MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

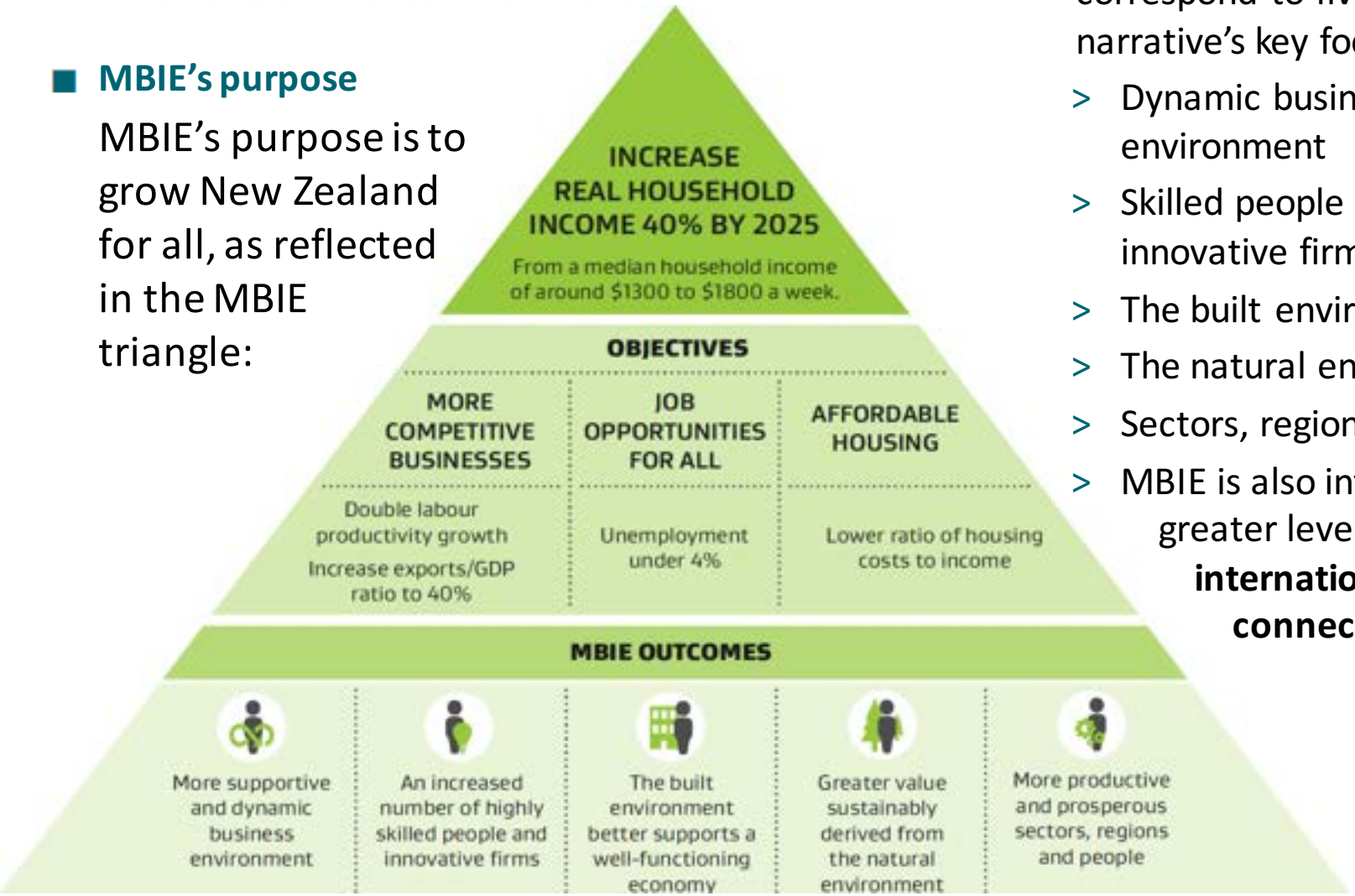
Innovation within the New Zealand Economy

Jim Metson
Chief Science Advisor
Ministry of Business Innovation and Employment

MBIE's objectives

MBIE's purpose

MBIE's purpose is to grow New Zealand for all, as reflected in the MBIE triangle:

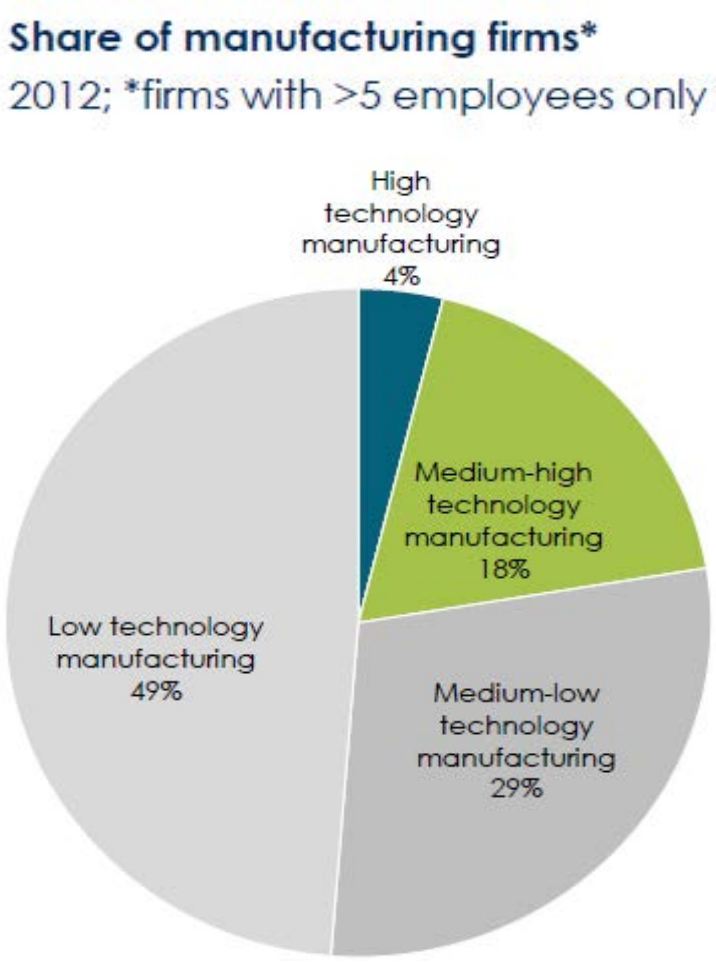


Focus areas

- MBIE's five outcomes correspond to five of the narrative's key focus areas:
  - Dynamic business environment
  - Skilled people and innovative firms
  - The built environment
  - The natural environment
  - Sectors, regions and people
  - MBIE is also interested in greater levels of **international connections**

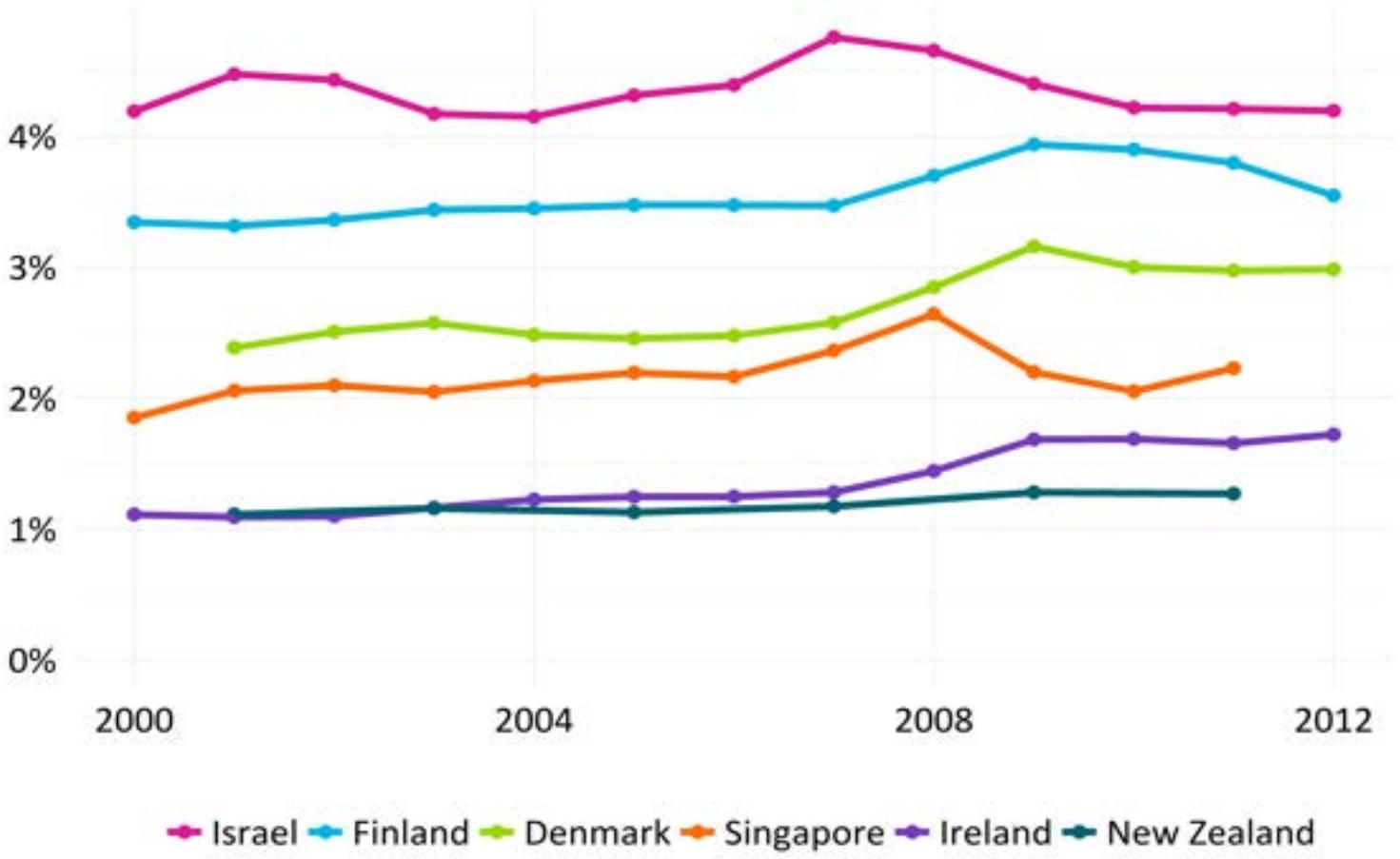
New Zealand's diverse economy

- A diverse economy has diverse technology needs.
- Industrial technologies can be applied across primary and manufacturing industries
- A diverse manufacturing sector
- Characterised by many small firms to medium firms, strongly focussed on exports
- Industry focus tends to be short to medium term, not long term



Source: High Technology Manufacturing Sectors Report (MBIE, August 2013)

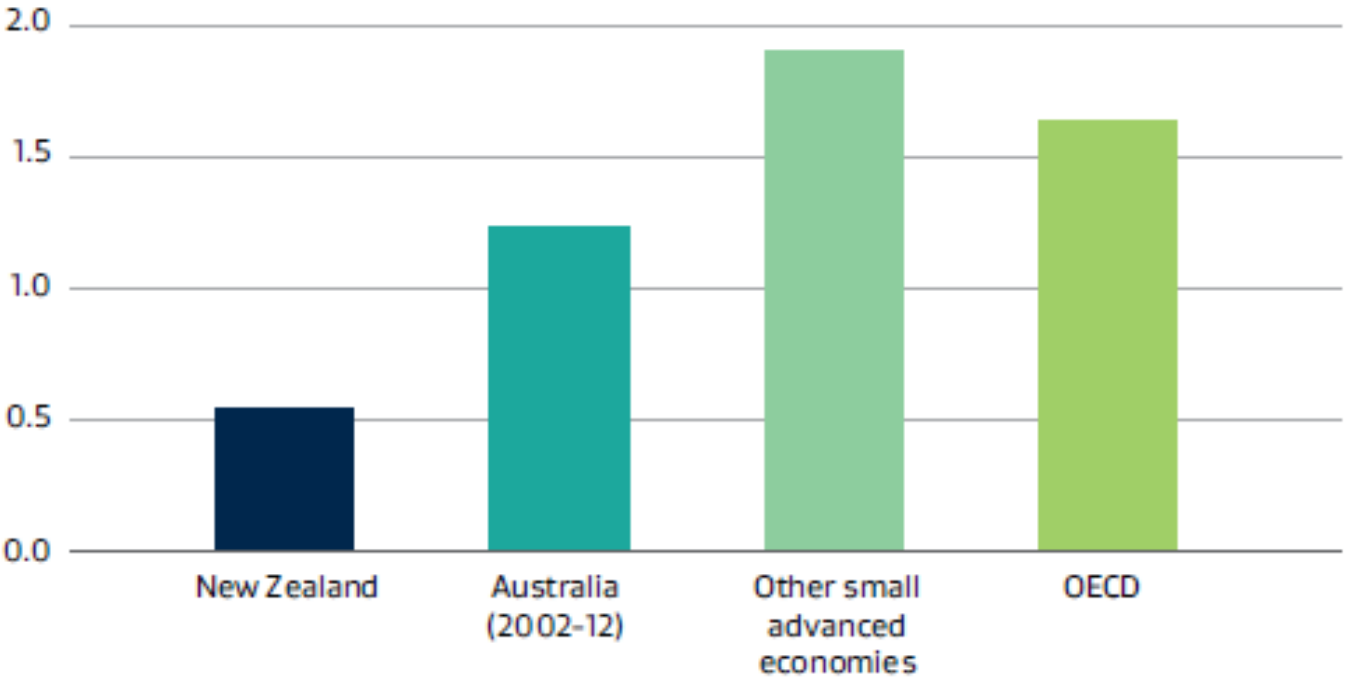
Small Advanced Economies
- R&D Expenditure as a % of GDP



Our Challenges

New Zealand's business R&D is lower than many other advanced economies

Business expenditure on R&D (BERD) as a percentage of GDP, 2014

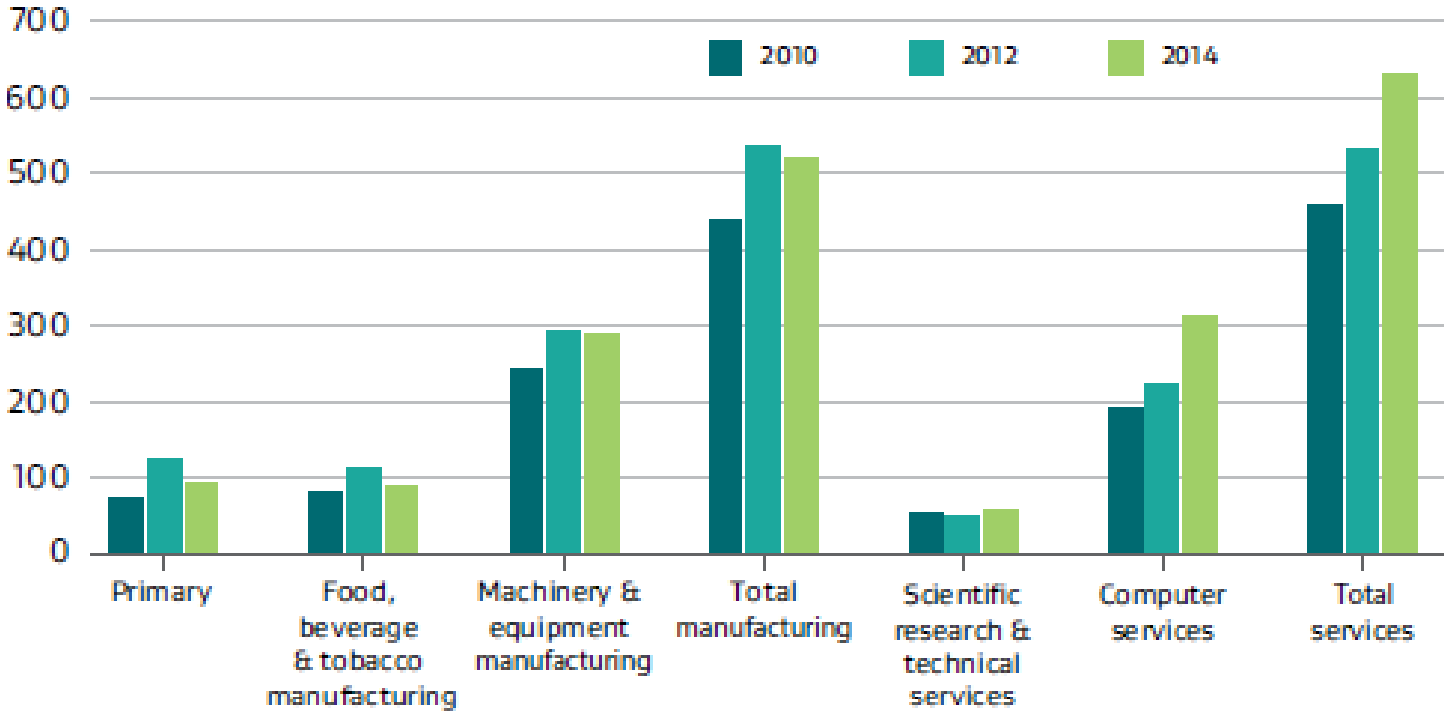


Source: Statistics New Zealand

But this is improving

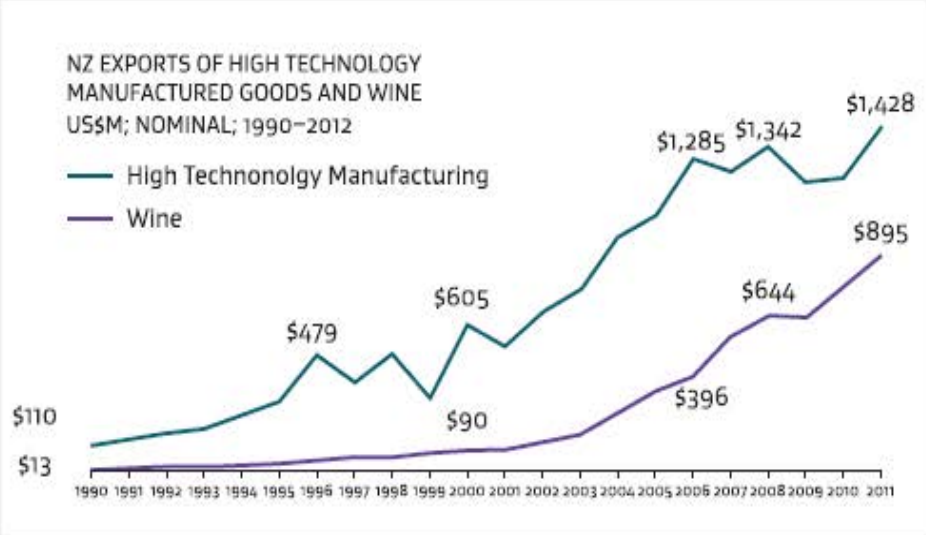
New Zealand is developing a strong base of R&D-intensive firms

Business expenditure on R&D by sector and selected industries, $ millions



New Zealand's high-tech exports

The high technology manufacturing sector has developed from small beginnings to become a significant export earner for New Zealand.



Spot light

The high technology manufacturing sector contributes:

- 0.7% to GDP (2010)
- 3.1% of goods exports (2012)

Some examples of our high technology products and services include:

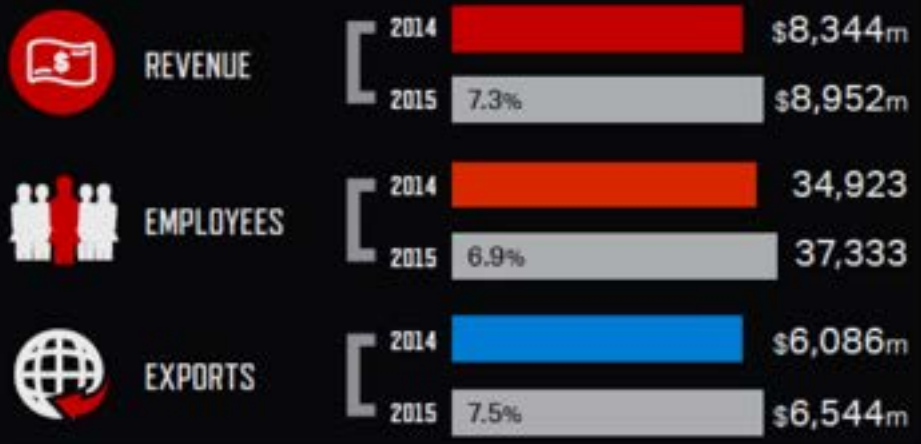
- Therapeutic respiration devices
- Instruments for physical and chemical analysis
- Electrical panels and consoles
- Communication equipment and retail medicines

High technology manufacturing is the most R&D intensive part of the economy, investing 4 times more than the New Zealand average. This investment pays off – firms are producing products and technologies that are new to New Zealand and new to the world.

Source: High Technology Manufacturing Sectors Report (MBIE, August 2013)

SNAPSHOT OF 2015 TIN100 REPORT: EXECUTIVE SUMMARY

TIN200 REVENUE - 2015 VS 2014



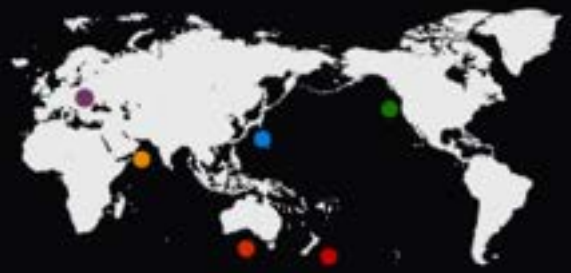
REVENUE GROWTH - 2015 VS 2014

TIN200	HIGH-TECH MANUFACTURING	ICT	BIOTECH
$609m	$256m	$324m	$30m
7.3%	4.6%	13.1%	8.0%

% OF REVENUE BY PRIMARY SECTOR - 2015

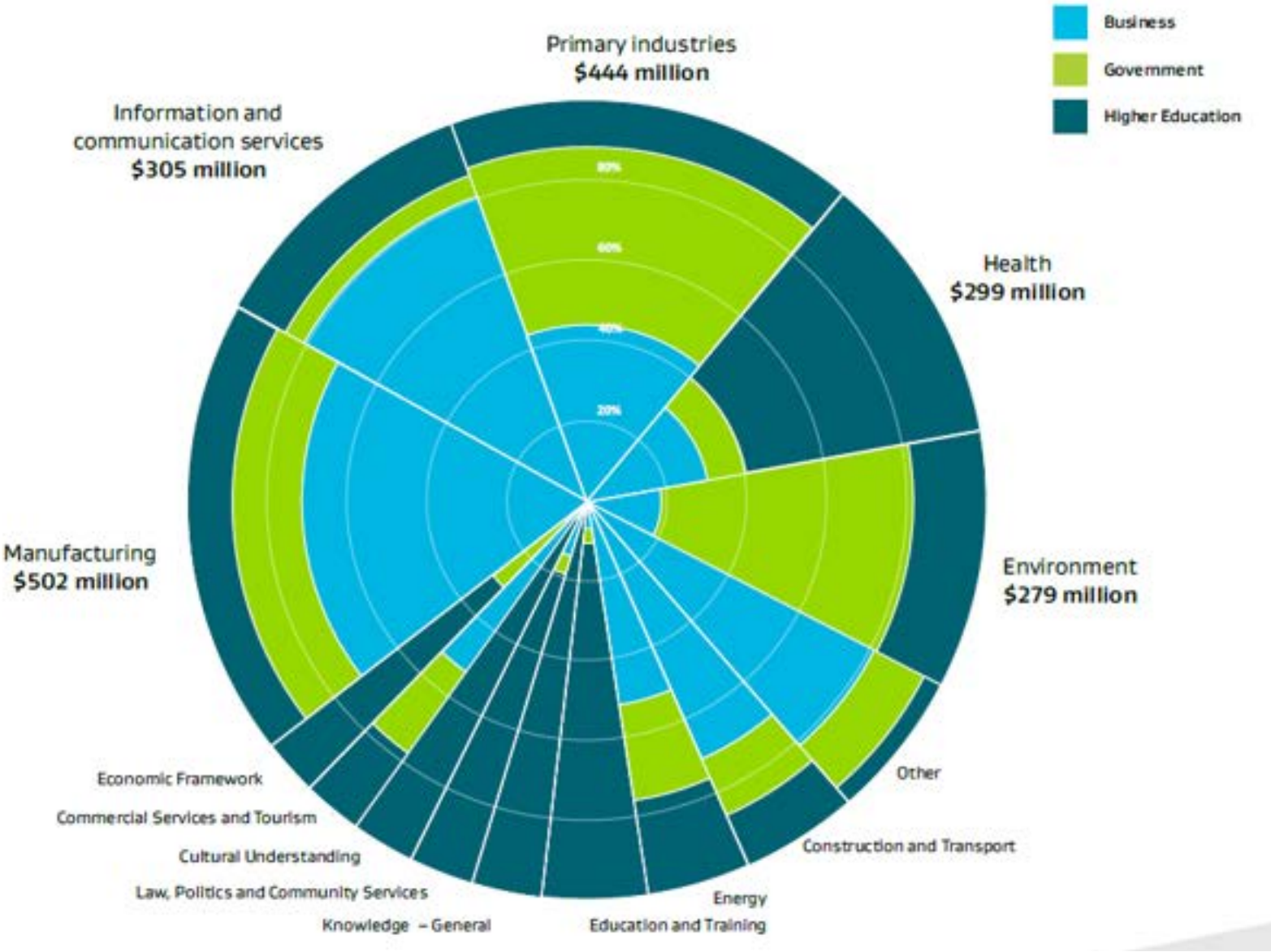
REGIONAL REVENUE GROWTH - 2015 VS 2014

NEW ZEALAND	$151m	6.7%	ME/OTHER	$29m	5.9%
AUSTRALIA	$211m	8.8%	EUROPE	$80m	7.9%
ASIA	-$1m	-0.3%	NORTH AMERICA	$140m	7.9%



NZ – The Business Growth Agenda

Expenditure on R&D, purpose of research and sector of expenditure



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CASE STUDY

THE HIGH VALUE MANUFACTURING CATAPULT

Dick Elsy (Chief Executive, High Value Manufacturing Catapult)

The High Value Manufacturing Catapult (HVMC), the first "catapult" centre to be opened, just three years ago, helps commercialise innovative manufacturing ideas. It combines seven centres of industrial innovation across Britain, bringing together the following capabilities:

- Provides companies with access to world-class facilities and skills to help scale up and prove high-value manufacturing processes;
- Develops a network of leading suppliers who contribute to key UK industry supply chains;
- Brings industry, government and research together around a shared goal to make the UK an attractive place to invest in manufacturing.

The Catapult's financial model works on the basis of shared risk, with funding coming from three sources:

1. Government core funding;
2. Industry funding;
3. Competitively won collaborative Research and Development (e.g. Horizon 2020 projects).

Government funding helps to give industry confidence to take the kind of technological risks from which it would normally shy away. Industry can access publicly-funded manufacturing equipment and skills and has greater freedom to experiment, develop these radical concepts and learn from experience.

The uptake of the HVMC has exceeded expectations and all of the commercial targets agreed at the outset have been surpassed. Industry funding has reached 45% with collaborative R&D at 30% and government core funding representing 25% of the total. The Catapult is now examining ways to secure this funding sustainably.

In the past 12 months the HVMC has attracted:

- 1515 private sector clients;
- 1012 projects;
- 1500+ SME engagements;
- £224m total income;
- £60m of innovation income accessed by SMEs;
- £180m order book with >50% competitively won collaborative R&D;
- 1250+ staff.

As social scientists, we are interested in why institutions such as this are successful at fostering innovation, as this can help with future institutional design. The reasons behind the HVMC's apparent success are likely to include the following: it enables risks to be shared between different organizations; it reduces some of those risks; and it provides a place where specialised and complementary skills can come together and grow.

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
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CallaghanInnovation

What we do

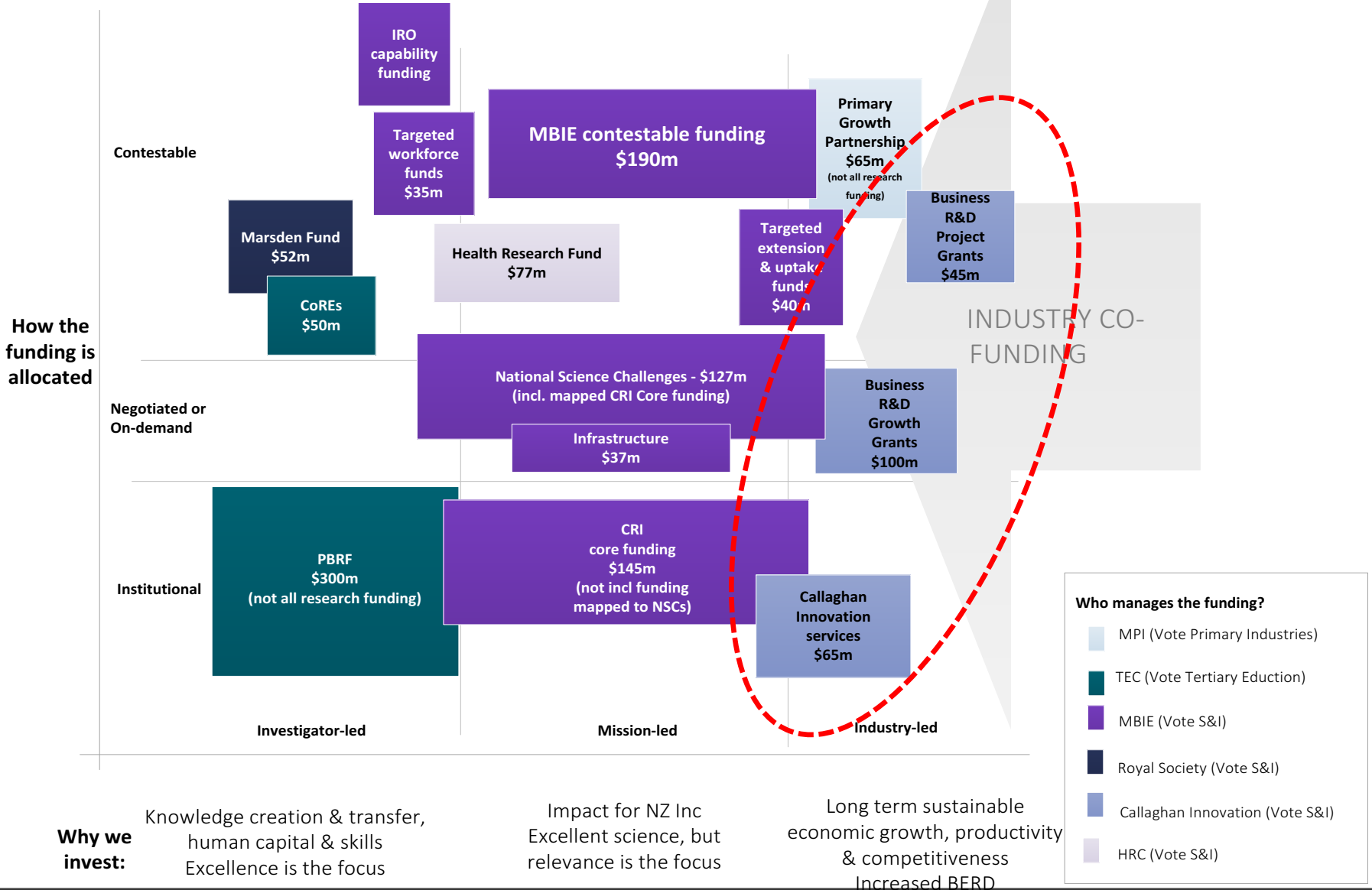
Delivering innovation services to businesses

- Technology and product development
- Access to experts
- Innovation skills
- Business collaborations
- R&D Grants

Building New Zealand's innovation capability

- Inspiring current and future innovators
- Technology networks
- International partnerships
- Pilot plants, incubators and innovation precincts
- National Science Challenge: Science for Technological Innovation

Funding of the science and innovation system

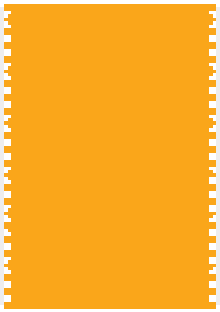


Why we invest:

Knowledge creation & transfer, human capital & skills Excellence is the focus	Impact for NZ Inc Excellent science, but relevance is the focus	Long term sustainable economic growth, productivity & competitiveness Increased BERD

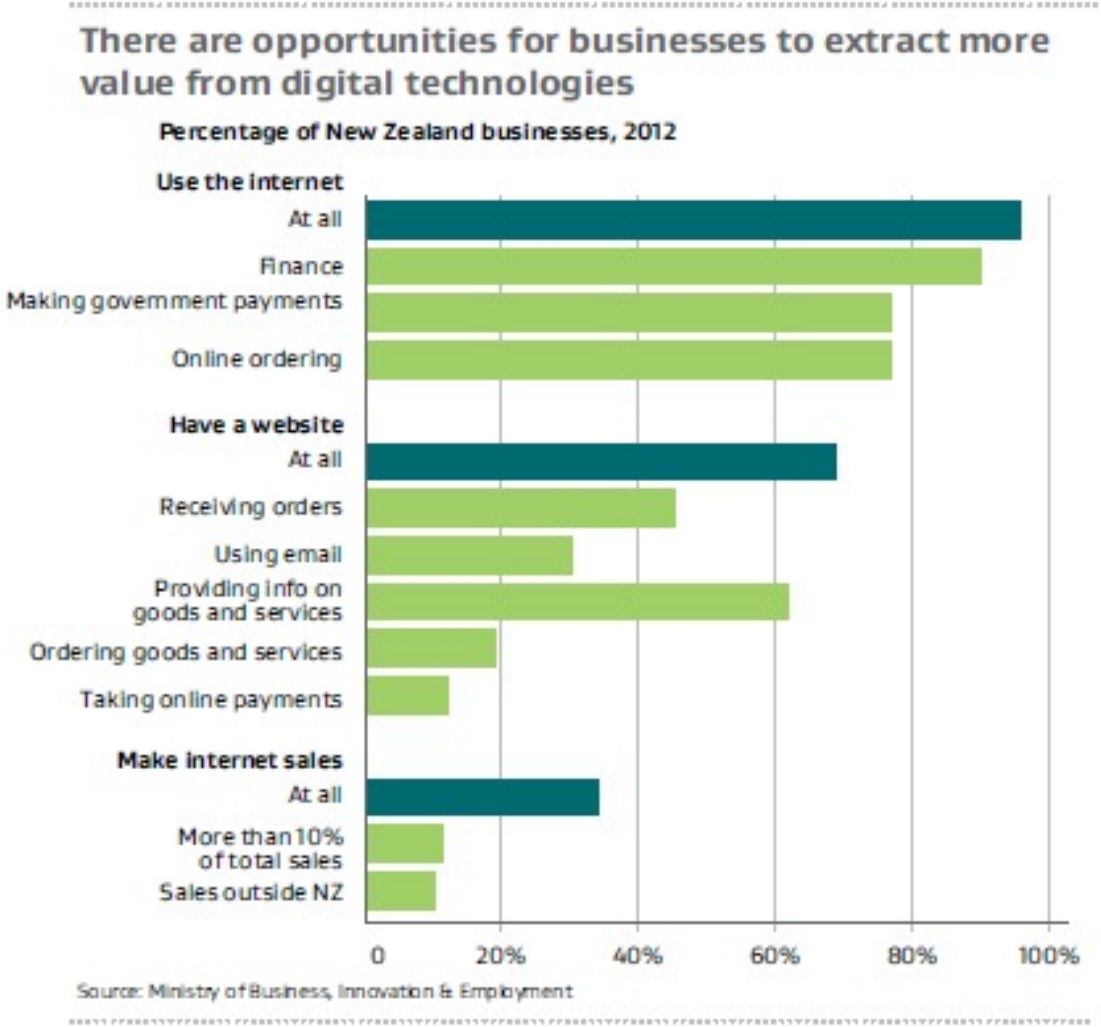
NZ – The Business Growth Agenda

Projects	Lead agencies	Status
Encourage business innovation		
Refine Callaghan Innovation Grant Programmes and product offerings to maximise increases to business innovation	MBIE, CI	
Conduct a Performance Indicator Framework Review on the development and implementation of Callaghan Innovation	SSC, CI	
Strengthen Callaghan Innovation's regional footprint to encourage innovation by regional firms	CI	
Enable smaller primary sector industries/firms to innovate through the PGP	MPI	
Evaluate progress with the new Technology Incubators and the performance of the wider incubator system	MBIE, CI	

Invest in increasing engineering graduate numbers building on the target of 500 additional graduates per year by 2017	TEC	
Increase the proportion of students studying to be engineering technologists and technicians through the Engineering E2E project	TEC	

Where are we now?

Next Steps

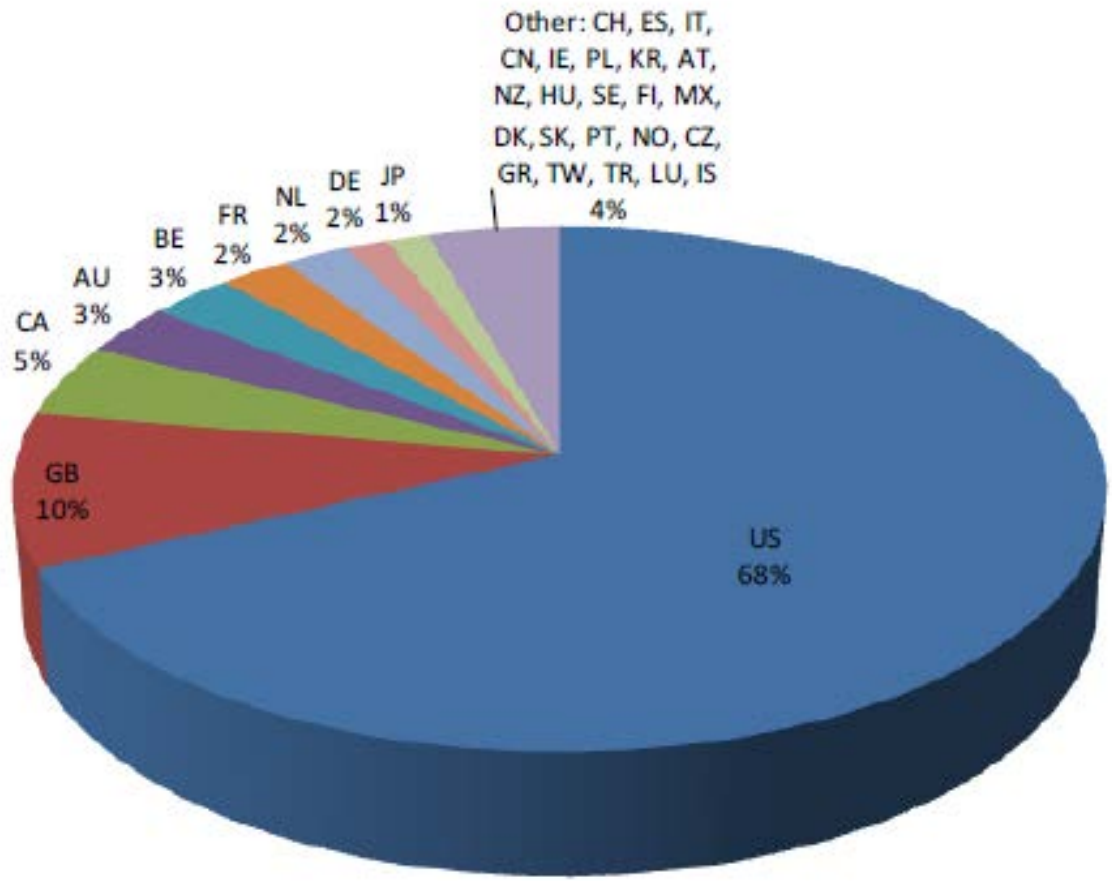

There are opportunities for businesses to extract more value from digital technologies
Percentage of New Zealand businesses, 2012
Use the internet
At all
Finance
Making government payments
Online ordering
Have a website
At all
Receiving orders
Using email
Providing info on goods and services
Ordering goods and services
Taking online payments
Make internet sales
At all
More than 10% of total sales
Sales outside NZ
0
20%
40%
60%
80%
100%
Source: Ministry of Business, Innovation & Employment

Universities and their role

- "…..estimates of the contribution universities have made to total economic growth in the United States since WWII range from 12% - 25%.
- A number of more recent studies have confirmed the importance of research universities to regional economic development in the United Kingdom and Europe – such universities are acting as key sources of productivity growth, drivers of change, and promoters of innovation."
- ROI on public investment (to society as opposed to the individual) range from around 11- 14%.

Commentary on Issues of Higher Education and Research – University of Auckland July 2010

University patenting by country (EPO, application years 1980-2000).



Veugelers, Callaert, Van Looy (2012)

UK Initiatives

> Risk of failure is an intrinsic aspect of innovation.

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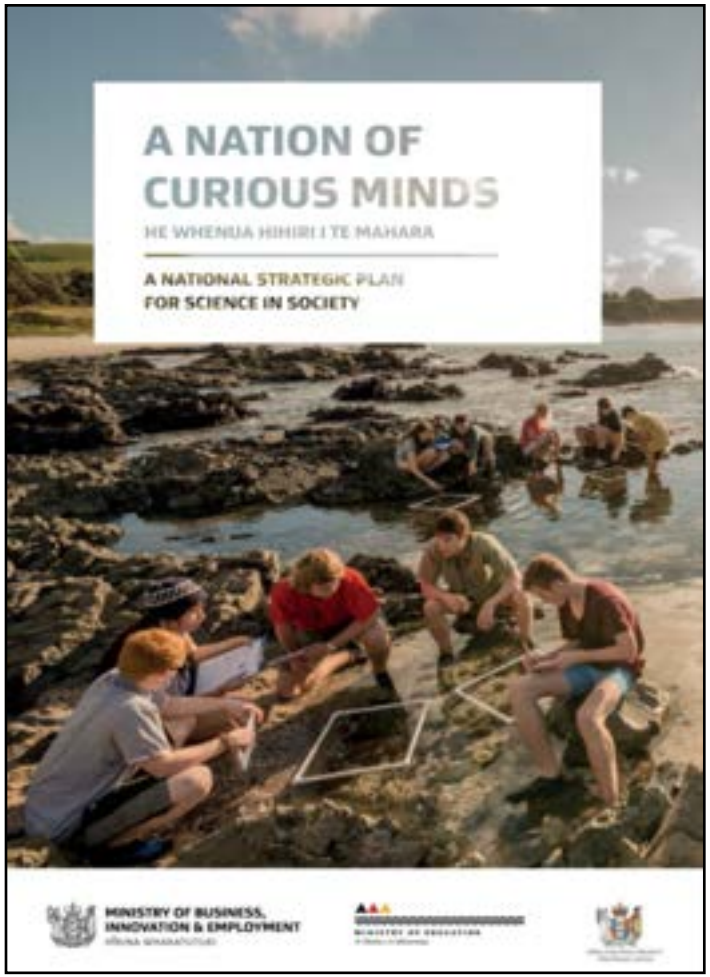
The future

- The **Science and Society Project** (arising from the National Science Challenges Peak Panel Report – the "leadership" challenge). Addresses the question of how we increase the "science capital" in New Zealand.
  - STEM skills
  - Scientists engagement with their communities
  - Public engagement with science (importance in social licence)



- How do we raise our game – in science excellence and in the applications of that science? …… We are productive, but excellence (across the spectrum) is a challenge…..