



# Australia-Korea:

Strengthened

Economic Partnership

A report prepared by:

Dr Michael Porter (Tasman Asia Pacific)

Steve Doszpot (Duesburys Strategic Connections)

Ron Maxwell (Maxwell and Druce International Pty Ltd)

for the Australia-Korea Foundation

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## Executive Summary

Australia and Korea<sup>1</sup> are important trading partners, with a strong and mutually beneficial relationship that reflects the underlying fundamentals of the two economies. The traditional complementary relationship is one in which Australia has supplied raw materials and food to Korea's factories and people, with Korea supplying manufactured goods to Australia. These traditional relationships are not only secure for the foreseeable future, but also have substantial growth potential, based around new opportunities in both technology and infrastructure.

The relationships in areas such as agriculture and food; and minerals and energy could be transformed into more of a partner relationship, through improved customer focus built around new technologies. This will involve intra-industry investment: by Korea in upstream activities in Australia and by Australia in downstream activities in Korea. It could also involve greater use of e-commerce, person-to-person contacts, and training of Koreans on Australia's food standards and conformance systems.

What this study shows is that there are emerging new areas for a strengthening of the economic relationship. There are opportunities in the more technology intensive sectors, in education and training and in infrastructure and utilities (and related professional services). Australia has pioneered new ways of private sector project finance of investment in infrastructure services, and export of these skills will be timely.

The well documented shortfall in much of urban and transport infrastructure service provision in the major cities of Korea creates an opportunity for Australia to export skills and expertise that are fundamental to removal of the bottlenecks that constrain urban Korea. What is more, the financial governance issues which continue to cause problems in Korea, can also be assisted by a move to a more Australian approach to the structuring and finance of infrastructure service provision – underpinned by customer and project funding rather than the model usually applied across Korea in the recent past.

The reform policies of Korea, and the corporate governance agenda, involve a moving away from government bank finance of state owned utilities, towards more project finance of infrastructure investments and some divestment and other forms of privatisation in infrastructure service provision. This provides opportunities for Australian financial institutions, professional service providers, and construction and operating companies in the areas of highways, tunnels, pipelines, water treatment plants, power generation units, and other infrastructure and utilities.

The other major change in Korea is the emergence of a knowledge-based economy. Korea's plans include a decreasing reliance on other countries and more reliance on the development of its own technologies. But it also

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<sup>1</sup> Korea refers to the Republic of Korea

implies a widening of its international cooperation in science and technology away from USA, Europe and Japan to other countries, both bilaterally and multilaterally.

The challenge for Australia is to become an important ally for Korea in achieving its science and technology objectives. While Korea will want to use many technologies developed within Korea, Australia could play an essential complementary role. Working towards such an objective will considerably strengthen the economic partnership between the two countries.

In many ways Australia and Korea are complementary in the technology area. Australia is relatively stronger in basic R&D and in the services sector, including education and training, that underpins the science and technology sector. Korea is relatively stronger in large-scale industrial application of technology and in marketing. Korea is relatively stronger in the successful commercialisation of R&D. Australia also benefits from the widespread use of English and in its innovative education system.

Australia could become the source of much of Korea's R&D capability (with the added role of assisting Korea to improve its own R&D capabilities through the education and training sector) and Korea could become the source of the financial and commercial skills needed to develop Australian R&D successfully on a large scale.

Such a vision does not need to be restricted to any particular technologies, but the more obvious possibilities would appear to be in information and communications technology, biotechnology, and environmental technology. These are in addition to manufacturing technologies such as automotive components where there is already a strong Korean interest in Australian capabilities. There are other potential areas such as nanotechnology and space technology.

There is emerging a new paradigm of comparative advantage between Australia and Korea. Australia has a comparative advantage in basic R&D, science and technology and human resources development. Korea has a comparative advantage in the commercialisation and industrialisation of technologies. By working together Australia and Korea can develop technologies, products and services for marketing to third countries: high technologies to countries such as Japan and USA and medium technologies to countries such as China.

The major barrier to achieving this vision is a lack of knowledge about each other's strengths and weaknesses across the industrial/commercial chain. At the present time both countries tend to think of USA (and then Western Europe and Japan) as potential partners. Encouragement needs to be given to the industry participants, and not just the researchers, to work together to get a better understanding of what each has to offer and what needs to be done to strengthen the relationship.

A key area in strengthening the relationship is education and training. Education and training has two roles in strengthening the economic partnership between Australia and Korea. The first is as a services export that not only earns income for Australia but also augments Korean education and technology. The second is as a means to change Korean perceptions of Australia.

The major challenge for Australia is to get across the message that Australia is both a centre of excellence for education and a source of technically or intellectually advanced inputs to assist Korean development. Increasing the number of Korean students participating in Australian university and vocational education will be a means, albeit medium to long term, of meeting this challenge.

In addition the Korean education system is facing major challenges, as it is not designed for an advanced knowledge based economy. Many Koreans recognise the system should be based around overall human resources development where there is a need for education and training that promotes quality, creativity and lifelong learning as well as education that is relevant to the needs of industry (and which prepares students to be more productive on entry to employment). These prospective changes offer new opportunities for Australia. There is indeed a window of opportunity for Australia to become a strategic partner for Korea's education and training sector – and redress the emphasis that Koreans have placed on an education in the USA.

This study recommends a number of specific initiatives namely -

- (i) Australia and Korea enter into an umbrella agreement designed to strengthen the economic partnership between Australia and Korea (e.g. a Trade and Investment Facilitation Agreement - TIFA). It should provide the framework for the recommendations set out below.
- (ii) Australia and Korea foster greater interest in each other's technology sectors: Australia as a source and a place to develop technologies and Korea as a source of funding and a partner in the development of successful technologies.
- (iii) Support be given to the development of closer linkages between Australia and Korea throughout the industrial/commercial chain in various technology segments (e.g. information and communications technology, biotechnology, photonics, environmental technology). This should initially involve workshops and possibly lead to the establishment of Australian/Korean clusters in particular technology segments.
- (iv) A bilateral arrangement be made on the implementation of intellectual property protection. This could include a Code of Practice and possibly a joint forum that would consider tangible issues raised by Australian and Korean firms about infringements of their intellectual property rights.

- (v) Australia and Korea work on a sector-by-sector basis towards adopting common systems for obtaining approvals/certificates that goods from each country comply with the standards and regulations applying in the other country.
- (vi) The Australian Government, in partnership with Australian private sector groups, continue to promote the capabilities of Australian businesses and the relevance of Australia's financial and advisory sectors to assist in the modernisation and reform of Korea's infrastructure and utilities. Such promotion should build on innovative partnerships between private sector and public sector entities, with improved customer focus, along lines pioneered in the new Australian infrastructure sector.
- (vii) There be increased support for road-shows, seminars and workshops presenting the Australian approach to reform of these sectors such as rail, roads, water, energy and communications infrastructure. The congestion in urban Korea creates a major opportunity for communication of how new project finance models can address both the problems and the need for improved quality of investment and governance in the infrastructure sector in Korea.
- (viii) A coordinated, long-term strategy be adopted involving the Australian Government and educational institutions to capture the attention of Korean Government and educational decision makers as to the quality and relevance of the Australian education and training system and products to the human resources development needs of Korea.
- (ix) A Government to Government cooperative agreement be reached whereby Australia agrees to provide advice to Korean authorities and institutions on developing Korea's new human resources development system and introducing Australian institutions that can provide the particular systems and courses that meet Korea's needs.
- (x) The use of scholarships and work placements be introduced for Korean postgraduate students in Australia as a longer term means to raise the general profile of Australian education and training among younger Koreans and to build a counterweight to the usual attraction of postgraduate students to the USA.
- (xi) The building of Australian alumni groups in Korea be supported.
- (xii) The media be utilised more extensively to increase the profile of Australia and Korea in each other's country, including through the exchange of industry specific media specialists who could highlight "success stories" of complementary initiatives. In addition, consideration be given to the implementation of the recommendations of the inaugural Australia-Korea Media Forum held in Sydney on 17 August 1999.

# TABLE OF CONTENTS

<b>Executive Summary</b>	<b>iii</b>
<b>1. Introduction</b>	<b>1</b>
<b>2. Australia and Korea – The Background</b>	<b>3</b>
2.1. Korea – Past and Present	3
2.2. Korea – The Future	4
2.3. Korea and Australia	5
<b>3. Strategic Market Assessment</b>	<b>9</b>
3.1. Attractiveness of Korean Market for Australian Business	9
3.2. Australian Competitiveness	11
<b>4. Industry Sectoral Issues</b>	<b>17</b>
4.1. Agriculture and Food/Minerals and Energy	17
4.2. Manufactures	19
4.3. Technology	21
4.4. Education and Training	37
4.5. Infrastructure and Utilities	41
4.6. Other Services	48
<b>5. Cross Sectoral Issues</b>	<b>53</b>
5.1. Profile of Australian Capabilities	53
5.2. Intellectual Property	54
5.3. Standards and Compliance	56
5.4. Commercialisation of Technology	57
5.5. Investment	57
5.6. Making Connections	58
<b>6. Conclusions</b>	<b>61</b>
6.1. Importance of issues by sector	61
6.2. General Initiative	61
6.3. Specific Initiatives	63
<b>7. Recommendations</b>	<b>67</b>
<b>Appendix A: Useful Korean Government Websites</b>	<b>69</b>



## 1. Introduction

During his visit to Korea in May 2000, Prime Minister Howard discussed with President Kim Dae-jung the possibility of exploring the scope for expanding trade and investment links between Australia and Korea. Subsequently the Korean and Australian Trade Ministers agreed to initiate studies on measures to strengthen the bilateral economic relationship.

This study, sponsored by the Australia-Korea Foundation (AKF), identifies ways of strengthening the economic partnership between Australia and Korea.

An initial study was completed on 30 April 2001. The initial study:

- (i) examined economic, commercial and industrial trends and policies in Korea (with particular emphasis on services, high technology and new economy/knowledge based economy (KBE) sectors and investment) current, and in prospect over the next 3-5 years;
- (ii) assessed the impact of these trends on Australia's existing trade/commercial links with Korea and the opportunity for enhanced bilateral commercial engagement; and
- (iii) identified for further study a small number of areas/market sectors where Government action might assist in broadening the basis of mutually beneficial bilateral economic activity.

This study was completed in August 2001. A similar study is being sponsored by the Korean Government.

The study involved discussions with three types of businesses:

- (i) those that are currently engaged in trade with Korea;
- (ii) those that have ceased trading with Korea; and
- (iii) those that are perceived to be potential trading partners.

There have also been a number of visits to Korea for discussions with Korean Government and business people.

The conversion rate used in this report is \$A1.00 equals 600 Won.

The authors of this study are:

- Michael Porter of Tasman Asia Pacific. He is also a director of the Investment Banking Group of Macquarie Bank and has been a Professor of Economics at leading universities such as Monash, Yale and Stanford. Dr Porter has led a number of major studies on infrastructure and trade in Asia for the World Bank, AusAID, the Asian Development Bank and State and Federal Governments in Australia.

## Australia-Korea: Strengthened Economic Partnership

- Steve Doszpot of Duesburys Strategic Connections, a division of Duesburys Chartered Accountants. Mr Doszpot is a private sector businessman who provides national and international marketing support and advice to government and business enterprises in Canberra. He was a major participant in the organisation of the Australia Today Indonesia '94 project.
- Ron Maxwell of Maxwell and Druce International Pty Ltd. Mr Maxwell has over 30 years experience in the Federal Government, primarily in the trade portfolios. He has been a consultant for the past 10 years providing advice on international business development issues to Australian and international governments and businesses.

## 2. Australia and Korea – The Background

*This chapter reviews the recent changes in Korea and its future directions. The existing economic relationship between Australia and Korea is summarised.*

### 2.1. Korea – Past and Present

Korea is now a major industrial nation after rapid economic growth over the last three decades. The average annual growth rate from mid 1960s to mid 1990s was over 8%. Over this period Korea built a strong economy with enormous human and capital resources, and technological capacity. Its manufacturing development, export growth, macroeconomic stability and poverty reduction were impressive.

At the end of 1997, Korea suffered a financial crisis with a rapid depreciation of the currency and drop in the securities markets. In response to the crisis, the Korean Government initiated a program to stabilise the economy and implement structural reforms that would address the underlying causes of the crisis and return Korea to a path of sustainable development. The policies being adopted in Korea in relation to information and communications technology and other technologies and services will move Korea towards the Australian/OECD structure. This involves rapid structural adjustment out of labour intensive industries and into higher value production activities.

Korea's early and strong rebound was due in part to a recovery in confidence resulting from the sharp increase in foreign exchange reserves related to the huge current account surplus. In addition a wide range of structural reforms were introduced to establish a more market oriented economy, thereby addressing the weaknesses that had made Korea vulnerable to a crisis. The reforms included significant changes in the financial system, the corporate sector, the labour market and government regulation.<sup>2</sup> This is in addition to the reform that has been underway in respect of trade. While the reform process is still not complete, it has had a positive impact on confidence, both within Korea and abroad, about the country's prospects.

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<sup>2</sup> This area of reform provides different types of opportunities for Australian businesses, for example, advising on the reform and restructuring process such as the privatisation of KEPCO's generating facilities as well as participating through investment in the privatised KEPCO.

## 2.2. Korea – The Future

There are risks to continued expansion in the near term. On the domestic side, the major risk would appear to be financial market instability, perhaps related to possible bankruptcies of large companies triggering difficulties in financial institutions. The major external influence will be developments in the USA where a slowdown will affect Korean exports – as would setbacks in key Asian countries such as Japan and China.

The rapidity of the recovery owes much to swift action by the IMF as well as to Korean nationalism (e.g. the switch away from imports created not only a very sharp recovery in the balance of payments and international reserves but also a platform for the sharp recovery in activity and demand). The recovery also owes much to the competitiveness of the “Korean model”. Winning dominant market share in global growth industries over two to three decades meant a focus on low costs and reasonable quality, as well as on large capacity.

There is a potential risk that the reform agenda will be derailed by the recovery, through complacency and/or reform fatigue.

The crisis and the response to the crisis have enabled Korea to move towards a more responsive and sustainable model. Korea has a number of competitive attributes that should see it continue to prosper in the long term.

One such attribute is the female labour force, unable so far to participate fully in the economy to their full potential for social and cultural reasons. Another attribute arises from the liberalisation of restrictions over foreign direct investment, which have been at levels<sup>3</sup> second only to China. With more and more foreign entrants to the Korean market, surplus capacity will be absorbed within a short period and foreign funds can be used to expand productive capacity using up-to-date practices.

In short, there is scope for labour force expansion and productivity growth, especially with the increased technical transfers likely with foreign direct investment inflows.

Korea with its population of nearly 50 million is already a large market with sophisticated consumers. Even though wealth may not be evenly spread throughout Korea, the greater Seoul conurbation is probably of the order of 26 million people with many more people with similar standards of living in the south eastern region around Pusan. This wealth is seen, for example, in the growth of tourism in the 1990s which, after the setback of the financial crisis in 1997-98, has resumed its upward path. The availability of

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<sup>3</sup> \$US15.9 billion in 4,136 projects in 2000: Ministry of Commerce, Industry and Energy, 8 January 2001.

discretionary disposable income is seen on a smaller scale in the example of the investment in the Korean entertainment industry by Melbourne Aquarium.

An important factor in Korea, at least in the political sphere, is the desire to be recognised as a major OECD country. In terms of economic policies, this should involve continuation of reform and moving towards a more market forces driven economy. At the same time the economic policies do involve an interventionist approach as Korea strives to build a knowledge based economy. This interventionist approach is encapsulated in the following statement by the Minister of Science and Technology:

We have both a vision and a strategy for making Korea an industrial powerhouse by boosting its scientific and technological prowess in the 21<sup>st</sup> century. When we realise our vision, we expect that Korea's competitiveness in the science and technology field will rank seventh in the world, with its "informationization" index placing fifth by 2025. By that time, the contribution of science and technology to the nation's economic growth is likely to reach roughly 30 per cent.<sup>4</sup>

The growth of these industries not only provides a direct source of economic growth but they also provide an indirect source through the productivity improvements they bring to more traditional industries.

Other aspects of the Korean Government's long term approach are reviving provincial economies, improving the living standards of lower income families, improving relations with North Korea, and the realisation of democracy and human rights.<sup>5</sup>

The realisation of these policies will be beneficial to Korea, in particular, and to Australia.

### 2.3. Korea and Australia

Korean and Australian GNP are about the same size although Korea's population is almost 2½ times that of Australia. In terms of GNP per head (purchasing power parity) Australia is about \$US22,000 while Korea's is about \$US13,000.

The structures of the two economies are different with Australia already having moved into the post-industrial society, with services accounting for over 70% of GDP and manufacturing about 25% - in Korea services share is 50% and manufacturing 40/45%.

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<sup>4</sup> Seo Jung-uck in Korea Economic Report, March 2001, at page 15.

<sup>5</sup> For example, see President Kim Dae-jung's New Year Message, 1 January 2001.

## Australia-Korea: Strengthened Economic Partnership

In 2000 Korea was Australia's fourth largest trading partner (\$A13.8 million in two-way trade), third largest export market (\$A9.0 million), and eighth largest source of imports (\$A4.8 million).

In 2000 Australia was Korea's 10<sup>th</sup> largest trading partner, fifth largest import source and 12<sup>th</sup> largest export destination.

This important trading relationship between Australia and Korea began in the 1970s when Korea began to purchase large quantities of minerals. Australian exports to Korea are still dominated by minerals and energy products followed by agricultural products. Some manufacturing products, particularly in the form of automotive components, have become important in recent years. In the services sectors, tourism and education are growing and becoming significant. Australian imports from Korea are mainly manufactured products such as motor vehicles, computers and telecommunications equipment.

The trading structure generally reflects that which Australia has with many countries, i.e. it is complementary in the traditional sense with Australia supplying the raw materials and food for Korea's factories and people. Nevertheless, there are indications of a mature trading relationship evolving between two countries with advanced technological skills such as the emerging exports of automotive components from Australia and the presence of Australian banks in Korea.

Korean investment in Australia is about \$A770 million, e.g. in the electronics industry by Daewoo, Samsung and LG as well as by POSCO in the resources industry.<sup>6</sup> There are other investments in the resources area in addition to POSCO such as KEPCO and Korea Zinc. There are apparently a few investments in the high technology area. One such investment is that of the Anam Industries group (a Korean semiconductor manufacturer) in Semiconductor Technologies Australia Pty Ltd – where the objective is to link Australian strengths in intellectual property in software design with Korean skills in manufacturing and marketing.

Australian investment in Korea is about \$A1,500 million. There is a range of different types of investment, e.g. from Melbourne Aquarium's investment in an aquarium in Pusan to Britax Rainsfords' (now part of Schefenacker International) investment in a Korean manufacturer of mirrors for the automotive industry as well as the investment by Coca-Cola Amatil. In the latter case Australian technology and management expertise was used to put in place new manufacturing and business systems in an existing Korean manufacturer.

Technology exchange between Korea and Australia in a prospective and potential business context to date is limited but growing.

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<sup>6</sup> Interview on 9 March 2001 with Korea International Trade Association (KITA).

In addition to examples already mentioned, Korea's Optical Internet Research Center is opening research laboratories at the University of Sydney (the Australian Photonics Cooperative Research Centre) and the University of Melbourne (the Centre for Ultra Broadband Information Networks).

Another example is the Korea-Australia Science and Technology Exchange Centre (KASTEC), which is based at the Pusan National University and at the CRC for Waste Management and Pollution Control in Sydney. Its objective is to promote the exchange of environmental technologies between Australia and Korea with a view to developing demonstration projects and commercial linkages.

A bilateral Agreement on Scientific and Technological Cooperation was signed on 17 September 1999. The Joint Committee on Science and Technology established under the agreement first met in March 2001.



### 3. Strategic Market Assessment

*This chapter examines the overall attractiveness of the Korean market for Australian business and Australia's competitive position. The major challenge for Australia is a relatively low profile compared with other countries. Australia's major competitive position has been in mineral and agricultural products. There is an emerging Australian competitiveness in the technology and infrastructure sectors – the sectors where the Australian profile has been lowest.*

#### 3.1. Attractiveness of Korean Market for Australian Business

The Korean market is positive for most Australian goods and services (including technology). Except for the special circumstances of 1998, the market has been growing steadily and even the slowdown in 1998 did not affect Australia to any significant extent because of the predominance of mineral and agricultural products in Australia's export profile. The market will remain attractive for the mineral suppliers, but may not continue to grow as fast as Korea places less emphasis on heavy industry. The ongoing liberalisation of trade in agricultural products should provide expanding opportunities.

In terms of the *market characteristics* of Korea for the manufacturing and services sectors, businesses consulted during the project were mainly positive:

- One small sized exporter of food processing equipment said the market in Korea is not large but provided steady sales. In its case the market is very clearly defined and there are no equivalent substitutes at this stage. A supplier of software that is used by the traditional Korean textile industry to move into high value added textile products expressed similar sentiments.
- One medium sized exporter of software to the banking industry has had good sales to Korea, but has satisfied most of the original demand and is now moving to new markets while maintaining existing customers. These new markets include new types of financial institutions (e.g. mortgage brokers) that are emerging in Korea as a result of financial deregulation and other countries. A similar situation applies with another software supplier.
- In the automotive components industry, the Korean market is growing steadily among automotive manufacturers within Korea and Korean automotive subsidiaries in third countries.
- There is a growing demand for professional services as evidenced by the work obtained by some Australian firms.

- There are many opportunities in the infrastructure/utilities sector, which may be enhanced as Australian financial institutions and professional services providers are involved in advising on new financing arrangements and ownership structures.
- The Korean Government's strategy for Korea to become an important scientific and technological nation indicates a growing market for technology in the form of exports of products incorporating high technology or of intellectual property and know-how. This should also mean an expanding market in education and especially training in the application of such technologies.
- In addition the national framework for human resources developed in Korea is presently being reviewed with positive implications for Australian education and training (especially the higher education sector) as discussed later in this report.

The *competitiveness conditions* within Korea are a challenge. In some industries such as electrical and electronics manufacturing, Korea is very competitive and at present there is little Korean interest in importing. Even with the successful companies in the software and professional services industry, there is always the potential of competition from suppliers in third countries such as the USA, Europe or Japan and from within Korea. The successful Australian companies in this area have in most cases developed a niche that is large enough for their purposes but is small enough not to attract major attention from other potential suppliers. Another approach is to have a product that is always ahead of any potential competitor. Nevertheless, competition from these other countries is always present because Australian companies do not have the same general high technology brand recognition as companies from, for example, the USA.<sup>7</sup> While the distribution system in Korea is sometimes considered to be a challenge (and probably is in some industries such as agricultural products), it has not been raised as an issue by the companies consulted in the manufacturing and services sectors. One comment did indicate a competitive advantage for Australia in the automotive components area in that Korean companies preferred to buy from Australian suppliers rather than Korean subsidiaries of European companies because of: (1) Australian products were cheaper and better quality, (2) access to advanced technology, and (3) the export credits generated under the Automotive Competitiveness and Investment Scheme (ACIS).

An important issue that normally arises in considering a country's attractiveness is the *financial and economic conditions* of doing business in that country. This covers items such as pricing and payment terms, tariffs and other barriers to entry, and foreign exchange conditions. While tariffs

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<sup>7</sup> Nearly every company consulted in the manufacturing and services sectors commented on the very little understanding that most Koreans had of the manufacturing and technological capabilities of Australia. This was also a theme that was raised by many Koreans.

and non-tariff barriers are an issue in some areas such as agriculture, the manufacturing and services companies consulted have not raised any items in this area as being of particular concern.

However, *legislative and socio-political conditions* have been raised on a few occasions:

- The Australian telecommunications equipment industry has raised the difficulties companies in that industry are confronted with in Korea (and many other Asian countries) in respect of the regulatory and approvals process, particularly the over-elaborate compliance regime. The process is costly, time-consuming, and requires a lot of documentation compared with other developed countries.
- Another company was able to work its way through the regulatory process, but commented on the very high costs incurred on legal and accounting fees to gain an understanding of what is required.
- Nearly all companies commented on the difference in Korean and Australian cultures, particularly in the way of doing business. Having made those comments, the successful companies went on to say that, as long as one understood and basically accepted the need to do business in a different way, the challenge could be overcome.
- None of the manufacturing and services companies consulted had been confronted in recent years with particular foreign investment barriers nor with labour problems within Korea.<sup>8</sup> There are investment barriers at present in the way of overseas-owned education and training establishments.
- Many firms commented on the intellectual property issue.<sup>9</sup> The successful companies usually found a way around this perceived weakness in Korea, for example, doing business with larger companies that had assets in third countries such as the USA which could be pursued in the event of any significant breach of their intellectual property rights. During the consultation process, a few companies were encountered that were reluctant to do business in Korea because of their fears about intellectual property infringement.

### 3.2. Australian Competitiveness

Overall Australian industry is competitive. This is most obvious in the areas of mineral and agricultural products where Australian producers can match

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<sup>8</sup> The only comments in this context were with the lack up-to-date skills of Korean workers in some areas of manufacturing (automotive components). While this labour issue was not raised by any of the Australian companies consulted, some Australian companies are confronted with this issue.

<sup>9</sup> It is understood that Korea has legislation that appears in the first instance to provide adequate protection. However, the legal process apparently does not involve the “discovery” process, which allows a claimant to ascertain what has really happened in the way of an infringement.

most competitors. It is also applicable in many areas of the manufacturing and services sectors, especially where production does not require high volume lower quality products.

In terms of *supply expertise* of the Australian manufacturing and services sectors:

- The Senior Vice President of Hyundai Motor Company has acknowledged that Australian automotive component manufacturers have excellent fundamentals and that Australia in particular has price competitiveness in the aluminium and magnesium castings areas.<sup>10</sup> The scale required by the Korean automotive industry suits Australian suppliers – 100/150,000 units per annum rather than two million per annum. If large-scale production is required, it would be better to produce in the market with the ongoing R&D being done in Australia.
- One small sized exporter of food processing equipment said that its prices/costs are not an issue in Korea. At this stage its capacity is adequate but increased worldwide sales may require an increase in capacity. Although the company is located in a regional area distant from the capital cities, its relatively high value product has so far meant that the cost and physical delivery is not an issue.
- Australian professional services providers (e.g. legal, accounting) are cost effective compared with the USA and UK.

In terms of *technology capability*, this is the strongest area of Australian competitiveness:

- Access to technology seems to be the driving force for Korea in the automotive components area. Korea does not want to rely on technologies from Japan, USA and Germany, but prefers to obtain if possible from Australia, especially light alloys where Australia is the technology leader as well as being the cheapest. FAPM has a general Memorandum of Understanding for cooperation with the Korea Automotive Industries Cooperative Association, including exchanges of technical information. FAPM also signed on 23 March 2001 an agreement for mutual cooperation with the Korea Automotive Technology Institute for the promotion of jointly funded cooperative R&D projects.
- Similarly, an Australian automotive components company, which has invested in Korea, has said that the only Australian it has working in

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<sup>10</sup> Dr Hyun Soon-lee at the Federation of Automotive Products Manufacturers Convention (FAPM) Convention, 4 May 2000. He said that Korean automotive makers are pushing forward the development of aluminium and magnesium parts to reduce weight. Korea hopes to cooperate with Australia to develop an Aluminium Space Frame and Magnesium Seat Frame. The Korean industry expects to employ Australia's excellent techniques and low cost basic materials with Korean production engineering.

Korea is a Quality Manager so as to raise the quality standards in Korea so that exports to Japan from Korea can become possible. The company also said that its major challenge with its Korean subsidiary was putting in best practice management practices and systems – where it used Australian expertise.

- The Korean Institute for Industrial Economics and Trade has proposed that Korea should pursue technological cooperation with Australia in the development of new lighter materials for automobiles and in technological cooperation among automotive components suppliers.<sup>11</sup>
- Technology and innovation is the major strength of the small sized exporter of food processing equipment previously mentioned. It is the international leader in its field and continually undertakes R&D to maintain its leading edge position.
- The objective of the investment of the Anam Industries group in Semiconductor Technologies Australia Pty Ltd is to link Australian strengths in intellectual property in software design with Korean skills in manufacturing and marketing. Australia is regarded as being very strong in software and systems development, which is a strong point for developing synergy between Australian and Korean IT companies.
- A Korean working in Australia for an IT company said that, although Australian technology is excellent, most Koreans are not aware of Australia's high IT standards.
- There is already some collaboration with Australia in computer games technology although some individual Korean firms do not believe they need access to overseas technology.
- The successful software exporters to Korea that were consulted had technology that was leading edge and there was little other competition.

In terms of *marketing ability*, the successful manufacturing and services companies are obviously doing the right thing. The major limiting factor is the issue raised in the paragraph on competitiveness conditions in the section on Attractiveness of Korean Market for Australian Business, namely, Australia's lack of a general high technology brand recognition. While individual companies can do so much to advertise and promote their own image and reputation, it will continue to be an uphill task for individual companies if Australia as a nation does not have that image and reputation. Other potential areas for improving marketing ability include:

- Encouraging investment (including intra industry investment) in Korea and Australia, i.e. Korea investing in upstream activities in Australia

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<sup>11</sup> Byoung-jun Song, Director of the Manufacturing Industries Analysis Division of KIET, in a paper dated 9 November 2000 on *Industrial Cooperation in the Automotive Industry Korea/Australia*.

with Australian investment in downstream activities in Korea. The investment in Korea usually brings the Australian supplier much closer to the ultimate customer. Such investment need not just be in traditional industries but also in high technology areas where the upstream activities are the R&D in Australia with manufacturing (particularly large scale) and marketing in Korea.

- Australian companies using Korea as the base to develop markets in neighbouring Asian countries, particularly China and Japan.
- Building on the relationships Australia has built up with resources purchasers such as POSCO and KEPCO. Some of the people in the Korean companies in resources areas know Australia well and have moved on to senior management positions in other parts of the companies – or they could provide introductions to people in the new areas of interest.

The issue of *management capability* (e.g. span of contacts/alliances in Korea, effectiveness of government and other Australian institutional support) has not arisen. Clearly, having a presence in the market is an important key to success as is strong support from Australian Governments. The only comment that has direct relevance was an Australian company that originally had difficulty in raising finance for its investment in Korea – however, the funds were ultimately raised.

### **CASE STUDY: Semiconductor Technologies Australia Pty Ltd (STA)**

STA believes Asia will become an important strategic region in terms of its business operations not only because Asia is the largest consumer and processing centre of downstream semiconductor products, but also because Asia will inevitably emerge as a centre of original and proprietary upstream technologies including design architecture, semiconductor processing and manufacturing. The self-feeding vertical integration in Asia will only intensify as disposable income levels and spending power rise rapidly in other countries in the region. STA's marketing strategy includes using Korea as a springboard to penetrate into China and Taiwan and then into more sophisticated markets such as Japan.

STA was established in 1997 to create a world-class semiconductor design centre in Melbourne. It is a wholly owned subsidiary of Korean semiconductor company Acqutek and operates as a fabless (non-chip manufacturing) semiconductor design company whose primary business is developing semiconductor IP ("Intellectual Property") in its own state-of-the-art semiconductor ("chip") design technology.

The company also contracts semiconductor design services for third parties, markets EDA tools and related training and third party products and arranges for the fabrication of the chips it designs from competitive, available fabrication companies in Korea, Taiwan and the USA.

STA was one of the initial sponsors of the Victorian Government CHIPSKILLS program, providing semiconductor design skills development programs via training courses and support. The CHIPSKILLS program has been implemented at the RMIT University, Swinburne University of Technology, Victoria University of Technology, Latrobe University, Royal Melbourne Institute of Technology TAFE, Boxhill Institute of TAFE, Western Melbourne Institute of TAFE and Barton Institute of TAFE.

The company's genesis goes back to the Korean semiconductor packaging group Anam Industries formed in 1965. Anam Industries progressively grew to become the world's largest contract packager of semiconductors. In 1985 the Group created Anam Semiconductor & Design Co. Ltd (Anam S&D) (later renamed Anam Semiconductor & Technology, Anam S&T and then later again Acqutek Co. Ltd) as Korea's first semiconductor design house. In 1994 Anam S&T formed a wholly owned subsidiary in Australia, Anam Technology Pty Ltd. In 1995 Anam Technology Pty Ltd created a wholly owned subsidiary ASIC Australia Pty Ltd, later renamed Semiconductor Technologies Australia Pty Ltd in 1997.

STA moved to operational mode in December 1997, with its first staff uptake of six engineers joining in early 1998. The early period of STA principally involved the training of its newly recruited engineers in the use of the complex design tools involved in designing, simulation testing and laying out integrated circuits. Marketing activities then commenced leading to the first contract design and chip supply contracts from the biggest toy manufacturer in Korea.

In late 2000 work commenced on the 'Combo' chip for powerline communications. Also in late 2000 Anam Technology Pty Ltd was consolidated into STA and work commenced on the establishment of the SWIP chip IP licensing portal.

Based on the company's existing depth of expertise in semiconductor design, it is planned to operate a B2B Internet Portal chip design IP licensing service called SWIP which will access semiconductor design IP created by STA and strategic alliance partner organisations in Korea, China, and Taiwan. The IP comprises libraries of reusable functional circuit core designs for

integrated circuits (“IC’s”). These reusable cores form the building blocks for systems-on-chip (“SOC”) solutions and are licensed to major systems houses, chip makers, design centres and major IC distributors.

The company is building a sound revenue and profit growth potential, moving from its establishment phase to a projected positive cashflow in 2001/2. The initial revenue is generated principally from world wide sales of chips currently in the final stage of development by the company and the licensing of semiconductor IP through SWIP.

Source: Mr Stephen Kim, Managing Director, Semiconductor Technologies of Australia Pty Ltd

## 4. Industry Sectoral Issues

*This chapter discusses the Australia / Korea relationship in various industry sectors. The emphasis is on how these relationships can be developed in the future. The emerging areas are in technology sectors (e.g. information and communications technology, biotechnology, environmental technology), education and training, and infrastructure and utilities.*

### 4.1. Agriculture and Food/Minerals and Energy

Australian exports to Korea have been dominated by minerals and energy products (particularly coal and iron ore and petroleum) followed by agricultural and food products (particularly sugar, wheat, beef and dairy products).

The challenges for Australia are:

- (i) to maintain and ideally increase its share of Korea's imports of minerals and energy in the face of increasing competition from countries such as China, Brazil and India;
- (ii) to increase its share of agricultural products; and
- (iii) to diversify further the range of products supplied from Australia such as processed food.

In the minerals and energy sector, the role of the Australian Government is relatively limited in maintaining and expanding trade - other than to support Australian firms in their efforts to open up new markets such as LNG and to ensure that non-economic factors are not allowed to influence the purchasing decisions of major Korean buyers.

In the agriculture and food sectors, there is a much more important role for the Government because of the protectionist approach by Korea to its domestic industry, which is not internationally competitive. The role of the Government is to maintain the pressure on Korea to continue the liberalisation of its market, including the detailed rules that will apply to the beef market as well as the higher tariffs that apply to more highly processed food, and to ensure that pressure from other countries such as the USA does not lead to decisions being taken on sourcing that deliberately favour the USA at the expense of Australia. A Free Trade Agreement between Australia and Korea that included agriculture and food would be of significant benefit to Australia, but it is difficult to envisage Korea agreeing to such an agreement in the near to medium term.

A feature of the global processed food industry is the consolidation of the number of major participants on the supply side and on the retail side. This

consolidation provides an opportunity for Australia, particularly because of the presence of major global food processors in Australia. However, capturing the opportunities available will depend not only on Australia being price competitive but also being a source of new and innovative products that satisfy food safety issues. That is, Australia needs to be regarded as a centre of excellence for food and so develop the “Made in Australia brand”.

The adoption of e-commerce (business-to-business) in the minerals and energy and agriculture and food sectors opens up possibilities to improve the competitiveness of Australian suppliers. This opportunity involves close cooperation between Australian suppliers and Korean purchasers. E-commerce that allows a more integrated relationship between buyers and sellers of the products can reduce the stocks that need to be held, particularly by the buyer, as well as speed up the transmission of documents and payments between the parties. Adoption of e-commerce of this nature implies that the buyer may want to deal with fewer suppliers, thereby making it necessary for Australian suppliers to ensure that they are the most attractive participants on the selling side. The other aspect of e-commerce is the initiative by some companies in the Korean meat trade to set up internet auction websites for the import, sale and distribution of beef.<sup>12</sup>

Other approaches to strengthening relationships between Korea and Australia in this area are:

- Wider and deeper investment links between the two countries. Wider investment links means even more investments than the existing investments such as those of POSCO and KEPCO in the Australian minerals industry. Korean interests could be encouraged to invest in the agriculture industry; for example, it would make sense for Korean interests to invest in the beef processing industry as well as other food processing sectors.<sup>13</sup> Deepening the investment links means Australian interests investing in the processing and distribution chain in Korea. This could involve Australian businesses investing in warehouses in Korea that could be linked to Korean investments in food processing in Australia – this approach could be used to improve the Korean system for handling chilled beef as distinct from frozen beef. Similarly, investment and other linkages with major food processors in Korea in segments where Australia has particular strengths provides a means of overcoming barriers in Korea in the medium term and provides a platform for joint marketing efforts in third countries.

<sup>12</sup> Interview on 22 February 2001 with Meat and Livestock Australia.

<sup>13</sup> Purchasing Australian farms by Koreans is of some interest but is unlikely to be as effective as investments at the processing stage where the buyers and sellers have a closer relationship.

- Australia supporting the attendance of Korean officials involved in the agriculture and food sectors at training courses in Australia, e.g. at the TAFE colleges in Australia that provide courses on food inspection, food standards, etc. This will develop over time awareness among Koreans of the techniques and processes used in Australia, which may translate into similar systems being used in Korea.
- Encouraging agricultural producers in Australia and Korea to meet regularly to share their concerns about the issues that confront them. These person-to-person contacts may not lead to immediate or medium term breakthroughs in the Korean market, but they will improve the understanding of each country's attitudes and the reasons therefor.

### **Conclusion**

Initiatives could be taken by the Government to promote closer linkages between Korean and Australian participants in the minerals and energy and agriculture and food sectors by way of e-commerce, closer investment linkages, training in Australian food standards and conformance systems, and person to person contacts.

## 4.2. Manufactures

### 4.2.1. Simply Transformed Manufactures (STMs)

Australian exports of STMs are dominated by gold bullion and aluminium. Other products such as unwrought zinc are also important.

The challenge for Australia is the same as that for minerals and energy products, namely, to maintain and ideally increase its share of Korea's imports. The role of the Australian Government is probably even more limited in STMs than in the case of minerals and energy.

As in the previous section, e-commerce and closer investment links are possible initiatives. Korea Zinc is already an example in the STMs sector. A future possibility could be encouraging POSCO to establish a position in Australia's iron and steel industry, e.g. through taking up an interest in the iron and steel manufacturing facilities to be disposed of by BHP as part of its merger with Billiton.

### 4.2.2. Elaborately Transformed Manufactures (ETMs)

Australian exports of ETMs are dominated by automotive components – the major item is the engines exported by Holden to Daewoo Motors. There may be prospects in other ETMs (e.g. communications equipment) where trade is possibly hindered by perceptions about barriers, real or imagined, facing Australian exports to the Korean market. The automotive industry is one where the knowledge-based activities are very important, e.g. in design

and engineering and in cooperation between assemblers and component suppliers so as to keep track of supplies and inventories.

The challenge for Australia is to find niche areas where closer ties can be developed between Australian and Korean manufacturing industry sectors, for example, by investment linkages based in many cases on Australian technological strengths and by initiatives on a sector by sector basis to remove the real or perceived barriers.

As discussed in a previous section, there is a strong interest by Korean automotive manufacturers in widening the trade in automotive components. This interest is particularly related to Australian competitive strengths (quality, technology and price). This interest is reciprocated by Australian companies investing in Korean component manufacturers using Australian skills and technologies and using Korea as a base for manufacturing and marketing to Korea and other countries. These are activities that are in the private sector realm.

One other area of ETMs that came to notice where there is an interest in exporting to Korea is in communications equipment, particularly products that have a high intellectual property content. However, Australian businesses perceive the Korean market to be difficult to enter because of the relatively complicated regulatory process. Intellectual property was also perceived as a concern<sup>14</sup>. Addressing these issues is an area where the Government can have an important role.

### **Conclusion**

Initiatives can be taken by the Government to facilitate stronger linkages between Australia and Korea in ETMs, for example –

- (i) Examining the possibility of a bilateral arrangement between Australia and Korea where the Governments would undertake to try and harmonise their approach to the implementation of intellectual property protection. The implementation could include a Code of Practice and possibly a joint forum that would consider tangible issues raised by Australian and Korean firms about infringements of their intellectual property rights.
- (ii) While there were mixed views among Australian industry about the benefits of Mutual Recognition Agreements (MRAs), there is support for mechanisms to be put in place that are similar to MRAs. These can be addressed on an industry-by-industry basis rather than across the board. In the communications equipment area, there is support for a bilateral arrangement between Australia and Korea that harmonises or at least moves towards a more common compliance regime for obtaining approvals for equipment in this industry sector.

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<sup>14</sup> See also the section on Intellectual Property in Cross Sectoral Issues.

### 4.3. Technology

A key element of the Korean Government's economic policy is the development of a strong knowledge-based economy (KBE) – along with the major reforms of the financial, corporate, labour and government sectors.<sup>15</sup> Examples of knowledge-based industries are information and communications technology (ICT), biotechnology, nanotechnology, space technology, alternative energy technology, and environmental technologies.<sup>16</sup> Some of these “industries” overlap, e.g. some of the environmental technologies use biotechnology. The term technology in the context of this report is not just the technology per se but includes the goods and services that may accompany the implementation of the technology (e.g. equipment and consulting services on the use of the technology and equipment). The areas targeted for foreign investment in Korea are those that incorporate advanced technologies.

Major elements of Korea's development plan for the KBE are: the development of ICT, upgrading the R&D/innovation system, and improving the education/human resources development system.

In the initial stages of Korea's economic development, it sought to commercialise R&D through the transfer, assimilation and improvement of technology from more advanced countries. Korea has acknowledged that this approach failed to secure core and fundamental technologies and so it was not able to keep pace with more advanced countries in terms of economic development. The future plans indicate an approach that is less reliant on other countries and more reliant on the development of its own technologies.<sup>17</sup> This is described in the Ministry of Science and Technology's website as a policy shift “from imitation to innovation”. As part of this new approach, Korea is looking to widen its international cooperation in science and technology away from USA, Europe and Japan to other countries, both bilaterally and multilaterally.

The goals of *Vision 2025* are:

- By 2005 – to join the top 12 nations in the world ranking for science and technology and thereby get ahead of all other Asian nations.
- By 2015 – to join the top 10 nations in the world ranking for science and technology and be the centre of research in the Asia Pacific region.
- By 2025 - to join the top seven nations in the world ranking for science and technology.

<sup>15</sup> President Kim Dae-jung's New Year news conference, 11 January 2001.

<sup>16</sup> What tends to distinguish knowledge-based industries from other industries is the relatively high level of innovation and human capital involved as well as a reliance on information and communications infrastructure.

<sup>17</sup> *Vision 2025: Korea's Long-term Plan for Science and Technology Development*.

The challenge for Australia is to become an important ally for Korea in achieving its science and technology objectives. While Korea will want to use many technologies developed within Korea, Australia could play an essential complementary role. Working towards such an objective will considerably strengthen the economic partnership between the two countries. It will have advantages for both countries.

In many ways Australia and Korea are complementary in the technology area. Australia is relatively stronger in basic R&D and in the services sector, including education and training, that underpins the science and technology sector. Korea is relatively stronger in large-scale industrial application of technology and in marketing. Korea is also relatively stronger in the successful commercialisation of R&D. While Australia benefits from the widespread use of English and in its innovative education system.

Australia could become the source of much of Korea's R&D capability (with the added role of assisting Korea to improve its own R&D capabilities through the education and training sector) and Korea could become the source of the financial and commercial skills needed to develop Australian R&D successfully on a large scale.

Such a vision does not need to be restricted to any particular technologies, but the more obvious possibilities would appear to be in ICT, biotechnology, and environmental technology.<sup>18</sup> These are in addition to manufacturing technologies such as automotive components where there is already a strong Korean interest in Australian capabilities.

There is emerging a new paradigm of comparative advantage between Australia and Korea. Australia has a comparative advantage in basic R&D, science and technology and human resources development. Korea has a comparative advantage in the commercialisation and industrialisation of technologies. By working together Australia and Korea can develop technologies, products and services for marketing to third countries: high technologies to countries such as Japan and USA and medium technologies to countries such as China.

The major barriers confronting the achievement of such a vision are:

- The perception of Koreans generally that Australia is not a source of technically or intellectually advanced inputs to assist Korean development (i.e. the lack of an Australian technology profile).
- Concerns among some Australian interests about intellectual property issues.

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<sup>18</sup> Vision 2025 (pages 78-79) identifies the six major promising technologies of the future as information technology, biotechnology, environmental technology, energy technology, mechatronics and systems technology, and materials and processing technology.

- Lack of sufficient capital to develop new Australian ideas and technologies through the initial commercialisation stage and into full-scale production.

### 4.3.1. Information and Communications Technologies

Information and communications technology (ICT) is at the core of the change in Korea's development paradigm. The previous paradigm was underpinned by strong capital accumulation and growth in labour inputs with the Government assuming the major role as a nationwide mobiliser of resources and overall manager. The new paradigm is the KBE, in which ICT is the principal enabler. ICT has two roles: it provides the infrastructure for the KBE and, at the same time, its own output is a large part of the KBE.

The ICT industry in Korea is composed of information and communication services, information and communications equipment, and software and computer-related services. The industry is dominated by the manufacturing of information and communications equipment (75%)<sup>19</sup> followed by 20% for information and communication services and 5% for software and computer-related services.<sup>20</sup>

#### **CASE STUDY: Financial Network Services - Korean Branch Operations**

Financial Network Services (FNS) is an Australian based Banking System software supplier providing software, installation, support, outsourcing, facilities management and consultancy services to Banks and other financial institutions in Asia, Middle East, Africa and Europe. FNS has representative offices in the United Kingdom, Malaysia, Hong Kong, Korea, Taiwan, Philippines, Indonesia, UAE and South Africa. FNS also has a range of active distributors spread throughout Asia, the Middle East and Europe.

FNS has a client base of over 100 Banks in 32 countries around the world. FNS' growth has seen employee numbers rise to 297 at June 2001 with export revenues of approximately \$45 million. The company is continuing to demonstrate its capacity to achieve strong international growth in Asia Pacific, the Middle East and Europe and will shortly enter the Japanese and US markets.

<sup>19</sup> More than one-half of which is components manufacturing with other large contributors being communications equipment and information equipment plus some broadcasting equipment.

<sup>20</sup> Ministry of Information and Communication, *Information Technology Overview of Korea: Statistical Profiles* (January 2001)

FNS originally began operations in Korea in the late 1980s. At that time the Korean banking market was highly regulated and there were some 38 banks in the country along with approximately 600 “credit union” type organisations and a small number of ancillary financial intermediaries. Due to the Korean regulatory restrictions in force at that time, FNS registered a branch through its Hong Kong subsidiary, and began operations with domestic management and staff augmented by naturalised Koreans from Australia. Over time FNS was able to register a branch directly owned by the Australian parent organisation.

Over the years FNS has built the business to the point where the company is the most successful foreign supplier of banking systems in Korea and holds a dominant position in the commercial banking market, having sold six systems into the country. The Korean branch now employs 22 staff with no expatriates. The branch generates approximately \$5 million in revenues annually with a margin of between 7% - 11% annually.

In the mid 90’s the Government of Korea realised it needed to rationalise and deregulate its finance sector as Korea was coming under severe pressure to open up its markets in line with Korea’s desire to join the OECD, WTO and other international trading organisations. As a result Korea embarked on a deregulation process, which together with the “Asian Currency Crisis” saw the domestic banking market drastically shrink in size in a very short period of time. Today the market stands at about fourteen commercial banks and the Government is intent on reducing this number further to approximately eight domestic banks, two or three of which will be foreign owned.

Over the years FNS has learnt a number of lessons on how to run a successful “foreign” operation in Asia including:

- (i) The necessity to have “local” management and staff whilst still maintaining western management and control principles.
- (ii) The necessity to understand “local” business customs and to modify western practices to suit local cultural and business conditions.
- (iii) The requirement to be more flexible in transfer pricing, accounting conventions, negotiations and contract conditions than would otherwise be the case in western style negotiations.
- (iv) The requirement to set up “tax effective” operations in each foreign domain.

- (v) The absolute necessity for personal relationships and an understanding that a contract is only a milestone on the negotiation path, and not the end of that path.
- (vi) The necessity of interacting with local regulators, decision makers and “power” cells and contributing positively to the local content aspirations of each country.
- (vii) The requirement for Australian management to comprehensively understand the local business culture, business rules and economic drivers for the country in question.

Source: Mr Tony Ward, Managing Director, Financial Network Services Pty Ltd

While Korea has advanced-level technologies in some areas of ICT, it is said that the overall level of technology is 60-70% of that in advanced countries. Major technology lags occur in some areas of the internet (e.g. security), optical communications, digital broadcasting, and computer software. Another issue for Korea is insufficient professional manpower.<sup>21</sup>

The Korean Government has released Cyber Korea 21, a plan to boost information technology (IT) at the school level, through the provision of around 160,000 personal computers to schools, construction of local area networks for 2,500 high schools, and comprehensive IT training for over 85,000 teachers.

A second goal of Cyber Korea 21 is to boost industrial competitiveness - primarily in the steel and shipbuilding sectors - through e-commerce. Government departments, too, are to be made more internet-capable, with a plan to introduce electronic document distribution.

As indicated above, there is, however, a problem with the government's ambitious plans – namely, a skilled manpower shortage in the IT sector. The Ministry of Information and Communication has conceded that there is likely to be a shortage of around 200,000 highly trained skilled personnel by the end of the year 2004. To counteract the problem, the government has recognised the need for remedial measures, including increasing its funding to IT colleges.

Part of the KBE development plan involves promotion of the Korean software industry. This includes providing financial support for foreign language programs for software specialists and for high quality workers who wish to study overseas. It also involves promotion of the culture industries, which includes the animation and game industries (including support for a Game Academy, an Animation Academy and a Film Venture Support Centre) and traditional culture industry.

<sup>21</sup> Korea Development Institute, draft (January 2001) of a paper on *IT in Korea: Current Situation and Policy Direction* at pages 11 and 12.

Australian companies are already active in Korea in ICT, many of the companies being in the computer software industry (e.g. software for the financial services industry, multimedia content, search engines/web development and industry specific software). There is also an interest by some Australian companies in supplying communications equipment.

Australia has not been a leading performer in terms of ICT industry production. Australia accounts for a very small part of the total world ICT production and exports. However, Australia has been a rapid adopter of ICT products. The outcome has meant that Australia has developed a large and growing trade deficit in ICT products. The potential is far more positive in terms of international trade in software, services and content where Australia is better placed to compete.

One of the main problems that Australia has to continually face is the small size of its economy as well as its remoteness from world markets, which has meant that the leading world ICT companies have not seen Australia as a place to locate globally scaled manufacturing facilities. Until recently, a further weakness has been the relatively poor track record in terms of commercialising research coming out of the universities and publicly funded research organisations.

While the personal computer is predicted to maintain its role in the short term, as the principal access device for the Internet, smart handheld portable devices such as mobile telephones are also becoming another important market segment. Current predictions are that the mobile phone will become the primary product in terms of future usage to funnel users onto the Internet.

### ***Third Generation Mobile Communication - 3G.***

Australia on a per capita basis is one of the largest users of mobile technology in the world and it is expected that the 3G wireless services will also be quickly adopted. Telecommunications have normally been based on voice transmission through wire. Recently there have been interesting developments as the telecommunications service has been gravitating towards transmission of data through wireless communication. The Asian region has emerged as the most dynamic wireless market in the world and is likely to remain the dominant player in the medium-term. In the next three years, Asia is expected to have approximately half of the world's wireless Internet subscribers, while the USA will probably have around one third.

Korea is the regional leader in Asia in internet access rates and has the highest ownership level of personal computers. While most of the world is still catching up with 2.5G technology, Japan until recently was expected to adopt 3G (third generation) technology by late 2001, with Korea following in 2002. However, recent announcements by NTT DoCoMo, the top-tier

Japanese mobile operator, that it would delay the launch of 3G services until October 2001, has caused some speculation in the industry. The delay has also started to make a dent on Korea's mobile-phone business and will probably impact the schedule of IMT 2000 services, Korea's ambitious 3G project. Putting aside the current impediments, there is no doubt that there will be many applications that can take advantage of this technology, utilising high speed and portability that 3G will provide, including: e-mail; making hotel reservations; booking airline/transport; entertainment; games; movies; financing - stock market, exchange rates; video conferencing.

3G is expected to revolutionise mobile communications, and will fundamentally change the way people communicate. The benefits expected from 3G are more robust data capability, including Internet access, and multimedia services. These new services will assist users to conduct ordinary voice communication and use the broadband Internet service through wire for domestic applications at home. While outside the home, it will provide users with the ability to enjoy mobile Internet service access around the clock, with ease of access and new dimensions in portability.

The internet is spearheading a massive change in Korea with the country emerging as one of the world's most "wired" economies. Internet penetration is about 49% of the population at around 21 million as at March 2001, while PC home penetration has been quoted at around 71%.<sup>22</sup> What is even more significant is the Koreans' determination and success rate in the introduction and implementation of broadband Internet, which is at around 6.25 million users as at the end of June 2001. Accordingly, Korea is by far the leading user of broadband technology in the world. Korea Telecom has the major share of the Internet market at 50%, followed by Hanaro Telecommunications with 25% and Thrunet with 17%.

The Korean Government has been single minded in its approach to build a knowledge-based economy as it realised that the future survival and prosperity of Korea depended on its ability to adapt itself to the digital revolution. Through this desire to change, a national vision of an "e-Korea" to become one of the ten leading nations in knowledge and information was fostered and implemented.

As the Korean internet population increased, a wide range of bandwidth intensive applications such as multimedia video, multimedia games, music etc were becoming available. Internet users became aware of the limitations of using the slow 64Kbps dial up modems and started to voice their discontent with the slow downloading speed, the heavy tariffs, difficulties in searching for information, poor connectivity, and the additional financial burden as increasing usage led to higher service fees. This was the background to an amazing turnaround. In three years Korea has become the "pilot-site" for the world in the utilisation and implementation of broadband technology.

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<sup>22</sup> Source: Korean Ministry of Information and Communication.

**Broadband lines per 100 inhabitants in OECD countries<sup>23</sup>**

2000 Year-end installed lines			
Country	DSL	Cable Modem	Total
<b>1. Korea</b>	5.88	3.32	9.20
<b>2. Canada</b>	1.29	2.62	3.91
<b>3. United States</b>	0.89	1.36	2.25
<b>4. Austria</b>	0.48	1.22	1.70
<b>5. Netherlands</b>	0.09	1.58	1.68
<b>6. Belgium</b>	0.42	1.00	1.42
<b>7. Sweden (+ 0.14 subs to the B2)<sup>24</sup></b>	0.45	0.62	1.21
<b>8. Denmark</b>	0.49	0.56	1.05
<b>9. Iceland</b>	0.70	0.00	0.70
<b>10. Finland</b>	0.29	0.29	0.58
<b>11. Japan</b>	0.01	0.49	0.50
<b>12. Switzerland</b>	0.06	0.38	0.43
<b>13. Australia</b>	0.05	0.34	0.39
<b>14. Norway</b>	0.01	0.34	0.34

The above table illustrates the broadband penetration in OECD countries as at 1 January 2001. At this time, commercial DSL services were available in 22 out of the 30 OECD countries, but it is interesting to note that, just three countries, Korea, USA, and Canada accounted for 91% of all DSL subscribers and 81% of all cable modem subscribers.

There are a number of factors that have helped Korea achieve their leading status in first internet, then broadband penetration. First, the unique Internet PC cafes that have sprouted up all over Korea since 1999. By mid 2001 there were over 20,000 Internet PC cafes offering broadband Internet services. This has developed a unique entertainment culture for the youth of Korea. They are exposed to the fascinating speed of the broadband Internet through a wide range of multimedia games and multi-user games where they are playing in teams of twenty or more, breaking the mould of the usual concept of the solitary “nerd” addicted to computer games – these games are now able to be joined by team mates even from remote locations, and technology permitting international locations. In addition, the lack of available space for outdoor games makes Korea an ideal location for these high speed dependent virtual reality games as a substitute.

<sup>23</sup> Source: DCITA State of Play – Broadband Services in Australia, May 2001

<sup>24</sup> B2 is a Swedish broadband provider that provides broadband access to urban areas using technology that bypasses the local loop.

Second, Korea's unique domestic housing environment has been a major contributor. As over 70% of the total population of Korea live in the seven largest cities including Seoul (10 million), the Internet service providers are able to focus on huge installation possibilities through hundreds of high-rise apartment complexes. The initial network deployment was thus achieved at a fraction of the cost in Australia.

Third, the usage cost of broadband (55% ADSL) is also a critical factor in the high utilisation in Korea. The average user pays around 40,000 won or around US\$28.00 per month for a continuous connection service (no dial up) that provides between 1Mbps to 5 Mbps access speeds. This compares with around A\$24.00 per month in Australia for a dial up "narrow band" 28.8Kbps - 56Kbps connection that usually also has a time related and or download cost as well. Broadband ADSL connections through Australian service providers vary from A\$84.00 per month for home consumption at around 512Kbps download, to faster options available for business connections at around A\$116.00 per month with up to 1.5Mbps download. In Australia, the user base is demanding faster access rates and a more reliable service delivery.

The low cost of internet usage in Korea is conducive to heavy use. The average monthly broadband subscription is US\$28 with unlimited access time, and the average ISP connection through a telephone line is only US\$8 per month with unlimited access time.

Koreans have also become major users of shopping online. Internet sales rose almost 40% to 665.7 billion won (US\$532.5 million) in the last quarter of 2000, according to a survey by the National Statistics Office.

In Australia the situation is vastly different. Of an estimated 3.9 million internet accounts in December 2000, 97% were still with "narrowband" dial-up providers<sup>25</sup>. High-speed internet/broadband is still a long way from becoming anywhere near as widely used as in Korea. Although there are numerous service providers now rolling out broadband around Australia, the uptake by Australian customers is very low, due in part to the comparatively high costs, restricted availability, and relative instability. The total national figures are estimated at around 120,000 users.

Connection through the dial up telephone line has been quite effective for sending and receiving email and for text based information such as newsletters, but it starts to show its limitations even with simple photographs, which can take up to a minute to download. The initial utilisation of the internet in Australia was impressive but once the novelty of the technology had worn off and the users became aware of the potential possibilities, they became frustrated at the limitations that the infrastructure was imposing on the use of this technology.

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<sup>25</sup> Source: Australian Bureau of Statistics.

This also impacts on Australian software developers, especially in the Games and Video and Audio markets, who are inhibited from testing the products that they are developing on the very medium that they are developing it for, the Internet. Demonstrations to potential overseas customers at times have to be delivered by other means, such as CD's while some promising developments in Cyber Education (with Korea) have had to be shelved due to the inability of Australia's Internet system to cope with the high speed requirements. The concept of convergence, where video, audio, the internet and various other entertainment media are accessed from a single device, requires higher access speeds. The problem for Australia's software developers is that the solution, high-speed broadband technology, which provides connections at least 10 times faster than the standard phone line, is available and already utilised, but in Australia only on a limited basis, especially when compared to Korea.

Despite these obstacles there would still appear to be opportunities in terms of Australian value-added services provision. The potential for Australian products, including education and training, software development, hardware integration and services provision appear to present mutual opportunities for Australia and Korea.

### **CASE STUDY: PowerSource Software Pty. Ltd.**

PowerSource's principals have successfully developed innovative software technology and licensed it to leading Australian and overseas firms. The company has been working successfully with leading Korean IT organisations continuously since 1997. These have included the Korea Racing Association (KRA), Daewoo Information Systems Co. Ltd. (DISC), Korea Electronics Technology Institute (KETI), and Samsung SDS.

The principal of PowerSource Software is Mr Arnold Kopff. In 1975, he joined Amalgamated Wireless Australasia Limited (AWA) and helped build the world's first sell-pay totalisator system. He left AWA in 1978 to become a founding member of RT Real Time Systems (RT). From 1978 through to 1985 RT developed the betting systems used by the TABs in Victoria, Tasmania and South Australia. In addition, tote systems designed by Mr Kopff were installed at over 30 racetracks in Australia and at two tracks in the Philippines.

In 1986 he co-founded Advanced Wagering Systems (AWS). In 1988, AWS supplied a totalisator system to the British bookmaking conglomerate William-Hill Mecca for installation in Botswana. In 1991, AWS and another Australian company, M&B Electronics, jointly developed the ARION wagering terminal and several hundred of these were subsequently sold to Australian racing clubs

and casinos. In 1992, AWS designed and implemented a pilot on and off-track betting system for Greenwood Racing Inc. in Philadelphia.

In late 1992 and early 1993, he was retained by Concurrent Computer Corporation and Stratus Computer Inc. to assist each company with the design of their benchmark systems needed for the Victorian TAB's RFP for a new betting system.

In 1993, UNIX-based software developed by Mr Kopff was licensed to Video Lottery Technologies Inc. the world's second largest supplier of on-line lottery systems. After returning to Australia at the end of 1994, AWS licensed similar software to Tattersalls Sweep Consultation. In 1996, a UNIX-based betting system designed by Mr Kopff was adopted by Jupiters Limited as the foundation for their statewide keno system in Queensland.

In late 1997, he was retained by Daewoo Information Systems Co. Ltd. to assist them and the Korea Racing Association with the detailed design study for a new on and off-track betting system for deployment throughout Korea. In early 1999, PowerSource was retained by the Korean Electronics Technology Institute (KETI) to devise an architecture and implementation plan for a national Korean sports lottery. In January 2000, PowerSource was retained by the Korea Racing Association and Samsung SDS, Korea's largest systems integrator, to provide technical consulting services for the duration of the four year project. Specifically, PowerSource is assisting both groups with the architecture, detailed design, implementation and testing of the new Korea-wide totalisator system.

During the second half of 2000, PowerSource developed a number of new technical innovations. These included advances in state-of-the-art Internet-based wagering, and the development of the JetStream Dynamic Content Engine, a high performance dynamic content accelerator. JetStream uses innovative technology devised by PowerSource that the company is presently patenting.

Source: Mr Arnold Kopff, Managing Director – PowerSource Software

### **CASE STUDY: Korea-Australia Photonics Association (KAPA).**

The Korea-Australia Photonics Association was founded in 2000 with a mission to foster and enhance academic and commercial collaboration between Korea and Australia in the Science and Technology of Photonics for the mutual benefit of both countries.

An inaugural Workshop was held in Cheju, Korea on 8 November 2000 and a second Workshop was held in Sydney on 6 July 2001. The scope of the Workshops covered research in both the academic and commercial spheres, as well as education and training. The Association has grown out of an increasing number of collaborative links in photonics between Australian and Korean researchers in both academia and industry.

The Photonics industry is booming worldwide and by 2013 the industry is expected to be worth over \$A900 billion. The Australian photonics industry currently employs a workforce of around 4,000. A recent survey has estimated that some 20,000 trained personnel will be required over the next 10 years to meet the requirements of the Australian photonics industry.

To meet this challenge, both university and technical training institutions across the country are introducing a range of new degrees and courses. In addition to national requirements, there will be scope to attract international students, particularly from south-east Asia, and to develop cooperative teaching links. For example, a joint Australia-Korea Photonics School is expected to be held in Korea in July 2002 under the auspices of the Korea-Australia Photonics Association.

Source: Professor John Love, Australian Co-operative Research Centre, Australian National University.

### 4.3.2. Biotechnology

Biotechnology covers human and animal health, agriculture and food, industrial biotechnology, bioinformatics, materials science and bioengineering (e.g. some environmental technologies). There are more than 2,500 companies worldwide dedicated to researching, developing and supplying biotechnology products and applications and many more with substantial involvement in the technology. Venture capital exceeding \$1.5 billion and overall equity finance of more than \$6 billion are flowing into biotechnology-based firms each year.<sup>26</sup>

Australian Governments are supporting the development of the biotechnology industry in Australia, e.g. the Commonwealth Government's National Biotechnology Strategy and the Victorian Government's financial support of the \$400 million Bio21 Australia project to create a cluster of research institutes and corporations in Melbourne. There are also specific Innovation Funds aimed at the biotechnology industry.<sup>27</sup>

<sup>26</sup> DFAT, *Australia's Trade: Influences into the New Millennium* (2001) at pages 74-75.

<sup>27</sup> *The Australian Financial Review*, 2 April 2001 at page 28.

According to the Korean Ministry for Science and Technology, the Korean Government's R&D budget for this year includes \$US250 million for biotechnology. The Government has declared the year 2001 the "Year of Biotechnology" and plans to put available science and technology resources together to build "B-Korea".

There is scope for substantial cooperation between Korea and Australia in biotechnology. There has already been a collaborative research project for the development of anti-viral drugs carried out by Biomolecular Research Institute (BRI) of Melbourne and the Korean Hepatitis Consortium. Funding and research proceeded for four years but work ceased towards the end of 2000.<sup>28</sup>

Interviews in Korea indicated there was potential for further Korea/Australia collaboration in areas such as biotechnology.<sup>29</sup> One Korean comment was that there was scope for Korean investment in the commercialisation of Australian biotechnologies, which could short-circuit the wait for the results of Korean investment in biotechnology.

The Bioindustry Association of Korea<sup>30</sup> presently has relationships with USA, Japan, France and Germany and is starting to build relationships with Israel and Canada. The Association organises large Korean delegations to international conferences such as the BIO conference in San Diego as well as bilateral conferences such as the Korea – USA/USA – Korea Biotechnology Industry Investment and Cooperation Conference held in Seoul in March 2001. The Association is also organising the Bio Korea 2001 International Exhibition and Conference to be held in Korea in November 2001.

Discussions in Korea in June 2001 indicated a strong desire by the Association to link with similar associations in Australia. Similarly, Korean biotechnology businesses, including those of the large Korean conglomerates are looking for opportunities in the biotechnology sector in which to invest; there is a desire to know about biotechnology developments and opportunities in Australia, which will enable the Korean businesses to spread their interests beyond Korea and USA.

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<sup>28</sup> It is understood that the first meeting of the Australia-Korea Joint Committee on Science and Technology held on 29 March 2001 discussed the progress of the collaborative research project, but no decision has been taken on its future. Advice received in Korea in March 2001 was that the Korean interests are presently considering how the work done may be taken forward. That advice indicated that the Korean Minister for Science and Technology was arranging for the data developed under the project to be put into a Korean venture company (i.e. a start-up company) with the information providing the basis for the capital of the company and that a CEO for the venture company was being sought.

<sup>29</sup> For example, interviews in early March 2001 with the Korea Rural Economic Institute and Korean Venture Business Association.

<sup>30</sup> The Association has over 60 companies as members plus over 150 associate members (individuals and organisations).

### 4.3.3. Environmental Technology

Korea acknowledges that its environmental technology lags behind that of more advanced nations by four to five years. The level of overall environmental technology is about 30-60% of that of developed countries. Core post treatment and pollution prevention technologies are especially underdeveloped.<sup>31</sup> The major environmental policy issues include: water conservation; the supply of clean water; the management of water supply (e.g. there is a high water leakage rate in the water pipeline network); sewage and wastewater treatment, management and reuse; air quality (the major pollutant is diesel fuelled motor vehicles); and landfill site management.

In January 2001 the Ministry of Environment formulated the Environmental Technology Development Strategy to nurture Korea's environmental technology industry into a highly competitive strategic export oriented industry. The strategy is being funded with about two trillion won (about \$A3.33 billion) over three years and involves eight government agencies. The strategy aims to lay the foundation for the Korean environmental technology industry to reach the level of advanced countries by 2010.<sup>32</sup>

The strategy includes –

- an investment fund to assist environmental start-up businesses, and
- a fund (the Eco-technopia 21 program) to develop environmental technology essential for the growth and competitiveness of the environment technology industry. The plan includes developing new technology expected to be in high demand as well as improving other technologies.

In addition, the Government will invest 5.5 trillion won (about \$A9.16 billion) in building environmental infrastructure, including wastewater treatment plants and waste incinerators, to help create market demand for environment technology.

The Korean Ministry of Environment has estimated the Korean market in 2000 for the environmental technology industry at 11 trillion won (about \$A18.33 billion) and expected to grow at about 15% per annum through 2005. The Ministry has established the Korea Environmental Technology Information Centre, which has a website which has a database on technologies; apparently, there are no Australian technologies on this site. There is a biannual trade exhibition, ENVEX (June and November), where technologies can be introduced to Korea.<sup>33</sup>

<sup>31</sup> Ministry of Environment, *Green Korea 2001* at page 70.

<sup>32</sup> Korea's long-term plan for science and technology development also calls for the development of technologies for alternative energy sources (including solar and hydrogen technology) and energy efficiency.

<sup>33</sup> While the organisers are Korean, there are two special organisers: the European Union Chamber of Commerce in Korea and the US-Asia Environmental Partnership.

There are no restrictions on the import of environmental technologies into Korea. As part of the Eco-technopia 21 program, Korean companies can cooperate with foreign research centres in developing environmental technologies. Korea could provide a basis for Australian businesses to work with their Korean counterparts in China.

The major opportunities for Australia would be in water, wastewater and marine technologies, including sensors.<sup>34</sup> The private sector is able to become involved in the environment sector such as water and incineration. There are already examples of French water companies becoming involved in the water sector. However, the number of Korean and overseas private companies involved is small. Most water related plants are owned by provincial and local governments; many would like to change but each government is adopting a “wait and see” approach – once there is a good example, others will follow.

Some linkages between Korea and Australia are already being established. The Korea-Australia Science and Technology Exchange Centre (KASTEC), which is based at the Pusan National University and at the CRC for Waste Management and Pollution Control in Sydney, is promoting the exchange of environmental technologies between Australia and Korea with a view to developing demonstration projects and commercial linkages. Individual companies are also pursuing environmental protection business in Korea.

### **Conclusion**

Some initiatives to overcome the barriers in the way of a stronger economic partnership between Australia and Korea in technology sectors are mentioned elsewhere (e.g. a Code of Practice in relation to intellectual property).<sup>35</sup>

In addition to those suggestions, the broader solution is to develop linkages throughout the industrial/commercial chain. There are some linkages through the Australia-Korea Business Council and its Korean counterpart, but these linkages are mainly in the traditional trade areas of minerals and agriculture. What is needed are effective linkages in the newly emerging technology intensive sectors, but should be closely linked with the education and training sector because of the role of that sector in assisting the development of the Australian profile.

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<sup>34</sup> There may also be opportunities in site remediation as these technologies are not well developed in Korea and USA companies are offering these types of technology.

<sup>35</sup> Korea's long-term plan for science and technology development calls for the strengthening of the laws to protect intellectual property rights. *Vision 2025* also states at page 147: “(A)s an active response to the growing international trend of protecting intellectual property rights, public awareness about intellectual property rights must be strengthened over the long-term.”

What is needed initially is a mechanism to promote a greater understanding among Koreans of Australia's strengths and among Australians of Korea's strengths. Most of the cooperation to date has been in the R&D field; many Koreans working at the R&D level in ICT, biotechnology and environmental technology are aware of Australia's capabilities. This awareness does not extend in any meaningful way beyond researchers. Discussions in Korea indicate that many people in businesses in these technology areas were not aware of or did not understand the depth of the Australian strengths.

There have been symposia involving Australian and Korean researchers. These should continue. However, what is really needed are workshops in particular technology segments that also include those who are responsible for the commercialisation, including marketing, of newly developed technologies. These types of workshops can improve awareness above and beyond researchers. The workshops can discuss issues such as –

- what is available in Korea and what are Korea's needs;
- what is available in Australia and what are Australia's needs;
- what are the strategic directions in Korea and Australia in the different segments of technology and in their commercialisation; and
- what are the needs and strategic directions of other countries in the Asia Pacific region such as Singapore as well as the major markets of China and Japan.

It may be desirable to have separate workshops in Australia and Korea before coming together in joint workshops.

If the workshops in particular segments are successful, they could lead to the creation of a Korean/Australian "cluster" in particular technology segments that would include in each cluster:

- relevant firms from each country,
- relevant R&D agencies,
- education and training institutions,
- financial services institutions,
- legal services, and
- product development and marketing specialists.

Initially, such clusters do not need to be created on a very formal basis. The major task is to get the participants talking together on an ongoing basis and to be linked by some form of Intranet. Some seed funding may be needed to promote the clusters, for example, the Australian-Korea Foundation could expand its current activities in the technology sectors to include the sponsoring of the workshops and clusters. If they are successful, they could be developed into more formalised fora where the Governments of Korea

and Australia could also participate; this would allow joint industry/government discussion of issues affecting the particular sector.

#### 4.4. Education and Training

Education and training has two roles in strengthening the economic partnership between Australia and Korea. The first is as a services export that not only earns income for Australia but also augments Korean education and technology. The second is as a means to change Korean perceptions of Australia.

As indicated in the previous sections on technologies, there is an awareness among some Koreans about Australia's strengths in R&D and science and technology. However, this awareness is limited to scientists working in particular fields. This awareness does not extend to education and training. Most Koreans when they consider overseas education think about the USA.<sup>36</sup>

The major challenge for Australia is to get across the message that Australia is both a centre of excellence for education and a source of technically or intellectually advanced inputs to assist Korean development. Increasing the number of Korean students participating in Australian university and vocational education will be a means, albeit medium to long term, of meeting this challenge.

##### ***Korean Students in Australia***

Korea had become an important source of overseas students for Australia with some 20,231 students in 1996. The numbers dropped substantially after 1997 to a trough of 9,547 in 1999 and have since risen to 11,556 in 2000. However, the largest component of these figures has been Koreans studying English Language in Australia and it has been the fluctuations in those numbers that have accounted for the variations in the total numbers. While there has also been a decline in the number of Korean students at schools and vocational education institutions, there has been a steady increase, albeit relatively small numbers, in Korean students at Australian universities: increasing from 1,157 in 1996 to 2,050 in 2000.

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<sup>36</sup> About 40,000 Koreans went to universities in USA in 1999/2000.

	1995	1996	1997	1998	1999	2000
<b>Schools</b>		<b>1,791</b>	<b>1,881</b>	<b>1,552</b>	<b>1,174</b>	<b>1,010</b>
<b>English Language*</b>		<b>13,032</b>	<b>10,682</b>	<b>4,912</b>	<b>4,197</b>	<b>6,228</b>
<b>VET Total</b>		<b>4,251</b>	<b>4,251</b>	<b>3,091</b>	<b>2,413</b>	<b>2,268</b>
TAFE					<b>541</b>	
Private					<b>1,872</b>	
<b>University Total</b>		<b>1,157</b>	<b>1,477</b>	<b>1,598</b>	<b>1,763</b>	<b>2,050</b>
Undergraduate				<b>1,174</b>	<b>1,297</b>	
Postgraduate				<b>424</b>	<b>466</b>	
<b>TOTAL</b>	<b>13,854</b>	<b>20,231</b>	<b>18,291</b>	<b>11,153</b>	<b>9,547</b>	<b>11,556</b>

Source: *Overseas Student Statistics 1998 and 1999*. 2000 figures from Table 3 attached to <[www.aei.detya.gov.au/industry/news/psnumbers/psn2000.htm](http://www.aei.detya.gov.au/industry/news/psnumbers/psn2000.htm)>

\* Table 48 of *Overseas Student Statistics 1999* states that in addition to the 10,682 and 4,912 South Korean students in the English Language sector on student visas in 1997 and 1998, there were an additional 4,150 in 1997 and 3,250 in 1998 on non-student visas.

Korea is one of the largest sources of international students in Australia for English Language along with Japan and China. However, Korea has been a minor source of university students compared with Malaysia, Singapore, Indonesia and Hong Kong. Although the Korean numbers are in general small compared with overall international university students, Korea is usually ranked about equal third with Japan as a source of vocational education students and school students.

### ***Korean Education and Training System***

The Korean education system served Korea well though to the 1990s in providing a general education for most Koreans who sought education and in supporting Korea's industrialisation policies from the 1960s to the 1990s. The Korean education system tended to focus on teaching students subject matter content ("know-what" knowledge) rather than teaching or coaching them on how to apply or utilise knowledge ("know-how" knowledge).

This type of education system is not well suited to the change in Korean industrial policy where the emphasis is now on becoming an advanced knowledge based economy. The education system now needs to be based around overall human resources development where there is a need for education and training that promotes quality, creativity and lifelong learning as well as education that is relevant to the needs of industry (and which prepares students to be more productive on entry to employment). Areas of reform that have been identified by the OECD/World Bank<sup>37</sup> as critical for Korea's knowledge based economy are:

<sup>37</sup> OECD/World Bank, *Korea and the Knowledge-based Economy: Making the Transition* (2000) pages 57 to 77.

- Deregulating the education system and increasing autonomy for private secondary and higher education, involving changes in curriculum and tuition, and permitting universities to set their own admission requirements, number of places, etc. This will promote diversity in the education and training system.
- Integrating the current formal, vocational, adult and distance education and training systems to meet the growing needs of lifelong learning.
- Reorienting the use of public and private resources to emphasise improvements in the quality of education at all levels.
- Introducing outcome-driven governance systems in education with clearly defined autonomy and accountability at the institutional levels and decentralisation to enhance local decision-making at schools and universities.
- Strengthening Korea's links to the global educational system. Universities should be encouraged to develop strategic alliances with world-class universities and encourage faculty exchange and joint courses. In addition, the curriculum in English and information and communications technologies should be strengthened to facilitate global communication and international links so as to better prepare Korean students for a globalised world.

Korea is moving to meet these challenges and there are some examples of where new initiatives are taking place such as cyber universities and colleges. Nevertheless, there is a realisation among decision-makers that much more needs to be done. A working group of Korean Government officials and advisers are currently developing a comprehensive human resources development plan.<sup>38</sup> This plan, a national framework for human resources development, could be finalised by September/October 2001. Discussions in Korea in June 2001 indicate that Korea is looking for new ideas and initiatives and that proposals by Australia to support Korea's new human resources development directions would be welcomed. There is a window of opportunity for Australia to become a strategic partner for Korea's education and training sector.

### Conclusions

- (i) A coordinated program by the Australian education sectors to the Korean market is necessary. While it is possible for individual institutions to go it alone in Korea, such an approach will not fully capture the emerging opportunities. A coordinated, long-term

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<sup>38</sup> The Korean recognition of the importance of human resources development can be seen in the changing of the name of the Ministry of Education to the Ministry of Education and Human Resources Development and in the promotion of the Minister to hold concurrently the position of Deputy Prime Minister so as to oversee all Ministries with responsibilities that impact on human resources development.

strategy involving the Australian Government and educational institutions is needed to capture the attention of Korean Government and educational decision makers as to the quality and relevance of the Australian education and training system and products to the human resources development needs of Korea. Such an approach can also emphasise Australian strengths in R&D and science and technology and so broaden Australia's high technology profile.

- (ii) The first step should be to develop a Government to Government cooperative agreement whereby Australia agrees to provide advice to Korean authorities and institutions on developing the new Korean human resources development system and introducing Australian institutions that can provide the particular systems and courses that meet Korea's needs.
- (iii) The most immediate needs of Korea that have so far been identified are:
  - courses that provide not only the necessary theoretical education but also practical training tailored to the employment needs of the student – either in his/her current employment or prospective employment;<sup>39</sup>
  - advice on Australia's skills in providing lifelong learning and in delivering distance education, particularly through on-line (or "cyber") delivery systems, and
  - courses that can be delivered on-line that are global in nature (i.e. globally developed content leading to a globally recognised qualification). The growth areas are English Language, business, certificate based information technology and financial planning and management courses that are internationally recognised.<sup>40</sup>
- (iv) The changing nature of the Korean economy should create a demand for vocational courses which can be delivered in a variety of modes – by studying in Australia, by off-campus (distance education) or by an offshore campus. An offshore campus would need to be a joint venture with a Korean institution where some (or all) of the courses are delivered in Korea with articulation (and English language studies) to vocational education and/or university courses in Australia. Different types of delivery could also apply to university courses,

<sup>39</sup> Korean business groups are looking for students that have skills immediately relevant to the needs of the business. There should be scope for Australian institutions to work with such businesses to develop courses that are relevant to their needs such as the corporate training courses already being provided by Australian institutions (e.g. the Ericsson/ANU cooperative approach in China).

<sup>40</sup> Koreans could be particularly interested in courses that are recognised by large multinational companies as such qualifications would increase the opportunities of obtaining employment with such corporations where the working conditions are usually attractive.

particularly specialised courses such as business and computer studies, health care, etc.

- (v) The use of scholarships and work placements for Korean postgraduate students in Australia as a longer-term means to raise the general profile of Australian education and training among younger Koreans and to build a counterweight to the usual attraction of postgraduate students to the USA. This longer-term strategy should also involve the building of Australian alumni groups in Korea.
- (vi) The education sector should work closely with other sectors, especially those in the high technology sectors (e.g. information and communications technology, biotechnology, environmental technology)<sup>41</sup> to ensure consistent messages are delivered to Korea. Such cooperative efforts may lead to Government/business sponsoring scholarships/work placements for Korean students in Australia.

## 4.5 Infrastructure and Utilities

### 4.5.1. Utilities

Korea has embarked on a large-scale program of privatisation. It covers telecommunications, electricity, gas, water, pipelines etc.<sup>42</sup> For example, Korea is working towards making the electricity market more competitive, based on the Victorian model. KEPCO is being restructured into six generating companies, including one for nuclear power. The five non-nuclear generating companies will be open to foreign investment as well as having a requirement for professional services. A similar approach, and therefore opportunities, is expected to be taken to the restructuring of the gas industry.<sup>43</sup>

In the water industry, it has been reported<sup>44</sup> that the Lyonnaise group of France (now ONDEO) is the preferred bidder for the first international wastewater tender in Korea. The 24-year BOT contract covers the design, construction and management of three sewage plants and an 85-km collecting network. Wastewater services will be supplied to Yangyu county (population 100,000), 60 km from Seoul, in Kyonggi province. The ONDEO group will take a 60% share of the consortium with 40% taken by Hanwha of Korea.

<sup>41</sup> Such cooperation with other industry sectors is also pertinent to other sectors, e.g. in providing training to Korean food and agriculture officials on Australian food standards and conformance systems.

<sup>42</sup> Meeting on 20 April 2001 with Professor Chang-hyun Cho, Chairman of the Presidential Commission on Government Innovation.

<sup>43</sup> Interview on 8 March 2001 with the Energy Policy Office of the Korean Ministry of Commerce Industry and Energy.

<sup>44</sup> *Global Water Report* 99, 7 July 2000 at page 10.

The Australian water industry is going through a reform process driven by the National Competition Policy with improved productivity being the result. The competition principles relevant to the water industry include:

- pricing oversight of water businesses as government business enterprises,
- competitive neutrality,
- structural reform of public monopolies,
- review of legislation to identify anti-competitive elements, and
- access to services of significant infrastructure facilities.

These changes provide a basis for the water businesses themselves to market their services to other countries that are embarking on a similar process of reform as well as providing reference sites for those firms that provide services to water businesses.

### **CASE STUDY: Macquarie GIF Purchase Korean Tunnel For Global Infrastructure Fund.**

Macquarie Global Infrastructure Fund (GIF), managed by Australia's Macquarie Bank group, recently (25 July 2001) announced it had agreed to purchase the concession interest in one of Korea's leading road tunnel projects.

The agreement to purchase the concession interest in the Soojungsan Tunnel Project in Pusan City, from the Soojungsan Tunnel Co. for a total acquisition price of 93.7 billion won (A\$141 million), follows this year's successful raising of \$263 million in funds by GIF from Australian and international investors. The purchase agreement is subject to the satisfaction of conditions including completion of the tunnel's construction.

The Soojungsan project, under construction since 1997 with completion scheduled for November 2001, is a 2.3km two lane tunnel linking Pusan Seaport and the Kyungby/Namahe expressway in Korea's south-east.

Macquarie's GIF is the world first unlisted global infrastructure fund to specialise in unlisted infrastructure investment opportunities. The Soojungsan Tunnel Project compliments GIF's current investments – which are projected to contribute portfolio returns of 20 per cent.

Macquarie spokesperson Greg Osborne said the Korean purchase agreement highlighted GIF's ability to tap into Macquarie Bank's unique access to infrastructure investment opportunities in OECD countries.

“While Australia has led the world in infrastructure privatisation, there is now a recognition that there are also excellent opportunities in infrastructure projects offshore,” Mr Osborne said.

Source: Macquarie Bank

## 4.5.2. Infrastructure

### ***The Australian Model of Infrastructure Project Finance – Relevance to Korea***

The Korean infrastructure market has recently shown that it is following the evolution in lending structures in other more mature western countries, by moving from a corporate finance focus to a project finance emphasis. From a pre Asian economic crisis situation, where all infrastructure borrowing was undertaken on a full recourse basis to the project sponsors, signs are now emerging of the development of international project finance techniques, including non-recourse finance.

Accordingly, Australia’s sophisticated and mature finance industry is well placed to capitalise on developments in this marketplace. Since the early 1980s, Australia has developed its world-leading financial skills and practices in the infrastructure sector, pioneering now established industry practices such as non recourse project funding, inflation linked bonds and the listing of infrastructure investment vehicles. These practices have sought to better link and reward the provision of equity and debt capital to project risks, and have produced an educated, informed market with a highly efficient allocation of project capital.

Australian companies in Korea now have the opportunity to focus on specialist financial activities that range from infrastructure and project finance, structured finance and cross border leasing to the management of specialised infrastructure investment funds.

### ***Korean Infrastructure Developments***

Korea’s investment in the transport and infrastructure sector has not kept pace with the growth in transport demand that has accompanied its transformation from an essentially agrarian economy to a sophisticated manufacturing producer and exporter. As a result, traffic congestion has risen rapidly, undermining Korea’s international competitiveness and presenting challenges for policy makers in meeting such a long-term investment shortfall. More than 16% of Korea’s GDP is logistics costs and more than 4% of its GDP is lost through traffic congestion costs.

Since the early 1990s the Korean Government has faced the dilemma of how to meet this investment shortfall, either through massive public works spending the country cannot afford, or by encouraging the private sector to build the nation’s infrastructure.

The Government opted for the latter course, introducing the concept of public/private partnerships through the Private Participation in Infrastructure (PPI) Act, which uses tax and other incentives to encourage domestic and international investors in roads, rail and port facilities to 2011. These investments are assessed against Social Overhead Capital (SOC) requirements, which are designed to take into account non-financial interests such as community needs and considerations.

Already a new international hub airport has been built outside Seoul, and high-speed railways are being built to lower traffic congestion and logistics costs. Subways are being expanded and alternative roads are being added to and around all urban areas in order to alleviate urban transport problems.

The plan is highly centralised and administered by the Ministry of Construction and Transportation, which oversees national development planning, infrastructure, surface transport and civil aviation affairs. The maritime and port functions are the responsibility of the Ministry of Maritime Affairs and Fisheries.

To feed its industrial base, Korea is highly reliant on the supply of natural resources from overseas markets. Consequently, an internationally viable shipping and shipbuilding industry has developed. However productivity delays and port congestion rob the country of almost 0.2 per cent of GNP annually<sup>45</sup>. As a result, Korea has embarked on an ambitious \$US30 billion port modernisation and building program to 2011.

The last decade has seen an enormous shift in freight traffic, from rail to the road and maritime sectors. While total domestic freight traffic grew more than 250% during the 1990s, rail traffic only rose 11% - representing a 20% decline in its share of the freight market. Notwithstanding this, Korea has an extensive and mature rail system, with the first intercity track linking Seoul and Inch'on in 1899.

Korea's rising economic prosperity is having profound effects on transport modes. Not only are more Korean commuters using their own vehicles, greater urbanisation has seen a drift away from the public bus system to a subway rail alternative. This has brought with it the need for new networks and more advanced urban public transport solutions.

A high-speed train service, similar to that found in Japan and France, is being constructed to link Seoul with Pusan while a second link to Hanan is being examined. To complement the subway system, an increasingly sophisticated and extensive road network is being constructed around the major cities, particularly Seoul, most of which was constructed to coincide with the 1988 Olympics. It is anticipated that seven north-south road trunk routes and nine east-west trunk routes will operate shortly, linking major city centres.

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<sup>45</sup> Ministry of Maritime Affairs and Fisheries

### ***Policy Co-ordination***

In an attempt to introduce a long-term planning culture, the Korean Government follows the Comprehensive National Territorial Plan (CNTP) for the use, development and preservation of land. The CNTP presents policies related to the distribution of population and industries, infrastructure supply, living conditions, the management of natural resources, and environmental conservation. Among the key policy initiatives are:

- the construction of high-speed transport and information networks, transforming Korea into the gateway to North East Asia.
- the reduction in surface travel time between any two points in Korea to a maximum of half a day, allowing more efficient distribution and transport flows.
- the building of information/telecommunication infrastructures so that Korea evolves into a “digitalized territory”.
- the planning for a unified Korea between North and South.

### ***Regulation and Government incentives***

The Private Participation in Infrastructure (PPI) Act indicates the Korean Government’s commitment to reform the way Korean infrastructure projects are financed, managed and owned by engaging the private sector in this task. Introduced in 1995, and amended in 1998 following the Asian financial crisis, the Act seeks to:

- move away from a regulatory system towards a promotional system, where the “creativity” of the private sector is rewarded;
- shift the development focus from the public to private sector;
- formulate a clearly defined and transparent bidding process;
- introduce legally recognisable legal practices, and
- establish standard and internationally accepted institutional arrangements for project execution.

The definition of “infrastructure” is broad and includes roads and ancillary facilities, railways, urban railways, harbour and port facilities, airport facilities, fishing harbour facilities, cargo terminals and warehouses, passenger terminals, non-road parking lots and urban parks. Projects qualify for consideration if they involve construction, expansion, renovation or operation of infrastructure facilities.

Projects worth over 200 billion won (about \$A333.33 million) are reviewed through a preliminary feasibility study. For a project to be approved, the Act requires the Government and Concessionaire to agree to revenue projections, project costs and an un-g geared real project IRR to determine the level of government subsidy for the project. Gearing of the project enables equity returns to be significantly higher than un-g geared projects.

Financing can be conducted in a number of ways:

- *BTO (Build-Transfer-Operate)*: The most widely pursued method. Ownership of the infrastructure facilities is transferred to the central or local government upon completion of construction, and the concessionaire has the right to operate the infrastructure facilities for a specified period of time.
- *BOT (Build-Operate-Transfer)*: The concessionaire assumes ownership of the infrastructure facilities for a specified period of time after completion of construction, upon which ownership is transferred to the central or local government upon termination of the concession period.
- *BOO (Build-Own-Operate)*: The concessionaire owns and operates the infrastructure facilities upon completion of construction.
- *BLT (Build-Lease-Transfer)*: Upon completion of construction, the concessionaire leases facilities to the government for a set period of time and upon termination of the lease, ownership is transferred to the central or local government.
- *ROT (Rehabilitate-Operate-Transfer)*: Upon rehabilitation of existing infrastructure facilities owned by the central or the local government, the concessionaire has the right to operate the facilities for a specified period of time.

Private sector investors can participate through open bidding in the case of solicited projects or by submission of a proposal in the case of unsolicited projects. The incentives include:

- a minimum revenue guarantee of up to 90% for solicited projects (110% revenue cap) and 80% for unsolicited projects (120% revenue cap);
- a buy-out clause in the case of a force majeure and in the case of a breach of agreement by the government;
- measures to stimulate creativity on the part of the private sector. For example, in the case where a concessionaire completes construction at a lower-than-projected cost, the guaranteed tariff is not adjusted accordingly. The cost reduction is then the concessionaire's additional gain;
- partial compensation for foreign exchange rate fluctuations;
- put options for foreign equity investments up to 50% of the total cost of a project;
- a 50% reduction on capital gains, and
- exemption of acquisition tax and registration tax.

Concurrent with the PPI Act is the concept of Social Overhead Capital (SOC), which is a means of assessing private sector investments against common criteria. Under this process, the Ministry of Construction and Transportation

presents a list of projects to a committee of Ministers, including the Ministry of Finance for approval in the Basic Plan. The committee ensures there is no over-investment in any one sector, unlikely given the parlous state of the infrastructure sector overall, and that the Government's share of investment and the proposed toll charges are reasonable.

The SOC Investment plan extends to 2020 and amounts to investment in roads, power, communication, rail, water, ports and airports totalling 1,004 trillion Won (about \$A1.67 trillion). Of this, 747 trillion Won (about \$A1.24 trillion) is to be spent between 2002 with a private sector contribution of 389 trillion Won (about \$A648 billion).

### **Conclusion**

There are many opportunities in the infrastructure and utilities sectors as Korea modernises its infrastructure.

An Australian financial institution (Macquarie Bank) has won many mandates in Korea in relation to the financial structuring of infrastructure projects in areas such as toll roads, ports, tunnels, power stations, communications, etc. The projects being managed offer many opportunities for Australian firms in the engineering and construction area, especially in the involvement of modern environmental technologies in the construction and operation of the projects. There are no doubt other areas of Australian skills and intellectual property that can participate in these infrastructure developments such as software products for energy and utilities companies.

If Australia can establish a track record in these areas, it opens up potential opportunities in North Korea. North Korea will require substantial rehabilitation of its power and energy (and possibly other infrastructure) sectors. As South Korea is unlikely to be able to afford to do that by itself, it provides an opportunity for Australia/Korean collaboration.

The challenge for Australia is to increase its profile as a source of expertise not only in the financing of infrastructure but also in the construction, operation and maintenance of modern infrastructure and utilities. The role for the Australian Government is primarily one of promoting the capabilities of Australia generally and particular companies in these areas.

### **Korean Cyber Village**

In Korea the concept of the fully automated home has become a reality through a series of Cyber Village apartment complexes (costing around \$US215,000 for a 146 sq m unit). There are 16 of these Cyber Villages in Seoul currently and many more currently under construction. These can be bought "off the plan" with a moving-in date of within two years from a purchase deposit being made. There is a high demand for these units – billed as the world's

most technologically advanced. Some of the features include a “webpad” — a portable Internet appliance that is the size of a laptop computer screen with touch control facilities. Shopping is simplified to clicking on grocery items, which are automatically ordered from electronic supermarkets such as, Hanaro Mart, the country’s largest supermarket chain, which then offers free deliveries twice a day. Other options currently available on the web-pad include: on line laundry services, online news and the ability to log on to the internet from anywhere in the apartment.

In Korea, there are already around 10,000 such “smart” apartments, occupied by ordinary families, offering the beginnings of a connected environment, with various levels of automation currently in use.

From August 2001, a high-speed fiber-optic network will make the “Cyber Village” environment even more powerful. Residents will, for example, be able to unlock their doors by mobile phone for their kids returning from school, check the security of their home remotely – room by room via visual security cameras, activate home air-conditioning from the office before leaving work at the end of a hot summer’s day, draw the curtains and so on.

In Korea, the home of the future has indeed arrived and expectations are that networked homes will spread quickly, because most key ingredients are already in place. Perhaps the most significant of these “ingredients” is the hundreds of clustered high-rise apartment complexes that are relatively easy and cost effective to wire with high-capacity “broadband” cables. In addition, there is a large population base of technology and “gadget” appreciating consumers, as well as an abundance of appliance manufacturers such as LG Electronics, & Samsung, eager to build Internet-enabled devices. The Korean Construction Ministry in May 2001 issued a regulation requiring all new apartments to be equipped with speedy Internet access.

Source: Based on article in Asia Week, 22 June, 2001, “Smart Homes Get Real” by Charles S. Lee

### 4.6. Other Services

Over the past decades, Korea’s growth-oriented industrial policy rewarded those companies that were both large and able to demonstrate continuing growth and thus an increasing number of jobs for Koreans. However, industrial policies in Korea were not coordinated with its legal structure, which did not allow the creation of holding companies. With hindsight it

became obvious that such a policy was holding back the growth of a viable and specialised service sector.

The Korean answer was the creation of business groups or “chaebol” companies that bought and sold from each other almost exclusively. This system inflated revenues and assets, and ignored the requirement to net out intra-group sales.

Through this system the many chaebol formed their own “in house” divisions/companies specialising in information technology, chemicals, raw materials and construction. However, the rivalry that existed among different chaebol created its own problems. The service companies that were created to provide services to a particular chaebol could not find clients from the other chaebol, because the potential client chaebol would suffer a revenue loss if it did so. This also prevented the service companies from doing their best to reduce costs and increase efficiencies.

Korean business settled for what they could get rather than sought out the best service available. As Korea now transitions to a future in which profit maximisation is accepted as an imperative for Korean industries and companies, the domestic market is deregulated and world-class companies can gradually compete in Korea, businesses will start to seek the best available options in terms of quality and price. In April 1998 the Korean Government implemented a ban on corporate cross – payment guarantees. Consequently, corporations could no longer finance their subsidiaries with credit or payment guarantees. Corporations were thus forced to trim down bloated businesses and had to dispose of their non – essential subsidiaries.

As a result individual companies, banks, and service companies now, no longer tolerate a poor-performing and high cost in-house department, such as the group’s IT business, when lower cost and higher quality options are available and needed to improve the company’s profitability and enhance its ability to service its own customers.

Enterprises now need to determine where they can be distinctive and add unique value in the overall business system, and will outsource those parts of the value chain in which they are less competitive to companies which can provide the service more effectively.

These changes have already impacted and will continue to give rise to the emergence of more specialised and capable service businesses that differentiate themselves from others based on the quality and cost of services provided.

Companies with better skills and capabilities will emerge to provide services that are far more specialised and unique than those of today in areas as diverse as ICT, systems integration, logistics and distribution, catering, property management, insurance, and personal finance/credit card processing. In the course of this study a number of Korean systems integration companies expressed a strong interest in forming joint ventures

with Australian systems integration companies with a view to looking at opportunities in third countries – utilising the complementary skills from each country to target markets in Asia and the United States.

Only more specialised and focused businesses will be able to achieve the required scale and build the skills and capabilities required to be successful in this more competitive “winner focused” economy, where even small differences in performance will lead to large differences in economic rewards.

The Korean economy has the potential to create many millions of new services sector jobs in the next five to ten years, and offer substantial investment/joint venture opportunities for Australian companies that can recognise the service sectors magnitude and growth potential in the new, knowledge based Korea.

Many of these new service sector jobs will be high value-added, high skilled professional jobs in areas such as accounting and finance, medical care and the legal profession as well as in education and information technology.

### Availability of IT Skills

R	Country	Survey
1	India	8.92
2	Hungary	8.10
3	Israel	7.61
4	Iceland	7.52
5	Australia	7.29
6	U.S.A.	7.23
7	France	7.16
8	Turkey	7.03
...	...	...
28	South Korea	6.40

Measures the extent to which qualified IT personnel are (10) or, are not (1) available in the country.<sup>46</sup>

Tourism: The number of Koreans who travelled abroad reached a new record in 2000, breaking the five million mark for the first time. The numbers of Koreans who came to Australia (12 months to June 2000) were 160,200 or 2.9% of the total outbound travel from Korea. This was a healthy 26.9% increase on the 1999 figures. The growth included sharp increases in the numbers of students, backpackers and those travelling to study abroad. Korean consumers, while remaining largely group travellers, have begun showing interest in special interest itineraries, focusing on activities such as golf.

<sup>46</sup> Source: The World Competitiveness Yearbook 2000, published by International Institute of Management Development.

The primary source market for Australia is Seoul, with secondary markets with promise being Pusan and Taegu. Australia is currently rated the 8<sup>th</sup> most popular destinations for outbound Korean travellers, behind Japan, China, USA, Thailand, Hong Kong, Singapore, and the Phillipines. Australia is most popular amongst the younger Koreans. In 2000 28% of Korean visitors to Australia were aged in their 20's, while 21% were in their 30's. In comparison only 16% of visitors from Korea were in their 40's and 12% in their 50's.<sup>47</sup>

As indicated in other sections of this report, the Internet is now well established in Korea as a significant marketing tool. Most national tourism organisations have a dedicated Korean language web-site, and there are already over 20 online travel agencies operating in Korea. The Australian Tourism Commission launched its Korean language web-site in March 2001. Deregulation of the telecommunications industry and the expansion of digital media and broadband access is expected to create new, cost effective communication channels for marketing and sales.

**Table: Korean Visitors to Australia<sup>48</sup>**

Year	Number of Korean Visitors
1995	167,975
1996	227,850
1997	233,815
1998	66,635
1999	108,634
2000	160,200

<sup>47</sup> Source: Korea National Tourist Organisation – 2000 Tourism Statistics

<sup>48</sup> Source: Bureau of Tourism Research, Australia



## 5. Cross Sectoral Issues

*This chapter brings together some of the issues raised in earlier chapters where they are of particular cross sectoral relevance.*

### 5.1. Profile of Australian Capabilities

The lack of an Australian profile in Korea affects many industry sectors, especially those sectors not involving agricultural and mineral commodities.<sup>49</sup>

A Korean who has not spent much time in Australia or who has not focussed on Australia, would think of Australia as a quarry and a farm and a nice place to visit – what a Korean taxi driver described as “paradise”. To those Koreans, Australia is not thought of as a “clever country”, as a source of technically or intellectually advanced inputs to assist in Korean development. This perception is captured in an Australian Education International (AEI) report of October 1998 on *Korean Perceptions of Australian Education*, which presented the results of quantitative and qualitative research in Korea on perceptions of Australian education. The report said:

On the basis of the research results those Korean students who choose Australia as a study destination are more likely to do so for reasons such as a perceived better living and study environment and low cost, rather than for the quality of its education product. *Unless Australia's quality profile is raised* and English language is linked more strongly with study in other sectors, for most Korean students Australia will remain as an ELICOS (i.e. English Language) destination and little else.

Tied in with the education image is a complex of other factors, such as the perceived level of development of Australia's science, technology, art, culture and sport. Given this, no one institution can “go it alone” in Korea, no matter what its size or standing elsewhere. To turn Korean perceptions around will require a coordinated, long-term promotional strategy at the institutional level, tied in with a national strategy based on the proven quality of the Australian education and training product.

A more recent study of Korean students in Australia said:

Koreans' perceptions of Australia are poorly informed and inaccurate, as are their perceptions of Australia's achievements in science and

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<sup>49</sup> The level of understanding in Australia about Korea is also low, where the opportunities are seen to be in Japan and China and South East Asia. Korea was rarely even on the “radar” of many organisations.

technology. Koreans do not think of Australia as comparable to the United States or Japan in terms of high technology.<sup>50</sup>

This is not to say that all Koreans are unaware of Australia's technological strengths. Koreans directly involved in R & D, especially basic R & D, are aware of Australian capabilities. But this awareness does not often extend to the management of Korean companies involved in technology areas. Koreans regard the USA, and to a lesser extent Western Europe and Japan, as the technology rich countries.

The suggestions made under Technology and Education and Training in the previous chapter go some way towards overcoming those perceptions of Australia.

In addition, there is scope to use the media to highlight the existing successful economic relationship between Australia and Korea. This can be done through publicising case studies and sponsoring the relevant media both in Korea and Australia. This media attention should be encouraged to shift focus to highlighting the new economy developments and the potential for opportunities to expand the economic relationship.

The benefits of Australia as a low cost, high quality provider of information and communications technology and software applications, as well as a provider of systems integration services, photonics, biotechnology, resource and environmental management and technological research and development should be marketed to key Korean Government and industry policy makers and influencers as well as to the "man on the street".

## 5.2. Intellectual Property

Over the years there has been concern amongst Australian exporters about the lack of safeguards on intellectual property rights (IPR) in some countries. These concerns relate not only to the possibility of resulting inferior products and thus possible damage to the reputation of the company concerned: IPR concerns can also reduce the chances that an innovative company can recoup its investment in research and development and release enhanced new products.

Companies also need to be on the alert to ensure that pirated copies of their own product produced in countries where intellectual property laws are not fully enforced, do not turn up in their home market or in third countries.

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<sup>50</sup> O Yul Kwon and See-Gyoon Park, *Australia-Korea Relations in Education: Issues and Prospects* (2000).

### Case Study -“Protecting property rights at customs

One of the most serious issues in the field of intellectual property rights in Korea is the fact that there are still many counterfeits produced in the Korean market. In terms of the total number of counterfeit imports seized by U.S. and Japanese customs, cases originating from Korea ranked 3<sup>rd</sup> and 1<sup>st</sup>, respectively. Similarly, the Korea Customs Service (KCS) reported an increase of 169 percent in counterfeit commodity imports and 146 percent in counterfeit commodity exports based on the number of cases compared with the previous year...”

“Pursuant to its international obligations, the Korea Customs Service announced that they have made significant gains in the interception of imported and exported IPR infringing goods, including counterfeit commodities in accordance with the WTO TRIPs and the Korea Customs Act.

In acknowledging the need to control IPR infringing commodities from its source, KCS has developed a measure on “Strengthening Trademark Protection including the Trademark Search System”. KCS explained that the import/export of a good by any person without trademark rights will be detected by a computerised trademark searching system. Also, for import/export enforcement on trademark infringing goods, even if a trademark is not reported at the time of import/export declaration, the declaration will not be processed if there are doubts about the authenticity of the product...”

“Also, the American Chamber of Commerce (AMCHAM) and the European chamber of Commerce in Korea (EUCCK) have continuously requested the strengthening of KCS’s IPR enforcement role. The office of the Investment Ombudsman (OIO) also expects this system to be useful for facilitating and improving the interception or IPR-infringing goods during the import/export clearance stage. Not only will this help dispel Korea’s international image as an IPR infringing country but it will also help protect its consumers, thus enhancing the overall foreign investment business environment...”<sup>51</sup>

It has generally been accepted that the Australian software industry has been at the forefront of worldwide development of applications. However, while realising the potential opportunities of their software products overseas, the software industry participants have been reluctant in general

<sup>51</sup> Source – The Korea Herald, 26<sup>th</sup> June 2001. The author, Lee Hyun-seob, is a tariff, tax, and clearance counsellor at the Office of the Investment Ombudsman.

to export to those markets where it has been perceived that software products may be subject to copyright infringements.

The protection of intellectual property has been hard to police and even harder to enforce through some legal systems. The problems are being addressed at many levels: the developers are introducing increasingly sophisticated protective measures for their own products while the countries in question, realising the negative impact to their economies (from an investment point of view), are also implementing stronger legal frameworks to protect IPR.

The Korean Government addressed these issues in June 2000 when it identified a concept of digital copying of materials, established rights for the digital transmission of materials, and enforced the punishment for infringement of digital copyright. The Government allows the IPR holder to claim compensation for damages, even in the case of unintentional infringement. The Government is promoting the use of digital copyrighted materials by allowing digital copying and transmitting in libraries.<sup>52</sup>

Nevertheless, there remains a perception among some Australian exporters, particularly potential exporters, that their IPR will not be adequately protected in Korea. There is scope for initiatives to be taken in this area to address this perception.

### 5.3. Standards and Compliance

An issue that arises for elements of the Australian elaborately transformed manufactures sector is the standards and compliance regimes in Korea (as well as in other Asian countries). The actual processes for obtaining approvals or certificates that the Australian goods comply with the various standards and regulations are time-consuming and often do not readily acknowledge that the goods in question meet internationally accepted standards.

In some elements of the Australian manufacturing sector, there is a willingness to work towards Mutual Recognition Agreements.

Korea will come under increasing pressure by major developed countries to take initiatives in these areas. It could be in Korea's longer term interests to be seen to be willing to move forward in these areas by working with Australia which, as a smaller developed country, will not pose the same potential threat to Korean businesses.

There is therefore scope for the Australian and Korean Governments to work together, perhaps on a sector-by-sector basis, to establish mutually beneficial arrangements in relation to standards and compliance regimes.

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<sup>52</sup> Source – 2000 Korea Internet White Paper, Ministry of Information and Communication

## 5.4. Commercialisation of Technology

The commercialisation of technology in Australia is not maximised due to the lack of sufficient capital to develop new Australian ideas and technologies through the initial commercialisation stage and into full-scale production. The existence of many leading innovative companies in Australia, combined with Australia's well educated and trained workforce, means that the advanced technology and manufacturing sectors have potential for further growth. In recent years this sector has diversified, particularly in technologically advanced products based on the application of innovative technologies. The manufacturing and services companies are increasingly attuned to export markets, with many producers in Australia developing strong niche markets in international arenas.

New developments in advanced technology manufacturing are also growing, including biotechnology, new materials technology, medical and scientific instrumentation, aerospace and defence. A number of innovative firms are producing leading edge scientific communications, military and industrial products, radar systems, optic fibre connectors, spaceborne communications and electronic warfare equipment.

The need to assist in the commercialisation of technology has been recognised by the Australian Government. It has taken a number of initiatives in the technology area, especially the support of R&D.

When Australian technology companies look for overseas support for the commercialisation of their technologies, they tend to look to the USA and to a lesser extent Western Europe and Japan. Korea should be an emerging source of support as the Korean Government places greater emphasis on becoming a knowledge based economy. Some Korean companies and organisations are already using Australia as a base to develop new products. The examples to date are limited, which means there is scope for the Australian and Korean Governments to foster a greater interest in each other's country: Australia as a source and a place to develop technologies and Korea as a source of funding and a partner in the development of successful technologies.

## 5.5. Investment

With the current restructuring in Korea there is considerable opportunity for investing in Korea by Australian organisations. The liberalisation of Korea's foreign investment policies, coupled with the ongoing regulatory reforms and the need for Korean firms to dispose of surplus assets and attract foreign capital, is enhancing the investment opportunities in Korea. The complementary opportunities for Korean firms to invest in collaborative research with Australian companies where the resultant manufacturing and marketing and distribution could be carried out by the Korean partners, is an attractive proposition.

### **CASE STUDY: Macquarie Bank / Shinhan Bank Joint Venture**

The recently established joint venture between Macquarie Bank and the Shinhan Bank and the resultant special business unit has created opportunities for Australian organisations to be in touch with Korean organisations. It is staffed by executives from Macquarie and Shinhan, and is based at Shinhan's head office in Seoul. The combination of Macquarie's financial innovation and infrastructure expertise together with Shinhan's extensive network of Korean clients and project financing capabilities, creates a new presence in the Korean financial market.

Source: Macquarie Bank

While there has been a substantial increase in foreign investment in Korea from foreign investors keen to capitalise on mergers and acquisitions, investment opportunities are still available and the promotion of these opportunities within Australia could provide new opportunities for some Australian organisations. While the Australian Government has been promoting Korean investment in Australian manufacturing and resources development Korean investment in Australian manufacturing and resources development projects, it would seem logical to initiate an awareness program both in Korea and Australia about the various mutually beneficial investment opportunities in both countries.

## **5.6. Making Connections**

The current economic relationship between Korea and Australia is on the one hand impressive due to the success of the traditional commodities sectors and several key niche areas where entrepreneurial organisations have capitalised on the potential for complementarity, such as the automotive components sector and software in the financial and Internet related areas. On the other hand, it seems incongruous that such successful economic relations between two countries could be achieved with so little relative knowledge and social contact between the countries. It is our understanding that from a media perspective, currently there is only one Korean correspondent working in Australia, for the Donga Ilbo in Sydney. From the Australian point of view the Australian Financial Review has a stringer based in Seoul while most other Australian media outlets cover Korea from Tokyo.

The government-to-government relationship and co-operation between Australia and Korea has been strong for quite a few years and the interaction and the vision for mutually beneficial enhanced economic relations is also being propagated at strategic levels in both Governments. The obvious anomaly is the lack of people to people contact. The personal, social, cultural and sporting links are in need of innovative ideas and strategies. Such links will underpin a strengthened economic relationship.

Korea is viewed by many Australian business people as a “difficult” market. In some cases this view is based on actual experience, but in many cases the information is based on hearsay.

Discussions with representatives of the Australia New Zealand Chamber of Commerce in Korea identified issues regarding the difficulties of Australian expatriates working in Korea, in particular issues with superannuation, taxation and work visas for foreign workers in Korea. There were several instances of difficulties in the recognition of defacto relationships where Korea’s recognition of these relationships is different to that in Australia.

The Australia – Korea Foundation has been actively engaged in broadening the relationship between Australia and Korea, with a particular emphasis on promoting individual and group visits and exchanges between the two countries, especially in the areas of commerce, industry and sports, education, science and technology, the arts and the media. These initiatives should be continued and if possible extended with a greater emphasis on publicising these initiatives through the Australian and Korean media outlets.

In August 1999 the AKF co-hosted an inaugural Australia-Korea Media Forum with the Korea Press Foundation. The forum was co-chaired by Mr Mack Williams the Deputy Chairman of the Australia-Korea Foundation and Mr Moon-Won Kim Chairman of the Korean Press Foundation. The meeting issued a number of recommendations:

- (i) the Australian-Korea Media Forum, with the participation of senior level journalists, should be held on a rotating basis in the Republic of Korea and Australia, with the support of the Korea Press Foundation and the Australia-Korea Foundation;
- (ii) in order to enhance the understanding between the two countries, an exchange program between a number of journalists from the two sides should be carried out for, say, one semester at an assigned university. The arrangements for this exchange program should be carried out under the agreement of the two Foundations;
- (iii) the two Foundations should encourage tie-up relations between media organisations of the two countries; and
- (iv) the two Foundations should urge their respective governments to ease visa requirements for stringers.

**CASE STUDY: Korean Students to Study Sport and Language in ACT.**

It is anticipated that about 20 students will be arriving from Korea in February 2002 to attend Kambah High School and participate in the Soccer Program developed at the school. The Korean students would also be part of the educational and cultural community of the school and graduate at the end of year 10 with an *ACT High Schools Certificate*. The usual pathway for elite sports students graduating from Kambah High School (16-17 years of age) is to Erindale Secondary College which has a "Talented Sports Program" which includes soccer.

During their stay in Australia it is the intention of the program to not simply concentrate on their soccer development. It is equally important that the students develop as individuals and as young men. It is proposed that the program would take advantage of the opportunities for the students to come to understand Australia and Australians.

Students would be a part of Kambah High School and would be included in all other aspects of education which includes educational excursions to places in Canberra and outside the ACT, participation in school soccer and futsal teams and in all other sports teams which include tennis, hockey, softball, rugby, badminton, volleyball, cycling, triathlon, cricket etc.

Source: Mr Chris Conti, Kambah High School ACT.

## 6. Conclusions

Based on the discussion in the previous chapters, the following table shows for each industry sector the relative importance of the key cross-sectoral issues that have arisen in the research for this report.

### 6.1. Importance of issues by sector

SECTORS	ISSUES					
	Australian Profile	Intellectual Property	Standards and Compliance	Commercialisation of Technology	Investment	Making Connections
Agriculture			XX		XXX	XX
Minerals & Energy					XXX	
STMs					XX	
ETMs	XXX	XXX	XXXX	XXXX	XXX	XX
ICT	XXXX	XXXX		XXXX	XXX	XXX
Biotechnology	XXXXX	XXX		XXXX	XXX	XXX
Environment Technology	XXXX	XXXX		XXXX	XXX	XXX
Education & Training Services	XXXXX	X	X		XX	XXX
Other services (infrastructure)	XXX	XX		XX	XXX	XXX

Note: The number of Xs reflects the relative importance of each issue ranging from apparently no importance where there is no X to very important where there are five Xs.

### 6.2. General Initiative

This study has identified a number of initiatives that could be undertaken to strengthen the economic partnership between Australia and Korea. These are brought together in the following section.

Most of these initiatives are quite specific and relate to issues of importance to the more technology intensive sectors, e.g. intellectual property, standards and compliance, technology workshops and clusters, a cooperative agreement on education and training, etc.

While it would be possible to pursue these initiatives separately, the opportunity could be taken to bring them under the umbrella of an overarching economic framework agreement between Australia and Korea.

There are already a number of quite specific economic agreements/memoranda of understanding between Australia and Korea at the government level as well as at the industry level. At the government level these include agreements/MOU on trade, double tax, science and technology, customs, quarantine, etc.

The Agreement on the Development of Trade and Economic Relations between Australia and Korea was signed in 1975. It would be opportune to develop a new agreement that reflects contemporary and future realities. The various initiatives suggested in this report could be brought under a new agreement such as a Trade and Investment Facilitation Agreement (TIFA) to allow for consistency in their treatment.

A TIFA can be as broad and comprehensive as the parties wish it to be – it can be viewed as an umbrella agreement enabling the parties to include sectoral and cross-cutting issues that they both agree would boost the economic links between the two parties. Because of its “framework” nature, there can be subsidiary agreements under the umbrella of a TIFA; new agreements can be added as new areas of cooperation are developed.

A TIFA would not involve border discrimination in trade and can be negotiated in a way that does not preclude other economies from signing on to the agreement – as a whole or in part.

Economic sectors that might be included in a TIFA are:

- Information and Communications Technology
- Biotechnology
- Environment Technology
- Education and Training
- Infrastructure
- Other services (e.g. banking and finance, business services)

Cross-sectoral issues that might be included in a TIFA are:

- Standards and regulatory harmonisation
- Quarantine
- Customs
- E-commerce
- Intellectual property rights
- Investment protection guidelines
- Access by professionals between Australia and Korea

The adoption of such an approach reflects the situation where the economic relationship between Australia and Korea has moved beyond trade to encompass other economic relations such as investment and technology development.

### 6.3. Specific Initiatives

The following conclusion was reached in regard to agriculture and food/minerals and energy:

Initiatives could be taken by the Government to promote closer linkages between Korean and Australian participants in the minerals and energy and agriculture and food sectors by way of e-commerce, closer investment linkages, training in Australian food standards and conformance systems, and person to person contacts.

The following conclusion was reached in regard to manufactures:

Initiatives can be taken by the Government to facilitate stronger linkages between Australia and Korea in ETMs, for example:

- Examining the possibility of a bilateral arrangement between Australia and Korea where the Governments would undertake to try and harmonise their approach to the implementation of intellectual property protection. The implementation could include a Code of Practice and possibly a joint forum that would consider tangible issues raised by Australian and Korean firms about infringements of their intellectual property rights.
- While there were mixed views among Australian industry about the benefits of Mutual Recognition Agreements (MRAs), there is support for mechanisms to be put in place that are similar to MRAs. These can be addressed on an industry-by-industry basis rather than across the board. In the communications equipment area, there is support for a bilateral arrangement between Australia and Korea that harmonises or at least moves towards a more common compliance regime for obtaining approvals for equipment in this industry sector.

The following conclusion was reached in regard to technology:

Linkages need to be developed throughout the industrial/commercial chain in the technology segments, including close links with the education and training sector. There are some linkages through the Australia-Korea Business Council and its Korean counterpart, but these linkages are mainly in the traditional trade areas of minerals and agriculture. What is needed are effective linkages in the newly emerging sectors. These sectors are primarily in the technology

intensive areas, but should be closely linked with the education and training sector because of the role of that sector in assisting the development of the Australian profile.

Workshops should be held in specific technology segments that include people who are responsible for the commercialisation and marketing of newly developed technologies. The workshops can discuss issues such as –

- what is available in Korea and what are Korea's needs;
- what is available in Australia and what are Australia's needs;
- what are the strategic directions in Korea and Australia in the different segments of technology and in their commercialisation; and
- what are the needs and strategic directions of other countries in the Asia Pacific region such as Singapore as well as the major markets of China and Japan.

If the workshops in particular segments are successful they could lead to the creation of a Korean/Australian "cluster" in particular industry segments that would include in each cluster:

- relevant firms from each country;
- relevant R&D agencies;
- education and training institutions;
- financial services institutions;
- legal services; and
- product development and marketing specialists.

Initially, the clusters do not need to be created on a very formal basis. The major task is to get the participants talking together and to be linked by some form of intranet. Some seed funding may be needed to promote the clusters, for example, the Australia-Korea Foundation could expand its activities in the technology sectors to include the sponsoring of the workshops and clusters. If they are successful, they could be developed into more formalised fora where the Governments of Korea and Australia could also participate; this would allow joint industry/government discussion of issues affecting the particular sector.

The following conclusions were reached in regard to education and training services:

- (i) a coordinated, long-term strategy be adopted involving the Australian Government and educational institutions to capture the attention of

Korean Government and educational decision makers as to the quality and relevance of the Australian education and training system and products to the human resources development needs of Korea.

- (ii) a Government to Government cooperative agreement be reached whereby Australia agrees to provide advice to Korean authorities and institutions on developing Korea's new human resources development system and introducing Australian institutions that can provide the particular systems and courses that meet Korea's needs.
- (iii) There is a need in Korea for many types of courses that can be provided by Australia.
- (iv) The use of scholarships and work placements be introduced for Korean postgraduate students in Australia as a longer term means to raise the general profile of Australian education and training among younger Koreans and to build a counterweight to the usual attraction of postgraduate students to the USA.
- (v) The building of Australian alumni groups in Korea be supported.
- (vi) The education and training sector should work closely with other sectors, especially those in the high technology sectors.

The following conclusion was reached in regard to infrastructure and utilities:

There are many opportunities in these sectors and Australian organisations are already winning business. The major Government role is one of promoting the capabilities of Australia generally and particular companies in these areas.

In relation to other services, there are opportunities in professional services, particularly those related to the modernisation and reform of Korea's infrastructure and utilities and as a result of the reforms to the commercial structure of businesses in Korea.



## 7. Recommendations

It is recommended that:

- (i) Australia and Korea enter into an umbrella agreement designed to strengthen the economic partnership between Australia and Korea (e.g. a Trade and Investment Facilitation Agreement - TIFA). It should provide the framework for the recommendations set out below.
- (ii) Australia and Korea foster greater interest in each other's technology sectors: Australia as a source and a place to develop technologies and Korea as a source of funding and a partner in the development of successful technologies.
- (iii) Support be given to the development of closer linkages between Australia and Korea throughout the industrial/commercial chain in various technology segments (e.g. information and communications technology, biotechnology, photonics, environmental technology). This should initially involve workshops and possibly lead to the establishment of Australian/Korean clusters in particular technology segments.
- (iv) A bilateral arrangement be made on the implementation of intellectual property protection. This could include a Code of Practice and possibly a joint forum that would consider tangible issues raised by Australian and Korean firms about infringements of their intellectual property rights.
- (v) Australia and Korea work on a sector-by-sector basis towards adopting common systems for obtaining approvals/certificates that goods from each country comply with the standards and regulations applying in the other country.
- (vi) The Australian Government, in partnership with Australian private sector groups, continue to promote the capabilities and relevance of Australian businesses and the relevance of Australia's financial and advisory sectors to assist in the modernisation and reform of Korea's infrastructure and utilities. Such promotion should build on innovative partnerships between private sector and public sector entities, with improved customer focus, along lines pioneered in the new Australian infrastructure sector.
- (vii) There be increased support for road-shows, seminars and workshops presenting the Australian approach to reform of these sectors such as rail, roads, water, energy and communications infrastructure. The congestion in urban Korea creates a major opportunity for communication of how new project finance models can address both the problems and the need for improved quality of investment and governance in the infrastructure sector in Korea.

- (viii) A coordinated, long-term strategy be adopted involving the Australian Government and educational institutions to capture the attention of Korean Government and educational decision makers as to the quality and relevance of the Australian education and training system and products to the human resources development needs of Korea.
- (ix) A Government to Government cooperative agreement be reached whereby Australia agrees to provide advice to Korean authorities and institutions on developing Korea's new human resources development system and introducing Australian institutions that can provide the particular systems and courses that meet Korea's needs.
- (x) The use of scholarships and work placements be introduced for Korean postgraduate students in Australia as a longer term means to raise the general profile of Australian education and training among younger Koreans and to build a counterweight to the usual attraction of postgraduate students to the USA.
- (xi) The building of Australian alumni groups in Korea be supported.
- (xii) The media be utilised more extensively to increase the profile of Australia and Korea in each other's country, including through the exchange of industry specific media specialists who could highlight "success stories" of complementary initiatives. In addition, consideration be given to the implementation of the recommendations of the inaugural Australia-Korea Media Forum held in Sydney on 17 August 1999.

## Appendix A: Useful Korean Government Websites

Office of the President	<a href="http://www.cwd.go.kr">http://www.cwd.go.kr</a>
Board of Audit and Inspection	<a href="http://www.bai.go.kr">http://www.bai.go.kr</a>
National Intelligence Service	<a href="http://www.nis.go.kr">http://www.nis.go.kr</a>
Presidential Commission on Women's Affairs	<a href="http://pcwa.go.kr">http://pcwa.go.kr</a>
Presidential Advisory Council for Science and Technology	<a href="http://pcst.go.kr">http://pcst.go.kr</a>
Office of the Prime Minister	<a href="http://www.opm.go.kr">http://www.opm.go.kr</a>
Korean Fair Trade Commission	<a href="http://www.ftc.go.kr">http://www.ftc.go.kr</a>
Financial Supervisory Commission	<a href="http://www.fsc.go.kr">http://www.fsc.go.kr</a>
Ombudsman of Korea	<a href="http://www.ombudsman.go.kr">http://www.ombudsman.go.kr</a>
Commission on Youth Protection	<a href="http://www.youth.go.kr">http://www.youth.go.kr</a>
Ministry of Planning and Budget	<a href="http://www.mpg.go.kr">http://www.mpg.go.kr</a>
Ministry of Legislation	<a href="http://www.moleg.go.kr">http://www.moleg.go.kr</a>
Government Information Agency	<a href="http://www.allim.go.kr">http://www.allim.go.kr</a>
Patriots and Veterans Administration Agency	<a href="http://www.pvaa.go.kr">http://www.pvaa.go.kr</a>
Ministry of Finance and Economy	<a href="http://www.mofe.go.kr">http://www.mofe.go.kr</a>
National Tax Service	<a href="http://www.nta.go.kr">http://www.nta.go.kr</a>
Korea Customs Service	<a href="http://www.customs.go.kr">http://www.customs.go.kr</a>
Supply Administration	<a href="http://www.sarok.go.kr">http://www.sarok.go.kr</a>
National Statistical Office	<a href="http://www.nso.go.kr">http://www.nso.go.kr</a>
Ministry of Unification	<a href="http://www.unikorea.go.kr">http://www.unikorea.go.kr</a>
Ministry of Foreign Affairs and Trade	<a href="http://www.mofat.go.kr">http://www.mofat.go.kr</a>
Ministry of Justice	<a href="http://www.moj.go.kr">http://www.moj.go.kr</a>
Supreme Public Prosecutor's Office	<a href="http://www.sppo.go.kr">http://www.sppo.go.kr</a>
Ministry of National Defence	<a href="http://www.mnd.go.kr">http://www.mnd.go.kr</a>
Military Manpower Administration	<a href="http://www.mma.go.kr">http://www.mma.go.kr</a>

Ministry of Government Administration and Home Affairs	<a href="http://www.mogaha.go.kr">http://www.mogaha.go.kr</a>
National Police Agency	<a href="http://www.npa.go.kr">http://www.npa.go.kr</a>
Ministry of Education	<a href="http://www.moe.go.kr">http://www.moe.go.kr</a>
Ministry of Science and Technology	<a href="http://www.most.go.kr">http://www.most.go.kr</a>
Korea Meteorological Administration	<a href="http://www.kma.go.kr">http://www.kma.go.kr</a>
Ministry of Culture and Tourism	<a href="http://www.mct.go.kr">http://www.mct.go.kr</a>
Ministry of Agriculture and Forestry	<a href="http://www.maf.go.kr">http://www.maf.go.kr</a>
Rural Development Administration	<a href="http://www.rda.go.kr">http://www.rda.go.kr</a>
Korea Forest Service	<a href="http://www.foa.go.kr">http://www.foa.go.kr</a>
Ministry of Commerce, Industry and Energy	<a href="http://www.mocie.go.kr">http://www.mocie.go.kr</a>
Small and Medium Business Administration	<a href="http://www.smba.go.kr">http://www.smba.go.kr</a>
Korean Industrial Property Office	<a href="http://www.kipo.go.kr">http://www.kipo.go.kr</a>
Ministry of Information and Communication	<a href="http://www.mic.go.kr">http://www.mic.go.kr</a>
Ministry of Health and Welfare	<a href="http://www.mohw.go.kr">http://www.mohw.go.kr</a>
Korea Food and Drug Administration	<a href="http://www.kdfa.go.kr">http://www.kdfa.go.kr</a>
Ministry of Environment	<a href="http://www.me.go.kr">http://www.me.go.kr</a>
Ministry of Labor	<a href="http://www.molab.go.kr">http://www.molab.go.kr</a>





Available online at [www.dfat.gov.au/akf](http://www.dfat.gov.au/akf)