

# **Australia's Chemical Industry – Failures and opportunities for the RACI**

**11<sup>th</sup> RACI Convention**

**Canberra**

**7 February 2000**

Ron Van Santen FRACI

Director ACTED

PO Box 673

West Perth

WA 6872

Tel 08 9447 6666

Fax 08 9246 2984

Email: [acted@acted.net](mailto:acted@acted.net)

## Abstract:

The paper describes failures of government, how they influence the shape of the industry today and some steps to promote international competitiveness by a new paradigm. It includes a description of the performance of the chemical industry, how it was shaped, its outlook, potential roles for government and initiatives for the Royal Australian Chemical Institute.

It represents personal views only and not necessarily of the RACI Division of Industrial Chemistry or of the Royal Australian Chemical Institute.

Ron Van Santen is a Director of A.C.T.E.D. - a techno-economic consultancy specialising in chemicals and energy-intensive industries. A.C.T.E.D. is based in Perth Western Australia and has provided advisory services to the chemical, oil and gas firms, and to governments at state and federal levels since 1988.

Ron has degrees in chemistry, economics and a Masters of Business Administration from the University of Western Australia. He is a Fellow of the Royal Australian Chemical Institute and its Chair of Industrial Chemistry. In recent months he has spoken at four overseas conferences, and organised and chaired the First Australian Chemicals Summit.

For three decades, Ron Van Santen has been involved with the chemical industry. He has travelled extensively overseas and involved with international agencies. His company provides the *Chemicals in Australia* site on the Internet detailing the country's chemical industry and its regulations.

## The RACI, Government & Industry

- ⊕ Chemical industry in “collapse?”
- ⊕ Government policies have failed.
- ⊕ Asia, role model, threat or opportunity?
- ⊕ Opportunities and regulations – a new paradigm
- ⊕ Need for clusters and becoming ‘smart’
- ⊕ Roles for government and the RACI

Ron Van Santen FRACI  
Director  
ACTED  
PO Box 673, West Perth WA 6872, Australia  
Tel 61 8 9447 6666 Fax 61 8 9246 2984  
acted@acted.net

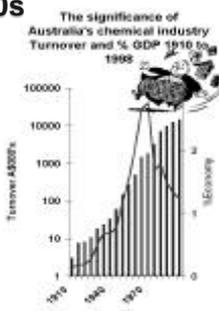
This is not a presentation about wishful directions for Australia's chemical industry, though I will hint at some. It is not about why we should have tariffs, anti-dumping legislation and other government assistance; I'll leave that. This is about the future and how we can help a key industry in Australia that has clearly lost its way. Above all, and why I am here today is that there is an important role for us the Royal Australian Chemical Institute working with government and the future industry. While I will be critical of government, it let us down, it has a very important role.

I will address the past. While history can be ‘water under the bridge’, for Australia's chemical industry, there are vital lessons. The results are here, people speak and mistakes repeated.

As I hope you will see, government initiatives today miss the target, and worse, sometimes doing more harm than good. In the end I want us, the RACI, to take some steps that will help chemistry and industry. These will strengthen our association and help shape a vision for our industry. Don't forget that most of us, directly or indirectly, owe our living to it. We must understand and insist that we have a say in its future. It's too important for it to continue to *collapse*<sup>i</sup> – and that word came from industry that recently said it was ‘In danger of extinction’.<sup>ii</sup> This is Australia's chemical industry speaking. What irony in the face of so much opportunity, and feedstocks, and raw materials, and skills, and they talk about its *extinction*. Unless you are retiring from society, you have to ask “why?”

### Since the mid '70s

- ⊕ Employment down from 70 000 to 45 000
- ⊕ Products reduced by one-third
- ⊕ Company closures (inc. Rhodes, NSW)
- ⊕ Imports exceed exports 3:1 (\$7bn trade deficit)
- ⊕ Very little investment



Is there substance to talk about its ‘extinction’? While sales have grown to \$18 billion per year, as a percentage of GDP – our national wealth creation, the chemical industry's relative value has collapsed to one-half since the mid 1970s, to below 1.5 per cent – very low. It's even as low as one-sixth of our neighbouring Asian countries. It is just one-half that of the Netherlands an industrialised nation not renown for chemicals.

Part of the reason is that since the mid-1970s, import tariffs, that ranged to 60 per cent, have been phased down to a maximum of 5 per cent and many high cost centres fell casualty. The petrochemical centre at Rhodes in New South Wales remains as pictures on my company's website.



With CSR Chemicals, Timbrol was one of only two Australian-owned petrochemical companies located at Rhodes. Timbrol was a very innovative Australian-owned company. It has gone from a dynamic, innovative, Australian -owned company to a hole in less than one lifetime.

Gone too are Australian plants that produced antibiotics, aspirin, tetrachloroethane and other halocarbons, carbon disulfide, chlorinated pesticides, chlorophenol, most herbicides, mannitol, oxo alcohols, phthalic anhydride, phthalate esters, polyvinyl acetate, rubber preservatives, sorbitol, vinyl acetate, vinyl chloride and xanthates.<sup>iii</sup> We have lost a huge slice of our chemical synthesis industry. So how important is the chemical industry today?

Australia's chemical industry represents one-tenth of Australia's manufacturing sector and now employs just 45 000 persons - 40 per cent less than in 1975. Just think one out of 2.5 lost their job – for good. For every dollar value it exports, three dollar's worth of chemicals are imported leaving a trade deficit of \$7 billion – exchanged if you like by Australia's exports of cereals. It has indeed collapsed since the mid-1970s: employment, the number of manufacturers, the industry's contribution to GDP and the number of synthesised chemicals have reduced by at least one-third. Yet, the demand for chemicals in the home market continues to grow with even faster growth in the nearby Asia/Pacific region. Australia has today even more petroleum, coal and mineral resource endowments, most are exported where more value is added than here. Worse, in the last two decades, Australia's share of investment in the Asia/Pacific region has continued to decline signalling that abundant natural resources and low sovereign risk are not sufficient to attract investment to Australia. How and why did we get into this mess?

Let me open based on three decades of involvement and suggest bluntly that Australia's chemical industry continues to be misunderstood, misrepresented and poorly acted upon by an 'apple polishing' bureaucracy.



Governments have by their initiatives, or a lack of them, failed to shape a competitive industry. Consider the massive Bass Strait oil and gas reserves off Victoria's coast. This windfall for four decades produced nothing enduring. Potential feedstock has done nothing for the international competitiveness of Australia's chemical industry. Just gas, petrol and, for some in the chemical

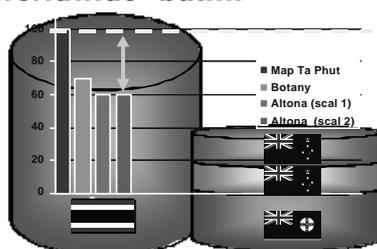
industry, high profits repatriated offshore. With access to that gas, the key petrochemical company at Altona in one year alone repatriated enough profits to the US to repay its entire shareholders' investment in Australia.<sup>iv</sup> It has never exported more than 10 per cent of its production and today its largest cracker is operating at one-fifth the scale of one in Thailand. More recently, it has recorded losses.<sup>v</sup> It, like others, simply followed rules laid down by government.

Notable among so many was a decision, barely recorded, by the Fraser Coalition two decades ago in 1979 that implicitly divided the future of the petrochemical industry. It divided the petrochemical industry between a complex at Botany, New South Wales, without competitive feedstocks using naphtha, and another at Altona with adequate ethane from Bass Strait then highly profitable without fully utilising the opportunity it presented. Government naively responded to 'Don't reduce tariffs, and we'll invest in a \$400 million naphtha cracker in Botany'. Ignored by government in agreeing was that no rubber would use the valuable C4 feedstock and it would compete with better-positioned and the rudely profitable complex at Altona. That decision by government split the petrochemical industry in two. Three years ago, ICI, now Orica, invested \$300 million so as to remain in business with an ethane-carrying pipeline from South Australia. Underscaled Altona is now costly to operate and four decades old - the new competitive metallocene-catalysed polymers will be imported, probably from Asia – Australia's new threat and lost - well perhaps almost lost, opportunity.<sup>vi</sup> 1979 was also the year the government signed agreements on gas development in the North West of W.A with implications on long-term development. I will come back to that.

Let me stress again, the rules were set by government – industry complied. Government was, and remains influential without appearing to understand the implications of what it does to the long-term future of industry.

There is today a joint venture of Kemcor, the merged Altona-based petrochemical company and the polyethylene business of Orica formerly ICI, it's called Qenos. It was described as Australasia's eleventh biggest ethylene producer and the eighth largest polyethylene producer worldwide.<sup>vii</sup> Can we now sit back and say the industry is making a comeback?

**Qenos – “11<sup>th</sup> biggest ethylene producer and eighth largest worldwide” but....**



Now look at how it comprises of three ethylene crackers whose total capacity is just two-thirds of even the first 1990 cracker at Thailand's Map Ta Phut modern complex, or the Pilbara Petrochemical Project (PPP) in W.A. as currently proposed. On a variable cost basis, each unit operates at a 30 per cent penalty compared to that one Asian ethylene plant.

Mistakes continue. Ten years later, the West Australian government lost \$0.4 billion supporting a petrochemical venture at the *end* of 1600 kilometre gas pipeline near Perth, referred to as 'PICL'. I mention that gas line as the transport tariff increases the gas by at least 60 per cent! Today a far larger venture in W.A., the PPP, described later, is seeking government support; it's still too small *and* does not incur that pipeline tariff. I ask, what sort of counsel did government receive to lose

\$400 million? Why was it not queried at the time? What quality of bureaucracy allowed it to happen?

If the past is a guide, the future with government initiatives is being regularly programmed for failure. I will share another two examples out of a dozen with you. First, some detail about investments today.

## **Industry's potential**

There are today few new investments in export-oriented manufacturing. Notable is WMC's \$700 million just commissioned ammonium phosphate fertiliser project near Mt Isa in Queensland to manufacture one million tonnes using sulfuric acid from Mt Isa and phosphate rock from Phosphate Hill. An exciting Australian-owned project that is world scale and export-oriented.

With enormous potential, and the 'new boy on the block', Anaconda Nickel in W.A. is producing nickel from nickel oxide that requires high pressure acid leaching using technology that WMC owns and operated in Cuba. Even our notorious submarine industry had a role to manufacture the enormous specialised reactor vessels. Not only pipping WMC to using laterite nickel ore, Anaconda has already signalled plans to build an ammonia plant. It has signed an MoU with Wesfarmers CSBP to produce ammonium phosphate fertiliser using the nearby Mt Weld phosphate deposit. It is even expressing interest in producing magnesium metal, so Anaconda is definitely the company to watch with megascale chemistry. Remember it came from nowhere, did not have the technology that WMC held, and is now even competing with WMC in nickel and potentially with ammonium phosphates. No wonder giant Anglo-American bought in. Will WMC and Anaconda be given a role in chemical industry development policies – will they join the others that talk about 'collapse', 'extinction' and needing import tariffs and anti-dumping protection? I think not, and that worries me. I want them on board. They must have a say.

Wesfarmers CSBP has recently commissioned a one-quarter world scale ammonia plant at Kwinana W.A. Scale penalties are compounded by incurring a fifty percent gas cost penalty for siting at the end of the 1500 km gas line that runs from the north of the state so it will only supply the local market. Its presence has now made things difficult for a much larger planned investment by Plenty River Corporation at the Burrup Peninsula in NW W.A which is at the head of the line, so its gas price would be two-thirds that of CSBP. Perhaps its partner, Indian fertiliser company Chambal Fertiliser, may help with exports as CSBP crowds them out of the southern market. Then again, check the Internet and check out the substance of Chambal.

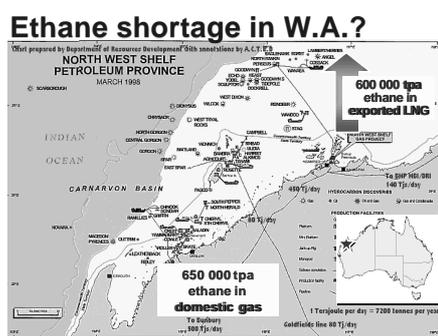
There is another similar scale ammonia project being constructed at Moura Queensland by Wesfarmers Dyno, mainly for explosive-grade ammonium nitrate also only for the home market; while Southern Fertilisers, a joint venture between BHP and Incitec at Lara Victoria was cancelled. Doubtful now is the \$2 billion petrochemical proposed venture in the northwest of Western Australia, the fifth chloralkali venture proposed for Australia – the Pilbara Petrochemical Project or PPP.

## **The Pilbara Petrochemical Project (or PPP)– an international bargaining chip?**

This \$2 billion project has not progressed for over one decade beyond a pre-feasibility study - last year it was deferred. Not being offered enough Australian government financial support, Shell, as a partner with Dow Chemical, has threatened to pull out altogether.

This venture is centred on caustic soda with co-produced chlorine shipped out as the chlorine vehicle, EDC<sup>1</sup>. Surplus ethylene production capacity would be *mopped* up with the production of low value glycol that could be metaphorically described as water-diluted ethane. An appeal of the project is that it addresses the situation where Australia is the world's largest deep-sea importer of caustic soda, with over one million tonnes per year required for the alumina industry. Caustic soda is produced from salt and gas (and energy) that are exported in very large quantities from the Burrup Peninsula as *ingredients*. The obvious conclusion is that Australia should add value to these ingredients by *baking the cake!*

The PPP is failing to get people excited because of a lack of ethane - the *carrier* to move the co-produced chlorine as EDC. Lack of ethane restrains the scale of operation and therefore results in operating cost penalties – meaning reduced competitiveness. While the proposed ethane cracker would have a 650 000 tonne capacity - 50 per cent larger than the *combined* output all three ethylene units in Australia, it is simply too small to be competitive.<sup>viii</sup>



It is important to note that Woodside and its partners established contracts to export LNG gas that is unusually rich in ethane (C<sub>2</sub>) to Japan. The ethane component is now locked out from use as feedstock within Australia.<sup>2</sup> Domestic use gas, or new fields such as Gorgon, is now the only potential supply of feedstock ethane.

It is relevant to note that propane (C<sub>3</sub>) and butane (C<sub>4</sub>) are extracted with 800 000 tonnes sold as LPG. Is there a case for government failing to provide for a clause for the development of W.A.'s *wet*, ethane-rich, LNG and to make the ethane available for the PPP? Is it a case where the ethane could be held as an undeclared *hostage*: keep it locked away and obtain assistance to compensate for lack of consequent scale of the PPP? Compensating for LNG contract renegotiation; using propane to replace ethane; or contingency compensation is more rational than offsetting inadequate scale. Let me explain with two government initiatives.

The Federal Government, through the Office of Strategic Investment Coordinator, has offered \$100 million to encourage an alumina refinery in Queensland. It is a strange offer as it would

<sup>1</sup> EDC is a common abbreviation for ethylene dichloride used exclusively to produce PVC polymer resin via VCM, vinyl chloride monomer. Its production requires an ethylene source normally produced at scales approaching one million tonnes per year. Due to its hazardous nature, and with no alternative disposal potential, chlorine is not shipped in bulk and transported as EDC or VCM. At times, the value of the chlorine component can actually become negative, offset by the value of the co-produced caustic soda. At such times, the ethylene becomes the *vehicle* to move the co-product chlorine to the market for PVC producers like Australian Vinyls in Victoria.

<sup>2</sup> One tonne of ethane-containing LNG (*wet* gas) has more energy and so, with the ultimate use as an energy source in Japan, will present shipping cost savings and, for the user, reduced distribution and storage costs. *Wet* LNG, as provided by W.A. will attract a premium per cubic metre over competing *dry* gas suppliers. Tied up in Schedule A-type supply contracts, it is not clear how much of that premium is shared between the Australian suppliers and Japanese customers.

compete with alumina refineries in Western Australia.<sup>ix</sup> It is even more difficult to accept if one recognises that if those W.A. refineries expanded, their production by the amount the new refinery will produce, up to 160 000 tonnes of ethane could be made available in W.A. from domestic gas.<sup>3</sup> Malaysia is also bidding for the alumina project, but should government disadvantage not only the existing alumina producers, but also W.A.' potential ethane supply?



To make the matter more complex, a second offer by government is being made to PPP joint venturers, Dow/Shell.<sup>x</sup> In a sense, Offer Two compensates for the lack competitiveness of scale caused by limited ethane supply. Remember, Offer One, for the Queensland alumina refinery, reduces the availability of ethane in WA and so then undermines the value of Offer Two for the PPP venturers, Dow/Shell.

What is the return to us, the providers of the capital, infrastructure and the owners of the resources? Both offers can be bargaining chips against overseas offers for the operators.

Is this auction approach, in response to a corporate strategic game, in our interest? Is it the best Australia can do? I of course acknowledge Queensland's interest in a gas line from PNG that requires a base load helped by the alumina producer. However, as I will show, Offer Two clearly compensates for inadequate ethane reflected in inadequate operating scale. Does Government really understand? Could it do better – consider the following.

Dow's partner Shell, has a one-fifth effective interest in Woodside's LNG production. Why is not the C2 component extracted for beneficial use – after all, Santos did so for two decades in South Australia *and* reinjected it into the ground for future use. What if the PPP is nothing more than amore than a 'bargaining chip' dressed up as a prefeasibility study to get a better deal from the Malaysian government? Are we in Australia being duped? A one million dollar pre-feasibility study by Dow/Shell being levered to a likely subsidy from Australia and then levered against another location. There *will* be a new petrochemical venture in the Asia-Pacific region and while I hope I am wrong, the evidence points to one of two scenarios.

- A leverage to gain Asian government incentives; in other words the venturers spend one million dollars in Australia and get at least hundred of millions from another government; or
- Australian government assistance to compensate for inadequate ethane that results in another underscaled project. While W.A.'s unusually ethane-rich LNG may indeed now be locked away in supply contracts with Japan, that is not to say they may not be released later, or supplied from alternative sources (such as Gorgon in which Shell has an interest). A far better deal might be to

<sup>3</sup> The Comalco alumina project will require 27 petajoules of gas per year at stage one, increasing to 80 petajoules by stage three. Given one petajoule is about 20 000 tonnes of gas, the ethane content, assuming 10 per cent gas, would range from 54 000 tonnes to 160 000 tonnes per year at stage 3.

link any assistance with the release of the hostage ethane – ie. as compensation for LNG contract renegotiation or capital costs to restructure the plant.

So by any reasonable assessment it's a simple dupe on the Australian public that has worked particularly well in underdeveloped economies where politicians can trumpet about potential projects valued in the “billions of dollars”. There will be the mantra of “multiplier” effect but the net result in fact is more often than not very few *quality* jobs while Australia pays for the depreciating infrastructure and receives a poor return on its investments. Remember these projects use foreign technology to produce products *sold on cheapness*, including cheap labour. We want to be valued on quality like in the competitive industries of the USA, Europe and Japan. We *can* do better and should take steps to promote that and ensure we obtain the best value, in the long term and a reasonable return.

Let me say something about Asia as it is becoming both a role model and a threat for Australia.

## Asia

For Australia, Asia presents a great opportunity with large and fast growing markets. It is also a threat to our industry having attracted one-half the world's new investment in chemicals. New plants in Asia are both large and use the very latest technology.



Their chemical industries are however at different stages of development ranging from the very large and new commodity chemical industry in Thailand, to older and fragmented production in China and India. More significantly, and in stark contrast to Australia, Japan and Taiwan are moving to increasingly higher value added technology-intensive products just like in Europe. Japan is also now an investor in Asia in commodity chemical manufacturing as its own commodity sector is losing its competitiveness. Taiwan too is making the transition aimed at its home industries, notably textiles and computer technology. South Korea is losing its competitiveness on scale, without evidence of a transition to the next level of sophistication or technology like for example Japan. South Korea is losing market share to the new entrants in Asia, notably Thailand, and soon others like Malaysia and perhaps Indonesia. The point is that most Asian countries are growing and getting smarter. Australia's industry is contracting – into *collapse* by its own judgment.

Many Asian countries are recognising the importance of ownership and access to the latest technology seen as key to reducing *their* lack of comparative advantage in feedstocks and construction costs. Many are therefore providing subsidies for new investment but *tied* to the use of technology. Japan traded access to its markets for technology, notably US - brilliantly. Here in Australia for the PPP, perhaps even for Plenty River, I sense a *Baywatch*<sup>vi</sup> job – waiting for a better offer from Malaysia. Simply put, Australia needs to capture the technology before we run out of feedstocks and more seriously, market opportunities to our north.

The matter of competitiveness is complex. Based on input factor costs, most Asian countries are not competitive on an international basis. Construction costs are substantially higher than the benchmark US Gulf Coast, often comparable to Australia. Their lower labour costs are offset by higher manning levels reflecting lower labour efficiencies and their energy costs are high. Most of Asia generally uses naphtha as the feedstock - a liquid petroleum refinery product that is priced at world levels. Only Thailand now has its own oil and gas supplies, though Malaysia, and perhaps later Indonesia will join Thailand with their own indigenous feedstocks. Scale and integration, helped by publicly funded infrastructure and 'tax holidays' is therefore very important for their short-term competitiveness. Remember however that many countries are emphasising something we doesn't – technology-intensive investment. Japan, that began its industry about the time Australia, is now an exporter of technology.

With the exception of the late starter countries with their own oil and gas reserves, the region will not become a major long-term exporter of primary commodity chemicals. Cheap gas centres such as the Middle East, western Canada and Venezuela have become low cost manufacturing centres for base or commodity chemicals and the primary forms are imported by Asian countries as inputs to further manufacture. Clearly then, here is an opportunity for Australia with a PPP-type project relying on cheap energy and feedstock. Sadly government in Australia appears to think that bland subsidies, whether direct or indirect, for foreign investment is the way ahead. In the interim Australia's chemical industry continues to push for price inflating anti-dumping legislation and the retention of import tariffs.<sup>xii</sup> Remember that countries like Singapore don't use them, while other countries are pursuing value added chemicals. Asian tariff rates are projected to soon fall below those in Australia.

## Technology

Of course, some of the difference in performance between Asia and Australia can be explained by timing. Whereas technological developments still originate from the US and Europe, and more recently Japan, those developed countries now have slower growing markets, without competitive feedstocks and some now with small-scale production centres. Consequently the very latest technologies and at the very largest scales are available to Asia, and to Australia of course, for commodity chemical manufacturing. This is today occurring without disadvantaging their home industries that are increasingly moving to higher value added products. In other words, the European states especially, are becoming importers of commodity chemicals manufactured from *their* technology. For most of Asia, often without access to competitive indigenous feedstocks, the benefit of technology is being helped by an operating environment of world-class infrastructure and sometimes by integration into world-scale petroleum refineries creating very competitive production centres.

In contrast then for Australia during its formative years, the foreign owners of our chemical production centres would not allow their Australian subsidiaries to supply Asia which was then supplied from competitively located plants in Europe and Asia, and later, from the Middle East and other gas-rich locations. Without that restraint today, Australia is now unable to supply Asia, not because of restraints imposed by its owners, but for lack of competitiveness. One-quarter world scale plants simply cannot compete with modern Asian plants using the latest technology.

It is relevant to note that those western countries and Japan that are supplying the technology to Asia for commodity chemicals, are increasingly shifting their own chemical industries into specialty and other higher value added chemicals. That technology is expensive and not available on the ready terms of commodity chemicals. Recognising the dearth of investment in higher value added products, Asian investment incentives are increasingly tied to the level of technology.

Australia doesn't so without change, we face a future similar to South Korea. Japan traded access to their market for technology, we offer bland subsidies.

## So what can we learn?

Unlike Australia, much of Asia, notably South Korea, Taiwan and Japan have achieved at some time of their development world-scale production centres for commodity chemicals *without* indigenous feedstocks, such as the cheap gas once<sup>4</sup> available to the Altona petrochemical complex in Victoria. Unlike most of Asia, with the notable exception of India and China, Australia's industry was implicitly allowed to fragment with up to three producers operating at scales typically one-third of the then world-scale competing to supply the small Australian market. Unlike most Asian countries, government in Australia never ensured appropriate mechanisms to manage entry to the industry and failed to create the environment for a secure future. Today it still fails to provide appropriate policy to attract advanced technologies.

Unlike Australia, Asian governments have established specific government agencies to steer, manage or influence the development of their chemical industries. Examples of such agencies include Japan's well-known MITI, Singapore's highly regarded Economic Development Board, China's new State Petroleum and Chemical Industry Bureau, and Thailand's Investment Board. These gather market intelligence and provide policy advice to shape their chemical industries. In Australia, the current 'Action Agenda on Chemicals', by the agency responsible for our industry, the Department of Industry, Science and Resources (DISR) includes RACI representation - we have so much independence to offer or, conversely, a future to lose. Unfortunately it draws on the goodwill of those that gain directly – bias inevitable. Who is on it – who is not!

To ensure the price and availability of feedstocks, the functional governments of many countries own or manage public resources, oil, gas, and feedstocks including their distribution. Remember what I said about the Woodside's ownership of ethane contained in the LNG exports. Further, and not evident in Australia until the mid 1990s and then only at a modest level, governments in Asia have funded extensive common-user infrastructure such as A\$7 billion provided for Singapore's giant Jurong Island petrochemical and refineries complex, and the large modern Map Ta Phut complex in Thailand.

Australia must ensure it gets far better value for its resource endowments. The failure to develop any significant chemical businesses from the Bass Strait and the North West Shelf resource base points at government, and not market failure.

We must better manage the international manipulations that come our way and so a competent and capable government bureaucracy is key. How many of these key bureaucrats are qualified in chemistry or indeed are members of the RACI?

## The environment

Before talking about the environment, let me say something about regulations. A recognised authority about international industrial development is Michael Porter, the author of that 800 page renowned international statement, *The Competitive Advantage of Nations*.<sup>xiii</sup> Porter and his team observed that countries with the most rigorous regulations and standards commonly lead in exports of affected products. So while most look upon them as costs, regulations and standards have been shown to be helpful for shaping world-competitive industry. Let me explain by example.

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<sup>4</sup> A Resource Rent Tax has increased the cost of gas (once \$0.29 cents per gigajoule) available to the petrochemical company.

The USA once led with environmental standards, it has now slipped behind many countries and today two-thirds of air pollution-control equipment sold there is produced by foreign companies. In contrast, where the U.S. leads with strict environmental regulations, it has become a leader such as in pesticides and the remediation of environmental damage; the phase-out of chlorofluorocarbons (CFCs) has made Du Pont and other American firms pioneers in finding substitutes. Many sectors subject to the greatest environmental regulatory costs have actually improved their trade performance, among them chemicals, plastics and paints.

Exacting regulations and standards is commonly presented to raise costs and make industry less competitive. Not necessarily so as Porter found *properly* constructed regulatory standards which, let me stress this, *aim at outcomes, and not methods*, encourages companies to re-engineer their technology. The results in most cases are processes that are not only less polluting, but also lowers costs or improves quality. What happens in response is that processes are modified by industry to decrease the use of scarce or toxic resources and recycle waste by-products. In essence, Porter found that carefully designed and advanced regulations *promote* competitiveness.



This is not to say that all companies will be happy about tough regulations. Increased short-term costs and the need to redesign products and processes are unsettling. The aversion to tough standards will be particularly notable in industries that feel threatened by international competition, as too often the case with Australia's old industry. We will quickly hear about threatened closures and job losses, so government must stand above the rhetoric and look to the future as hard as that may be for politicians with an eye to the next election.

The evidence points to the fact that strict environmental regulations do not per se undermine international competitive advantage; indeed, they more often than not enhance it. Tough standards trigger innovation and upgrading. Strict product-regulations tend to prod companies into innovating to produce less polluting or more resource-efficient products. Germany for example has the world's tightest regulations in stationary air-pollution control, and its companies hold a wide lead in patenting, and exporting, air-pollution and other environmental technologies. We have set targets for lower CO<sub>2</sub> emission targets. There are opportunities for producing low CO<sub>2</sub> emitting products and processes – an industry worth some US\$500 billion in environmental improvement.

We need a new mindset in Australia. We see regulations as costs – they can become incentives especially if in line with, or even advanced of, international standards. Our government agencies need to 'sniff the wind' and adopt advanced regulations and standards to give our industries an edge. The danger is of course that the agencies may not effectively cooperate and feel intimidated by the challenge. In essence, if the regulatory agencies are too sensitive to claims about cost imposts on industry, they serve only to undermine national competitive advantage and create opportunities for foreign suppliers with more advanced products. However, if those agencies are properly set up *and* coordinated, then a system of international review should be initiated to monitor developments and thereby ensure domestic regulations and standards that not only match but even more advanced. So while many of the regulatory agencies define their roles in social or

public welfare terms, they miss their potential more valuable role of stimulating national competitiveness. Here is another role for the RACI – to work with these agencies as unbiased professionals to help set appropriate standards to shape a new competitive industry in Australia.

## A missed opportunity

Let me share an example of a missed opportunity for Australia. A couple of years ago after I spoke at a Shanghai conference, a managing director of a local manufacturer stood up in the audience and said “you Australians gave us a quite a fright and could have severely hurt our business. We are very relieved in China.” Let me explain his relief.

As you know while PVC is a common plastic used for plumbing and sewer pipes, as a chlorinated plastic it is under great pressure to restrict, if not to ban its use in Europe. It does not safely degrade, is associated with dioxins in the environment, and its plasticisers have been shown to be endocrine disruptors – hormone imitators. PVC is however cheap because the chlorine, included with the VCM or EDC, is sometimes effectively at negative prices so PVC often acts as a chlorine sink for the world's chloralkali projects. There are alternatives to PVC, it comes down to short term costs.

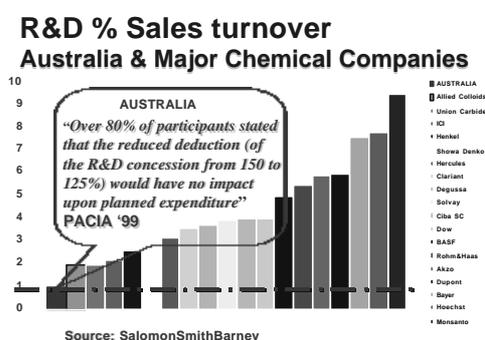
In 1996, the SOCOG Committee was pressured to introduce a PVC-free Olympic Games village. Industry felt threatened and so the CSIRO was funded by an Australian industry association to identify the risks of PVC and alternatives. Though contested by some senior RACI members, the industry-funded report came out in such a way to enable the Olympic games to use PVC if no practicable alternative is available. Now, if Australia had banned or at least restricted PVC at the Games, it would have provided very cheap international promotion for an alternative polymer or polymer blend. No wonder the managing director at Shanghai was concerned. A threat, not an opportunity was perceived in Australia. Given strong incentive to reduce PVC (and other chlorine chemicals), Australia should have objectively evaluated alternatives to PVC resin. Sure, it is important and widely used, and yes, a petrochemical venture in the NW of W.A. may have to use it as a ‘vehicle’ for chlorine, *but* there are alternatives to PVC, at least for some applications. Even if a niche market, an alternative could have been a great opportunity for Australia to produce a replacement polymer or even a titanium pigment blended polymer. We had available free and high profile advertising. What went wrong?

Australia has only one PVC manufacturer that imports VCM (monochloroethene) precursor chemical. A quarter million tonnes is moved by trucks to two sites in Victoria that polymerise this hazardous chemical. The price in Australia is higher than open market prices by a 5 per cent tariff and even more by the threat of well-used anti-dumping legislation. The manufacturer was even put up for international sale and failed, while only about one hundred employees are actually involved in the basic manufacturing step. Being hazardous as a carcinogen and a halocarbon, my company was retained by the Department of Foreign Affairs and Trade to assess the impact of a potential international trade ban on VCM. It was *not* in our brief to comment on the opportunity – only as a threat. The world is receptive to PVC alternatives but Australia acted on a threat. Even a niche market in world markets can be very profitable for Australia. Let me say before I go on, this is not an attack on this common plastic, I am simply questioning why no-one said, ‘Yes, there may be a cost *but*, let us realistically evaluate the opportunities for Australia.’ We have a world-class polymer CRCs ready to evaluate alternatives. Let me know if you disagree with me that Australia has a distorted perspective of its place in the world with chemicals and polymers. Then ask yourself, why?

I suggest to you that government bureaucracies have a commodity chemical mindset from responding to industry groups that strive to protect old, once highly profitable businesses that speak

with well-funded voices. Niche markets, in this case an alternative polymer to PVC, can be much larger than the combined output of the Australian plastics raw material industry; and certainly much larger than the threat to 100 jobs at Laverton North and Altona. In any event, there may always be demand for PVC and room for the PPP. Why didn't we consider it? Why do we have to remain locked in chemicals produced with imported technology owned offshore by those that plead to retain import tariffs, anti-dumping and government assistance. By any measure, it is bizarre. We must get smart, and promote enduring integrated industry. The Asians are doing this. How far does that graph I showed earlier have to show more falls before government wakes up? Are Australians being duped by *just over the horizon* investments? Let me say that the *horizon* is a long way away for *chemicals*!

So how 'smart' are we, and is there an effort to become smarter? Well I have already suggested that we don't have the same focus on technology as many our Asian neighbours. I do note of course that R&D concessions have become more focussed, but how important is research and development, key to the growing competitiveness to the core of the chemical synthesis industry in Australia?



Consider this graph where R&D outlays for a range of multinational chemical companies – many represented in Australia.<sup>xiv</sup> The latest 'Performance Survey'<sup>xv</sup> by PACIA – an industry association that represents the chemical synthesis sector, in Section 6.1 shows R&D at just 1.0 per cent of sales. At one per cent therefore it is typically no more than one-quarter of those of their parent companies. No wonder the published table was qualified by PACIA with; "*Over 80% of participants stated that the reduced reduction (ie. by my words of the R&D concession from 150 to 125%) would have no impact upon planned expenditure*". I need say no more.

So, in being critical on government bureaucracy and their counsel, is there still a role for government in Australia? Absolutely, and very important! However given its track record I hope you agree that government must stay away from backing 'winners' and avoid the subsidies and other hand-outs of public money that flows to overseas shareholders or competes with better investments. Key is transparency of its actions. Government must help build industry clusters and smartness. It also must build on its image with industry and gain its confidence. At the last 'Australian Chemical Summit', initiated by my company, all proposed government speakers were requested to be removed by an industry association in return for its participation and support. Clearly, government has to build up its credibility with the chemical industry. Government demonstrably does not have the respect it must have though it has a symbiotic relationship with old industry that portends failure.<sup>xvi</sup>

## The role for the bureaucracy and government

One cannot help but conclude that any enduring success in the chemical industry is more a product of accident than design by government. Within the bureaucracy, we must have specialists able to recognise global trends and plan accordingly. We must maximise the return on our resources and one important role for government is to support industry *clusters*.

Clusters are a key part to a *competitive* chemical industry. Clusters are groups of firms that draw their competitiveness *not* primarily from cheap energy, cheap labour, cheap raw materials and government subsidies and tariffs as important to old industry, but by *relationships*.

Clusters draw their competitiveness *outside* the business, *not from within* with cheap raw materials, labour, energy that hallmark most projects today in Australia. European states, Japan and the US have competitive industries in clusters where all the sort of things that Australia's chemical synthesis industry talks about are expensive. Cheap labour, cheap raw materials and cheap energy, promoted as pre-eminently important in Australia, are *not* key to their success. For example, at one German cluster the advantage of relationships and facilities was calculated at about the same value as I calculate the gas cost advantage in NW of W.A.<sup>xvii</sup> I am sure we all agree we don't want to be valued because we are cheap professionals and yet that is what is being promoted. Check out by whom - government follows. Let's work on them!



### Competitive advantage (& why Australia needs clusters!)

- ⊕ Factor inputs (eg. labour, raw materials, energy) are an ephemeral source of competitive advantage in a global economy.
- ⊕ *Competitive advantage* comes from the business environment and supporting institutions.

Michael Porter, The Competitive Advantage of Nations, 1998.

We need clusters in Australia where competitive and *innovative* industry is related to universities and research centres and other businesses and services; just as in successful countries. We must get off the cheapness bandwagon; and get off the import tariffs, anti-dumping and government moneys 'gravy train'. These are beggar they neighbour policies – low impact on the many, so as to benefit a few. There are far better alternatives.

We have only one growing chemical industry cluster that I recognise in Australia - it is in the early stages of development. It is not in NSW or Victoria as the original centres of chemical industry, but in W.A. In evidence Alcoa, a large multinational has already located its worldwide research centre there and I suspect an *Australian* company that started in the mid 1970s may become very prominent in Australia. With BHP in methanol production, that newcomer Australian Coogee Chemicals, has the dubious honour of developing its own technology in commercial organic chemicals. Remember this is unique for Australia since the closure of that Australian chemical company, Timbrol. That embryonic cluster growing around alumina has great promise. Does government know and has it the skills to help it?

For it is here, I see one important role for government. No, not to pick winners; not to provide industry subsidies, but to provide general educational facilities, *general* purpose research facilities, industry-training centres, provide information and other *general* support. This proposal is far from new, but it *is* sadly new for Australia's chemical industry.

Government must assume the role of *gardener* and nurture and fertilise the soil: to create a fertile environment for the seeds to grow – *not* to select the seeds. We, the RACI, must help the *gardener*.

Another key role for government is to provide a forum for *qualified and experienced* people to come together – to *facilitate change and a climate conducive to an enduring future*. Australia must become comfortable that growth can only come with planning and change. Politicians must feel comfortable that some 'weeds' must die as they crowd out the new growth. The new sprouts

includes *outsiders* Anaconda, Alcoa, Vanadium Australia and WMC who are not current members of the *chemical industry*, they must have a say in the future.

Then too we must help government to advertise the opportunities and excellence of Australian businesses and people. It must help create international awareness of Australia's potential. We do possess excellence with world leaders in some areas of chemistry. A small gesture perhaps, but why not tag our products and services to the effect of; 'Proudly made in Australia'. Who has heard of Australian chemicals overseas? The only significant export-oriented chemical activity in Australia, aside from WMC's phosphate plant, is in titanium dioxide pigment. Sadly, again, the Australian partner of that plant, sells its pigment under its American partner's name. I accept the commercial reality, but we should seek the means to promote an image of, *Proudly and Capably Australian*. By the way, that company employs the Becher process, very Australian. Who knows about Australia's excellence? Who cares?

## A possible role for the Royal Australian Chemical Institute

Let me wind up with this slide. There are many possibilities too many to do more than hint at. As this is the Royal Australian Chemical Institute, let me confine myself to what we can do now.

**Important initiatives for the RACI**

- ✓ Become champion and partner with future industry
- ✓ Work with government and agencies.
- ✓ Use the Internet to renew membership and structured personal profiles (& option of business)
- ✓ Classify and publish papers and articles as information manager.



**SO THAT THE RACI:**  
Reinforces its position as a *network* of professionals  
Becomes a *manager* of information

I would like the RACI to:

- Become a champion and partner for future smart industry.
- Provide counsel to government and its bureaucracy, notably the regulatory agencies but also those responsible for our industry. Do have a look at the 1970s formulae being presented to DISR's Action Agenda on Chemicals. We are being trounced by countries to our north – where is our government? Where is the RACI?
- *Effectively* use the Internet. That means using it to not just renew our membership, but using it to identify our speciality and talents; an extension could provide for details of our business. This creates a super network for the public, the government and us. A win-win, low, if not zero cost initiative.
- Ensure all conference papers and articles, including those in *Chemistry in Australia*, are published on the Internet linked by a suitable classification system. We the RACI must become a super network of specialists. Conference papers and journals must be 'harvested' and managed by us.

By such use of the Internet, we become the managers of the chemistry intellect core of Australia. This is low cost, and well within current budget. Bear in mind we already have a full time officer doing something *we* could do via the Internet and perhaps at zero cost or less. I was appointed by Council as Chair to consider the Internet – I am now lobbying for your support.

- Raise our profile. Where was the RACI during the Aviation Gas debacle? What a great opportunity we missed. So many others! Senator Minchin needs independent counsel from us.

To wind up, I would rather have talked about the exciting technology being developed around Australia. I felt a greater need to share my concerns about the parlous state of the industry in Australia as confirmed by PACIA. I sincerely hope the RACI will become more involved with future industry and government.

Look at our strengths. The RACI is a respected professional voice that has the contacts, the knowledge and an unquestionable interest in a *sustained* future for Australia's chemical industry. We can help shape *our* future and by that, our Institute. We must get involved in the *network*, including the obsolete Action Agenda by DISR.

To conclude on the subject of *networks*, I am reminded of the movie by that name, '*Network*'. Howard Beale, beautifully acted by the late Australian Peter Finch, was frustrated with the television network for which he worked. He shouted into the street below "*I'm mad as hell, and I'm not going to take it anymore.*" Howard was joined by other shouts. The 'network' took notice, and responded.

I want to see the RACI promote a network that includes government and the new smart chemical industries. We will then grow with it! But, while we must work with industry – let's make sure we don't hang on to the old. Let's make sure we tag onto the exciting new technology and the new polymers, but *not* on three-decade old activities that the Action Agenda implicitly sees as its future - that attitude will drag us down in the process. It's not easy to stand strong and independent and above the old. We can do it!

I hope my next talk will be able to be about some exciting new 'green chemistry', new plastics and new methanol technology and, how we can be smart! We can contribute to the shaping of appropriate regulations and standards (the Avgas debacle was avoidable). I want to be positive – it is difficult while the current climate works against that.



Government needs us!

Thank you.

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- <sup>iii</sup> Van Santen, R, 'Guide to Chemicals in Australia', *The Petrochemical Industry*. ACTED, 1993
- <sup>iv</sup> Business Review Weekly, April 23-29, 1983 page 53.
- <sup>v</sup> Net revenue was \$263m on assets of \$237m.
- <sup>vi</sup> European Chemical News, Vol. 70, No. 1868 05/07/1999 P5
- <sup>vii</sup> Asian Chemical News, Vol. 5, No. 213 *Australia: Kemcor to Lower Stake In Orica Joint Venture*. 19/04/1999 P7
- <sup>viii</sup> Asian Chemical News, Vol. 5, No. 220 14/06/1999 P27
- <sup>ix</sup> Asian Chemical News, *Australia: a hurdle too far? The Pilbara cracker project faces an even greater problem*, Vol. 5, No. 224 12/07/1999 P30.
- <sup>x</sup> Australian Financial Review, October 1999, "*Deal close on \$2 billion W.A. ethylene plant*". Refers to meeting of Senator Nick Minchin with Dow Chemical in Chicago, USA.
- <sup>xi</sup> Baywatch is a popular TV series that was able to attract funding from governments because it serves to promote the region for tourism. The Queensland government offered \$4 million but the government of Hawaii offered a much larger sum. Strategic international negotiation is a common practice of multinational companies.
- <sup>xii</sup> Asian Chemical News, Vol. 5, No. 225 *Australia: No Quick Cuts - Australia's Chemical Industry Is Concerned About the Effect of Reducing the Country's Tariffs* 19/07/1999 P8.
- <sup>xiii</sup> Porter, Michael 1998, *The Competitive Advantage of Nations*, Free Press, New York.
- <sup>xiv</sup> SalomonSmithBarney, Gyrus 1999, *The Search for Value in Global Chemicals*. July 1999.
- <sup>xv</sup> The Plastics and Chemical Industry Association (PACIA) '*Performance Survey 1998*', 1999.
- <sup>xvi</sup> Olson, Mancur, *The Rise and Decline of Nations*, Yale University Press, New Haven and London, 1982. Several examples were provided of relationships of government and industry that were described as *sympiotic* and not in the best interest (eg. page 148).
- <sup>xvii</sup> European Chemical News, *Chemical Attraction*, p33, December 1999.