



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HIKINA WHAKATUTUKI

Innovation within the New Zealand Economy

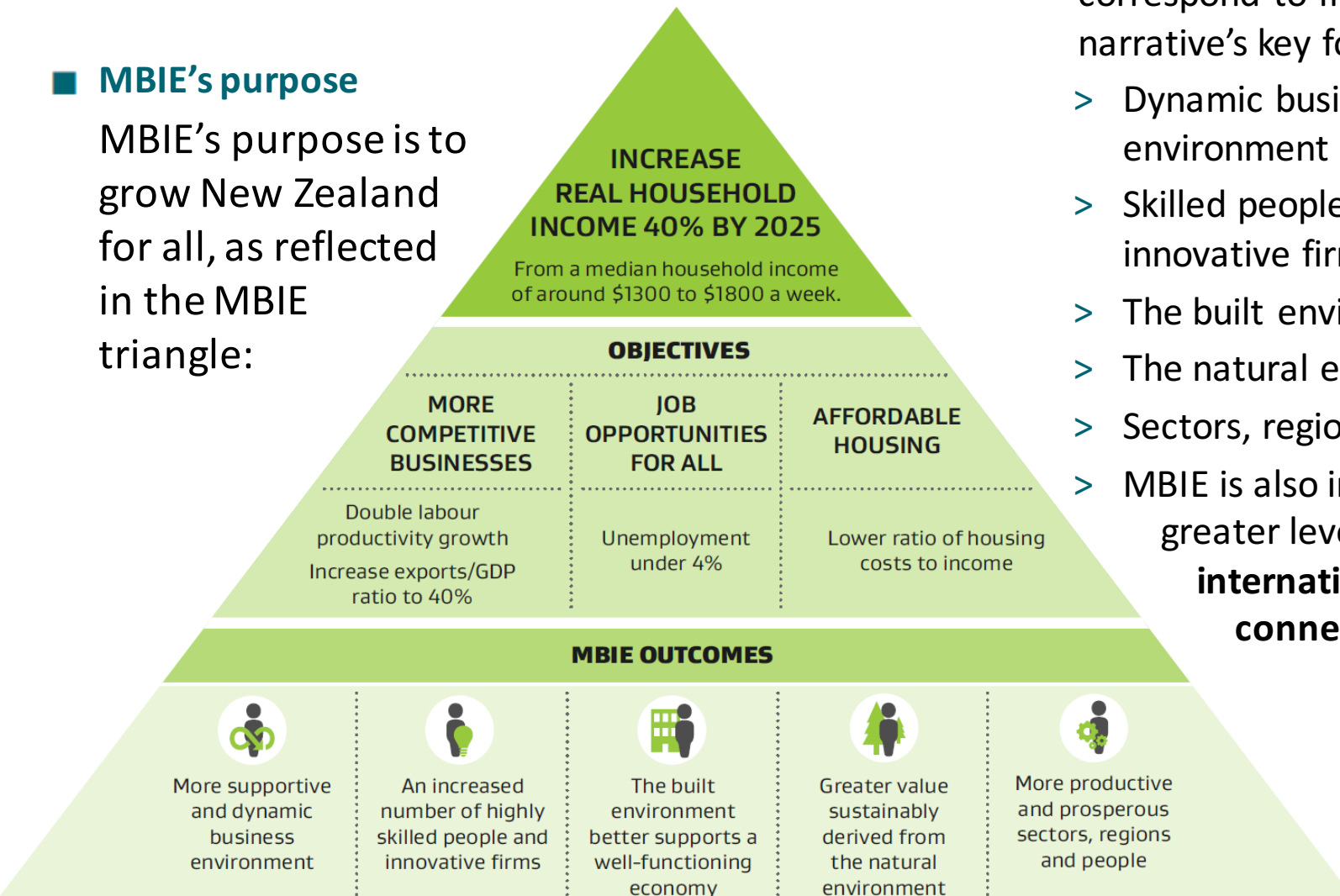
Jim Metson
Chief Science Advisor
Ministry of Business Innovation and Employment

Three overlapping trapezoidal shapes in shades of blue, green, and teal are positioned at the bottom of the slide, partially overlapping the text.

MBIE's objectives

■ MBIE's purpose

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



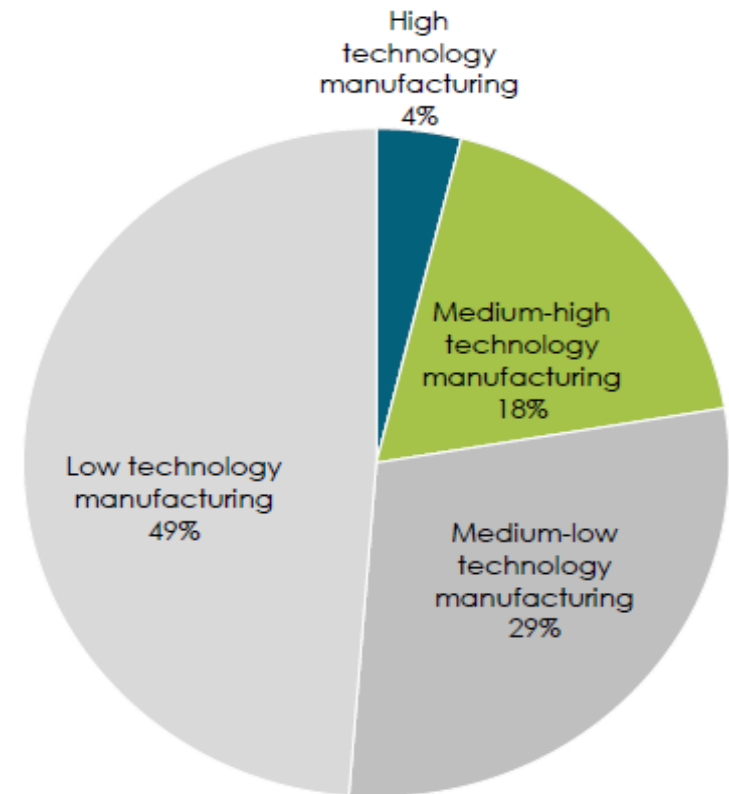
■ Focus areas

- > 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

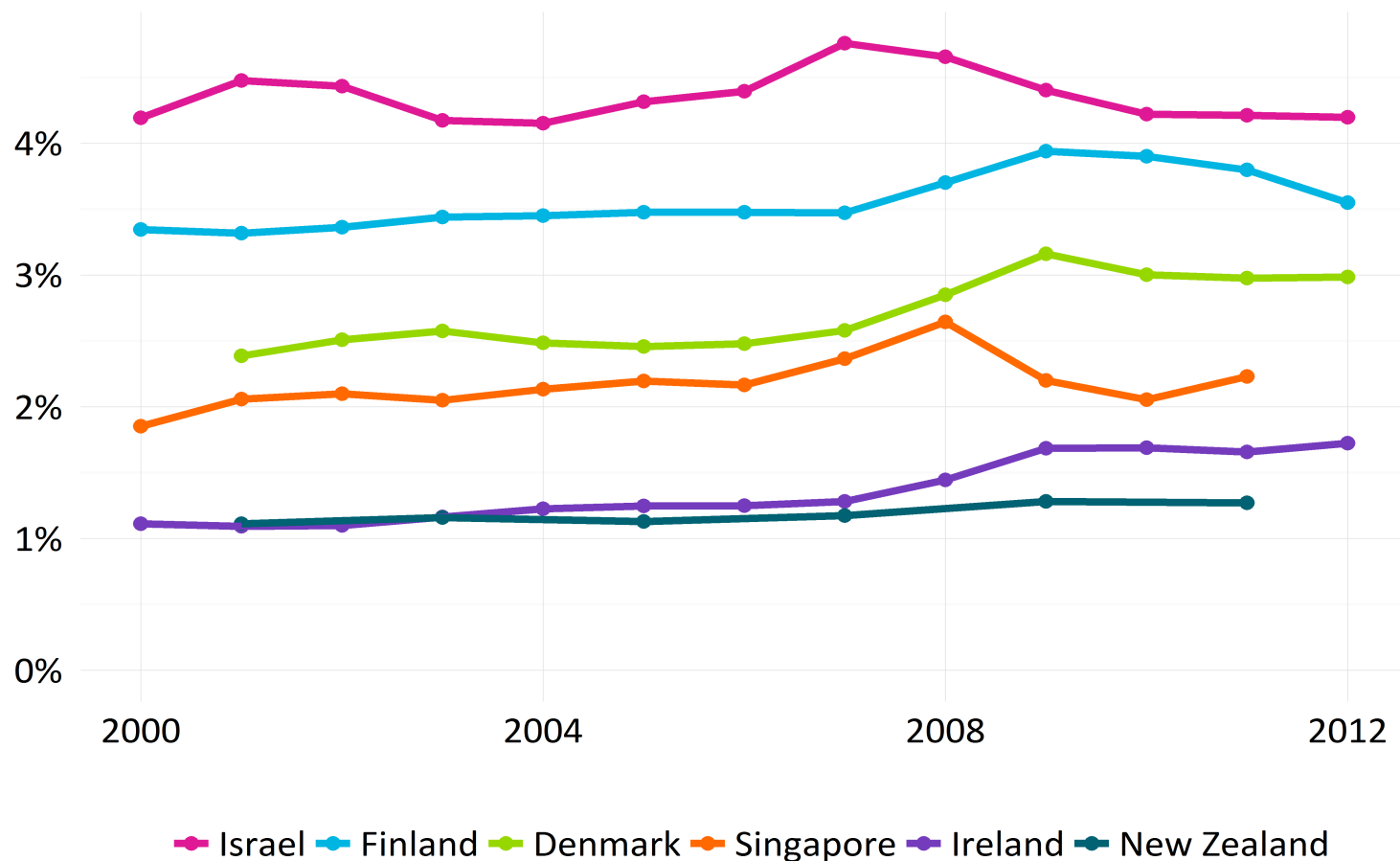
- A diverse economy has diverse technology needs.
- Industrial technologies can be applied across primary and manufacturing industries
- A diverse manufacturing sector
- Characterised by many small firms to medium firms, strongly focussed on exports
- Industry focus tends to be short to medium term,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

Share of manufacturing firms*
2012; *firms with >5 employees only



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

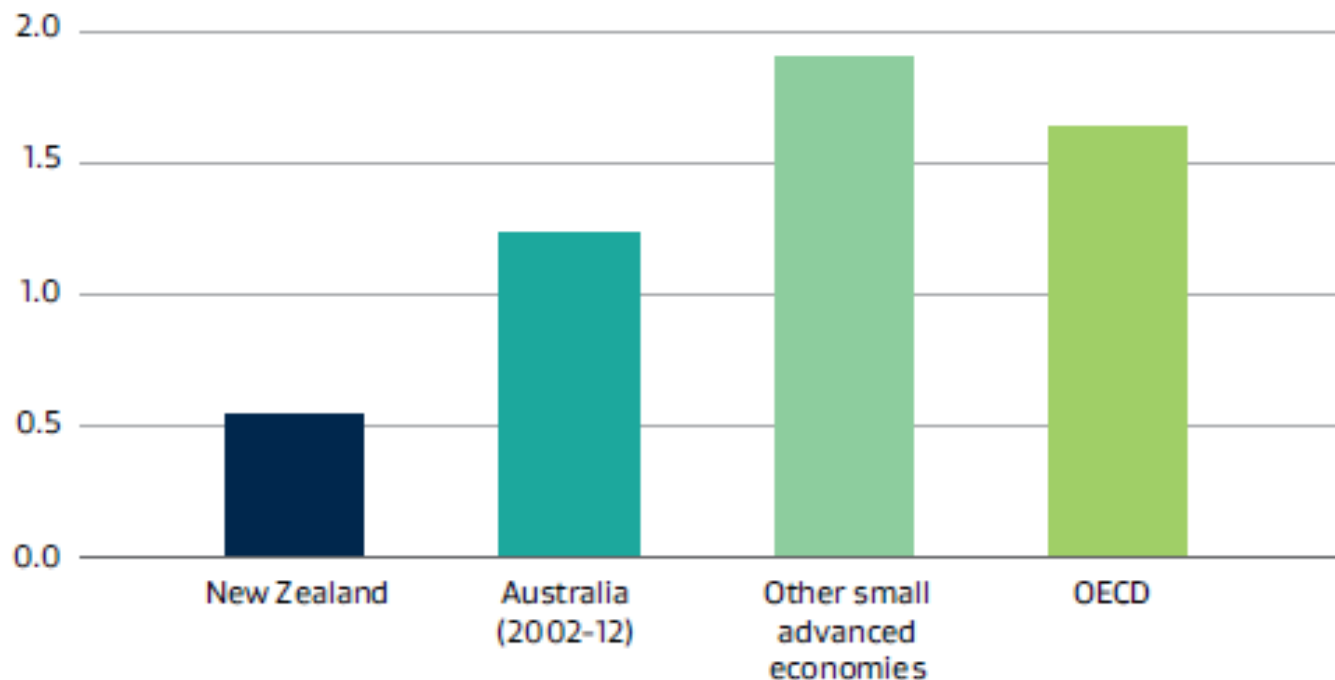
Small Advanced Economies - R&D Expenditure as a % of GDP



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



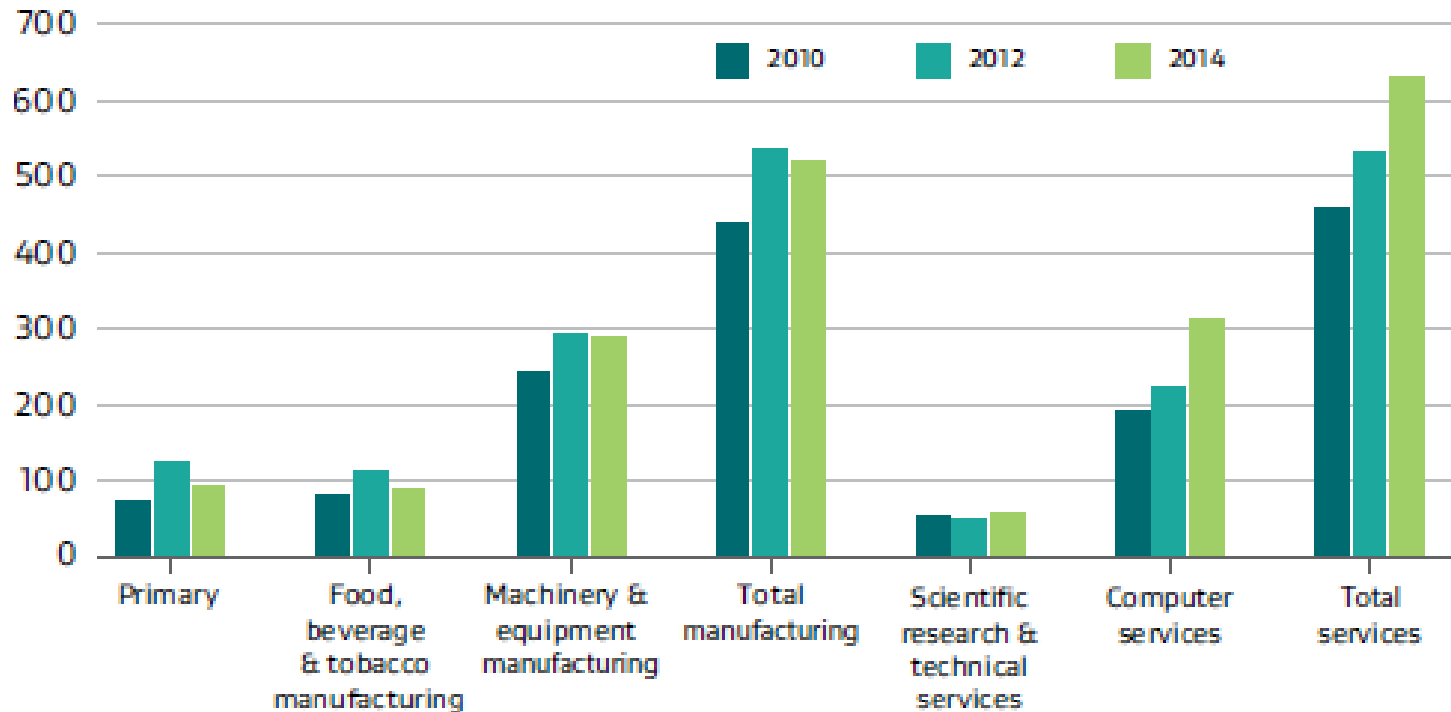
Source: Statistics New Zealand



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.

NZ EXPORTS OF HIGH TECHNOLOGY
MANUFACTURED GOODS AND WINE
US\$M; NOMINAL; 1990–2012

— High Technology Manufacturing
— Wine



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

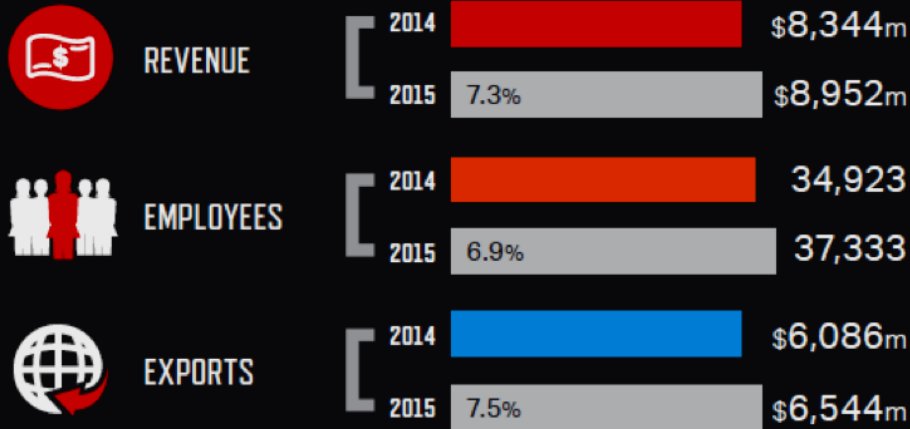
High technology manufacturing is the most R&D intensive part of the economy, investing 4 times more than the New Zealand average. This investment pays off – firms are producing products and technologies that are new to New Zealand and new to the world.

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

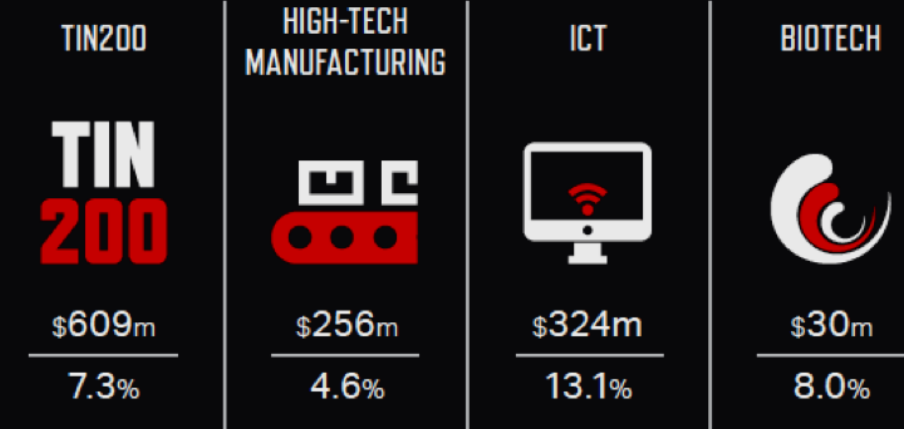


SNAPSHOT OF 2015 TIN100 REPORT: EXECUTIVE SUMMARY

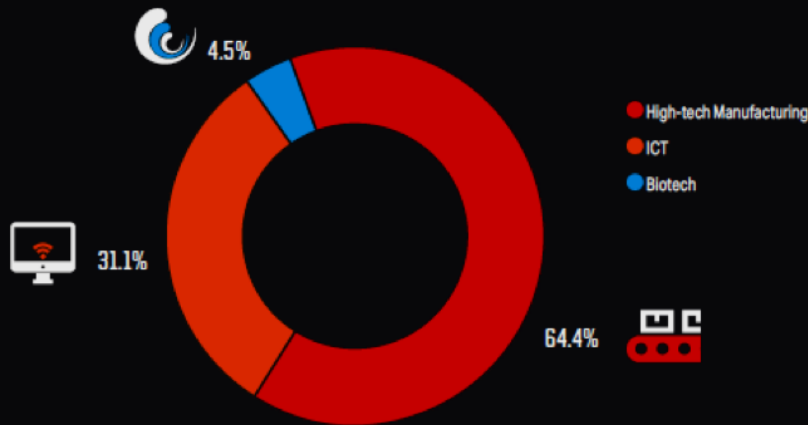
TIN200 REVENUE - 2015 VS 2014



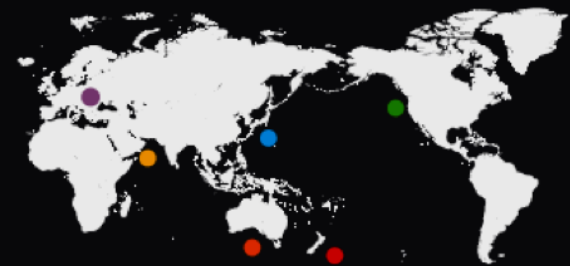
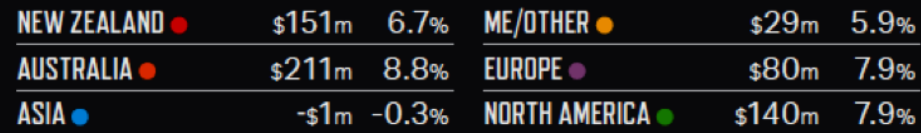
REVENUE GROWTH - 2015 VS 2014



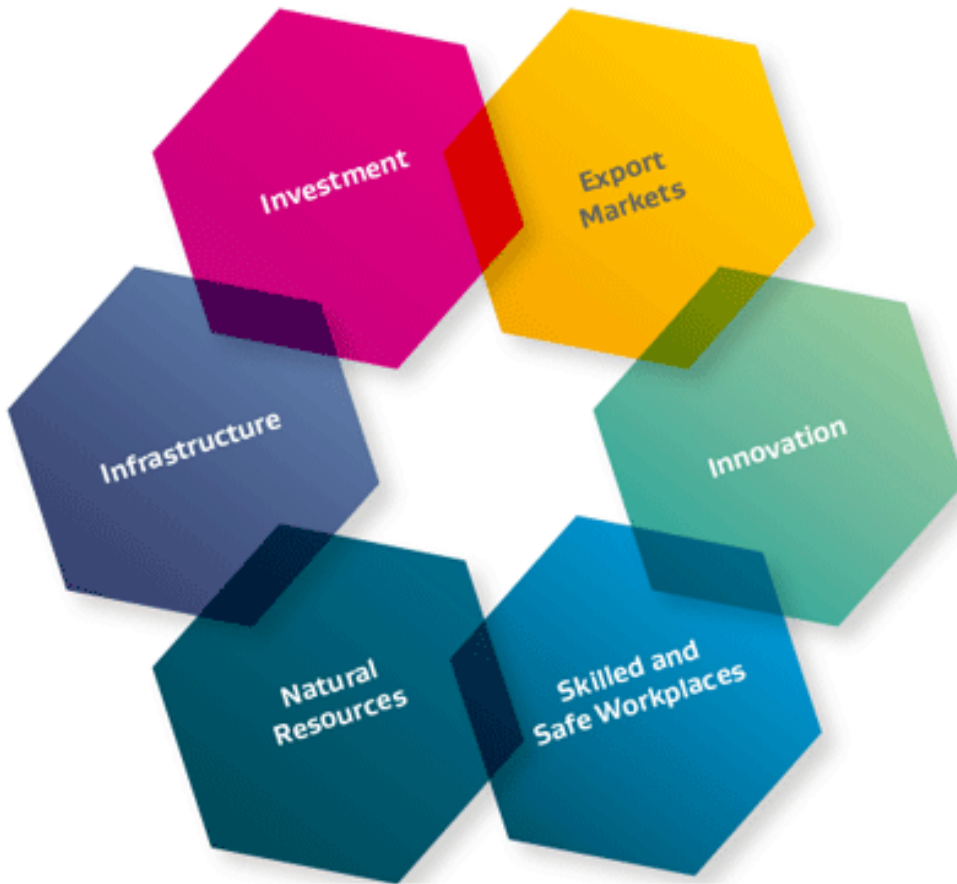
% OF REVENUE BY PRIMARY SECTOR - 2015



REGIONAL REVENUE GROWTH - 2015 VS 2014



NZ – The Business Growth Agenda



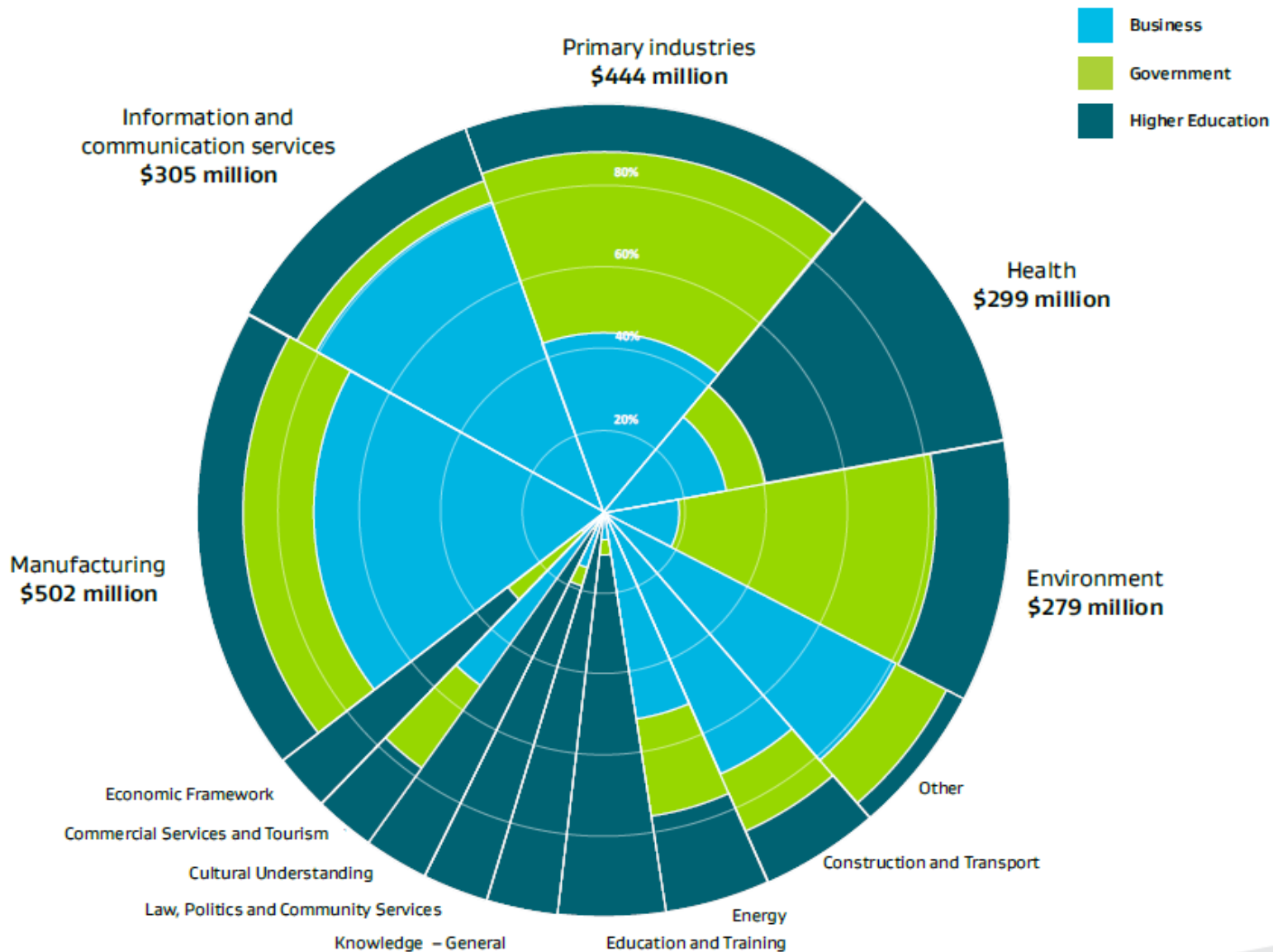
The Business
Growth Agenda

2015/16

Towards 2025



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





INNOVATION: MANAGING RISK, NOT AVOIDING IT

Evidence and Case Studies

Annual Report of the Government Chief Science Advisor 2014

UK Government Office for Science



CASE STUDY

THE HIGH VALUE MANUFACTURING CATAPULT

Dick Ely (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.



Callaghan**Innovation**

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

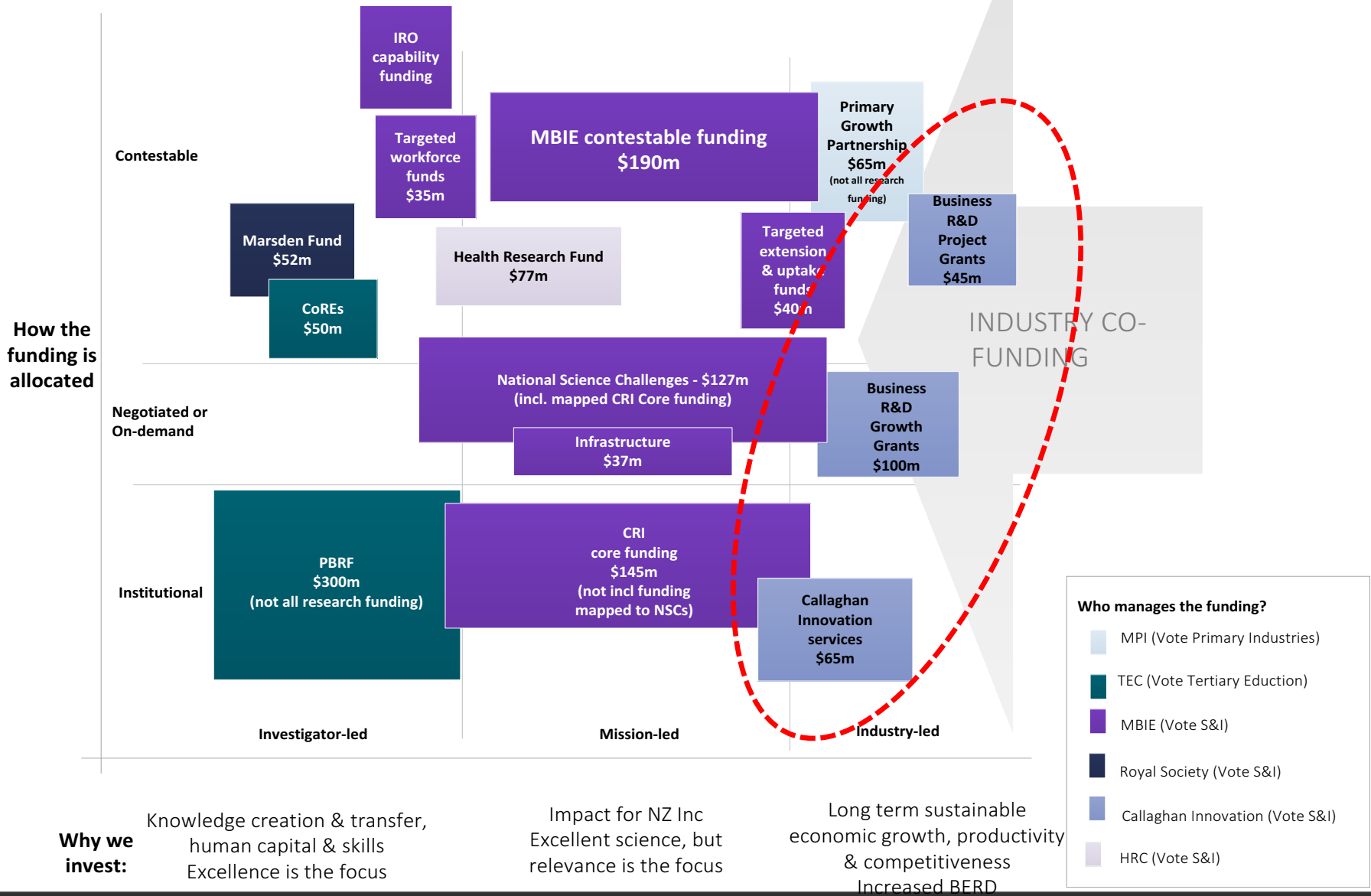
International partnerships

Pilot plants, incubators and innovation precincts

National Science Challenge:
Science for Technological Innovation



Funding of the science and innovation system



NZ – The Business Growth Agenda



The Business
Growth Agenda

2015/16

Towards 2025



MINISTRY OF BUSINESS,
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HIKINA WHAKATUTUKI

September 2015

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?

Committed up to \$210 million to extend ultrafast broadband to cover at least 80% of New Zealanders. As at June 2015, 724,000 end users were able to connect through the UFB initiative.

Three new technology incubators established to create new R&D-intensive start-ups. Eighteen high-tech start-ups are on their way to commercialising valuable new intellectual property(IP) after receiving repayable grants of up to \$450,000 over two years.

Invested an additional \$100 million in the Rural Broadband Initiative. As at June 2015, 242,000 end users were able to connect through the RBI programme.

Legislation implemented to ensure the tax system does not discourage R&D.

Allocated \$28.6m over four years for the ICT Graduate School programme. Successful proposals for Auckland and the South Island have been announced.

Launched and implemented six National Science Challenges which align and focus New Zealand's research on large and complex issues by drawing scientists together to achieve a common goal through collaboration.

Grown the number of engineering students by 25% over six years and the number of graduates by 23%. Lifted the number of degree-level and above ICT graduates from 1,145 in 2010 to 1,550 in 2014.

Launched the New Zealand Business Number (NZBN), a single identifying number assigned to all businesses, government agencies and commercial entities, designed to make it easier for businesses to work with government.

485 high-tech firms increased their investment in R&D through government grants with \$433 million in active contracts. Total funding for R&D grants through Callaghan Innovation increased to \$161.5 million per year.

Announced that Vodafone, Kathmandu and Wynyard Group will be anchor tenants in the Christchurch Innovation Precinct.

Created a new \$50 million Mobile Blackspot Fund to extend mobile coverage into black spot areas of main highways and key tourist areas.



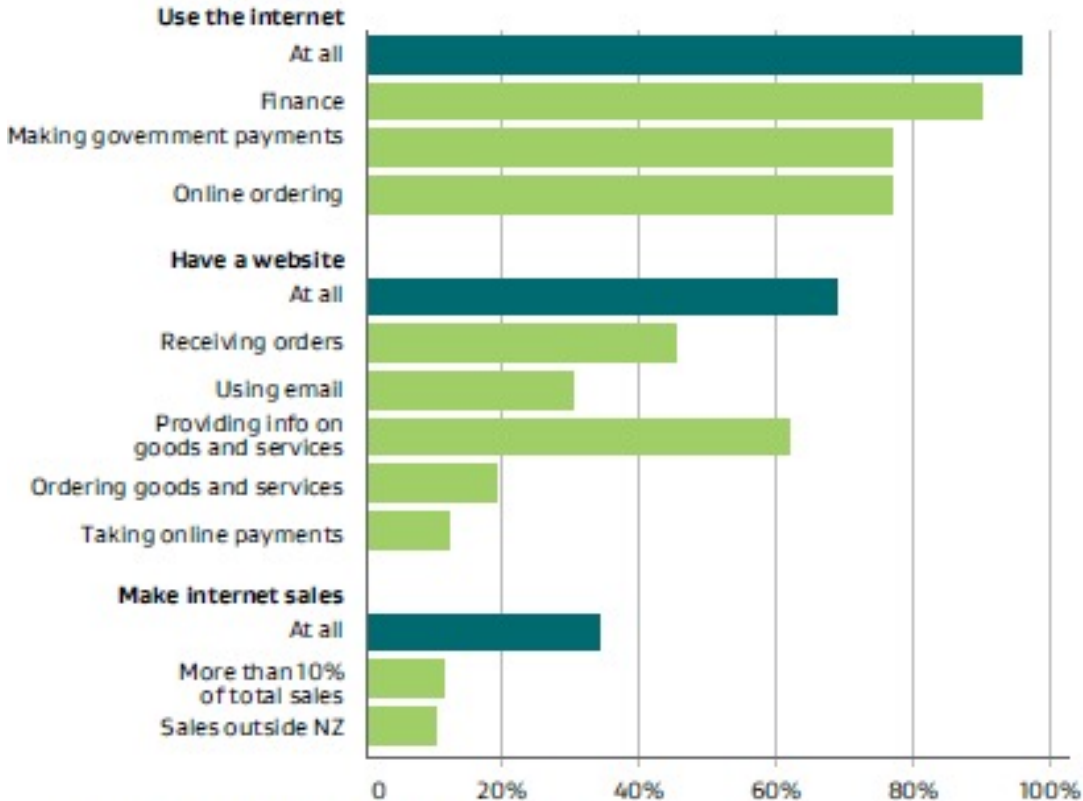
**Major
milestones**



Next Steps

There are opportunities for businesses to extract more value from digital technologies

Percentage of New Zealand businesses, 2012



Source: Ministry of Business, Innovation & Employment

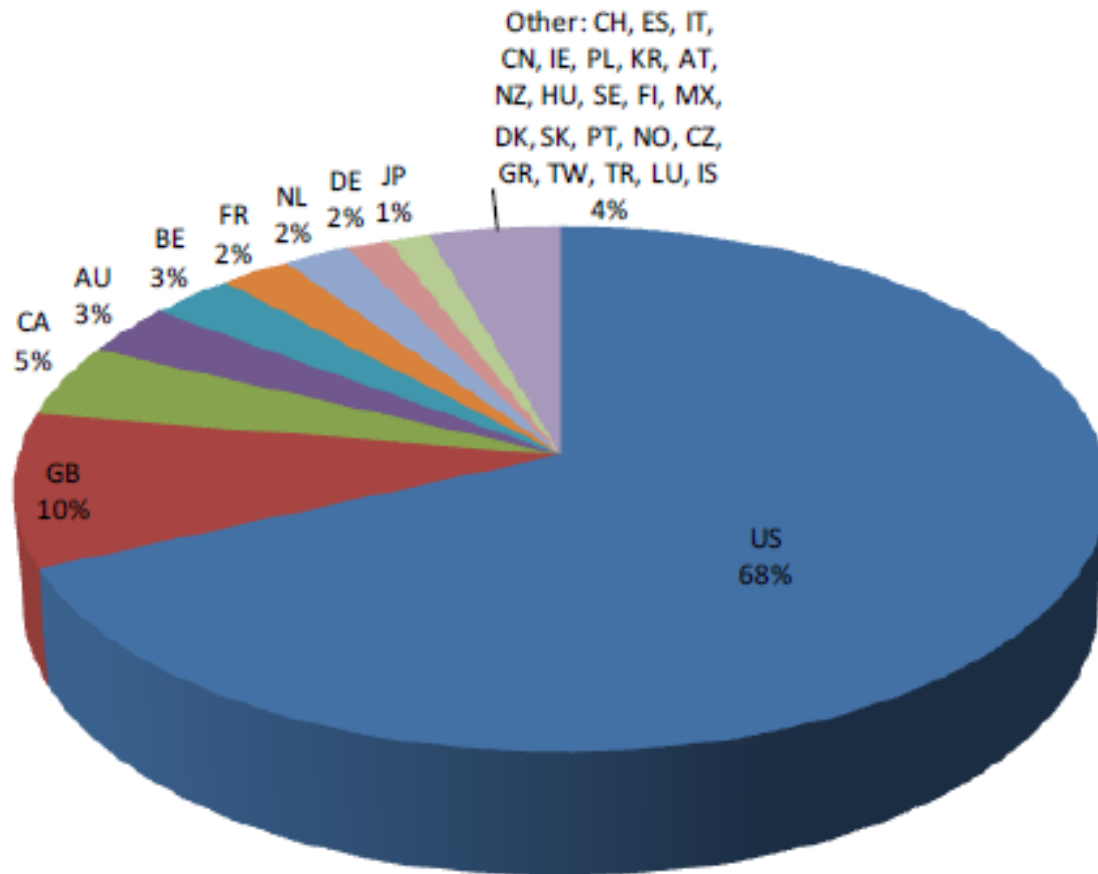


Universities and their role

- “.....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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Evidence and Case Studies

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.....

