

CHEMICAL ECONOMICS - P1

In October 2013 I was in the UK at the time when the Grangemouth petrochemical facility owned and operated by Ineos was threatened by closure over an industrial dispute. At the time this was resulting in a high level of concern in the political sphere in both Scotland and the UK in general. The political concern was exacerbated by the upcoming 2014 referendum on Scottish independence. Concern was expressed in political circles that the closure of Grangemouth would have a knock-on effect of closure of Scotland's only refinery at Grangemouth which would raise fuel security issues for an independent Scotland. The political pressure resulted in settlement of the industrial dispute (in favour of the company) and for now the operation and jobs appears saved. Since that time Ineos have announced plans to make major investments in trans-Atlantic shipment of low cost ethane from the US to its European facilities which should further improve the profitability of the operation and help its future.

Coming back to Australia, the contrast in the political attitude to the hydrocarbon processing industries was stark. Shell announced the sale of the Geelong refinery and potential closure if it could not be sold. This follows earlier announcements of the closure of the Shell refinery at Clyde in Sydney and Caltex's Kurnell refinery. And recently (March 2014) BP have announced the closure of their refinery operation at Bulwer Island near Brisbane. These announcements have been greeted with relatively little political concern with relatively few commentators expressing a concern that such closures would compromise Australia's fuel security.

An impact of refinery closure will be the closure of chemical processing operations juxtaposed to refineries. This particularly affects the availability of propylene for the production of polypropylene in Sydney. For now the Geelong refinery seems secure after the announcement if its purchase by Vitol goes ahead, so that polypropylene production in Victoria may be saved for now. However, it should be noted that closure of the Geelong refinery would not only place a question of polypropylene manufacture but would probably undermine the profitability of ExxonMobil's Footscray refinery which would in turn impact on Qenos' ethane cracking operation at Altona.

As well as this, there is increasing concern in industrial circles for the future price and supply of natural gas. This has been expressed by Dow Chemical and concern on this matter has been expressed by Dow in the pages of *Chemistry in Australia*.^[1]

This situation is resulting from the very large export LNG projects coming on-stream in Gladstone. Originally these were set to be supplied from coal seam gas (CSG), but political issues with rolling out CSG developments and the high cost of these developments would appear to have changed the gas source to the more conventional gas sources supplying Australian industry. The consequence is that gas suppliers are reluctant to supply gas under long term contracts that do not meet the high value current for LNG exports. The consequence is that, if available, gas prices are set to double or triple over the next few years.

These changes in the feedstock supply chain will have an effect of the supply and price of ethane for cracking operations in Australia. This is because much of the ethane could be incorporated into the natural gas system as reticulated gas or as LNG valuing the ethane effectively at LNG export prices. This is far higher than feedstock for cracking operations in other parts of the world and higher by

about 50% than liquid feedstock. Retrofitting back to liquid feedstock is not an option because it would require considerable expenditure in re-building downstream liquids handling facilities which were removed when the facilities near Botany and Altona converted to gas feedstock. Potentially the Australian chemical plants could have the dubious distinction of being the worlds' highest cost producers of commodity plastics.

The rise in price of gas would also have a major impact on the cost of production of other chemicals most notably the large ammonia and fertilizer production facilities on the eastern seaboard. Also affected would be the methanol plant at Laverton.

The result would be a major contraction in the chemical and allied industries in Australia which would have major ramifications for the future employment of chemists and engineers.

What about other high value industries?

Agriculture and agricultural products industry are often touted as Australia's future. As an owner of a self managed super-fund, I must say the investment opportunities in this sector have been historically poor and I do not see any prospect of change to the sector. We spread the idea that 20% of manufacturing is in the wine industry, but this could be a lifestyle choice for many rather than a future export industry. From my observations the leader in agricultural produce is New Zealand who dominate overseas wine lists from our region with their Sauvignon Blanc and Pinot Noir (as well as selling ice cream and dairy) with the Cabernets and Chardonnay from Chile and Argentinean Malbec leading the pack in bigger reds with Australia seemingly happy to play in the second division or supply boutique wines such as Grange to be drunk by politicians and their ilk [2].

Australia's competitive advantage

In today's global village economy, industries grow by having a competitive advantage. This competitive advantage is often local in character and can be quite specific to that location. Industries without a competitive advantage go into decline unless supported by government regulation or financial backing. This latter situation is still surprisingly common, for instance trade to the EU results in import tariffs to "protect" European industry but as recent history shows when some industries have a cost advantage higher than the trade barrier then decline is inevitable. Industry protection can take other forms as well as trade, for instance, production of ammonia for fertilizer is seen by many countries as a strategic necessity and is highly regulated in many countries, especially in the developing world.

The WTO and similar organisations and bi-lateral trade agreements aim to eliminate barriers to free trade but the outcome is often best regarded as regulations to lower trade barriers rather than eliminate them. There are some countries committed to free trade such as Australia where relative to most other countries trade barriers are low.

The importance of trade barriers in protecting industry should always be a consideration when planning export oriented business as this will distort the underlying economics and any perceived competitive advantage.

Given the caveat on trade barriers, what are Australia's competitive advantage. The answer clearly (as we all know in our bones!) is basic minerals (iron ore, coal, gold etc.) and basic agricultural products (wheat, cotton, wool etc.) which are exported to the major economies at prices which

cannot be matched by local production (including trade barriers if they exist). For example Australian coal landed in the UK will be of lower cost than UK produced coal.

The Australian competitive advantage in minerals is enhanced by large reserves of high quality minerals, for example Australian iron ore has an iron content of over 62% whereas many indigenous sources in importing countries have iron content well below 40%.

In the past Australia also had a competitive advantage in energy in the form of low cost natural gas and electricity (generated from the abundant supply of low cost coal. However, over the past decade this competitive advantage has disappeared. Domestic gas is being increasingly priced relative to the high value north Pacific LNG market (as opposed to the lower price that occurs in the north Atlantic LNG market) and electricity prices have significantly increased from regulation, carbon taxes, renewable energy schemes and infra-structure investment. These changes in the price of energy have major implications for adding value to Australia's minerals, in fact destroying many industries and increasing barriers to new added value ventures. Fundamentally most added-value industries are chemical process industries so that these changes have major implications for industrial chemistry and chemical engineering in Australia.

Quo Vardis

So in order to understand the position of the chemical industry in Australia, In subsequent papers, I will generate some thoughts on the competitive situation of the Australian chemical industry relative to its peers and in particular against its peers in South East Asia.

References

[1] "PACIA releases report on global megatrends" *Chemistry in Australia*, July 2013, p. 5; and "Calls for a competitive gas market," *Chemistry in Australia*, September 2013, p.9

[2] See: <http://www.abc.net.au/news/2014-07-15/wine-exports-down/5597506> and <http://www.theaustralian.com.au/video/id-50bDJxbjo5QlgQgTBVsKXv8va7kqJ5Zq/International-drinkers-squeeze-Australian-winegrowers>