

Brief.

November 2020

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Callaghan Innovation
Briefing to the Incoming Minister

Seizing a once-in-a-lifetime opportunity

Shared vision for New Zealand
Convening the leadership

Exploring a post-pandemic workforce
Let's science the s#*& out of it

R&D Tax Incentive
A great example of pan-agency collaboration

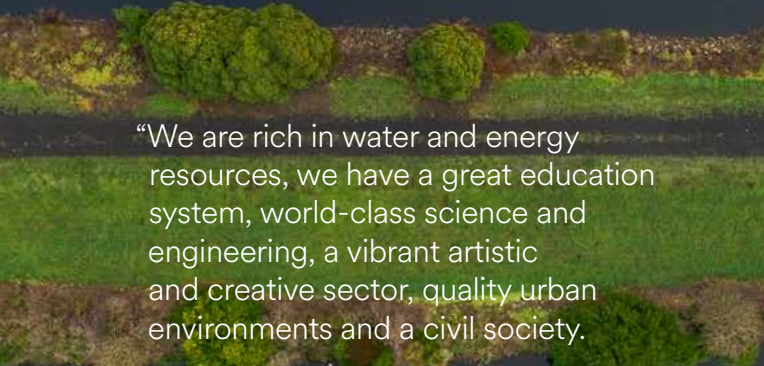
Gracefield Innovation Quarter
Tangible demonstration of post-COVID-19 collaboration

Invitation to all of government
Join us on the innovation journey

All this plus

**Business as usual
... but better**

The only real option is to innovate



“We are rich in water and energy resources, we have a great education system, world-class science and engineering, a vibrant artistic and creative sector, quality urban environments and a civil society.

When we combine all this with our unique landscapes and our pristine mountains and seas, **we have the chance to be the place where talent wants to live.**

What is needed is a national strategy and the resolve to move consciously towards its vision.”

Sir Paul Callaghan



Let's innovate
to build back
better

Callaghan Innovation

Briefing to the Incoming Minister

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What is needed is strategy and resolve. We'd
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**This document is intended to be read as part of a set of three
publications (Annual. Brief. Beyond.).**

The first was Callaghan Innovation's 2020 Annual Report
(callaghaninnovation.govt.nz). This Briefing to the Incoming Minister is
to be read second. The final publication is intended to be a website that
will launch in the new year.

Cover image: At 5:42am EDT on Friday,
29 June 2018, SpaceX's Dragon spacecraft
lifts off on a Falcon 9 rocket from Space
Launch Complex 40 at Cape Canaveral Air
Force Station in Florida, carrying more than
2,600 kilograms of research, equipment,
cargo and supplies that will support dozens
of scientific investigations aboard the
International Space Station.
Image credit: SpaceX



Kia ora from Vic

I am proud to be leading an organisation that is fearlessly focused on the future

New Zealand has an opportunity to diversify its economy, prepare for the future, and thrive in a pandemic-affected global economy.

Our country's relative success in managing COVID-19 presents a once-in-a-lifetime opportunity to innovate. With focused intervention, New Zealand can diversify our economy, support emerging high-value sectors and position businesses for global growth. At Callaghan Innovation we believe a collective, long-term vision is needed to galvanise the nation towards a shared recovery and a future we can shape together.

In 2011, Sir Paul Callaghan said: "What is needed is a national strategy and the resolve to move consciously towards its vision." I believe Callaghan Innovation was conceived to be that resolve. The COVID-19 pandemic (and New Zealand's response) has helped me understand more acutely that achieving Sir Paul's – or indeed any – vision requires innovation and resolve from everyone, working together.

We have lived through years of digital disruption in a matter of months. It seems as if everything has been flipped upside down (and inside out) within a very short space of time. Before COVID-19, New Zealand was facing significant challenges in the coming decades from technology, demographic and environmental changes. These challenges were accelerated further by the global pandemic, and the next two decades will only bring more challenges as the exponential change in our world continues to play out.

At Callaghan Innovation, we work with around 3,000 New Zealand entrepreneurs and innovative businesses. They – and others like them – represent an opportunity to reshape our economy for a future that can go far beyond a rebuild of existing industries. Industry leaders are telling us they need a shared vision for recovery now, more than ever before. At the same time, Callaghan Innovation has reviewed the recovery thinking presented by thought leaders across New Zealand's industry, science and business sectors. There is a surprising level of commonality in their aspirations for our future.

We can't know the future, but we can prepare for it. Innovation is all about starting with a hypothesis, testing it and going back to the drawing board if things don't work. At Callaghan Innovation we have been 'innovating within' since I took over three years ago, and that first-hand experience is what we now offer you. I believe our success as a nation in a COVID-19-affected world will require all government agencies to strive together towards true transformation.

Callaghan Innovation is uniquely trusted to become the agency empowered to convene the leadership for this transformation. For the past two years, Callaghan Innovation has participated in Colmar Brunton's Public Sector Reputation Index, and has been recognised as in the top five most trusted 50 government agencies. In 2020 we ranked second only to Fire and Emergency New Zealand in the leadership pillar, moving up from third in 2019. ▶



New Zealand's Innovation Agency is ready to step up and also become this country's innovating agency.

The past is gone, and we're not looking back.

New Zealand's productivity growth hasn't always kept up with those of other countries in the OECD. Recently, Callaghan Innovation's in-house research team updated the data Sir Paul Callaghan used as evidence in his 2011 presentation: *Sustainable economic growth for New Zealand: An optimistic myth-busting approach*. New Zealand still has a long way to go on many measures.

However, New Zealand has the resources, talent and opportunity for a successful and innovative future. We need to act now – and take advantage of the opportunities that the current COVID-19 crisis presents. Together, we must refresh the ways in which we are working so that we can address the complex challenges we face.

We look forward to working with you to achieve your objectives and drive towards a better future for New Zealand.



Vic Crone

Callaghan Innovation CEO



Callaghan Innovation is the official innovation agency of the New Zealand Government.

It's also the only Crown entity to have been named after a single individual, local scientist Sir Paul Callaghan. Want to understand why, and be inspired like we are? Watch Sir Paul's 20-minute presentation that set us all on this journey:

bit.ly/optimisticmythbusting.

The International Day of Women and Girls in Science, celebrated in February 2020, was about encouraging a new generation of women and girl scientists to tackle major challenges of our time.

Farzana Masouleh (pictured) is one of the bright minds working at our Gracefield Innovation Quarter (GIQ). In partnership with Hutt Science, Callaghan Innovation hosted 45 Year 11-13 female students at our GIQ site in Lower Hutt. The young women delved into the exciting worlds of hi-tech sensors, 3D printing and precision measurement. Meanwhile, at our Auckland location, Year 9-13 students covered everything from engineering and big data to bioengineering and augmented reality.



Science, technology, engineering and math (STEM) jobs are increasingly important for New Zealand's future. At Callaghan Innovation, we are seeing serious demand for STEM skills from the businesses with which we work, especially frontier industries like robotics, food science, aeronautics, big data, smart transport, health technology, artificial intelligence (AI) and sustainable energy.

These skills will become even more in demand as we move into our technology-driven future.



Watch our vision story

Click here or visit bit.ly/LookToUs
to watch the video (3:37)

Opportunity knocks



Right now, our opportunity to innovate is banging on the door – and we need to answer it!

Even pre-COVID-19, New Zealand was a country that needed innovation.

Historically, our economy's long-term challenges have included low productivity and wages, skill shortages, limited domestic capital markets, a lack of diversification and under-investment in infrastructure.¹ New Zealand has also had low rates of technology transfer and weak investment in knowledge-based capital, reflected in our low investment in business Research and Development (R&D) expenditure relative to GDP.² We have lagged behind our OECD peers in both labour productivity and productivity growth, translating to a lower GDP per capita.³

Pre-COVID-19 Callaghan Innovation had already seen opportunities to use technology changes in the coming decades to finally shift some of these measures. To prepare for the future, we have been focused on economic diversification to digital industries (as well as science and engineering technical support across agri-tech, med-tech, ICT advanced manufacturing, bio-tech and clean-tech). Our efforts have complemented the Government's wider Industry Transformation Plans to address how our economy's focus will be moved from volume-based commodities to high-value export industries. ►

1. *Economic Plan for a Productive, Sustainable and Inclusive Economy (2019)*. New Zealand Government.

2. *Achieving New Zealand's Productivity Potential (2016)*. New Zealand Productivity Commission.

3. *Productivity by the Numbers: 2019 (2019)*. New Zealand Productivity Commission.

World-wide, the scale and pace of technological change has been unprecedented, and the impacts are amplified by interactions with other socio-economic factors such as shifting demographics, globalisation and the transition to a sustainable, zero-carbon economy.

And then COVID-19 happened

Our customers told us that the top five impacts of COVID-19, which revealed some consistent challenges across the innovation ecosystem, such as revenue generation, supply chains, keeping talent and funding for R&D.

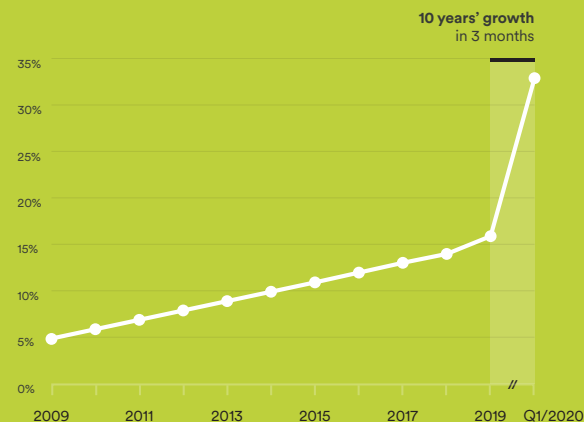
1. 50 percent reported delays in their ability to launch products and services.
2. Others were affected by the closure of markets (49 percent) – national (28%) and/or international (30 percent).
3. 33 percent said they were affected by closures of supply chains – national (24 percent) and/or international (12 percent).
4. 20 percent report having to let staff go or reduce their pay.
5. 19 percent said investor funding was affected. ▶

The leap

How fast is the world around us moving? Consider how e-commerce has replaced physical channels in just three months.

mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/five-fifty-the-quickening

US e-commerce penetration, %



Source: Bank of America; Forrester Analytics; ShawSpring Research; US Department of Commerce; McKinsey analysis

Numbers in 2040

Two decades from now or 20 minutes from now?



50% of all cars sold are autonomous



65% of people live in urban areas

9.15B world population (7.63B in 2018)



India is the world's second-largest economy



AI¹ is everywhere



+1.62°C average temperature rise



54% of cars sold are electric

1. esa.un.org/unpd/wup/
iom.int/news/iom-migration-research-series-no-31-migration-and-climate-change

Before COVID-19, urbanisation, accelerating technological change, an aging population and greater global connections were already reshaping the world as we knew it. McKinsey estimates¹ that, compared with the Industrial Revolution, change is happening 10 times faster and at 300 times the scale, with roughly 3,000 times the impact.

The COVID-19 pandemic has only intensified these trends – which have been termed “the quickening” and “the great acceleration”. McKinsey research² found that e-commerce penetration in the United States doubled in just three months, having previously taken 10 years to double. Microsoft Chief Executive Satya Nadella said recently that the company had seen two years’ worth of digital transformation in only two months.

This acceleration comes with a unique opportunity. We know from previous recessions that technology and automation rise to the forefront during crises to create new market opportunities and business efficiencies.

Beyond COVID-19

A more productive, sustainable and inclusive economy can be delivered by supporting world-leading environmental, social, cultural and economic opportunities. It is critical that we help businesses to start, maintain or even accelerate their R&D and innovation in a COVID-19-impacted world.

Innovation and R&D are the keys to unlocking potential. Callaghan Innovation’s 2018 report, *Growing the Pie*, estimated that New Zealand’s nine ‘unicorns’ – businesses worth more than \$1 billion each – had created more than \$34 billion in value between them. However, their total value to New Zealand was much greater than that because of their contributions to other start-ups, and to philanthropic causes. *Growing the Pie* showed the value that entrepreneurs drive into our economy through creating ideas, scaling those ideas globally and then exiting, something that creates a whole new cycle of start-ups, job creation and fresh capital investment.

New Zealand’s innovating agency

Callaghan Innovation understands now that we must practise what we preach. We know our customers are most successful when they are innovating simultaneously on their products, operations and business models. We are doing the same.

Many organisations, both private and government, run single programmes on things like transforming back-office IT and enabling more interactions via digital channels. Our approach is to transform our services through a new business model and the way we operate through a new operating model, and upgrade physical assets (infrastructure and digital) to enhance our services and the way we operate.

For the past 24 months, Callaghan Innovation has been undergoing its own transformation, by adopting three new ways of working.

1. The Treasury required Callaghan Innovation to deploy the Managing Successful Programmes (MSP) framework for our Gracefield Innovation Quarter (GIQ) programme, which aims to fulfil our duty of care to staff and tenants at our Lower Hutt site. We have voluntarily opted to use MSP across all our internal transformation programmes. Along with this, we have established an Enterprise Programme Management Office and extended its scope from managing just our programmes to managing our whole portfolio of investments, including core business to support the Government’s objectives.

We are now able to pivot this portfolio quickly depending on Government priorities. During the Alert Level 4 COVID-19 response, we pivoted our strategy and were able to re-organise our work quickly to support the Government’s response and our customers’ immediate needs. ►

1. mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-four-global-forces-breaking-all-the-trends
2. mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/five-fifty-the-quickening

Numbers in 2040

Two decades from now or 20 minutes from now?



AR/VR³ is the ubiquitous viewing platform



China is the world’s largest economy



170B connected devices
(Up from 40B in 2018)



47% of jobs have been automated



180m people are on the move due to climate change



US\$160 per barrel of crude oil
(Up from US\$70 in 2018)

3. [Augmented reality/virtual reality](#)

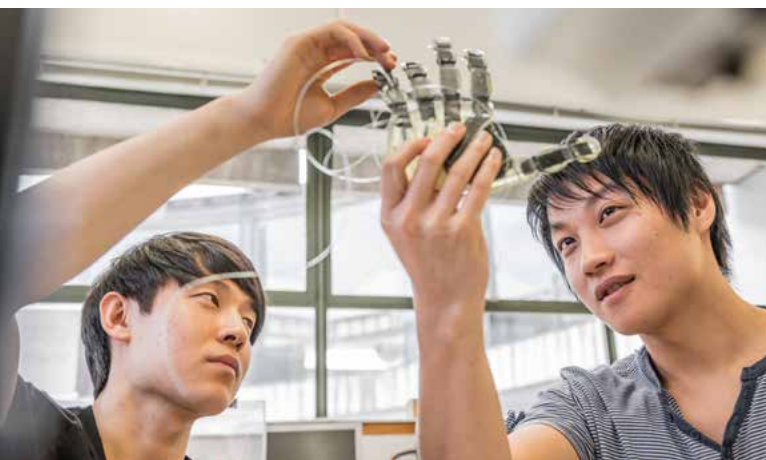
quantumrun.com/future-timeline/2040-pwc.com/gx/en/world-2050/assets/pwc-world-in-2050-summary-report-feb-2017.pdf

- MSP has been proven a success, but we believe it does not meet all our requirements. Callaghan Innovation has chosen to blend MSP with the Regenerative Approach, which has been described by Māori participants as “the closest thing to Te Ao Māori, the Māori worldview that isn’t it”. Threads of wellbeing, quality of life and kaitiakitanga are clearly visible in this way of thinking.

The Regenerative Approach is rapidly gaining attention around the world. It has been selected as the change framework the Commonwealth of Nations will use to try to reverse climate change through its Common Earth initiative.

- In the first half of 2021, Callaghan Innovation will bring in agile practices and structures using MSP and the Regenerative Approach. This will be a sustainable way to achieve similar outcomes to crisis management, where cross-disciplinary teams operate at pace against missions aligned to Government objectives.

Going agile will increase our impact by freeing up our capability from a base of traditional silos into multi-disciplinary and multi-organisational teams to tackle our most pressing priorities. We can also leverage the significant expertise in networks such as KEA and the Edmund Hillary Fellowship, and bring that value to our customers and partners across the innovation ecosystem. ►




Life in 2040

COVID-19 has accelerated our journey towards what our future will look like. We need to prepare for that change now.

The world in 2040 will look very different from that of today. The fourth Industrial Revolution will have completed its cycle.

The next two decades will be full of challenges as the exponential change in our world continues to play out.

- **The New Zealand population aged over 65 has doubled**, and life expectancy has increased by five years, putting extreme stress on our superannuation and health systems. Yet our working-age population (15-64) has only increased by 10 percent. Half the workforce will be Māori, Pacifica and Asian.
- **India and China will be home to half of all middle-class consumers.** We will have to adapt our products and capabilities to meet these higher-value consumer needs, which are different from those of our current primarily western trading partners. These consumers are increasingly environmentally responsible.
- **The notion of ‘the job’ is a distant memory.** People build portfolio careers through entrepreneurship, start-ups, freelancing and independent contracting. New technologies completely change both where and how we work; new types of roles (e.g. artificial-organ farmers) emerge. A new generation is attracted to social enterprise, which offers a sense of purpose and value. New Zealand will need a highly flexible, adaptive education system and workforce with new regulatory mechanisms to support them.
- **More internal and international climate refugees are requesting assistance** – up to 1.7 million people displaced in the Pacific region alone. New Zealand may be seen as a refugee ‘haven’, putting pressure on aging infrastructure.
- **Limited health care resources and staff will shift the focus to self care**, with technology supporting independent living for the elderly and pre-emptive diagnosis. Patients will have greater control, using AI to support self-diagnosis of health issues and treatment options. 3D-printed, functional organs and tissue have been approved for human transplant by the FDA. New Zealand’s historically low organ donation rate is no longer a health consideration.
- **Traditional competition will change.** The complexity of change will require partnership-driven innovation: NZ Inc will have to move from national competition to collaborating for global growth with shared risks/rewards.
- **Our food choices will be influenced by ethical and environmental values.** Technology innovation in alternative proteins and milk products, ultimately at a price point on par with traditional products and affecting the value of our animal-based agricultural economy. Alternative proteins will become the first choice for the majority of consumers globally.
- **Of the top 30 economic entities in the world, more than 20 will be corporations, not countries.** Global technology and commerce will demand a rethink of national and international structures, norms and behaviours.



During the initial COVID-19 response, central government was able to move swiftly and decisively using crisis management. In some instances we saw walls being broken down across agencies that we'd not seen before, due to the imperative to act. However, crisis management is not a sustainable way to operate and will burn out our human capital.

Callaghan Innovation is still a work in progress. But work in progress is the new normal for all of government as we continue to respond to pandemic-related developments. To date we've learned some useful things, and we'd like to share them with our colleagues in other agencies. Likewise, we believe we could learn a great deal from them.

COVID-19 has changed and blurred – and will continue to change and blur – the nature of work, technology, innovation, collaboration and leadership, and the nature of the organisations that have traditionally been responsible for each of these silos. ■

“We have to **energise people and motivate people** and get them thinking in a different way. The most important thing is to get a national conversation going where there's an awareness building in the country about what we're capable of and some excitement around what we can do...

We either **stake our claim in the global economy**, play to our strengths, develop new ones, prosper and grow, or we face a very poor future indeed.”

Sir Paul Callaghan, 2010

What we want to focus on

1.

R&D Tax Incentive

The RDTI was launched in May 2019 as an interagency project by MBIE, Inland Revenue and Callaghan Innovation. The RDTI supports businesses doing ground-breaking R&D in areas such as AI, blockchain, genetics, mechanical/structural engineering and agri-tech.

In the first year, the focus was to raise awareness of the new tax credit. Callaghan Innovation led promotional activities directing users to the purpose-built RDTI Hub website, and 1,150 people are subscribed to regular updates. Engagement activities included meetings and events with over 7,000 people.

This year, the focus is on deepening engagement with businesses that have shown interest in applying, including those previously receiving Growth Grants. All current Growth Grant contracts will end by 31 March, and these customers need to understand the different eligibility criteria and process for moving to the RDTI, which may mean they are not eligible, or receive less funding. This impact will be felt primarily by digital businesses, who in some cases will lose significant support. Our team will continue to capture customer feedback and provide this to MBIE.

From an operational perspective, Callaghan Innovation and Inland Revenue are continuing to refine the application and assessment process to improve the customer experience.

2.

Post COVID-19 workforce

The world of work is being transformed by technological advances such as AI, robotics, autonomous everything and big data analytics. Research published earlier this year indicated that transitioning our workforces due to automation will deliver to 14 of the United Nations' 17 Sustainable Development Goals.

Living and working in a more sustainable way is more than just good business. It can affect everything from socioeconomics to diversity and climate issues.

Using a mission-based innovation philosophy, Callaghan Innovation proposes to discuss with you leading a pilot mission on the future workforce needed to support highly innovative economy. We would convene all relevant government agencies and private sector players and identify what we can achieve in a defined period that supports the Government's policy in the future of work and innovation space.

We propose using innovative practices to co-create and develop market-ready prototypes to progress this goal. Callaghan Innovation is well placed to lead this short-term, multi-agency pilot mission on the future of work, given our focus on technology, research and innovation, and our close relationships with New Zealand's most future-focused private companies.

3.

Gracefield Innovation Quarter

The Gracefield Innovation Quarter (GIQ) in Lower Hutt is an innovation hub with specialist premises and facilities, including workshops, pilot plants, labs and equipment. Many businesses work out of GIQ, from small start-ups to R&D teams from major international companies.

Our vision for GIQ is to make it a vibrant, supportive and connected innovation community. This type of work is a demonstration of post-COVID-19 collaboration, enabling all kinds of R&D businesses to learn from one another.

To move towards this future state, we are running a strategic programme of work in collaboration with partners across the innovation ecosystem, academia, central and local government, iwi and the local community.

The site currently needs upgrading, and there is a significant management and governance focus placed on HSE issues as a result of a legacy of lack of investment. In May 2019 the Government invested more than \$110 million in addressing many of these issues demanding immediate attention, including structural upgrades, asbestos contamination remediation and maintenance.

This work is due to be completed by 2023 and will provide the foundation for GIQ's future development as a world-class hub for R&D innovation.

4.

Invitation to all of government

As New Zealand's innovation agency, Callaghan Innovation aims to act as an exemplar to the rest of government on how a modern state-sector agency operates in the world of technology and innovation proliferation thrown upon us by the Fourth Industrial Revolution and accelerated by COVID-19.

We have either embedded or are embedding a range of practices to support a modern state-sector agency to lead and respond in the more volatile and uncertain environment we are all facing.

Our invitation to the rest of government is for other agencies to come along with us in our innovation journey.

COVID-19 has provided us with an opportunity to reset ways of thinking and become a more adaptive, flexible and fast-moving organisation.

We will lift our partnerships with other government agencies and departments to deliver government policy and our current programmes more effectively.

Our priorities

The trends are clear. Our role now is to shape the future in partnership with business and government.

The immediate areas of focus we would like to discuss with you to ensure we are supporting the innovation ecosystem and your priorities include:

1. The impact of COVID-19 on business enterprise R&D (BERD) targets and stimulating R&D investment:
 - Next steps in operationalising and embedding the R&D Tax Incentive
 - Supporting R&D in the medium term given projected delays to the 2 percent increase in BERD target
 - The grant appropriation and the evolution of the R&D grant services
2. Building innovation capability in New Zealand to address productivity issues, including supporting the role of innovation and technology in the wake of COVID-19
3. Running a proposed pilot mission on the future workforce to support post COVID-19 innovation economy
4. The evolution of our services in a world of volatility, uncertainty, complexity and ambiguity:
 - Policy development and implementation for the health of the innovation ecosystem across multiple policy teams and delivery agencies
 - The Gracefield Innovation Quarter strategic programme
 - Callaghan Innovation's transformation to a modern innovation agency that is citizen centred, inclusive, collaborative and uses technology to scale its impact
 - Using agile and trying new ways of doing things
5. Budget bids
 - Further funding to support Māori sector, Agritech, HealthTech and Food Innovation Network
6. Appointment of Board members to replace departing members.

Key areas

Economic development

The innovation ecosystem needs effective, co-ordinated support from Government to thrive. Innovation and R&D are the keys to unlocking potential. A more productive, sustainable and inclusive economy can be delivered through our support of world-leading environmental, social, cultural and economic opportunities.

Innovation capability and new technologies are vital to addressing the fundamental challenges of productivity in New Zealand and building a new economy in a COVID-19-affected world.

There is a huge opportunity for Callaghan Innovation to be more ambitious in our definition of 'organisational transformation', e.g. through the Digital Technology Industry Transformation Plan.

In order to grow New Zealand's pipeline of entrepreneurs and potential unicorns we must support these organisations more strongly in areas such as market fit and access to skills to globally scale and capital.

The government must approach this as an ecosystem of coordinated support that it is currently not doing.

Our focus on unlocking the R&D potential of the Māori Economy to help achieve cultural, environmental and economic aspirations, contributes to the government's vision of a productive, sustainable and inclusive future for Aotearoa New Zealand.

As an agency that sits across the Research, Science and Innovation and Economic Development portfolios, Callaghan Innovation is uniquely placed to deliver mutually reinforcing initiatives.

Small business

The vast majority of New Zealand's businesses are small businesses. There are around 530,000 small businesses – defined as having fewer than 20 employees – in New Zealand, representing 97 percent of all firms.

They account for 28 percent of employment and contribute over a quarter of New Zealand's GDP.

Approximately 50% of the \$50 billion Māori Economy is made up of SME's. Research shows that Māori companies have higher rates of innovation and R&D than NZ businesses as a whole, but are under accessing government support. There are opportunities to have greater impact and ensure these businesses are aware of and can access our support.

COVID-19 has forced many of these to adopt new technologies and innovate to make their businesses more efficient so they can survive and thrive.

If we are to fundamentally shift our economy, then a more ambitious culture of capability building and an innovative mindset are needed throughout our small businesses.

Callaghan Innovation works with small businesses that are innovative or R&D-focused. The number of these firms needs to grow for the benefit of our entire country.

Callaghan Innovation is well placed to deliver initiatives for the small business portfolio that are aimed at increasing firm growth and productivity.

We do this already through the Regional Business Partner Network but we believe there are further opportunities to scale government intervention in this sector of the economy.

Environment, climate change and primary industries

Environmental innovation is critical to delivering improved environmental outcomes for New Zealand.

Callaghan Innovation works closely with enviro-tech companies and is well placed to deliver initiatives aimed at growing the enviro-tech sector in New Zealand.

New Zealand has a real strength in terms of environmental entrepreneurship.

Tikanga Māori, the spiritual values of reciprocity and balance of people, environment, natural resources not only help us be better New Zealanders but bring global competitive advantage. Māori play a significant role in our primary industries, collectively owning large proportions of these assets.

Callaghan Innovation can help organisations tap in to this capability and create opportunities for partnerships focused on environmental innovation.

The redevelopment of GIQ presents a huge opportunity to test environmental innovations and create a hub for environmental innovation.

Plus business as usual...

We will continue business as usual with our wide range of programmes that support innovation and R&D.

The Gracefield Innovation Quarter Programme is focused on delivering a vibrant, supportive and connected innovation community.



Who we are. 10 fast facts

1. Callaghan Innovation is a government agency supporting hi-tech businesses in New Zealand.
2. We activate innovation and help businesses grow faster for a better New Zealand.
3. We're named after the late Sir Paul Callaghan, who championed the role science could play in making New Zealand an economic success.
4. Callaghan Innovation was formed following the recommendation from the 2011 Powering Innovation report, which looked at how to boost the growth of businesses in the manufacturing and services sectors.
5. Callaghan Innovation is a catalyst for the commercialisation of science, engineering, technology and design.
6. We aim to accelerate the growth, scale, intensity and success of innovation in New Zealand, to build business investment in R&D and support export growth.
7. We partner with ambitious businesses of all sizes, providing a range of innovation and R&D services to suit each stage of growth.
8. We're a mix of 458 researchers, engineers, scientists, technologists, designers, entrepreneurs, advisors and administrators delivering self-help and on-demand services and tailored programmes.
9. We work closely with government partners, Crown Research Institutes and other organisations that help increase business investment in R&D and innovation.
10. Callaghan Innovation has four urban offices, and a partnership network spread across 12 regions in New Zealand.

“If New Zealand is to grow its economy more rapidly it must overcome geography to build nationwide communities of *innovators, entrepreneurs and businesses.*”

Sir Paul Callaghan



There is more detail on all of our business as usual in Appendix One.

... but better

It's about more than just commercialisation now

By applying innovation theory and practices as we work and grow as a country, we will more quickly solve the critical issues our society faces – poverty, inequality and climate change.

Treasury Living Standards Framework

The Treasury's Living Standards Framework reflects our Government's commitment to thinking about what matters for New Zealanders' wellbeing, now and into the future.

It includes 12 domains of current wellbeing outcomes, and four capital stocks that organise indicators of sustainable intergenerational wellbeing: Natural, Social, Human and Financial/Physical.

It will soon be mandatory for all government agencies to report on KPIs based on all four capitals rather than just the last.

At Callaghan Innovation we can be 'inspired' by Sir Paul Callaghan's vision or wait to be 'required' by law. New Zealand already has a foundation for partnership, participation and protection.

The wellbeing approach

The wellbeing approach of the Government is grounded on the idea that it is imperative to consider the long-term impacts of policies on the quality of people's lives, and that, alone, short-term output measures will not work.

The approach has given New Zealand momentum – which has yet to be seen anywhere else in the world – towards the adoption of a truly intergenerational world-view focused on integrating cultural, social, environmental and economic wellbeing outcomes.

Our country's unique commitment to the relationship between the Government and the indigenous Māori people, as defined by Te Tiriti o Waitangi, gives us a strong foundation for shared principles of partnership, participation and protection.

That relationship brings with it a greater understanding of the importance of cooperation between people and their places.

“We are approaching the fastest, deepest, most consequential technological disruption in history.”

This was [Fast Company's](#) headline on 5 October 2020.

The story stated what we at Callaghan Innovation also know: that in the next 10 years, key technologies will converge to completely disrupt the five foundational sectors – information, energy, food, transportation and materials – that underpin our global economy.

The authors predict – as we do – the “deepest, most consequential technological disruption in history and with it, a moment civilization has never encountered before”.

With this disruption comes a unique opportunity for New Zealand to innovate and deliver new solutions to society that will improve living standards for all.

Combining innovation and technology with purpose and profit

Callaghan Innovation was set up to focus on economic businesses but, in less than a decade, we are now seeing the rise of social entrepreneurs.

The new thinkers are combining innovation and technology with purpose and profit to provide new ways of solving our social problems.

We've earned their trust

“Trust is the glue of life. It's the most essential ingredient in effective communication.

It's the foundational principle that holds all relationships.”

– Stephen Covey

New Zealand is trusted

New Zealand is rated in international surveys as one of the world's most peaceful and least corrupt countries.

The 2017 Global Peace Index, which compared 162 countries for the risk of personal violence, rated New Zealand as the world's second safest country just after Iceland.

Transparency International's 2017 Corruption Perceptions Index ranked us the least corrupt country in the world, equal with Denmark.

New Zealand is also the second safest COVID-19 country, after Germany, according to a Forbes report released in September.

The study assessed 250 countries on the efficiency of their quarantine systems, health readiness and management and detection of the virus.

Forbes first carried out the study in June and named Switzerland as the safest country, with New Zealand at number nine.

Our government is trusted

At a time when data from the [Gallup World Poll](#) suggests that trust in public institutions has been going down recently in OECD countries, a recent [Colmar Brunton poll](#) shows 88 percent of New Zealanders trust their government to make the right decisions about COVID-19 (well above the G7 average of 59 percent), and 83 percent trust it to deal successfully with national problems.

Callaghan Innovation is trusted too

[Colmar Brunton's Public Sector Reputation Index 2020](#) named Callaghan Innovation the fifth most trusted government organisation. We were the second-highest-scoring government organisation for leadership. Leadership was measured as:

- Is a forward-looking organisation
- Contributes to economic growth
- Is easy to deal with in a digital environment
- Is a successful and well-run organisation

As a trusted organisation, Callaghan Innovation is well placed to convene the leadership of entrepreneurs and government that will bring New Zealand's brilliant minds together to solve the big challenges ahead.

A message from Pete

“Our people work for an organisation, but they believe in a vision.”

The world has fundamentally changed in the past eight months. Callaghan Innovation has an opportunity to help bring together the public and private sectors to rise to the new challenges we are facing with our vision of building New Zealand into “the place where talent wants to live”.

Every organisation needs a light on the hill to focus on. A vision and a goal that will stretch it.

In the six months from October 2019 to March 2020, Callaghan Innovation ran a series of almost 50 internal workshops. Attendees focused on the value of the organisation having a vision. Key findings demonstrated:

- The importance of our having a strong, compelling vision and purpose, which scored 9.4 (out of 10)
- The strength of attachment to Sir Paul Callaghan’s vision – of ‘the place where talent wants to live’, which scored an 8
- The importance that achieving Sir Paul’s vision should have for Callaghan Innovation, which scored 8.1

Of course, Sir Paul’s vision was for all New Zealand, not just for the organisation named after him. Before endorsing his vision as our own, leadership at both the board and executive levels had to re-imagine the role Callaghan Innovation might have in achieving such a broad goal.

Callaghan Innovation has adopted ‘a place where talent wants to live’ as its own vision, for our country as well as an organisation where talent wants to be.

Sir Paul also said “What is needed is a national strategy and the resolve to move consciously towards its vision”. We would welcome the opportunity to discuss with you the work going on to create this national strategy and the role Callaghan Innovation could play in this.

Reputation and trust

Callaghan Innovation has been in the top five agencies in the annual Public Sector Reputation Index for the past two years.

The globally validated framework used by Colmar Brunton to measure public sector reputation uses four pillars. They are:

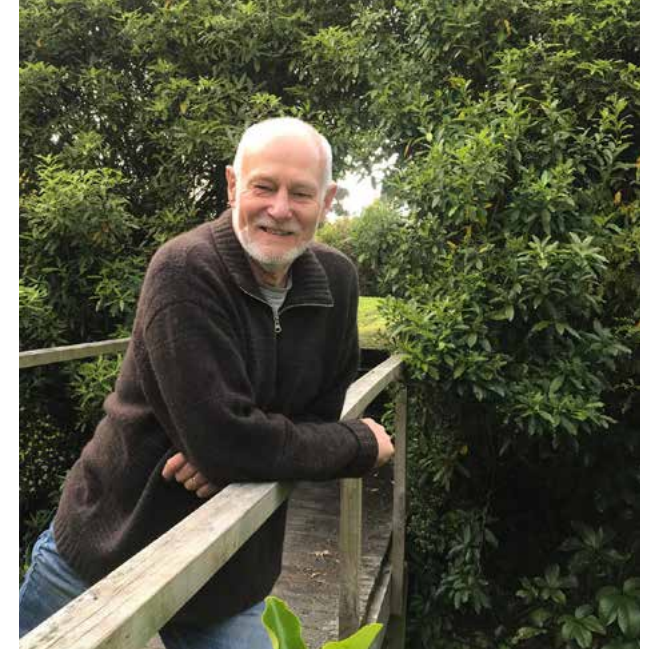
- Trust
- Social responsibility
- Leadership
- Fairness

Trust is rated on how a government agency is perceived to: listen to the public’s point of view; use taxpayer money responsibly; be trustworthy; and be relied upon to protect individuals’ personal information. In 2020 Callaghan Innovation scored fifth out of 50 agencies for trust.

Leadership is judged by how much survey participants feel the agency: is forward looking; contributes to economic growth; is easy to deal with in a digital environment; is a successful and well-run organisation; and prepares New Zealanders for the future challenges that we face as a nation.

This year Callaghan Innovation gained one place to rank second for leadership.

We are proud to be rated so highly, and the rankings demonstrate how the organisation’s leadership, from the Chief Executive down, has made a tangible difference.

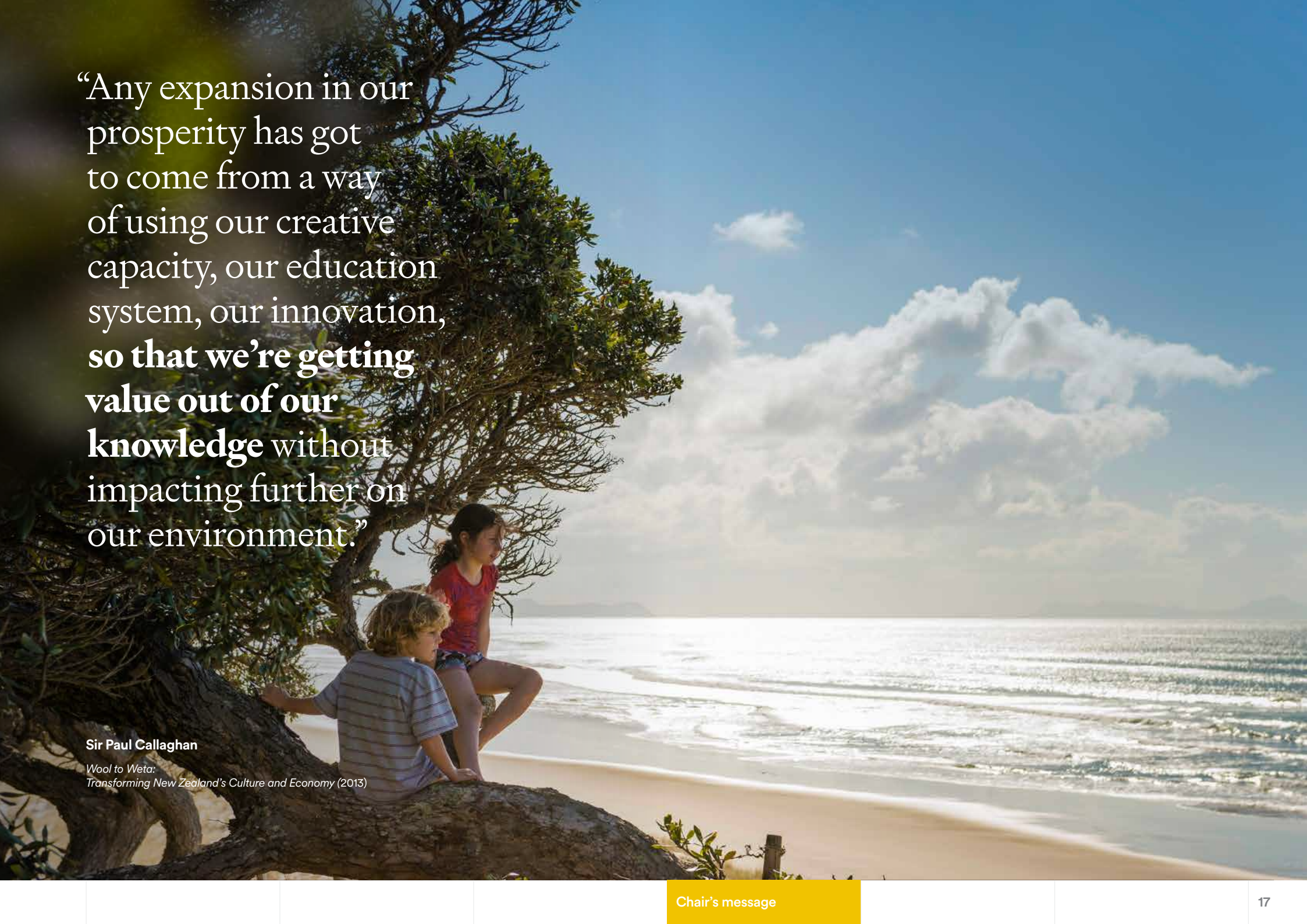


Callaghan Innovation can push the boat out further and easier than other agencies because innovation is expected of us. Accordingly we can be an exemplar for modern state agencies.

Vic Crone as Chief Executive, along with her team, has ensured that Callaghan Innovation is successful and well run, that it is always looking forward, and that it is focusing its energy on preparing the population for tomorrow’s problems rather than today’s.

Sir Paul Callaghan dreamed the dream. The board backs Vic, her leadership team and the people at Callaghan Innovation – along with everyone across all of government – to see the dream delivered.

Pete Hodgson
Callaghan Innovation Chair



“Any expansion in our prosperity has got to come from a way of using our creative capacity, our education system, our innovation, **so that we’re getting value out of our knowledge** without impacting further on our environment.”

Sir Paul Callaghan

*Wool to Weta:
Transforming New Zealand’s Culture and Economy (2013)*

How we engage with you

In person

The Chair of the Board and the Chief Executive will meet with you at a frequency of your choosing. These meetings provide an opportunity for substantial discussions on wider and pressing issues, and have been held at both monthly and quarterly intervals.

Officials from Callaghan Innovation are part of your weekly Research, Science and Innovation (RSI) officials, providing a more regular opportunity for updates and policy discussions.

Briefings

We will provide briefings directly to your office on issues or where you have requested information. These are often provided in collaboration with the Ministry of Business, Innovation and Employment (MBIE) and other government partners.

Our fortnightly reports provide you with day-to-day updates on general progress.

Reporting

We will provide you with regular updates on our performance. The Entity Performance and Investment branch of MBIE will assist you in reviewing and approving them.

Our corporate reporting documents are:

- *Statement of Performance Expectations*: a yearly statement of our objectives and performance measures for the upcoming financial year. *Timing: May, annually*
- *Annual Report*: a yearly report reviewing our financial and non-financial performance for the previous financial year. *Timing: August, annually*
- *Quarterly reports*: quarterly updates on our ongoing performance against our strategy and indicative performance against our financial and non-financial performance measures. *Timing: End of the month following the completion of each quarter*
- *Statement of Intent*: a five-yearly document that sets out our goals and objectives, and our strategic approach to how we will achieve them. *Timing: We are in the third year of the current Statement of Intent. It will be refreshed in early 2021 for the new strategic period commencing in July 2021*

Note: The Statement of Performance Expectations, the Annual Report and, in relevant years, the Statement of Intent, are tabled by you in the House in around October each year.



Prime Minister Jacinda Ardern and Minister for Research, Science and Innovation Megan Woods visiting Callaghan Innovation's Gracefield Innovation Quarter, 25 May 2020.

What we do

Our current five-year strategy helps us to activate innovation and accelerate commercialisation for New Zealand.

We are in the third year of the strategy, which seeks to address challenges such as fragmentation in the ecosystem, low rates of commercialisation and low levels of R&D.

The strategy has five strategic pillars to address these issues:

- **Build the Critical Foundations.** We need to have strong foundations to support R&D and enable it to thrive
- **Show the Future.** Showing New Zealand where technology is taking the world, how we must adapt and how innovation drives success
- **Fuel Demand.** Fuelling demand for New Zealand innovation and being a voice for innovators
- **Empower Innovators.** Empowering innovators by partnering with businesses and delivering the right services and funding support at the right time, for the greatest impact
- **Connect the Ecosystem.** Connecting innovators to local and global ecosystems and collaborating to remove friction in the R&D ecosystem

Our strategy is to show New Zealand what the future looks like and to show how we'll get there.

We stimulate demand for New Zealand innovation and connect New Zealand innovators to, and remove friction from, the innovation ecosystem. We partner with businesses to empower them to innovate.

In a world affected by COVID-19, innovation will play an important role in our economic recovery. High-value R&D activity is critical for a fast economic recovery. R&D creates new and innovative export opportunities, while lifting New Zealand's productivity.

Callaghan Innovation is ready to lead this part of New Zealand's recovery as we respond together to the ongoing effects of COVID-19.



Our own innovation journey

Building the critical foundations of New Zealand's innovation ecosystem.

The Government will not be left untouched by the interactions between the Fourth Industrial Revolution and other major social, economic and demographic changes.

Government organisations can use technology changes to achieve significant gains in the performance and efficiency of interactions with their citizens.

Technology and innovation can be utilised for us to:

- Truly put citizens at the centre of decision-making
- Collaborate deeply and co-create, not just within government but across industry
- Use technology and automation to scale their services and impacts
- to deliver future best practices, including agile, lean, design thinking, and regenerative and wholistic systems design.

Callaghan Innovation is undergoing its own internal transformation targeted at rapid step change to address operational deficits inherited at its establishment. In the next year we will evolve significantly both our business model and our operating model.

The key goals of our transformation are:

- Increase impact from government investment
- Increase efficiencies in the way we work
- Meet rising customer expectations
- Scale services and impact of government organisations
- Respond to rapid disruption and uncertainty in the coming decade and better utilise the immense skills, expertise and resources at hand.

We have four key programmes underway that are enabling us to shift from a command-and-control system to a flexible, collaborative organisation operating at pace.

1.

Digital transformation

The Digital Transformation Programme will improve the productivity and quality of our services both now and in the future.

The progress made in FY20 lays a strong foundation for the coming years. Callaghan Innovation has successfully transitioned to Google Workspace, creating a modern online working environment enabling and improving collaboration between teams within Callaghan Innovation.

The system is allowing a more collaborative, data-driven and agile Callaghan Innovation. The improvements will enable us to adapt to future demand, and to incorporate machine learning, business process intelligence and AI.

2.

Tātai Whetū

The Tātai Whetū programme about our culture and processes is changing the way we operate.

We want to increase our impact on the innovation ecosystem and be a world-class government agency that is an exemplar of innovation. The Tātai Whetū programme provides a blueprint for Callaghan Innovation's future operating model that will be implemented in FY21.

Tātai Whetū has introduced a new organisational change framework, He rangi hou kei tua, and has refined the vision for the organisation.

3.

Health and safety

We are in the process of strengthening our health and safety culture and processes at Callaghan Innovation. The work includes addressing a number of factors including our critical risks, as well as the hauora (wellbeing) of our people.

Through this project, and recognition of the wide array of health and safety challenges at the Gracefield Innovation Quarter (GIQ), we have progressed our health and safety journey but still have some way to go.

We are moving to the next stage of this project to the Home Safe Every Day programme, which has three phases: discovery, transition and transform. Our discovery phase is well underway.

4.

Gracefield Innovation Quarter

GIQ is being upgraded to be a vibrant, supportive and connected innovation community.

For the future GIQ, Callaghan Innovation is running a strategic programme of work in collaboration with partners from across the innovation ecosystem, academia, central and local government, iwi and the local community.



Read more about our work in this space in Appendix Two.

Our people

Our people are our most important resource. Our Callaghan Innovation team is made up of 458 people ranging from researchers, scientists and engineers to technologists, investment managers and innovation advisors – all working alongside our support teams to empower our customers.

Home Safe Every Day

Our Home Safe Every Day programme comprises a range of initiatives focused on keeping our people safe and healthy at work. Our Risk Framework provides consistent tools, expertise and dedicated resources to help our people identify and categorise business-related risks.

To help our people thrive at work, we have established a ‘Hauora’ wellbeing programme focused on five core areas: connecting, physical activity, continual learning, community engagement/giving and mindfulness.

We hope to see more engagement, less presenteeism and absenteeism and improved productivity – and most importantly, our people will be in a good frame of mind to perform at their best and get the most out of their careers.

Demographic information

Total number of Callaghan Innovation employees (as at 30 June 2020)	458
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Workforce by location

Auckland	95
Wellington	336
Christchurch	27

Workforce engagement (figures for part time/full time do not include our six casual employees).

Casual	6
Part time	52
Full time	400
Fixed term	62
Permanent	390

Gender

Male	288
Female	170

Ethnicity

Asian	4.8%
Māori	1.9%
New Zealander	26.2%
Pacific Islands	1.5%
UK and Europe	13.1%
Unknown	46.3%
Other	6.2%

Age

Less than 20 years	0.9%
20-29 years	8.7%
30-39 years	26.2%
40-49 years	28.6%
50-59 years	24.0%
60-69 years	9.8%
70-79 years	0.4%
Unknown	1.3%

We're committed to being a good employer

Leadership accountability and culture

We continue to invest in our leadership programme to ensure we have the right leadership skills and capabilities for the future, including emotional intelligence and courageous conversation skills. We are also investing in key leadership talent through the provision of in-depth leadership development experiences.

Recruitment, selection and induction

We know that great talent is hard to find. We are shifting our sourcing model to one that exemplifies innovation, engages proactively with talent and is more agile.

Building an open, diverse and inclusive workforce that attracts highly motivated people with a broad range of abilities, experience and talent is vital for us. Our refreshed Welcome Programme provides a consistent approach to enable our people to get up to speed quickly and be effective in their roles. We're connecting every type of employee – gig workers, interns, summer students and permanent staff – to the Callaghan Innovation employee experience through welcome activities, key communication channels, seeking feedback via Officevibe and celebrating successes. ▶

Employee development, promotion and exit

We are committed to employee development through our learning and development programme. We have an active secondment programme and currently 21 people are formally seconded in a range of roles.

As part of our exit process, we talk with departing employees about how they found their time with us. We use this information to continue improving the Callaghan Innovation experience.

Flexibility and work design

We have well-developed frameworks and processes to support flexibility and work design. This helps our people to blend their work and personal lives effectively. As part of our COVID-19 response, we embraced this further and have recently enhanced our flexible work policies and frameworks. We will implement the changes in 2021.

COVID-19 has enabled us to speed up elements of our Digital Transformation Programme, and our workforce is better connected across key digital platforms than ever before.

Remuneration, recognition and conditions

In the past two years we have worked actively to improve the market relativity of salaries paid to our scientists and engineers.

In 2020, with COVID-19 restrictions, we are working with a very limited budget while continuing to address any gender inequities.

We have established values-based reward and recognition programmes and recognised 16 employees who have also consistently demonstrated Callaghan Innovation values in their work.

We also recognise employees who have completed 20, 30, 40 and 50 years' loyal service at Callaghan Innovation (and its predecessor organisations).

We have reviewed the job evaluation framework to ensure relativities and fairness in our remuneration structures.

Harassment and bullying prevention

We actively work to ensure we have a workplace free from bullying and harassment, and our DVFREE framework supports this. Callaghan Innovation received one formal bullying complaint in FY20. The allegation was investigated and no finding of bullying was made.

Safe and healthy environment

Our Home Safe Every Day programme comprises a range of initiatives focused on keeping our people safe and healthy at work. COVID-19 has affected our health, safety and environment work, and we have focused our efforts on ensuring employees' safety and wellbeing in remote, home and lockdown conditions.

Our Hauora programme focuses on the five areas of wellbeing. COVID-19 has also meant an increased investment in wellbeing, both physical and emotional, and our people have reported that this has been extremely useful.

We have also increased our focus on health and safety, and we have seen an increase in reporting.

We completed 159 work inspections in FY20.

Event reporting increased by 21 percent on last year, with 202 events reported made up of:

- 81 incidents (an 11 percent increase)
- 45 near misses (a 2 percent increase – from 44 to 45)
- 76 hazards (a 43 percent increase). ■

Our people
are our most
important
resource.

*A key focus is
our new Home
Safe Every Day
programme.*

How we're funded

Callaghan Innovation is funded from seven appropriations within Vote Business, Science and Innovation, and also raises commercial revenue through its Research and Technical Services, as shown in the table below.

Further detail can be found in Callaghan Innovation's 2020/21 Statement of Performance Expectations: callaghaninnovation.govt.nz/sites/all/files/callaghan-innovation-spe-june-2021.pdf

Title	Description	Total revenue 2020/21 (\$m)
Callaghan Innovation Operations: Multi-Category Appropriation	This appropriation, made up of the following three categories, enables us to broker and provide innovation services to businesses and deliver programmes that enhance New Zealand's innovation system.	
<i>Building Business Innovation</i>	<i>This category is limited to activities that raise awareness of and increase business investment in R&D.</i>	38.5
<i>R&D Services and Facilities for Business and Industry</i>	<i>This appropriation is limited to providing research and technical expertise and facilities to business and industry.</i>	81.4
<i>Business Research and Development Contract Management</i>	<i>This appropriation is limited to the selection of businesses or individuals for either the provision of the Research Science and Technology output or the award of grants, and to negotiating, managing and monitoring appropriate contracts with these businesses and individuals.</i>	8.3
Future-proofing New Zealand's Manufacturing Sector by Driving Industry 4.0 Uptake and Skills Development	This appropriation is limited to a package of complementary elements that target different stages of Industry 4.0 uptake. We intend to increase the uptake of Industry 4.0 and improve the productivity and competitiveness of New Zealand firms.	1.4
Business Research and Development Grants	Growth Grants were designed to increase R&D investment by businesses with a strong track records of R&D spending in New Zealand.	138.4
Targeted Business Research and Development Funding	R&D project grants support greater investment by businesses in R&D, especially those with less established R&D programmes. We provide up to 40 percent co-funding of R&D costs. Our R&D experience, career and fellowship grants support undergraduate and graduate students to work in commercial R&D environments as interns in New Zealand's excellent commercial R&D facilities.	32.5
Repayable Grants for Start-ups	Our Incubator Support Programme accelerates the growth and success of high-value New Zealand start-up businesses through a range of services and funding. We intend to support the development and growth of new technology-focused business start-ups.	17.9
National Measurement Standards	This appropriation is limited to providing specified standards to satisfy the needs for traceable physical measurement in New Zealand.	8.8
Capital Expenditure	This appropriation is limited to capital expenditure to support the development of Callaghan Innovation's strategic infrastructure.	12.1

Performance metrics

▲
0.80%

Growth in BERD
% of GDP¹

0.75% Baseline (FY19)

1.00% Target (FY23)

▲
21k

Growth in number of
companies innovating²

20k Baseline (FY17)

21k Target (FY23)

▲
\$2.2b

Growth in value of
investment deals³

\$1.7b Baseline (FY19)

\$1.6b Target (FY23)

▲
\$3.2b

Growth in value of high-tech
exports⁴

\$2.7b Baseline (FY19)

\$3.4b Target (FY23)

▲
5-600

Growth in the number of
start-ups⁵

400-600 Baseline (FY19)

800-1,200 Target (FY23)

1. StatisticsNZ R&D survey.

2. StatisticsNZ business operations survey.

3. EY VC Monitor & PwC Young Companies Finance Index.

4. StatisticsNZ export data.

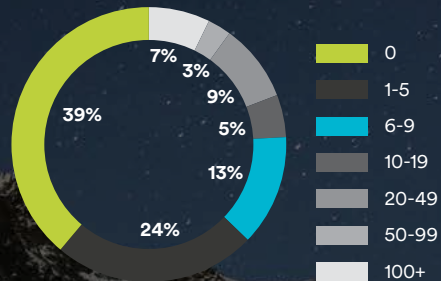
5. Start Up Genome Report.

Our customer demographics

Generally, Callaghan Innovation customers are new small or medium businesses in specialist areas, with a reliance on key relationships.

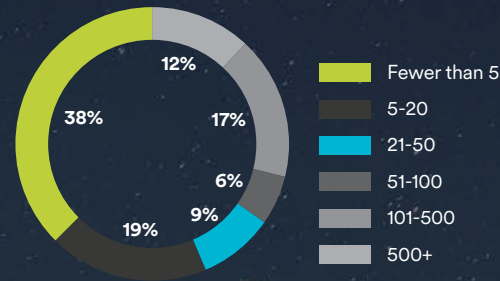
Number of employees

Average: 33



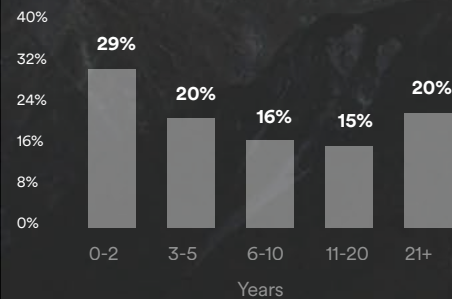
Number of customers

Median: 17

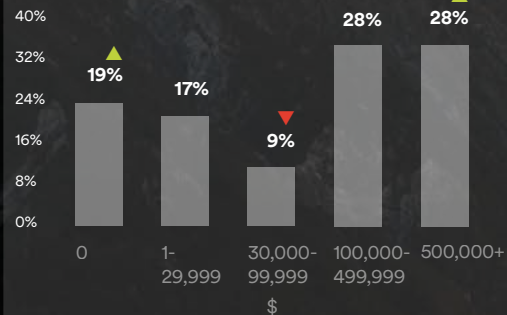


Tenure

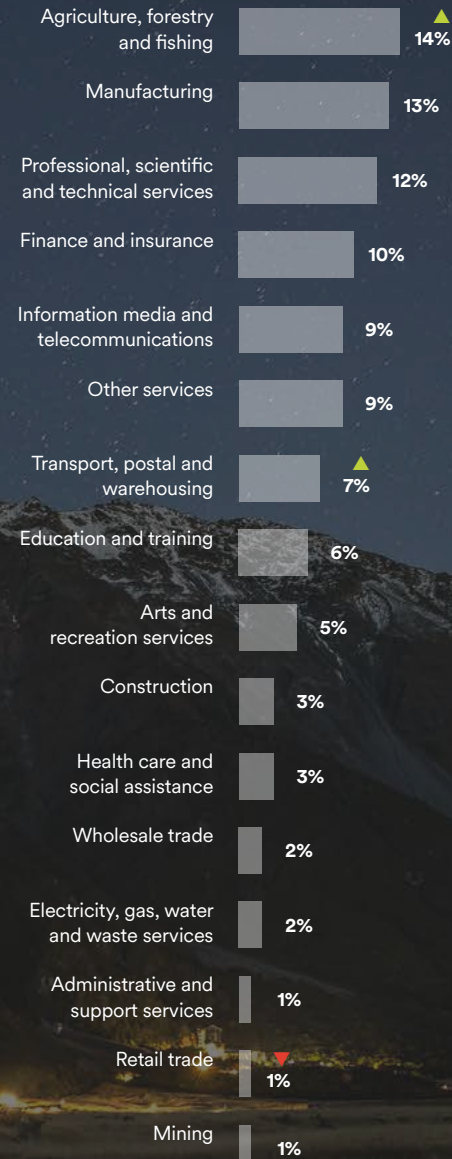
Median: 6 years



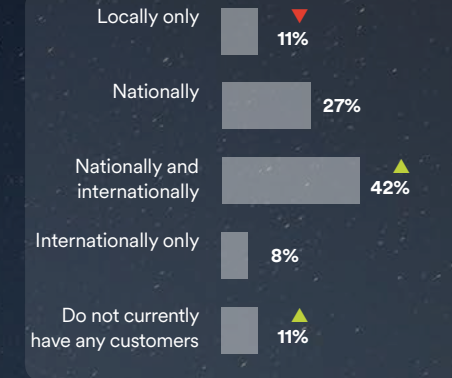
Revenue



Industry



Customers located



Suppliers located



50% Exporters **66%** Importers **77%** Any international trade

Base: Callaghan Innovation users (n=199)

▲ ▼ Significantly higher/lower than Total Innovators

The Board and Executive Leadership Team

Board



Executive Leadership Team



Appendix One: What we deliver to support the innovation ecosystem

We deliver or administer a variety of initiatives on behalf of both the RSI and Economic Development portfolios to provide tangible benefits to the innovation ecosystem. Each of these fits within the strategic themes of showing the future, fuelling demand, connecting the ecosystem or empowering innovators.

Show the future

Our **Insights Team** helps both innovators and our organisation to capitalise on the future opportunities created by going beyond the ubiquitous global megatrends. Through identifying key global shifts and the impacts these will have, we help New Zealand innovators to identify innovation opportunities with the potential for global markets, and assist them to be early movers for competitive advantage. Through applying these insights internally, we can help ensure Callaghan Innovation is placed to support the innovators operating in these spaces. Advanced materials, advanced manufacturing, bio-tech, data and the Internet of Things are some of the technology platforms we focus on.

The **Industry 4.0 Demonstration Network** helps drive the uptake of Industry 4.0 technologies amongst New Zealand manufacturers, with the aim of increasing their productivity and global competitiveness. Through directly demonstrating the improvements and value that the use of robotics, automation, data analytics and AI can bring, the Network seeks to encourage businesses to adopt and use these technologies to realise productivity gains. It comprises a mobile showcase, a network of site visits and smart factory tours, with up to two factories demonstrating deeper Industry 4.0 engagement.

AddLab helps inspire and enable businesses to explore the opportunities that additive manufacturing (3D printing) provides for their development processes. Connecting manufacturing businesses with emerging technologies allows for the limitations of existing techniques to be overcome, leading to new complex products in a time-efficient manner.

AddLab provides both an R&D service, developing concepts and early prototypes with businesses, and a consulting service, helping to assess how additive manufacturing may contribute to their businesses and connecting them with commercial providers and partners.

Fuel demand

The **Technology Incubator** programme helps de-risk and accelerate the commercialisation of deep-tech ideas through to commercial ventures. Given the risks and distance to market, this programme seeks to bridge the gap to ensure that the economic returns of ideas largely originating from our research institutes can be realised, and contribute to the growth of our deep-tech sector. Through the contracted technology incubator providers, businesses have access to up to \$750,000 in capital and a range of commercialisation services, including strategy development, commercialisation expertise and business coaching, to help them make their ventures investment ready for their next private funding rounds.

Founder Incubators provide concentrated, core business support and extensive networks for early-stage businesses to help them develop and accelerate their paths to market. Incubators provide services to help businesses validate ideas in the market and build strong businesses around the ideas. This includes assistance with technology and market validation, business planning and development, capability building and governance. Founder Incubators focus on building entrepreneurial capabilities among high-growth start-up teams that leverage less complex technologies and need to move fast to capture market share. 371 founder teams have been supported through Founder Incubators since 2017, and 218 ventures have gone on to raise additional capital through the markets (\$253 million). Current providers of this service include ThinLab, The Icehouse, Soda Inc, Creative HQ and The Factory.

The **Accelerator** programme has the same broad objectives as the incubator programmes, but focuses on rapid and intensive product development to establish investment-ready start-ups, and often complements the services offered by founder and technology incubators. The programme comprises programmed events and intensive mentoring to drive rapid formations of early-stage start-ups. The programme concludes with a final pitch to an audience of potential investors at which seed, angel or venture capital funding might be attracted. 68 teams have been accepted for accelerator programmes since 2017, supporting 194 founders. 14 ventures have gone on to raise further capital (\$16 million). Current providers of this service include Lightning Lab, Sprout, Flux and Kōkiri.

Kōkiri is a Māori business accelerator programme, based on kaupapa Māori values and focused on accelerating early-stage, Māori-led start-ups with bold ambitions. Through supporting Māori-led start-ups with high-growth potential to develop their business capabilities and wellbeing, Kōkiri aims to build a strong, connected and valuable community that is investable and enriched through Te Ao Māori, and make positive economic, social, cultural and environmental impacts in Aotearoa and Te Ao. Supported by Callaghan Innovation, this provides start-ups with access to start-up mentors, coaches, investor networks and a \$10,000 start-up grant.

The **New Zealand Food Innovation Network** (NZFIN) is a national network of processing plants, supporting firms to develop their food and beverage products. The primary focus is on delivering support through four regionally based food hubs – FoodPilot (Palmerston North), FoodBowl (Auckland), FoodSouth (Lincoln) and FoodWaikato (Waikato). Intended to improve the industry's international competitiveness, NZFIN removes access barriers for firms by reducing the costs and risks of food and beverage development and innovation. NZFIN achieves this by providing firms with open access to expert knowledge, equipment and connections across the spectrum of commercial scale-up, helping them to develop products from prototype through early-product and market validation.

Science for Technological Innovation is a National Science Challenge focused on enhancing New Zealand's capacity to use physical sciences and engineering for economic growth. Hosted by Callaghan Innovation, it aims to develop world-leading science and technology relevant to New Zealand, with a focus on building enduring partnerships between researchers, businesses and Māori organisations. In the 10-year life of the challenge, approximately \$110 million will be invested in 70 leading-edge hi-tech projects, encompassing more than 450 researchers, engineers and scientists from almost 40 research organisations.

Our **Championing Young Innovators** programme seeks to encourage more young people, from primary school to university, to pursue careers in innovation. Delivered through partnerships with several external organisations, it helps to ensure a pipeline of future talent in our innovation ecosystem. For example, the Wonder Project is delivered in partnership with Engineering New Zealand to encourage more young people, from primary school to university, to pursue careers in innovation, and includes several components targeted at different age bands. Other current programmes and initiatives include Venture Up, Chiasma, The Social Experiment and the Pūhoro STEM Academy.

Connect the ecosystem

Scale-Up NZ is a free online platform that makes it faster and easier for ambitious businesses to find and connect with the people, capital and other help they need to innovate and grow, here and offshore. It also creates opportunities for investors, incubators, multinationals and other collaborators to connect with innovative New Zealand businesses, helping to support and develop our ecosystem. Through the platform we also provide up-to-date information and insights on a range of active innovative companies, and facilitate first introductions between interested parties. ►

The **Regional Business Partner Network** provides connections to advice and services to enable New Zealand businesses to grow their capabilities. Jointly administered with New Zealand Trade and Enterprise, this nationwide network provides businesses with localised access to information, training and development services and funding.

Regional Business Partner Growth Advisors act as account managers, assessing businesses and working with them on their needs and growth opportunities. The network is a key channel to customers for Callaghan Innovation, and helps administer more than 50 percent of our grants.

We facilitate **clusters of Māori businesses** with a desire to innovate or create shared opportunities. These collaborative projects help build connections, reduce the costs of R&D and promote the sharing of knowledge among the partnering businesses. Current clusters include:

- Nuku ki te Puku – a collective of organisations focused on developing high-value nutrition business in Asian markets. The collective has supported a wide array of Māori iwi, land trusts and incorporations to invest in global R&D and innovation that is supporting the creation of high-value jobs
- Hemp Collective – a diverse group of government, Māori and research partners who have helped to develop the potential of hemp, a new legal commercial industry. This has resulted in the development of an industry capability roadmap to help newcomers locate capability and entry points to the industry
- Natural Products Collective – a collective of 110 natural product companies that collaborate, share ideas and resources, and identify where government initiatives can support their growth aspirations. The Collective has now formed its own governing body and a legal entity to manage the collective going forward

Callaghan Innovation develops and maintains **strategic international partnerships** to ensure that New Zealand is at the forefront of innovation best practice. These relationships create access to new ideas, access to markets and talent, investment opportunities and collaboration opportunities. Our relationships bring value to our customers, our organisation and the broader New Zealand innovation ecosystem. Key relationships include those with Australia, Israel, the United Kingdom, Ireland and Singapore.

International delegations (incoming and outgoing) form a significant part of our international relationship activity. Recent examples include: a delegation of New Zealand agri-tech innovators attending evokeAG, Asia Pacific's largest agri-food -tech event; Vic Crone leading a delegation of Crown Research Institute chief executives to San Francisco to learn from best-practice examples in R&D and commercialisation; and a Japanese business delegation visiting the Gracefield Innovation Quarter to learn about our vibrant innovation sector to foster economic links under the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. Given the current COVID-19 travel restrictions, Callaghan Innovation is exploring virtual engagement options to ensure that our international connectivity continues.

Empower innovators

R&D funding

Callaghan Innovation delivers several funding programmes to incentivise businesses to invest in R&D and support them to grow the size of their R&D programmes. The largest of these is the **R&D Tax Incentive** (RDTI), a 15 percent tax credit on R&D expenditure, which is jointly administered by Callaghan Innovation and Inland Revenue. Callaghan Innovation's role is to assess whether the businesses' activities meet the definition of R&D under the RDTI legislation, and thus qualify for the RDTI. While the RDTI is delivered through the tax system, the Minister of RSI is the Minister responsible for the relevant appropriations and policy settings.

Callaghan Innovation also administers several **R&D grants** to provide direct and targeted financial support to businesses that complement the broad-based RDTI mechanism.

- **Project Grants** are targeted at businesses that are new to R&D. With a 40 percent co-funding rate, these provide a significant boost for businesses that are at an early stage of their R&D journeys. Since the scheme was launched in 2013, we have supplied more than 2,300 Project Grants to help businesses get their R&D programmes off the ground.
- **Student Grants** provide funding to businesses to subsidise the cost of student summer interns (Experience Grants), PhD or Masters students (Fellowship Grants) or the first six months' salary costs for recent graduates hired by the businesses (Career Grants). These schemes provide a strong incentive for businesses to bring in new talent from the tertiary sector, both creating opportunities for students and supporting the innovation and R&D skills pipeline. This scheme has helped more than 1,600 students to receive placements in industry in the past four years alone.
- Getting Started Grants are available for businesses at the beginning of their innovation journeys. Delivered through the Regional Business Partner Network, they provide up to \$5,000 for a broad range of early-stage innovation activities, including basic prototyping, technical feasibility studies, and the development of Intellectual Property strategies.

A time-limited **R&D Loan Scheme** was launched in May to assist R&D-performing businesses to survive and recover from COVID-19. Recognising the high costs associated with R&D programmes and the role R&D will play in New Zealand's economic future, the scheme allows eligible businesses to borrow up to \$400,000 under favourable lending conditions. This scheme is a short-term measure, and applications will close on 31 March 2021. As at 17 September 2020, \$74.6 million of loans had already been provided to 211 businesses, enabling them to continue their R&D activity.

Capability support

Our **Research and Technical Services** group helps businesses to innovate and commercialise through support for design, product development, prototyping and R&D. Employing more than 130 of New Zealand's leading scientists, engineers and technicians across three cities, the group offers expertise and associated infrastructure to a wide range of companies, from start-ups to some of New Zealand's largest businesses, to solve the tough technical challenges they are facing. This group is organised across four key technology platforms: advanced manufacturing; advanced materials; bio-tech; and the Internet of Things and Data Solutions.

Callaghan Innovation owns two businesses that generate commercial revenue and contribute to New Zealand's innovation capability in specialist areas:

- **GlycoSyn** is a world leader in the development and manufacture of active pharmaceutical ingredients for pre-clinical and clinical trials. With significant expertise in and infrastructure for carbohydrate and complex chemistry, it provides fee-for-service pharmaceutical development contracts to domestic and international businesses, in addition to manufacturing its own patent-protected products for international supply. GlycoSyn is also a potential part of New Zealand's vaccine production capability for COVID-19.
- **KiwiStar Optics** is a global leader in precision optics for astronomy, directly contributing capability to New Zealand's space technology sector. It is specialist optics design and manufacturing company, customising solutions for the astronomy, instrumentation and space markets both domestically and abroad. ▶

The **Measurement Standards Laboratory (MSL)** is New Zealand's national metrology institute, providing services that are a key enabler for technology development and the international competitiveness of New Zealand businesses. MSL is responsible for maintaining the national measurement system essential for international and domestic trade, and the efficient function of electricity markets, safe aviation, high-value manufacturing and law enforcement; the 175 internationally recognised measurement standards it provides enable New Zealand exports to be accepted in more than 100 markets. MSL is also a key component of New Zealand's standards and conformance system, which is calculated to contribute \$2.4 billion in premiums to New Zealand exports and 0.6 percent to GDP.

The Māori data pilot, **Pātaka Raraunga**, is a free website to drive Māori R&D data and Māori economy data to the forefront. While data is widely recognised as one of the most valuable assets of the modern world, many who work with Māori, or who serve Māori communities and whānau, have limited access to reliable data for and about Māori. Delivered through a partnership with Figure.NZ, more than 1,800 charts and over 60 tables of reliable Māori data have now been published, an important first step in teaching people how to use data in ways that can help them make better decisions.

Our **Sectors teams** partner, either directly or indirectly through the Regional Business Partner Network, with ambitious companies and unique Māori entities to help them achieve success through commercialisation and innovation. Our business innovation advisors and customer managers use their deep sector knowledge and networks to provide advice and connect customers with the capability, capital, business support and training they need to progress their enterprises. Our current focus sectors are Digital, Health, Food & Beverage, Agri-tech, Manufacturing, Energy & Environment, Transport & Logistics, Māori Economy and Start-Ups.

Our **Innovation Skills** programmes help businesses build their innovation capability by helping them acquire the knowledge, skills and motivation to innovate and succeed. The range of programmes helps build capability in different areas: Lean helps achieve better productivity through engaging staff; Build for Speed helps deliver better software, faster; Driving Innovation helps develop better products and services, faster; Innovation IP helps identify and strategically manage intellectual property; and Capital Education helps start-ups understand the capital-raising process and how to raise the capital they need to create thriving businesses.

The **HealthTech Activator** is a coordinated, ecosystem-wide support mechanism for early-stage founders and companies in New Zealand's health-tech sector. The Activator makes it easy for health-tech companies to find and access the support they need to turn their health innovations into successful businesses, and de-risks and accelerates the commercialisation of innovation in our health-tech ecosystem.

The **Product Accelerator** undertakes research for innovative manufacturing companies to enable them to compete in and grow their markets. By connecting industry with research expertise, the Accelerator helps to solve industry problems, build productivity and support the transformation of the economy through diversification and improving its knowledge intensity. This is achieved through a process of direct engagement with companies, defining new opportunities through R&D, connecting with the right research expertise, and delivering the resulting projects.

The **Bioresource Processing Alliance** seeks to increase the volume of high-value materials derived from secondary bioprocessing streams through smart science and technology. Working with industry partners, it helps to convert low-value primary industry and other biological waste streams into high-value export goods, reducing waste and increasing New Zealand's exports in general. The Alliance provides a portal for companies to the combined world-class science capabilities and technical facilities of four of New Zealand's national research providers: AgResearch, Callaghan Innovation, Plant & Food Research and Scion.

The **Gracefield Innovation Quarter (GIQ)** gives businesses access to our best scientific and technical expertise, advice, services and specialist facilities through their co-location in a single site. It includes access to Victoria University of Wellington's Ferrier Research Institute and Robinson Research Institute, which are also located at GIQ. This ready access to expertise helps businesses to fast-track product development, scale-up, deployment and testing, accelerating their R&D journeys. ■

Appendix Two: How we are strengthening our critical foundations

We have several key transformation programmes and initiatives in place to improve our ability to serve the ecosystem and to care for the wellbeing of our staff.

Our **Digital Transformation Programme** will improve the productivity and quality of our services both now and in the future. The move to Google Workspace and the redevelopment of both our funding platform and our website will improve our collaboration and productivity, while the increased automation in our systems will allow us to redeploy our people for more impact. These systems are also being built to adapt to future demand, and will allow us to incorporate machine learning, business process intelligence and AI for further gains. As the customer has been placed at the heart of this process, this will also deliver improved ease of access to our services and increased transparency in our processes.

The **Tātai Whetū** programme is dedicated to improving the way we operate, with a specific focus on the development of our culture and processes. Through this comprehensive and transformational programme we are seeking to both increase our impact on the innovation ecosystem and be a world-class government agency that is an exemplar of innovation for others to follow. Current focus areas within this include: process optimisation and reviewing our operating model; implementing our change framework, He rangi hou kei tua, to assist us in being a more agile organisation; refining the vision for the organisation and what we are here for; and extensive customer experience (CX) work as part of the CX project to help us better understand and be able to serve our customers. The programme will also embed the principles of Māoritanga in the ways we work, shaping Callaghan Innovation as an exemplary Treaty partner.

- Our significant customer experience work, the CX project, has helped us understand the needs of innovators, and we are now testing processes and products that will result in an improved and more efficient distribution of our services. Through studying those doing R&D or innovation towards commercial benefits, we have mapped the journey of innovators through New Zealand's innovation ecosystem, from initial idea to ultimate success; this has helped to understand their needs, who was best placed to deliver them, and where there were gaps in support. Applying these learnings internally has allowed us to triage and tailor our responses to customers, allowing for a more efficient distribution of our resources for maximum impact, and to move to address gaps for frontier firms with the greatest potential. We are prototyping this approach with our HealthTech customers, and we expect this to be an area of continual learning for the organisation.

- The **Research and Technical Services Strategy** seeks to improve the impacts of our research and technical services on New Zealand businesses while operating within a viable financial model. This has involved identifying our ideal target customers – the high-impact innovators with the greatest potential to contribute to New Zealand's economy – assessing their needs, and identifying ways to increase support for this group, while ensuring sufficient commercial revenue is generated for sustainable operations within the current funding envelope. Additional components of the strategy include developing an R&D sharing platform and 'moonshot lighthouse' centres in areas of national significance.

Our vision for the **Gracefield Innovation Quarter** (GIQ) is a vibrant, supportive and connected innovation community, but the site is currently in poor condition due to decades of underinvestment. In May 2019 the Government invested over \$110 million to address many issues demanding immediate attention, including structural upgrades to buildings, asbestos contamination and deferred maintenance; this work is due to be completed by 2023 and builds the foundation for future development. To define this future state, we are running a strategic programme of work in collaboration with partners to deliver world-class facilities and an innovation community at GIQ that will support businesses to commercialise and undertake R&D effectively in New Zealand.

We are seeking to **build our Māori capabilities** within the organisation towards being a better Treaty partner. In addition to our dedicated Māori economy team, we host a two-day Kia Māia Marae experience designed to help our staff learn more about Māori business, culture, history, language and people, and how it can lift the New Zealand economy and differentiate us on the world's stage. We also operate a cultural app for our staff, Te Pou Herenga, to help with delivering mihi and the pronunciation of te reo.

We have also developed **relationships with the local iwi** Te Ātiawa and Ngāti Toa around our Waiwhetū (Gracefield) site. This has resulted in several joint research projects including:

- A new vaccine project, where funds are being sought to support education on vaccines to the local community, delivered through Te Ātiawa's medical centre, and plans to run workshops with local youth in this science discipline
- The use of seaweed feed to lower cow methane emissions, where local rangatahi will be involved in the collection, identification, extraction and processing of seaweed collected from Wellington Harbour

Te Ātiawa and Ngāti Toa are in discussions now on the partnership of a Māori-designed cube satellite

As we are now looking at the future development of our site, the local iwi are key partners in those discussions

We have established an **Enterprise Project Management Office** to ensure the strategic alignment and successful delivery of programmes and projects. Through providing guidance, governance and tools, the office assists the deployment of multi-disciplinary and agile teams, ensures projects are aligned with our strategic objectives, and contributes to our projects being fit for purpose to assist benefits to be realised.

Our **Leadership Development** programme helps to improve our leadership capability at each level of the organisation. Based on a leadership skills gap analysis completed in 2019, it is helping to build the skills required by our leaders to lead an agile workforce and ensure a high duty of care for our employees. The three components of this programme are: training in crucial conversations; promoting mental health at work; and a coaching programme based on self-reflective practice.

Our **Wellbeing Strategy**, based on the te whare tapa whā model of hauora, guides a holistic approach to ensuring the health and wellbeing of our people and organisation. The strategy focuses action on three pillars of: education – the opportunities for our staff to upskill and continue lifelong learning; environment – our systems and processes are designed with consideration of impacts on wellbeing; and community and engagement – the wellbeing offerings that are available and promoted to our staff. ■



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We look forward to working with you
to achieve your objectives and drive
towards a better future for New Zealand.

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