

Green

Smart Green Innovation

Green Party election priority

Smarter Greener Economics

Introduction.....3
Summary5
Situation.....6
Solution.....14

Authorised by Jon Field, Level2, 17 Garrett Street, Wellington.



Introduction

Innovation lies at the heart of a smart, green economy. Economies that innovate do better over the long term, creating good jobs that pay well and enable us to live quality lives within environmental limits.

Innovation is also one of the best ways we can add value to our exports. If we want to be a rich country, with an economy that supports well-paid jobs, protects our environment, and looks after our most vulnerable, we need to export what rich countries export. That means selling high value-added manufactured goods and services, not just low value commodities.

Under the current National Party Government, our export economy has simplified. We are becoming ever more reliant on exporting commodities like milk powder, which is rapidly destroying our rivers and lakes, and leaving our economy increasingly vulnerable to the fortunes of one market — China.

But there is an alternative, and that is the Smart Green Economy.

*An essential question for the economic **future** of a country is how **innovative** it is.*

- Josh Lerner, Head of Entrepreneurial Management, Harvard University

Innovation creates the know-how that enables us to do more with less, better protecting the natural world we love while allowing us all to live prosperous, fulfilling lives. We need big, new, socially and environmentally innovative ideas if we are to protect our unique and endangered plants and animals and deal with our high levels of inequality and child poverty.

New Zealanders are renowned for our ability to solve problems, yet we starve our innovators of the resources needed to turn our

breakthrough moments into valuable, exportable solutions. We invest half what most other developed countries do on research and development, we patent relatively few new ideas, and our universities are slipping backwards in the international rankings.

We can do so much better. In fact, until we make crucial breakthroughs in how we earn our way in the world, we will continue to rely on increasing levels of pollution, debt, and asset sales to support our current way of life.

We can continue down the path of National's short sighted Pollution Economy or we can change course and embrace a Smart Green Economy. The choice is ours.



Dr. Russel Norman

GREEN PARTY CO-LEADER

Contact: Russel.Norman@parliament.govt.nz

Summary

The Green Party will help secure the long-term prosperity of New Zealand by significantly ramping up our investment in innovation and nurturing the innovation ecosystems that will support the successful translation of brilliant ideas into the stuff we can build a rich nation from.

1. **\$1 billion of new government funding over three years** for research and development, kick-starting a transformational shift in how our economy creates wealth.
2. **Government to take a collaborative partnership approach to innovation with the private sector**, which will include:
 - a. R&D funding made up of tax credits and grants;
 - b. A requirement for firms that go into overseas ownership to repay their grants;
 - c. A new voluntary option for large grants, where companies that receive significant taxpayer funds agree to the Government taking an equity stake in their business.
3. **Enhance the incentives to study and teach engineering, mathematics, computer and the physical sciences.** The Green Party will fund an additional 1,000 places at tertiary institutions for students of engineering, mathematics, computer science, and the physical sciences, costing \$50 million per year.

Situation

New Zealanders work harder and earn less than most other people in the developed world.¹ While our economy may be growing, we are not all seeing our wages rise commensurately. In fact, growing inequality has become a defining feature of our economy over the past 30 years.

Along with growing indebtedness, 1973 was the last year when New Zealand recorded a current account surplus, meaning we have been spending more than we have been earning as a nation for the past 40 years. This is clearly not sustainable.

Successive Governments' response has been, in effect, to work harder, not smarter — to incentivise an economy that extracts more minerals, produces more milk solids, exports more raw logs, and opens up more markets to sell them into. This short-term strategy has benefited some but ultimately seen our productivity stagnate and our wages fall behind the rest of the developed world.

Finance Minister Bill English now sees our low-wage economy as a potential competitive advantage, rather than a problem, candidly admitting that New Zealand's 30 percent lower wages than Australia's should attract more business here in the next few years.²

Our productivity performance mirrors our economic performance, and our productivity has underperformed against the rest of the developed world.

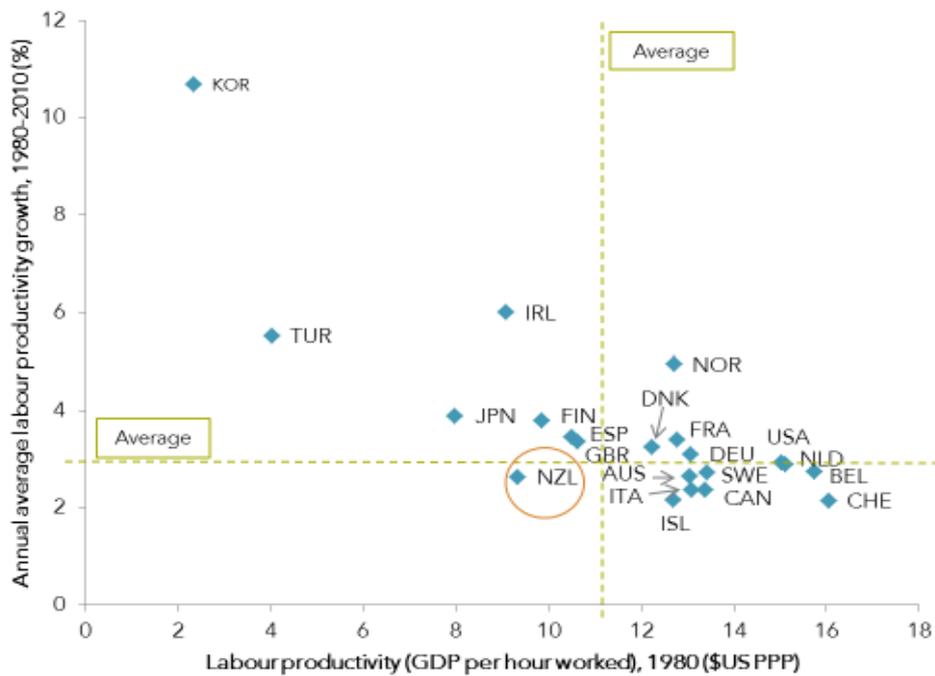


Figure 1: New Zealand's aggregate labour productivity level and growth rate compared. Chart source: OECD and Productivity Commission.

Despite having one of the lowest levels of labour productivity in the OECD in the 1980s, labour productivity growth in New Zealand remains among the lowest amongst our peers.³ New Zealand shows no sign of catching up to high productivity countries, despite radical levels of market reforms throughout the 1980s and 1990s. Our low productivity means we create relatively less wealth for every hour we work.

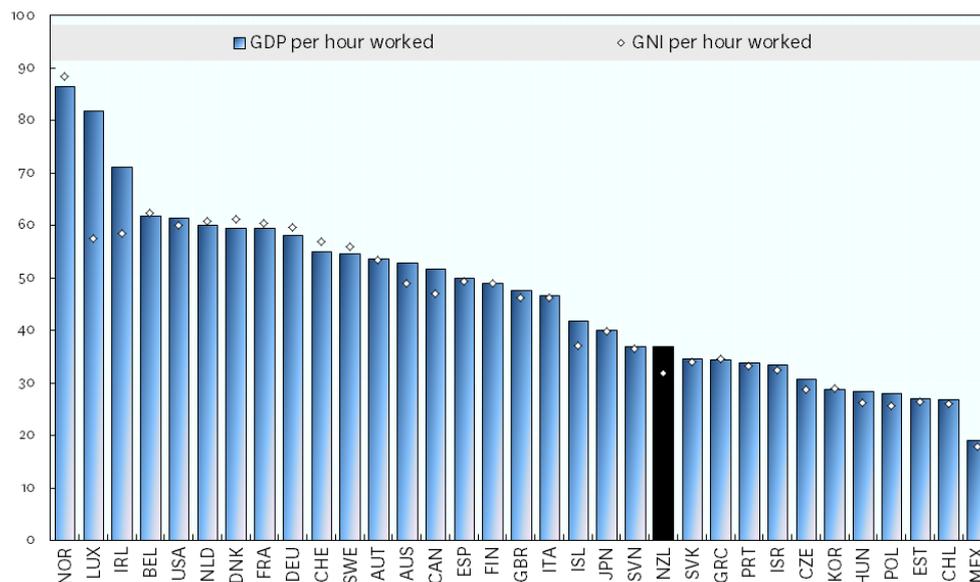


Figure 2: GDP and GNI per hour worked. Chart source: OECD.

New Zealand’s weak productivity growth has been driven by a fundamental lack of investment in innovation along with other factors like weak levels of competition in our home market, poor business management, and low levels of employee engagement.

Compared to other small, developed economies — some of the richest countries in the world — our economic complexity significantly trails Finland, Denmark, Israel, and Singapore. These countries make things, like integrated circuits, cell phones, and medicines that other countries can’t make. This is their competitive advantage that enables them to pay high wages.

By comparison, New Zealand largely produces commodities, which most countries can also produce. And we’re having to produce more and more of them just to get by. This ‘commodity thinking’ is about competing on price, which means lower costs, lower environmental standards, and lower wages.

New Zealand, as a nation, is working longer, not smarter.

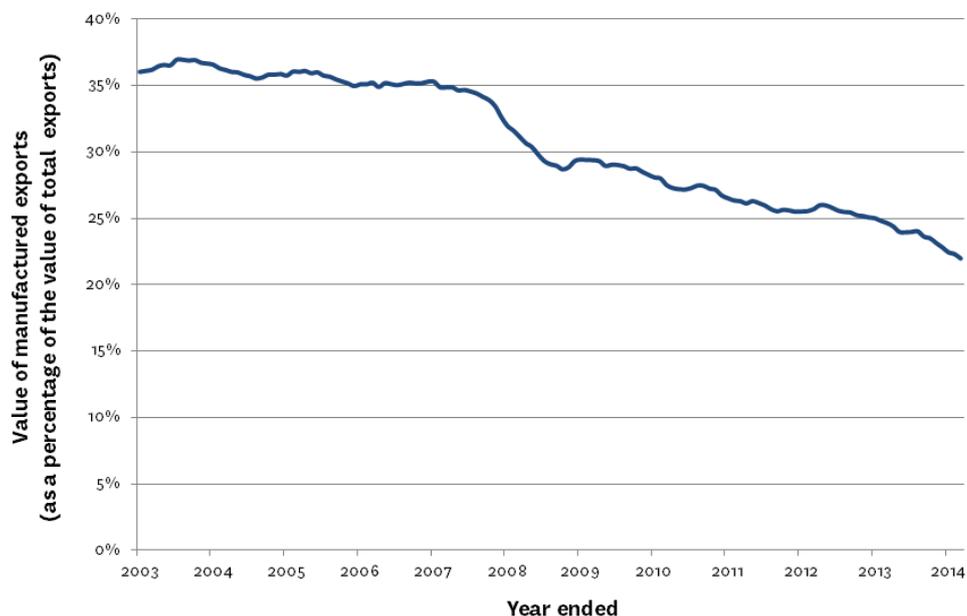


Figure 3: The value of manufactured exports as a percentage of the value of total exports. Chart source: Statistics New Zealand.

Innovative activity, as measured by research and development (R&D) and patenting is closely associated with the levels of output and income at a country level. For technology intensive industries, innovation is the most important determinant of export performance.⁴

How much do we as a nation under-invest in R&D?

1. Investment in R&D

We invest roughly half of what most other developed countries do in research and development, and considerably less than other small, advanced economies.

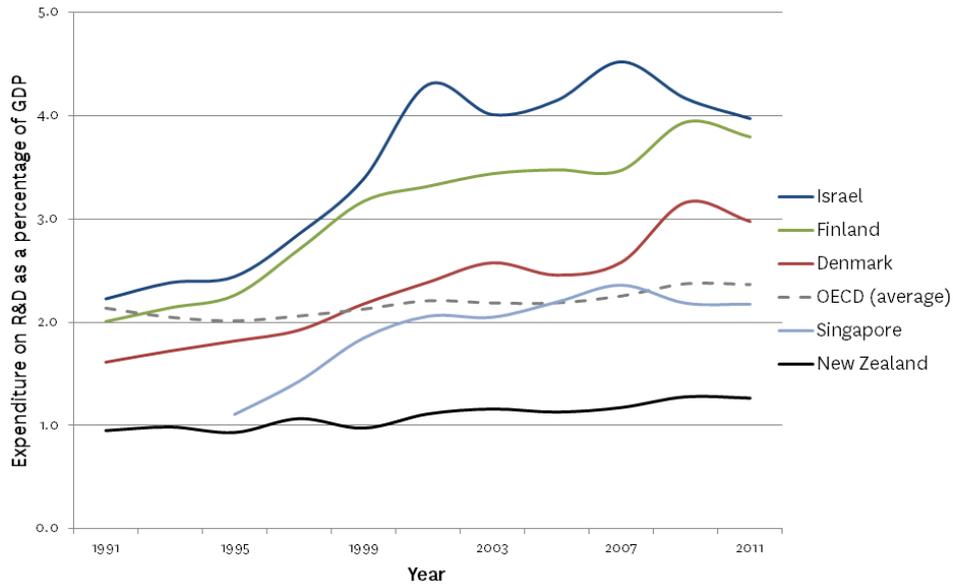


Figure 4: Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP. Chart source: OECD.

2. Patents

On a per capita basis, the average OECD country produces nearly four times as many patentable novel ideas as New Zealand.

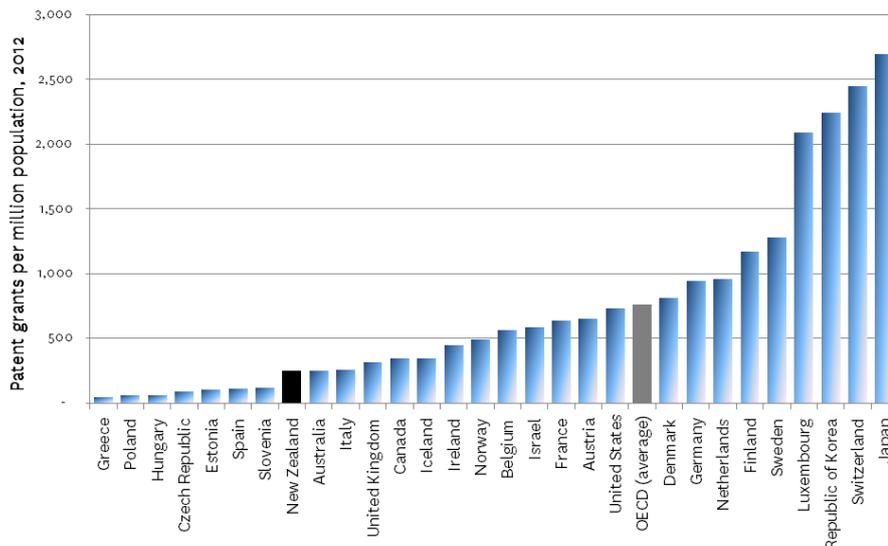


Figure 5: Estimated patent grants per million people in 2012. Chart source: OECD & WIPO Patent Statistics.

3. Excellence in our universities

Our universities have struggled to keep up with the best institutions overseas.

Ranking / Year	2008†	2013	Change
Auckland University			
• QS World University Rankings	65	94	↓down
• Times World University Rankings	173	164	↑up
• Academic Ranking of World Universities	201-302	201-300	
Massey University			
• QS World University Rankings	283	343	↓down
• Academic Ranking of World Universities	303-401	401-500	↓down
Victoria University			
• QS World University Rankings	227	265	↓down
• Times World University Rankings	251-275	276-300	↓down
• Academic Ranking of World Universities	402-503	401-500	
Canterbury University			
• QS World University Rankings	186	238	↓down
• Times World University Rankings	301-350	301-350	
• Academic Ranking of World Universities	402-503	401-500	
Otago University			
• QS World University Rankings	124	155	↓down
• Times World University Rankings	201-225	226-250	↓down
• Academic Ranking of World Universities	201-302	201-300	

† Times' rankings start 2011

Our approach to investment in R&D has resulted in a significant knowledge gap opening up between New Zealand and the rest of the developed world. It will take determined effort to turn this around.

Rather than seriously invest in research and innovation, National has spent the last six years in government focused on restructuring the state innovation system. The latest round of restructuring has been at least the seventh since 1985,⁵ resulting in a significant loss of expertise in science policy and funding areas and leaving a complex funding landscape of National Science Challenges and Centres of Research Excellence — each with its own governance structure but without an overarching national strategy to work to.

Steven Joyce, Minister of Science and Innovation, is on record saying that science and innovation can have a transformational effect on a nation's economy but is failing to put his money where his mouth is.⁶

In real terms, National plans to *cut* its research investment by 10.2 percent over the next three years and by 21.0 percent out to 2023/24.⁷

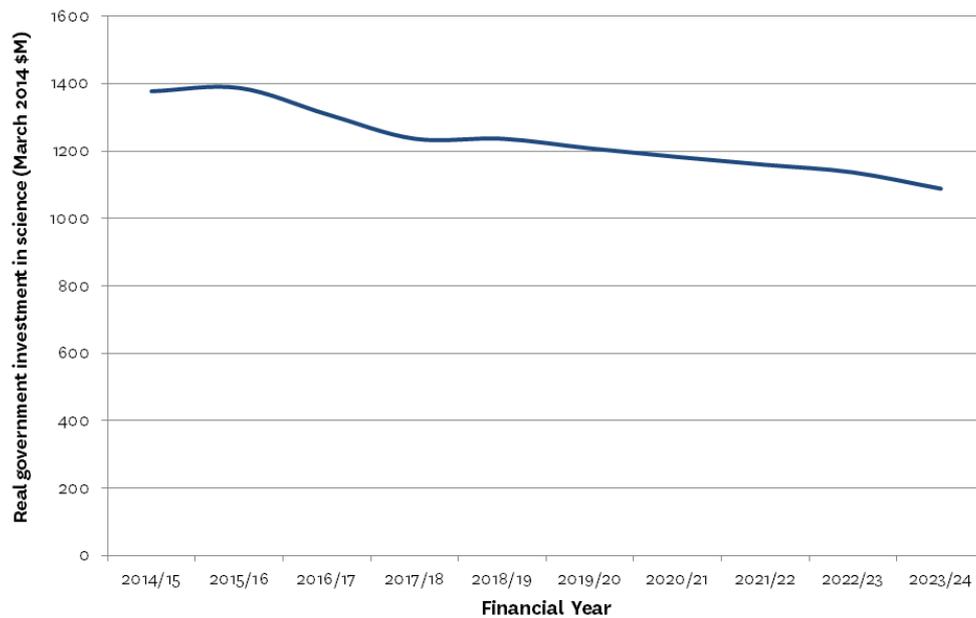


Figure 6: Real Government investment in science going forward (March 2014 dollars). Chart source: Parliamentary Library, MBIE, & Treasury.

The Government's own 2011 review of the innovation sector recommended "progressive increases in Government investment in R&D to at least match the OECD average".⁸

National's plan for innovation will not deliver the step-change we need for our long-term underperforming economy.

Economist David Skilling has studied small advanced countries and shown that these economies can outperform larger advanced economies over the longer term. Countries like Singapore, Denmark, Finland, and Israel have adopted policies that have more than made up for their lack of size and sophistication.⁹

These small successful states have relatively larger governments and investment in R&D is high. Niche manufacturing industries make up significant parts of their economies while high-tech exports make up a

disproportionate share of their exports when compared to larger developed economies.

In these small and prosperous economies, the Government has played an essential role supporting the innovation ecosystems that underpin their sophisticated, high-wage economies.

The Green Party believes in the vital role an agile, integrated state sector can play. To overcome the limitations of size and isolation, the government can adopt an active, partnership approach to working with the private sector to build our economic prosperity.

Most of the radical, revolutionary innovations that have fuelled the dynamics of capitalism — from railways to **the internet and nanotechnology** — can trace even the most courageous, early and thus capital-intensive ‘entrepreneurial’ investments back to the state.

- Mariana Mazzucato

Innovation economist Mariana Mazzucato and others have thoroughly debunked the myth that the government is an obstacle to innovation and economic development.¹⁰ Mazzucato uses the example of the Apple iPhone — one of the most sophisticated consumer products ever invented — to illustrate the role the state sector has played in the development of the major technologies underlying the iPhone. Nearly all of the main technologies that make the iPhone ‘smart’ were government funded: the internet, Siri voice recognition, GPS, and the touchscreen display.

Governments might not always be best placed to pick what individual projects get developed further but the evidence supporting government taking a leadership role in the innovation ecosystem is overwhelming.

Why innovation is so important

Innovation, put simply, is the commercialisation of product and process novelty and it lies at the heart of long-term economic prosperity. Innovative countries are the wealthiest.

In 1881, New Zealand entrepreneur William Davidson commissioned the refit of the ship Dunedin with a compression refrigeration unit for meat shipment. One year later, the Dunedin sailed for London making history as the first commercially successful refrigerated shipping voyage. This innovation became the foundation of the refrigerated meat industry enabling New Zealand agriculture to thrive.



Innovation lies at the heart of a smart green economy. Innovation requires few resources other than clever people working together with supportive business leaders and financiers to add value to what we export and efficiency to how we work. It can allow us to dramatically lower the adverse environmental and social impacts of our economic activity.

Solution

To build a smarter greener economy that benefits all New Zealanders, the Green Party will significantly lift levels of government investment into innovation and education.

1. A further \$1 billion investment into R&D

To help address the underinvestment in research and development, the Green Party in government will invest an additional \$1 billion over the next three years into this sector: an additional \$100 million in 2015/16, \$400 million in 2016/17, and \$500 million in 2017/18.

As a nation, we currently invest \$2.6 billion into R&D — split fairly evenly between private and public sector investment — which is 1.27 percent of GDP.

This level is well below the OECD average of 2.4 percent.¹¹ And it gets worse looking forward as the current government's budget projections see the R&D investment dropping in the years ahead.

In time, we can expect the private sector to match an increased investment by government into innovation. In Finland, for every new dollar the government invested, business expenditure on research and development grew by three dollars.¹² Even a conservative dollar-for-dollar match from the private sector would set the stage for a significant shift in how our economy creates wealth.

Assuming a dollar-for-dollar match, we would see New Zealand's R&D spending increase to 1.65% GDP by 2017/18. If the private sector responded by matching the increased government spending three fold, overall R&D spending would increase to over 2% of GDP by 2017/18.

This would begin to put New Zealand on the right track.

Expert innovation working group

The Green Party will establish an expert innovation working group after the election to decide on the best way to deliver this step-change in innovation funding. The group will include representatives from the science community, universities, business and Māori.

The expert group will review the extensive changes made to the innovation system, keeping it at arm's length from Government ministers. Their terms of reference will charge them to deliver a R&D funding system that optimises the most effective delivery systems.

The terms of reference of the Working Group would include best way to implement R&D tax incentives.

R&D tax incentives are the easiest way to encourage innovation throughout the economy, help foster serendipitous discovery, and don't carry the political transparency risks inherent with direct subsidies. Increased tax enforcement can lessen the risks that R&D tax subsidies are abused.

Three quarters of all OECD countries use R&D tax credits including two of the most innovative countries in the world — Japan and South Korea. In its 2007 review of our innovation ecosystem, the OECD recommended, "Given New Zealand's very low levels of business R&D investment, the provision of a tax incentive in this area seems urgently needed."

*Small countries do not **succeed** because they have lower taxes or smaller governments...small countries succeed economically when their governments are prepared to **invest more** in science and innovation.*

- Shaun Hendy, MacDiarmid Institute

The expert working group will also be tasked with exploring the feasibility of extending any R&D tax credit to management training for medium-sized New Zealand-owned firms. Managers are crucial in driving innovation and improvements in business processes. While some of New Zealand's firms are as good as any in the world, there is a large 'tail' of firms that are mediocre. MED benchmarking research done in 2011 showed that the average New Zealand firm is below the top 59 percent of Australian and the top 75 percent of the US manufacturing firms in management performance.¹³

Investing in better management practices can help to improve the New Zealand economy's ability to develop and diffuse technical and operational innovations.

In light of the sustainability challenges facing New Zealand — our declining quality of water, the loss of native biodiversity, and increasing carbon emissions — the expert working group will also focus on how to make sustainability a key criterion for assessing all future industry grants.

Finally, the group will deliver an independent, highly transparent process to evaluate the public investment in R&D grants. This will help drive much needed openness in government and help refine our innovation infrastructure. Future governments will have to accept the inevitable failure that comes with investing in innovation along with sharing in the brilliant successes.

Keeping it Kiwi

When a successful New Zealand grown company is sold offshore, many of the benefits of any public investment in R&D go offshore too. There are a number of policies we can adopt to help slow the flow of valuable intellectual property offshore.

Under the Greens' plan R&D grants given to successful enterprises will now have to be repaid if the business is sold offshore. Businesses that benefit from public investment will be required to, at the very least, repay that investment to assist with the recycling of capital into the next generation of young, innovative businesses.

For companies seeking additional public R&D funding, the Green Party will explore offering innovation grants in the form of a passive

investment in the enterprise. This investment can be written off in the first year but provide windfall profits for the taxpayer if the company is successful and subsequently sold.¹⁴

The current Government is taking baby steps towards the equity approach through its new business incubator programme. We will expand this approach more generally.

Small countries are particularly vulnerable to the loss of intellectual property offshore. When our most successful high technology business Fisher & Paykel Appliances was sold offshore, New Zealand taxpayers had invested \$16 million of research grants into the firm.¹⁵

Priority industries

New Zealand's history of heavily investing public funds into agricultural research and development has limited our ability to diversify and grow other parts of our economy. The dominance of the agricultural sector has led to our singular reliance on it.

National have continued to support agriculture's dominance in innovation funding. Well over 25 percent of government spending on R&D supports agriculture or primary industries.¹⁶ A majority of National's ten new Science Challenges are related to primary industry while National's signature investment in innovation — the Primary Growth Partnership — again is solely focused on the farming, fishing, and horticulture sectors.

The primary sector is important and it is vital that we add further value in the primary sector and that we protect the clean and green brand that underpins the sector by protecting the natural environment. But our economy needs to diversify. The Green Party will assist in that diversification with \$1 billion of new R&D funding.

Innovation is path dependent, so the Green Party will establish new grant criteria to ensure greater investment in promising new paths in the ICT, renewable energy, and manufacturing sectors.

Denmark chose to direct much of its public R&D expenditure into ICT, energy, and manufacturing rather than its equally important agricultural sector. This strategy to fund a broader range of research has seen Denmark's labour productivity soar ahead of New Zealand's,

*even in its agricultural sector.*¹⁷ This happens because the spill over benefits of innovation in the ICT and manufacturing sectors are greater than those in the agricultural or mining industries.¹⁸

Māori innovation

Supporting research and development in the Māori economy gives New Zealand businesses a unique edge in innovation — one that values kaitiakitanga and sustainability. Māori will share in the boost to government R&D funding to support He Kai Kei Aku Ringa — Māori economic development.

The Green Party recognises the, as yet, unresolved claims of Māori to protect their intellectual property rights under Wai262. We will continue to support Māori to develop mechanisms to protect cultural knowledge in culturally appropriate ways.

2. Investing in people & communities of innovation

Highly productive countries empower people to innovate through education. The National Government has a poor record on education, having cut both the Bright Futures PhD Scholarships and the NZ Science and Technology Post-doctoral Fellowships scheme in their first three years, and not funding education to a level to keep up with inflation and changing student numbers.

Funding for tertiary education will shrink in real terms by 10.4 percent out to 2018 under National's budget projections.

However, higher levels of research and development activity in New Zealand will require higher numbers of skilled people from a broad range of disciplines. New Zealand currently has a shortage of graduates in engineering, mathematics, computer and the physical sciences.¹⁹ In engineering for example, our universities graduate 1,500 engineering students, well short of the 2,750 needed each year if New Zealand is to build an innovation-led economy.²⁰

The Green Party will fund an additional 1,000 places at tertiary institutions for undergraduate and postgraduate students of engineering, mathematics, computer science, and the physical sciences. This will cost \$50 million per year.²¹ The money will be made available to universities but we will respect the autonomy of universities' decision making as to whether they offer the places.

This new funding will not impact those students hoping to study in the humanities. We value the creativity and the ability to analyse and integrate knowledge that is fostered in the arts and see this as an important part of our vision for an innovative and highly educated society.

As well as creating more spaces at a tertiary level for these skill sets, the Green Party will set aside a further \$20 million to adopt some of the key recommendations below from the Government's own *Powering Innovation* report ensuring we produce a new generation of young people inspired to move into creative and entrepreneurial careers in the sciences and engineering.

The Green Party will:

1. Launch a major national campaign promoting the benefits of a career in the sciences, maths, and engineering professions to young people;
2. Re-establish student allowances for post graduate students costing \$11.3 million per year;²²
3. Establish new government funds for PhD scholarships in the priority areas of engineering, mathematics, computer and the physical sciences for R&D capability building;
4. Create specific educational incentives for removing barriers to groups who are currently underrepresented to study engineering, mathematics, computer and the physical sciences;
5. Increase funding for industry-based and co-funded Masters and PhD programmes in applied science and engineering;
6. Increase funding for industry co-funded work experience for students in science and engineering.

3. The importance of startups

High technology startup companies and social enterprises are an important part of the innovation story. Startups are the new companies taking ideas to market. Many fail, but those that do succeed create a disproportionate amount of new, well-paid jobs in advanced economies. Since 1980, nearly all net job creation in the United States has occurred in firms less than five years old.²³ New firms have been and are likely to continue to be the real engines of job growth.

Startup companies require conducive 'ecosystems' of talent and support to succeed. Auckland, Wellington, and Christchurch have developed promising startup ecosystems in the technology and social enterprise fields. Clustering of firms has proven to be successful.

To further support the startup sector, the Green Party will:

1. Establish a seed fund of \$10 million to help kick-start new social enterprises and Māori social enterprises (to be recycled over time);
2. Simplify the taxation of stock options for qualifying startups, recognising the value of 'sweat equity' and assuming the introduction of a comprehensive capital gains tax (excluding the family home);
3. Work with tertiary education providers to introduce educational incentives in the sciences, technology, engineering, and mathematics fields including new scholarships and degree holidays for those taking a break from university or polytech to start up new for-profit and social enterprises;
4. Explore a new legal structure more appropriate for social enterprises;
5. Create a special officer within Immigration New Zealand to advise and support entrepreneurs who want to move to New Zealand and include a new points category for immigrants who can attract local venture capital demonstrating a market value for their startup.²⁴

Two promising startups

Blueskin Energy

Scott Willis had a vision to provide his community with cost effective green energy and create a revenue stream to reinvest back into other energy projects within his Blueskin community in Dunedin. Blueskin Energy is a social enterprise — a rapidly emerging new kind of organisation that uses business models and tools for a social purpose. Profits are typically reinvested to advance a social or environmental good, rather than distributed back to shareholders or owners.²⁵

After a year of wind testing, Blueskin Energy is now ready to take the next steps to build a community wind turbine cluster: commission an energy yield assessment, submit a Resource Consent Application, and begin capital raising to initiate the development.

Goodnature

Goodnature was founded by Robert Greig, Stu Barr, and Craig Bond in 2005 and produce a high-tech, low toxicity, humane trapping solution to protect native birds and plants from predators like rats, stoats, and possums. The self-resetting nature of the traps means they can enhance the productivity of trappers working in the conservation estate by up to a factor of 20.

Goodnature's big break came when they secured a Department of Conservation seed grant to develop their brilliant idea into a working prototype that could then be rigorously field tested. As a result of close government collaboration, the traps have been largely perfected – they are amongst the most humane pest traps in the world.

Goodnature have grown from a company of three to employ 13 staff and are now exporting their trapping technology to 15 different countries including the USA, Australia, and Sweden.

4. Price driving innovation

Markets fail when price signals do not reflect the true costs and benefits of production and consumption. The OECD found that pricing an externality, like carbon, closer to its true cost will incentivise companies to innovate to remain competitive and efficient.²⁶

*CEOs want more **government** action, particularly in areas where regulation enables business, such as climate change. More than **80 percent** of CEOs favour clear, consistent government policies to address climate change.*

- PricewaterhouseCoopers 12th CEO Survey, 2009

The use of environmental taxes in New Zealand is one of the lowest in the OECD.²⁷ There is great potential, through ecological tax reform, to shift taxes off productive work and onto waste, pollution, and the use of precious natural resources.

The Green Party introduced a levy on waste in 2008 which successfully incentivised the reduction of waste and the new technologies to support waste reduction and recycling.

In June of this year, we proposed a new carbon tax to replace the ineffective and discredited Emissions Trading Scheme.²⁸ An effective price on carbon will create an incentive for carbon emitters to find innovative ways to reduce pollution and do business more sustainably. All revenues raised from the carbon tax will be recycled back to families and businesses through a \$2000 income tax-free band and a one percent company tax cut. Not only will our Climate Tax Cut leave households and the climate better off, it will give low-carbon businesses a competitive advantage over their currently less efficient rivals.

5. Smart regulation driving innovation

Smartly crafted incentives and regulations can spur a flourishing market for products and services that help households and businesses achieve our urgent environmental goals.

The state of California has some of the most stringent environmental regulations in the world. Their ambitious renewable energy targets, for example, have resulted in a big increase in clean energy manufacturing jobs. In the last decade, green jobs grew three times faster than the job rate in the state as a whole, with high value-added manufacturing accounting for 20 percent of all green jobs created.²⁹

A Green Government will pass smart regulations that help drive innovation and improve productivity, speeding up the transition to a cleaner, more energy efficient economy.

For example, the Green Party will:

1. Create long-term enforceable targets for renewable energy production to deliver a 100 percent renewable electricity generation system by 2030;
2. Implement new National Environmental Standards for water quality, environmental flows, and intensive agriculture;
3. Phase out farming practices that are cruel or inhumane, such as sow crates and battery chicken cages, to help drive innovation in humane farming systems amongst other things.

If we want to move our agri-food sector away from simple commodities, we need to offer the pull of R&D support but also the push of environmental regulatory constraints. It's all very well to tell the dairy sector to innovate but, when there are no limits on water pollution and no price on greenhouse pollution, the simplest strategy is to increase volume production of milk powder. And that is exactly what they are doing. Smart regulations and pricing externalities provide incentives to innovate.

6. Deepening capital markets

Deeper more mature capital markets, a culture of savings, and leveraging the balance sheet of the Government are all necessary complementary policies to nurture our innovation ecosystem here in New Zealand.

The Green Party will:

1. Implement a comprehensive capital gains tax (excluding the family home) to level the investment playing field;
2. Establish a public option for KiwiSaver to further incentivise savings;³⁰
3. Establish the Green Investment Bank to act as an independent and expert facilitator of private sector capital to new investment into smart green innovation;³¹
4. Direct the NZ Super Fund and ACC Fund to establish a high technology investment fund equal to at least one percent of their investment portfolios.³²

Sources

- ¹ Hendy & Callaghan (2013), *Get Off the Grass*, p1
- ² TVNZ (2011), *English's low wage comments fall flat*. Retrieved from: <http://tvnz.co.nz/business-news/english-s-low-wage-comments-fall-flat-4112083>
- ³ Productivity Commission (2013), *Productivity by the numbers: The New Zealand experience*, p31. Retrieved from: http://www.productivity.govt.nz/sites/default/files/NZPC-Conway-Meehan-Productivity-by-the-Numbers_0.pdf
- ⁴ *Ibid*, pp9-10
- ⁵ Parliamentary Library (2014). Available at: <https://www.greens.org.nz/misc-documents/government-restructuring-state-innovation-system-1985>
- ⁶ Ministry of Business, Innovation & Employment (2014), *Draft National Statement of Science Investment 2014-2024*, p18. Retrieved from: <http://www.msi.govt.nz/assets/MSI/Update-me/News/draft-NSSI-statement-consultation.pdf>
- ⁷ Parliamentary Library (2014), MBIE (2014), *Draft National Statement of Science Investment 2014-2024*, Treasury (2014), *Budget 2014 Fiscal Strategy Report*
- ⁸ Raine, Teicher, and O'Reilly (2011), *Powering Innovation*, p4. Retrieved from: <http://www.msi.govt.nz/assets/MSI/Archive/PoweringInnovation.pdf>
- ⁹ David Skilling (2012), *In Uncertain Seas: Positioning Small Countries to Succeed in a Changing World*. Retrieved from: www.landfallstrategy.com/wp-content/uploads/2012/03/Small-countries.pdf
- ¹⁰ Mazzucato (2013) *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*, Faulkner & Senker (1995) *Knowledge Frontiers: Public Sector Research and Industrial Innovation in Biotechnology, Engineering Ceramics, and Parallel Computing*
- ¹¹ Parliamentary Library (2014) & Statistics New Zealand (2012) *Research and Development Survey 2012*
- ¹² Hendy & Callaghan (2013), p81
- ¹³ Ministry of Economic Development (2011), *Management Matters in New Zealand: How Does Manufacturing Measure Up?*, p iv Retrieved from: <http://thedevelopersadvocate.biz/uploads/3/1/7/5/3175218/med.pdf>
- ¹⁴ The policy details around the paying back of R&D grants will be finalised by an expert working group.
- ¹⁵ Business Day (2013). Retrieved from: www.stuff.co.nz/business/industries/9330487/Hi-tech-grants-flow-offs
- ¹⁶ Ministry of Business, Innovation & Employment (2014), *Draft National Statement of Science Investment 2014-2024*, p21.
- ¹⁷ Hendy & Callaghan (2013), pp152-153
- ¹⁸ Hausmann & Hidalgo (2013), *The Atlas of Economic Complexity: Mapping Paths to Prosperity*
- ¹⁹ Hendy & Callaghan (2013), p168
- ²⁰ Institution of Professional Engineers New Zealand (2010), *National Engineering Education Plan*. Retrieved from: http://www.ipenz.org.nz/ipenz/forms/pdfs/NEEP_Project_Report.pdf
- ²¹ Parliamentary Library (2014). Based on figures from: <http://www.tec.govt.nz/Resource-Centre/Rates-categories-and-classifications/SAC-Rates/2015-SAC-funding-rates/>, <http://www.studylink.govt.nz/about-studylink/statistics/student-allowance-ytd-12.html>, and *Student Loan Scheme Annual Report 2013*, pp 24, 49.
- ²² Question for Written Answer (2014). Retrieved from: http://www.parliament.nz/en-nz/pb/business/qwa/QWA_01152_2014/1152-2014-holly-walker-to-the-minister-for-tertiary

²³ Kauffman Foundation (2009), *Where Will the Jobs Come From?* Retrieved from: http://www.kauffman.org/~media/kauffman_org/research%20reports%20and%20covers/2009/11/where_will_the_jobs_come_from.pdf

²⁴ In 2013, Canada launched a new immigration programme, offering residency for high-tech entrepreneurs who have secured C\$75,000 of local angel investment in their start-up company.

²⁵ Kaplan (2013), *Growing the Next Generation of Social Entrepreneurs and Start-ups in New Zealand*. Retrieved from: www.fulbright.org.nz/publications/2013-kaplan/

²⁶ OECD (2010), *Taxation Innovation and the Environment*.

²⁷ OECD (2012), *OECD Economic Surveys: New Zealand 2011*, p160

²⁸ For more information, refer to: <https://www.greens.org.nz/climateplan>

²⁹ Next 10 (2014), *California Green Innovation Index*, 6th Edition. Retrieved from: <http://greeninnovationindex.org/sites/greeninnovationindex.radicaldesigns.org/files/2014-Green-Innovation-Index.pdf>

³⁰ For more information, refer to: <https://www.greens.org.nz/kiwisaver>

³¹ For more information, refer to: <https://www.greens.org.nz/greeninvestmentbank>

³² Raine, Teicher, and O'Reilly (2011), *Powering Innovation*, Recommendation 17.3