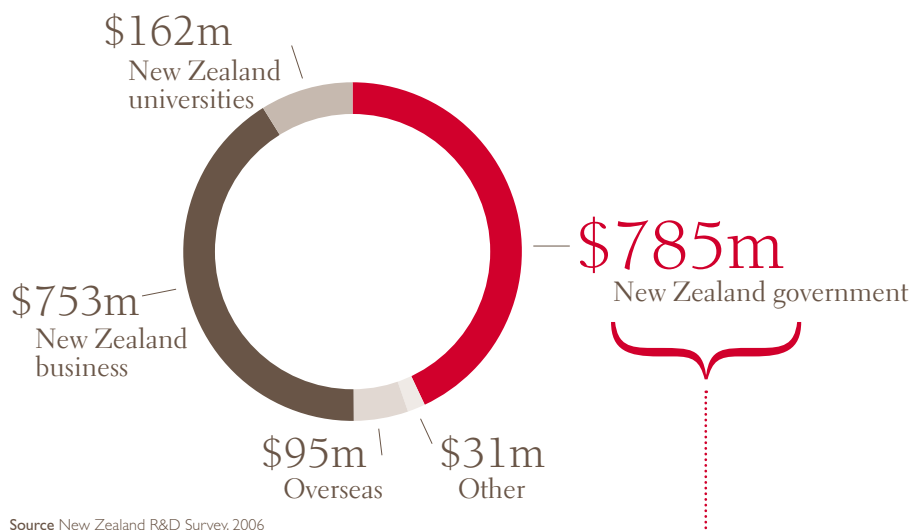


NOVEMBER 2007

RS&T Scorecard

This Scorecard details investments and outputs within the research, science and technology (RS&T) sector in New Zealand. Measures for the national RS&T system and output measures for Vote RS&T (the money that the government appropriates through the Budget to the research, science and technology portfolio) are included to provide a comprehensive picture of the New Zealand RS&T system.

Source of funds for R&D

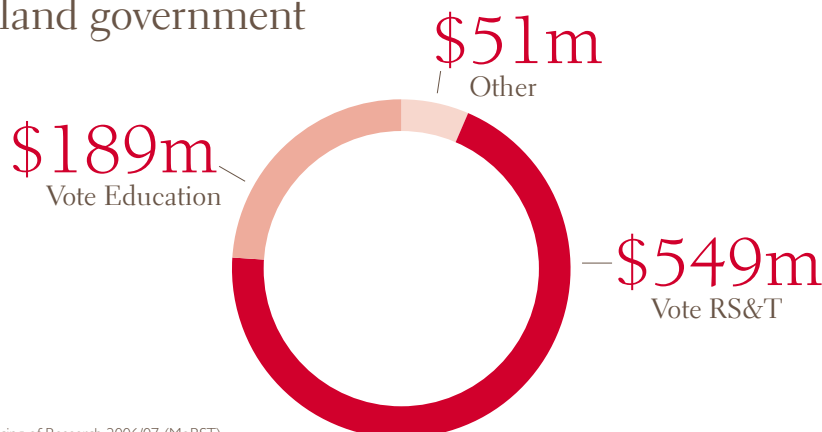


Source New Zealand R&D Survey, 2006

NATIONAL RS&T MEASURES

These measures include relevant or most useful OECD Main Science and Technology Indicators (MSTI) data and data reported in *Research and Development in New Zealand 2006* (hereafter referred to as New Zealand R&D Survey 2006). The New Zealand R&D Survey is jointly sponsored by MoRST and Statistics New Zealand and is run biennially. R&D Surveys independently gather statistics from government, the tertiary sector and private business and are representative of the whole R&D sector and not just that funded by Vote RS&T.

New Zealand government



VOTE RS&T MEASURES

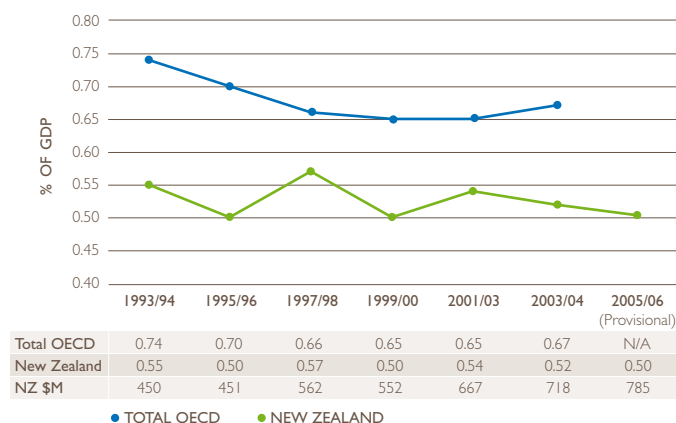
These measures analyse the government's direct funding of the RS&T system. Information has been provided to MoRST by the funding and investment agents, principally the Foundation for Research, Science and Technology (FRST), the Health Research Council (HRC) and the Royal Society of New Zealand (RSNZ). Vote RS&T measures will be more fully reported in future years.

Investment

National RS&T measures – investment

GOVERNMENT-FINANCED GROSS EXPENDITURE ON R&D

Source OECD MSTI 2007/01, except 2005/06, New Zealand R&D Survey 2006



COMPOSITION OF GROSS EXPENDITURE ON R&D BY SECTOR

Source OECD MSTI 2007/01

	NZ \$M	OECD ⁽¹⁾ MILLION CURRENT PPP \$
Business expenditure on R&D (BERD)	763	524,204 ^P
Government expenditure on R&D (GOVERD)	469	91,244 ^P
Higher education expenditure on R&D (HERD) ⁽³⁾	593	136,528 ^P
TOTAL	1,825	751,975^P
GDP 2005/06	155,885⁽²⁾	34,310,093^P
BERD as percentage of GDP	0.49 ^P	1.53 ^P
GOVERD as percentage of GDP	0.30 ^P	0.27 ^P
HERD ⁽³⁾ as percentage of GDP	0.38 ^P	0.40 ^P
TOTAL	1.17^P	2.20^P

(1) OECD MSTI 2007/01 PPP values.

(2) Statistics New Zealand GDP current price expenditure measure, year ended 31 March 2006.

(3) Universities only.

P = provisional.

SOURCE OF FUNDS FOR R&D BY FUNDER AND RECIPIENT SECTOR

Source New Zealand R&D Survey 2006

SOURCE OF FUNDS	RECIPIENT SECTOR			TOTAL \$M
	BUSINESS \$M	GOVERNMENT \$M	HIGHER EDUCATION \$M	
NZ business	615.9	89.5	47.5	753.0
NZ government ⁽¹⁾	86.5	351.4	346.8	784.7
NZ universities	0.6	4.6	156.8	162.0
Overseas	53.1	22.1	20.0	95.3
Other funding sources	7.2	1.7	21.8	30.7
TOTAL	763.3	469.4	592.9	1,825.6
	%	%	%	%
NZ business	81	19	8	41
NZ government	11	75	59	43
NZ universities	0	1	26	9
Overseas	7	5	3	5
Other funding sources	1	0	4	2
TOTAL	100	100	100	100

(1) Includes New Zealand local government agencies.

Note Due to rounding, some figures may not add to stated totals.

Vote R&ST measures – investment

VOTE RS&T – MAIN OUTPUT EXPENSES

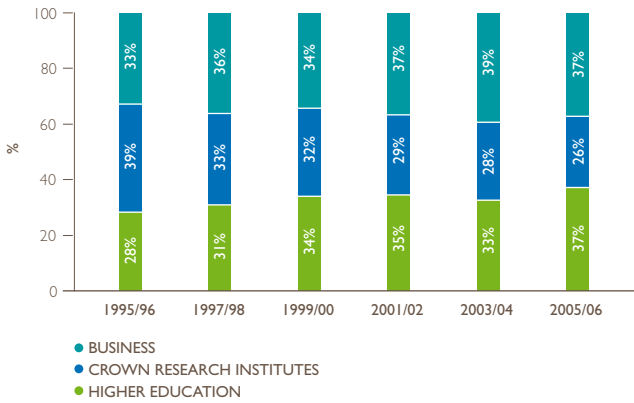
	ESTIMATES 2007/08 \$M	5 YEAR INCREASE FROM 2002/03 %
Research for Industry (RFI)	200.7	27
Environmental Research	93.4	22
New Economy Research Fund (NERF)	65.8	34
Health Research	59.0	67
CRI Capability Fund/Non-Specific Output Funding	50.6	103
Technology New Zealand	47.2	111
Marsden Fund	35.9	31
Supporting Promising Individuals	18.7	102
International Investment Opportunities Fund	9.6	
Pre-Seed Accelerator Fund	8.3	
Social Research	5.9	52
National Measurement Standards	5.8	36
Maori Knowledge and Development Research (MKDOC)	4.9	10
Engaging New Zealanders with Science and Technology	4.3	51
Development of International Linkages	3.2	
Research and Development Facilitation and Promotion Service	0.6	
Technology Partnerships NZ	0.6	
Advanced Network	0.2	
Research Contract Management (non-departmental)	21.1	57
Advice on Shaping the Science System	13.4	60
Capital	5.3	
Other	3.8	
TOTAL VOTE RS&T	658.1	40

Investment CONTINUED

National RS&T measures – investment CONTINUED

COMPOSITION OF GROSS EXPENDITURE ON R&D BY SECTOR

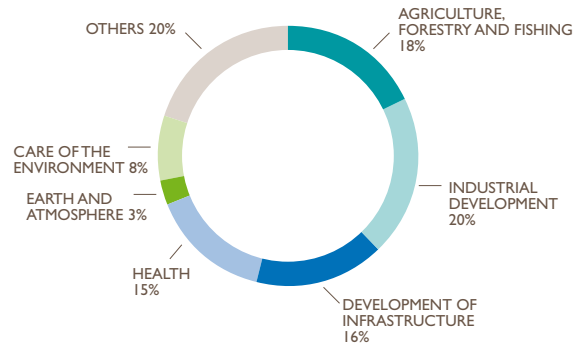
Source MoRST A Decade in Review; New Zealand R&D Survey 2006



Note This chart does not include the non-CRI government sector which performs approx. 4% of GERD.

BREAKDOWN OF RESEARCH PERFORMED IN NEW ZEALAND

Source New Zealand R&D Survey 2006



Vote RS&T measures – investment CONTINUED

INCREASE IN VOTE RS&T OVER TIME

YEAR	OPERATING \$M	CAPITAL \$M	TOTAL \$M	TOTAL INCREASE IN OPERATING EXPENDITURE FROM 2003/04	
				\$M	%
2003/04	491	24	515		
2004/05	542	19	560	51	10
2005/06	620	7	627	128	26
2006/07	642	2	645	151	31
2007/08 ⁽¹⁾	653	5	658	161	33

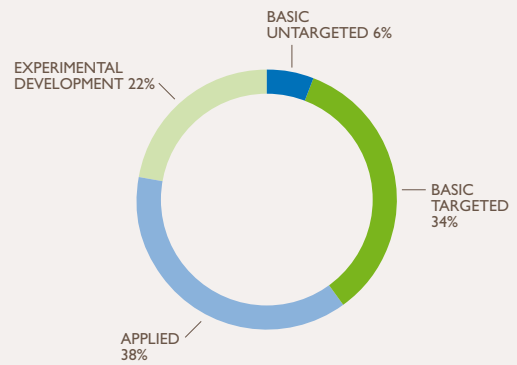
(1) Budgeted expenditure. Estimates May 2007.

Note All figures excluding GST.

VOTE RS&T BY RESEARCH TYPE

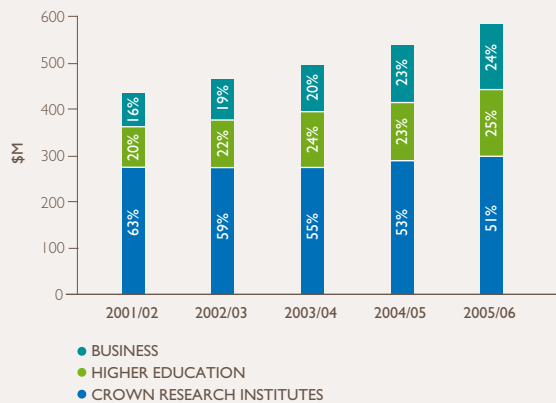
Source FRST & RSNZ

(Only including NERF, RFI, Environment, MKDOC, Social, TechNZ and Marsden output expenses.)



VOTE RS&T ALLOCATED BY RESEARCH PROVIDER

Source FRST, HRC and RSNZ

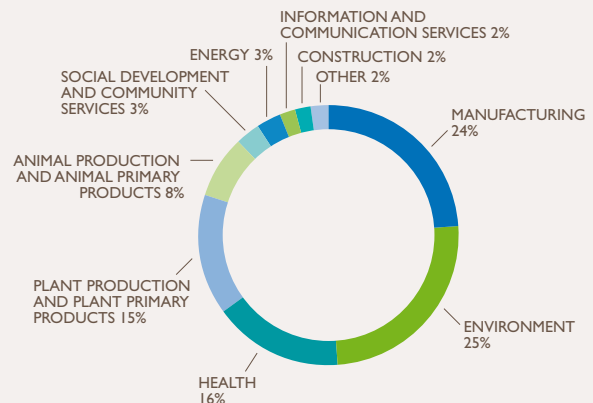


Note Percentages show overall provider share per year.

VOTE RS&T BY SOCIOECONOMIC OBJECTIVE (SEO)

Source FRST, HRC and classified to SEO by MoRST

(Only including NERF, RFI, Environment, MKDOC, Social and Health output expenses.)

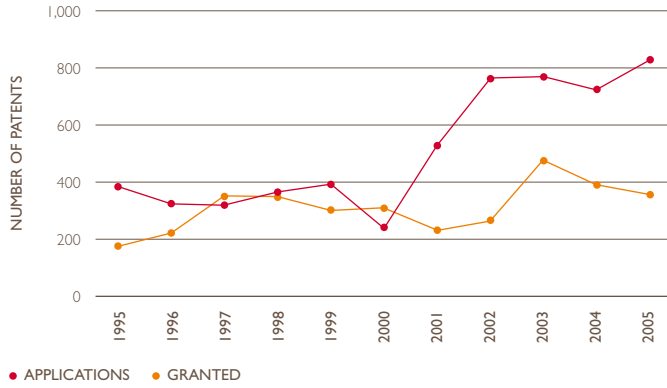


Innovation

National RS&T measures – innovation

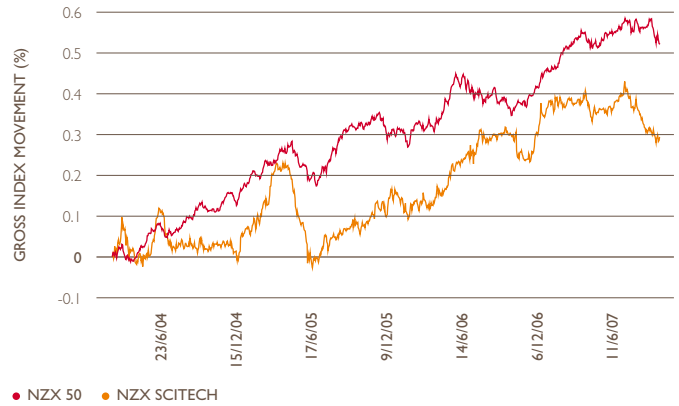
NEW ZEALAND STANDARD PATENTS

Source: Intellectual Property Office of New Zealand



NZX SCITECH INDEX

Source: NZX (for further details, see www.nzx.com)

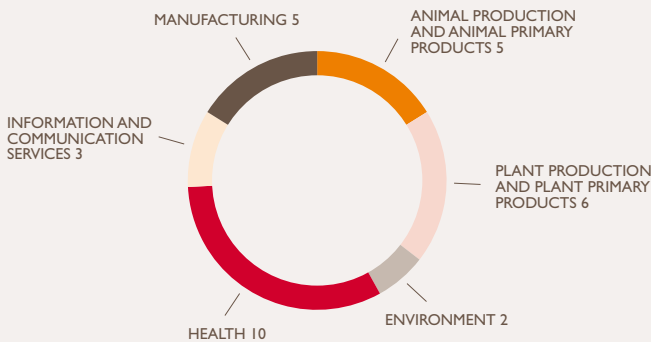


	NO. OF FIRMS	GROSS INDEX	INDEXED CAP. (\$M)
1-Jan-04	18	1,028	275
1-Jan-05	21	1,165	467
1-Jan-06	22	1,153	526
1-Jan-07	25	1,450	1,101
14-Aug-07	27	1,328	1,170

Vote RS&T measures – innovation

NUMBER OF SPINOUTS FROM VOTE RS&T RESEARCH BY SECTOR (2005/06)

Source: FRST



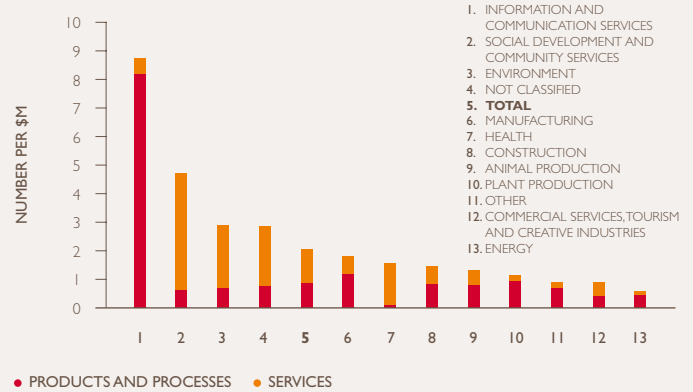
Total number	31
Total annual sales revenue	\$15.4 million
Total export earnings	\$4.6 million

Note: Only FRST-funded contracts included.

NUMBER OF PRODUCTS, PROCESSES AND SERVICES PER MILLION \$ FROM VOTE RS&T BY SOCIOECONOMIC OBJECTIVE (2005/06)

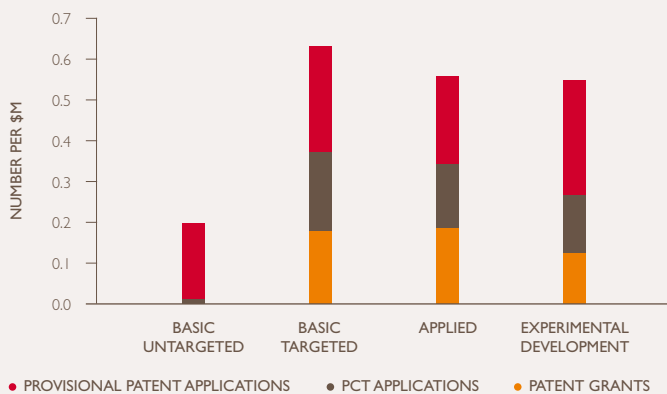
Source: FRST and HRC

(Only includes NERF, RFI, Environment, MKDOC, Social and Health output expenses.)



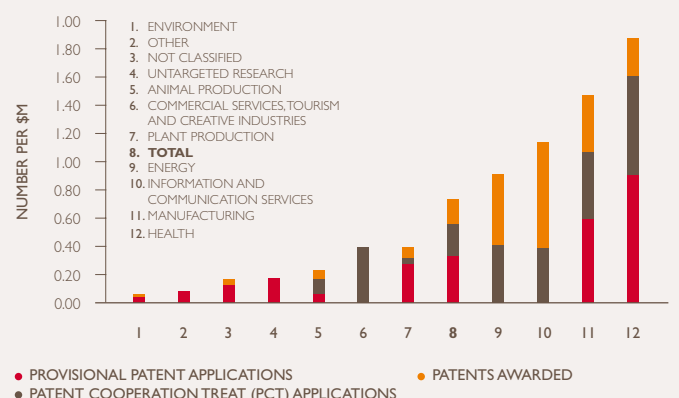
NUMBER OF PATENTS PER MILLION \$ FROM VOTE RS&T BY TYPE OF RESEARCH (2005/06)

Source: FRST and RSNZ (includes PGS&T, NERF and Marsden output expenses)



NUMBER OF PATENTS PER MILLION \$ FROM VOTE RS&T BY SOCIOECONOMIC OBJECTIVE (2005/06)

Source: FRST, HRC and RSNZ (includes PGS&T, NERF, Health and Marsden output expenses only)



People

National RS&T measures – people

PERSONNEL PERFORMING R&D IN NEW ZEALAND (2005/06)

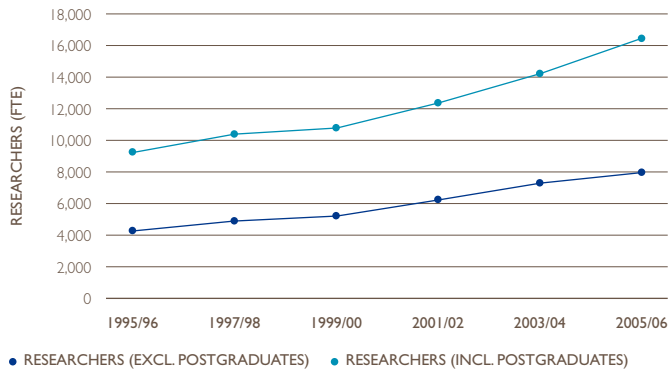
Source New Zealand R&D Survey 2006
FTEs by highest qualification. 2006 reference year.

QUALIFICATION	FTEs	%
PhD	3,591	16
Bachelor ⁽¹⁾	14,739	64
Technical and trade ⁽²⁾	1,710	7
Other qualifications	3,144	14
TOTAL	23,178	100

(1) Bachelor's degrees or equivalent, and postgraduate qualifications other than PhD. All postgraduate research students in the higher education sector were included in this group.
(2) Technical and trade qualifications, eg NZ Certificate of Engineering or Science, or NZ Trade Certificate.
Note Due to rounding, some figures may not add to stated totals.

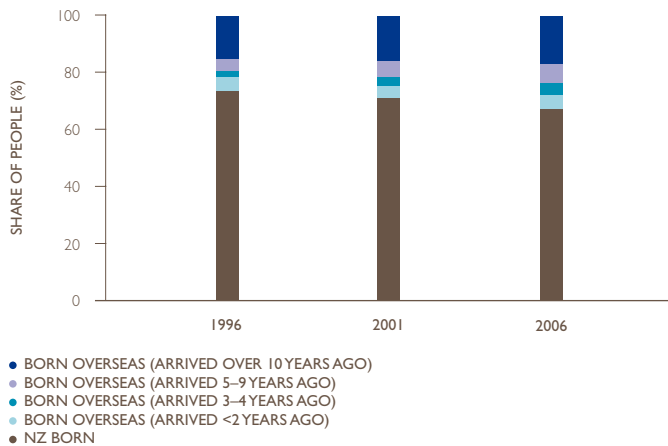
TIME SERIES OF RESEARCHERS PERFORMING R&D IN NEW ZEALAND

Source MoRST A Decade in Review and New Zealand R&D Survey 2006



PEOPLE WITH UNIVERSITY-LEVEL QUALIFICATIONS AND OCCUPATIONS BY BIRTHPLACE (1996/06)

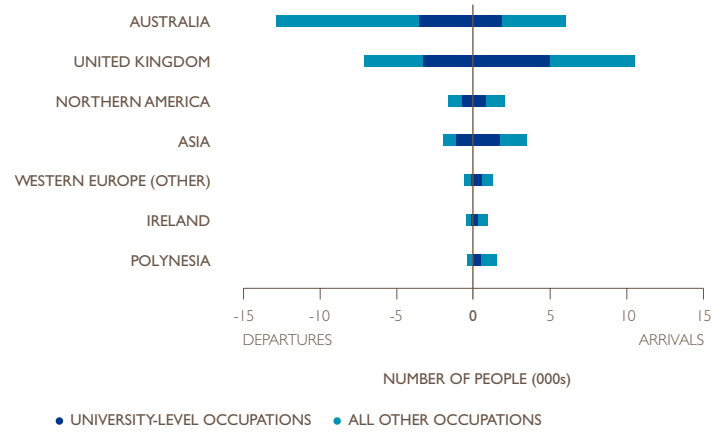
Source 2006 Census data



Note University-level qualifications include bachelor-level degrees and higher qualifications. University-level occupations include all specialist managers, professionals group 1 and professionals group 2.

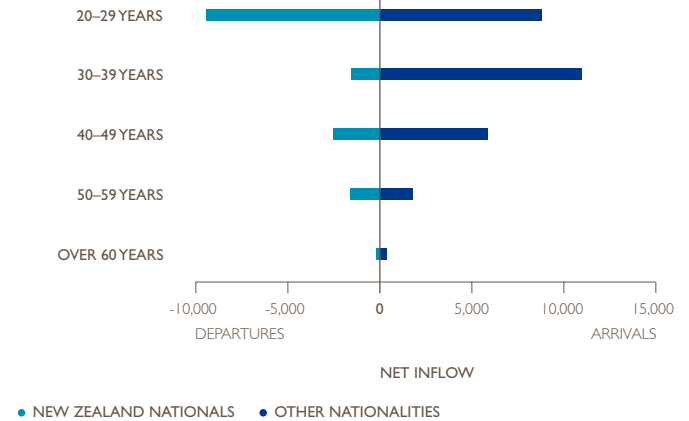
PERMANENT AND LONG-TERM MIGRANTS ARRIVING AND DEPARTING NEW ZEALAND, YEAR ENDING JUNE 2005

Source MoRST A Decade in Review



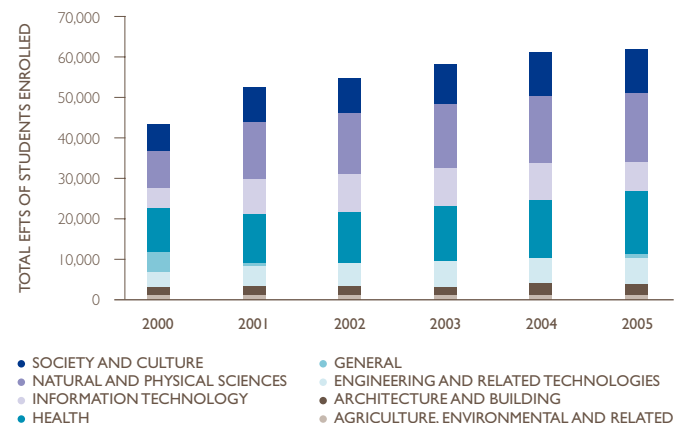
NET INFLOW OF PEOPLE WITH UNIVERSITY-LEVEL OCCUPATIONS BY AGE BAND (2000/05)

Source MoRST A Decade in Review



NUMBER OF STUDENTS PARTICIPATING IN RS&T TERTIARY COURSES AND GRADUATES FROM 2000/05

Source Ministry of Education

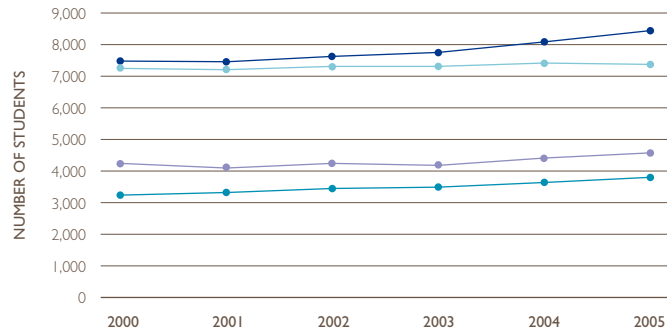


Note This only includes courses that are classified as science and technology (S&T). S&T courses include all courses coded as broad subjects: natural and physical sciences, information technology, engineering and related, agricultural, environment and related, and health, as well as other selected narrow subjects under society and culture, and architecture and building. The total FTEs for students enrolled in all society and culture courses, and architecture and building courses, will be higher. This only refers to students obtaining a bachelor's degree or higher.

National RS&T measures – people CONTINUED

STUDENTS OBTAINING SCIENCE AND TECHNOLOGY BACHELOR'S DEGREE BY GENDER AND DOMESTIC STATUS (2000/05)

Source: Ministry of Education

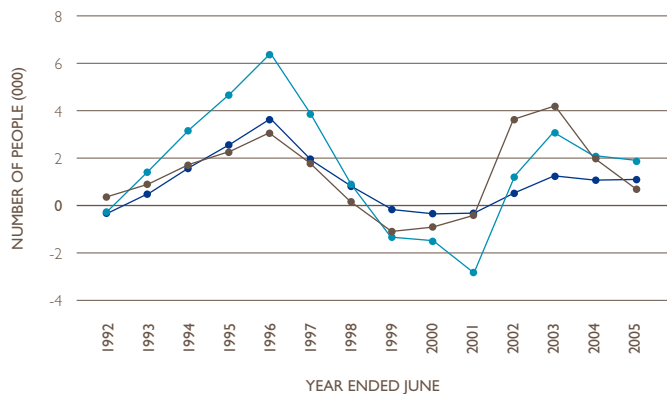


● S&T BACHELOR'S COMPLETED ● DOMESTIC ● FEMALE ● MALE

Note: Science and technology degrees were chosen from qualification coding and include all degrees coded under the broad subject categories of natural and physical sciences, information technology, engineering and related, agricultural, environmental and related, and health, as well as other selected narrow subjects under society and culture, and architecture and building.

NET PERMANENT AND LONG-TERM MIGRATION OF PEOPLE WITH RS&T OCCUPATIONS (1992/05)

Source: MoRST A Decade in Review



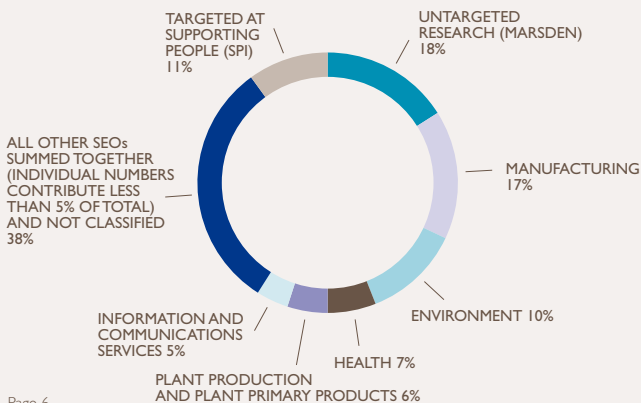
● SCIENTISTS AND ENGINEERS ● TOTAL POPULATION (DIVIDED BY 10)
● UNIVERSITY-LEVEL OCCUPATIONS

Vote RS&T measures – people

POSTGRADUATE STUDENTS AND POSTDOCTORAL RESEARCHERS SUPPORTED BY VOTE RS&T

Source: FRST, HRC and RSNZ

(PGS&T, NERF, SPI, Marsden and Health output expenses only.)



Linkages

National RS&T measures – linkages

CO-AUTHORSHIP OF PAPERS

Source: MoRST 2006 National Bibliometric Report 2001–2004

	1986–88	1995–97	1999–01	2002–04
% of NZ papers with international co-authors	20	30	37	43
Number of countries involved in co-authorship of NZ papers	57	83	91	112

CO-AUTHORSHIP OF PAPERS BY COUNTRY

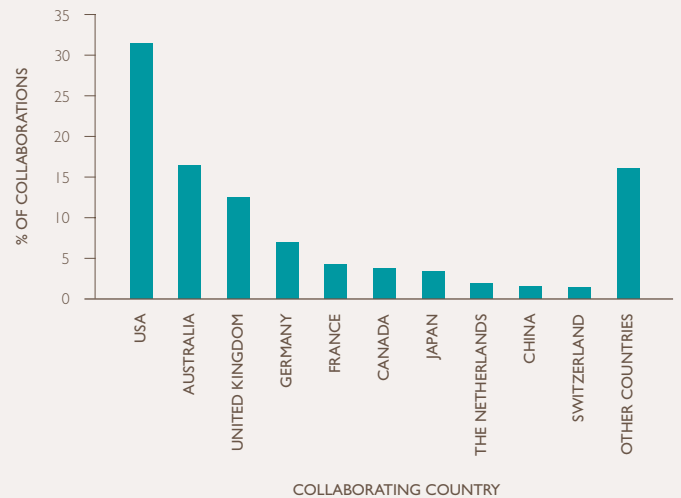
Source: MoRST 2006 National Bibliometric Report 2001–2004

COUNTRY	1986–88 %	1995–97 %	1999–01 %	2001–04 %
USA	37.7	36.7	33.2	33.7
Australia	23.8	22.1	24.0	24.0
UK	19.5	19.3	21.0	21.9
Canada	8.4	9.2	8.4	8.4

Vote RS&T measures – linkages

INTERNATIONAL COLLABORATIONS SUPPORTED BY VOTE RS&T BY COUNTRY

Source: HRC reported collaborative ventures from 2005/06 contracts, RSNZ reported collaborations from Marsden and ISAT grants active in 2005/06, FRST reported collaborations from 2006/07 contracts.



Note: The figures include all types of collaborations, including formal ventures involving several researchers in different countries, relationships between individual researchers, and international exchanges through ISAT grants. No weighting is applied for the scale of a collaboration, eg a consortium involving 30 researchers and five countries is treated the same as a collaboration between two individuals.



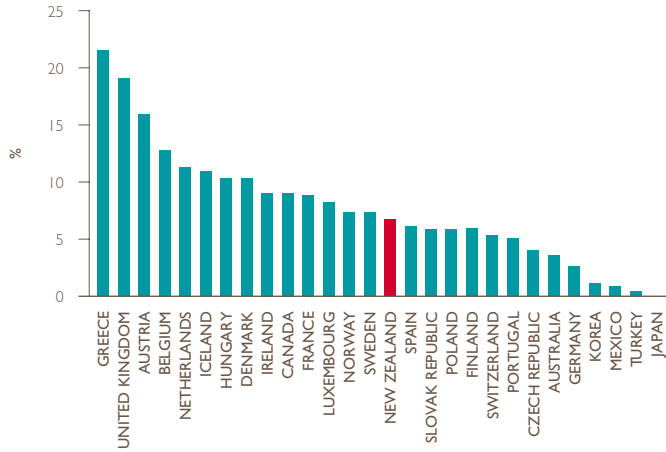
Linkages CONTINUED

National RS&T measures – linkages CONTINUED

PERCENTAGE OF GERD FINANCED FROM ABROAD

Source MSTI 2007/01

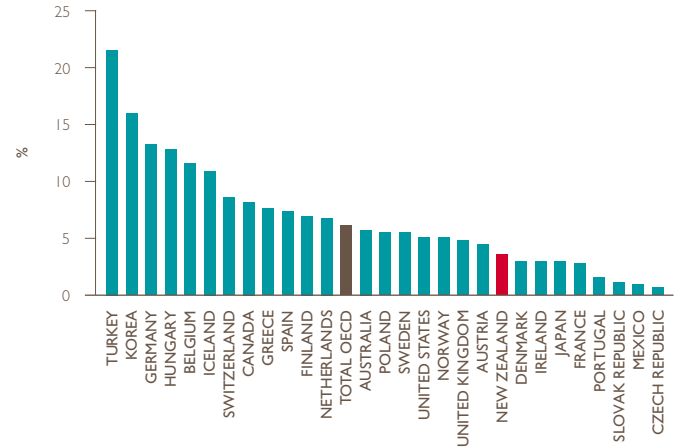
Note Data for 2004 or most recent year



PERCENTAGE OF RESEARCH CARRIED OUT BY UNIVERSITIES, FUNDED BY BUSINESS

Source MSTI 2007/01

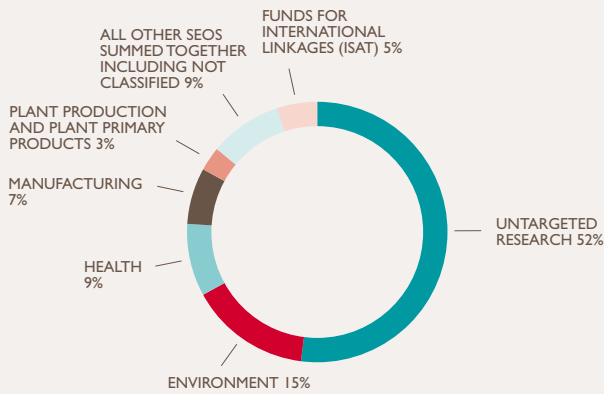
Note Data for 2004 or most recent year



Vote RS&T measures – linkages CONTINUED

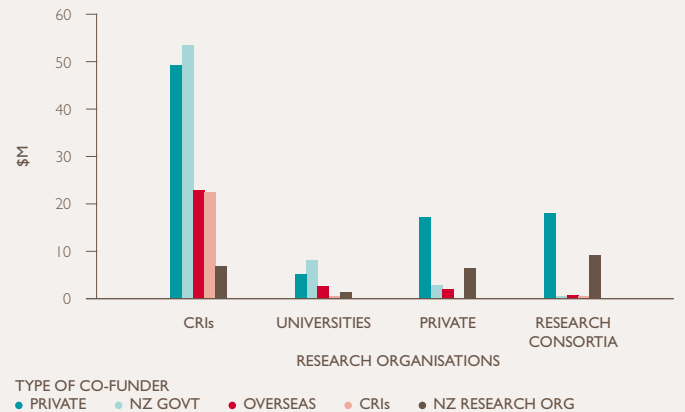
INTERNATIONAL COLLABORATIONS SUPPORTED BY VOTE RS&T BY SEO

Source FRST, HRC and Marsden



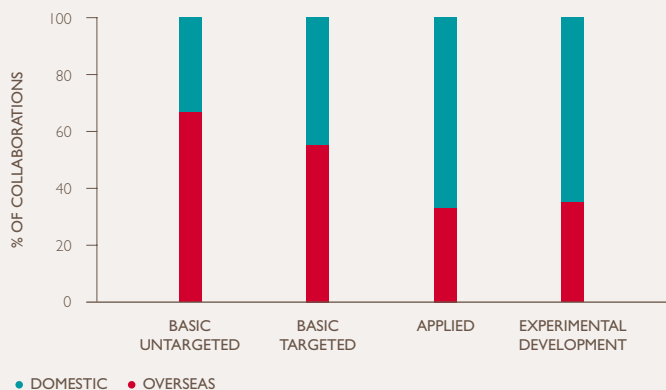
CO-FUNDING OF VOTE RS&T RESEARCH

Source FRST co-funding reported 2005/06



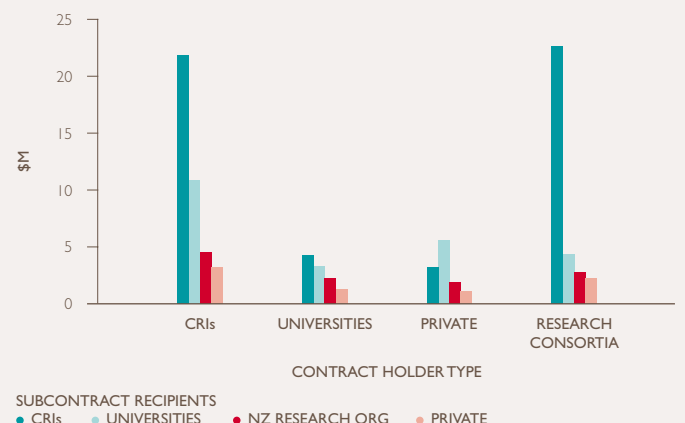
DOMESTIC AND OVERSEAS COLLABORATIONS SUPPORTED BY VOTE RS&T BY RESEARCH TYPE

Source FRST and RSNZ



SUBCONTRACTING IN VOTE RS&T RESEARCH BY TYPE OF ORGANISATION

Source FRST (subcontracting reported 2005/06)

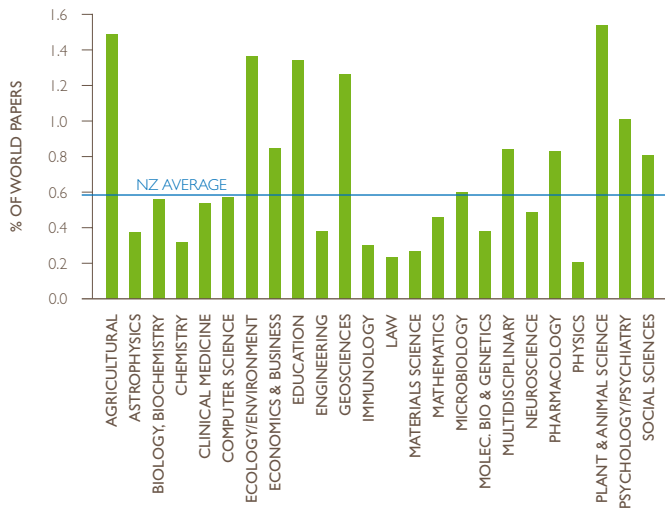


Science quality

National RS&T measures – science quality

NEW ZEALAND PAPERS AS A PERCENTAGE OF WORLD PAPERS

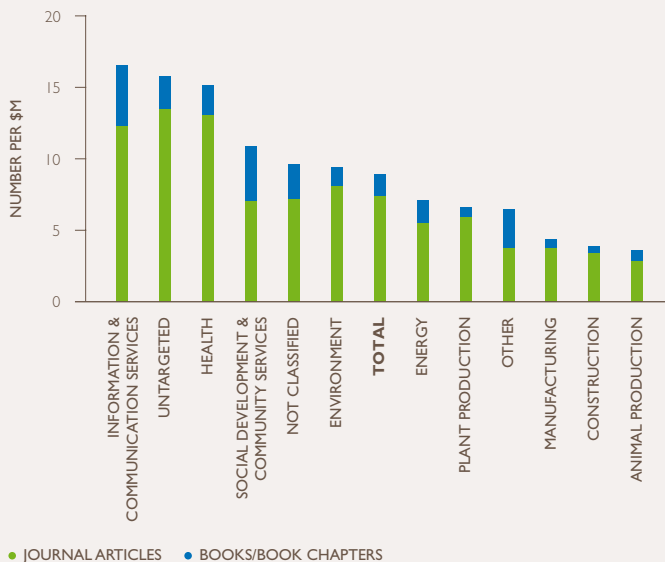
Source MoRST National Bibliometric Report 2001–2004 (2006)



Vote RS&T measures – science quality

PEER-REVIEWED PUBLICATIONS FROM VOTE RS&T BY SEO

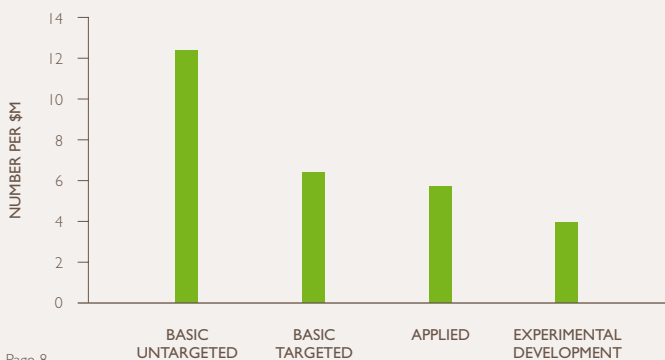
Source FRST, HRC and RSNZ



● JOURNAL ARTICLES ● BOOKS/BOOK CHAPTERS

PEER-REVIEWED PUBLICATIONS PER MILLION \$ FROM VOTE RS&T BY RESEARCH TYPE

Source FRST and RSNZ



Methodology

If no data source is referenced, the source is internal to MoRST. All external data sources are acknowledged.

All dollar values are GST exclusive. (Some minor exceptions occur eg, in Vote RS&T – Main Output Expenses, Supporting Promising Individuals.)

The Vote RS&T allocation to R&D (\$549m) on page 1 is the 2006/07 estimate of R&D expenditure and excludes non-R&D items such as 'Research Contract Management' and 'Advice on Shaping the Science System'. The total Vote RS&T (\$658.1m) on page 2 is the total Vote estimate for 2007/08.

In some Vote RS&T measures, totals will differ from total Vote RS&T due to the exclusion of some output expenses for which measures were not reported.

Some Vote RS&T measures have been presented by socio-economic objective (SEO). RSNZ Marsden Fund contracts have been included in some measures as untargeted research and not included in others. MoRST classified FRST contracts into SEO classes using abstracts and relevant profiling information provided by researchers.

In some places, we have normalised Vote RS&T data, using counts per million dollars, to compare output expenses. We recognise that this is approximate because there is a time lag between funding research and generating outputs.

Vote RS&T measures have been chosen to try to reflect the diversity of ways in which science is carried out. Individual measures should not be used to benchmark sectors or fields of research.

MoRST's publication *Research Development in New Zealand: A Decade in Review (2006)* compiles and summarises data from six R&D surveys from 1994 to 2004. This information has been complemented with results from the latest R&D Survey, completed in 2006, for presentation in this Scorecard.

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