U_3O_8 45 000 oz Au 450 000 oz Ag	$1.9b
Mt Gordon expansion	Western Metals	Mt Isa, Qld	mid 1998	37 kt Cu	$125m
Nifty SX-EW	Straits Resources	Nullagine, WA	late 1993	17 kt Cu	na
Cloncurry SX-EW	Cloncurry Mining	Cloncurry, Qld	early 1996	6 kt Cu	$11m
Girilambone SX-EW	Straits Resources	Nyngan, NSW	mid 1993	17 kt Cu	na
Mt Cuthbert SX-EW	Murchison / Brancote	Cloncurry, Qld	late 1996	5.5 kt Cu	na
Iron and steel					
Blast furnace upgrade	BHP	Port Kembla, NSW	1996	2.6 Mt	$400m
HBI plant	BHP	Port Hedland, WA	1999	2.5 Mt	$2.5b
Tinplate expansion	BHP	Port Kembla, NSW	1999	150 kt steel	$304m
Billet caster	BHP	Whyalla, SA	1999	300 kt	$70m
Hot Stip mill expansion rolling mill upgrade	BHP	Western Port, Vic	1999	na	$l00m
Wire mill upgrade	BHP	Newcastle, NSW	1999	na	$44m
Lead					
Port Pirie refinery upgrade	Pasminco	Port Pirie, SA	1998	35 kt Pb	$30m
Mineral sands					
TiO_2 pigment plant expansion	Tiwest JV	Kwinnana, WA	1996	83 kt TiO_2	na
TiO_2 pigment plant	Millenium Inorganic Chemicals	Kemerton, WA	1996	79 kt TiO_2	na

Project	Company	Location	Startup	New capacity	Capital expend
Synthetic rutile plant expansion	Tiwest JV	Chandala, WA	1996	183 kt SR	na
Synthetic rutile plant expansion	Iluka	Capel, WA	1996	250 kt SR	na
Nickel					
Acid plant	WMC	Kalgoorlie, WA	1996	500kt sulphuric acid	$146m
Bulong	Preston Resources	Kalgoorlie, WA	1999	9kt Ni	$242m
Cawse	Centaur Mining	Kalgoorlie, WA	1999	9kt Ni	$274m
Murrin Murrin	Anaconda Nickel	Leonora, WA	1999	45kt Ni	$1b
Zinc					
Townsville zinc refinery	Sun Metals (Korea Zinc)	Townsville, Qld	late 1999	170 kt Zn 325 kt sulphuric acid	US$425m

Source ABARE, submission no. 42, pp. 18-19.

G

Appendix G – Major minerals processing projects (November 1999)

Project	Company	Location	Status	Startup	New capacity	Capital expend.
Alumina						
Projects under construction or committed						
Pinjarra alumina refinery	Alcoa World Alumina	Darling Ranges, WA	Efficiency improvements under construction	2001	165 kt alumina	na
Worsley alumina refinery	Reynolds Australia Alumina	Darling Ranges, WA	Expansion, under construction	late 2000	1250 kt alumina	$800m
Less advanced projects						
Comalco alumina refinery project	Comalco Aluminium Malaysia	Gladstone, Qld or study underway	New project, location	after 2000	1400 kt alumina	$1.4 b
Wagerup refinery expansion (stage 2)	Alcoa World Alumina	Darling Ranges, WA	Expansion, feasibility study completed	na	1100 kt alumina	$700m
Aluminium						
Less advanced projects						
Lithgow aluminium smelter	Aust-Pac Aluminium	Lithgow, NSW	New project, feasibility study underway	na	450 kt aluminium	$2.75 b

Project	Company	Location	Status	Startup	New capacity	Capital expend.
Kurri Kurri aluminium smelter	Capral Aluminium	Kurri Kurri, NSW	Expansion, feasibility study completed	na	50 kt aluminium	$250m
Copper						
Projects under construction or committed						
Port Kembla copper smelter / refinery	Furukawa / Nittetsu / Nissho / Iwai / ITOCHU consortium	Port Kembla, NSW	Reconstruction, under construction	early 2000	120 kt Cu cathode	$271m
Less advanced projects						
Qsmelt copper smelter	Queensland Minex (Mineral Commodities)	Phosphate Hill Qld	New project, feasibility study underway	2002	105 kt Cu matte 175 kt sulphuric acid	$120m
Crude iron and steel						
Projects under construction or committed						
Blast furnace expansion-	BHP	Port Kembla, NSW	Expansion, under construction	2001	0.4 Mt	$93 m
Less advanced projects						
DRI plant	Australian United Steel Industries	Pilbara, WA	New project, feasibility study completed	na	3.6 Mt DRI	$1.8 b
DRI and steel plant	An Feng Kingstream	Geraldton, WA	New project, feasibility study completed	na	2.4 Mt steel	$1.4 b
HBI plant	Mt Gibson Iron	Geraldton, WA	New project, feasibility study completed	na	2.6 Mt HBI	$1.1 b
Pellet and HBI plant	Mineralogy	Pilbara, WA	New project, feasibility study completed	na	6.0 Mt pellets 4.0 Mt HBI	$1.8 b
Pig iron plant	Australian Bulk Minerals	Port Latta, Tas	New project, feasibility study completed	na	0.5 - 1 Mt pig iron	$120m
Pig iron plant	SA Steel and Energy	Coober Pedy, SA	New project, feasibility study underway	na	2.5 Mt pig iron	$830m
Steel mini mill	Boulder Group, Australian Overseas Resources, Danieli	Newcastle, NSW	New project, feasibility study underway	na	110 kt steel	$215m

Project	Company	Location	Status	Startup	New capacity	Capital expend.
Steel plant	Compact Steel	Rockingham, WA	New project, feasibility study underway	na	1.4 Mt steel	$1.5 b
Gold						
Projects under construction or committed						
Fosterville	Perserver-ance	Fosterville, Vic	Expansion, committed	late 2000	50 000 oz	$29m
Mt Rawdon	Equigold	Bundaberg, Qld	New project, under Construction	2000	80 000 oz	$32m
Vera Nancy	Normandy	Charters Towers, Qld	Expansion, under construction	early 2000	100 000 oz	$48m
Less advanced projects						
Ashburton	Taipan	Ashburton, WA	New project, feasibility study completed	2000	na	$43m
Ballarat	Ballarat Goldfields	Ballarat, Vic	New project, pre-feasibility study completed, on hold	na	100 000 oz	$65m
Bendigo	Bendigo Mining	Bendigo, Vic	New project, pre-feasibility study completed	early 2002	150 000 oz	$70-$100m
Boddington / Wandoo	Normandy	Perth, WA	Expansion, feasibility study underway	2003	> 300 000 oz	$350m
Cowal	North	West Wyalong, NSW	New project, feasibility study underway	na	250 000 oz	$220m
Gwalia Deeps	Sons of Gwalia	Gwalia, WA	Expansion underground feasibility study underway	2003	150 000-200 000 oz	$60m
Maud Creek	Kilkenny Gold	Katherine, NT	New project, feasibility study underway	2000	55 000 oz	$24m
Ridgeway	Newcrest	Orange, NSW	New project, feasibility study underway	early 2001	150 000 oz 12 kt Cu	$175m
Sarsfield	MIM / Haoma Mining	Ravens-wood, Qld	New project, feasibility study completed	2000	60 000 oz	$45m

Project	Company	Location	Status	Startup	New capacity	Capital expend.
St Ives	WMC	Kambalda, WA	Expansion, on hold	na	150 000-300 000 oz	$157m
White Foil	Cogema SA	Kalgoorlie, WA	New project feasibility study underway	mid 2000	na	na
Magnesium						
Less advanced projects						
Arthur / Lyons River magnesium metal project	Crest Magnesium	Bell Bay, Tas	New project feasibility study underway	2003	95 kt magnesium metal / alloy	$1.08b
Batchelor magnesium project	Mount Grace Resources	Darwin, NT	New project, pre-feasibility study nearing completion	2002	50 kt magnesium metal	$625m
Magmetal project	Australian Magnesium Corp (QMC / Normandy / Fluor Daniel)	Rock-hampton, Qld	New project, feasibility study nearing completion	2002	90 kt magnesium metal	$800m
PMMA project	Pilbara Magnesium Metal Associates	Pilbara, WA	New project, feasibility study underway	na	50 kt magnesium metal	na
South Australia magnesium project	SAMAG (Pima Mining / RFC)	Port Augusta, SA	New project, feasibility study underway	2003	52.5 kt magnesium metal / alloy	$640m
Woodsreef magnesium project	Golden Triangle Resources	Woodsreef, NSW	New project, pre-feasibility study underway	2003	80 kt magnesium metal / alloy	$630m
Nickel						
Less advanced projects						
Marlborough	Preston Resources	Rock-hampton, Qld	New project, feasibility study completed	2001	25 kt Ni 2 kt Co	$738m
Murrin Murrin 2	Anaconda Nickel	Leonora, WA	Expansion, feasibility study underway	2001	55 kt Ni 4.5 kt Co	$1 b
Syerston	Black Range Minerals	Parkes, NSW	New project, feasibility study underway	na	13 kt Ni 3 kt Co	$493m
Yabulu refinery expansion	Billiton	Townsville, Qld	Expansion, feasibility study underway	2002	35 kt Ni 1.3 kt Co	$200m

Project	Company	Location	Status	Startup	New capacity	Capital expend.
Silicon						
Less advanced projects						
Lithgow silicon project	Doral Mineral Industries / Portman Mining JV	Lithgow, NSW	New project, feasibility study nearing completion	early 2001	30 kt silicon metal 17 kt silica fume	$100m
Titanium						
Less advanced projects						
Kemerton TiO_2 pigment plant	Millenium Inorganic Chemicals	Kemerton, WA	Expansion, on hold	na	190 kt TiO_2 pigment	$470m
Kwinana TiO_2 pigment plant	Tiwest JV	Kwinana, WA	Three stage expansion, on hold	na	180 kt TiO_2 pigment	$200m
Pinjarra rare earth plant	Rhodia Pinjarra.	Pinjarra, WA	New project, feasibility study underway	late 1999	15 kt rare earth nitrates	$60m

Source ABARE, submission no. 42, pp. 20-24.

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