



globalvoices

## **A comparative study of innovation cultures in Israel & Australia**

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## GLOBAL VOICES

Global Voices is a non-profit organisation seeking to promote an understanding of and participation in international diplomacy by young Australians.

We do this through regular events and research & development opportunities in Australia, and the coordination of youth delegations to important diplomatic forums abroad.

***Our mission*** is to provide opportunities to young Australians to research, discuss and contribute to foreign policy both at home and abroad.

***Our vision*** is for young Australians to be heard and engaged on the world stage.

## AICC DELEGATION TO ISRAEL

Global Voices partnered with the Australia-Israel Chamber of Commerce to send youth delegates on a high-level delegation to Israel in March 2012.

The delegation was led by two leading Australian corporate and philanthropic leaders: Carolyn Hewson AO (Director of Westpac, Stockland, BT Investment Management and BHP Billiton) and Carol Schwartz AM (Chairman, Our Community and Qualitas Property Partners, Director, Stockland, Yarra Capital Partners and Bank of Melbourne). The weeklong trip to Israel included visits to leading universities and their technology transfer companies and representatives from Israel's Higher Education Board, Israeli Captains of Industry, Chief Scientist and heads of Industry Programs.

The AICC aims to enhance travel between Australia and Israel, to highlight the importance of bi-lateral trade. In particular, a focus on the merit of Australian tourism in Israel is a key component of their mission.

## JUSTIN POWELL

Justin Powell, 20, is currently studying a Bachelor of Arts degree at Monash University with majors in political science and international studies. His interests include Australian political history, as well as international conflict and development – especially Middle Eastern affairs. Originally from country Victoria, Justin has had experience working in local government and the legal industry, having been associated with Bond University Law.

## Introduction

“An investment in knowledge always pays the best interest.”

- Benjamin Franklin

Israel's innovation culture is intrinsic with its economic success. This report provides an analysis of Israeli innovation and submits Israeli ideas that Australia can adapt in developing its own innovation economy. It is comprised of three sections: Part I examines Israel's approach to innovation and industry development and offers a perspective into the cultural and political factors that cultivate it. Part II asserts that despite the cultural differences there are lessons Australia can learn from the Israeli innovation culture, particularly in its cultural conception of economic risk. Part III proposes solar energy as an area where these lessons can be applied.

## Chutzpah: Understanding Israel's Economic Success

‘We should use our imagination more than our memory,’ urged Shimon Peres, Israel's eminent statesman and current President. The quote's context is unclear – Peres has certainly addressed a diverse range of issues since entering public life in 1959 – but he might as well have been speaking on the cusp of the technological boom sometime in the late 1980s. While Israel's economic development has always been strong (led by a need to quickly generate infrastructure and industry following Israel's immigration influx and independence in 1948), global monetary conditions in the late 1970s led the country to experience something of a mild economic crisis. The state's budget was heavily in deficit and inflation had reached triple-digits.<sup>1</sup>

To reinvigorate the economy, Israel's strategy relied partly on conventional political reforms: greater trade liberalisation measures were introduced and competition laws were relaxed. However, more

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<sup>1</sup> Jonathan Nitzan and Shimshon Bichler, *The Global Political Economy of Israel*, 2002, p. 407.

importantly, its approach placed a great deal of faith in the capacity of the Israeli imagination. By cultivating ideas and taking risks – attitudes that will reveal themselves as inherent in Israel's development culture – less than a decade later Israel had emerged as a high-tech and innovation powerhouse. As Joseph Schumpeter opined in 2010, 'over the past two decades Israel has been transformed from a semi-socialist backwater into a high-tech superpower.'<sup>2</sup> Indeed, in his 1990 book *The Competitive Advantage of Nations*, Harvard Business School professor Michael Porter dedicated just one sentence of his 855 page thesis to Israel;<sup>3</sup> today Schumpeter's superlative analysis and the abundance of literature dissecting Israel's success stands as a testament to Peres' philosophy and the brazenness of the Israeli ambition it embodies.

Israel's economic success is remarkable. Today the country registers more start-ups and a larger venture capital industry per capita than anywhere else in the world. It boasts the second highest number of companies listed on the NASDAQ outside the US (behind China)<sup>4</sup> and in 2011 recorded a GDP growth rate of 4.9 per cent – triple the average pace of the 34 advanced economies, yet slower than the heights of around ten per cent which Israel experienced at the turn of the century.<sup>5</sup> It also ranks highly on human development indicators, including 17<sup>th</sup> on the United Nation's Human Development Index (2011).<sup>6</sup>

For a country of only eight million people deprived of natural resources and which exists in a constant state of political hostility (neighbourly antagonism that often overtly calls for its destruction), Israel's success has occurred in the face of seemingly insurmountable challenges. Why,

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<sup>2</sup> Joseph Schumpeter; 'Beyond the Start-Up Nation', *The Economist*, 29 December 2010, reproduced at [http://www.economist.com/node/17796932?story\\_id=17796932](http://www.economist.com/node/17796932?story_id=17796932), accessed 12 April 2012.

<sup>3</sup> Michael Porter; *The Competitive Advantage of Nations*, New York, 1990.

<sup>4</sup> Leon Lazaroff, 'China to Capitalise on Nasdaq Jump with Tech IPOs', *Bloomberg*, 8 May 2012, at <http://www.bloomberg.com/news/2012-05-07/china-to-take-advantage-of-nasdaq-jump-with-tech-ipos-bny-says.html>, accessed 9 May 2012.

<sup>5</sup> Alisa Odenheimer and Gwen Ackerman, 'Israel Punches Above Weight As GDP Beats Developed World', *Bloomberg*, 22 September 2011, at <http://www.bloomberg.com/news/2011-09-21/israel-punches-above-weight-as-gdp-outperforms-developed-world.html>, accessed 19 April 2012.

<sup>6</sup> Human Development Report 2011, Table 1, 'Human Development Index and its components', United Nations, 2011, at [http://hdr.undp.org/en/media/HDR\\_2011\\_EN\\_Table1.pdf](http://hdr.undp.org/en/media/HDR_2011_EN_Table1.pdf), accessed 19 April 2012.

for example, does it produce ‘more start-up companies than large, peaceful and stable nations like Japan, China, India, Korea, Canada and the United Kingdom?’<sup>7</sup> Understanding how this success has occurred is critical to considering ways in which Israeli innovation schemes can be applied in other nations – including Australia. Possible explanations can be found in a number of theories advanced by academic, business and political figures.

Consistently, a number of themes can be found at the crux of these theories. They concern relationships between sectors of the economy and cultural factors that reflect Jewish culture, strong nationalism and the country’s perilous political state.

Recently a great deal of attention has been paid to the articulation of these ideas as made by Dan Senor and Saul Singer in *Start-Up Nation* (2009). As a study of the Israeli innovation and start-up phenomenon, *Start-Up Nation* has quickly become something of a definitive analysis for many Israelis. It’s easy to understand why; Senor and Singer’s flattering contention is certainly compelling. Labelling the possible explanation that ‘Jews are smart’ as overly simplistic and deceptive, they instead offer a theory that emphasises Porter’s Cluster Theory.<sup>8</sup> Porter defines this theory in 1998:

‘Clusters are geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition.’<sup>9</sup>

According to Senor and Singer, Israel’s primary ‘cluster’ is its high tech industry. From this cluster four key sectors stem that enable innovation and economic development: academia, business, government and the military.

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<sup>7</sup> Dan Senor and Saul Singer; *Start-Up Nation*, New York, 2009.

<sup>8</sup> *Ibid.*

<sup>9</sup> Michael E. Porter; ‘Clusters and the New Economics of Competition’, *Harvard Business Review*, Vol. 76(6), November/December 1998, pp. 77-90, p. 78.

This cluster, however, should not be perceived as exclusively high-tech. The close relationships between Israeli economic sectors allow ideas to cross-pollinate a diverse range of industries. Whilst high-tech may be, as Senor and Singer suggest, the epicentre of Israel's cluster, its operation canvasses innovation that impacts the entire economy. For example, recycled water technology developed by Israeli engineers and chemists impacts the agricultural sector.<sup>10</sup> Even ideas that don't originate in the cluster's epicentre – such as programs geared towards social development – can gain traction and appropriation in other sectors of the economy due to the strong cross-sector relationships.

Each of Senor and Singer's four enabling sectors will now be addressed.

The academic sector: Israeli universities and research institutions are world class – not only in their scientific output, but also in their ability to engage business and commercialise their discoveries. The Weizmann Institute pioneered this system in 1959 through the establishment of its research commercialisation and marketing arm, Yeda.<sup>11</sup> Today Weizmann, although small in enrolment terms, generates more income from licence fees and royalties than any other higher education institution globally.<sup>12</sup> This model has been replicated by other Israeli universities (notably the Hebrew University of Jerusalem) and it highlights the cyclical role of the cluster in driving innovation: science benefits business, which, through royalties, feeds money back into the research apparatus for the development of new ideas.

This relationship is of key importance. It underscores the notion that Israel is not just developing innovation for the sake of scientific integrity, but with the clear intention for enterprise (and other sectors by association – be they royalties to the innovator or taxes to the state) to profit from it in

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<sup>10</sup> Melanie Lidman, 'Wastewater Wonders', *The Jerusalem Post Magazine*, 8 June 2010, at <<http://www.jpost.com/Magazine/Features/Article.aspx?id=183787>>, accessed 20 April 2012.

<sup>11</sup> Yeda Research and Development Company Pty. Ltd., The Weizmann Institute of Science, at <<http://www.yedarnd.com/>> accessed 19 April 2012.

<sup>12</sup> Richard Larkins, *Ancora Imparo*, Monash University, June 2006, at <<http://adm.monash.edu/records-archives/archives/memo-archive/2004-2007/stories/20060607/ancora-imparo.html>>, accessed 19 April 2012.

the free market. Essentially, Israel is using research as a platform to grow its economy. This ambition is certainly not unique to Israel, but the combination of circumstances and attitudes enable greater success in achieving economic growth than anyone else, in terms of sheer numbers. Central to this is the closeness of business to research: according to OECD estimates, Israel spent 4.2 per cent of its GDP on civilian research and development (R&D) in 2011 – the most of any country per capita. It is significant to note is that nearly 80 per cent of this support came directly from business, rather than from the Israeli government via grants or from research institutes through bursaries.<sup>13</sup>

However, it would be remiss to imply that the Israeli government plays a small role in R&D and innovation. Rather, this statistic suggests that the capacity and willingness of Israeli private enterprise to invest in innovation is very high and that the government's role in the innovation cluster is that of an economic advocate and regulator – particularly through the Chief Scientist. The high level of private investment means that the Israeli government is not required to assume the dominant funding role driving innovation, allowing it to focus its energies on connecting businesses to ideas.

A key example of this advocacy is the establishment of the Yozma program in 1993 which offered tax incentives to foreign investments in Israeli. In its initial stages, the Israeli government promised to double any investment with state funds. Consequently, Israel's annual venture capital outlays rose nearly 60 fold between 1991 and 2000 – most of it private.<sup>14</sup> Although Israeli politics is far from stable with the Knesset having seen a revolving door of governing parties in recent times, there remains a bipartisan cultural commitment to this phenomenon. The often very personal passion that underscores many Israeli politicians' advocacy for domestic and foreign investment exemplifies this.

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<sup>13</sup> 'R&D Spending', *The Economist*, 1 October 2011, at <<http://www.economist.com/node/21531002>>, accessed 19 April 2012.

<sup>14</sup> George Gilder; 'Silicon Israel', *City Journal*, Vol. 19, No. 3, 2009, at <[http://www.city-journal.org/2009/19\\_3\\_jewish-capitalism.html](http://www.city-journal.org/2009/19_3_jewish-capitalism.html)>, accessed 1 June 2012.

Indeed, Senor and Singer devote the first chapter of *Start-Up Nation* to recounting Peres' steadfast support for Shai Agassi's Better Place scheme – even in the face of derision.<sup>15</sup>

The third supporting factor is the military. National service in the Israeli Defence Force (IDF) is compulsory for Israelis and the military has a strong entrepreneurial bent: units are actively engaged in problem solving and developing practical ideas that seek to improve military standards or the wider community. The intensity of this training is a valuable influence on Israeli innovation. The IDF cultivates a start-up and analytical culture that can – and evidently does – endure in the skills sets of many Israelis.<sup>16</sup> It is through IDF service that many business relationships are made and through the ongoing reserve duty that they are maintained. It is a concept that further emphasises the interconnectedness of the Israeli economy.<sup>17</sup>

Each of these enabling sectors point towards the existence of a fundamental culture that is persuasive in understanding why the Israeli innovation economy is as successful as it is. The cluster theory is useful in explaining how the system works, but it is essentially an outcome of the culture that has created it. It poses the question: what is it about the Israeli culture that has driven the successful development of its cluster?

One reason is elementary; Israel is a geographically small state and thus people and industry are naturally close. An interconnected cluster is easy – or at least easier – to develop when its components are right next door. Israel's geography also underscores its success in building commercial innovations that have a global focus. The small size of Israel's consumer market means that entrepreneurialism and commercial innovation tend to skew towards ideas that chase international interest. The 'think global' attitude is emphasised by the growth of Israel's high-tech industry, where innovative start-ups focusing on data applications have flourished with international

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<sup>15</sup> Dan Senor and Saul Singer; *Start-Up Nation*, 2009, pp. 1-11.

<sup>16</sup> 'MBAs are for wusses', *The Economist*, 26 August 2010, at <<http://www.economist.com/node/16892040>>, accessed 19 April 2012.

<sup>17</sup> Dan Senor and Saul Singer; *Start-Up Nation*, 2009.



support.<sup>18</sup> According to the Israeli government, today there are 70 active venture capital funds with bases in Israel, but further 220 international groups who invest in Israeli innovations.<sup>19</sup>

The second explanation echoes this attitude by reflecting Israel's turbulent history and its approach to 'risk'. Israelis exist and innovate in a state perennially on the brink of war, where security cannot be taken for granted. In this context, the risk involved in investing in an unproven idea seems somewhat trivial. This is especially so when the options for economic growth are limited. Israel is a country with scarce natural resources and limited opportunities for integration with its neighbours. While it is easy to romanticise Israel's innovation culture as something that feeds the national intellect, commercialising new ideas to suit its unique circumstances has been foremost about its survival.

Ultimately, it is the success with which Israel has managed to turn this survival into prosperity that is remarkable. While Senor and Singer are quick to dismiss the simple justification that 'Jews are smart', it is an inescapable factor. The combination of a traditional Jewish culture that promotes, as Peres claims, 'dissatisfaction' with an uncertain political existence is economically explosive.<sup>20</sup> Israel is good at innovation because it *is* an innovation. Ari Applbaum argues that if Zionism was a business plan, 'then Israel is its equally unimaginable successful outcome', characterised by all the brazenness of Israeli ambition and risk taking inherent in its culture.<sup>21</sup>

The uniqueness of the Israeli ethos can be appropriately captured in a distinctly Jewish term. The Yiddish 'chutzpah', derived from Hebrew and meaning insolence or audacity, has historically drawn

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<sup>18</sup> Tobias Buck, 'Israel's army of tech start-ups', *Financial Times*, 30 November 2011, at <[http://www.ft.com/intl/cms/s/d45b0c5c-1a83-11e1-ae4e-00144feabdc0,Authorised=false.html?\\_i\\_location=http%3A%2F%2Fwww.ft.com%2Fcms%2Fs%2F0%2Fd45b0c5c-1a83-11e1-ae4e-00144feabdc0.html&\\_i\\_referer=#axzz1wvETATSD](http://www.ft.com/intl/cms/s/d45b0c5c-1a83-11e1-ae4e-00144feabdc0,Authorised=false.html?_i_location=http%3A%2F%2Fwww.ft.com%2Fcms%2Fs%2F0%2Fd45b0c5c-1a83-11e1-ae4e-00144feabdc0.html&_i_referer=#axzz1wvETATSD)>, accessed 30 May 2012.

<sup>19</sup> *Venture Capital in Israel*, Invest in Israel, 2012, at <<http://www.investinisrael.gov.il/NR/exeres/A19A138D-87A7-416B-8D62-1C968E035E13.htm>>, accessed 31 May 2012.

<sup>20</sup> Simon Peres; in Dan Senor and Saul Singer, *Start-Up Nation*, 2009.

<sup>21</sup> Ari Applbaum, 'Beyond Clusters: Review of Dan Senor and Saul Singer', *The David Project*, December 2009, at <[http://www.thedavidproject.org/index.php?option=com\\_content&view=article&id=253:david-project-perspectives-issue-3&catid=77:david-project-perspectives](http://www.thedavidproject.org/index.php?option=com_content&view=article&id=253:david-project-perspectives-issue-3&catid=77:david-project-perspectives)>, accessed 20 April 2012.

negative connotations. The classic legal definition of the term seems to support this, defining chutzpah as ‘when a man kills both his parents and begs the court for mercy.’<sup>22</sup> In Israel’s context, it is hard to think of a better way to describe the sort of unconventional ambition philosophies like Peres’ – which prioritise the idea over the experience – embody. Many cultures perceive risk with negative connotations. With chutzpah, a risk is an opportunity worth exploring.

### Australia and Israel: Comparisons and Lessons

Given the cultural roots of Israel’s success, is it possible to mimic or apply aspects of its innovation economy in other nations, such as Australia?

Australia and Israel are both ‘isolated’ from their neighbours (albeit for very different reasons) and can be considered young societies, inhabiting ancient lands. In terms of climate, the two states enjoy a lot of sun and apparently not enough water where it is needed; and with relatively small populations, both need to think global when commercialising ideas. Significantly, they are both successful economies. Australia and Israel rank within the top 20 on the UN Human Development Index and are expected to register GDP growth at rates of between three and four per cent over the next year.<sup>23,24</sup> Notably, the strength of each respective economy enabled both states to avoid recession, or at least significant economic contraction following the 2008 Global Financial Crisis.

Yet there are also obvious differences. Australia is 376 times larger than Israel and is more decentralised. If the closeness of each of Israel’s economic sectors is integral to the success of its cluster, then due to its size, Australia is naturally disadvantaged. It also lacks the political tension

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<sup>22</sup> Alex Kozinski and Eugene Volokh, ‘Lawsuit, Schmawsuit’, *Yale Law Journal*, Iss. 103, Yale University, 1993, p. 463.

<sup>23</sup> ‘Statement 2: Economic Outlook’, Australian Government, Budget 2011-2012, at <[http://www.budget.gov.au/2011-12/content/bp1/html/bp1\\_bst2-01.htm](http://www.budget.gov.au/2011-12/content/bp1/html/bp1_bst2-01.htm)>, accessed 25 April 2012.

<sup>24</sup> ‘Bank of Israel revises growth forecast upwards’, *Globes*, 16 March 2012, at <<http://www.globes.co.il/serveen/globes/docview.asp?did=1000736620&fid=1725>>, accessed 25 April 2012.

that characterises Israel's existence: there is no national military service to foster entrepreneurialism and leadership, and culturally Australia does not share the same conception of 'risk' as Israel. Without the broader security context and existential history the Israeli approach reflects, an Australian idea of risk is more deeply embedded in consideration for the economic consequences.

This is a notion supported by prominent Australian businesswoman Carolyn Hewson:

"In Australia we don't have that external political pressure or the burning platform that underpins Israel's urgency to survive and succeed. Consequently, in a region of relative economic prosperity there is little reason to embrace significant business risk and indeed failure in business is not tolerated. It is seen as a substantial failure in life rather than being part of the ultimate road to success."

Indeed, it is in examining the makeup of the two economies that the differences are most fundamental. The ongoing health and growth of Australia's economy is commonly attributed to its natural availability of profitable resources. This is something Israel lacks: the total resources sector represents 19 per cent of Australia's GDP yet is conspicuously absent from Israeli breakdowns.<sup>25</sup> With a lower threshold for risk and a strong economy that allays the need to push into new industries, how can Australia's innovation culture be characterised?

From the outset, Leon Kempler, Chairman of the Australia Israel Chamber of Commerce, asserts the need for Australia to embrace innovation:

"Any nation including Australia which does not promote innovation backed by academic excellence within an economic and taxation friendly environment will fall behind the world

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<sup>25</sup> Tim Colebatch; 'Our economic irrationalism', *Sydney Morning Herald*, 13 March 2012, at <http://www.smh.com.au/opinion/politics/our-economic-irrationalism-20120312-1uwde.html>, accessed 15 April 2012.

of nations...The importance of creativity through art, science and knowledge is the key factor which will propel Australia in a positive way to realise its potential.”

Certainly, there is evidence of positive efforts being made by Australians to develop an innovation culture. The South Australian government has been instrumental in establishing a defence sector cluster that fosters innovation and skills applicable to mining, defence, engineering and transport;<sup>26</sup> and in 2010 AU\$168 million was invested nationally in venture projects.<sup>27</sup> There are a string of Australian companies that have capitalised on innovative ideas – Cochlear, Resmed, Pharmaxis and Gekko Systems stand as examples – and the establishment of Commercialisation Australia, supported by federal funding, seeks to further translate ideas into business.<sup>28</sup>

However, it is significant to note the prominence of government in Australian innovation development. Of the AU\$168 million raised in venture capital in 2010, a substantial portion came from government sources – chiefly the federal government’s Innovation Investment Fund.<sup>29</sup> This stands in stark contrast to Israel where US\$796 million was raised in venture capital in 2011 and over 80 per cent of civilian R&D funding came from the private sector.<sup>30</sup>

Clearly government plays a key role in fostering an innovation culture, as it has in Israel through the Yozma program and its continued advocacy, some of it through funding. But just as the involvement of business in the Israeli cluster – its close relationship to research and ideas – is a central factor in Israel’s success, it can be argued that the comparative apprehension of Australia’s private sector is holding its own innovation culture back. Says corporate strategist Patricia Toohey:

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<sup>26</sup> ‘SA to fund new TAFE mining centre’, *Trades Career*, 30 May 2012, at <<http://www.tradescareer.com.au/news/sa-to-fund-new-tafe-mining-centre>>, accessed 4 June 2012.

<sup>27</sup> Katherine Woodthorpe; in Michelle McNamara; ‘An Overview of Australia’s Venture Capital Industry’, *Business Review Australia*, 8 March 2012, at <[http://www.businessreviewaustralia.com/money\\_matters/overview-australia-s-venture-capital-industry](http://www.businessreviewaustralia.com/money_matters/overview-australia-s-venture-capital-industry)>, accessed 31 May 2012.

<sup>28</sup> *Ibid.*

<sup>29</sup> Australian Innovation Fund, AusIndustry, 2012, at <<http://www.ausindustry.gov.au/programs/venture-capital/iif/Pages/default.aspx>>, accessed 1 June 2012.

<sup>30</sup> ‘R&D Spending’, *The Economist*, 1 October 2011.

“I am not sure we are even comfortable with the term 'entrepreneur' as it challenges our conservative nature and perhaps has been used alongside those who have tried and failed rather than those who have tried and failed and tried and failed and then tried again and succeeded!”

So what lessons can Israel offer? Despite the fundamental differences in risk perception and survival, there is potential for Australia to adapt Israeli ideas and grow its innovation culture. Kempler, Hewson and Toohey all offer perspectives that emphasise three areas worthy of consideration: cross-sector relationships, global opportunities and cultural thinking.

Senor and Singer assert Israeli innovation is successful because of its cluster. Where Australia can develop this idea is in establishing closer relationships between research and business aided by government. Kempler points to the role of the Israeli Chief Scientist, typically a figure with an academic background, as a key mediator in this process. He believes that the most successful Israelis in this role have been those with commercialisation and entrepreneurial experience. Leadership and advocacy for cross-sector relationships of the sort Israel’s Chief Scientist provides would assist Australian innovators connect their ideas to business.

The need for such advocacy is particularly evident when analysing the commercialisation processes of Australia’s research institutions. The country’s chief scientific research organisation, the CSIRO, has had a turbulent history with commercialisation despite a number of superlative discoveries. Business has criticised CSIRO dealings as overwhelmingly bureaucratic and its funding structure, where up to 90 per cent is sourced from government, indicates that there is a wealth of ideas that are not reaching markets.<sup>31</sup>

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<sup>31</sup> Ian Townsend, ‘Concerns raised over commercialised CSIRO’, *ABC News* 14 August 2010, at <<http://www.abc.net.au/news/2010-08-14/concerns-raised-over-commercialised-csiro/943764>>, accessed 31 May 2012.

“When the research is ready for commercialisation, most of it will go offshore. The government must fund late development if it is to retain the major benefit for the nation.

The later stage may be more expensive but the risk is reduced.”

The success of the Yozma program in Israel emphasises government’s role in encouraging innovative investment. But while government is crucial in connecting innovation sectors, Toohey states that it is ultimately business – free from Australia’s short-term political focus and the inevitabilities of bureaucracy – that needs to take up the challenge to invest.

“It is most likely better to occur from the commercial sector - where there are different accountabilities and different processes for making things happen... if academia can be loosely considered as helping to identify problems, seek to understand those problems and offer alternatives that can deliver change, imagine the potential if that is combined with the expertise of business in translating ideas into reality.”

It seems we only need look to Israel to see just what that potential could look like.

The second consideration is the need to think globally when commercialising ideas. Says Kempler:

“Israel on the innovative level is collaborating at all levels in Asia. Australia needs to understand that we are part of Asia and that Europe is no longer such a significant relationship. We need to benchmark against our neighbours in what is becoming a very competitive world.”

Hewson supports the need for Australians to think globally “from day one” rather than consign thinking to the limitations of the local market. Israel’s success in pitching ideas globally and attracting foreign investment stands as a testament to the potential this approach offers. Australia’s

proximity to the burgeoning markets of the Asia-Pacific region further emphasise the global innovation opportunities at its disposal.

Most importantly, however, Israel's innovation culture should inspire Australia to rethink its conception of risk. The prosperity of Australia's economy, secured by a strong resources industry, should not foster complacency towards developing ideas that seek to establish and grow new sectors. States Toohey:

“The big picture is really about celebrating innovation, proactively looking for talented individuals and nurturing their ambitions through idea to start up.”

Embracing ideas and entrepreneurialism and understanding failure as a lesson rather than a mistake would enable Australia's innovation culture to blossom. Israel's successful innovation economy may be rooted in survival, but Australia – even with its prosperity – should observe the Israeli experience and recognise that it's a process worth pursuing. Withchutzpah, Australia can further conflate intellectual and economic growth

### **An Innovation Case Study: Solar Power**

A key area where Australia can learn from Israel to develop new sectors of its economy is in energy innovation. Israel's status as a world leader in renewable energy – chiefly solar power – is well known. In the 1950s, Israeli engineer Levi Yissar developed a solar water heater to address an energy shortage spurred by the influx of immigrants to Israel.<sup>32</sup> By the 1970s Oil Crisis, the need to develop non-fossil fuel reliant means of energy had become apparent. Physicist Harry Zvi Tabor, brought to

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<sup>32</sup> John Bacher, *Petrotyranny*, Toronto, 2000, p. 70.

Israel from the UK shortly after its foundation by Prime Minister David Ben-Gurion, developed the prototype for a type of solar heater, which is now used in 90 per cent of Israeli homes.<sup>33</sup>

With few stable oil and resource supplies from neighbouring states, Professor David Faiman of Ben-Gurion University contends that finding and developing new ways to power Israel is a high priority. In addition to the proliferation of home solar heating, Israel aims to have 10 per cent of its energy derived from renewable sources by 2020.<sup>34</sup> This program is widely supported in the commercial sphere: Israeli Power Company Avara plans to build 50 commercial solar plants in the Negev region by 2014.<sup>35</sup>

The similarities between the Israeli and Australian climates point to an area where Australia can learn from the Israeli process and where collaboration can occur. Like Israel, the Australian interior, with its abundance of sunlight, is optimal for solar power innovation. Indeed, Australia's recent efforts to encourage uptake of domestic solar water heating systems echo the Israeli process of 30 years earlier. This contrast highlights the dilemma that has driven the Israeli innovation process: the need to develop new technology in the absence of stable access to existing means. Australia, with large coal and gas deposits, has never found itself in a position where it has *had* to innovate for energy; but the global trend away from fossil fuel sourced power towards 'sustainable' and 'green' technology – such as solar – has bestowed enormous opportunity on states that are naturally geared towards developing these new technologies.<sup>36</sup>

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<sup>33</sup> Neal Sandler, 'At the Zenith of Solar Energy', *Bloomberg Businessweek*, 26 March 2008, at <[http://www.businessweek.com/globalbiz/content/mar2008/gb20080326\\_485582.htm?chan=globalbiz\\_europe+index+page\\_companies](http://www.businessweek.com/globalbiz/content/mar2008/gb20080326_485582.htm?chan=globalbiz_europe+index+page_companies)>, accessed 25 April 2012.

<sup>34</sup> David Faiman, 'Solar Energy in Israel', *The Jewish Virtual Library*, 2012, at <<http://www.jewishvirtuallibrary.org/jsource/Environment/Solar.html>>, accessed 25 April 2012.

<sup>35</sup> Maurice Picow, 'Avara Power to "Electrify" the Negev Desert After Aigning 15 Solar Energy Deals', *Green Prophet*, 9 February 2010, at <<http://www.greenprophet.com/2010/02/arava-solar-deals/>>, accessed 25 April 2012.

<sup>36</sup> 'Huge renewable energy opportunities for Australia', *Energy Matters*, 31 May 2008, at <[http://www.energymatters.com.au/index.php?main\\_page=news\\_article&article\\_id=119](http://www.energymatters.com.au/index.php?main_page=news_article&article_id=119)>, accessed 2 June 2012.



Ignited by an energy shortage, Israel's solar innovation industry was about increasing the status quo. Australia's should be about improving it. Certainly, Australian innovation in the solar industry is occurring: many Australian research institutes are deeply involved in developing new types of solar technology, including the central creation of solar cells capable of converting the sun's rays into more intense energy.<sup>37</sup> Where Israel offers key lessons is in its experience commercialising these concepts and developing them as a mass energy source – not just as a supplement to fossil fuel power, but as a replacement.

One project, Zenith Solar, involved the construction of a solar power plant at a kibbutz east of Ashdod using an innovative type of solar panel capable of absorbing roughly five times more sunlight than traditional panels. Although the project is a product of innovation and R&D – CEO Roy Segev claims Zenith Solar's ultimate aim is to make solar energy cost effective with fossil fuel – its commercial application powering a kibbutz means that it's as much about meeting energy needs as it is testing new ideas.

Zenith, a private enterprise, is a start-up that bought the rights to its solar technology from Ben-Gurion University and Germany's Fraunhofer Institute. It established itself by raising private venture capital and operates without government funding. This example underscores the culture inherent in the Israeli innovation economy, where business identifies an opportunity to commercialise a technology and create a new industry rather than simply compete with existing models. Faiman articulates the opportunity solar power offers to Israel:

“The world is consuming the energy equivalent of 200 million barrels of oil a day...if we can reduce that, the environmental footprint will be enormous.... And in 20 years, if we in Israel

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<sup>37</sup> Olivia Coldrey, *Financing Solar Energy Through the Innovation Cycle* Australian Solar Institute, 28 February 2012, at <[http://www.australiansolarinstitute.com.au/SiteFiles/australiansolarinstitutecomau/ASI\\_Presentation\\_5th\\_Annual\\_Queensland\\_Energy\\_Conference\\_\(28\\_February\\_2012\).pdf](http://www.australiansolarinstitute.com.au/SiteFiles/australiansolarinstitutecomau/ASI_Presentation_5th_Annual_Queensland_Energy_Conference_(28_February_2012).pdf)>, accessed 25 April 2012.

move in this direction, 60 to 70 percent of our electricity needs will not cost anything, and at that stage, what you pay will be based on the operation and maintenance costs.”<sup>38</sup>

Australian business should seize on similar ideas and use its natural advantage to test and develop new solar technologies. Australia’s security of fossil-fuel derived energy allows it to have the best of both worlds in developing a replacement for while reaping the benefits of an energy source that, according to Shimon Peres, no one seems to want but isn’t ready to give up.<sup>39</sup> The majority of solar innovation developed in Australia is conducted, like Israel, in research institutes – chiefly the CSIRO. But these establishments lack the zeal and the ambition to commercialise ideas through existing or new businesses that Israel has, and the connectedness with business.<sup>40</sup> Without the interest of private investment, ideas are shelved and momentum is stymied. Potential is lost.

Israel offers much insight in establishing and developing solar power. It’s an area where collaboration between research and business can produce innovative outcomes, and where technology can have global applications. Ultimately, this case study highlights that its most useful lesson is ultimately the central idea that innovation is something that should be embraced by the business for the sake economic and intellectual development.

## Conclusion

The Israeli innovation culture is deeply rooted in its unique cultural characteristics. Yet, at the core of many Israeli innovations lies a necessity to do something different, for the sake of adaptation. Australia too is adapting, and in many of these areas Israel provides lessons and offers world leading technology that Australia can seize and improve upon. The Australia-Israel relationship, especially

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<sup>38</sup> David Faiman; quoted in Ilene Prusher; ‘In Israel, solar power that won’t need subsidies’, *The Christian Science Monitor* 28 April 2009, at <<http://www.csmonitor.com/Innovation/Energy/2009/0428/in-israel-solar-power-that-wont-need-subsidies>>, accessed 2 June 2012.

<sup>39</sup> Shimon Peres in Senor and Singer, *Start-Up Nation*, 2009, p. 5.

<sup>40</sup> Ian Townsend; ‘Concerns raised over commercialised CSIRO’, *ABC News*, 14 August 2010.

through research and corporate partnerships, can play the central role in fostering a joint innovation culture. Collaborating with the sometimes unstable and ambitious Israel may appear to be something of a risk for Australians, but ultimately we too could probably do with a bit of chutzpah.

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