

The Power of 3

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Driving the future further

Lithium Valley – opportunity knocks

“The key to success is being in the right place at the right time, recognising you’re there, and taking action!” Ray Kroc

Overview

As previously noted in this publication, in the latter part of the 20th century silicon was an elemental game-changer. In the US, its use in transistors revolutionised electronics and computerisation, altering forever the ways in which humans work, rest and play in today’s interconnected digital world.

Now, as the Energy Revolution of the 21st century ramps up, lithium has become the *element de jour*. So, where on Earth is the ideal base for the world’s burgeoning lithium-ion battery (LIB) economy?

An electronics super-economy

Silicon Valley, on the west coast of the US, was – and is – the culmination of decades of synergy and evolution. But how did a provincial backwater in California become the world capital of technology? Over a century or so, it was the combination of infrastructure, logistics and synergistic businesses, fierce space-age competition, a 1960s-induced cultural renaissance and an open-minded, risk-taking approach that resulted in a powerhouse of intellectual property and manufacturing encompassing some of the world’s largest companies, among them Google, Apple and Tesla, to name but a few.

Tellingly, it was the advent of the silicon (rather than germanium) transistor in 1956 that began the reinvigoration of California’s electronics industry – to the extent that, in 1971, US journalist Don Hoefler coined the term ‘Silicon Valley’ for the entire region ... and it stuck.

The rest, of course, is history. Silicon Valley is now an industrial business network valued at around US\$3 trillion dollars¹.

Knowledge doubling

This is how *Industry: Tap into news* describes Buckminster Fuller’s creation of the ‘Knowledge Doubling Curve’:

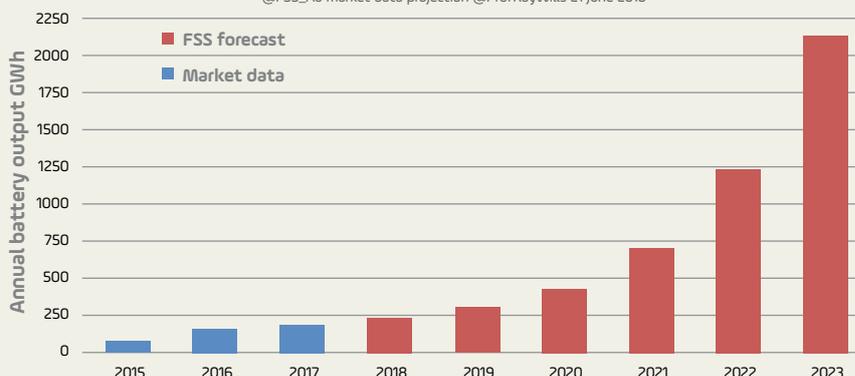
[He] noticed that until 1900 human knowledge doubled approximately every century. By the end of World War II knowledge was doubling every 25 years. Today things are not as simple, as different types of knowledge have different rates of growth. For example, nanotechnology knowledge is doubling every two years and clinical knowledge every 18 months. But on average, human knowledge is doubling every 13 months. According to IBM, the build-out of the ‘internet of things’ will lead to the doubling of knowledge every 12 hours.

Surge in demand

Silicon Valley took a century to develop but the pace of the Energy Revolution is far more frenetic. In the age of the LIB, knowledge and markets are the great enablers. With a global desire for cleaner air (via cleaner energy) increasing exponentially – propelled by government policies, consumer demand and OEMs² committed to phasing out internal combustion engines in favour of electrically propelled vehicles – an Energy Revolution powered by LIBs is hardly a ‘bubble’. Demand, now and well into the future, is locked in.

Global production and 5-year projection of annual factory battery output

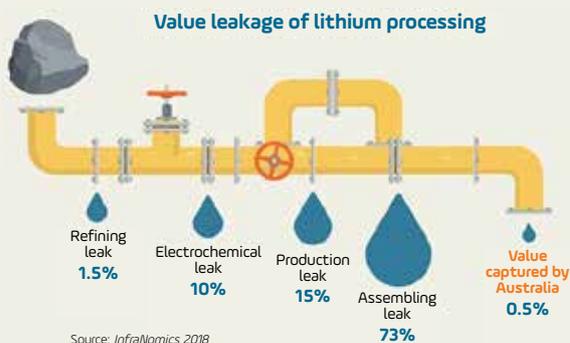
@FSS_Au market data projection @ProfRayWills 21 June 2018



Lithium Valley – the concept

Western Australia (WA), long home to the world's largest lithium mine (at Greenbushes), wants to make its mark on the Energy Revolution. To do so, it is evolving from its previous 'quarry' mentality, with plans to process lithium concentrates and produce lithium chemicals rather than just mining and exporting the raw ore.

Currently, WA dominates the raw material input of lithium globally, supplying more than 50% of what's required for total LIB production worldwide. Much of that originates from the Greenbushes mine of Talison Lithium. In recent years, another six mines have been commissioned in WA – three in the Pilbara, two close to Kalgoorlie and one near the south coast at Ravensthorpe. Meanwhile, Kidman Resources/SQM are close to turning the first sod at Earl Grey. Right now, the producing mines export mineral concentrates without any downstream processing, meaning that WA captures only 0.5% of the lithium value stream.



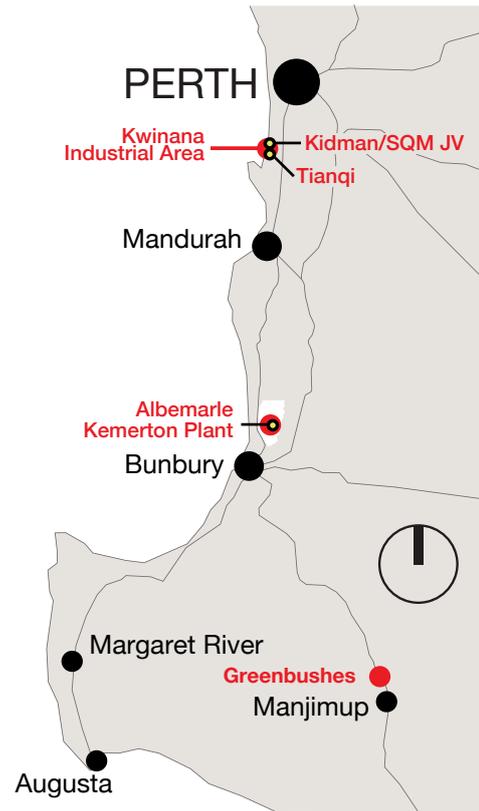
That may all be about to change though, with the creation of an Antipodean 'Lithium Valley'. The plan is for much of the lithium WA produces to migrate to its coastal refineries, where some of the nation's best industrial infrastructure, as well as synergistic businesses, are already *in situ*. One lithium refinery is close to completion, another has been committed to and a third is in the final stages of assessment. It's all happening on the west coast, with the focus on Kwinana, located near the state's capital city, Perth.

The Kwinana Industrial Area, which evolved in the early 1950s, remains one of the most advanced industrial parks in the world – home to petroleum, alumina, nickel and cobalt refining, as well as the production of fertilisers, industrial chemicals, gases and cement; in fact, most of the ingredients necessary to support that Antipodean Lithium Valley.

As with Silicon Valley in the last century, WA is an emerging entrepreneurial hub in its own right. With appropriate infrastructure, logistics and synergistic enterprises already in place, there's a strong parallel with the pre-transistor days of California. Meanwhile, critical mass is building in the form of a thriving local lithium concentrate business, while construction of the world's largest lithium-hydroxide refinery is also underway. What's all-important now is an ecosystem of risk-taking and innovation facilitated by affirmative government policies that encourage investment across the board.

Locally, Regional Development Australia has developed a blueprint for establishing **Lithium Valley in WA**, with the state government setting up a taskforce to facilitate the opportunity. The newly formed Lithium and Energy Materials Industry Consortium, an industry-based group, aims to work with the state in augmenting this once-in-a-generation opportunity.

Unfortunately, the nation's federal government, despite its 'commitment to innovation', is taking the shine off this vision for the future by heralding reductions in R&D benefits for companies developing and advancing technologies in the lithium sphere.



If Lithium Valley can indeed be successfully implemented, WA's stronghold on the primary inputs will provide significant leverage over the rest of the supply chain. In so doing, an environment ripe for the creation of a flourishing downstream processing hub will eventuate, capturing that supply chain, projected to be worth trillions of dollars in the not-too-distant future.

Right now, Australia has the opportunity to net a large proportion of the revenue stream that could flow from a Lithium Valley in the west, a stream that could dwarf the nation's current GDP. What's required is affirmative political will – particularly on the part of the country's federal government – to turn that vision into reality.



(Photo courtesy of New Atlas; credit – pxhidalgo/Depositphotos.)

And finally ... As pointed out previously in this publication, lithium batteries are toxic when chewed or ingested. Given their size and shape, button batteries are a particular risk to small children and animals. Now, **researchers** have found that administering honey quickly and at regular intervals can prevent major damage before the battery can be removed. However, this is not recommended where sepsis is present, if the oesophagus has already been perforated or when an infant is less than a year old. Of course, prevention beats cure, so keep button batteries safely out of reach of those at risk.

Which Perth-based company can help make Lithium Valley a global success?



NOTES

¹ <https://www.businessinsider.com.au/silicon-valley-history-technology-industry-animated-timeline-video-2017-5?r=US&IR=T>

² An OEM (original equipment manufacturer) is traditionally defined as a company the goods of which are used as components in the products of another company, which then sells the finished item to users. The second firm is referred to as a VAR (value-added reseller), which, by augmenting or incorporating features or services, adds value to the original item. A VAR works closely with the OEM, which often customises designs based on the VAR's needs and specifications.

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