

Queensland Connects

ACCELERATING QUEENSLAND'S
INNOVATION-DRIVEN ENTREPRENEURS

THE STRATEGIC FRAMEWORK



VISION

To be the globally leading inclusive ecosystem for natural resource management innovation driven entrepreneurship



OBJECTIVE

Conduct place-based experimental initiatives for fostering collaboration and IDE growth across and within Qld regions



PURPOSE

Transform Qld into a globally leading hub for IDEs by optimising and leveraging our strengths in sectors linked to Qld's natural resources



SCOPE

Inclusive of the whole of Qld but focused on our comparative advantage in sectors linked to Qld's natural resources

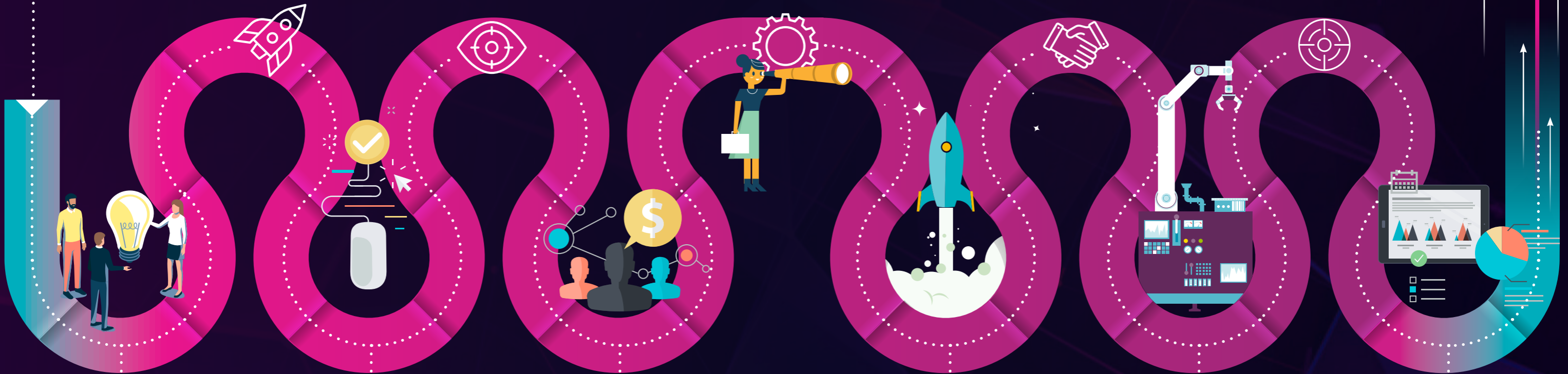


MUST WIN BATTLE

COLLABORATION

ENGAGING THE HEARTS AND MINDS OF ALL QUEENSLAND REGIONS AND STAKEHOLDERS

STRATEGIC INITIATIVES



INITIATE SUB-REAPS

UNLOCK THE VALUE CHAIN FOR STARTUPS

ENHANCE RISK CAPITAL NETWORKS

STARTUP SUPPORT PLATFORM(S)

ADOPT & ADAPT CORE TECHNOLOGIES

DISRUPT INNOVATION & ENTREPRENEURSHIP STATISTICS

MINISTER'S FOREWORD

The Queensland Government understands that through innovation we have the potential to create millions of jobs in industries and companies that do not yet exist. That is why we partnered with Massachusetts Institute of Technology (MIT) in the Regional Entrepreneur Acceleration Program (REAP).

Since 2015, the Queensland Government has invested \$755 million through the Advance Queensland program to back innovators to create jobs.

Advance Queensland has supported 5,200 innovators, leveraged \$670 million in additional investment and supported 16,400 jobs.

Through our partnership with MIT we want to continue to develop and expand our local capacity to plug our innovators and entrepreneurs directly into the ecosystem. We want to provide the support they need to turn great ideas into commercial realities, to scale up and market globally.

In partnership with industry, universities, business and venture capitalists, the Queensland Government will continue to build the state's innovation ecosystem through programs like MIT REAP to support new regional approaches to encourage entrepreneurship and support local jobs.



The Honourable Kate Jones MP
*Minister for Innovation and Tourism Industry Development
Minister for the Commonwealth Games*

A MESSAGE FROM THE QUEENSLAND CHIEF ENTREPRENEUR



The Office of the Queensland Chief Entrepreneur is working towards cementing Queensland's reputation as Australia's startup state. MIT REAP is recognised internationally as an evidence-based practical approach to driving innovation and its decision to rollout its program in Queensland recognises that this state is already a globally recognised place of innovation and entrepreneurship.

Digital platforms are expanding across economies, reshaping the business models of a wide range of industries, from finance and healthcare to media and retail. The communities, governments and companies driving this trend are diverse and disparate. Some are startups, others are giants of the digital economy. Others, still, are traditional firms that are adapting to a more digital world by adopting an active platform and ecosystem strategy.

The work coming out of programs such as MIT REAP is instrumental in providing a framework and platform to further develop the ecosystem, industry sector and ensure that new businesses, innovators and entrepreneurs continue to choose Queensland as a place to do business and test new ideas. Geographically, Queensland has a decentralised population which makes it all the more important to galvanise and strengthen the sector and make strong connections between entrepreneurs around the state, as well as more broadly across Australia and internationally.

Participating in Team Queensland, Cohort 5, and contributing and developing ideas has been an energizing experience, as has working with fellow innovators from the Queensland Government, The Queensland University of Technology, University of Queensland, Redeye Apps, Blue Sky Ventures and Rio Tinto.

I commend the work of this report and all those who participated directly and were connected to MIT REAP and Team Queensland. My hope is that this report sparks the next phase of development for innovation and startup ecosystem in Queensland to truly strengthen the reputation of our state as one renowned for innovation and entrepreneurship.



Leanne Kemp

← Queensland's
Chief Entrepreneur



REFLECTIONS FROM THE TEAM CHAMPION

Innovation and entrepreneurship are critical for a prosperous Queensland. For over two decades, Queensland has invested significantly in building its research and innovation capability.



The Smart State Strategy of the late 1990's and 2000's saw an increase in the state's science research base – especially the establishment of large scale life science research infrastructure and capability. The early years of 2010's saw an emphasis on Queensland's sectoral strengths in resources, agriculture, tourism and construction. With the advent of the Advance Queensland (AQ) program in 2015, the focus shifted to growing an entrepreneurial innovation ecosystem underpinned by enhanced collaboration between entrepreneurs, industry and universities.

While the AQ program has galvanised Queensland's entrepreneurial ecosystem, there is still work to be done to transform the state into a global innovation hub. Channelling the state's entrepreneurial energy into growing a knowledge-intensive ecosystem in sectors in which it has a comparative advantage is a natural next step. However, this requires a rigorous approach to identifying the opportunities, challenges, interventions and tracking of progress.

The Massachusetts Institute of Technology's Regional Entrepreneurship Acceleration Program (MIT REAP) is a two-year program that provides opportunities for regions around the world to engage with MIT in an evidence-based, practical approach to strengthening innovation-driven entrepreneurial (IDE) ecosystems. Each year, the MIT REAP accepts up to eight regional teams to engage in accelerating regional innovation and entrepreneurial ecosystems. Each REAP team consists of five to eight highly influential members representing entrepreneurs, government, corporates, universities and risk capital. Teams have opportunities to interact with the MIT faculty and REAP community to address issues within the existing ecosystem and implement policies and programs to drive change.

Team Queensland enrolled as a part of MIT REAP Cohort 5 in June 2017. The team is represented by the Queensland Government, Queensland University of Technology, the University of Queensland, RedEye Apps (startup), Blue Sky Ventures, Rio Tinto and the Office of the Chief Entrepreneur.

MIT REAP Team Queensland is focused on Innovation Driven Entrepreneurs (IDEs) in Queensland's key mining, agribusiness, and environment sectors to promote sustainable growth and overcome barriers to innovation and knowledge transfer.

This report provides an overview of the key issues for developing innovation-driven entrepreneurship in Queensland that were identified from the evidence based assessment. Team Queensland's work has attempted to extend the REAP framework to ensure that entrepreneurial ecosystem is not just limited to Brisbane but also to Queensland's regional towns – each with their unique comparative advantages. It is our sincere hope that the work undertaken will contribute to Queensland's future economic competitiveness.



Professor Arun Sharma
QUT Deputy Vice-Chancellor

*Team Champion
MIT REAP Team
Queensland Champion*

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Queensland has economic strengths in sectors linked to natural resources, such as mining, tourism and agriculture.



Building from a strong base



QUEENSLAND'S ADVANTAGES

 **5.0m** population

 **20%** of Australia's population

 **AU\$349bn** gross state product

 **6.1%** unemployment

 **2.5x** size of Texas


 **449K** businesses


Queensland's economy is robust with strong institutions, a stable banking sector and a well-developed informal investment sector. Queensland's economic stability reflects the national context, with the Australian economy being in its 28th year of uninterrupted growth¹.


Queensland is a high wage economy and its unemployment rate has remained steady in recent years. Queenslanders work 0.8 hours more each week than the national average, but have below-average labour productivity per hour worked.

The state has strong policies for trade, taxation, accountability, public participation, rights and freedom, as well as economic strengths in sectors linked to natural resources, such as mining, tourism and agriculture. Queensland's key export commodities are coal, travel and beef.

Reflecting its economic strengths, Queensland has more full-time jobs in mining and construction, and more part-time jobs in accommodation or food services, and education or training than Australia as a whole. Queensland has comparably less full-time jobs in professional, scientific and technical (PST) services.

 **MINING & RESOURCES**
11.8% of Queensland's economy
61,000 jobs
(2.5% of Queensland jobs)

 **TOURISM**
3.9% of Queensland's economy
138,000 jobs
(5.8% of Queensland jobs)

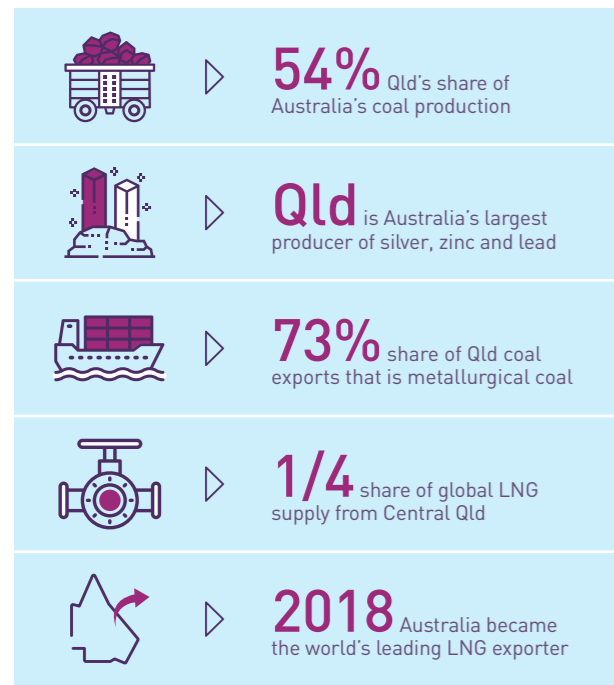
 **AGRIBUSINESS**
3.5% of Queensland's economy
63,000 jobs
(2.5% of Queensland jobs)



QUEENSLAND'S TOP 3 EXPORTS (AU)²

\$33.2bn coal **\$10.4bn** travel **\$4.5bn** beef

Mining, Oil and Gas



There are over 800 mining equipment, technology and services (METS) companies in Queensland³ employing 20,000 people, generating \$7 billion in revenue and \$2.5 billion in value add to the Queensland economy.

Queensland METS businesses view international growth and export expansion as a key opportunity. Compared with the Australian average, more Queensland METS companies are involved in exporting activities (82% compared with 66% for Australia).

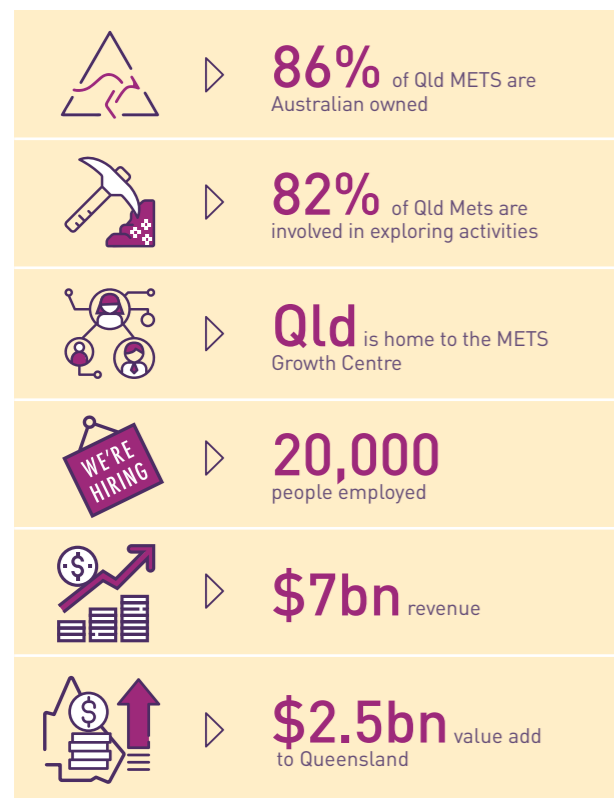
A higher proportion of Queensland METS are operating as sub-contractors to tier 1(s) in Queensland (48% compared with 30% overall in Australia).

While only 19% of METS head offices are in Queensland, 32% of METS companies report undertaking business activities in Queensland.

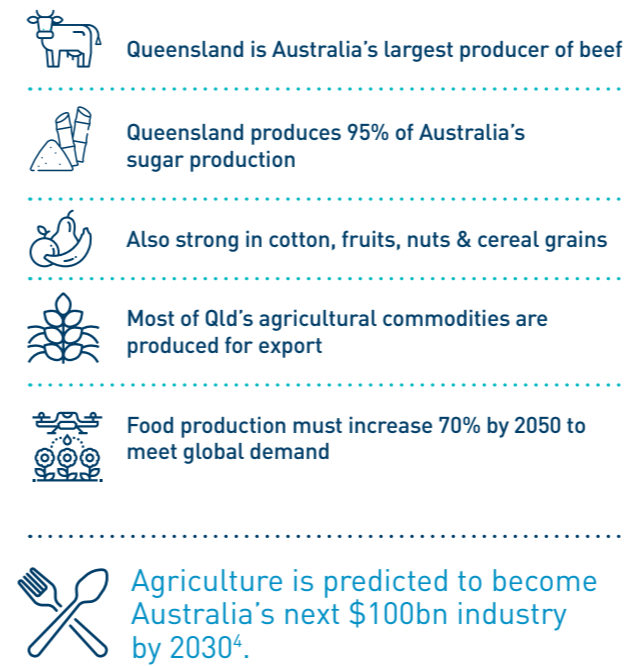
Queensland METS were more likely to be involved with coal than other state/territories (93% compared with 73%). 75% of Queensland METS are engaged in activities outside the mining industry, including oil and gas, infrastructure and construction. Australia has some of the strongest mining-related research institutions in the world.



METS



Agribusiness



More than 30,500 agricultural businesses are based in Queensland. In 2016-17, the gross value of agriculture in Queensland was \$14 billion or 23% of the total gross value of agricultural production in Australia (\$61 billion). The sector is forecast to grow to \$18.5 billion in 2018-19⁵. In 2016-17, the value of Queensland's agriculture and food exports was \$12 billion, representing 18% of the states total overseas exports⁶.

Employment in Queensland's agriculture sector has experienced a long-term decline to 2014, now equivalent to the size of mining employment.

AgTech has grown rapidly in Australia in recent years⁷.

SproutX, Australia's first AgTech accelerator, has been driving growth.

In 2017, Australia entered the top five most active countries in AgTech and the deal count in agrifood tech has increased 76% in 2017 to 32 deals, with 91% being at seed stage.

Australia's producer support is low (1.3% of gross farm receipts) when compared with the United States (US) (9.4%) and Europe the EU (18.9%).



Tourism and the Great Barrier Reef

Tourism is a critical sector for Queensland, directly and indirectly contributing \$12.8 billion and \$25.4 billion, respectively to Gross State Product in 2016-17⁸.

Tourism directly and indirectly contributes 137,500 FTEs and 79,000 FTEs respectively to Queensland's total employment (5.8%).

Queensland is home to the Great Barrier Reef (GBR), arguably the most globally recognisable nature-based tourism attraction and World Heritage Area (WHA). Roughly the same size as Japan (344,400 km²), the GBR is the world's largest coral reef system stretching 2,600 kilometres along the coast of Queensland.

Over the last 30 years, the GBR has lost more than half its coral cover, mainly due to agricultural run-off, outbreaks of crown of thorns starfish, cyclones, and a warming of water temperatures due to climate change⁹.

The GBR is an important asset for Queensland. The GBR draws more than two million tourists each year and supports a sizeable tourism industry in Far North Queensland. The GBR creates around 64,000 jobs and directly and indirectly contributes AU\$6.4 billion to Australia's economy¹⁰.

HOME TO THE WORLD HERITAGE LISTED GREAT BARRIER REEF (GBR)

Majestic in size

- ▶ Spans 2600kms of Qld's coast
- ▶ Formed 6000 years ago
- ▶ Roughly the same size as Japan

Iconic tourism attraction

- ▶ 2.7 million visitors per year
- ▶ 64,000 jobs
- ▶ US \$56bn value as an economic, social and icon asset



QLD'S EMERGING STRENGTHS

- Sustainable tourism
- Marine science technology
- Drones for monitoring and surveillance

STARTUP ECOSYSTEM QUEENSLAND

Queensland is globally well ranked for ease of starting a new business.

For the purposes of this report, and the MIT REAP Panel Survey data, we define a 'startup' as:

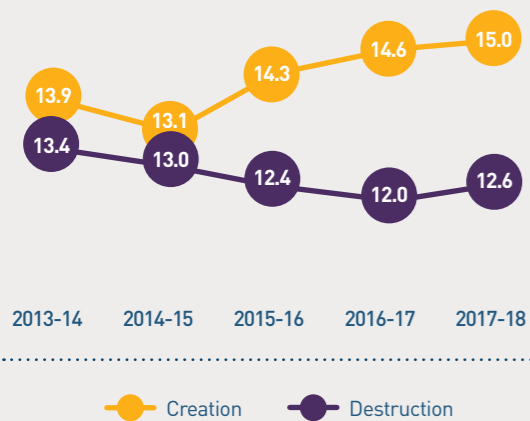
- A new business started in the last five years
- Innovating through technology or new business models
- Exporting either interstate or overseas

Queensland is home to 448,725 registered businesses – 19.4% of all Australian businesses¹¹. Queensland had 67,190 new business entries in 2017-18, with a below national average increase of 5% from 2016-17.

Queensland represents 19.0% of Australia's new business entries in 2017-18. This has fallen from 20.3% in 2013-14, a result of faster growth in New South Wales, Victoria and the Australian Capital Territory, reflecting a growing culture of creating new businesses in Australia. Queensland's business creation rate has been increasing, but destruction rates had been declining until recently¹¹.

Queensland's entrepreneurial and startup climate is moderate, with an overall increase in business creation and decrease in business destruction. Home to almost

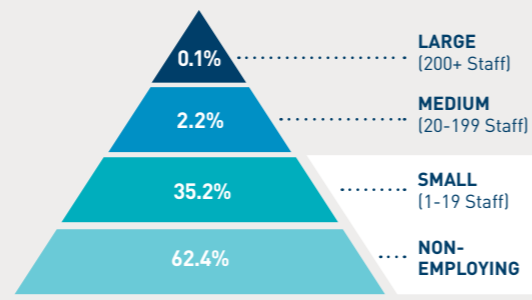
BUSINESS CREATION AND DESTRUCTION RATES FOR QLD (%)



20% of Australian new businesses, most are small-medium enterprises.

Most Queensland businesses are small to medium sized enterprises (SMEs). Compared with Australia, Queensland has more non-employing businesses and slightly fewer small businesses.

QUEENSLAND BUSINESS BY NUMBER OF STAFF



98% of all Queensland businesses are small business

RESULTS FROM THE GLOBAL ENTREPRENEURSHIP MONITOR — AUSTRALIA 2017¹²

52.3% of Australian adults believe they have the skills and knowledge to start a business (global average is 43.8%).

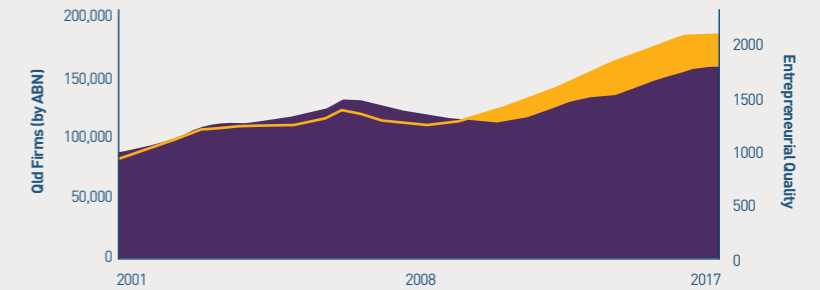
12.2% of Australian adults were actively starting and running a new business in 2017.

Australia's entrepreneurial activity is moderate amongst developed economies, but Australia struggles to scale startups.



QLD FIRM ENTRIES (BY ABN)

- Quantity of Qld Firm Entries (by ABN)
- Quality of Qld Firm Entries Index



Critically, the entrepreneurial quality of new Queensland firms has been increasing¹³. Collectively, the higher quality firms combined with the lower destruction rate suggests more resilient businesses are being created.

Queensland performs well in terms of annual business entries per 10,000 residents, due to strong performance from regional Queensland.

There are varying reports on the number of 'startups' in Queensland, a result of both definitional and measurement errors.

QUEENSLAND STARTUP REPORTS

MIT REAP Panel Survey (2018)	▶ 20% of new businesses established in the last five years in Queensland met the criteria to be classed as startups. This equates to an estimated 55,000-65,000 startups in Queensland
Startup Muster (2018)	▶ 1,617 identified as a startup founder. ▶ 19.7% were based in Queensland (around 319 founders)
2thinknow (2017)	▶ 535 startups in Greater Brisbane ▶ 100 in the regional Queensland at the end of June 2017
Markham, Kruger and Cacioppe (2016)	▶ 83+ in regional Queensland, mainly based in Cairns, Toowoomba and Townsville ▶ 87% of regional Queensland Founders being male
Cacioppe (2015)	▶ Queensland's tech hubs have a startup formation rate of 12 per million population ▶ This is below the national average of 20 to 30, and well below US hubs with startup formation rates of 97 and 256
Kruger and Cacioppe (2014)	▶ 226+ startups ▶ 500+ founders in South East Queensland

Compared with other business owners, innovation-driven entrepreneurs (IDE) and their businesses are¹⁴:

- ▶ Usually started by males (78%), with extensive industry knowledge and prior experience
- ▶ Skip ideation and move along the growth stages more quickly
- ▶ Are more likely to have intellectual property
- ▶ Tend to be based in Brisbane and the Gold Coast
- ▶ Focus more on selling to farmers, and less on consumers and tourists
- ▶ Only 14% believed they are involved in the entrepreneurial ecosystem
- ▶ Tend to believe they are being supported
- ▶ More likely to access personal credit cards, venture capital and crowdfunding
- ▶ More likely to be risk-takers and early adopters of digital technologies
- ▶ Tend to be more likely to experiment, adopt technology, and problem solve
- ▶ Are likely to value outsourcing of non-core capabilities
- ▶ Are flexible businesses with high error tolerance and the capacity to learn from experience, rather than follow rules
- ▶ More likely to be planning to invest in their businesses and new technology over the next 12 months
- ▶ More likely to be aiming to expand and export interstate or overseas, or to purchase new land, plant equipment or fixed infrastructure over the next 12 months.

The State of Innovation-Driven Entrepreneurship in Queensland

Queensland is on the right track with an emerging startup ecosystem, 12 regional innovation hubs and a willingness to engage across the state.

The state government's Advance Queensland (AQ) program is making significant and sustained R&D investments to develop IDEs.



80% of stakeholders believe that Queensland's entrepreneurial ecosystem is in the early stages of development and still emerging^{17,14}. Yet Queensland is gaining a reputation for being a 'startup state'.

"We have come a long way in 3 years of AQ" [SR206]

AS AT 30 JUNE 2019, THE QUEENSLAND GOVERNMENT HAS COMMITTED



\$503 million to back over
5,200 innovators. Their projects will drive over
16,400 jobs.

Queensland has excellent lifestyle factors that draw and retain entrepreneurs in the state. The Precinct, a flagship startup and innovation hub located in Brisbane's Fortitude Valley, opened in 2017. AQ supports twelve regional hubs across Queensland through the Advancing Regional Innovation Program. Other key initiatives include Ignite Ideas, the Advance Queensland Industry Attraction Fund, QOCE, Investor Pitch Night, the MIT Innovation and Entrepreneurship Bootcamp and Startup Onramp.

Most Queensland universities offer programs that stimulate entrepreneurial activity among students, and the community¹⁵. Over 40 spaces and programs are located outside Brisbane to support entrepreneurial growth.

THE AQ PROGRAM BROADLY AIMS TO:

- 
Inspire
 - ▶ Ignite the innovation spirit of Queenslanders
 - ▶ Inspire the entrepreneurs of the future
 - ▶ Celebrate and support those who have a go
- 
Discover
 - ▶ Attract and retain world-class talent
 - ▶ Enable researchers and industry to solve global challenges in Queensland
 - ▶ Prepare Queenslanders for the jobs of tomorrow
- 
Connect
 - ▶ Build innovation networks
 - ▶ Create global connections
 - ▶ Increase collaboration
- 
Invest
 - ▶ Attract local and global investment to Queensland
 - ▶ Help innovators become market and investment ready
 - ▶ Improve service delivery through innovation
- 
Grow
 - ▶ Harness innovation to create opportunities
 - ▶ Unlock the potential of SME and regions for innovation
 - ▶ Accelerate development of high-growth firms
 - ▶ Government is a lead customer and innovator



Queensland's entrepreneurial ecosystem stakeholders believe that **Queensland is on the right track** and that Queensland government funding and support should "be applauded" [SR154]. They attribute the rapid growth in the Queensland startup community to the AQ investment.

"I'm impressed by the range of government programs and entrepreneurial centres to help small business innovation and startups" [SR229]

However, more can be done to identify startups and bring them into the community. Entrepreneurs want to continue the momentum: "Let's do more of it, faster!" [SR123]. In particular, Queensland's entrepreneurs believed:

- ▶ Queensland has a competitive business environment and businesses need help to develop and maintain cooperative linkages
- ▶ A key obstacle to starting up or growing a business in Queensland is balancing work and family life, followed by a lack of funds/capital
- ▶ Queensland stakeholders provide resources for business development and R&D, but have low levels of engagement and effectiveness in providing support and solutions
- ▶ The stakeholder groups could improve engagement, funding and advice (mentoring, education and connection)
- ▶ Opportunities exist for Queensland's education sector to more effectively develop entrepreneurial skills
- ▶ There is insufficient data to inform business development and growth in Queensland

Stakeholders should proactively establish a decision support system for founders and entrepreneurs to connect with academia and research, risk capital and funding, business and talent; procurement and policies respectively. Key areas for improvements are:

- ▶ Improving access to funding
- ▶ Building the right team
- ▶ Enhancing entrepreneurial education and skills
- ▶ Promoting a risk culture
- ▶ Strengthening ecosystem collaboration
- ▶ Building an inclusive entrepreneurial ecosystem
- ▶ Improving awareness of activities and information
- ▶ Improving ecosystem programs



SUCCESS STORY

wotif

Founded in Brisbane in 2000

Processed 36% of online accommodation sales in AU and 18% in NZ

Introduced new functions, such as weekend-only searches

Listed on the Australian Stock Exchange in 2006

Head 5 offices outside of Australia by 2007

Over 1.9 million bookings per year

Acquired by Expedia in 2014 for AU\$700M

SUCCESS STORY

TANDA



Founded in 2012 by 4 QUT students



First paying customer in 2013



Won 2014 QUTbluebox Innovation Challenge



Participated in a mission to San Francisco in 2014



Hit a milestone of 2 million clock-ins using software in 2015



Received a Knowledge Transfer Partnership grant of A\$43,333 in 2015



Global partnership with Domino's pizza in 2016



110+ employees in 4 countries

EMERGING OPPORTUNITIES

Queensland's diverse climate has yielded a critical mass of climate-linked expertise. Most Queensland universities are above world standard in environmental science.

... "let's become a world leader in environmental science and technology..." [R34]

The state's geography also offers opportunities for innovation to overcome the tyranny of sparsity. High wages, remoteness and extreme conditions have led to the emergence of critical mass in robotics and unmanned aerial vehicles (UAVs).

Queensland is home to the ARC's Australian Centre for Robotic Vision at QUT, CSIRO's Queensland Centre for Advanced Technologies, the newly established Boeing Autonomous Systems Program and Softbank Robotics.

Queensland should benefit from a strong footprint in the newly established Australian Space Agency, offering opportunities for satellite communication/imaging and space robotics.

Opportunities will also arise from the relocation of Australian Defence Force operations to Queensland. Prime contractors with an existing strong presence in Queensland include Boeing Defence Australia, Northrop Grumman, Airbus, Thales, Raytheon, Sikorsky (Lockheed Martin), Rheinmetall and BAE Systems. Defence primes are relevant to sectors linked to natural resources as they build relevant technology platforms.

Queensland is a great place to test ideas. Startups can pilot in a small but robust, sophisticated and accessible domestic market characterized by high incomes, as well as being well-educated, digitally savvy, multi-cultural and well-travelled. Domestic market scale is enabled by integration with Asia through easy access to markets, strong trade agreements, cultural exchanges, tourism and education. Nationally, Australia ranks 19th for domestic market scale.

STAKEHOLDERS SUGGESTED THE FOLLOWING AREAS OF FUTURE FOCUS FOR QUEENSLAND'S ENTREPRENEURIAL ECOSYSTEM:

- ▶ Small businesses ("concentrate on small or micro-businesses" [R50])
- ▶ New-to-market products ("make Queensland the place to launch radically awesome startups - not copycat, derivative or iterative "innovation" businesses." [R108])
- ▶ Procurement ("Queensland Government needs to address their current procurement practices..." [R153])
- ▶ A regional focus ("Ongoing investment to accelerate and support regional startups, ecosystems, mentors and funding" [R175])
- ▶ Supporting scale-ups ("Programs and funding that support scale-ups" [R175])
- ▶ Focus on linking globally ("focused TIQ program and ministerial trade missions to help Queensland startups scale internationally" [R175])
- ▶ Increase ecosystem engagement ("Better engagement with Queensland industry to help solve their problems" [R175])

GRAND CHALLENGES



Cyclical Economic Sectors

Australia's economy has transitioned through one of the most significant mining booms in its history. A result of this unfettered boom has been the crowding out of other industries¹⁶. This has resulted in the call for a more diversified economy¹⁷.

Queensland's entrepreneurs described significant industrial transformation occurring across mining, transportation, agricultural production, manufacturing and warehousing, and retail.

... "the boom has dropped at the moment but it will come back... up North coal mines buy out properties, so you're losing the farming..." [R23]



Sustainable Development

Climate change is a key concern for Queensland stakeholders and entrepreneurs. Entrepreneurs also identified sustainability and environmental management as a key megatrend likely to impact their business over the next 10-20 years.

To address climate change economies will need to adopt sustainability and businesses will be expected to be good corporate citizens. Stakeholders identified an opportunity to innovate and create new industries through sustainability and specific government regulation.

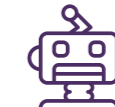
... "Our product is there because there is regulation..." [R9]

Protecting the GBR will be critically important for Queensland. The exportation of Queensland's natural resources has increased substantially resulting in greater levels of shipping and larger vessels traversing the GBR. Legislation around vegetation has been established to deal with agricultural run-off.

... "Within the decade, you'll see that long-term king hit to the Barrier Reef..." [R16]

Queensland entrepreneurs highlighted the need to better manage critical resources like water and energy. Participants envisioned an era of smart sustainable cities.

... "Energy is a real issue and it's an enabler for all business... We'll see significant disruption in that sector..." [R16]



Technological Disruption

... "I've never known a time that change has happened so quickly..." [R15]

The future will see the time spent on physical tasks reduce substantially as automation changes the way we work. The time a worker spends on routine tasks will be reduced by up to two hours per week¹⁸. For Queensland to improve its labour productivity, it will need to adopt automation more quickly than other states.

... "Every factory I go to is putting in more robots and getting rid of more people..." [R1]

... "more and more shops will shut... you've got no parking for starters." [R3]



SUCCESS STORY

clipchamp



Founded in 2012 by a group of QUT staff and their friends



Launched platform in 2014



Won 2015 QUTbluebox Innovation Challenge



Integration partnership with Vimeo in 2016



Raised A\$1.45 million seed round in 2016



Launched online video editor in 2018



3.5+ million users



~20 employees



Changing Nature of Jobs

The increase of automation and the shift from manufacturing to a service economy will require labour market adaption. Workers will have more time to spend on interpersonal, creative, decision-making and information synthesis tasks. Entrepreneurship will become a serious career as new business startups drive jobs growth.

“you’re going to lose jobs to robots, but you counter that by making more jobs to fix the robots... we’re humans, we adapt” [R23]

Politicians will debate the universal wage. As services are increasingly offered online, Australian contractors will be competing with contractors in low wage economies with competitive advantages.

However, jobs will not be completely lost to automation. Instead, the types of jobs available will change. This will lead to changes in Australia’s labour laws as workers demand fewer working hours, greater flexibility and more leisure time.



Societal Transformation

The future will see a liberalisation of people’s perceptions, values, education and health. New and disruptive products are becoming more mainstream as consumers demand cheaper, faster, and easier solutions.

Shifting societal trends will lead to increased social integration and multiculturalism. However, stakeholders also described an increasing social polarisation.

Linked with societal transformation is the changing role of government. At the state level, the Queensland government will need to support, and even lead, the industrial transformation and adaption to megatrends through selective regulation.

Stakeholders also indicated that local government would play a new role in the era of smart sustainable cities.

“...there might be a new role for local government in all of that...” [R16]

Agricultural production processes will change to enable food to be grown closer to cities through new methods like vertical farming.

Stakeholders believe that technology will be an enabler of innovation and IP protection, as it will allow people to more immediately record their ideas, regardless of where they are.

“Business is business... businesses will naturally adapt.” [R9]

Businesses focused on solving problems in the world will always be successful. However, stakeholders feel small businesses may struggle to remain on top of megatrends and that Queensland may not evolve as quickly as the rest of the world.

Stakeholders also cautioned that some technologies could be used for the wrong purposes, such as military robots. They highlighted the need for strong ethics and corporate social responsibility.



KEY ISSUES

“...there’s frustration with the fragmented nature of the innovation ecosystem” [SR12]



Collaboration

Business collaboration on innovation with higher education institutions in Australia is low (4.8% in 2016-17, unchanged from 2014-15), with Australia ranking in the bottom half of OECD countries¹⁹.

Queensland firms (22%) do slightly better than the national average (18%), but collaboration remains a problem, particularly in regional areas^{20,21}.

Even when there is collaboration, universities are incentivised to work with large corporates. Many universities have no precedent for collaboration with SMEs. They have not established any connection or procedures for interaction. As a result, Queensland underperforms globally in translating research into commercial and social benefits.

Many Queensland researchers are based in universities^{26,21}. Co-location of research and businesses facilities, joint appointments, industry champions and the movement of staff between research and industry will help foster fruitful partnerships and the transfer of knowledge.

“I think leveraging university resources, universities as a business and having the public being able to access public resources to start private enterprises that benefit the Australian public... It shouldn’t just be students that get to access these facilities, it should be businesses.” [R2]

Stakeholders indicated that they believe universities do a poor job of interfacing with business and that there is not a high level of trust in establishing effective working relationships. Entrepreneurs find it difficult to navigate, communicate and work with universities.

“I approached QUT to be the university partner on an Advance Queensland project. I rang and spoke to a person who said they’d get someone to contact me and no one did... Maybe I should have followed up better, but I thought, well, if QUT can’t follow up to get employment for post grads, then probably not a good way to start.” [SR94]

Providing tailored university Open Days for entrepreneurs and innovators may assist with businesses engagement. Universities need to have a centralised system for managing enquiries that will foster stronger links and ensure enquiries are responded to. Improving pitching by staff in both businesses and universities could help ideas and projects to be shared more effectively.

There is also a need to increase the connection between buyers (such as corporates, universities and government) and startups. Providing ‘David and Goliath’ events could help bring entrepreneurs and buyers together.

Stakeholders highlighted the need to strengthen collaboration across Queensland as the sheer size of the state causes disconnection across regions and key stakeholder groups. Currently many of the entrepreneurial ecosystem activities are predominantly based in Brisbane or the Gold Coast. Stakeholders were particularly frustrated at how much funding and support goes to South East Queensland (SEQ).

“everybody insists on having head offices in Brisbane...” [R18]

Yet regional areas have many advantages over cities for starting new businesses, with lower cost of living, rent, and expenses, as well as fewer competitors.

Many respondents expressed the desire to see more work undertaken in regional areas and that much needs to be done to develop entrepreneurship in regional Queensland:

“Stakeholders need to engage with the rural and remote communities and explore how to create sustainable business in those regions...” [SR112].

To further develop entrepreneurial mindsets across Queensland regions, entrepreneurial advice (mentoring, education and connection) as well as promotion of activities, programs and information could be more regionally focused. There is also an opportunity to develop city and country exchanges and events to promote awareness and knowledge.

“Regionally, more needs to be done to provide this service to business... I do not know of any programs that are available locally...” [SR162]

Respondents generally described a feeling of exclusion from the ecosystem resulting in underhanded business tactics. Developing an inclusive code of conduct that is shared amongst the ecosystem may assist to overcome these issues.

“I found the backstabbing and nastiness/lack of integrity of other businesses and entrepreneurs to be heartbreaking. Both sexism and ageism and just the general white male culture at all levels” [SR14]

A key challenge is the timing, affordability, location and inclusiveness of ecosystem events. A commonly described aspect of segregation was around tech versus other startups.

“...the focus is very much on tech startups. Even though the spiel was to provide mentoring and community, I feel that there is separation...” [SR101]

Communications Infrastructure

Australia ranks 59th for fixed broadband and 6th for mobile broadband speeds globally.

Australia is not maintaining its performance in communication infrastructure. In some regions there is inferior high-speed internet and mobile phone coverage. High quality, high speed, reliable and cost-effective communications infrastructure is critical for new venture development.



88% of Australians have a smartphone (as of 2017)²²
560m collective glances

"Not have internet dropping out, not have phone systems struggling to work with NBN..." [R18]

IN 2016 QUEENSLAND HAD²³:

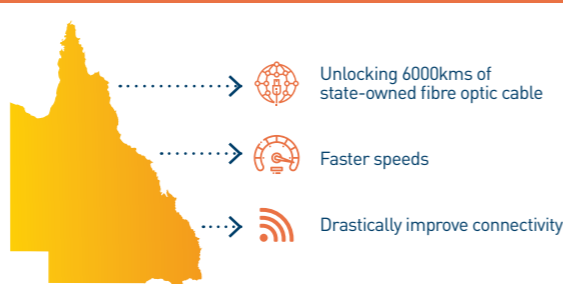
- 3.8 million Internet users
- 78.9% of homes had an Internet connection
- 85% of all individuals have access to the internet
- 78% of businesses access to the internet

Most Queenslanders are digitally connected and make everyday use of digital services for a variety of purposes. But penetration of digital technologies remains relatively low in agriculture, healthcare, and mining. Indeed, Queensland entrepreneurs identified inferior internet and mobile phone coverage is a key barrier to starting up or growing a business in Queensland.

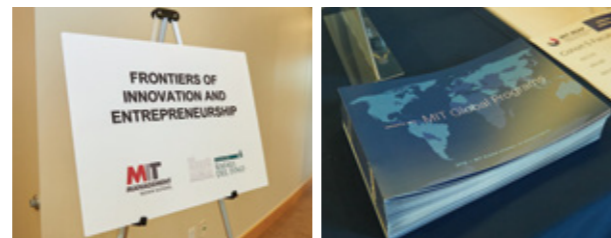
"We're hamstrung by the lack of access to reliable and affordable broadband due to operating in a regional area. This is a core service that we rely on to operate successfully and enable us to grow." [R203]

Stakeholders indicated that Queensland is losing competitive advantage due to communications infrastructure and that there is a critical need for access to faster, cheaper and more reliable internet and mobile phone coverage.

Fibre Co Queensland Government establishing a new state-owned entity



A large sparse landmass leads to disconnection



The Queensland Government's Procurement Policy currently centres on: PRINCIPLES OF QUEENSLAND GOVERNMENT PROCUREMENT



- Value for money (primary principle)
- Advancement of economic, environmental and social objectives
- Integrity, probity and accountability
- Leaders in procurement practice
- Working together to achieve outcomes
- Governance and planning



Procurement

Australia's government procurement of advanced technology products sits at 3.3, below the global median of 3.4 in 2017-18.

Queensland is not leveraging purchasing capacity to grow IDEs. According to the MIT REAP Panel Survey, Government represents only 3% of Queensland's startups customer base. Government procurement is one of the most critical links in unlocking the value chain for entrepreneurs. Focused reforms to procurement processes will help increase purchasing from startups.

"Queensland Government needs to address their current procurement practices..." [SR153]



Connecting Startups to Risk Capital

"One of the biggest critical failures is the lack of venture capital and seed funding..." [R16]

A lack of funding was cited by Queensland entrepreneurs as a key barrier to starting or scaling IDEs. While there are several risk capital providers in Queensland, there is a lack of deals. This suggests that risk capital providers are looking to invest in IDEs different to those forming in Queensland. Instead, venture capital and Angel investors from SEQ tend to invest more in startups in Sydney and Melbourne^{30,15}.

Queensland VC investment also tends to focus on mature firms (5+ years), but Queensland struggles to convert startups into investment ready scale-ups. The long-term decline in investment deals, but increase in deal value, indicates a cautious investment approach in Queensland.

"More focus is needed to assist companies at mature stage of development rather than just startups." [SR134]

In the past five years, Brisbane Angels, Queensland's largest angel investment group, invited over 835 companies to pitch at their investor events but only funded 37³¹.

Queensland entrepreneurs desire greater access to funding, particularly access to venture capital. There is a need to develop investment ready startups in Queensland, as well as opportunities for businesses wanting to scale from \$1M to \$100M revenue.



Data Science

"DIGITAL1ST: Advancing our digital future" emphasised the need to maximise the use of existing data, develop data security and leverage analytics for evidence-based decisions. Queensland stakeholders highlighted a critical need to develop data science skills in Queensland.

"We don't have anybody who is skilled at data analysis and AI. We don't have systems and processes that can interrogate data..." [R16]

Entrepreneurs believed insufficient data was available to inform business development and growth, with many not making use of the data available to them. This is despite Queensland entrepreneurs being unwilling to share their own business data.

"We need grid meteorological data for optimised rotational grazing management, logging of vehicle data and monitoring of visitor access to biosecurity zones." [R27]

There are significant gaps in regional data on innovation and entrepreneurship, with the more effective data being inaccessible. Consolidating government efforts may improve data rigour and availability. Initiating a consortium or cooperative for Innovation and Entrepreneurship Metrics could overcome issues and focus investment across Australia.

The Longitudinal Australian Business Integrated Intelligence (LABii) database was developed by the Queensland University of Technology (QUT) for the purpose of constructing entrepreneurial quality index (EQI) modelling.

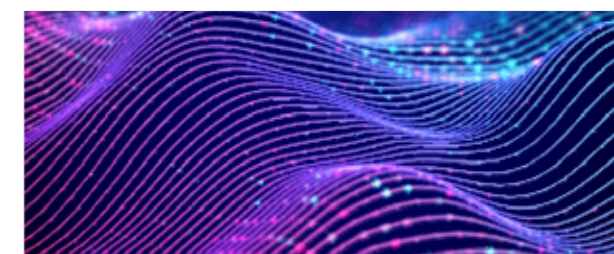
LABii is micro-business data based on the Australian Business Register (ABR) linked with other micro-data, such as IP Australia.

Any population business data with either ABN or entity/trading name can be integrated. It is extremely powerful for policy and program analysis and enables both timecasting and placecasting.

LABii enables data-driven satellite accounting, as well as entrepreneurial quality benchmarking and forward projections.

In addition, the Global Entrepreneurship Monitor (GEM) Australia is being increased in sample size by five times in 2019 to provide regional and industry estimates and comparisons.

Other opportunities, such as bibliometric strategy tracking and uniform Higher Education Alumni programs would enable greater insight into innovation and entrepreneurship in Australia.



Looking forward to 2024

OUR VISION

The globally leading inclusive ecosystem for natural resource management innovation and entrepreneurship.



STRATEGIC FRAMEWORK

STRATEGIC OBJECTIVES



Globally Leading

Global advantages using local sectoral comparative advantages



Inclusive

Strengthening all Queensland communities and regions



Natural Resource Management

Leveraging sectoral strengths linked to natural resources



Innovation

Generating value from new business models, sectoral domain knowledge and technologies



Entrepreneurship

Starting & scaling Innovation-Driven Entrepreneurs (IDEs)

PURPOSE:

Optimise and leverage sectoral strengths in natural resources and grow technological capabilities to transform Queensland into a globally leading hub for IDEs.

SCOPE:

Inclusive of the whole of Queensland, focusing on our comparative advantage in sectors linked to natural resources.

OBJECTIVE:

Conduct place-based experimentation of initiatives for fostering collaboration in Queensland regions to grow IDEs in sectors linked to natural resources.

SUCCESS STORY



Founded in 2015. Graduated from UQ's Germinate accelerator program

Launched FitMachine in 2016

KPMG Australia Energise Awards winner, April 2017

Received A\$350k in state and federal grants in 2017

Participated in a startup trade mission to Israel, August 2017

Signed deals with major companies

Secured A\$4.8M Series A funding, led by Blackbird Ventures in 2018

~20 employees

SUCCESS STORY

temando™



Coding and beta testing in 2009



Online shipping platform launched in 2011



Raised A\$1m seed round in 2011



Raised A\$5m series A funding in 2012



2013 IBM Global Entrepreneur of the year Award for AU, APAC & runner-up globally



Raised A\$50m series B Funding in 2015



Integrated platform with Australia Post in 2015



Partnered with Magento to launch global solution in 2017

STRATEGIC EXECUTION

TEAM QUEENSLAND IDENTIFIED SIX CORE INITIATIVES

1 INITIATE SUB-REAPS: QUEENSLAND CONNECTS

Sub-REAPs have been experimented with a few willing regions. The aim was to pilot connecting the key ecosystem stakeholders to identify a purpose that leverages each region's comparative advantages. Sub-REAP teams build intra-regional connections and state-based collaborations. The sub-REAPs embed the importance of:

1. having all key players at the table, and
2. joint ownership and accountability for strategic interventions aligned to sub-regional comparative advantages.

2 UNLOCK THE VALUE CHAIN FOR STARTUPS

Buying from a startup validates their business model. Procurement that disadvantages smaller, newer businesses are counterproductive to the development of IDEs in Queensland. There is a need for targeted experimentation of programs such as the Singapore government's Accreditation@SG Digital program, which aims to 'green light' local startups for government contracts. Areas to address include transparency in procurement processes and relaxation of conditions related to turnover or insurance.

3 ENHANCE QUEENSLAND'S VENTURE CAPITAL

Encouraging and supporting fledgling angel investors will deliver more accessible funding. AQ already funds angel networks and with collaboration across these networks, firm mergers and opportunities for collaboration are enabled. Education and training can increase the likelihood of individuals becoming angels, while incentives can reinforce investor value. Other initiatives include celebrating angel investors, drawing on "recycled entrepreneurs" and unlocking investors from real estate.

4 HOLISTIC STARTUP SUPPORT PLATFORM(S)

The entrepreneurial journey is individual but includes universal key stages. A coordinated, government-backed, journey mapper tool, including key stages aligned with grants, events, mentoring, training and resources, could enable businesses to progress along their journey faster. The tool would incorporate rewards and incentives, build ecosystem collaboration and participation and enhance grants management, procurement decisions, angel investment and data gathering.

5 ADOPT & ADAPT CORE TECHNOLOGIES

Technological developments in robotics, UAVs and big data analytics have occurred in many sectors because of high wages, cyclical labour shortages and sparse geography. IDEs will result from adapting these technologies more generally or in new contexts. This can be enabled through knowledge transfer across key stakeholders, regions and industries.

6 DISRUPT I&E METRICS

There is currently a clear gap in the metrics for monitoring innovation and entrepreneurship at the local level. There is also a critical need for disruption of existing approaches – both in terms of data capture and dissemination – to boost research that can assist businesses, entrepreneurs and investors to find and seek place-based opportunities.

Queensland Connects



Strategic Risks

The Queensland entrepreneurial ecosystem operates in a highly competitive environment. Strategic risks to the proposed initiatives include:

- ▶ Lack of clearly defined initiatives
- ▶ Other stakeholders disconnected from REAP
- ▶ Continued support of the Queensland Government
- ▶ Variable economic conditions
- ▶ Competition from other national/international locations for talent
- ▶ Inability to keep up with rapid technological change in economic powers such as the US/China
- ▶ Rapid disruption that results in reactive, rather than proactive solutions

» Initiative 1: INITIATE SUB-REAPS

Problem Statement

Queensland has many excellent entrepreneurs, corporations, universities and risk capital providers, but collaboration is not strong. MIT REAP brings all five stakeholder groups to the table, but all Team Queensland members are based in Brisbane and have limited perspective on regional activities. There is no co-ordinated approach to leveraging Queensland's regional competitive advantages.

Team Queensland knows that strengthening startup formation outside SEQ will deliver economic and social benefits for Queensland regions. However, a lack of regional representatives makes it difficult for Team Queensland to fully understand and consider the requirements of Queensland's unique regions. Moreover, not all regions are able to execute certain interventions due to resource constraints. Local knowledge is critical to ensure interventions in regions are successful.

Initiatives already in place

The Queensland Government has laid a strong foundation by building regional innovation ecosystems through programs such as:

- ▶ AQ Advancing Regional Innovation Program (ARIP)
- ▶ AQ Regional Network Fund
- ▶ Published Queensland Govt Reports on the Queensland Startup Ecosystem include:
 - ▶ Regional Queensland 2015 Startup Ecosystem Report
 - ▶ South East Queensland 2014 Startup Ecosystem Report
- ▶ Startup Onramp Pre-Accelerator
- ▶ Regional Angel Investors Support Program



SUCCESS STORY

LIGHTWEAVE



Founded in 2016, by a group of QUT students



Launched HeatVR with Brisbane Heat from Big Bash league in 2016



CEO Sam Hussey was named 2017 Brisbane Entrepreneur of the Year finalist



Partnered to create a custom-designed AR app in 2017



Joint venture with Exceed Sports and Entertainment 2017



Selected for the 2018 HYPE UQ SPIN Accelerator Program



~10 employees



Founder participated in the Virgin Startup Step Up program



Founder won young business person of the year in the 2018 Lord Mayor's Business Awards

Team Queensland's MWB is all about engagement. The Queensland entrepreneurial ecosystem stakeholders already undertake extensive engagement activities across the state. The opportunity that arises in the sub-REAP initiative is to translate these efforts into a more formal methodology. This would ensure regional strategic interventions are locally constructed and focused on regional comparative advantages.

The sub-REAPs aimed to ensure all stakeholders were at the table. Each sub-REAP team was required to identify one influential member to represent each stakeholder group. Teams were told to identify people with social capital who were actively involved in the community and had great connection with the other individuals in the same stakeholder group.

Similar to MIT REAP, each sub-REAP identified a team champion to oversee the project. Although the MIT REAP is a two-year program, the sub-REAPs are more dynamic and evolving, without a defined timeline. The aim was to establish regional teams that will continue collaboration long-term.

Execution involved Team Queensland initiating the sub-REAP pilot teams. Sub-REAP teams were supported to develop their own MWBs that could be implemented, with the support of Team Queensland. As the sub-REAP teams start to roll out their interventions in late 2019, Team Queensland will mentor and monitor progress.



SUB-REAP PROCESS



Team Formation

Identify pilot regions, bring all stakeholders to the table, host a kick-off meeting in region



Regular check-ins

Team Queensland regularly undertakes check-ins with sub-REAP teams to offer guidance



Form a baseline

Sub-REAP teams collate intelligence about their region with Team Queensland providing guidance and support



Strategy formation

Sub-REAPs adopt shared language and shape a shared vision and MWB



MWB Implementation

Team Queensland supports and empowers pilot regions to implement their MWB



Integrate

Annual sub-REAP meeting and networking event to bring teams together for cross-regional learnings



Connect

Link teams to Team Queensland website and link with MIT Alumni program

Going forward, we will aim to promote and amplify the sub-REAP method on a state-wide basis.

Queensland Connects



TOOWOOMBA SUB-REAP

- VISION:** Globally leading hub for AgriTech & Energy IDEs
- PURPOSE:** Scale IDEs in Toowoomba
- FOCUS:** AgriTech & Energy
- STATUS:** Team established. AgriTech traction tour of ecosystem members to the Netherlands. Showcased Toowoomba ecosystem at Bio in Philadelphia.
- CHALLENGE:** Risk Capital Stakeholder. Data Rockstar capacity.
- INITIATIVES:** Identify global IDEs to scale through local HotDesQ

Queensland Connects



GLADSTONE SUB-REAP

- VISION:** A centre for sustainable IDEs
- PURPOSE:** Support IDEs to smooth cyclic economy MWB: Reduce economic reliance on existing industry
- STATUS:** Team established with regular meetings. Recruited a Data Rockstar
- CHALLENGE:** Risk Capital Stakeholder
- INITIATIVES:** Visible leadership | Investor Environment Dinner



SUCCESS STORY



Founded in 2001

Spin Off in 2006

Raised \$9m USD series A funding from 3 investors in 2006

Raised \$18m USD series B funding from 5 investors in 2013

Raised \$40m USD series C funding from 5 investors in 2015

IPOed in 2016. Headquartered in Milpitas, California

Received 2016 J&J award at AusBiotech national conference

Received grant of \$1.3m USD

» Initiative 2: UNLOCK THE VALUE CHAIN FOR STARTUPS

Problem Statement

Government, large corporates and universities need to hard-wire their procurement policies to enable IDEs to have a fair chance of becoming a supplier. While government and corporates have the strategic intention of working with startups, it tends to be the known and trusted suppliers that are consistently contracted.

Decision-making on procurement occurs either in finance teams or at the middle level of government, corporations or universities. The restrictive procurement policies are the result of the need to minimise risk and justify supplier selection.

Government leading procurement reform sends a signal to corporates that startups are legitimate options. Simplifying procurement administration processes would also help more startups access this type of 'investment' and would enable them to validate and grow their products.

Initiatives already in place

The Department of Innovation, Tourism Industry Development and the Commonwealth Games (DITID), and the Queensland Government more generally, has worked to progress procurement policies by following models such as the Singapore Procurement scheme and lessons learnt from the implementation of procurement policies for the recent Commonwealth Games. The Office of Small Business (OSB) is currently undertaking policy work to enhance the Buy Queensland framework for SMEs. DITID is working collaboratively with OSB.

Initiatives in place include:

- ▶ Buy Queensland
- ▶ Internet and Communication Technology (ICT) SME participation scheme
- ▶ Queensland Indigenous Procurement Policy

Further Possible Solutions?

- ▶ Implementation of a Procurement Reform Working Group to revise processes through consultation to understand barriers to SMEs/new businesses and they may be changed to be more inclusive.
- ▶ Government to share knowledge to facilitate a broader unlocking of procurement for startups.
- ▶ Implementation of intelligent procurement processes
- ▶ Campaigns to engage startups and industry



» Initiative 3: ENHANCE VENTURE CAPITAL & ANGEL NETWORKS

Problem Statement

The REAP survey and interview data revealed a lack of understanding and availability of funding for entrepreneurs, particularly in Queensland's regions.

Few investment programs in Queensland target sectors linked to natural resources, such as agriculture, mining and tourism. There is tremendous opportunity to disrupt these sectors.

Angel investors are one form of early stage capital that could be used more effectively in Queensland. Angel investors are High Net Worth Individuals (HNWI) who invest money, skills, experience and networks into new business ventures. Angel networks operate in most Australian capital cities. Brisbane has a fledgling Queensland VC and Angel Investors meetup group with 230 members.

Initiatives already in place

The AQ Business Development Fund has supported more than 40 Queensland startups to turn their ideas into commercial realities. This, in turn, has supported over 100 new jobs and attracted new industries to Queensland. Key initiatives in place include:

- ▶ AQ Regional Angel Investors Support Program
- ▶ AQ Business Development Fund (BDF)

The AQ Regional Angel Investors Support Program provides funds to connect potential angel investors in regional Queensland with startup investment opportunities.

The Queensland Government offers information about various forms of business funding:

www.business.qld.gov.au/running-business/growing-business/becoming-innovative/funding/sources

Further Possible Solutions?

There is opportunity to take a sectoral focus to venture capital and angel networks. The state government could establish programs focused on sectors linked to natural resources, including:

- ▶ Building a venture capital and angel network community
- ▶ Enhancing Queensland's angel networks and identifying interstate / global learnings
- ▶ Celebrating angel investors through case studies and awards
- ▶ Identifying and showcasing possible regional investment opportunities for angels
- ▶ Providing information about becoming an angel with tax advantages highlighted
- ▶ Financing education programs to include information about angel networks
- ▶ Hosting a "Money" dinner for HNWI's to educate and network discretely
- ▶ Developing an investor playbook
- ▶ Showcasing ideas that investors can relate to e.g. AgTech for Farmers



BUSINESS STAGE	FUNDS REQUIRED					
	<\$10k	\$10k	\$100k	\$2m	\$5m+	\$50m+
Seed	PR	PR/G/A	A/G	VC		
Early Stage	PR	PR/G/A	A/G/VC/F	VC/F		
Growth		PR/G/A	A/G/VC/F	VC/F/S/E	VC/MB/SE	
Established			VC/F	VC/F/S/E	VC/F/MB/SE	VC/F/MB/SE
Expansion			VC/F	VC/F/S/E	VC/F/MB/SE	VC/F/MB/SE

Funding source key: PR: Personal resources, family and friends, crowd funding; G: Government grants; A: Angels; VC: Venture Capital; F: Financial institutions, banks, credit unions; MB: Merchant banks; SE: Stock exchange

SUCCESS STORY

✓ SafetyCulture



Luke Anear launched the company from his garage in Townsville in 2004



iAuditor app was launched in 2012



Funded by Atlassian co-founder, Scott Farquhar, & Blackbird Venture in 2014



Raised A\$6.1m series A funding from 4 investors in 2015



Offices in Sydney, Kansas City & Manchester



Raised A\$30m series B funding from 4 investors in 2016



Launched spotlight, an incident reporting app



Raised A\$60m series C funding from 5 investors in 2018



15,000 organisations are using iAuditor globally



200+ employees today

» Initiative 4: STARTUP SUPPORT PLATFORM(S)

Problem Statement

“The pathway to becoming a founder is very unclear...” [SR180]

Most startups in Queensland do not feel that they are linked into the entrepreneurial ecosystem with just 14% of the Queensland startups surveyed feeling as though they were connected. There was a lack of awareness of programs, services, activities or information available to support them. More could be done to identify and support IDEs.

Stakeholders suggested developing an electronic journey mapper to identify a startup's place in the journey and suggest relevant support. The tool could provide links to key information such as business plan templates, events, mentoring, training, access to angel and venture capital finance, and procurement, prize or grant opportunities. The tool would reduce the need to input data for each opportunity, enable firm benchmarking and provide a more transparent and rigorous method for selecting startups for procurement and grants.

Initiatives already in place

Currently, many players are attempting to develop various platforms to support startups in Queensland, but none are gaining traction. Startups will not engage with all the many platforms currently under development. A single open source platform could provide holistic support to startups. Consolidating efforts would reduce duplication, wasted resources and enable adoption. A government backed open architecture tool would enable co-creation of such a platform.

Further Possible Solutions?

There is an opportunity to establish a working group and procure a startup or startups to develop the Holistic Startup Support Platform. The Holistic Startup Support Platform could be promoted to businesses when they register in Queensland, or when they interact with the ecosystem to encourage adoption.

» Initiative 5: ADOPT & ADAPT CORE TECHNOLOGIES

Opportunity Statement

Queensland's mining and agricultural sectors have developed a range of core technologies, such as robotics, autonomous intelligent systems, Unmanned Aerial Vehicles (UAVs) and big data analytics. These technologies may have wider application and utility than just the industry they were developed for.

Case studies and storytelling highlighting these core technologies will encourage cross-sectoral applications and adaptation.

Initiatives already in place

An issue identified by the MIT REAP Plan is the lack of data analysis capabilities in Queensland. Initiatives currently in place include:

- ▶ AQ IndustryTech Fund
- ▶ AQ Ignite Ideas Fund

Further Possible Solutions?

Other possible interventions include:

- ▶ Roadshows
- ▶ Pitching – problem-solutions or challenge-opportunities
- ▶ Grand challenges posed by government with some benefit attached to participation e.g. X-prize competition
- ▶ Highlighting lessons and success stories
- ▶ Encouraging collaboration and knowledge transfer amongst regions and across industries
- ▶ Ecosystem tourism

» Initiative 6: DISRUPT I&E METRICS

Problem Statement

Theoretically, transformative change starts at the local level. Research shows that for transformation to occur there is a need to enhance a regions' learning ability, data and research capabilities, and agility/adaptability. There is currently a real and critical gap in some of the metrics that can monitor innovation and entrepreneurship at the local/regional level. Moreover, the definition and measurement of IDEs is challenging. Because there is currently an uncoordinated approach to I&E metrics across Australia, no one data source is done well. There is a critical need to disrupt innovation and entrepreneurship metrics in Australia.

Initiatives already in place

The Federal Government is undertaking an Innovation Metrics Review, but is looking for leadership in this space.

Several data products are currently being developed by QUT (within the Australian Centre for Entrepreneurship's Metrics section):

- ▶ The Longitudinal Australian Business Integrated Intelligence (LABii) database (developed as a part of MIT REAP by Team Queensland)
- ▶ The Global Entrepreneurship Monitor (GEM) Australia (important for measuring nascent entrepreneurs and delivering international comparisons)
- ▶ QUT Alumni entrepreneurship survey (which could be standardised and rolled out across all Australian universities)
- ▶ Strategy tracking (we are tracking changes in economic development, tourism and entrepreneurship policies across time and place using bibliometrics).

There is currently no critical mass of data scientists focused on developing methodologies to disrupt I&E metrics and progress on data mapping is slow.

Further Possible Solutions?

The Queensland Government and QUT could take a leadership role to coordinate other states and territories to disrupt I&E metrics – both in terms of

data capture and dissemination –to boost innovation and entrepreneurial research, and assist businesses/entrepreneurs and investors to find and seek place-based opportunities.

LABii could be further developed by drawing on global frameworks to develop firm-level metrics. Global frameworks that could be used include:

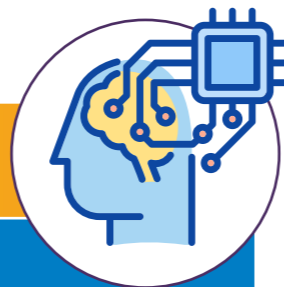
- ▶ Global Innovation Index
- ▶ Global Competitiveness Index
- ▶ Social Progress Index
- ▶ Social and Environmental Accounting (e.g. smart water metering, electricity metering)

LABii could be used as the population framework for many business orientated databases. For example, LGAQ has developed data lake (LG Sherlock) that could be harnessed to augment the LABii business frame. This could potentially provide valuable local level insights into businesses, particularly around planning, waste, water use, customers, trade and employment.

LABii could also be further developed to deliver firm-level data-driven satellite accounts industries not captured in the ANZSIC such as tourism, METS, creative industries and digital trade. There is also opportunity to develop real time and robust data products around innovation factors such as human capital, funding and global demand. LABii could be used to precisely map jobs and skills capabilities.

By developing these important data sources, Queensland will be able to develop evidence-based policy, and provide vital information for councils, investors and businesses. Place-casting and time-casting will enable visualisation of data in new ways that can provide users great usability and insight. Moreover, Queensland could be home to the largest training centre for data rockstars and scientists in Australia. Specialist data scientists focused on innovation, entrepreneurship and business metrics could deliver real world data solutions and policy analytics to the benefit of industry, regions, government and business.

MUST WIN METRICS >>>



A multi-measure approach is being taken to measure success using leading indicators, panel data and detailed regional statistics. Both mind-set measures and harder startup metrics are being tracked for changes.

All measures will be estimated for pilot regions, Queensland and the industry sectors of interest. Key metrics include:

- ▶ Growth in the quantity and quality of startups using LABii¹³.
- ▶ Job creation in resource-linked industries using the Business Longitudinal Analysis Data Environment (BLADE). Like LABii, BLADE uses the ABR as the primary data source, but includes employment and financial statistics.
- ▶ Increase in VC deals, mergers, alliances & acquisitions using ABS Venture Capital and Later Stage Private Equity cat. 5678.0
- ▶ Increase in government and corporate procurement from startups and SMEs, using Queensland government data relating to the procurement of SMEs to be supplied by DITID
- ▶ Increase in nascent entrepreneurship and ecosystem engaged startups using regional Global Entrepreneurship Monitor (GEM)
- ▶ Improvement in entrepreneurial mindset as measured by QUT Alumni Panel Survey.
- ▶ Interviews to compile lessons & success stories from sub-regions like those conducted by the MIT REAP Team Queensland during REAP.

Sustainability Plan

Nationally, there is little coordination of innovation, entrepreneurship research and strategy. Developing a peak body would help coordinate and advocate for the sector, while an Innovation and Entrepreneurship Research Council could oversee research activities and guide shared metrics.

The sub-REAP strategies, initiatives and methodology will be used to inform Advance Queensland's regional approach to innovation. In doing so, these initiatives will be supported by the broader Advance Queensland program and will link directly with the next phase of Advance Queensland. Already other regions are interested in adopting the MIT REAP methodology, particularly Mackay, which may see a need to pivot the current ARIP focus.

Longer-term, there is the possibility to establish either a cooperative research centre, or transformation hub, to disrupt and fundamentally reshape innovation, entrepreneurship metrics and evidence-based policy in Australia. A national level approach is needed to facilitate greater collaboration between corporates, startups, universities and government agencies. This facility could develop a commercial or not-for-profit arm to become a stand-alone organisation at the end of the CRC or Hub term of life.

Backbone Organisation

PHYSICAL BACKBONE

Advancing Regional Innovation Program (ARIP)



ACCELERATING IDEAS IN QUEENSLAND—BACKBONE STRUCTURE

	ADVOCACY	STRATEGY	METRICS
FEDERAL LEVEL	Startup Aus Innovation & Science Australia	Department of Industry, Innovation & Science	Australian Bureau of Statistics A new I&E Research Committee
Powered by the MIT REAP Framework and Team Queensland			
STATE LEVEL	Office of the Queensland Chief Entrepreneur Queensland Government	Enterprise council DITID Advance QLD Queensland Connects	Australian Centre for Entrepreneurship (ACE Metrics)
LOCAL LEVEL	Regional Health/Local Chamber of Commerce	Local Government/ Economic Dev. Group.	LGAQ/Council/Local University

PROS:

- ▶ Designed for collective impact
- ▶ Cross-sector leaders come together to deliver wide-reaching outcomes
- ▶ Common agenda with shared measurement
- ▶ Already in progress & biased towards action
- ▶ Easy access to critical data

SUCCESS STORY



Founded in Brisbane in 2014

Accepted into Y Combinator summer program in 2015

Raised A\$1.36m seed round in 2015

Raised another A\$4m seed round in 2016

400,000 users & 150,000 courses

Secured partnership in 2017

Raised undisclosed series A in 2017

7 offices worldwide; 150+ employees

RESEARCH COMPENDIUM

QUEENSLAND'S STARTUPS

According to the MIT REAP Panel Survey, startup owners were significantly more likely than other entrepreneurs and business owners/managers in Queensland to:

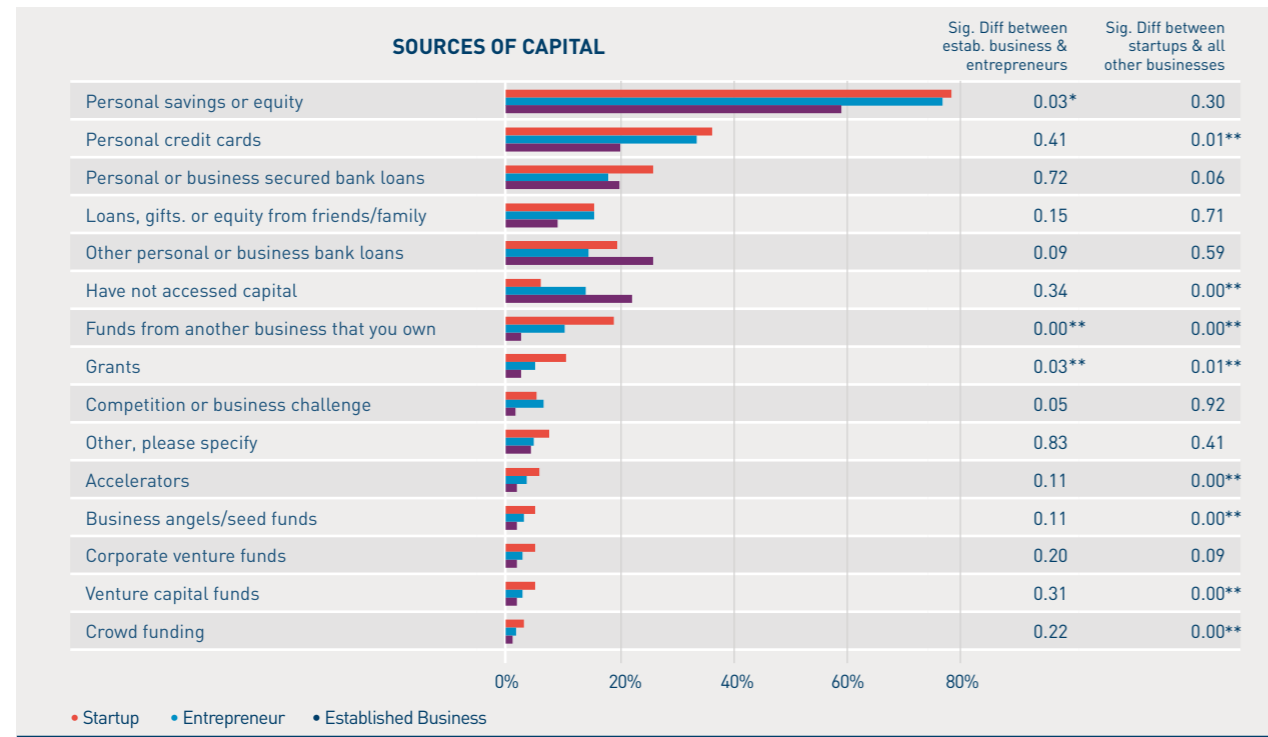
- ▶ Have experience setting up a prior business (56% vs 31%)
- ▶ Have extensive background industry knowledge (56% vs 37%)
- ▶ Be operating more than one business (28% vs 17%)
- ▶ Be exporting interstate (59% vs 9%)
- ▶ Be exporting globally (58% vs 5%)
- ▶ Have trademarks (27% vs 8%)
- ▶ Have copyright (27% vs 8%)
- ▶ Be based in Brisbane and the Gold Coast but less likely to be based on the Sunshine Coast and other regions of Queensland
- ▶ Be more focused on selling to other businesses than consumers or government



Access to Finance

Startup owners, like other Queensland entrepreneurs and business owners, were most likely to access personal savings or equity as their primary form of finance.

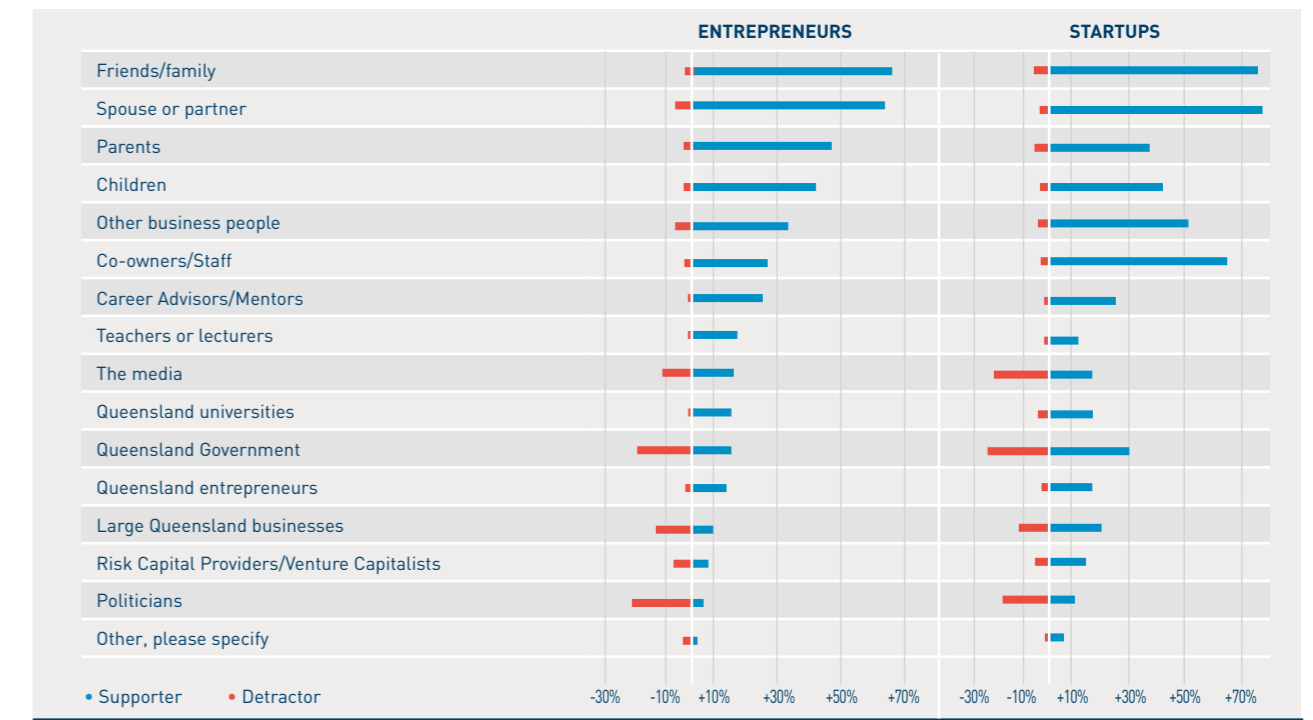
Startup owners were significantly more likely to source funds from personal credit cards, other businesses they own, grants, accelerators, business angels/seed funding, venture capital funds and crowdfunding. They are significantly less likely not to have accessed capital.



Supporters and Detractors

The main supporters of startups in Queensland are spouse or partner, followed by friends and family then co-owners and staff. Startups were significantly more likely than other entrepreneurs to believe that their co-owners and staff, politicians and the Queensland government are supporting them.

The primary detractors for both entrepreneurs and startups were politicians and the Queensland Government. The stakeholders most likely to be both supporters and detractors are the media, the Queensland Government and politicians.



Entrepreneurs' Business Philosophy

The most valued business philosophy of both startups was R&D, with the least valued being the use of data to inform decision-making.

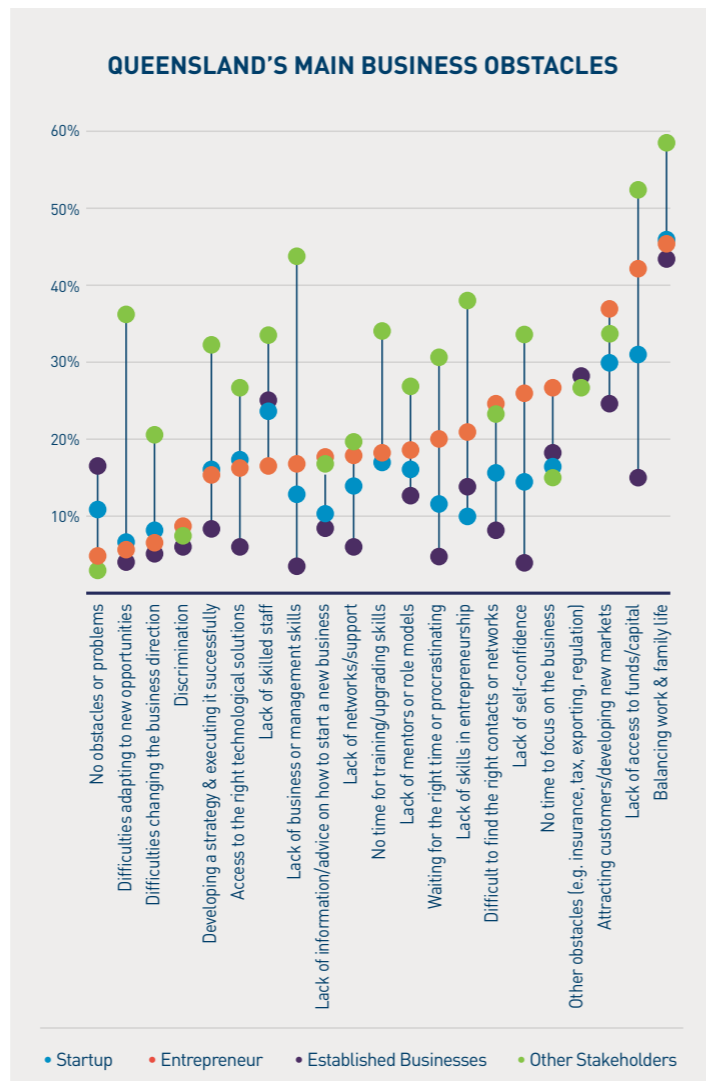
Startups were significantly more likely than other entrepreneurs to:

- ▶ Be risk takers
- ▶ Be one of the first to use digital technologies
- ▶ Recruit staff who were better skilled or more knowledgeable than themselves
- ▶ Use technology to support/enhance their business performance
- ▶ Value learning from other businesses



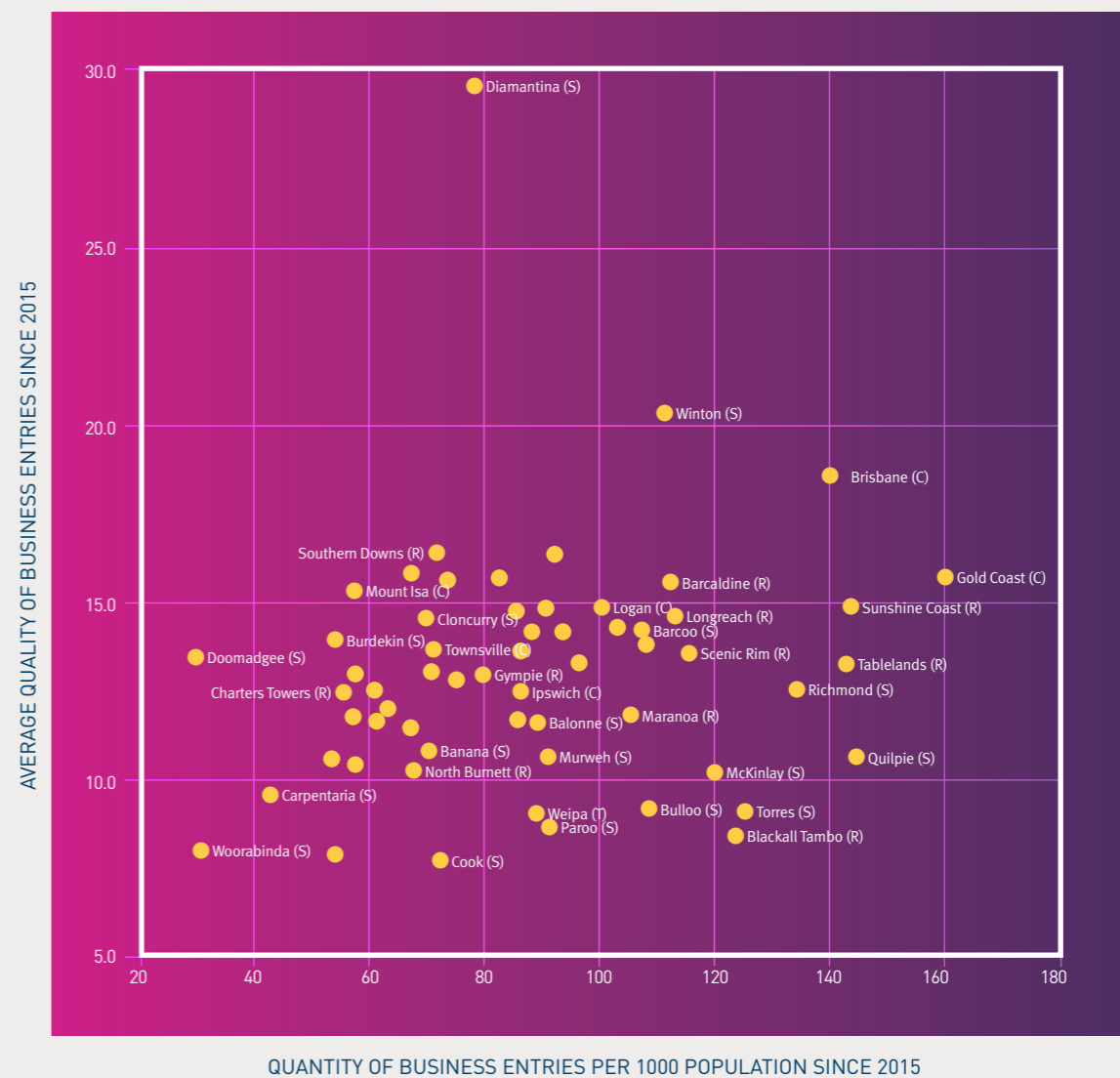
Main obstacles or problems facing people starting up or growing a business in Queensland

The main obstacle to starting up or growing a business in Queensland was cited by half of startups and entrepreneurs as balancing work and family life. Age was statistically significant, with 77% of 18-19 years olds in business finding it difficult to balance work and family life, compared with around 51% of those aged 20 to 49 and 35% of those over 50. This suggests that business people find better work-life balance as they get older.



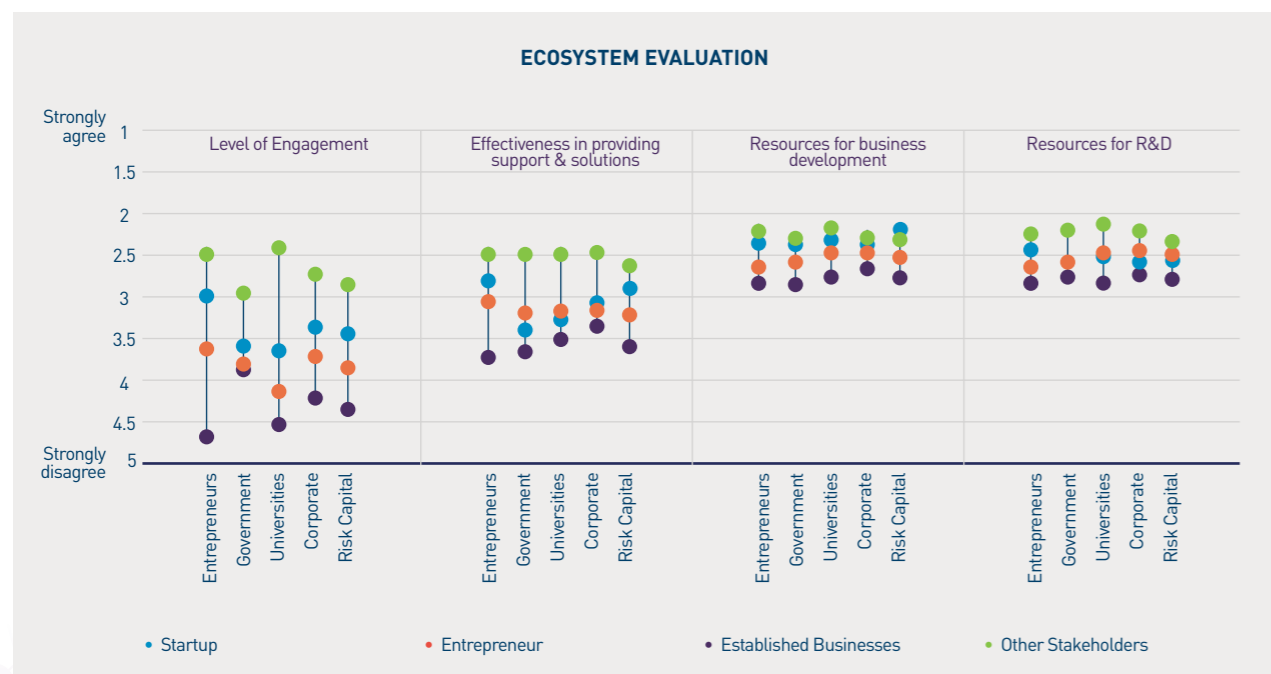
ENTREPRENEURIAL QUALITY OF QUEENSLAND'S REGIONS

QUANTITY VERSUS QUALITY OF NEW ENTRIES SINCE 2015



Ecosystem Stakeholder Evaluation

Queensland stakeholders were evaluated highly in their provision of resources for business development and R&D. However, they rated lower in their level of engagement and effectiveness in providing support and solutions.



HUMAN CAPITAL CAPABILITIES

I-CAP	E-CAP
<ul style="list-style-type: none"> ▶ Quality of STEM education (GCI) is rated well (5/7) ▶ PISA scores on science, maths and reading have declined for Australia since 2006 ▶ STEM Graduates per capita (OECD) are growing but supply is below demand, offset by skilled migration and off-shore work ▶ Australia scores well (5/7) on availability of scientists and engineers (GCI) ▶ Rocard Report ranks Australia 60/142 countries for availability of scientists and engineers ▶ Australia ranks 5th on Nature Index for scientific outputs ▶ Australia has above average numbers of researchers/ professionals engaged in R&D per million population at 4539.5 in 2018 (GII), but business investment in R&D has fallen 	<ul style="list-style-type: none"> ▶ Australia ranks high on perceived entrepreneurship capabilities, but low on perceived international opportunities (GEM) ▶ Australia ranks No. 1 amongst developed economies for Entrepreneurial Employee Activity (EEA) in established businesses (GEM)

AUSTRALIA:

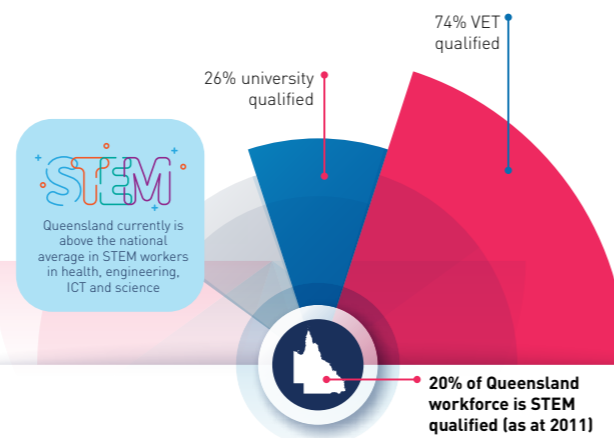
- ▶ 4th globally for population intelligence (INSEAD)
- ▶ Lowest public investment in tertiary education in the OECD as a share of GDP²⁵
- ▶ 90% of Australia's population aged 18-25 years are enrolled in tertiary education (the global median is 34.7%)²⁶
- ▶ 43% of Australians aged 24-64 years have tertiary education²¹
- ▶ 8.21 per 1,000 population aged 25-64 have a doctorate (less than 1% of the population)
- ▶ 1st on tertiary enrolment globally, scoring 100 against the global median of 37²⁷

Queensland has a strong education and training sector, with world-class institutions that attract international research talent and invest in R&D.

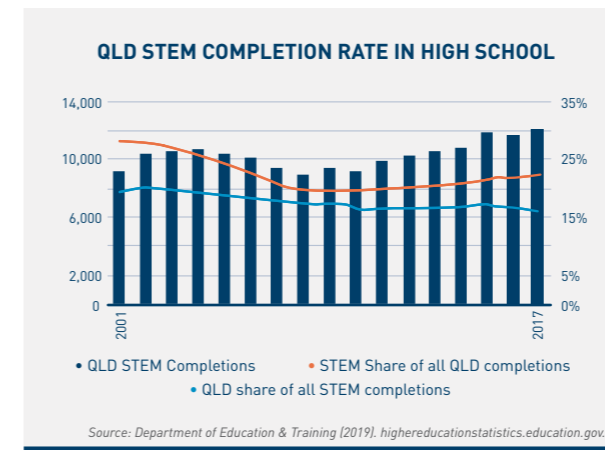
Education and training are a substantial industry for Queensland. Education is also a key driver of productivity in the labour force²¹. Queensland has well-educated human capital, but below national average educational attainment amongst adults 25-64 years. This is worrying with the Australian school system performance declining nationally over the last decade, both relative to other countries and in real terms²⁹. Domestic school student performance in mathematics and science is going backwards and vocational education is also slipping.



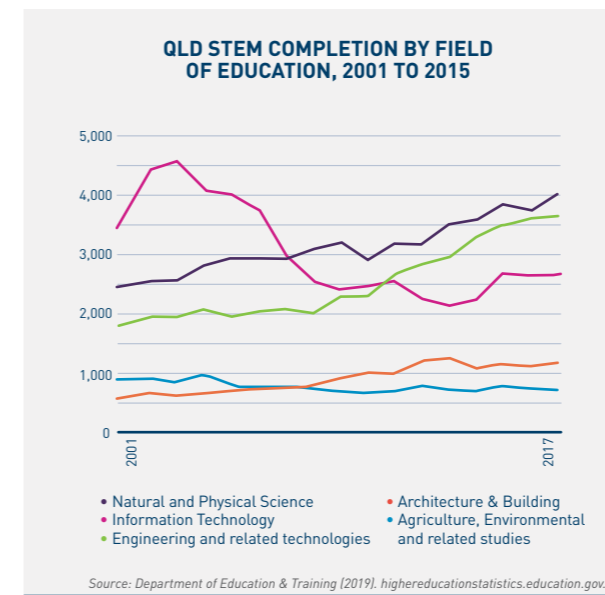
STEM HAS BEEN DRIVING LONG-TERM JOBS GROWTH IN QUEENSLAND²⁹



STEM participation in Queensland universities needs to increase. The STEM share of all Queensland completions has dropped from 28.7% in 2001 to 18.6% in 2010. It has slightly increased to 21.8% most recently. In 2015, the OECD average was 22% with countries like Korea and Germany having rates closer to 30%²⁸. However, Queensland is performing above the Australian rate of STEM completions of 20.7%.



The main declines in STEM completions in Queensland has come from ICT, which decreased 4% per annum between 2005 and 2015 (a greater decline than the Australian decline of 3% per annum). There was a slight softening in agriculture, environmental and related studies, but other STEM fields experienced growth. While ICT completions have had a slight upturn, they remain below historical highs. Without addressing low ICT uptake, Queensland is likely to lack the ICT capacity needed to remain competitive in the future.



“staffing is always difficult... particularly in regional Queensland.” [R18]

QUEENSLAND UNIVERSITIES

- ▶ There is a strong tertiary education system
- ▶ Critical in developing a skilled STEM labour force
- ▶ Four ranked in the top 400 universities in the world (QS Top Universities ranking):
 - ▶ The University of Queensland (UQ) (47th)
 - ▶ Queensland University of Technology (QUT) (244th)
 - ▶ Griffith University (320th)
 - ▶ James Cook University (377th)
- ▶ Perform relatively strongly in environmental sciences, and medical and health sciences (ERA rankings)²¹
- ▶ But rankings in ICT and agricultural / veterinary sciences have dropped
- ▶ Employ the majority of Queensland researchers

Entrepreneurship education is relatively new, but there is an array of short-term creative activation events. Queensland's entrepreneurs did not feel the education sector was effective in developing entrepreneurs, although they believed this had improved. They suggested the need for cross-training to improve skills that entrepreneurs aren't good at, as most start out by trying to do everything.

“resilience, courage, creativity, imagination, operationalisation, people management and... the ability to persevere through costs.” [R2]

Queensland has low levels of digital skills, meaning that entrepreneurs import talent from overseas or pay high salaries to local talent. Because of this, many SMEs lack economic diversity in market, customers and products. This leads to businesses adopting, rather than developing, new-to-market innovations.

“I went through freelancers.com... I've now got a few guys that can build the websites... the price is humongously different.” [R7]

In summary, Queensland's workforce may not be appropriately equipped for future jobs. The future will likely see a shortage of STEM workers in Queensland, which will impact productivity and international competitiveness. Queensland needs to invest in retaining and building domestic capability in STEM, cross-training students in both STEM and business, and enabling females to pursue STEM²¹.

Skills gaps may arise in digital technology, data analytics, computer science, and soft skills like leadership, entrepreneurship and creativity. Other soft skills highlighted as important included confidence, networking ability, people skills, resilience, courage, presentation skills, agile project management, change management and negotiation. Upskilling teachers in STEM and encouraging experimenting with curriculum delivery and assessment could make teaching a more attractive profession. Expanding the existing school partnerships model and ensuring STEM subjects are university pre-requisites would encourage students to learn STEM²¹.

“at primary, secondary and tertiary level we're still teaching in a way that is not conducive to the shifting demands of 21st century society.” [R2]

UNIVERSITY-INDUSTRY DISCONNECTION

- ▶ Australia's university-industry research collaborations score 4.3 / 7 in 2017 (median was 3.5)³⁰
- ▶ Australian researchers are concentrated in the university sector: 2.5 times as many researchers in the university sector than the business sector
- ▶ Just 4.68 business researchers per 1,000 employed in Australian firms. So, businesses lack the internal capacity to undertake research and are not being internally educated about its importance²¹
- ▶ Australia ranks the lowest in research and industry collaboration among the OECD countries¹⁹
- ▶ Only 20-30% of Queensland firms collaborate³¹
- ▶ As a result, Queensland underperforms in translating research into commercial and social benefits²¹
- ▶ While there has been growth in the number of businesses working with universities since 2011, this integration needs to increase²¹
- ▶ Improved university and industry partnerships are critical for the dispersal of knowledge
- ▶ Solutions: co-location of researcher facilities and businesses, joint appointments, secondments, industry champions and the movement of staff between research and industry

FUNDING CAPABILITIES

I-CAP	E-CAP
<ul style="list-style-type: none"> ▶ Australia's R&D expenditure as a percentage of GDP in 2015 was 1.9%, which is below the OECD average of 2.3% and that of other high-income countries ▶ Public R&D expenditure in Queensland was \$538.5 Million in 2016-17 (ABS) ▶ Business R&D expenditure in Queensland was \$1,955.6 M in 2015-16 (ABS) ▶ Higher education R&D expenditure in Queensland was \$1,918.4 M in 2016 (ABS) ▶ In 2015-16, gross expenditure on R&D (GERD) for Australia was \$31.2 billion, a decrease of \$2.3 billion (7%) from 2013-14. GERD as a proportion of GDP also decreased from 2.11% in 2013-14 to 1.88% in 2015-16 ▶ Queensland's GERD as a % of GDP was 1.53% in 2013-14, below the national average. Despite long-term growth in GERD intensity, Queensland's expenditure on R&D is below the intensity rate of Korea (4.2%), Finland (3.3%), Japan (3.5%) and the USA (2.7%) ▶ During 2015-16, expenditure on R&D by Australian businesses was \$16,659 million ▶ Queensland's business expenditure on R&D as a percentage of GSP was 0.64% in 2015-16, below the national average of 1.0% and most OECD nations ▶ Korean businesses invest three times more and the US and Germany invest two times more than Queensland³². These countries also have more up-to-date and detailed statistics on business R&D expenditure than Queensland and Australia ▶ Queensland's higher education R&D expenditure was 0.63% of GSP, below the Australian national level of 0.66% of GDP 	<ul style="list-style-type: none"> ▶ Lending is regulated and easy to access for established businesses (GCI). Loans are offered once the business has been operating for 2yrs ▶ Australia has a strong banking sector and credit is reasonably easy to obtain (GII). Legal rights are one of the strongest in OCED ▶ Australia ranks 6th in financial market development³³ ▶ Australia scores 3.4 on a scale from 1-7 for VC availability, just above the global median of 2.9³³. Availability of VCs in Australia is relatively weaker than other high-income countries (GCI) ▶ On the index of VC deals per investment location, Australia ranked 16th globally, scoring 31.3, which was above the median of 8.5 in 2018²⁷ ▶ VC and private equity investments are growing³⁴ ▶ Australia's informal investment sector is strong, with 4.1% of the population being business angels in 2016¹². This is comparable to the US (4.2%) and above the average for developed countries (3.4%) ▶ Australian startup funding in 2017 remained strong, up 1.4% on 2016 to US\$555.63M³⁵ ▶ According to Venture Pulse, in Q4 2018, Australia VC hit a record US\$899 million, up from US\$659.9 million in 2017³⁵. But VC investment in Queensland and Australia does not compare favourably with the rest of the world. VC investment in Australia is low at 0.02% of GDP, below the OECD average and behind countries such as Israel, the United States, Canada, Korea, Ireland, Finland and Sweden

Australia's banking sector is one of the most stable in the world (despite above average costs of banking and service charges) and there is a strong informal investment sector. Businesses tend to be financed through equity (60%) and debt and trade credit (40%).

Australia's informal investment sector is strong, with 4.1% of the population being business angels in 2016¹², which is comparable to the US (4.2%) and above the average for developed countries (3.4%). In the past 5 years, Brisbane Angels, Queensland's largest angel investment group, invited over 835 companies to pitch at their investor events but only funded 37²⁴.

... "the biggest critical failure in Australia is the lack of venture capital and seed funding..." [R16]

But Australia has low Venture Capital (VC) investment, below the OECD average and behind countries like Israel, the US and Canada. VC investment in Australia tends to be risk averse and focused on mature firms (5+ years), rather than startups³⁶. There is a tendency to fund firms in Sydney and Melbourne, rather than Brisbane (even for Queensland based VCs).

VC investment per capita³⁷:

- ▶ South East Queensland = AU\$5
- ▶ Australia = AU\$4
- ▶ UK = AU\$15
- ▶ Israel = AU\$183
- ▶ Silicon Valley = AU\$4,241

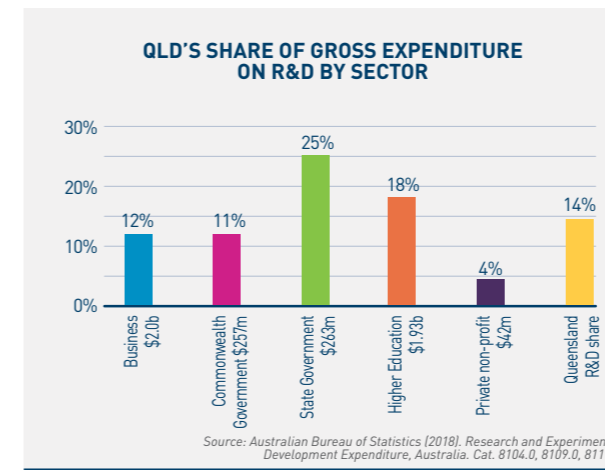
... "Capital raising is a real issue for new startups" [SR19]

Investment deals in Queensland have declined over the past 10 years from 153 in 2007-08 to 87 in 2016-17 (down 6% p.a.). The value of these deals has increased from \$1,126 million in 2007-08 to \$1,924 million in 2016-17 (up 6% p.a.). This may be reflecting investment in a smaller number of secure deals to minimise risk. Regardless, most recently (between 2015-16 and 2016-17) Queensland recorded a strong upward trend in VC deals (up 21%) and value (up 69%).

Recommendations:

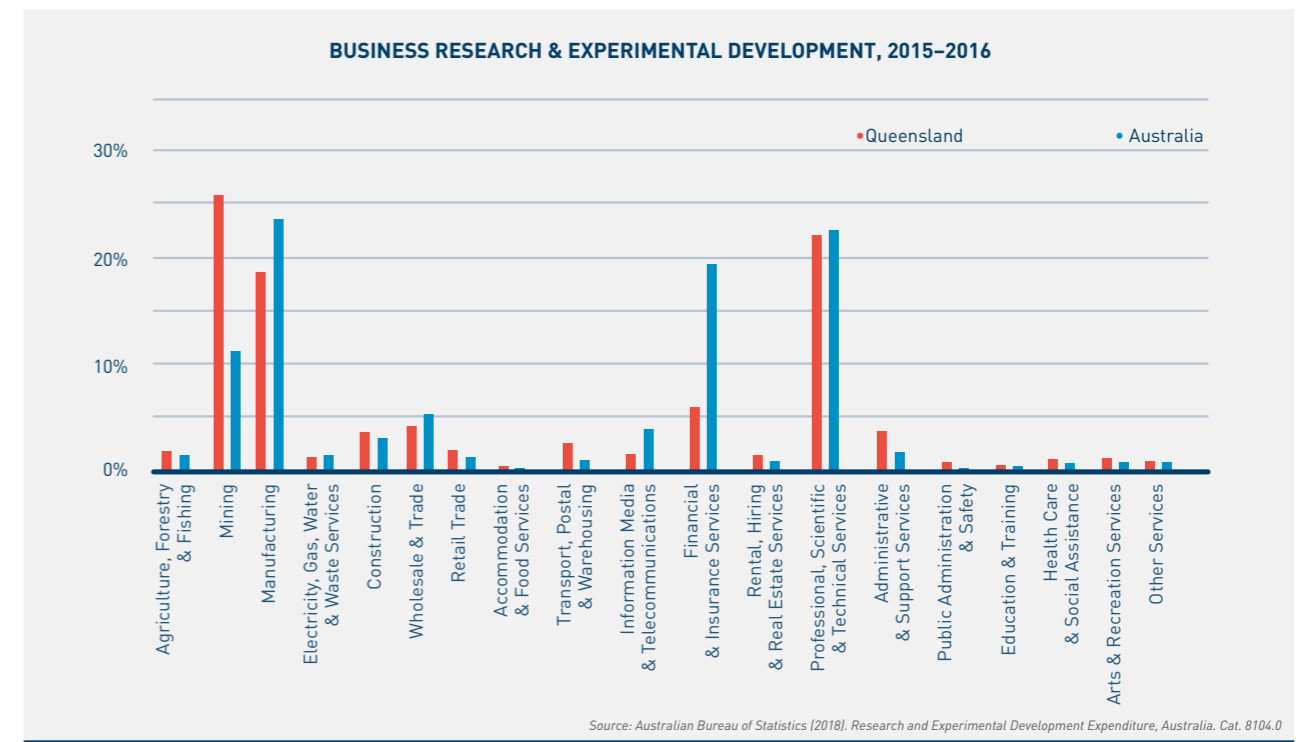
- ▶ Provide entrepreneurs with information sheets about risk capital providers
- ▶ Improve access to finance through financial innovations e.g. comprehensive credit reporting and alternative funding programs
- ▶ Further develop IDEs in Queensland to encourage more VC deals

Queensland's R&D expenditure in 2014-15 is about \$4.4 billion, representing 14% of Australia's \$32 billion spent on R&D. Queensland underperforms for R&D expenditure both nationally and internationally, with businesses and the federal government under-investing.



... Queensland has 20% of Australian business, but only 18% of patents & 12% of business R&D spend

Most R&D expenditure in Queensland comes from private sector businesses (44%), but this is below the national average of 52%. Australia's business expenditure on R&D has been declining with this trend being more pronounced in Queensland. Queensland businesses invest less in R&D as a percentage of



The second highest contributor to R&D expenditure in Queensland is higher education (43%) and this is higher than the national average of 34%³⁸.

Queensland's higher education R&D expenditure increased from \$1,667.5 million in 2014 to 1,918.4 million in 2016 (up 15%). Yet Queensland's proportion of all higher education R&D expenditure increased only marginally to 18%, indicating that higher education in Australia is generally increasing its R&D spending.

Queensland's higher education sector is more likely to invest in:

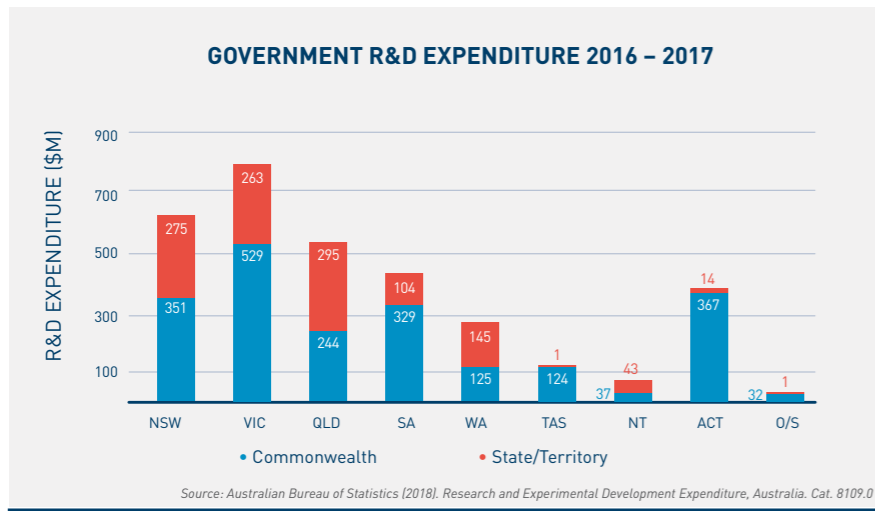
- ▶ Experimental development
- ▶ Applied research
- ▶ Environmental sciences
- ▶ Agriculture and veterinary sciences
- ▶ Technology

GDP than those in NSW, VIC, SA and WA. The state may lose competitive advantages if businesses are not encouraged to invest in R&D.

... "You know would actually help? The R&D tax breaks" [R1]

Encouraging SMEs in Queensland to engage and invest in R&D would increase productivity, improve competitiveness and establish collaborations that create an innovation culture²¹.

- ▶ Manufacturing, mining and construction contribute 56% of all business expenditure on R&D.
- ▶ Since the mining downturn, mining and construction R&D expenditure has softened.
- ▶ Queensland businesses expenditure on R&D against the national average:
 - ▶ Spend more on:
 - ▶ Mining (+14%-points)
 - ▶ Construction (+3%-points)
 - ▶ Spend less on:
 - ▶ Financial insurance services (-12%-points)
 - ▶ Manufacturing (-6%-points)
 - ▶ Information media & telecommunications (-2%-points)



The Queensland Government's AQ program and the Queensland higher education sector have made significant and sustained investments in R&D and IDEs in recent years²¹. Opportunities exist to lobby federal government for a fair share of R&D investment and to create initiatives to encourage industry to spend more on R&D in Queensland.

Australia generally is losing competitive advantage by not maintaining its performance in communication infrastructure due to the sheer size of the country and the continued reliance on fixed line technology³³. There is opportunity to focus on developing and attracting mobile and satellite communication infrastructure and technology.

Australian respondents scored the quality of Australia's electricity and telephone infrastructure as 6.2 on a scale of 1-7, with a median of 4.35³³. Australia's score and ranking for infrastructure, especially electricity and communications, deteriorated in 2017-18. This was due almost entirely to a deterioration in the score and ranking for Australia's 'quality of electricity supply', from 6.4 out of 7 points and a rank of 22nd in 2016-17 to 5.7 points and a rank of 44th in 2017-18⁴⁵.

There are 3.8 million internet users in Queensland, with most using it for banking, social networking, shopping, and entertainment. Only 1/3rd use it for education and little more for health services²³.

"Despite the rollout of the NBN there has been no discernible increase in adequate access to services necessary to conduct any form of digital business in our region... The situation for us though means there is no real opportunities available to enable automation or monitoring of critical infrastructure or processes in agriculture, which is increasingly necessary due to overwhelming costs associated with staff." [R27]

INFRASTRUCTURE CAPABILITIES

	I-CAP	E-CAP
INFRASTRUCTURE	<ul style="list-style-type: none"> ▶ 85% of all individuals and 78% of businesses have access to the internet (GII). Most people with jobs (95.1%) are online, compared to just 72.5% of those not employed ▶ Australia ranks 22nd globally for ICT adoption (GCI) ▶ Australia ranks 24th for Information and Communication Technology (ICT) access, scoring 80.4 on the ICT access index, which was above the median of 67.7, but below of maximum of 94.2²⁷ ▶ Australians have access to the latest technologies but individuals rank poorly on digital skills and automation (GCI) ▶ Penetration of digital technologies in Australia is relatively low in agriculture, healthcare, and mining (GCI) ▶ Australia's Internet bandwidth (kb/s per internet user) scored 88.3 in 2017, above the median of 55.1, but below the maximum of 8397.9 achieved by Luxembourg³³ ▶ In July 2019, Australia ranked 59th globally for fixed broadband speeds, with an average download speed of 37.88 Megabits per second (Mbps). This is below the global download average of 58.66 Mbps³⁹ ▶ Australia ranks 6th globally for mobile broadband speeds with an average download speed of 58.87 Mbps, above the global average of 26.96 Mbps ▶ The Inclusive Internet Index rates Australia 25th out of 86 countries, behind Russia and Hungary⁴⁰ 	<ul style="list-style-type: none"> ▶ Electricity supply is sufficiently stable, but not sustainable for the environment (GCI) ▶ Australia's ranking in providing "Quality of Electricity" fell in 2018. Queensland has the highest installed capacity of rooftop solar in Australia ▶ 86% of households have access to internet, however the speed is slow (UN) ▶ Efficiency of customs clearance of Australia is similar to many other developed countries (WB) ▶ Australia's Logistics Performance Index score was 3.8 on a scale of 5 in 2018 (global median was 2.7). Australia ranked 19th globally⁴¹ ▶ The total volume of data downloaded in the three months to 31 December 2017 was 3.6 million Terabytes (or 3.6 Exabytes), up 19.7% compared with the three months ended 30 June 2017 and a 38.6% increase in the year ending December 2017 ▶ There were 27.0 million mobile handset subscribers in Australia at 30 June 2018, an increase of 1.1% since December 2017 ▶ Australia had 845,605 internet users per M of population in 2015, with the median being 498,300⁴² ▶ There were 14.7 million internet subscribers in Australia at the end of June 2018, an increase of 3.6% from the end of December 2017⁴³

Queensland ranks below average on 2017's Australia's Digital Inclusion Index 55.3/56.5⁴⁴.

The infrastructure in Queensland is world class, however acquiring assets and other infrastructure platforms is complex and cumbersome. As identified earlier, a key challenge for Queensland is communications infrastructure. High-speed internet and energy costs are relatively expensive for new businesses.

"Technology is one of our biggest problems because 80% of our job is sitting in front of the computer. So, every time the internet has a problem we literally can't do any work..." [R18]

DEMAND

	I-CAP	E-CAP
DEMAND	<ul style="list-style-type: none"> ▶ Queensland's Digital First strategy has created demand for developing digital technologies to service public sector department. ▶ Industry-Research collaboration for Australia is lowest in the OECD countries (GII) ▶ Australia's trade, competition and market scale scored a 78.9 in 2018, above the median of 60.7²⁷ 	<ul style="list-style-type: none"> ▶ Roy Morgan's annual Customer Satisfaction reports indicate most retail purchases in Australia are price driven ▶ Australia is the 4th largest e-commerce market in the Asia-Pacific (GCI). With a stable cash rate and wages growth, Australian's saving ratio has fallen over the last decade (RBA) ▶ With US\$1,235 billion in GDP Australia's domestic market is small but reasonably accessible (GII) ▶ Australia's domestic market scale as measured by GDP PPP\$ was US\$1,235.3 in 2018. The median was 174, with the maximum being \$21,269 for China, followed closely by \$19,362 for the US²⁷ ▶ Australia scored 5.2 for production process sophistication against a median of 3.8 and a 5.7 for availability of latest technologies, with a median of 4.8³³ ▶ Australia's buyer sophistication was 4.0 on a scale of 1-7, with a global median of 3.4³³

Australia ranks 19 on the Global Innovation Index (GII) for domestic market scale. Australia's domestic market is relatively small, and Australia is removed from the US and Europe (GII). Australia is in close proximity to Asia and has very strong trade relations with this region. Queensland has 16 sister cities in China alone.

Australia's government procurement of advanced technology products does not excel, scoring 3.3 in 2017-18, equivalent to the global median³³. Evidence suggests there is opportunity for government and corporate procurement reform to accelerate IDE growth and innovation.

Manufacturers employed more than 171,300 workers in Queensland in 2018-19, contributing \$20.3 billion to the economy. In January 2017, the Queensland government announced an extra \$7.6 million as part of an Advanced Manufacturing Roadmap. This was designed to help traditional manufacturers develop job-generating advanced techniques.

Most retail purchases (cars, appliances, clothes and electronics) in Australia are price driven due to a lack of product manufacturing innovation⁴⁶.

Key barriers to innovation cited by Queensland businesses³¹:

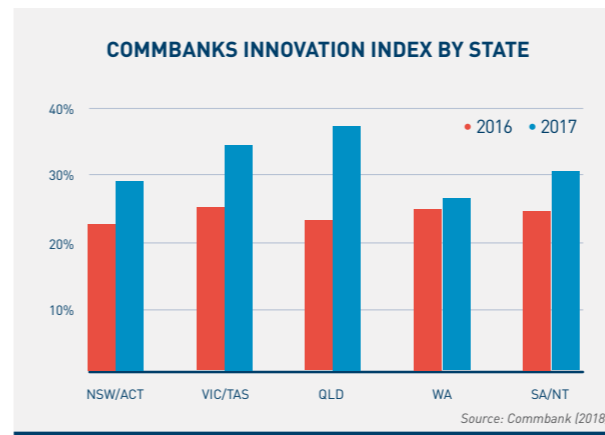
- ▶ government regulation and compliance
- ▶ lack of growth in market demand
- ▶ increased competition
- ▶ availability of skilled labour
- ▶ poor understanding of the innovation agenda
- ▶ problems of size and scale

CULTURE & INCENTIVES

I-CAP	E-CAP
<ul style="list-style-type: none"> ▶ Australia is number one on the Global Creativity Index 2015⁴⁷ ▶ Australia's scientific research institutes are well placed to attract talent - Australia granted 11,000 visas for Post Graduate research in 2017-18 ▶ The quality of Australia's scientific research institutions scored 5.7 in 2017-18, against a median of 3.9 and a maximum of 6.0³³ ▶ There are currently 16 Australian Government research agencies, which are funded around \$2 billion a year for R&D activities. The Australian Government invests \$10 billion each year on R&D related to science and innovation⁴⁸ ▶ CSIRO is the largest Australian Government research agency, employing 5,000+ staff and receiving \$1.5 billion in funding in 2016-17. CSIRO ranks 18th in the Reuters top 25 global innovators list for government. CSIRO is ranked the 15th largest patent application filer amongst government and research institutions worldwide in 2017 (PCT) 	<ul style="list-style-type: none"> ▶ Entrepreneurial intentions are lower than other OECD countries (GEM) ▶ Few Australians are prepared to take "above-average" or "substantial" financial risks with just over half the population unwilling to take any financial risk. Females are more risk averse (HILDA) ▶ 42.9% of Australia's adult population who perceived good opportunities to start a business indicated that fear of failure prevented them from starting a business, compared with a global median of 36.5%¹² ▶ Only 54% of Australians (18-64 years) in 2016 thought starting a business was a worthwhile career choice (GEM). The global median was 61.3%¹² ▶ 71.5% of Australian's agreed that successful entrepreneurs receive high status. The global median was 69.2%¹² ▶ Australia scored 88.3 on the business freedom index, ranking above the median of 63.5⁴⁹ ▶ Australia has a high rate of entrepreneurship activity globally. Men tend to be keener to start a business than women, believing they are more entrepreneurial⁵⁰. Female entrepreneurial activity in Australia is 65% that of males¹² ▶ Almost half of all Australians believe our level of entrepreneurship is "good" to "excellent", with 1 in 3 wanting to own their own business. Young Australians are the most aspirational (nearly 1 in 2)⁵⁰ ▶ 12.3% of Australians identified as nascent entrepreneurs, with the intent to start a business within three years. The median was 17%, with a range from 4.8% to 66.6%¹²

CULTURE & INCENTIVES

- ▶ Domestic modifiers: Most innovation-active firms in Australia
- ▶ Australia ranks 23rd against 31 OECD countries for proportion of firms undertaking new-to-market product innovation
- ▶ Innovation-active businesses in Australia have a return on investment of 1.97 times and the payback period is generally in the first 12 months (64%)
- ▶ 49% of Australian businesses are innovation-active
- ▶ 9.3% of Australian businesses are undertaking new-to-market product innovation
- ▶ Generally, innovation-active businesses invest in technology (49%), sales and marketing (48%) and staff training and expertise (47%)⁵¹. They often do so to improve efficiencies / productivity (53%) and to improve the quality of their offering (43%)
- ▶ According to CommBank's Innovation Index, Queensland was the top innovation hotspot in Australia in 2017. However, all states and territories improved their innovation performance during 2017
- ▶ Queensland has the widest regional spread of innovative entrepreneurship⁵²



There is a positive relationship between business innovation and growth⁵³, specifically:

- ▶ Innovation in goods/services increases firm turnover growth by 3.3% points
- ▶ Innovation in marketing increases firm growth by 4% points
- ▶ Persistent innovators generate four times the employment growth and five times the sales growth of regular innovators
- ▶ Innovation-active high-growth firms (HGF) have 9.7% higher turnover growth

HGF MYTH DEBUNKED

MYTH:
HGFs are all small, young, high-tech firms.

REALITY:
HGFs are diverse both internationally and in Australia making them difficult to target with policy.

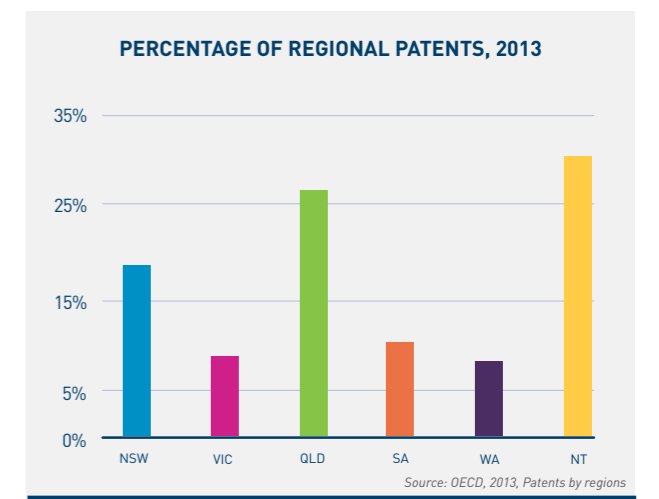
In recent years, Queensland has had a relatively strong innovation agenda aimed at progressing investment in R&D by business, higher education and government sectors²¹. Around 88% of Queenslanders believe that innovation is important for Queensland's future and 58% believe that Queensland is an innovative state⁵⁴.

... "Most do not want to take a risk and just want a job..." [SR65].

Queenslanders are innovative and creative with strong technical talent, but they are risk averse. Almost half of all Queenslanders have an idea that they believe has potential, but only 17% progressed the idea. The primary barrier is cited as finance⁵⁴. Instead, most Queenslanders are employed in the public sector, with entrepreneurship not viewed as a stable or lucrative career choice. This is despite Queensland ranking well globally for starting a new business and ease of doing business.

... "it's not about who gets there first, it's about who does it better..." [R7]

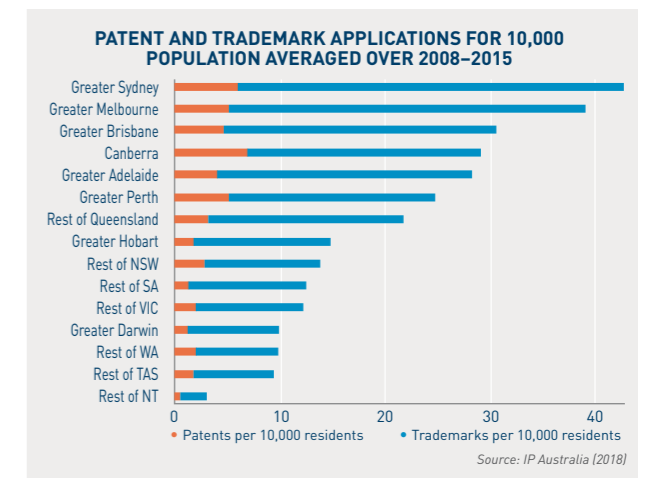
While Australian residents increased patent applications by 16% between 2014 and 2015, Queensland was the only state to record a decline in patent applications (down 12%). Queensland underperforms in patents filed per million population. In 2013, Queensland's patent performance (65) remained below that of Australia's (76). The most active nations, such as Japan, Finland and Sweden, file more than 250 patents per million population.



In the same period there was double-digit growth in trademark applications in all states and territories. Queensland recorded a 15% increase in trademarks, around the national average, but above the rate of NSW (12%) and Victoria (11%).

Brisbane records fewer patent and trademark applications per 10,000 people than Sydney or Melbourne. But Queensland traditionally has a higher rate of trademarking and patenting activity outside of the capital city compared with other states and territories²¹.

... "We talked about patents... it doesn't really protect you. All we can do is protect our own IP." [R7]



FOUNDATIONAL INSTITUTIONS	EXPLANATION	AUSTRALIA	
		SCORE	RANK
Ease of doing business (WB)	Composite country ranking from the World Bank across 10 topics relating to ease of operating private-sector firms	80.1	14
Starting a business (WB)	Ranking of the simplicity of starting a new business for entrepreneurs incorporating and registering a new firm	96.5	7
Paying taxes (WB)	Ranking level of tax rates and administrative burden in tax payment for typical medium-size firms	85.6	26
Resolving Insolvency (WB)	Ranking level of weaknesses in insolvency law and main bottlenecks in the process	78.8	18
Enforcing contracts (WB)	Ranking level of time/cost for resolving a commercial dispute including degree of good practices in the court system	79.0	3
Property Rights (IEF)	Score across the strength of laws allowing individuals to accumulate five types of property rights (including IPRs)	78.7	5
Government Integrity (IEF)	Score capturing levels of trust, transparency and absence of corruption	77.4	5
Labour Freedom (IEF)	Score capturing flexibility and efficiency of a country's labour market including hindrance to hiring etc	79.7	5
Trade freedom (IEF)	Score capturing tariff and non-tariff barriers to imports and exports.	89.1	5
Corruption Perceptions Index (TI)	Overall ranking of countries in their composite level of perceived corruption (high ranking implies high corruption)	70.0	13

METHODOLOGY STATEMENT

The research presented in this report adopts a pragmatic mixed method research design to triangulate primary and secondary quantitative and qualitative data to elicit insight into Queensland's entrepreneurial ecosystem.

SECONDARY DATA COLLECTION

A desktop audit of secondary data was used to evaluate innovation and entrepreneurship capacity in Queensland. Statistics were systematically sourced from various government and international organisations based on the MIT REAP framework.

PANEL SURVEY

An online survey was conducted in early 2018 with 1,018 Queensland residents, 18 years or over, who:

1. thought about, attempted, or set up a business in Queensland in the last 5 years;
2. Owned or operated an established business located in Queensland;
3. Researched or helped Queensland businesses to startup, grow or develop.

The survey contained 40 questions that explored the challenges and barriers of entrepreneurship in Queensland, as well as business philosophy and perceptions of the business environment. Responses were weighted to the population of Queensland businesses as at June 2017 by industry classification and broad business location. Nascent entrepreneurs were identified by modelling the total number of businesses by nascent entrepreneurship results from the Global Entrepreneurship Monitor for Australia, 2016/17. Adjusted-Wald and design-based F-tests verified significance.

IN-DEPTH INTERVIEWS

In-depth semi-structured interviews were conducted face-to-face or via telephone with 28 participants in early 2018. Participants were identified from those who indicated they would be willing to participate in an interview in the panel survey. In total, 93 potential participants were approached and 30% agreed to participate. The interviews ranged from 30 minutes to 2 hours in duration. The interviews were recorded and transcribed intelligent verbatim, with open and axial coding uncovering themes and concepts arising naturally from the participants' perspectives.

FOOTNOTES

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