

**INNOVATION
INSIGHTS
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Building an Australian innovation ecosystem

A strong industrial fabric, productive relationships between industry and academia, and a well-developed entrepreneurial mindset are essential elements of an effective innovation ecosystem. So how does Australia compare? And what should we be doing better?

Over the past 20 years I've been fortunate enough to have the opportunity to work on innovative technologies in the United States, Europe and Australia. Each region has its own idiosyncrasies and I've learned a huge amount from observing and working within them. In this AIRG Innovation Insight, I'd like to briefly share my experience working within each system, with some observations on the lessons Australian innovators could learn from their overseas peers.

Selling science in Switzerland

I went to work with DuPont central research in the US, just after I completed my PhD in Materials Science in Switzerland. At the time, DuPont was the largest chemical company in the world. It was an intellectually stimulating environment where I worked with people much brighter than myself, on really exciting projects

like blue laser technology (which 10 years later would become Blu Ray). It was applied research at its best – there was a lot of money and support, which meant a group of scientists could lock themselves in a room and come up with ground breaking new ideas.

When I moved back to Switzerland, my career took a different course. I was still working as a scientist, on solar cells at

the Swiss Federal Institute of Technology (EPFL), but now I had the added benefit of commercial experience gained while working in industry. The professor I was working with put me in charge of licencing the technology we were developing, and from there I learned how to 'sell science'.

One experience really shifted my perspective. I attended a sales presentation for dye-sensitised solar cells and



BY CHRIS BARBÉ,
CEO OF CERAMISPHERE

CERAMISPHERE IS AN AUSTRALIAN COMPANY THAT USES PROPRIETARY ENCAPSULATION AND CONTROLLED RELEASE TECHNOLOGY TO PROVIDE SOLUTIONS TO GLOBAL HEALTHCARE AND INDUSTRIAL CLIENTS. OUR PRODUCTS ARE HIGHLY COMPLEX MATERIALS, BUT OUR MANUFACTURING PROCESS IS RELATIVELY SIMPLE. IN OTHER WORDS, OUR INNOVATION IS IN THE CHEMISTRY, RATHER THAN IN THE PROCESS USED TO PRODUCE IT — AT LEAST AT PRESENT. THAT'S BECAUSE WE MADE A KEY DECISION EARLY IN THE LIFE OF OUR BUSINESS TO RETAIN COMPLETE CONTROL OF OUR IP, RATHER THAN LICENSING IT, WHICH MEANT WE HAD TO SCALE UP AND DO THE MANUFACTURING OURSELVES. AS A RESULT, WE MANUFACTURE OUR PRODUCTS USING A BATCH PROCESS WITH SIMPLE, OFF-THE-SHELF CHEMICAL MANUFACTURING EQUIPMENT. SOME PARTS OF THE PROCESS ARE AUTOMATED, BUT NOT ALL.

HOWEVER, WE STILL FACE SIGNIFICANT CHALLENGES AS AN AUSTRALIAN-BASED MANUFACTURER, ESPECIALLY WHEN IT COMES TO SERVICING A GLOBAL CLIENT BASE.

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watched a demonstration of the cell functionality that involved grinding a raspberry until the juice permeated the electrode and powered a small fan. Everyone in the room was audibly impressed, and I watched the team collect cheques from investors that same night. It made me realise that if you want to raise money to fund your research, you have to learn to explain complex things in simple terms and learn to enthuse people.

The Australian innovation ecosystem

I moved to Australia in 1997 and continued to work in sol-gel science and technology under the auspices of the Australian Nuclear Science and Technology Organisation (ANSTO). The work we were doing had clear commercial applications outside the scope of ANSTO's core focus on nuclear science — so in 2007 I was involved in setting up Ceramisphere first as a fully owned

subsidiary of ANSTO and in 2010 as a privately-owned company. Those experience have enabled me to observe the Australian innovation ecosystem from the perspective of both a research institution and a commercial enterprise.

The Australian system is markedly different to those of both Europe and the United States. On the positive side, Australia's research accomplishments are impressive, particularly in comparison to the population, underpinned by a strong education system which attracts talented overseas students. On the downside, the translation of research to commercial enterprises in Australia is relatively poor.

Part of that is due to the absence of a strong and dense industrial fabric. In Germany, Switzerland, and the US there's a high concentration of small, medium and large well-funded companies who can

help propagate innovation. In those countries, a company can act quickly on promising research outcomes by creating a new business, or adopting them into an existing business, without the need to establish a new entity or raise additional capital.

As has been widely observed, actively supporting the connection between industry and academia is a key way the Australian government could help make innovation more commercially viable. That means looking beyond entities such as Cooperative Research Centres (CRCs) to encourage a seamless interchange of knowledge and personnel between the academies and SMEs.

Japan is a useful model of this approach, with a high level of mobility between universities and industry, allowing scientists to spend stretches of time in both industry and academia, and enabling them to commercialise and orient future research and development. Australian industry and academia work in two different worlds, with little mobility between them. My own company has had some good collaborations with the CSIRO and universities, but for the most part their timelines are very different to our commercial ones. They also seem more interested in working with large multinationals than with smaller local companies.

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More positively, there are some indications that Australian investors are becoming more attuned to the demands of commercialisation, with a more entrepreneurial mindset. The investors in our business are all entrepreneurs themselves, which is key. They're interested in building a business, not just getting a rapid return. Even if they come from a very different industry, they understand the challenge and they're in it for the long term.

Nonetheless, we could do more in Australia to cultivate a flexible innovation culture. In the US, failure is expected and almost celebrated. In Australia, it's less acceptable to fail and the rewards of entrepreneurship aren't viewed in the same way. That's something we need to change — and one of the best ways to do so is to learn from successful innovators, at events like the AIRG's regular round tables.

You can find out more about these and other member engagement activities online.

