THERE IS A FUTURE: SMART MANUFACTURING

President’s Message

When we first decided that smart manufacturing would be the focus of this issue of B/HERT News, the recent spate of restructuring announcements by iconic names in manufacturing such as Ford, Toyota, GMH, Boeing, Shell and Alcoa had not announced their decisions regarding their futures in Australia. Whilst such decisions do have major implications for the workforces, communities and regions affected, we must keep these adjustments with our economy in perspective.

While the proportion of Australia’s GNP devoted to manufacturing has rapidly declined over the past two decades, this decline should be considered in the context of the steady growth of other sectors such as services and mining and mining related activities. Notwithstanding this change in the proportion of our GNP devoted to manufacturing, for the foreseeable future, there is an important place for manufacturing in the Australian economy.

While we should not understate nor underestimate the many challenges facing Australian manufacturing, the articles that follow give reason for some optimism. They show in stark and practical terms what the phrase ‘mobility of capital’ really means where in some cases short product lifecycles have created the dynamic whereupon manufacturers have needed to decide to move all or some of their facilities to be close to customers or to their suppliers.

These case studies also show how the rapid emergence of new technologies, new products and new market segments means that manufacturers are today requiring a level of strategic, operational and marketing dexterity never before considered necessary within this sector of our economy.

We hope that you find the real life stories of Australian manufacturing companies who are making their mark in a global marketplace, challenging, interesting, and educational but most of all, inspiring.
Managing Director, Alan Lipman, living.

off our standard of living. Far from it! Improving Australia’s competitiveness in global markets means a few different things. It means investing in the skills of our workforce so that Australians have the opportunity to move into sustainably higher paid jobs. It means investing in infrastructure that has a high economic return. It means ensuring that firms and their employees are freed from unnecessary regulatory burdens. And it means having the right incentives in place to encourage innovation and competition.

At K Care we currently have three manufacturing plants, one in the Perth suburb of Malaga and two in Sydney situated at Revesby and Eastern Creek. With dealers throughout Australia, New Zealand, United Kingdom, Europe, Singapore, Hong Kong, and the United Arab Emirates we export to the world.

Manufacturing locally gives us a couple of real advantages over our competitors. For example, our products for hospitals and aged care facilities include specially designed chairs for people with disabilities or mobility problems. If a customer comes to us and asks for a modification – such as changing the colour to make them less institutional or increasing the weight rating from 120kg to 400kg – we have six industrial engineers in our research and development department who can quickly adapt and modify to suit the request. That’s a massive advantage to us, just as it is for our engineers and design team to be able to work closely with tertiary institutions to ensure that our products remain at the cutting edge of the industry.

In fact, we are currently negotiating an agreement with the research department of a major Australian tertiary institution to formalise a relationship whereby we will combine to develop creative ideas in the K Care space, which we will then manufacture for market. As shown by recent developments such as our innovative Air Comfort Deluxe Version 2 bed and the newly released KA118 height adjustable, tilt and space shower commode, K Care has long seen the need to remain at the creative edge of our highly-competitive and rapidly growing sector.

Such partnerships, where we combine the skills and experiences of our industrial engineers with the best and the brightest brains from outside the industry, will enable us to stay at the forefront while still remaining an Australian company. Not that we entirely eschew overseas manufacturing. K Care’s factories are good at producing 10,000 of something but if we need to go overseas to manufacture in order to be

Creative and Cutting Edge

Read, watch or listen to the news these days and you could be forgiven for thinking that manufacturing in Australia is, if not actually dead, then tucked up in Intensive Care and on life support. It’s true that some sections of manufacturing are doing it tough, but to lump together all the industries that make up a vast and varied sector gives a warped and negative picture of the Australian economy while ignoring the success of organisations like mine - K Care.

In one name or another we’ve been around in Australia since 1976, starting as KDB Engineering then becoming part of the Hills group in 2002 and – through the acquisition of four other brands – morphing into Hills Healthcare Equipment in 2009.

Now, after being sold in 2013 to private equity firm Anacacia Capital, we are K Care, a proudly Australian-owned business that manufactures and distributes hospital, residential aged care and community care equipment for the Australian and international markets.

For us, the sad part of the current manufacturing story is that there is a general acceptance that our products must be manufactured overseas – people have been so beaten down by the relentless negativity that they don’t expect an organisation like ours to be making high quality products within Australia. But we are, and we will continue to do so because we believe that it gives us an overall advantage in a very competitive market. Yes, wages are cheaper in Asia but we believe the downsides – which are rarely discussed – more than compensate.

In a recent (April 2, 2014) and widely-reported speech by the Secretary to the Treasury, Dr Martin Parkinson, all the media attention focussed on his call for a discussion on the GST rate. Very little was written on his assessment of the future of high-class manufacturing in Australia. There were, he said, opportunities to come from the steadily increasing growth of the Asian middle class. “To put that into context, the number of middle-class consumers in the Asia Pacific region is expected to grow from half a billion in 2009 to 3.2 billion by 2030,” Dr Parkinson said. “Consequently, by 2030, it is estimated that just under two-thirds of spending by the world’s middle class will come from the Asia Pacific region, compared to around one quarter today. This growing middle class will demand high-end goods and a wide range of services, going far beyond mineral resources and agricultural commodities.”

Dr Parkinson said that to capture the benefits “we will need to compete on the global stage for Asian demand for services and high-end manufactures on the basis of both cost and quality.” Contrary to how it is sometimes portrayed in the media, competing on the global stage does not mean driving down wages or trading off our standard of living. It means investing in the skills of our workforce so that Australians have the opportunity to move into sustainably higher paid jobs. It means investing in infrastructure that has a high economic return. It means ensuring that firms and their employees are freed from unnecessary regulatory burdens. And it means having the right incentives in place to encourage innovation and competition.

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competitive. However all are designed and produced by our engineers and we ensure that we own the IP. In addition, we have a philosophy that any work which is sent overseas for manufacture must be replaced by additional products to be manufactured locally.

The question of IP is, of course, one of the problems that companies are finding with moving their manufacturing off-shore. A 2012 Bloomberg article reported on a number of US companies that had decided to withdraw from overseas manufacturing, preferring to revert to using factories in the US. The business owners cited a number of factors, including difficulty in communicating design modifications, problems with supply through customs and shipping delays, concern about theft of IP, quality control, regulatory and legal uncertainty, and the inability to have smaller orders made.

There is also the fact that with the rising affluence of Chinese citizens, wages have increased, making the financial case even less certain. In fact, some Chinese companies are shifting their manufacturing to other countries to take advantage of lower wages.

With the Australian dollar fluctuating considerably in recent years, currency variations are also a factor that needs to be taken into account by any business considering shifting its manufacturing base. In an article published on The Conversation website, joint authors Phillip Toner, from the University of Sydney, and Roy Green, from the University of Technology, Sydney, wrote of manufacturing “becoming more globalised, more knowledge-intensive and more interdependent with value-adding services, such as design, engineering, computing and marketing.” But, they said, its future in Australia remained important for at least two reasons: “first, manufacturing drives innovation and technological change – key elements of our productivity performance – and second it contributes to our external trade balance.”

Australian manufacturing was responsible for around a quarter of the total private sector expenditure on research and development which, they said, was “directed to adapting existing technologies and developing new ones, increasingly as part of an advanced services economy. And even more is spent on ‘non-R&D’ innovation, such as new business models, systems integration and high performance work and management practices, with diffusion effects throughout the economy.”

At K Care we continue to invest in Australian manufacturing. In December 2013 we completed the purchase of OxfordEME, a Sydney-based manufacturer of medication carts and veterinary products. Oxford has also just taken delivery of a brand new laser turret punch at a cost of $1.4M. The arrival of this equipment substantially increased our manufacturing capabilities in Sydney.

K Care now employs more than 125 people and if we made the decision to move overseas we would lose the skills – both in people and technology – that we have invested a considerable amount of time and money in developing. K Care’s story is echoed through hundreds of similar businesses, companies that believe that a combination of innovation, technology, smart working and outstanding product development will equip them to remain Australian in every aspect of their operations.

The industry is not in Intensive Care – but if it was it’s comforting to know that there would be an outstanding K Care product available to make the stay far more comfortable.

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Promoting Excellence in Learning and Teaching in Higher Education

The Office for Learning and Teaching (OLT) promotes excellence and supports change in learning and teaching in Australian higher education institutions, working towards improving the student experience by celebrating and promoting outstanding teaching and by researching and embedding innovative good practice.

The inaugural OLT conference Learning and teaching for our times - higher education in the digital era will be held in Sydney on 10 and 11 June 2014.

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There is a pervading view that manufacturing as an industry in Australia is in decline. Certainly manufacturing today is a challenging environment with multiple long-term factors driving the current shape of the industry. The statistics relative to GDP are clear - manufacturing in Australia peaked in the 1960s at 25 per cent of the country’s gross domestic product, and has since dropped below 10 per cent and continues to decline as the contribution from Services dominates.

And Australia is not alone. Comparisons with the global economy are similar. In 1964 manufacturing’s share of global GDP was roughly 50 percent larger than it is today. (McKinsey Quarterly).

Manufacturing in Australia is in a state of transition. External factors such as exchange rates, the trend for off-shoring to low labour-cost countries and the scale of today’s mass production have fundamentally reshaped the future for Australian manufacturers. Recent changes such as the GFC, volatility in the marketplace and the competition for skills in a boom market have all negatively impacted the manufacturing sector. So what of the future? What will it look like and what are the factors that will shape the manufacturing of tomorrow? Is Smart Manufacturing the answer?

The future of Australian manufacturing will be a new one where there is no return to the past – to succeed in our high cost economy manufacturing needs to fundamentally “change its spots” and be characterised by a focus on higher value-added production utilising some disruptive technologies and revolutionary changes, much higher levels of integration of supply chains and a balance between advanced production and available skills. Smart manufacturing has the potential to play a key part in this transformation.

There is no disputing that demand for locally manufactured goods is reducing significantly in some sectors but it is notably growing in others. While domestic demand for locally produced goods is affected, this is against a backdrop where global demand for manufactured goods is continuing to increase as the consumption in emerging middle classes continues unabated. For companies who are diversified or agile enough to adapt these are significant opportunities for the factories of the future.

Although there is a significant focus on technology as the future of Smart manufacturing it is only part of the story. QMI Solutions’ view is that there are five levels to consider within a manufacturing organisation and success involves recognising and addressing the importance of performance and competency in each of the five levels – refer figure 1.

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“Smart manufacturing marries information, technology and human ingenuity to bring about a rapid revolution in the development and application of manufacturing intelligence to every aspect of business. It will fundamentally change how products are invented, manufactured, shipped and sold” to quote Sujeet Chand, Chief Technology Officer, Rockwell Automation.

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Internal cust omer and meeting efficiency as built to order becomes common practice in the manufacturing processes and techniques mass production, which will require revisions in e.g. robotics in farming. In Australia this will also expanded use of robotics in current and new fields e.g. robotics in farming. In Australia this will also be characterised by mass customisation versus mass production, which will require revisions in the manufacturing processes and techniques as built to order becomes common practice in addressing specific customer requirements.

Smart manufacturing is poised to take advantage of the growth in the Internet of things where connected devices will autonomously share information. When applied to connect the equipment in a factory with the ERP systems and supply chains, such technologies can have a transformational impact on product design and production. When such technologies are applied to new manufacturing processes it is clear that there will be significant disruption to the current methods of production.

Skills – The skills to support a Smart manufacturing future will be a critical challenge for the businesses and industries looking to adapt and the education institutes looking to support them as innovation and collaboration become success factors. Recently competition for skills in a boom market has resulted in a loss of quality skilled workers from the manufacturing sector. Resource sector projects and their supply chains have attracted these skilled workers and the manufacturing sector has struggled to compete as a career option. Manufacturing has lost its appeal as a career choice. In 1964 more Harvard Business School graduates entered manufacturing than any other field (McKinsey Quarterly). That is not the case today. The industry is also losing ‘baby boomer’ workers and owners through retirement with limited succession planning – impacting on the skills base and industry capacity. These skills shortages are a real risk to the successful adoption of Smart manufacturing in Australia. This will be at all levels from leadership, management, engineering, procurement and supply chains to the skilled labour capable of operating the Smart manufacturing technologies of tomorrow. As industries transform and create and rely on new technologies, it will be necessary for the required training to be available to support this. Traditional institutional courses plus online and in-house training will all be critical elements of ensuring the workforce is appropriately skilled for the new roles Smart manufacturing will require.

Opportunities – Smart manufacturing and the future of successful manufacturers will be characterised by demand-driven supply chains and companies that have the most effective channels to their markets and can best identify opportunities to meet these requirements with their own products or within their integrated supply chain capability. It is invaluable to consider the parallels to other high cost economies that are successful in manufacturing and the factors that determine this. Some common traits are:

- Global outlook
- Focus on efficiency and meeting customer requirements
- Value add plus outsourcing

(QMI Solutions Manufacturing Sector Review for Queensland Government)

For those businesses that have historically been domestically focused, the challenge will be to develop an international outlook - not only in terms of marketing, but also with respect to product design for targeted international customer segments and optimising the balance
between value adding locally and appropriate off shoring. This may involve compliance with multiple design standards and languages but for competitive products can open new market opportunities significantly larger than are available in Australia.

**Networks** - There will be a bright future for those manufacturers who can recognise the advantages of expanded networks – both in the gains to be had from networking smart machines and sensors into their production processes, but also by extending this throughout their supply chains. The internet of things also has the potential to extend this network fully into a customer base to support demand-driven production. Imagine the power of being able to be rapidly alerted to a customer need for a spare part by systems linked to their asset management monitoring and using this information to create a job for the production of a spare part to replace the one that is about to fail. When multiple manufacturers are networked the benefits expand for all participants.

The other significant network issue is the unprecedented connectivity that customers and buyers now have to global information and markets which is creating new, digital pathways to market – challenging the traditional marketing approaches and increasing the pace of change.

Smart manufacturing holds the promise of better supporting mass customisation and providing faster service in a customer driven market.

**Summary**

Manufacturing is transforming and in Australia, as in many other high cost economies, Smart manufacturing will be the way of the future. This presents both significant challenges and opportunities for those businesses ready to embrace the changes. To succeed may require a complete disruption to current business practices and systems and management commitment to the level of change required.

The future of manufacturing will be characterised by Smart manufacturing, mass customisation demand driven supply chains supported by networked equipment and senses coupled with smart business systems and appropriately skilled staff to support these.

This renaissance in manufacturing (as some are referring to it) will require companies to recognise and embrace the opportunities. Those that overcome the barriers to respond and adapt will be those that are best positioned to take full advantage of the opportunities that this will provide.

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Workers Union
National Secretary,
Paul Bastian,
products made here.
undercut superior
fruit to steel sheets - to
imports - from canned
policies allow inferior
possible.  The same
the smallest penalties
dumped’ they receive
when they are ‘found
dumped’ they receive
free market trade policy means Australia
advanced economy.  Our country’s addiction
to free market trade policy means Australia makes
imported goods cheaper.
While the world has changed and we are now
hurting into an information age - where services
are increasingly looked to as the generator of
growth and jobs - manufacturing remains at the
heart of both technological development and
economic growth.
There is no doubt that the relative size of the
manufacturing sector has fallen, to just under 10
per cent of the economy in Australia. However,
the role of manufacturing as the most intensive
research and development sector of the
has not changed. Manufacturing still
employs 14 per cent of the world’s workers and is
responsible for 17 per cent of global output, but
these figures underestimate its importance. As
the World Economic Forum states:
“One of the main challenges regarding
manufacturing is that the metric of describing it
as a percentage of GDP fails to reflect the sector’s
global and complex nature, especially in worldwide
value chains, and its impact on capabilities and
knowledge dissemination across value chains.”
Put more simply, manufacturing’s importance in
driving growth and productivity isn’t fully
reflected in the simple measure of its size as a
share of GDP.
Manufacturing sits at the core of the concept of
economic complexity championed by thinkers
like Professor Goran Roos. Manufacturing,
especially in its advanced and global form, is the
most advanced, high-tech sector of any economy
and as such is the incubator and generator of new
innovation, technology, processes and products
and a crucial support to these advances being
taken up by other sectors. A broad, advanced
and internationally linked manufacturing base
is central to maximising our growth potential
across the global economy.
For these reasons, it is hard not to be optimistic
about the manufacturing sector, especially
globally. But we are all aware of the incredible
pressures that the sector is under domestically.
While optimism can give us comfort, realism
demands that we soberly consider these
challenges and do what we can to ensure they are
met and Australia retains a strong manufacturing
sector and all the benefits this brings.
In recent years the short-term pressures of the
mining boom and Dutch-disease have
combined with longer-term pressures of intense
competition from low cost industrialising
countries. The mining boom, now entering a
record production phase, has kept the Australian
dollar at historical highs, as our competitor-
developed economies have printed money,
devaluing their currencies. Added to this is
probably the most free market trade policy of any
advanced economy. Our country’s addiction to
free market trade policy means Australia makes
it easy for imports to be dumped on our markets
and when they are ‘found dumped’ they receive
the smallest penalties possible. The same policies
allow inferior imports - from canned fruit to steel
sheets - to undercut superior products made
here. And we see each new bi-lateral agreement
exchange the interests of manufacturing for the
interests of agriculture.
It is these factors that are responsible for the
extreme pressure Australian manufacturing is
under. Any attempt to blame wages and unions
for the sector’s troubles do a disservice both to its
dedicated workforce and to the sector as a whole.
Wages increased by 2.5 per cent from December
2012 to December 2013, while inflation increased
2.7 per cent. We have also seen a drop in
recent wage agreements in the latest rounds of
manufacturing EBAs. Talk of a wages blowout
is not supported by any facts and has a clear
political motivation. It distracts from the real
issues that face the sector and makes addressing
those issues harder, not easier.
The future of Australian manufacturing lies in
making better use of advanced technology,
creating innovative new products, accessing new
markets, supplying to global supply chains and
crucially, improving the skills of the workforce.
Australia needs to compete on quality, skills
and technology. Competing on wages is a
competition we will never win and will make
the country worse off in the process. All of
these sources of growth and advantage need
to be harnessed by manufacturing companies
themselves but firms also need support to
transition to a sustainable growing 21st century
industry.
In addition, it is crucial that we recognise that
a productive future in manufacturing will rely
on worker engagement. We need programs to
courage workers to participate in continuous
improvement programs and productivity
partnerships. This will not happen if we descend
into a war on wages.

Our country’s addiction to free market trade policy means Australia makes it easy for imports to be dumped on our markets and when they are ‘found dumped’ they receive the smallest penalties possible. The same policies allow inferior imports - from canned fruit to steel sheets - to undercut superior products made here.
This support needs to be comprehensive and it needs to target those areas where firms are facing the greatest obstacles. It is not the case that all the government needs to do to ensure a prosperous manufacturing sector is get out of the way. This is the absent uncle theory of industry policy. The uncle is never seen nor heard from, but you know he’s sitting in front of a fireplace somewhere wishing you well while he sips a whiskey. Industry needs infrastructure, basic research, consistent and smart regulations, a fair-trading environment, a skilled workforce and access to partners. The real role of government is to promote and support industry as a partner, not to wish it well while not lifting a finger.

The type of industry support that is needed is not the cash handouts to manufacturers that have become synonymous with industry support in recent years. We need a smarter, better targeted and more nuanced industry policy; one that helps firms do what they need to do to maximize their potential and their growth.

Direct government support will always be crucial for the defence sector. In addition, government procurement policies generally should also include considerations of industry development goals. Without addressing the barriers to firm growth, manufacturing will never reach its real potential in Australia. Industry policy in the 21st century means targeted interventions to address coordination failures, information failures, financial market failures, skills needs, infrastructure needs, and incentives for growth enhancing activities. It also means addressing the fact that other countries act strategically both in their industry and their trade policy, and by failing to do likewise, we sell our workers and businesses short and invite the scorn or our competitors.

While Australia has an impressive research sector, too often this work is not linked into the needs of industry. We need to improve how researchers and business collaborate, so our industry can benefit from our greatest scientific and engineering minds.

A ‘Patent Box’ tax credit is one way countries around the world are acting to attract and retain new ideas in their manufacturing industries. Tax breaks, whether a credit or a discount, are provided for activity that is generated through the use of a patent. A ‘Patent Box’ tax credit is one way countries around the world are acting to attract and retain new ideas in their manufacturing industries. Tax breaks, whether a credit or a discount, are provided for activity that is generated through the use of a patent. Not only does this promote innovation and technological development and importantly its use in production, but it increases our competitiveness compared to other advanced manufacturing countries. Australia should follow this lead and introduce a similar scheme.

These are just two examples of what a smart industry policy means, and a smart manufacturing sector needs the support of a smart industry policy. Other areas also need to be addressed: access to markets and global supply chains, financial support especially through short term disruptions, support for skilling of workers, and better protection against dumping - to name just a few. Manufacturing businesses know this, but to know and not act isn’t good enough.

Business, not just unions, need to make the case that industry policy isn’t a dirty word or a bankrupt concept, both individually to government and through their various associations. A policy that is based on partnership, where government acts on new opportunities. These precincts should be built upon not torn down for ideological or manufactured cost cutting reasons.

The former Government acknowledged this problem and responded with a proposal to establish 10 Industry Innovation Precincts, backed by a $500M Industry Collaboration fund. These precincts would bring together researchers and industry so they could together tackle the challenges facing firms and whole sectors of industry, as well as innovate to create and build on new opportunities. These precincts should be built upon not torn down for ideological or manufactured cost cutting reasons.

Ultimately it is ideas that generate sustainable growth, whether it’s in manufacturing or any other sector. Supporting the generation and use of ideas in industry is crucial if we are to compete with other advanced manufacturing countries. This doesn’t just mean we need a world-class educational system, although we certainly do. It also means we need to have the best support for the generation and use of ideas in manufacturing possible.

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Founder and Executive Chairman of Seeley International, Mr Frank Seeley AM, knows what it takes to transform a unique idea into a thriving business. Under his leadership, Seeley International has gone from strength to strength and is today Australia’s largest manufacturer of heating and cooling systems for the domestic, commercial and industrial markets, with an enviable reputation as an innovative market leader.

The early days
In 1972, the budding young entrepreneur who had been busy pounding the pavement selling portable evaporative coolers, lost his job. It was then that he had an epiphany. As he saw it, the biggest problem with the units he had been selling was the corroding of metal parts. It was then that he started developing plans to produce the world’s first all-plastic cooler.

Despite most people telling him it couldn’t be done, Frank kept his faith and started a manufacturing operation from the garage of his suburban Adelaide home – producing 1,000 portable coolers in the first year. It was his drive to succeed and an unwavering commitment to innovate that would become his hallmark traits, and these remain as strong as ever today.

Having achieved remarkable sales success, he then turned his focus to designing and developing an all-plastic rooftop cooler. The idea proved to be a significant breakthrough for the entire industry, and today all-plastic rooftop coolers are an industry standard. In fact, the introduction of the all-plastic cooler was so successful that the rooftop cooling market in Australia grew from 12,000 units sold annually to more than 70,000!

Leadership and Imagination

Despite a number of major setbacks, which included two major fires, the years that followed saw Seeley International steadily grow, and today it employs more than 400 people, has manufacturing operations at Lonsdale, South Australia and Albury, New South Wales, and sales offices in each mainland capital city as well as in the UK, USA, South Africa, Italy and France. In addition to holding some 300 patents and exporting to more than 120 countries, its stable of award-winning brands include Breezair, Braemar, Coolair, Convair and Climate Wizard.

Secrets of success
Seeley International has a business-wide philosophy of leading the industry through its commitment to innovation. With a strategy that has proved successful time and again, a team of developers push the envelope and constantly look over the horizon, so that by the time a competitor replicates any of Seeley’s popular products, they have already been superseded by newer technology developed by Seeley International.

Research and development are paramount, and out of the 50 engineers employed by Seeley International, more than a dozen form the ‘Imagineering’ team which focuses solely on “over-the-horizon” innovation and product development.

A strong commitment to continuous improvement is also deeply entrenched in the Seeley culture. The company has chosen to manufacturer most of its own parts, including electric motors, pumps and other major components to ensure greater quality control, rather than relying on a third party provider sharing a similar ethos and exacting standards.

Seeley’s workforce continues to play an important part in this process as well, and in the past five years a continuous improvement program has seen staff suggesting and driving more than 1,200 projects which have produced outstanding results - improving safety by 35 per cent, increasing productivity by 12 per cent and generating savings worth $650,000.

Leading the pack
Just as Frank Seeley’s vision for an all-plastic rooftop cooler redefined the market so many years before, Seeley International continues to reinforce its industry dominance through ground-breaking innovations.

In 2012 Seeley International launched the world’s first 6-star ducted gas heating range, which was welcome news for people wanting to reduce...
their energy consumption and environmental impact without compromising on quality or performance.

Not content with that, the company went on to set new standards with the release of its remarkable Braemar “Super-Six” ducted gas heater in 2013 – a heater that is regarded as the most energy-efficient in the world.

Developed at the company’s Albury factory in New South Wales, the Braemar “Super-Six” ducted gas heater redefined the paradigm for the ratings system currently in use across Australia, taking 6-star efficiency standards to a new level and making it without peer in the industry.

As further evidence of its continuous improvement mandate, work is already underway to develop an LPG model and a 32kW version.

Another jewel in the crown for Seeley International is its hyper-efficient indirect evaporative dedicated outside air system, Climate Wizard, which improves air quality by delivering large amounts of fresh, cool air without adding moisture. More than a decade in development, Climate Wizard offers exceptional cooling performance and is able to greatly reduce energy consumption costs and reduce the carbon footprint – using up to 80% less energy than some alternative systems.

Awards and accolades

The trophy cabinet at Seeley International offers a who’s who of state, national and international awards, which are testament to its commitment in designing and manufacturing quality products. Recent wins have included Seeley International being crowned as ‘Best manufacturer – stand-alone cooling’ category at the 2013 Climate Control Awards held in Dubai, for Climate Wizard. That accolade joins a long list of others for Climate Wizard, which won the Energy Efficiency and Carbon Management Award in the 2013 Banksia Awards and the 2013 Australian Business Awards for Innovation. It has previously won the 2010 Product Excellence Award at the Air Conditioning, Refrigeration and Building Services (ARBS) Industry Awards, the Greenplumbers ‘Energy Efficient Product of the Year’, the 2011 Australian International Design Awards, and the 2013 World Ag Expo Top 10 New Products Competition.

Seeley International was also winner of the Environmental Solutions Award in the annual 2013 Business SA Export Awards in recognition of its innovation and success in industry and export. Leading by example, Seeley International founder and Executive Chairman, Frank Seeley AM, also has an impressive list of personal awards. He was made a Member of the Order of Australia in 2001, and won South Australian Entrepreneur of the Year in 2005. In 2010, he was state winner of the Jason Lea Award at the South Australian Family Business of the Year Awards. In 2011, he was named South Australian of the Year and received a Lifetime Achievement Award from Manufacturers Monthly and in November 2012 he was given the Innovation Heroes Award from the Warren Centre for Advanced Engineering. In 2013 Frank Seeley was selected as the 2013 Ernst & Young Champion of Entrepreneurship, the 2013 Family Business Australia Award for Entrepreneurship, as well as receiving BRW’s Environmental Innovation Award for commitment to developing environmentally-friendly products.

Back to the future

Australians have a reputation for thinking outside the square, and that approach has produced a number of world-firsts – including the first feature length film (The Story of the Kelly Gang), the electronic pacemaker, the wine cask, the powerboard, the Hills Hoist, WiFi technology, the electric drill, black box flight recorders, and the bionic ear among an array of inventions.

Seeley International has also contributed to that list of accolades, developing world-first products such as its Braemar “Super-Six” ducted gas heater. Unfortunately, Australia does not have a good track record in recent years in supporting local inventors, with many having gone off shore as a result. That failing must be addressed as a priority. The failure of the car manufacturing industry suggests that efforts must turn to manufacturing unique, quality products for domestic and international markets that deliver on consumer demand and offer new technologies and features that set them apart from the rest.
Manufacturing companies need to understand where they want to be and recognise opportunities to open and expand in global markets by offering high value, and highly innovative products. Seeley International is living proof that an ongoing commitment to innovate, automate and accelerate can result in Australian manufacturers leading the future, on a global scale.

Seeley International plans to continue compensating for the higher production costs within Australia by focusing on innovation, developing world class technology and implementing high levels of automation. That approach, combined with empowering and training its workforce, has seen the growth of its exports of innovative products as well as outstanding growth in its domestic market share.

While most effective research and development activities can be led by those commercial companies that use new technologies in their products, there is also tremendous value in greater partnerships between manufacturing companies and universities, with the Federal Government having a funding role in such arrangements.

The next steps
Seeley International is on a trajectory to become a billion-dollar company by the year 2020, and has put in place a 10-year plan designed to continually increase its Australian market share and achieve significant expansion overseas. The launch of its own subsidiary in Africa in March 2014 is one initiative as part of a concerted push to take its Australian-designed and manufactured air-conditioners to all corners of the planet, with a range of other exciting products and expansion activities yet to come.

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Alliance Builds a New Manufacturing Capacity with Real Impact

Manufacturing and jobs: very topical and rarely out of the news! But, news is too often of frustration and failure. Recent debate in the media and in government is divided over state support, and not optimistic. What will future Australians do? Should Australia be supporting strategic manufacturing business, despite apparently negative prospects?

Our ongoing partnership in Australian pharmaceutical manufacturing tells a very different story and a story that is not often heard - a success that goes against such common perceptions. This article provides our shared perspectives – the inside story of a new and innovative alliance.

The Pharmaceutical Industry has had its own specific challenges. It’s a very different tale to that of the car industry, or for that matter most other manufacturing sectors. The pharmaceutical manufacturing industry has been undergoing constant change for over two decades, facing a host of major challenges – including over-capacity, outdated processing, low cost generic imports being promoted by its main customer, the Australian Government, and the expiring of originator patents.

One example of this is GSK’s Boronia manufacturing plant in Victoria: six years ago, under the cloud of head office ‘strategic review’, the jobs of over 500 specialized people were at risk where the country would lose a specialist manufacturing site.

The GSK leadership devised a daring response with a foundation of three ‘Blue Chip’ strategies; 1) streamline manufacturing processes to reduce cost and increase productivity, 2) ‘Grow the business’ through an expanded product portfolio that focused on their stronghold high technology platforms of Blow-Fill-Seal (BFS) technology and Dry Powder Inhalers (DPI), and 3) ‘Best People’.

Philip Leslie is Head of Technical at the Boronia plant: “To deliver all three of these blue chips, it was seen essential to have the very best people in the team and a source of both premium applied science knowledge along with practical skills and to be able to call on people with alternative and disruptive ideas.”

A local partnership based on our shared goal - to promote Pharmaceutical Manufacturing in Australia naturally evolved between the Victorian State Government, Monash Institute of Pharmaceutical Sciences (MIPS) led by Bill Charrman, and the site leadership team at Boronia.

Of course the GSK problem is really a global one for all innovator pharma companies, with manufacturing facing increased competition from imported generics. But, the Australian manufacturing sector had further problems, struggling to survive in an environment of a high Australian dollar.

So our partnership had to devise an innovative business plan that brought our key strengths together, and do what other regions had struggled with. Our shared vision was to link the scientific staff at the MIPS Parkville campus with a parallel team of production specialists at Boronia, to form The Australian Pharmaceutical Centre for Innovation and Industrialisation (COI2). As Philip observes “To be successful at manufacturing in Australia has its challenges – the high Australian dollar and high labour costs, creates an environment where international companies look to other parts of the world to invest. The most successful manufacturing operations need to be world-class in efficiency, and to focus on technologies that require high levels of technical capability and to be innovative. Partnerships can become critical in creating such an operational environment.”

A dedicated laboratory with specialized research staff at Parkville was created. This lab sits in the middle of the MIPS faculty site at Parkville, in Melbourne’s Biotech heartland. This lab has evolved with a unique fusion of GSK’s Lean Laboratory principals, with direct open access to Monash and MIPS technical experts in drug delivery, whose skills aligned ideally with GSK needs.

David Morton is Associate Professor at MIPS, and Head of the laboratory: “[GSK] knew that they were going to struggle unless they could reinvent themselves with a relatively high-technology new product pipeline. Australia has to be value-adding. We can’t just be turning out things that our competitors can do more cheaply. We have a real diversity of people with amazing knowledge, and an attitude to brainstorm ideas to this common goal – we just needed the right environment.”

The lab has supported many new programmes, contributing to a number of changes to significantly reduce the cost of production at the plant whilst also supporting a number of new products under development. The lab has drawn together Monash pharmaceutical scientists and Monash engineers: this structure means the operations also introduced GSK to a range of high-caliber Monash Graduates - who over the past six years have been recruited into the Boronia team to expand its capability.

With the support of the Monash collaboration this strategy has worked. Continual efficiency gains
has seen costs reduce and a highly significant turnaround in volumes. "As we reduced our costs, our volumes increased," says Philip, "Due to this and our marketing efforts, the increased volumes caused a tipping point to being reached. The best thing a manufacturing facility can have is increased volumes which help to spread our overheads and enable increasing efficiency. This leads to further reduction in our costs, which leads to increased volumes. As a result the site turned a corner."

Industry leaders tell us our relationship is unusual as well as innovative, operating in the manufacturing space. Open Innovation was Henry Chesborough's 'new paradigm' for effective collaborative strategic paths to innovation. The central premise being 'all the smart people don't work for us'. However, pharmaceutical interfaces struggle with this paradigm: the special nature of innovation in the development of a new drug means that collaboration is predominantly limited to what is termed 'pre-competitive research'. An arbitrary line is drawn, allowing companies and universities to openly work together, but only to look at identifying drug targets - once discovered the lines are closed and the gloves are off, and the secretive hunt for molecules begins - and this generally remains closed to the finishing line.

From David's perspective: "The relationship [with the GSK team] is very important to me because it gives me access to those people who actually own real problems. Those real problems are often more interesting and challenging than the perceived problems people within academic circles get to see. We can direct our research to have high impact, and get the best peer review possible - it has to actually work."

So our collaboration has found a way to break this dilemma in the manufacturing context - as we operate at the industrialization point of the medicine's journey.

Philip notes: "The Centre is unique: there is nothing like it anywhere in the world in the pharmaceutical industry and GSK would like to replicate it. A key barrier it has surmounted is trust: GSK trust Monash with information and Monash trusts GSK not to exploit them. The agreement around publishing and IP is key and plays to both party core principals."

In 2012 the funding for the Centre from the government expired. However, the success of the Centre saw GSK step in and fully fund the collaboration. The turnaround at the site has seen GSK commit to an investment approaching $60M in expansion of manufacturing capability. The R&D alliance has reduced the risk of failure in developing new products, with GSK recently completing a $4M investment in a unique purpose built pilot industrialisation facility, for developing new innovative ideas and products, and to enable them to be brought to the market - a facility which is also available for local industry.

The exciting outcome of this is this is what we termed Open Industrialization: our extension of the Open Innovation concept, and is available to other biotech companies in Australia and research institutes that wish to develop their ideas further with the support of GSK and Monash, and avoid the scenario where companies have to go overseas for this capability.

Education and training has remained a major central feature of the collaboration. We have found many opportunities for young people to gain direct work experience within CoI2, and this contributes to a longer-term sustainability with a deliberate plan designed to both technical and professional specific skills needed and to create the future 'best people'.

This relationship has been recognised by stakeholders from government ministers to senior executives in both organisations as unique in its open interchange of complimentary expertise, in dealing with intellectual property, and in this Open Industrialisation approach filling the critical gap between academia and industrial operations.

In 2013, we were delighted to be recognised by two prestigious B/HERT awards: The Outstanding Achievement in Collaboration in R&D, and the overall award for Outstanding Achievement in Collaboration. Until this time, we had never really looked for outside recognition or publicity, but were very much focussed on the job in hand. But, this recognition has helped open our eyes to the future, to enhance the belief in what we are doing. The real key to our success has been attitudes of the core individuals. There are significant cultural barriers to collaboration in Australia, and the more we develop our partnership and share our experiences, the more obvious these become. Many find it hard to break endemic attitudes in both universities and industry, and these must change for others to see the benefits we have gained. It’s really not about ‘what’s in it for me…’

We also need to shed the attitude of looking for state and federal support as single entities with purely inward vision and self-interests. So for more great manufacturing stories in Australia, it is essential that companies tap more effectively into the talent and innovative ideas that universities have to offer and it is essential for University partners see the opportunity to work on issues that affect our economy as well as partner in an environment where many of the students wish to be employed. The outcome of these collaborations is good news stories in manufacturing, for key skills development and exciting industry-relevant research. A Win-Win partnership for all involved.
Global, Local and Growing

Australian manufacturers are recognising the future of the industry lies in advanced manufacturing, where businesses leverage innovation and productivity. The challenges facing the industry have been analysed and re-analysed by numerous industry level reviews and task forces, and span a mix of issues that are both within and outside a manufacturing managers’ control. Despite this, Boeing continues to find real value in Australia. Our investment in innovation to support the growth and productivity of our local Boeing business units has spanned over 87 years and takes advantage of a highly-skilled workforce, world-class universities and innovative research organisations. We understand that Australia will never be a low cost destination for manufacturing, and as such, focus our efforts on achieving best value as a global enterprise.

Boeing is approaching a centenary milestone in 2016. As the world’s largest aerospace company, it employs more than 168,000 people globally, with customers and operations in more than 150 countries. Boeing Australia comprises the company’s largest footprint outside the United States with more than 3,200 employees working at 27 sites, engaged across the full breadth and scope of our commercial and defence businesses. Through the decades, Boeing and its heritage companies have contributed to the economic growth and development of Australia, forming part of the fabric of the Australian aerospace and defence-industrial landscape. Every day more than 100,000 people fly on Boeing airplanes in Australia and all of our local employees are very proud of this legacy. We realise in the current climate, we must work smarter to assure our continued success and growth into the 21st century.

Local aerospace manufacturing in Australia

Boeing Aerostructures Australia in Victoria is focused on high tech, high value composite manufacturing and assembly of advanced aerospace components. Located in Fishermans Bend, Melbourne, more than 1,300 employees work on Australia’s largest commercial aerospace contract - a 20-year, $4 billion dollar program to build the moveable trailing edge components (flaps and ailerons) for the most technically advanced commercial airplane in the world, the 787 Dreamliner. The airplane control surface design is unique to Australia, using innovative composite materials and processes.

Boeing Aerostructures Australia is also the sole source manufacturer of 737 ailerons and tabs, 777 rudder, tabs and elevators and 747 moveable leading edges. These high value manufacturing export contracts for Australia feed a global Boeing Commercial Airplane backlog of 5,080 airplanes valued at $374 billion (as at end 2013).

Long-term demand for commercial aviation predicts growth in emerging markets such as China and India, and across regions such as the Asia Pacific and the Middle East. From Boeing projections this amounts to nearly 36,000 new, more efficient, more environmentally advanced airplanes valued at $4.8 trillion. As a business, we are absolutely focused on ensuring Boeing Aerostructures Australia remains productive
and competitive over the long term, in order for Australia to prosper from the export growth potential of this market over the coming decades.

Research and innovation focus
Beyond the 787, Boeing is continuing to design and develop the materials, the systems and the processes that will underpin the future of aviation both in the commercial and defence sectors. BR&T-Australia is one of six international research centres for the company, and the largest outside of the United States. BR&T-Australia has built critical mass in areas of expertise that support the growth and productivity of our local Boeing business units, while strategically collaborating with many of the best aerospace research institutions across the country. We’ve invested heavily in establishing world-class research and development facilities co-located with Boeing Aerostructures Australia at Fishermans Bend in order to ensure that transition and scale up of technological advances can transition seamlessly and efficiently into the production environment.

BR&T-Australia’s researchers work on tomorrow’s challenges for the production environment. The co-location with Boeing’s production design and engineering teams ensures researchers have embedded and intimate knowledge of how to scale and transfer technologies from the research world into the factory. As Boeing Aerostructures Australia creates further efficiencies to move down the cost curve on new manufacturing programs such as the 787 Dreamliner, BR&T-Australia continues to assess future productivity enhancements, and can support their integration within the factory.

BR&T-Australia researchers live by a mantra of “cost, weight and simplicity”. This means having a relentless drive to reducing the cost of manufacturing operations through productivity gains, seeking step change opportunities for weight savings on aerospace components to enhance the efficiency of our customers operations, and to always keeping it simple! That means simple in terms of design, but most importantly simple in terms of manufacturability.

New technologies
These new products and technologies are also becoming more nimble and flexible. We’re seeing the emergence of new tools, new materials and new processes. Advances in software and communications technology are continuing at a breathtaking pace. This includes big data and the industrial internet, low cost computing, automation and robotics, nanotechnology, unprecedented levels of precision, some even occurring at the molecular level.

New forms of collaboration, such as flexible fabrication and mass customisation where machines are moving ever closer to the customer, and research and development is moving ever closer to manufacturing. Gone are the days of designing in one place and building in another. The emergence of micro-factories is creating and sustaining new types of jobs.

As trends in manufacturing move beyond simple quality and productivity improvements, they are impacting the very nature of workforces. These changes are boosting efficiency and improving performance, driving relentlessly competitive global industries to engage in a determined search for even better tools, talent and technologies.

Manufacturing today is a highly-skilled, high-tech occupation, sitting at the intersection of two worlds . . . the physical and the virtual. It is increasingly as much about engineering and design as it is about knowledge and software. Manufacturing has moved away from the traditional stereotype of metal-bashing workers in overalls to a smart, design-led industry that sits at the very heart of innovation.

Australia: future focused

In the context of this new industrial revolution, there is a solid future for manufacturing in Australia. New vistas are opening. Australia can compete and win in the Asian Century. It is well documented that more than three billion people are projected to move into a new middle class across the vast Indo-Pacific region by 2030. In aviation, there is no clearer demonstration of this than the rising demand in China where there are currently 92 airports under construction, with six of them the size of Chicago O’Hare.

Australian advanced manufacturing is set to prosper in this era of Asian growth – in aerospace, food processing, medical devices, mining technology, robotics and unmanned systems, pharmaceuticals and biotechnology, and clean technology. With regard to clean technology in particular, competitive manufacturers around the world are today heavily focused on reducing their energy footprint as a component of their manufacturing costs, as is certainly the case right here at Boeing Aerostructures Australia in Fishermans Bend. This trend toward long-term efficiency in energy consumption and clean
manufacturing is vitally important to ensure future competitiveness in a carbon-constrained world.

Australia’s strong national innovation system lends itself to success in all of these areas, with world class universities, a collaborative environment and excellent provisions for the protection of intellectual property, and strong publically funded research organisations, such as the CSIRO.

The Australian manufacturing sector has demonstrated an ability to create globally competitive, high value, high technology products, even in the challenging cost environment of parity-plus for the Aussie dollar. But to do this well and consistently in the future will require high and sustained productivity and innovation. This includes investments that drive individual company prosperity, but also rest at the very core of Australia’s national competitiveness.

Working together, Australians can and must create a more diversified economy, including an advanced value-added manufacturing and innovation economy, an ecosystem within which high tech aerospace manufacturing will thrive for a long time to come. In striving for this, we must not look simply to government to provide all the answers or to create all the enabling conditions. Regardless of where governments stand on these issues, there are many things that industry can do in order to enhance its own competitiveness. Being innovative requires both leadership and calculated risk-taking from all key stakeholders.

In the manufacturing sector this means industry, workforces, the research community, and governments all working together toward a common goal of competitiveness. At the end of the day the innate ingenuity of Australians themselves will help carry the day, because to some degree the essence of innovation is about tolerating failure and learning from it.

At Boeing, we’ve been most successful in Australia and in our broader global enterprise when we join with industry partners, with scientists and researchers, supportive governments, and with our employees and customers to solve problems and take advantage of emerging opportunities. Increasingly, and proudly, we are able to do much of this with unique Australian know-how, which is precisely why Boeing Australia is the largest growing footprint for the company outside of the United States. The age of Australian advanced manufacturing is entering an exciting new era underpinned by innovation, one that The Boeing Company stands ready to deliver on.

Michael Edwards is the General Manager for Boeing Research & Technology-Australia. He is a former co-chair of the Technical Working Group supporting Australia’s Manufacturing Leaders Group during 2013, and a former Board member of Manufacturing Excellence Taskforce Australia Limited (META) over 2013. Michael is also a member of the RMIT University School of Aerospace, Mechanical and Manufacturing Engineering (SAMME) Industry Advisory Board, and an industry representative on the Strengthened Export Controls Steering Group for the Australian Department of Defence.
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