

# Public Sector Financing of Research 2007/08

DECEMBER 2007



ISBN: 978-0-478-06152-9

DATE: DECEMBER 2007

PUBLISHED BY THE  
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## Executive summary

- 1.1 This report presents statistics about planned government funding of research activity for 2007/08<sup>1</sup>. In this report, research activity includes “research and development (R&D)”, “policy-related studies” and “other research-related activity”. These terms have specific meanings and are defined in Annex 1.
- 1.2 The data was collected by a survey of public sector agencies and analysis of selected budget votes following the internationally accepted methodology.<sup>2</sup>
- 1.3 Intended funding of research activity by local and central government agencies for 2007/08 was \$1,211 million.
- 1.4 Intended investment in R&D was \$946 million. The majority of this (\$601 million) was from Vote Research, Science and Technology (RS&T); a substantial portion (\$291 million) was from general university funding through Vote Education.<sup>3</sup> The contribution from other central government agencies was \$48 million, and local government was \$6 million.
- 1.5 Intended funding of policy-related studies was \$107 million. The majority would be spent by public service departments (\$77 million). Other government agencies intended spending \$11 million and local government, \$19 million.
- 1.6 Intended funding of other research-related activities was \$158 million.
- 1.7 Fifty-eight percent (\$548 million) of the R&D investment for 2007/08 was not allocated to a research provider. Where allocations had been made, \$7 million was allocated to in-house research units, \$76 million to government-owned research facilities, \$267 million to universities and polytechnics, \$14 million elsewhere in New Zealand, and \$1 million internationally.
- 1.8 The socio-economic purpose of most intended R&D had not been determined. Where a socio-economic purpose had been determined, the major targets were health, information technology, social, and environment.
- 1.9 Planned research activity that was not funded from Vote RS&T or general university funds from Vote Education was \$321 million. This was an increase of \$9 million from 2006/07<sup>4</sup>. Planned R&D decreased by \$8 million to \$54 million. Policy-related research increased by \$21 million to

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<sup>1</sup> Research terms are defined in Annex 1; public sector agencies are defined in Annex 2.

<sup>2</sup> For international methodology, see Annex 3; for survey questions, see Annex 6.

<sup>3</sup> For Vote RS&T breakdown, see Annex 4; for Vote Education (GUF), see Annex 5.

<sup>4</sup> Report of 2006/07 survey can be viewed at: <http://www.morst.govt.nz/publications/anz/p/financing-research/>

\$108 million. Other research-related activity decreased by \$4 million to \$158 million. These changes largely reflect improved definition use.

1.10 Agencies planning to fund R&D grew by one to a total of 40.

## Introduction

This study is the second in an annual series<sup>5</sup> that aims to quantify planned investment in research activity by the New Zealand public sector for the forthcoming financial year. In this series, research activity includes “research and development (R&D)”, “policy-related studies” and “other research-related activity”. These terms have specific meanings and are defined in Annex 1

This study complements, and is available earlier than, the biennial retrospective survey of the business, government and higher education R&D.<sup>6</sup>

In this study, the Ministry of Research, Science and Technology (MoRST) has purposefully taken a wide approach to capturing research activity funded by the public sector, and has included all research activity funded by local authorities. Public sector agencies carry out research activities that are both precursors to and applications of the more narrowly defined R&D.

The resulting statistics form essential background tools for government advisers who develop science, environmental, general economic and social policy. The statistics also inform the public and their representatives about the purpose of government-funded R&D.

By identifying central and local government investment in research activity, this study helps demonstrate that research is relevant to local communities, and that Government has an important role in developing New Zealand science and technology capability.

The term R&D as used in this study has an internationally defined meaning and is sometimes also known as Frascati R&D. This definition is the one used for collecting national statistics, such as those presented in OECD tables.

This study also collected data on policy-related studies and other research related activities. These are excluded from the definition of Frascati R&D, but provide a broader picture of research activity carried out by central and local government.

The OECD methodology for collecting information on public financing of research and experimental development (R&D), as defined in the Frascati manual,<sup>7</sup> was followed.

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<sup>5</sup> <http://www.morst.govt.nz/publications/a-z/p/financing-research/>

<sup>6</sup> <http://www.morst.govt.nz/publications/statistics/rd-survey/>

<sup>7</sup> OECD (2002) Frascati Manual – Proposed standard practice for surveys on research and experimental development. OECD. Paris: France ISBN 92-64-19903-9  
<http://www.oecdbookshop.org/oecd/display.asp?CID=&LANG=EN&SF1=DI&ST1=5LMQCR2K61JJ>

## Methodology

### SAMPLE AND DATA SOURCES

MoRST sought information about research-related activities from a survey of:

- All 85 local authorities (city, regional and district councils and unitary authorities);
- All 36 public service departments; and
- Seventy-four other state services, including non-public service departments, some Crown entities, Crown agents, district health boards, autonomous Crown entities and independent Crown entities and excluding school boards of trustees, most Crown entity companies, Crown entity subsidiaries and the Reserve Bank of New Zealand.

MoRST also reviewed selected budget votes for information about research funding.

### FRAMEWORK

MoRST invited public sector agencies to complete a survey in which they self-reported data for the 2007/08 financial year about the:

- Types of research activities that they fund;
- Amount budgeted for R&D, policy-related studies and other research-related activities – all figures are GST exclusive;
- Type of research organisation that would carry out their research; and
- Socio-economic purpose of that research.

### CONSTRAINTS AND QUALITY ASSURANCE

Agencies reported their best estimates, often in situations where budgets were not prepared along the lines described in the survey, and where the socio-economic purpose of research and development was unclear. MoRST checked data for reasonableness and discussed responses with agencies if clarification was needed.

In order to improve the survey from the previous year, clearer definitions were provided for the types of research activities, and socio-economic categories were reordered. Local authorities were provided with a table showing how the council activity categories mapped to socio-economic purposes.<sup>8</sup>

The survey results are subject to measurement errors which need to be considered when using this report. The survey does not comment on the quality of budget decisions or on any outcomes that may result from them.

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<sup>8</sup> For explanations given to local authorities, see Annex 7.

## Findings

The findings section first presents information about the rate of survey return, then the dollar amounts allocated to the wider research activities, and then the focus narrows to R&D funding only. R&D funding is presented by socio-economic objective and research provider. The last section gives a breakdown of local authority information.

### SURVEY RETURN AND R&D RATES BY CLASS OF AGENCY

The return rate for the survey was 71%, a 10% increase on the previous year. A breakdown of response rates is shown in Table 1.

**Table 1 Rate of survey return by class of government agency**

CLASS OF PUBLIC AGENCY	NUMBER OF RETURNS*	NUMBER IN CLASS	% RETURN RATE
Public service department	25	36	72
Non public service department	3	3	100
Crown entities	2	2	100
Crown agents	15	15	100
District health board	16	21	76
Autonomous Crown entity	17	22	77
Independent Crown entity	10	11	91
Local authority	50	85	59
TOTAL	138	195	71

\*Returns include phone messages confirming that the agency did no R&D.

The number of agencies reporting that they funded R&D was 46; this was seven more than for 2006 (see Table 2). Many agencies do not carry out R&D because of the nature of the organisation. However, within some classes of government agency, particularly district health boards and local authorities, some have set up research programmes and others have not.

**Table 2 Rate of R&D reported by class of government agency**

CLASS OF PUBLIC AGENCY	NUMBER REPORTING R&D	NUMBER OF RETURNS	% REPORTING R&D
Public service department	9	25	35
Non public service department	1	3	33
Crown entities	2	2	100
Crown agents	10	15	67
District health board	5	16	31
Autonomous Crown entity	5	17	29
Independent Crown entity	4	10	40
Local authority	10	50	20
TOTAL	46	138	33

## BUDGET ALLOCATION FOR RESEARCH ACTIVITY FOR ALL OF GOVERNMENT

The budget allocation for research activity for the 2007/08 financial year, as determined by this survey, was \$1,211 million. Policy-related studies and other research-related activities make a 22% contribution to New Zealand research activity (see Table 3). All dollar values are in New Zealand dollars and are exclusive of GST.

Where agencies commented on accuracy of dollar values provided, all said that figures were likely to underestimate actual spending.

**Table 3 All of government estimated funding of research activity by category**

CATEGORY OF RESEARCH <sup>9</sup>	%	\$ (MILLION)
Research and development	78	946
Policy-related studies	9	107
Other research-related activities	13	158
TOTAL	100	1,211

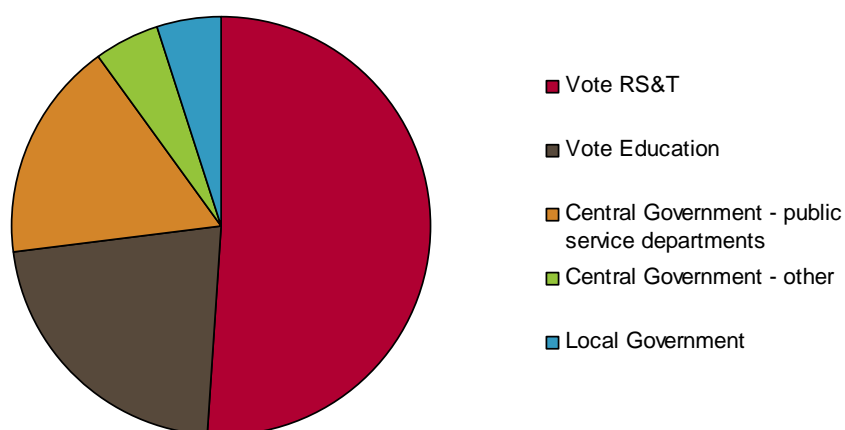
<sup>9</sup> These categories are defined in Annex 1.



## BUDGET ALLOCATION FOR RESEARCH ACTIVITY BY GOVERNMENT SECTOR

Half of research activity in New Zealand is funded through Vote RS&T, and is administered largely by funding and investment agencies that operate at arm's length from Ministers and policy departments (see Chart 2, Table 4). One fifth is funded through Vote Education and administered by the Tertiary Education Commission (TEC). This money is known as general university funds (GUF) and is used for education and research. Public service departments control almost one-fifth of government research activity funds, while other government agencies and local government control the remaining 10% in equal share.

**Chart 2 Distribution of funding by sector**



**Table 4 All of government estimated funding of research activity by sector**

SECTOR	%	\$ (MILLION)
Central government – public service departments (excludes Vote RS&T)	17	203
Central government – other (excludes Vote Education GUF)	5	57
Local government	5	59
Vote RS&T	51	601
Vote Education (GUF) funding	22	291
<b>TOTAL</b>	<b>100</b>	<b>1,211</b>

## BUDGET ALLOCATION BY TYPE OF RESEARCH ACTIVITY

### Research and development

Most R&D funding was allocated from Vote RS&T (\$601 million) by MoRST and its funding and investment agencies, or allocated by the TEC from Vote Education (\$291 million). TEC distributes funds to tertiary education institutions that in turn allocate these general university funds (GUF) to education and research. Planned government funding of R&D other than through Votes RS&T and Education (GUF) was \$54 million (see Table 5).

**Table 5 Estimated funding of R&D by sector**

SECTOR	%	\$ (MILLION)
Central government – public service departments (excludes Vote RS&T)	2	19
Central government – other (excludes Vote Education GUF)	3	29
Local government	1	6
Vote RS&T R&D	66	601
Vote Education (GUF)	28	291
TOTAL	100	946

### Policy advice

Most policy advice was carried out by public service departments (see Table 6). This is consistent with their major role, which is to provide policy advice to Ministers.

**Table 6 Estimated funding of policy-related studies by sector**

SECTOR	%	\$ (MILLION)
Central government – public service departments	71	77
Central government – other	11	11
Local government	18	19
TOTAL	100	107

### Research-related activity

Public service departments funded the majority of ‘other research-related activity’ (see Table 7). Some of these departments have substantial monitoring roles (e.g. Statistics New Zealand, and the New Zealand Food Safety Authority). The top 5% of government agencies that fund other research-related activity included three regional councils.

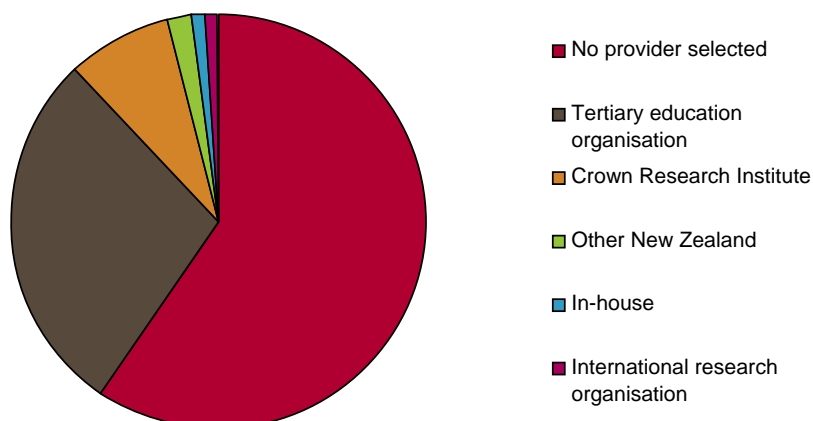
**Table 7 Estimated funding of other research-related activities by sector**

SECTOR	%	\$ (MILLION)
Central Government – public service departments	68	107
Central Government – other	11	17
Local Government	21	34
TOTAL	100	158

## PROVIDERS OF RESEARCH AND DEVELOPMENT FOR ALL OF GOVERNMENT

Most funding for R&D was not allocated to a particular provider at the time that budgets were set. The size of the allocation to tertiary education institutions largely reflects the government appropriation administered by TEC (see Chart 2 and Table 8).

**Chart 2 Distribution of research funding by provider**



**Table 8 Provider of research and development for all of government**

PROVIDER OF RESEARCH AND DEVELOPMENT	%	\$ (MILLION)
Public sector agency in-house	<1	7
Crown research institute	7	70
Tertiary education organisation	32	299
Other New Zealand-based research organisations (private or publicly listed enterprises; state-owned enterprises; producer boards; research associations, local community-owned trusts, not in-house local or central government)	2	14
International research organisation	<1	1
No provider selected at this time	59	555
<b>TOTAL</b>	<b>100</b>	<b>946</b>

## PROVIDERS OF RESEARCH AND DEVELOPMENT BY SECTOR

There were different patterns between sectors with respect to which types of organisations were being funded to provide R&D services (see Table 9 and Charts 3a, 3b and 3c).

**Table 9 Providers of research and development by sector**

PROVIDERS OF RESEARCH AND DEVELOPMENT	CENTRAL PUBLIC SERVICE	CENTRAL OTHER	LOCAL GOVERNMENT
	%	%	%
Public sector agency in-house	< 1	1	6
Crown research institute	10	3	67
Tertiary education institution	1	92	12
Other New Zealand-based research organisations (private or publicly listed enterprises; state-owned enterprises; producer boards; research associations, local community-owned trusts, not in-house local or central government)	1	3	15
International research organisation	< 1	0	0
No provider selected at this time	88	1	0
<b>TOTAL</b>	<b>100</b>	<b>100</b>	<b>100</b>

Chart 3a shows that most public-service funded R&D was not allocated to a type of provider. This is because most of this funding is contestable by all research providers.

**Chart 3a Providers of public service R&D**

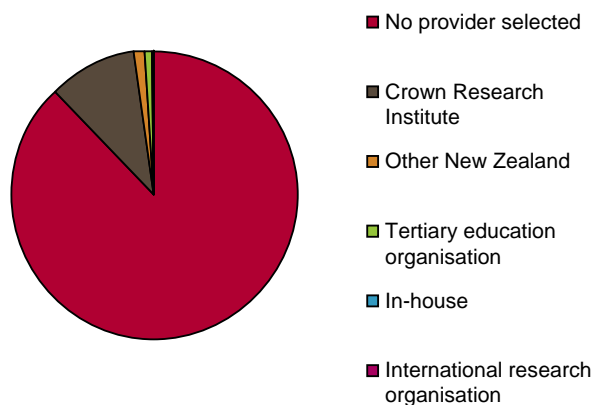


Chart 3b shows that the majority of other central government funding was allocated to tertiary education organisations. This is because most of this funding is administered by the TEC and goes to the tertiary sector.

**Chart 3b Providers of other central government R&D**

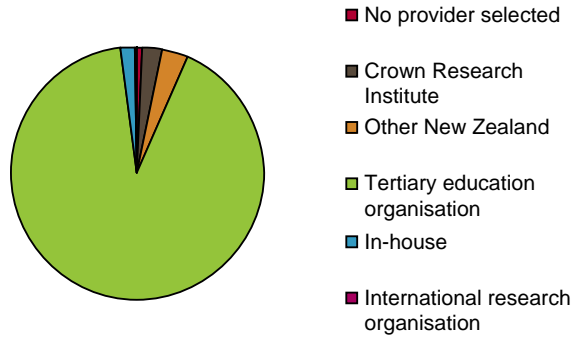
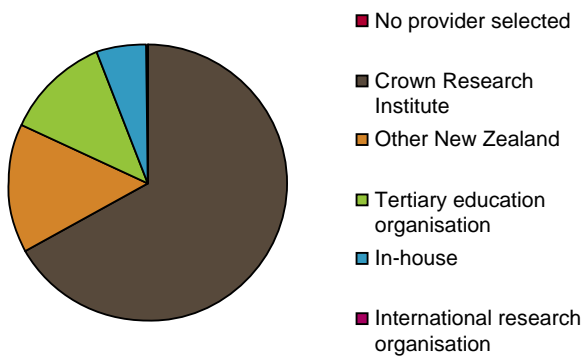


Chart 3c, shows that local government had identified its providers of R&D. While these were mainly CRIs, 'other' New Zealand-based research organisations were also important providers of research to local government.

**Chart 3c Providers of local government R&D**



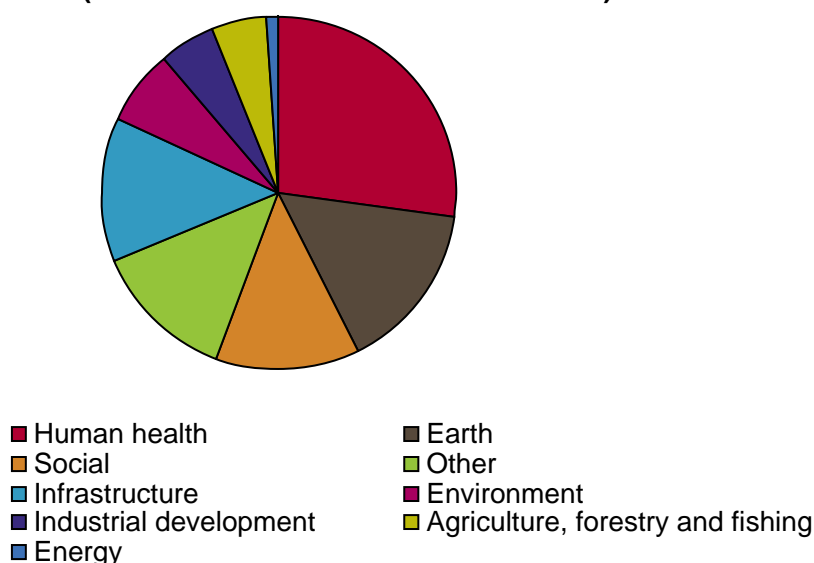
## BROAD PURPOSE OF RESEARCH AND DEVELOPMENT FOR GOVERNMENT EXCLUDING VOTES RS&T AND VOTE EDUCATION (GUF)

The broad purpose of research is also known as the socio-economic objective (SEO), and is distinct from the immediate objectives, or the researcher's field of research. The classification used in this study is based on the OECD classification.

Human health was the most highly funded socio-economic category for R&D. This category includes funding by health, sports and food safety agencies.

The socio-economic purpose of 13% of funded R&D was not easily assigned to categories used in the survey.

**Chart 4 Purpose of R&D across government agencies (excludes Votes RS&T and Education)**



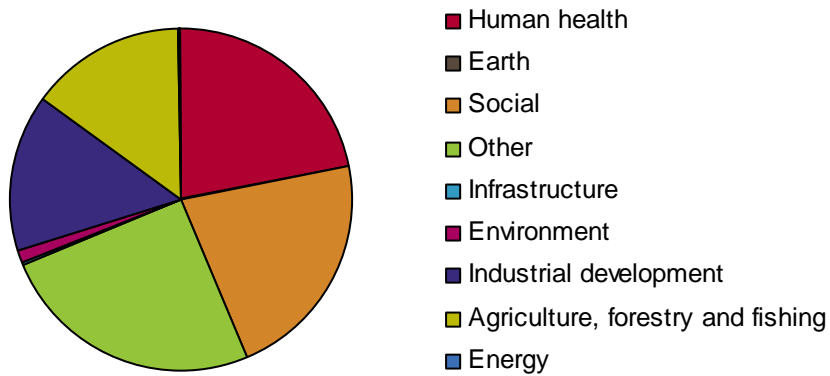
**Table 10 Purpose of research and development for local and central government (excludes Vote RS&T and Vote Education (GUF))**

PURPOSE OF RESEARCH AND DEVELOPMENT	%	\$ (MILLION)
Agriculture, forestry and fishing and related technology	5	3
Industrial development	5	3
Human health – protection and improvement of	28	15
Environment – control and care of the	7	4
Infrastructure – development and general planning of land use – construction of buildings, planning issues, but not pollution	13	7
Social structures and relationships (includes education)	13	7
Energy – production, distribution and rational use	1	< 1
Earth's crust and mantle, seas, oceans and atmosphere	15	8
Defence R&D for military purposes	0	0
Other civil research – includes large amounts of biosecurity and cultural R&D	13	7
TOTAL	100	54

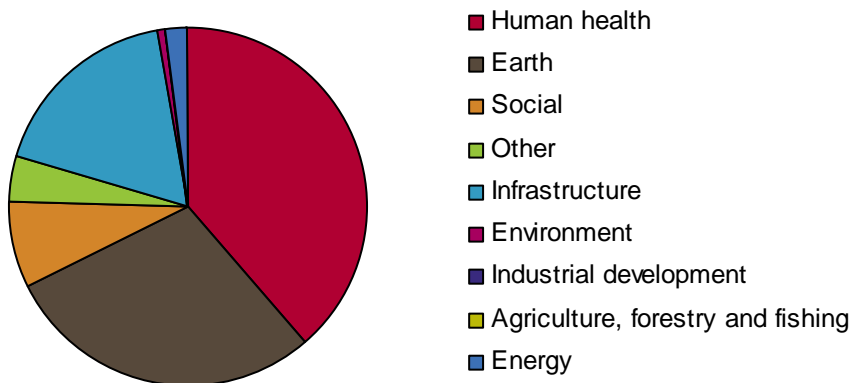
**BROAD PURPOSE OF RESEARCH AND DEVELOPMENT BY SECTOR  
EXCLUDING VOTES RS&T AND VOTE EDUCATION (GUF)**

The patterns of purpose of R&D differ strongly across the three sectors of Government (see Charts 5a, 5b and 5c, which exclude Votes RS&T and Education, and Table 11).

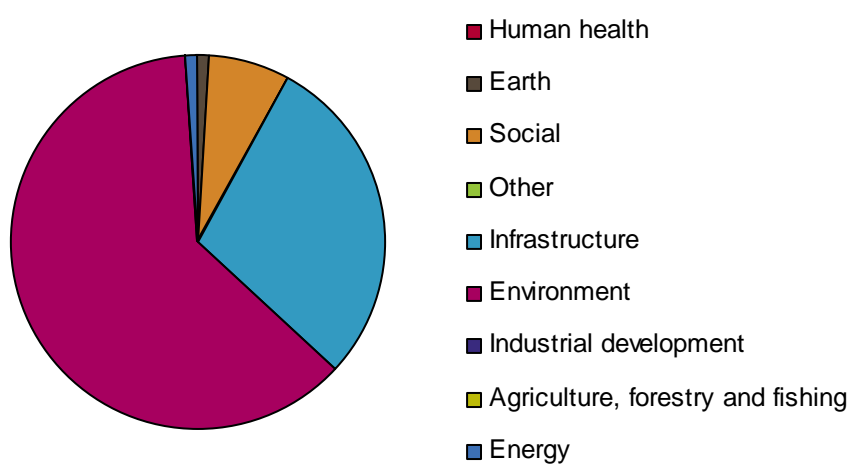
**Chart 5a Purpose of public service R&D**



**Chart 5b Purpose of other central R&D**



**Chart 5c Purpose of local government R&D**



**Table 11 Purpose of research and development by sector  
(excludes Vote RS&T and Vote Education (GUF))**

PURPOSE OF RESEARCH AND DEVELOPMENT	CENTRAL PUBLIC SERVICE	CENTRAL OTHER	LOCAL GOVERN- MENT
	%	%	%
Agriculture, forestry, fishing and foodstuffs	15	0	< 1
Industrial development	15	0	0
Human health – protection and improvement of	22	39	< 1
Environment – control and care of the	1	< 1	62
Infrastructure – development and general planning of land use – construction of buildings, planning issues, but not pollution	< 1	18	29
Social structures and relationships (includes education)	22	8	7
Energy – production, distribution and rational use	< 1	2	1
Earth's crust and mantle, seas, oceans and atmosphere	0	29	1
Defence R&D for military purposes	0	0	0
Other civil research – includes large amounts of biosecurity and cultural R&D	25	4	0
TOTAL	100	100	100

New Zealand is adopting a revised Australia New Zealand system for classification of research. This system has a stronger emphasis on biosecurity and New Zealand cultural R&D, and should help in identifying socio-economic categories in future surveys.

#### **BUDGET ALLOCATION TO R&D AS A PERCENTAGE OF GDP**

The estimated total government funding of R&D, as a percentage of GDP was 0.58%. This is an increase of 0.03 percentage points on the 2006/07 figure of 0.55%. The estimate is based on \$946 million planned R&D from this survey, and the GDP figure for New Zealand of \$163.387 billion for the year to March 2007.<sup>10</sup> This is the same calculation used in the 2006/07 survey and it includes funding of R&D by local authorities. The contribution of local authority funded R&D for 2007/08 was 0.004%.

<sup>10</sup> Further information on this figure is at <http://www.stats.govt.nz/store/2007/06/gross-domestic-product-mar07qtr-hotp.htm?page=para021Master>



## Local government summary

This section presents a breakdown of local government's planned expenditure on research activity for 2007/08. In this report, research activity includes "research and development (R&D)", "policy-related studies" and "other research-related activity". These terms have specific meanings and are defined in Annex 1. New Zealand local government is made up of 85 local authorities, and 50 of these responded <sup>11</sup>

Eighteen of the 50 local authorities planned to spend about \$60 million on research activity, an \$8 million increase on 2006.

Planned funding of R&D was \$6 million by five local authorities. Another five local authorities indicated that they funded R&D but did not provide a dollar value. Planned local government-funded R&D was 0.12% of local authority income.

Policy-related studies planned funding was \$19 million by 16 local authorities. Another eight local authorities indicated that they funded policy-related studies, but did not provide a dollar value.

Other research-related activity funding was \$34 million by 17 local authorities. Another six local authorities indicated that they funded these activities. Other research-related activities include general purpose data collection, routine software development, scientific and technical information services, testing and standardisation and feasibility studies.

Most research and development (67%) would be carried out by Crown research institutes, 12% by tertiary education institutions, 15% by other New Zealand-based research organisations, and 6% was planned for in-house research.

The major socio-economic purpose of R&D was control and care of the environment (62%). Infrastructure in areas of commerce and trade, urban and rural planning, and transport was also important (29%). Seven percent of planned R&D was for social structures and relationship purposes; 1% for energy, earth and atmosphere studies; and less than 1% for animal production and human health.

The dollar figures are best estimates only. For each of the three research activity categories, there were local authorities who reported that they were funding work, but were unable to make dollar estimates. The reported constraints were a combination of time and cost accounting structures that did not allow easy separation of research activity from other work.

Some local authorities reported that they gained science knowledge about care and control of the environment through Envirolink.<sup>12</sup>

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<sup>11</sup> See Annex 1 for definitions of research terms and Annex 2 for make up of local government.

<sup>12</sup> <http://sites.yellow.co.nz/site/envirolink/> or [www.envirolink.org.nz](http://www.envirolink.org.nz)

## RATE OF SURVEY RETURN

The return rate for the survey was almost 60%, a 13% increase on the previous year.

**Table 13 Rate of survey return by class of local authority**

CLASS	RETURNS*	NUMBER IN CLASS	% RETURN RATE
Regional council and unitary authority	9	13	69
District council	29	56	52
City council	12	16	75
TOTAL	50	85	59

\* Returns include phone messages confirming that the agency did no R&D.

## FUNDING OF RESEARCH ACTIVITIES BY LOCAL GOVERNMENT

This study of public financing of research found that 18 of the 50 responding local authorities planned to spend about \$59 million on research activity (see Table 15). Changes from the previous year largely reflect better use of survey definitions.

Other research-related activity such as routine sampling and monitoring made up more than half of local government research activity. Across all government agencies, three regional councils were in the top 5% of funders of other research-related activity.

Local government income for year ended 30 June 2006 was \$5.4 billion, and included \$686 million of central government assistance.<sup>13</sup> Thus research-related activities were about 1.1% of total local authority income, and the R&D component was about 0.12%.

**Table 15 Estimated funding of research activity by local authority sector**

TYPE OF RESEARCH ACTIVITY	%	\$(MILLION)
Research and experimental development	11	6
Policy-related studies	32	19
Other research-related activities	57	34
TOTAL	100	59

<sup>13</sup> Local authority financial information: [http://www.localcouncils.govt.nz/lqip.nsf/wpg\\_url/About-Local-Government-Local-Government-Statistical-Overview-Index#LocalGovernmentFinance](http://www.localcouncils.govt.nz/lqip.nsf/wpg_url/About-Local-Government-Local-Government-Statistical-Overview-Index#LocalGovernmentFinance)

## RATE OF R&D IN LOCAL GOVERNMENT

The number of local authorities reporting that they funded R&D was 10; this is a similar proportion to that reported in 2006. R&D as defined for this survey has a specific internationally recognised definition as defined in Annex 1. While 10 of the 50 responding local authorities planned to fund R&D (20%), the overall percentage may be as low as 11, as 35 local authorities did not respond to the survey.

Some of the changes in local authority reporting of R&D activities between 2006 and 2007 are a consequence of a better understanding of the definition used, rather than a change in the type of activity carried out by the local authority.

Some local authorities reported use of the MoRST-funded Envirolink scheme. This scheme allows the authority to access research without meeting the full cost of funding it. This survey does not distinguish between funding and uptake of R&D.

**Table 14 Rate of R&D reported by class of local authority**

CLASS	NUMBER REPORTING R&D*	NUMBER OF RETURNS	% REPORTING R&D
Regional council and unitary authority	3	9	33
District council	4	29	14
City council	3	12	25
TOTAL	10	50	20

\* Five agencies of these reported that they carried out R&D, but did not provide dollar values for R&D.

## BREAKDOWN OF FUNDING OF RESEARCH ACTIVITIES BY TYPE OF LOCAL GOVERNMENT

Regional and unitary councils, as a group, planned to spend more on each type of research activity than either the district council or the city council group (see Table 16).

More than half of research activity to be funded by local government was routine sampling and monitoring. This emphasis was most marked in regional and unitary authorities, and is consistent with their role undertaking statutory environment management responsibilities under the Resource Management Act.

**Table 16 Estimated funding of research activity by local authority sector**

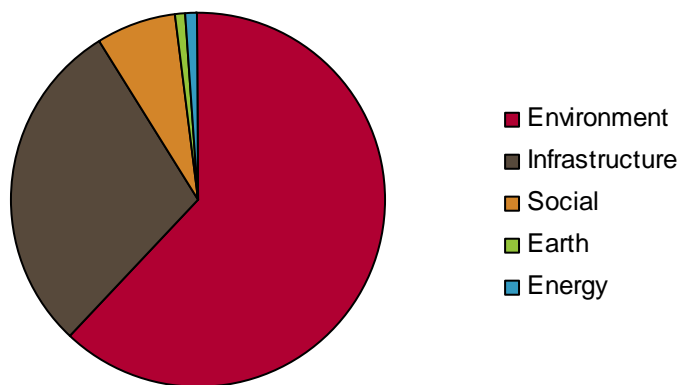
SECTOR	CITY COUNCIL \$(MILLION)	REGION & UNITARY \$(MILLION)	DISTRICT COUNCIL ¶ \$(MILLION)
Research and experimental development	< 1	6	<1
Policy-related studies	3	14	2
Other research-related activities	4	27	3
TOTAL	7	47	5

## PURPOSE OF RESEARCH AND DEVELOPMENT IN THE LOCAL AUTHORITY SECTOR

The number of local authorities reporting that they intended to fund R&D was 10; however, the number reporting dollar values for intended R&D was five.

The R&D that local authorities planned to fund was strongly weighted toward control and care of the environment (62%). This, together with development of infrastructure (29%), made up the bulk of budgets, and these two categories were the most commonly reported by the five local authorities (see Chart 6 and Table 17).

**Chart 6 Purpose of local government R&D**



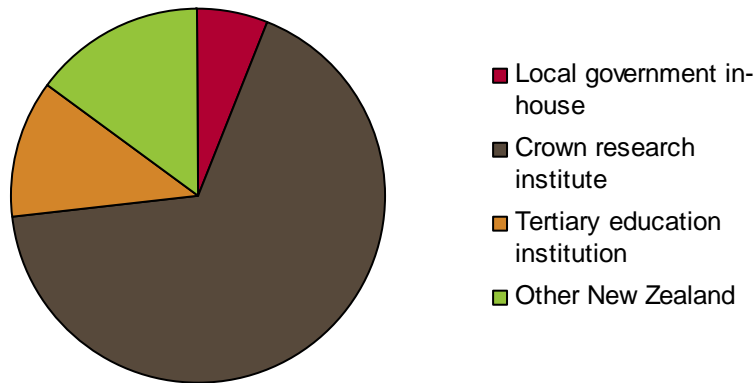
**Table 17 Purpose of research and development for local government**

PURPOSE OF RESEARCH AND DEVELOPMENT	%
Agriculture, forestry, fishing and related technology	<1
Industrial development	0
Human health – protection and improvement of	<1
Environment – control and care of	62
Infrastructure – development and general planning of land use – commercial and trade services (4%), urban and rural planning (8%) and transport (17%)	29
Social structures and relationships (includes education)	7
Energy – production, distribution and rational use	1
Earth’s crust and mantle, seas, oceans and atmosphere	1
Defence R&D for military purposes	0
Other civil research	0
TOTAL	100

## PROVIDERS OF RESEARCH AND DEVELOPMENT IN THE LOCAL AUTHORITY SECTOR

Each of the five local government agencies had identified the type of provider that would be carrying out its R&D in the coming year. Crown Research Institutes are important research providers to local authorities, as are independent research organisations (see Chart 7 and Table 18).

**Chart 7 Providers of local government R&D**



**Table 18 Providers of research and development for local government**

PROVIDERS OF RESEARCH AND DEVELOPMENT	%
Local government in-house	6
Crown research institute	67
Tertiary education institution	12
Other New Zealand-based research organisation (private or publicly listed enterprises; state-owned enterprises; producer boards; research associations, local community-owned trusts)	15
TOTAL	100

## **Conclusion**

This survey has been successful in making broad measures of planned financing of research activity by the public sector for 2007/08, and its findings are consistent with those reported in 2006.

The results reflect improvement in completion rates for the survey and in application of the definitions used in the survey. Some agencies have difficulty identifying planned expenditure. This is an ongoing area for improvement for this survey.

The changes in total funding of research activity by agencies, excluding Votes RS&T and Education (GUF), were more a product of better definition use than of any trend across government. This is an important consideration if year-to-year or if international comparisons are to be made.

The separate section on local government funding of research may assist local authorities in identifying their research activities and needs.

## **Annex 1 Glossary of research activity terms used in this report**

### **Research and Development (R&D)**

“Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of [people], culture and society, and the use of this stock of knowledge to devise new applications.” OECD Frascati Manual (2002). It involves original investigation to gain knowledge that is new to the world. The new knowledge may (or may not) have a specific practical application.

### **Policy-related studies**

Local or national government or business enterprise policy work. It includes analysis and assessment of existing programmes, policies and operations (evaluation services); defence and security analysis; and legislative commissions of inquiry concerned with general government, departmental policy or operations.

### **Other research related activities**

These activities include general purpose data collection, routine software development, scientific and technical information services, testing and standardising, and feasibility studies as described below.

#### **General purpose data collection**

Routine sampling or monitoring, including regular market or stakeholder surveys. Examples include routine water level or air quality monitoring relevant to the Resource Management Act 1991 or the Local Government Act 2002.

#### **Routine software development**

Work on system-specific or programme-specific advances on publicly available software; and solving technical problems that have been previously.

#### **Scientific and technical info services**

For example, advisory services, production of conference proceedings, bibliographic services, and patent services.

#### **Testing and standardisation**

Maintenance of national standards, calibration of secondary standards and routine testing and analysis of materials, components, products, processes, soils, atmosphere, etc.

#### **Feasibility studies**

Studies for proposed engineering projects, including socio-economic impact assessments. However, feasibility studies on research projects are part of R&D.

### **Vote**

A group of one or more appropriations made in the Government's budget, e.g. Vote Research, Science and Technology.

## **Annex 2 Glossary of public sector agencies**

### **PUBLIC SECTOR AGENCY**

'Public sector' is a broad term that refers collectively to the state sector and local government. 'Agency' is a synonym for 'organisation' – a blanket term that includes departments, Crown entities, Offices of Parliament, or any other type of organisation.<sup>14</sup>

### **PUBLIC SERVICE DEPARTMENT**

A public service department is a department or ministry that exists mainly to provide policy advice to ministers. Others also have administrative roles.<sup>15</sup>

### **NON-PUBLIC SERVICE DEPARTMENT**

A small number of agencies that are departments for the purposes of the government reporting entity under the Public Finance Act, but which are not listed in the First Schedule to the State Sector Act and therefore are not part of the Public Service.<sup>16</sup>

### **CROWN ENTITIES**

A generic term for a diverse range of entities within the Crown Entities Act 2004, namely: statutory entities, Crown entity companies, Crown entity subsidiaries, school boards of trustees, and tertiary education institutions. Crown entities are legally separate from the Crown and operate at arm's length from the responsible or shareholding Minister(s); they are included in the annual financial statements of the Government.

### **CROWN AGENTS**

A Crown entity that must give effect to government policy when directed by the responsible Minister – a statutory entity.

### **DISTRICT HEALTH BOARD**

A district health board is a Crown entity that runs hospitals.

### **AUTONOMOUS CROWN ENTITY**

A Crown entity that must have regard to government policy when directed by the responsible Minister. A statutory entity.

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<sup>14</sup> <http://www.ssc.govt.nz/glossary/>

<sup>15</sup> <http://www.teara.govt.nz/NewZealandInBrief/GovernmentAndNation/6/en>

<sup>16</sup> <http://www.ssc.govt.nz/glossary/>



## **INDEPENDENT CROWN ENTITY**

A Crown entity that is generally independent of government policy. One of the three types of statutory entities.

## **LOCAL GOVERNMENT**

Local government is made up of 85 local authorities. They comprise 12 regional councils and 73 territorial authorities (16 city and 57 district councils). Four territorial authorities also have powers of a regional council. These are often called 'unitary' authorities. Chatham Islands Council is also a unitary authority.<sup>17</sup> Each local authority is autonomous and is accountable to the community it serves. As distinct from 'central government'.

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<sup>17</sup> [http://www.localcouncils.govt.nz/lqip.nsf/Files/PDF/\\$file/InfoSheet01.pdf](http://www.localcouncils.govt.nz/lqip.nsf/Files/PDF/$file/InfoSheet01.pdf)

### Annex 3 International methodology notes

The OECD has an established methodology that many countries follow to gather and report their government budget appropriations or outlays for R&D. The methodology is set out in the Frascati Manual.<sup>18</sup> While a common methodology is useful to assist in collection and analysis of data, individual country constraints on the collection of data mean that valid international comparisons of GBAORD (government budget appropriations or outlays for research and development) data require significant contextual information.

The 2002 Frascati Manual was followed for this study. The following are notes from the manual to assist readers to understand the methodology used in this survey.

Government support for R&D was measured using data from budgets. This essentially involved identifying all the budget items involving R&D and measuring or estimating their R&D content in terms of funding. The analysis of Vote data was from the first government budget agreed by Parliament. These estimates are less accurate than performance-based data, but are available earlier.

The basic definition used by OECD, i.e. “research and experimental development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications”, has been modified to better fit New Zealand use of English, but is the same in essence.

For survey purposes, respondents must distinguish R&D from a wide range of related scientific and technological activities. These other activities are very closely linked to R&D both through flows of information and in terms of operations, institutions and personnel. As far as possible, they have been excluded from measures of R&D, but some have been quantified as policy research or other research-related activities.

Basic research, applied research and experimental development are all included but are not identified separately. The analysis covers natural sciences and engineering (NSE) and social sciences and humanities (SSH), and makes no distinction between the two.

‘Government’ covers central and local government. Public enterprises are excluded, as they are treated as part of the business enterprise sector. For the purposes of GBAORD calculations, however, OECD recommends that central government should always be included, and that local government funds, i.e. those raised by local taxes, should be excluded.<sup>19</sup>

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<sup>18</sup> OECD (2002) Frascati Manual – Proposed standard practice for surveys on research and experimental development. OECD. Paris: France ISBN 92-64-19903-9

<sup>19</sup> In this study, while central and local government figures have been combined (as for 2006/07), the contribution of local government has also been identified separately.

GBAORD covers not only government–financed R&D performed in government establishments but also government–financed R&D in the other three national sectors (business enterprise, private non–profit, higher education), as well as internationally. All GBAORD data was based on the funder’s rather than the performer’s information.

GBAORD clearly includes all outlays to be met from taxation or other government revenue within the budget, including public general university funds (GUF). It also includes both current costs and capital expenditure.

Multi–annual projects budgeted in only one year or over several were allocated to the GBAORD of the year(s) in which they were budgeted, not in the years of performance. Multi–annual programmes that were authorised at some stage but budgeted over several years were to be allocated to the years in which they were budgeted, not the year of authorisation.

OECD notes that only contributions to international R&D programmes or organisations solely or mainly concerned with R&D should be included, and that contributions of a general nature, like those to the UN, the OECD, the EU, etc., should be excluded. However, contributions to certain international research institutions should be included. For New Zealand this includes the Australian Synchrotron.

Appropriations for which corresponding revenue is expected either from other government sources or other sectors was excluded from GBAORD according to the net principle.

The allocation of R&D appropriations or outlays to socio–economic objectives was at the level that most accurately reflects the funder’s purpose(s). Following OECD recommendations, where a funder had problems identifying the primary purpose of the R&D or where there seemed to be differences between the ‘purpose’ and the ‘content’ of a programme, work that was derived from an existing study was classified with it, and work that was an indirect spin–off was classified according to the objective of the new project.

## Annex 4 Vote RS&T

Vote RS&T includes several sets of appropriations. Those that were included in this study as R&D funds are shown in the table below. CDRP (Cross Departmental Research Pool) funds are accounted for by the government department receiving them and so are not included in this table.

R&D FUNDING 2007/08	\$ 000
Research for Industry	200,660
Environmental Research	93,449
New Economy Research Fund	65,803
Health Research	58,995
Technology New Zealand	47,223
CRI Capability Fund	50,612
Marsden Fund	35,878
Supporting Promising Individuals	18,658
International Investments Opportunities Fund	9,600
Social Research	5,860
Pre-Seed Accelerator Fund*	8,267
Maori Knowledge and Development Research	4,867
Global Expert, formally Global Technology Partnership and Technology Partnerships NZ	564
NZ Government contribution to the Australian Synchrotron**	609
<b>TOTAL</b>	<b>601,045</b>

\* In the 2006 report on public sector financing of research, the Pre-Seed Accelerator Fund was not included as Vote RS&T R&D funding. The fund has been recategorised as R&D for the 2007 as it is normally used to fund R&D rather than other research activity.

\*\* Frascati Manual notes that only contributions to international R&D programmes or organisations solely or mainly concerned with R&D should be included. For New Zealand, the Australian Synchrotron is equivalent to ESRF (European Synchrotron Radiation Facility) and so is included in this survey.

## Annex 5 University funding breakdown

To finance their R&D activities, universities draw on three major types of funds. The type of fund and the treatment given in this survey are:

- R&D contracts and earmarked grants received from government sources – government grants are recorded at their agency source;
- Own income from endowments, shareholdings and property; and surplus from sale of non-R&D services such as fees from individual students, subscriptions to journals and sale of serum or agricultural produce – excluded from survey; and
- The general grant they receive from the Ministry of Education in support of their overall research/teaching activities – as described below.

The New Zealand Government funds R&D in universities through several funds within Vote Education. Funds applied to R&D for 2007/08 (revised October baseline update) are described in the table below.

R&D FUNDING 2007/08	\$ 000
Performance-Based Research Fund (introduced 2004 – 07)*	215,920
Centre of Research Excellence (introduced 2002/03)	32,841
Partnerships for Excellence	19,400
Centre for Research Excellence – capital funding	20,000
Starpath Project	3,316
TOTAL	291,477

By convention, all research financed from general university funds is allocated to the purpose ‘general knowledge, i.e. research financed from general university funds’ when reporting on public sector financing of R&D. This convention has been adopted internationally because of the problem of obtaining suitable data.

\* The PBRF provides funding to tertiary education institutions (TEI) on the basis of their research quality. Between 2004 and 2007 the PBRF progressively replaced the EFTS (equivalent full-time student) ‘top up’ funding for research. TEIs individually control how much of their funding is allocated to research.

## **Annex 6 Survey form**

### **PUBLIC SECTOR FINANCING OF RESEARCH 2007/08 SURVEY**

#### **PURPOSE OF THIS SURVEY**

The purpose of this survey is to gather information about the level and nature of research financed by the public sector. The information will inform:

- Interested parties about how the public sector funds research; and
- Ministry of Research, Science and Technology policy development.

#### **CONFIDENTIALITY**

All responses will be treated in confidence, subject to the Official Information Act 1982. MoRST will use only aggregate data by sector in the public report.

#### **HOW TO ANSWER**

- Save this file to your computer system, then print it for your records.
- Either complete a paper copy of the survey and post it to MoRST, or open the saved survey file, complete the survey on your computer, save it and then email the saved file to [statistics@morst.govt.nz](mailto:statistics@morst.govt.nz).
- Please use data for the financial year **1 July 2007 to 30 June 2008**.
- Supply GST EXCLUSIVE dollar values only.
- Enter zero when the answer to the question is zero.
- Leave answer boxes blank where there is no response.
- For yes/no responses, write yes or no; or if unsure, add a comment.

**YOUR CONTACT DETAILS: PLEASE ALTER IF INCORRECT**

## QUESTION 1

Does your organisation routinely or occasionally carry out any of the following?

Type of activity*	Explanation	Yes/No
Research and experimental development (R&D)	“Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of [people], culture and society, and the use of this stock of knowledge to devise new applications.” OECD Frascati Manual (2002). It involves original investigation to gain <b>knowledge that is new to the world</b> . The new knowledge may (or may not) have a specific practical application.	
Policy-related studies	Local or national government or business enterprise policy work. It includes analysis and assessment of existing programmes, policies and operations (evaluation services); defence and security analysis; and legislative commissions of inquiry concerned with general government, departmental policy or operations.	
General purpose data collection	Routine sampling or monitoring, including regular market or stakeholder surveys. Examples include routine water level or air quality monitoring relevant to Resource Management Act 1991 or the Local Government Act 2002.	
Routine software development	Work on system-specific or programme-specific advances on publicly available software; and solving technical problems that have been overcome before.	
Scientific and technical information services	For example, advisory services, production of conference proceedings, bibliographic services, and patent services.	
Testing and standardisation	Maintenance of national standards, calibration of secondary standards and routine testing and analysis of materials, components, products, processes, soils, atmosphere, etc.	
Feasibility studies	Feasibility studies for proposed engineering projects, including socio-economic impact assessments. However, feasibility studies on research projects are part of R&D.	

\* This survey does not collect information on education and training in the sciences, specialised health care, industrial activities that are not R&D, patent and licence work, or administration.

## QUESTION 2

In the 2007/08 financial year, what funds have been or are likely to be allocated to the following?

Type of activity*	Budget \$ GST exclusive	Comments
Research and experimental development		
Policy-related studies		
General purpose data collection, routine software development, scientific and technical information services, testing and standardisation or feasibility studies		

\* Explanations of these three categories are provided in the previous question.

## QUESTION 3

Looking only at **research and experimental development projects** planned for the 2007/08 financial year, who is likely to carry out this work?

Provider of research and experimental development	Proportion of funded R&D as %
Your organisation (in-house)	
Crown research institute	
Tertiary education institution (university and polytechnic)	
Other New Zealand based research organisation (private or publicly listed enterprises, state-owned enterprises, producer boards, research associations)	
Local government sector (not in-house)	
New Zealand central government sector (not in-house)	
International research organisation	
No provider selected at this time	
Other – please specify	
<b>TOTAL should be 100%</b>	



#### QUESTION 4

Looking only at **research and experimental development projects** planned for the 2007/08 financial year, what is the end purpose of this work?

Checking the initial objectives of an R&D project can help identify its purpose.

Please enter percentage of total R&D budget allocated to each purpose.

Enter 0 where no work for this purpose is likely to be funded.

<b>Environment – control and care</b> Impacts on physical environment, and covering pollution in or due to air, water, soil and substrata, noise, solid waste disposal and radiation	<input type="text"/> %
<b>Development of infrastructure</b> <b>Commercial and trade services</b> Includes retail and wholesale trade, finance, insurance, utilities, recreational, tourist and other commercial services	<input type="text"/> %
<b>Urban and rural planning</b> Total planning of urban and rural areas, better housing, and improvements to the community environment	<input type="text"/> %
<b>Transport</b> Transport design, operation and maintenance of infrastructure including economics, safety, new systems and environmental side effects	<input type="text"/> %
<b>Information, communication, and technology software</b> Information and communications services, including computer software information processing, library and related services, broadcasting	<input type="text"/> %
<b>Energy – production, distribution and rational use</b> Supply, production, conservation and distribution of all forms of energy (except propulsion)	<input type="text"/> %
<b>Human health – protection and improvement</b> Includes food hygiene, biochemical engineering, epidemiology, prevention of industrial diseases and drug addiction	<input type="text"/> %
<b>Social structures and relationships</b> Includes education, cultural activities, improvement of working conditions, management of business and institutions, social security systems, political structure of society, social change, social processes and social conflicts	<input type="text"/> %
<b>Earth and atmosphere</b> Exploration and exploitation of the earth’s crust and mantle, seas, oceans and atmosphere but excluding pollution, soils for agriculture, or fishing	<input type="text"/> %

<b>Industrial production and technology</b>	
<b>Meat and fish processing</b>	
Processing, storage techniques, packaging and products	%
<b>Dairy processing</b>	
Processing, storage techniques, packaging and products	%
<b>Fruit, crop and beverage processing</b>	
Fruit, crops and non-animal food and beverage processing; storage techniques, packaging and products	%
<b>Fibre and skin</b>	
Processing and products from natural and artificial fibres, textiles, carpets, furnishing, clothes, footwear	%
<b>Wood and paper products</b>	
Wood and paper processes and products	%
<b>Materials, construction, electronics and engineering</b>	
Minerals, materials and industrial processing; construction systems; designs and products; electronic and instrument hardware; and engineering processes and systems	%
<b>Agriculture, forestry, fishing and foodstuffs</b>	
<b>Animal production</b>	
Animal production systems and products including disease and pest protection, animal genetics	%
<b>Dairy production</b>	
Dairy animals, and dairy production	%
<b>Horticultural, arable production</b>	
Horticultural crops and management practices, arable crops and other plants to improve yield, persistence	%
<b>Forestry</b>	
Forestry management systems for tree improvement, propagation, establishment, silviculture	%
<b>Fishing</b>	
Fish harvesting, assessment, management and aquaculture (marine and freshwater)	%
<b>Defence</b>	
Primarily for defence matters regardless of content or whether they have a secondary civil application, but excluding civil R&D financed by defence establishments	%
<b>Other</b>	
Please specify, e.g. general knowledge	%
<b>Total</b>	<b>100%</b>

Thank you very much for completing this survey.

MoRST is committed to keeping our surveys short. How long did you take to do this survey?	
MoRST is committed to making our survey reports more useful. What aggregated data from this survey would be most useful to your organisation?	
Please add any comments about this survey or accompanying information.	

For help or information please contact:  
Ministry of Research, Science and Technology,  
PO Box 5336,  
Wellington 6145.  
[statistics@morst.govt.nz](mailto:statistics@morst.govt.nz)  
Phone (04) 917 3053 or (04) 917 2900

## **Annex 7 Explanations for city, regional and district councils**

### **Your areas of research**

Councils operate in a changing environment – it is not always business as usual. Research activities help keep councils on top and to move ahead. Often this work is related to resource management, health and safety, strategic planning and, more recently, sustainability.

### **Your budget for research**

Sometimes councils get grants such as Envirolink<sup>20</sup> to help fund research, but most is funded from rates. A council can easily identify the budget for a research project where the work is outsourced. This task is harder when research is done in-house. Staff members who work in service provision or resource management are likely to carry out some scientific monitoring and may also run research projects. Evaluation of council schemes and policy-related studies are also included in the broader spectrum of research.

### **Why is it worthwhile to know your budget for research?**

Science and technology are fundamental to transforming our economy and improving our well-being. Knowing about forecast expenditure on research helps councils demonstrate how they are using research to assist in the promotion of the social, economic, environmental and cultural well-being of their communities.

### **Why does MoRST want to know your budget for research?**

Statistics about research are essential background tools for advisers who work on science, environmental, general economic and social policy.

### **What does MoRST know already about local body research?**

- Many local bodies underestimate the extent of research they carry out;
- For 2006/07, 95% of budgeted R&D was for environment care and control; and
- The private sector is an important contributor to R&D in local government.

### **What will MoRST do with your data?**

All data received will be treated in confidence, subject to the Official Information Act 1992. MoRST will present only aggregate data by sector in the public report.

### **How does local council 'expenditure by activity' map to MoRST's request for R&D data by socio-economic purpose?**

Local councils report expenditure by activity categories that are based on Statistics New Zealand's New Zealand Standard Industrial Classification. Councils use these

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<sup>20</sup> <http://www.envirolink.govt.nz/>

activity categories for all work related to the activity. Some of this work will be research and experimental development (R&D).

The table below shows how local council activity categories are likely to map to OECD socio-economic purposes used by MoRST in national surveys of R&D. This table can be used as a guide when completing the survey of public sector financing of research 2007/08.

<b>Council activity category</b>	<b>Socio-economic purpose</b>
Culture, recreation and sport	Social structures and relationships or development of infrastructure - information, communication and technology software
Environment protection	Environment - control and care
Emergency management	Development of infrastructure - urban and rural planning
Governance	Social structures and relationships
Property, forestry, agriculture and other	Agriculture, forestry, fishing and foodstuffs - forestry, or animal production or dairy production
Regulation and planning	Development of infrastructure - urban and rural planning
Roading	Industrial production and technology - materials, construction
Solid waste	Environment - control and care
Transport	Development of infrastructure - transport
Wastewater	Industrial production and technology - materials, construction
Water Supply	Industrial production and technology - materials, construction Environment - control and care