

SUBMISSION 13

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21 July 2006

Submission to the inquiry into the state of Australia's manufactured export and import competing base now and beyond the resources boom

Please accept my submission to the inquiry as follows. While I have no problem with my submission being made public, I request that my home address, and in particular my private telephone and email addresses shown above not be published on the Internet, as these are often harvested for unsolicited marketing purposes.

My submission is I believe well founded on my experience of 33 years in manufacturing, engineering, information technology and related research & development programs. I began my career in electrical engineering with BHP in 1973 at the Port Kembla Steelworks and progressed through a variety of roles in businesses including automation of heavy industry, operational systems for the defence forces, information and communications systems in heavy industry, utilities, infrastructure and resources sectors, and general management of technical disciplines. I now work for Sinclair Knight Merz (SKM) providing engineering consulting services.

From 2001, I managed the Australian Secretariat for the international Intelligent Manufacturing Systems (IMS) scheme. The IMS scheme facilitates linkages between industry and research organisations in its member countries, and forms collaborative research & development projects on advanced manufacturing technologies. The Secretariat contract was between SKM and the Department of Industry, Tourism and Resources and has just recently been concluded as a consequence of the Minister for Industry, Ian Macfarlane, having decided that Australia would cease its involvement in the IMS scheme.

I am writing as a private citizen because I no longer have any official involvement in the IMS scheme, and I am not aware that SKM has any official position on the subject of your inquiry.

My purpose is to provide you with the insights I have gained through working with both the manufacturing and resources sectors, and in particular promoting and managing the IMS scheme to industry in Australia.

My central proposition is that to ensure continued growth of Australian society, we must establish a diversity in our sources of sustainable wealth generation based not only on extracting value from the natural endowments of the land and environment, but also on creating and exporting products built upon our greatest renewable resource: the intellectual capabilities of our people. We should therefore invest in growing, sustaining and harvesting our stock of intellectual capital through measures such as world-class education and life-long development, attracting the best minds and keeping them working for Australia, undertaking world-leading R&D linking private and public

interests and funding, and fostering IP commercialisation, entrepreneurship and world-class business practices.

The barriers to achieving this vision are complex and will require a sophisticated combination of policy, behavioural incentives, and facilitating activities supported by government.

Some of the barriers I have observed and encountered are:

- ❑ The Australian business culture is risk averse and failure is not tolerated. Consequently Australians will invest only in certainties and tangibles (such as ore reserves, proven and secure markets, bricks and mortar property and infrastructure), and much less so in intellectual property and uncertain future prospects. In contrast, cultures like the USA consider failures in bold but risky business ventures that were conducted honestly, as badges of honour and experience. Their investors seem to have a much more sophisticated understanding of the subtleties and potentials of IP-based investments.
- ❑ There is a focus on short-term returns from investments in intellectual property that tends to drive the limited R&D investment towards products and away from processes. Products have very limited market lifetimes, but innovative processes are more likely to provide sustainable returns over longer terms by enabling successions of product innovations and production improvements.
- ❑ Universities and public research institutions have fundamentally different success drivers than does industry. Academics' careers are driven by their production of peer-reviewed and cited publications, and by the extent to which they have secured publicly funded research grants. Industrial commercialisation of R&D results requires confidentiality, active management of risk, protection of IP, and the securing and licensing of IP rights. This fundamental disconnection of interests inhibits the formation of linkages between business and the public research communities, and so incapacitates the ability of Australian business to confidently invest in Australian R&D conducted by academics.
- ❑ Business R&D capacity was scaled back in the late 20th Century as costs were cut, with many of the iconic research groups (eg. BHP Research, Ericsson) closed and not replaced with other arrangements. The researchers were retrenched and moved to the public sector or overseas. Therefore Australia's industrial research capacity has diminished, as has its ability to effectively engage with the R&D institutions.
- ❑ While all Australians value a good education, their interests, as reflected in the media, do not generally highlight the value and achievements of the physical sciences and engineering. Consequently the coming generations are not attracted to these disciplines as career choices, preferring instead to opt for the finance, law and medicine. Therefore our pipeline of future intellectual capital for manufacturing is meagre.

It is clear that manufacturers in developing economies with low input costs, exemplified by China, are exerting tremendous pressure on mature, but traditional, manufacturing industries. The global manufacturing environment is undergoing profound change requiring adaptation just for survival, let alone for generating prosperity.

Manufacturing remains at the core of wealth creation and employment and is the foundation of our lifestyle. The world's manufacturing economies generate the demand for raw materials and energy that drives the boom in Australian resources industries. Australia is fortunate to have rich natural resource endowments that have provided the springboard for our resources companies to grow into globally significant multi-nationals. These companies participate in the global manufacturing supply chains and will be able to sustain their positions while their resources remain in demand, and while they have secure and relatively exclusive control over supply.

In contrast, few Australian manufacturing companies stride the world stage as significant players in their market segments. Competition today exists not only between companies, but also between global supply chains. Participating in these supply chains requires that Australian manufacturers

offer competitive differentiated products and services over which they too have exclusive control. The principal resource enabling this would be their intellectual property.

The emerging business model is founded on knowledge as a key asset and a source of competitive advantage. There is now a global race for ideas and the skilled people that can drive the innovation that creates commercial value from these ideas. Skilled Australians are among those sought and successfully contributing to world leading manufacturers and research institutions. The challenge is to bring much more of this activity home to Australia and to build on it.

Unfortunately much of Australian manufacturing industry is trapped in a traditional industrial paradigm, based predominantly on tangible resources, traditional skills, simple products and processes, mass production, and wistful longing for the old certainties and protections. It has been slow to embrace the so-called knowledge economy, cannot command a price premium for its products and is vulnerable to low cost competition in an increasingly open global market. (There are however some exceptions such as ResMed and Cochlear in the medical devices market, and Bishop Technologies in the automotive sector whose strengths rely on their strong management of intellectual property). The parlous state of Australian manufacturing is reflected in the large Australian trade deficit in elaborately transformed manufactures, standing in excess of \$70 billions per annum (2003 figure).

To redress this deficit and regain a significant share of the market for elaborately transformed manufacturing products, Australian industry must learn to master awareness and uptake of new knowledge, exchanging researchers and research results with supply chain collaborators, fostering entrepreneurship, and speed to market. According to Arie de Geus, author of "The Living Company" and formerly with Royal Dutch Shell, "the only sustainable competitive advantage is the ability to learn faster than our competitors".

Market forces alone will not stimulate sufficient collaborative activity over the duration required to enable significant and sustainable footholds in global supply chains to be gained by our industry. Governments have generally recognised that they need to balance the needs of business, research and national interest policy, and have targeted interventions to create the national and international innovation infrastructures.

One such intervention is the international Intelligent Manufacturing Systems (IMS) scheme. This was created in the period 1989 to 1995 through negotiations and trials between industry in Japan, the USA and the EU, with support from Australia, Canada and Switzerland. The scheme was formally launched by means of inter-governmental memoranda in 1995 and has been operating successfully since then. For over a decade, Australian companies and researchers have collaborated with leading international companies and researchers in IMS R&D projects worth over \$160 millions. Successes along the way included the early introduction of stereolithography and other rapid prototyping technologies, the development of advanced automation systems, and development of product lifecycle management technologies to cater for the move to producer responsibility for end-of-product-life disposal in some jurisdictions. The IMS program is a proven way to share the costs, risks and benefits of the pre-competitive R&D necessary to meet contemporary and future manufacturing challenges.

Uptake of the IMS scheme by industry in Australia suffered in its early years through lack of awareness of the scheme, because it was not well marketed. Since 2001 when the Secretariat was outsourced to SKM, the awareness has improved markedly. However because the capacity of industry to pursue R&D was diminished, as mentioned earlier, and because there was no tied IMS project funding scheme in Australia (unlike the EU's 5th framework, and tied funding schemes in Japan and Korea), the recruitment of Australian industry into projects remained difficult and slow. Even if willing, Australian companies have had to apply successively to various funding schemes until one could be found whose assessors understood and appreciated the nature of the IMS arrangements, and whose funding terms were acceptable to the companies involved.

However just at the time when this type of linkage infrastructure is becoming increasingly important and valuable, and despite industry representations in support of IMS, the Australian government has elected to terminate its support for Australia's involvement in the IMS program. The government has directed industry instead to the Industry Cooperative Innovation Program (ICIP), a small funding scheme for R&D collaboration projects, whose guidelines sit uneasily with those of the IMS scheme. No clear plan has been provided for mechanisms, alternative to IMS, which provide the facilitative structures and network of linkages that generate industry-relevant collaborations. In particular there has been no explanation of how Australian companies are to successfully find and negotiate their project consortium arrangements, nor how these should operate.

So while industry previously has the facilitation infrastructure available, but without any linked project funding, it now may have project funding without the linkage facilitation. Neither alternative is satisfactory in assisting industry to progress towards international collaboration for developing knowledge intensive manufacturing processes and products.

In the meantime, the IMS scheme will continue with its remaining membership including the EU, Japan, Republic of Korea, Switzerland and the USA. It has a proven framework for consortium arrangements including IP protection and allocation, but Australian companies and researchers will find it difficult to participate.

The government has foreshadowed an industry statement within the next year to address the need to reinvigorate Australian manufacturing as a key contributor to a strong and growing Australian economy. It is to be hoped that global engagement of our manufacturing industry at all levels and stages of value creation will be of central importance, and the freely accessible facilitation mechanisms will be provided. Without it, Australia's manufacturing industry will become smaller, more vulnerable and globally marginalised.

I hope the deliberations of this inquiry will also assist in lowering the barriers and establishing facilitative mechanisms and support that will stimulate the growth of Australian wealth from our knowledge, as well as from the gifts of our beautiful land.

Your sincerely,

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