

**GNS Science**  
Statement Of Corporate Intent  
2015-2016

*Mai i te rangi, ki te nuku o te whenua,  
ka puta te ira tangata i te po,  
i te whaiao, i te ao mārama.  
Ko Te Pū Ao mātou.*

*From the sky and the land,  
came people from the night,  
to the old world, to the world of light.  
We are GNS Science.*

# Statement of Corporate Intent 2015-2016

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## Abbreviations

ACC	Accident Compensation Corporation
CRI	Crown Research Institute (companies established in 1992 to replace DSIR)
DoC	Department of Conservation
DSIR	Department of Scientific and Industrial Research (disestablished in 1992)
ECS	Extended Continental Shelf
EECA	Energy Efficiency and Conservation Authority
EEZ	Exclusive Economic Zone
EQC	Earthquake Commission
EPA	Environmental Protection Authority
ESR	Institute of Environmental Science and Research
IAEA	International Atomic Energy Agency
ICDP	International Continental Scientific Drilling Program
IODP	Integrated Ocean Discovery Program
IPCC	Intergovernmental Panel on Climate Change
LINZ	Land Information New Zealand
MCDEM	Ministry of Civil Defence and Emergency Management
MBIE	Ministry of Business, Innovation and Employment
MFAT	Ministry of Foreign Affairs and Trade
MfE	Ministry for the Environment
MoE	Ministry of Education
MoH	Ministry of Health
MoT	Ministry of Transport
MPI	Ministry for Primary Industries
NSC	National Science Challenge
NZP&M	New Zealand Petroleum and Minerals (a division of MBIE)
NZTA	New Zealand Transport Agency
OECD	Organisation for Economic Co-operation and Development
RSNZ	Royal Society of New Zealand
WHOI	Woods Hole Oceanographic Institution

# 1 Introduction

## 1.1 Context for the Statement of Corporate Intent

This *Statement of Corporate Intent* heralds an important milestone in the history of GNS Science. Our story begins more than 150 years ago with our foundation in 1865 as the *New Zealand Geological Survey*. Many years later, the *Geological Survey* merged with the DSIR *Geophysics Division* and *Institute of Nuclear Sciences*, as well as parts of *Physics and Engineering Laboratory* and *Chemistry Division*. The *Institute of Geological and Nuclear Sciences* was incorporated as a limited liability company on 1 July 1992.

Following on from 150 years of excellent science and service to New Zealand, GNS Science will continue to evolve as a national research provider. As we set our direction for the next 150 years of science and service, we see opportunities to sharpen our focus, grow our science partnerships, enhance our already excellent science capability, improve our internal corporate culture and enhance our national and international reputation.

To bring benefit to New Zealand, we must understand how and why the world is changing, proactively respond and adapt to those changes in ways that are tailored the nation, and make the best decisions we can using the resources available to us.

Our *National Science Vision* is a set of specific sector strategies in four key science domains that define our company: *Environmental Stewardship*, *Geoscience Knowledge*, *Resilience to Natural Hazards* and *Wealth from Geological Resources*. Aligned with these core sector strategies, in this sesquicentennial year we will launch new national initiatives to

1. Discover the geological history, hazards and resources of *Zealandia*, the submerged and largely unknown part of New Zealand that makes up more than 95% of the country's area
2. In concert with other national research partners, reposition GNS Science to be the nation's lead *Energy Crown Research Institute* and setting a path for New Zealand's sustainable energy future that provides energy security, protects our environment, and creates wealth.
3. Integrate new and extant disaster risk reduction and resilience programmes in a *Safer Societies* initiative that will help New Zealand better understand disaster risk, strengthen disaster risk governance to manage disaster risk, invest in disaster risk reduction for resilience and enhance disaster preparedness for effective response.

These concepts are more fully developed in our *2015-2025 GNS Science Strategic Plan*, which sets the broad direction for the coming decade. Its intent is to advance our special mission in a world that is dynamic, uncertain and rapidly evolving technologically. The *Plan* is intended to be our *Story Of Our Future*. To succeed, that story must be guided by our values and a clear understanding of our place in the national innovation system. It also must describe how we will take advantage of the key opportunities that become available to us.

## 1.2 Statutory framework

This *Statement of Corporate Intent* is prepared by the Board of Directors of the Institute of Geological and Nuclear Sciences Limited (GNS Science) pursuant to the Crown Research Institutes Act 1992.

GNS Science operates primarily under the CRI Act, the Companies Act 1993 and the Crown Entities Act 2004. Shares in the Company are held on behalf of the Crown by the Minister of Science and Innovation and the Minister of Finance.

In 2015-2016 we expect that Direct Crown Funding will provide 31% of our total revenue, with the remainder coming from contestable research contracts (28%) and technology transfer<sup>1</sup> (41%) to a wide range of government agency, local body and private-sector users.

## 1.3 Our rationale

Earth is a mass of 6 billion trillion tonnes, held together by gravity and heated internally by radioactivity and externally by solar radiation. Gravity and heat drive plate tectonics and the processes that generate and store the energy, minerals, and water that underpin wealth and life, and create the fertile regions that sustain our industries and people. Plate tectonics also creates the volcanoes, earthquakes, tsunamis, floods and landslides that threaten the industries and people that they sustain.

We meet New Zealand's need to discover and understand these earth processes and materials. We facilitate the application of this research in accord with the CRI Act, through our technology transfer services that create wealth, protect the environment, and improve the safety of people. With our predecessors, we are now entering our 151<sup>st</sup> year of fulfilling this trusted role of delivering independent scientific advice.

For these reasons we are also participants in seven of the eleven National Science Challenges. We will lead *Resilience to Nature's Challenges* with our knowledge of natural physical hazards and their societal risks and impacts. The *Sustainable Seas* and *Deep South* Challenges will benefit from our knowledge of seabed and sub-seafloor geology, and from our research in past climate that is the key to verification of numerical models of future climate. Our understanding of soil degradation, groundwater and geomicrobiological systems are germane to the *Our Land & Water* and *New Zealand's Biological Heritage* Challenges, and our ion-beam capability in materials science will add value the *Innovative Technologies* and *Building Better Homes, Towns and Cities* challenges.

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<sup>1</sup> *Technology transfer* means the transfer of information to our public and private-sector stakeholders, through consultancy, product commercialisation, access to data, and education.

## 2 Core Purpose

### 2.1 Purpose

Our purpose is to undertake research that drives innovation and economic growth in New Zealand's geologically based energy and minerals industries, that develops industrial and environmental applications of nuclear science, that increases New Zealand's resilience to natural hazards, and that enhances understanding of geological and earth-system processes<sup>2</sup>.

### 2.2 Outcomes

We will fulfil our purpose through the provision of research and transfer of technology and knowledge in partnership with key stakeholders, including industry, government and Iwi/Māori, to:

- Increase resource security and economic benefit from the development and diversification of New Zealand's oil, gas, geothermal energy and mineral industries;
- Improve the sustainable management of and increase economic returns from groundwater resources;
- Create value for New Zealand industry through the use of isotope and ion beam technologies;
- Increase New Zealand's resilience to natural hazards and reduce risk from earthquakes, volcanoes, landslides and tsunamis;
- Enhance the geotechnical engineering that underpins New Zealand's transport and energy infrastructure;
- Increase understanding of the geology and past climates of New Zealand, the Ross Dependency and Antarctica.

### 2.3 Scope of operation

To achieve these outcomes, we are the lead CRI in:

- Geothermal energy, oil, gas, and gas hydrates (including carbon sequestration);
- Mineral and geo-microbiological resources;
- Groundwater processes and quality;
- Application of nuclear and isotope science and ion beam technology;
- Geological hazards, risk mitigation and societal impacts of natural hazards;
- Earth-system processes and landscape evolution;
- The geological component of global environmental processes and climate change.

We will work with other research providers and end-users to contribute to development of:

- Ocean-floor exploration;
- Freshwater management;
- High-value manufacturing;
- Hazards management;
- Climate-change adaptation and mitigation;
- Antarctica.

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<sup>2</sup> This statement was approved by Cabinet in 2010.

### 3 Organisational Values and Vision

#### 3.1 Values

In developing our 2015 – 2025 *Strategic Plan*, we began by updating our organisational values to accurately represent the principles and behaviours that we hold in the highest regard. The table below explains what each of these fundamental values means to us and lists an action associated with that value.

These actions describe a logical, interconnected and cyclic sequence. Through **discovery** and **collaboration**, our science is **applied** to national problems and is a source of trusted **advice**. If we adhere to these values and take these actions, we will **thrive** as an organisation and be able to reap the benefits of our success and return to start the cycle again to make further discoveries.

These same colour-coded values feature in the *Organisational Vision* and *National Science Vision* that are introduced later in this document.

#### GNS Science Values



ACTION	Value	What it means to us
DISCOVER	Quality	We deliver excellent science and innovation
COLLABORATE	Teamwork	We partner with the best
APPLY	Impact	Our work makes a profound difference to New Zealand
ADVISE	Integrity	We are trusted, impartial and reliable
THRIVE	Success	We are a safe, sustainable and clever company

### 3.2 Corporate Vision

Following 150 years of excellent service to New Zealand, GNS Science continues to evolve as a national research provider.

As we set our direction for the next 150 years of service, we see opportunities to sharpen our focus, grow our science partnerships, enhance our already excellent science capability, improve our internal corporate culture and enhance our national and international reputation.

The table below builds on our five corporate values by summarising what GNS Science will become if we successfully pursue these opportunities. The intersection of each value and opportunity defines an element of our overall vision for the company.

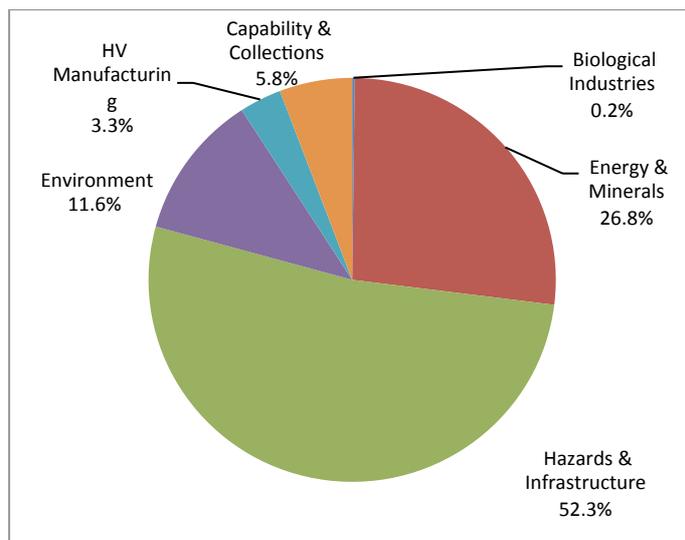
ACTION	VALUE	Opportunities					
		SHARPEN FOCUS Choosing what we will do, what we won't and understanding how we choose	GROW PARTNERSHIPS Choosing who we work with and how we work with them	ENHANCE CAPABILITY Building the skills of our staff and the capability of our infrastructure	IMPROVE CULTURE How we work and how we see ourselves	BUILD REPUTATION How others see us	CAVEATS <i>What we will not do</i>
DISCOVER	QUALITY We deliver excellent science and innovation	We will reshape our research investments based on national needs and a regularly updated science strategy	We will collaborate with leading research providers to create the best science teams possible	We will build and sustain world-leading capabilities in key impact areas, including staff, technical services, infrastructure, databases and collections	We will enhance science excellence by supporting individual and team creativity	We will be recognised by our peers and the nation as a world-class research organisation	We will not support research programmes that will not establish or sustain our national or international scientific prominence
COLLABORATE	TEAMWORK We partner with the best	Our science investments will be driven by the research and services needs of government, industry and community partners	We will conduct our research through joint partnerships with government, industry, universities and iwi	Our science investments will be driven by the research and services needs of government, industry and community partners	We will deploy cross-organisational research teams to provide comprehensive and effective science solutions	We will clearly, effectively and proactively communicate the relevance of GNS Science, our teams and our research partners	We will not seek work more appropriately done by a different national research provider as outlined in our core purpose
APPLY	IMPACT Our work makes a profound difference to New Zealand	We will prioritise targeted research to address near-term requirements while developing new fundamental science to serve future national needs	We will actively translate our knowledge and expertise to solve key national problems for government, industry and iwi	We will implement relevant impact metrics, track our performance against these metrics and develop new capability guided by our performance	We will actively translate our knowledge and expertise to solve key national problems for government, industry and iwi	We will clearly and effectively communicate the impact of our excellent science to government, industry and the nation	We will not invest in capability that is not aligned with our Statement of Core Purpose or with delivery of current or future impact
ADVISE	INTEGRITY We are trusted, impartial and reliable, impartial, reliable and transparent	Our research and service activities will always be guided by our Statement of Core Purpose	As appropriate, we will serve with our partners as leaders, collaborators and/or facilitators to deliver national benefit	Our staff, infrastructure and systems will be ready, resilient and rapidly deployable to meet the needs of the nation	We will promote respect, personal integrity, professional ethics and a positive attitude among our staff	We will sustain and enhance our reputation as a trusted advisor and source of science knowledge to the nation	We will not speak publicly outside our areas of expertise or comment on policies of government, opposition or political organisations
THRIVE	SUCCESS We are a safe and sustainable clever company	We will ensure financial viability through prudent operating discipline, best business practises and strategic capital management	We will partner with other research providers to deliver cost effective outcomes and impact where possible and practicable	We will implement workforce and capability planning and make infrastructure investments aligned with our science and impact strategies	We will optimise efficiency and productivity while continually striving to meet our goal of zero harm to our staff and the environment	We will implement a prioritised and structured programme of marketing and engagement with key clients and stakeholders	We will not compromise the GNS Science Values, the wellbeing of our people or our open and collaborative culture

## 4 Relationship to Government Priority Areas

The partitioning of our revenue across the Government's priority research outcome areas, as represented by projected revenue streams, is given in Table 1.

**Table 1: Projected revenue in each of the Government's priority research areas**

Government Priority Research Outcome Areas	Direct Crown Funding (\$k)	Contestable MBIE, EQC & RSNZ (\$k)	Technology Transfer (\$k)	Total (\$k)	Statement of Core Purpose Areas
Biological Industries	100	0	75	175	C
<i>Primary</i>	0	0	0	0	
<i>High value food</i>	100	0	75	175	
Energy & Minerals	8,795	4,422	9,786	23,003	A
<i>Energy Resources</i>	2,899	2,097	3,439	8,435	
<i>Sustainable Energy</i>	3,529	1,306	4,197	9,032	
<i>Mineral Resources</i>	2,367	1,019	2,150	5,536	
Hazards & Infrastructure	10,607	14,547	19,760	44,914	D,E
<i>Hazards &amp; Infrastructure</i>	10,364	14,547	19,047	43,958	
<i>Urban Development</i>	243	0	713	956	
Environmental	3,749	3,985	2,255	9,989	B,C,F
<i>Antarctica</i>	600	1,260	0	1,860	
<i>Climate &amp; Atmosphere</i>	2,352	1,045	80	3,477	
<i>Land &amp; Freshwater</i>	413	1,680	2,175	4,268	
<i>Terrestrial Ecosystems</i>	384	0	0	384	
High Value Manufacturing	516	1,516	844	2,876	C
<i>Novel Materials</i>	516	1,516	844	2,876	
Other	3,348	189	1,425	4,962	A-F
<i>Capability &amp; Collections</i>	3,348	189	1,425	4,962	
<b>TOTALS</b>	<b>27,115</b>	<b>24,659</b>	<b>34,145</b>	<b>85,919</b>	



Total distribution (includes EQC support for GeoNet, Platform partner funding, and NSC funds)

## 5 Deployment of Direct Crown (Core) Funding

Table 2: Deployment of Direct Crown Funding

Category	Government Outcome Areas	Direct Crown Funding (\$k)	Measures of performance that are underpinned by Direct Crown Funding as specified in Tables 3, 4 and 5
<b>Direct Crown Funding total</b>		<b>27,115</b>	
<b>Non-NSC research and sub-contracts</b>	Biological Industries	100	Percentage of publications with other institutions
	Energy & Minerals	5,795	Value of research sub-contracted out to other organisations
	Hazards and Infrastructure	9,607	Graduate scholarships funded
	Environmental	849	Graduate students supervised
	High Value Manufacturing	266	Research effort (FTEs)
	Other (capability enhancement)	1,383	
	<b>Sub-total</b>	<b>18,000</b>	
<b>National Science Challenge-aligned Research*</b> (indicative only - under negotiation as NSC scopes are refined)	Resilience	1,000	Reviewed science papers, monographs & maps
	Sustainable Seas	3,200	Publication rate (papers/research FTE)
	Deep South	1,600	Use of science - h <sub>1</sub>
	Land and Water	600	Registered users of collections/data
	BioHeritage	500	
	Innovative Technologies	250	
	<b>Sub-total</b>	<b>7,150</b>	
<b>Public science collections &amp; databases</b>		<b>1,965</b>	
<b>Nationally Significant Collections and Databases Supported by Direct Crown Funding</b>			
<ul style="list-style-type: none"> <li>• National Earthquake Information Database</li> <li>• New Zealand Geomagnetic Database</li> <li>• New Zealand Volcano Database</li> <li>• Regional Geological Map Archive and Data File / Geological Map of New Zealand</li> <li>• National Groundwater Monitoring Programme contributing to the Geothermal Groundwater Database)</li> <li>• National Petrology Reference Collection and PETLAB Database</li> <li>• New Zealand Fossil Record File</li> <li>• National Paleontological Database and Collection</li> </ul>			

\*In the Core Funding variation of 23 June 2014, CRIs indicated the alignment of Core Funding with National Science Challenges for the year 2014/15. MBIE recognises that the scope of research in the Challenges has changed considerably since those initial discussions when indicative levels of the CRI's Core Funding aligned to the Challenges was indicated. This has led MBIE to agree an initial reduction in the CRI's Core Funding contribution to the Challenges based on the reduction in scope due to the removal of the Natural Hazards Research Platform from the Challenge 'Resilience to Nature's Challenges'. MBIE further acknowledges that the adjusted alignment of the Core Funding amounts specified in Table 2 are still indicative, as final numbers are yet to be agreed which correspond with the finally agreed Research Plans for each Challenge and the CRI's ability to deliver based on its SCI. On that basis, the parties have agreed the final allocation of the CRI's Core Funding to the Challenges may increase or decrease from the amounts set out in Table 2 but must reflect the ability of the CRI to contribute to Challenge Research Plans in a manner that aligns with its SCI. MBIE has agreed that to the extent there is misalignment, and following best efforts by the CRI to ensure alignment through the relevant Challenge governance groups, it will allow the CRI to redirect any Core Funding in Table 2 which does not align with the Challenges to areas which fall outside the scope of the Challenges but which continue to align with its SCI in order to allow the CRI to deliver on its SCI.

## 6 Key Stakeholders

Our key stakeholders are

- Crown shareholders - Minister of Science and Innovation and Minister of Finance
- Other Ministers, through their Ministries and Departments, specifically
  - Minister for Canterbury Earthquake Recovery (CERA)
  - Minister for Economic Development (MBIE)
  - Minister for Tertiary Education, Skills and Employment (universities)
  - Minister of Foreign Affairs (MFAT, NZAID)
  - Minister for Climate Change Issues (MfE)
  - Minister for the Environment (MfE)
  - Minister of Conservation (DoC)
  - Minister of Housing (MBIE - Building and Housing Information)
  - Minister of Energy and Resources (MBIE - NZP&M)
  - Minister of Civil Defence (MCDEM)
  - Minister for Building and Construction (MBIE)
  - Minister for Land Information (LINZ)
  - Minister for Primary Industries (MPI)
  - Minister of Health (MoH)
- Public good research funding agencies (MBIE, RSNZ, EQC)
- Local government entities (the 78 regional, district, unitary and city councils)
- Commercial clients and other research users in New Zealand and overseas
- Government entities (NZTA)
- Non-governmental organisations (NGOs)
- The New Zealand public including Iwi/Māori
- New Zealand and overseas collaborators (universities, CRIs, research associations, consultancies)
- Our staff

Our stakeholder strategy involves continual engagement with key staff members interacting with stakeholders throughout the year. This builds the relationships and embeds stakeholder needs within our internal culture and thinking. Consideration of the needs of New Zealand as a whole, and of these stakeholder groups, underpins the activities outlined in this document.

## 7 National Responsibilities

We have stewardship of many national facilities and programmes that underpin our achievement of our core purpose and support many other research and technical users:

- **GeoNet**, the national network for monitoring earthquakes, volcanoes, tsunamis, landslides, and tectonic deformation, that provides timely advice on these events to government agencies and to the public;
- The **Natural Hazards Research Platform** that coordinates the related research programmes of its members GNS Science, NIWA, University of Canterbury, Massey University, Opus International Consultants and The University of Auckland;
- The **National Isotope Centre**, the country's only accelerator mass spectroscopy and ion-beam technology facility that, with its associated laboratories, supports environmental, climate, and materials research;
- The **National Groundwater Monitoring Programme** and database that provides the national view on groundwater quality, links the quality with human influence, and develops best-practice methods for sampling, monitoring, and data interpretation;
- **National Fossil, Rock and Mineral Reference Collections** and associated databases that underpin New Zealand's earth science research, resource development, and hazard assessment;
- The **National Geological and Geophysical Map** archive and associated databases that underpin New Zealand's earth science research, resource development, and hazard assessment;
- The **National Earthquake Information, Geomagnetic and Volcano Databases** that support tectonics and geohazards research; and
- As host of the **Resilience to Nature's Challenges National Science Challenge** we have responsibilities for its management and mission delivery.

## 8 Strategic Issues

A new long-term strategic plan has been developed that focuses on core priorities for New Zealand, not only for the coming five years but also out to 2025. It shapes an enduring *Statement of Corporate Intent* beginning in this financial year to satisfy our *Statement of Core Purpose* and at the same time to provide a basis for its revision. The following issues are key to these tasks.

### 8.1 High performance culture

A key strategic issue is sustaining and enhancing a high performance culture. The new plan informs and guides three important efforts:

- A review of organisational design to determine if structural changes might yield a performance dividend
- Enhanced leadership development programmes to improve commercial skills, leadership ability and diversity
- New incentives for staff to pursue research opportunities aligned with our strategy.

### 8.2 National and international impact

A key strategic issue is ensuring that we have national and international impact that brings significant benefit to New Zealand. We will develop and apply extant and new science capability in clearly defined areas to achieve this. Our plan sets the research agenda through clearly articulated pathways for revenue growth. As part of this we will lead and participate in National Science Challenges and in other government-funded collaborative opportunities including Centres of Research Excellence and the Marsden Fund.

### 8.3 Leveraging intellectual property

A key strategic issue is more effective commercialisation of our intellectual property. A fundamental component of our plan provides incentives for the growth of our IP portfolio.

### 8.4 Iwi/Māori engagement

A key strategic issue is the need to maintain and enhance engagement with Iwi/Māori. Establishing new alliances requires thoughtful and bilateral understanding of expectations. To ensure that we make real and timely progress we will design and implement two to three additional projects with Iwi in areas of mutual interest and strategic importance.

### 8.5 Collaboration and National Science Challenges

A key strategic issue is leadership and participation in the National Science Challenges. We are leading the *Resilience* challenge and participating in other Challenges where we have the requisite capability and infrastructure. Through these, and other collaborative research and commercialisation opportunities, we will make further progress in removing barriers to



science and technology partnerships. Consistent with our mandate, we will collaborate with industry and government to benefit New Zealand where we have the skills and capacity.

### 8.6 Knowledge transfer

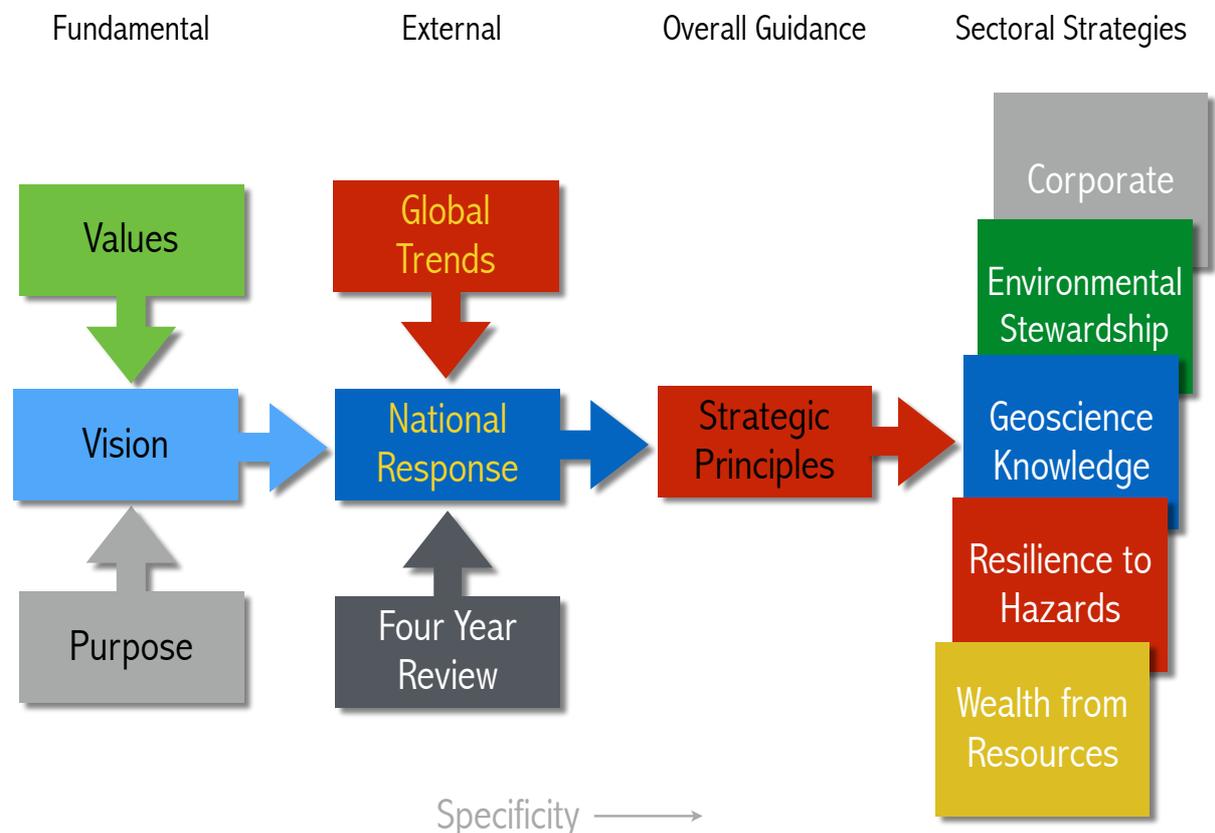
A key strategic issue is ensuring that we have an efficient process to transfer technology and knowledge to end-users. We have made significant progress in reducing barriers to accessing Crown-funded data while at the same time deriving revenue from value-added data products. We will continue to work to lower those barriers while providing tailored and high-value knowledge and services to the economic sectors we face.

### 8.7 Strategy Logic

The logic flow diagram below summarises our high-level thinking in developing the *2015—2025 Strategic Plan*. Beginning at the left with the organisational *Values* (§3.1) that are the principles and behaviours that we hold in the highest regard, and the GNS Science *Statement of Core Purpose* (§2) that defines our clear, explicit and enduring strategic role, we developed an detailed organisational *Vision* (§3.2).

To ensure that our science is relevant and our company is efficient and effective in a dynamic environment, we must develop a national response that takes account of external trends and national needs. Further, we must respond to the observations and advice given to us by independent panels through *Four Year Rolling Reviews*.

Using this information, we established a set of overarching strategic principles to guide an overall *National Science Vision* (§8.8) that is more completely developed through a set of increasingly specific sector strategies in four key science domains: *Environmental Stewardship*, *Geoscience Knowledge*, *Resilience to Natural Hazards* and *Wealth from Geological Resources*. A fifth strategic component focuses on external and internal *Corporate* matters that are common to all the science sectors.



## 8.8 National Science Vision

Our one-sentence science vision is **New Zealand—Cleaner, safer and wealthier**. These goals are entirely consistent with our national role as defined by our *Statement of Core Purpose* and with our *Values*.

The elements of our science vision are set out in the table below, where our role and the outcomes we will deliver for New Zealand are listed in four key science domains. The discover-collaborate-apply-advise action sequence (§3.1) is used to explain in more detail what we will do and how it will bring national benefit.

Sector strategies for each science domain are presented in more detail in the following sections.

### Science Vision New Zealand—Cleaner, safer and wealthier

Domain		Resilience to Natural Hazards	Wealth from Geological Resources	Stewardship of the Environment	Geoscience Knowledge
Our Role		Develop and support the nation's ability to understand, communicate and mitigate the impacts of earthquakes, landslides, volcanic eruptions and tsunamis and to become more resilient to these hazards	Provide the nation with tools to enhance resource security and optimise responsible use of its hydrocarbon, geothermal and mineral resources; develop high value materials and processes for industry	Enhance the nation's ability to understand and sustainably manage air, land, sea-level, climate, groundwater and interconnected surface waters	Expand understanding of earth science in New Zealand and ensure that geoscience data, information and collections are gathered, managed and accessible now and in the future
Outcome for New Zealand		Reduced economic, social and environmental impacts of natural hazards on communities and infrastructure	Use of our energy and minerals resources, and high-value industries are optimised to create wealth for the benefit of the nation	Achievement of our aspirations for kaitiakitanga, leading to social, cultural, health and economic benefits for citizens	A comprehensive and accessible geoscience knowledge base supporting policy and decision making by governments, communities and industries
Themes		Monitoring hazards Understanding hazards Mitigating impacts Societal and economic resilience	Renewable energy Petroleum Minerals New materials and processes	Climate Sea level Air Groundwater Societal engagement	Discover Zealandia Geoscience information
Actions	DISCOVER	Understand natural hazards and community exposure to support risk mitigation and community resilience	Delineate and quantify New Zealand's energy and mineral resources, and develop new materials and processes	Understand ancient and modern environmental systems and processes and determine the impacts of human activity and changing climate	Explore and map the geological history, structure and processes of the entirety of Zealandia
	COLLABORATE	Partner with researchers, stakeholders and communities in national and international programmes for disaster risk reduction	Collaborate with universities, governments and industry to provide leadership in understanding and promoting geological resource potential, and with high-value industries to promote uptake of new technologies	Partner with Central Government, regional authorities, iwi, industries, universities and the public to empower environmental stewardship	Cooperate with creators, users and stewards of geoscience data and collections to ensure security and accessibility now and into the future
	APPLY	Target science, engineering and technology outputs to provide safeguards from the impact of natural hazard events	Apply knowledge to increase security, profitability, competitiveness and investment in New Zealand's minerals, energy and high-value industries	Improve the accuracy, reliability and coverage of environmental monitoring networks and paleoenvironment proxies, with effective mechanisms for dissemination to and engagement with stakeholders	Use geoscience information, high performance computing, data analysis and new technologies to facilitate innovation that serves local, regional and national needs
	ADVISE	Provide authoritative and independent information and advice to support risk mitigation, community resilience and informed decision-making in response to and in preparation for natural hazard events	Provide independent and respected advice to inform debate on resource development and on opportunities in minerals, energy and high-value industries	Provide authoritative, unbiased data and advice to support development of informed policies, plans and strategies for environmental stewardship and climate change mitigation	Promote, educate and build public and stakeholder awareness of our geology, associated geoscience information and its potential benefits for the nation

## 8.9 National Strategic Initiatives

Our *National Science Vision* (§8.8) is a set of specific sector strategies in four key science domains that define our company: *Environmental Stewardship*, *Geoscience Knowledge*, *Resilience to Natural Hazards* and *Wealth from Geological Resources*.

Aligned with these core sector strategies, in this sesquicentennial year we will launch at least three new national strategic initiatives:

***Discover Zealandia*** Over the past 150 years, we have done an excellent job to produce geological, geophysical and geochemical data that have yielded an accurate and detailed understanding of the history, hazards and resources in the emergent parts of New Zealand. Geological data for this part of the country are available as seamless digital maps at any desired scale.

While this work will continue (particularly at a more detailed scale in strategically important areas such as cities and in and around critical infrastructure), GNS Science will shift its major discovery focus to the offshore EEZ and ECS. These submerged and poorly known parts of our continent make up more than 95% of the country's area and it is vital that we better understand the geological evolution, climate history, natural hazards, and the energy and mineral resources hidden within *Zealandia*.

We will lead *Discover Zealandia* but operate it as a collaborative venture together with strategic national and international research partners including CRIs, universities, IODP and WHOI.

***Energy Futures*** In concert with other national research partners, it is our intention to reposition GNS Science to be the nation's lead energy CRI, setting a path for New Zealand's sustainable energy future that provides energy security, protects our environment, and creates wealth.

Among the goals of this initiative are acceleration of progress toward the 2025 renewable energy target, new materials and technologies for storage and efficient use of energy and energy networks, resilience of energy infrastructure to natural hazards, a better understanding of the potential of deep geothermal resources for long-term baseload power generation, and wealth creation from our largely unknown offshore energy resources.

Like *Discover Zealandia*, we will lead *Energy Futures* collaboratively with strategic national and international research partners including CRIs, university departments and industry.

### ***Safer Societies***

New Zealand has recently signed the ***Sendai Framework for Disaster Risk Reduction***, whose desired outcomes are "... *the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.*"

GNS Science is uniquely placed to lead the science that will inform the development of a national strategy for disaster risk reduction and resilience to support the New Zealand government's obligations under the Sendai Framework because [1] we are stewards for *GeoNet*, [2] we invest over \$6M of core funding annually in hazards and resilience research; [3] we host the Natural Hazards Research Platform; [4] we host the *Resilience National Science Challenge*; [5] we apply our knowledge to support New Zealand to build resilience; [6] we have strong links with people across the stakeholder spectrum; and [7] we have enduring partnerships with international hazards and risk organisations.

Our goals are to:

- Enable linkages between key research programs so that New Zealand has a joined-up national approach to Disaster Risk Reduction and Resilience (DRRR);
- Work alongside government during the development of a national strategy and advocate for the use of science to build an evidence-driven policy;
- Address key gaps in national DRRR framework such as a consistent approach to risk assessment across all perils;
- Use this expertise to develop strong risk management across government and the private sector;
- Transfer this knowledge to assist other countries to formulate measures to similarly address the Sendai Framework;
- Ultimately, work in partnership with government, communities and the private sector to build *Safer Societies* in New Zealand and overseas.

A successful *Safer Societies* initiative will integrate new and extant disaster risk reduction and resilience programmes in an effort that will help New Zealand better understand disaster risk, strengthen disaster risk governance to manage disaster risk, invest in disaster risk reduction for resilience and enhance disaster preparedness for effective response.

## 8.10 Individual Science Strategies by Theme

Enhanced Resilience to Natural Hazards				
Themes	Monitoring Hazards	Understanding Hazards	Mitigating Impact	Societal and Economic Resilience
<b>Desired Outcomes</b>	<p>Comprehensive early warning capability for all perils</p> <p>Delivery of real-time risk and impact information following hazards events</p> <p>Enhanced and effective communication of hazard and risk through media channels</p> <p>Comprehensive response planning for future events in New Zealand and the SW Pacific</p>	<p>NZ positioned as an international hazards laboratory</p> <p>Integrated hazards research leading to comparative risk across all hazards</p> <p>Improve physical understanding of natural hazards processes and their consequences</p> <p>Identify events of national significance and develop end to end research projects</p> <p>Vision Matauranga included in all of our relevant research</p>	<p>Enduring partnerships with government agencies to ensure long term delivery of quality advice</p> <p>Recognised as the custodian of the national hazard models for all perils</p> <p>Land use planning, emergency management and engineering research outputs are embedded policy development at all levels of government</p>	<p>Sustain national success of Natural Hazards Research Platform and make the Resilience National Science Challenge a national success as host organisation</p> <p>Enduring partnerships with insurance and other business sectors to deliver accurate and timely risk evaluations</p> <p>Be a trusted advisor to Resilient Auckland initiatives</p>
	<p>Real-time warnings of life threatening natural hazards events for the public</p> <p>Real-time information to CDEM and critical infrastructure providers to support good decision-making</p> <p>Informed and prepared public for national scale events</p>	<p>Better understanding and communication of New Zealand's natural hazards</p> <p>GNS seen as a desirable place to work and seen as international preferred partners in hazards research</p>	<p>Safer people, buildings and infrastructure</p> <p>Reduced social and economic impact of natural hazards</p>	<p>Informed choices on the expansion of Auckland urban areas</p> <p>Increased societal resilience to natural hazards</p>
<b>End Result</b>				

Environmental Stewardship					
Themes	Climate	Sea Level	Air	Land and Water	Societal Engagement
Desired Outcomes	<p>Paleoclimate observations and modelling from Antarctica to the tropical SW Pacific help us understand how past climate change affected Zealandia</p> <p>Use paleoclimate studies to estimate the impact of climate change on New Zealand's environment, society, and prosperity over the next 100 – 200 years, with a focus on the impacts of sea level rise</p>	<p>Develop a quantitative temporal and spatial risk analysis on the impact of current and future sea level rise on New Zealand, with a focus on coastal inundation, urban flooding, groundwater salinisation, land loss, and infrastructure vulnerabilities</p>	<p>Improved understanding of contaminant transfers between air, land and water and the resulting environmental impacts</p> <p>Understand the drivers of air quality in New Zealand, particularly regarding particulate matter</p> <p>Understand and measure the source and fate of key greenhouse gases</p>	<p>Understand the structural characteristics of, and the fluxes of water into, out of and through NZ aquifers</p> <p>Enhance ability to predict the response of NZ aquifers to pressures such as climate change and land use intensification</p> <p>Greater understanding of the causes and mitigation of environmental effects, such as subsidence, induced seismicity and impact on near-surface aquifers, linked to geothermal resource utilisation.</p>	<p>Develop engagement and knowledge exchange mechanisms that give the NZ population an active role in environmental stewardship</p> <p>Develop tools for NZ decision-makers to address multi-faceted issues</p> <p>Improve public awareness of environmental risks</p> <p>Support New Zealand's efforts as a good global citizen in understanding and mitigating the impacts of climate change and environmental degradation</p>
	End Result	<p>New Zealand society, infrastructure, and economy are more prepared for and resilient to climate change and sea level rise</p>	<p>Improved air, land and water management strategies through scientific evidence and defensible data sets, methods and models</p> <p>Increased economic returns from, and sustainable management of, NZ's natural capital</p> <p>Public confidence in the management of air, land, groundwater and connected surface water resources</p>	<p>New Zealanders are informed and empowered to undertake environmental stewardship</p>	

Wealth from New Zealand's Geological Resources				
Themes	Renewable Technologies	Conventional and Unconventional Hydrocarbons	New Materials and Processes	Minerals
Desired Outcomes	<p>Quantification of deep and near surface geothermal systems, better understanding of materials/engineering requirements and improved modelling tools for effective resource utilisation</p> <p>Mitigation of environmental issues, process chemistry and resource characteristics that detrimentally impact sustainable geothermal resource utilisation</p> <p>Establishment of NZ Geothermal Centre of Excellence to coordinate academic and industry partnerships, and promote greater geothermal uptake</p> <p>Retention of world-leading geothermal research and specialist analytical capability</p>	<p>Comprehensive understanding of all NZ sedimentary basins to allow authoritative evaluation of their petroleum prospectivity</p> <p>Holistic models for understanding and predicting the evolution of petroleum systems within our sedimentary basins</p> <p>Paleogeographic models describing the depositional evolution of reservoir fairways for all basins (source to sink)</p> <p>Premier provider of technology transfer to the energy sector</p> <p>Establishment of gas hydrates as a viable energy source for the future</p>	<p>Improved utilisation of energy efficiency in primary and manufacturing industries and products</p> <p>Improved resilience of electricity and gas distribution networks</p> <p>Established R&amp;D provider for New Zealand manufacturing industries</p> <p>New technologies for renewable energy resource utilisation</p> <p>Characterisation of NZ's unique extremophile microbiology and potential applications</p>	<p>Research leadership in onshore and offshore mineral deposit models</p> <p>Increased understanding of the mineral potential of our EEZ and ECS</p> <p>Comprehensive assessment of the mineral potential of onshore NZ</p> <p>New explorers and better targets for existing explorers</p>
	End Result	<p>Improved energy security for New Zealand</p> <p>Better quantification of our geothermal resources</p> <p>International technology export opportunities with focus on Asia-Pacific and Latin America</p> <p>New commercial markets, clients and research partnerships</p> <p>Scientific uptake by existing and new users of geothermal resources</p> <p>World-leading analytical facility that continues to support New Zealand and international geothermal industry and research community</p>	<p>Increased national and international investment in NZ petroleum exploration and development</p> <p>Demonstration of unconventional petroleum and gas hydrate potential</p> <p>Increased wealth creation from exports of oil and gas conversion products</p> <p>Security of energy supply</p>	<p>Improved energy security</p> <p>More efficient domestic use of energy</p> <p>More competitive dairy export commodities</p> <p>Wealth creation from export and import of new technologies and expertise</p>

Geoscience Knowledge		
Themes	Discover Zealandia	Geoscience Information
Desired Outcomes	<p>Comprehensive multi-scale geological mapping of the Zealandia continent onshore and offshore</p> <p>GNS as a leading technology and research provider in land and subsea geological, geophysical and geochemical mapping</p> <p>New Zealand positioned as an international focus region for active plate tectonics, geological hazards, climate and biodiversity research</p> <p>Strengthened knowledge of the morphology, stratigraphy, surface and sub-surface structure, tectonics, evolution, biological history, of Zealandia</p> <p>Underpinning urban, regional, basin, national and crustal scale geoscience models and datasets developed to support applied research and exploration</p> <p>Improved resolution, accuracy and precision of the geological, geochemical and geophysical characterisation of Zealandia</p>	<p>Integrated geoscience databases, maps and collections that support multidisciplinary science exploration and discovery from knowledge to practice</p> <p>Integrated geological models that provide effective transition from knowledge to practice</p> <p>Geoscience databases, maps and collections that comply with international standards and integrate with tools and frameworks internally and globally</p> <p>Effective, up-to-date, accessible and relevant geoscience databases, maps and collections</p> <p>Enhanced research productivity through efficient interdisciplinary use of documents, data, maps, models, ideas and information</p>
	End Result	<p>Stakeholders use up-to-date, accurate geoscience information and expert advice from GNS to guide learning and decision-making</p> <p>Efficient and effective access to geoscience databases and collections</p> <p>Science results and research data are accessible in appropriate formats for all users</p> <p>Seamless and layered digital geological, geochemical and geophysical map products</p>

## 8.11 Corporate Strategies by Theme

External Relations and Commercialisation				
Our Role	Creating value by facilitating and effectively linking the business with our external stakeholders			
Objectives	<ul style="list-style-type: none"> <li>Increased revenue and profits from research, technology transfer and commercialisation activities</li> <li>New commercialisation projects and joint ventures progressed from the spectrum of our work</li> <li>New collaborations and joint ventures with Maori stakeholders</li> <li>New Zealanders know and appreciate our science</li> </ul>			
Actions	<ul style="list-style-type: none"> <li>Facilitate the development of research and technology transfer proposals</li> <li>Facilitate, develop and maintain relationships with internal and external stakeholders</li> <li>Work with research teams to identify and progress commercialisation opportunities and appropriate partners</li> <li>Partner with internal and external stakeholders to identify and develop Vision Mātauranga opportunities</li> <li>Incorporate outreach activities into our research work</li> <li>Encourage and foster innovation</li> <li>Streamline project management and reporting systems to become more efficient</li> </ul>			
Themes	Business Development	Research	Maori	
Desired Outcomes	<p>Respected by our clients and stakeholders as the trusted advisor</p> <p>First port of call for our stakeholders in solving their problems</p> <p>Profitable commercialisation opportunities developed</p> <p>High level of awareness and visibility of GNS Science brand</p>	<p>Research funding maintained at a level that fully supports our research capability and our Statement of Core Purpose</p> <p>Effective use of direct crown funding aligned with stakeholder support, to address issues of national importance</p>	<p>Respected and used by Iwi to address their problems</p> <p>Direct Maori involvement in our work</p>	<p>Our work is known and respected</p> <p>Increased knowledge and understanding of our science by New Zealanders</p>
End Result	A clever company			

Corporate Services				
Our Role	Enabling the business to effectively and efficiently deliver to its statement of core purpose	HR	Health & Safety	Information Services
Objectives	<ul style="list-style-type: none"> <li>• Zero harm</li> <li>• Profitable company</li> <li>• Streamlined operating practices making us more efficient</li> <li>• High performing and robust systems; useable, connected and interoperable</li> <li>• Fit-for-purpose facilities and infrastructure that unpins science operations and initiatives</li> <li>• Trusted support partner to the science delivery business units</li> <li>• High performance culture</li> </ul>	Engaged and productive workforce whose behaviours align with core values Leaders and staff have the right skills and capability that aligns with our business needs Key talent is recruited, retained and nurtured Robust and transparent tools and systems	Robust and transparent tools and systems A culture where staff are actively working towards zero harm Best business practice, that meets all legal and statutory obligations	Effective, up-to-date and interoperable systems that enable the full value of data, information and collections to GNS, NZ and the research community Enhanced productivity through efficient systems and workflows Infrastructure aligned to business needs
Actions	<ul style="list-style-type: none"> <li>• Implementation of services that enable the company to address current and future business needs</li> <li>• Develop and implement plans to provide the infrastructure to support the business</li> <li>• Provide advice and leadership to the company in areas of expertise</li> <li>• Streamline operating practices and systems to become more efficient</li> <li>• Increased alignment between corporate and science activities</li> <li>• Recognise and reward innovation and excellence</li> <li>• Develop our leaders and staff</li> <li>• Strengthen our health and safety systems to keep our people safe</li> </ul>			
Themes	Finance			
Desired Outcomes	<p>Relevant information produced which is timely, reliable, accurate and usable</p> <p>Financial sustainability through prudent business operating discipline and best business practice, that meets all legal and statutory obligations</p> <p>Infrastructure and strategic capital investment</p> <p>Aligned with business needs</p> <p>Respected as a desirable and responsible business partner who is easy to do business with internally and externally</p> <p>Enhanced productivity through efficient systems and workflows</p>			
End Result	<p>Our people are safe</p> <p>We are an employer of first choice</p> <p>Profitable company, increased shareholder value</p> <p>Modern and robust technology, systems and processes</p> <p>Strong stewardship and governance</p>			

## 8.12 Near-Term Goals for 2015-16

Sections §8.10 and §8.11 enumerate the principal outcomes we desire and the objectives that we wish to attain in the first years of our long-term strategic plan, grouped in six areas: Enhanced Resilience to Natural Hazards, Environmental Stewardship, Wealth from New Zealand's Geological Resources, Geoscience Knowledge, External Relations and Commercialisation, and Corporate Services. In the coming 2015-16 year, we expect to deliver on these strategic goals:

### Enhanced Resilience to Natural Hazards

Contracting and startup of *Resilience* National Science Challenge and funding of first round of research projects

Comprehensive response planning with future framework for all-perils 24/7 warning centre

Growing partnerships with key agencies, particularly EQC, MCDEM and Auckland Council

### Environmental Stewardship

Develop and calibrate a groundwater model of the Southland region and assist Environment Southland to apply this model under the NPS for Freshwater Management 2014

Iwi partnerships investigate monitoring air quality around Whakarewarewa and groundwater quality around Lake Rotorua, both with Ngati Rangiwewehi

### Wealth from New Zealand's Geological Resources

Paleogeographic models describing depositional evolution for all frontier basins and new baseline geoscience knowledge to guide resource estimation

Understanding of methane hydrates and their role as a viable transition fuel and source of future wealth

### Geoscience Knowledge

Quantitative temporal and spatial risk analysis on the impact of current and future sea level rise on New Zealand, with a focus on coastal inundation, urban flooding, groundwater salinization, land loss, and infrastructure vulnerabilities

Structure and priorities for large-scale marine mapping under MMAP programme

More efficient and effective access to geoscience databases of national significance

### External Relations and Commercialisation

Streamline relationship management with key government agencies

Catalogue and evaluate commercialisation potential of extant IP portfolio

Improved forward revenue pipeline projection information

### Corporate Services

Monthly corporate productivity statistics communicated to all staff

Systems and practices that fully meet requirements of new HSE legislation

More efficient and transparent career path, performance, development and remuneration systems

Refreshed information services strategy with plans developed and implementation commenced relating to databases, infrastructure and records

## 9 Human Resource Indicators

The following metrics will measure our success in being a good employer.

**Table 3: Human resources indicators**

	Actuals 2013	Actuals 2014	Expected 2016
Full-time equivalents (FTEs)	360	371	375
Scientists and specialists	252	260	263
Science support	51	54	55
General support & management	57	57	57
Distribution of science effort (FTEs)			
Research	147	161	160
Technology transfer	156	153	158
Staff turnover	6.5%	6.1%	6%-8%
ACC workplace safety accreditation	Secondary	Tertiary	Tertiary
Injuries, causing missed work days, per million work hours	0	4	<5
Staff engagement (% proud to work for GNS Science) <sup>1</sup>	84%	N/A	>80%

<sup>1</sup> this will not necessarily be measured every year

## 10 Research and Technology Transfer Key Performance Indicators

Tables 4-7 give the KPIs upon which we will report annually. Other information, of a commercial-in-confidence nature, will be included in quarterly reports to the shareholders.

**Table 4: End-user collaboration indicators**

	Actuals 2013	Actuals 2014	Expected 2016
Commercial revenue (\$000)	30,638	31,621	>32,000
Commercial revenue per FTE (\$000) – <i>generic indicator</i>	85	85	85
Percentage of end-users satisfied with the way GNS Science sets their research priorities ( <i>Colmar Brunton</i> annual survey)	71	75	>75
Percentage of end-users confident that GNS Science considers their sector's priorities when setting research priorities ( <i>Colmar Brunton</i> )	59	68	>75
Percentage of end-users satisfied with the overall quality of their experience with GNS Science over the past 3 years ( <i>Colmar Brunton</i> )	79	93	>85
Value of research contracts to other research organisations (\$000)	8,195	9,269	>14,000
Value of research contracts from other research organisations (\$000)	2,514	2,708	>2,500
Number of advisory groups active	6	6	6

We design our research plans taking into account the global state of scientific knowledge and our connectivity in collaborating nationally and globally to compensate for low staff numbers in some areas. The following metrics will measure our success in these collaborations, and our overall performance in the research that underlies our technology transfer.

**Table 5: Research collaboration indicators**

	Actuals 2013	Actuals 2014	Expected 2016
Peer-reviewed publications (calendar year)			
Total publications	210	256	250
International co-authorship – <i>generic indicator</i>	65%	66%	67%
Other New Zealand co-authorship – <i>generic indicator</i>	23%	23%	23%
Total co-authorship – <i>generic indicator</i>	88%	89%	90%
GNS Science only authorship - <i>generic indicator</i>	12%	11%	10%
Percentage of end-users that have confidence in GNS Science's ability to form the best teams to deliver outcomes	78	85	>85
Number of visiting researchers hosted	101	90	>80
Number of graduate scholarships funded	36	33	>25
Number of graduate students supervised	100	141	>100

Note: Publication totals are from Scopus + ISI Web of Science; listing in SCImago unknown (lack the analysis software)

Our strategy is to take end-user needs into account in designing our research strategy. Our technology-transfer indicators will measure our relationships with these commercial, central-government and local-government clients and achievement of excellence for them.

**Table 6: Technology-transfer indicators**

	Actuals 2013	Actuals 2014	Expected 2016
Technology & knowledge transfer			
Commissioned reports (ca. 55% tech-transfer revenue)	278	261	275
Reports / scientist FTE	0.9	0.8	0.9
Geohazard reports (ca. 28% tech-transfer revenue)	592	608	620
Reports / scientist FTE	2.0	2.0	2.0
Laboratory analysis reports (ca. 11% tech-transfer revenue) (stable isotopes >10000, geothermal >7500, radiocarbon >1800, water >700)	20,000	20,000	20,500
Reports / scientist FTE	66	64	64
Total Reports / Scientist FTE – <i>generic indicator</i>	69	66	67
IP licensing in NZ and overseas of processes, products and services			
Number	29	29	20
Value (\$000)	1,197	1,587	800
Client feedback average score (out of 10)	7	7	7-8
Percentage of end-users that have adopted knowledge from GNS Science in the past 3 years ( <i>Colmar Brunton</i> )	90	94	>90
Percentage of end-users satisfied with their experience of accessing knowledge or technology from GNS Science	79	93	>90
Projects achieving outcomes or creating opportunities for Iwi/Māori	25	26	25
Database use			
Number of databases accessible to the public via the web	30	26	26
Registered external users of GNS Science data	3,187	5,909	>5,000
Users accessing the GNS Science website			
Total number	341,610	488,565	>450,000
Daily peak	11,647	18,149	>10,000
Number of users accessing the GeoNet website			
Total number (1000s)	438,000	632,000	>500,000
Daily peak (000s)	20,116	49,000	>30,000

**Table 7: Science quality indicators**

	Actuals 2013	Actuals 2014	Expected 2016
Peer-reviewed science papers and book chapters (preceding calendar year)	310	275	320
Other publicly available papers and reports (preceding calendar year)	57	78	70
Publication rate peer-reviewed papers/ monographs/maps per scientist FTE	1.0	0.9	1.0
Mean citation score – <i>generic indicator</i>	1.5	1.3	1.4
Use of science: $h_1$ -score (# of publications with at least this same number of citations)	75	84	80
Scientist visibility: $h_2$ -score (# of staff with an $h$ -score of at least this same number)	19	20	20

We will operate in a financially responsible manner and remain financially viable. We budget to generate an appropriate rate of return on equity. Table 7 gives the financial performance indicators upon which we will report annually. Other information, of a commercial-in-confidence nature, will be included in quarterly reports to the shareholders.

**Table 8: Financial performance indicators and targets**

Year ending 30 June	2015 forecast	2016 budget	2017 outlook	2018 outlook
Return on equity	6.5%	5.0%	6.7%	8.0%
Revenue per FTE (\$000) – <i>generic indicator</i>	211	236	244	249
Profit per FTE (\$000) <sup>1</sup>	18	22	25	27
Equity ratio <sup>2</sup>	57%	60%	63%	66%
Capital renewal <sup>3</sup>	129%	130%	120%	119%
Operating margin <sup>4</sup>	8.5%	9.3%	10.0%	10.8%
Quick ratio	1.5	1.2	1.2	1.2
Interest cover	n/a	n/a	n/a	n/a
Profit volatility <sup>5</sup>	11%	11%	11%	12%
Forecasting risk <sup>6</sup>	-0.5%	-0.3%	-1.7%	-0.8%
Revenue growth	2%	10%	5%	3%

<sup>1</sup> profit is earnings before interest, tax, depreciation and amortisation (EBITDA)

<sup>2</sup> ratio of shareholder's funds (or total equity) to total assets expressed as a %, as determined by the Company's accounting policies and set out in the balance sheet

<sup>3</sup> capital expenditure to depreciation and amortisation expressed as a %

<sup>4</sup> EBITDA / revenue

<sup>5</sup> Standard deviation of EBITDA for past 5 years / average EBITDA for the past 5 years

<sup>6</sup> Five year average of return on equity less forecast return on equity

## 11 Reporting

### 11.1 Quarterly and half-yearly reports

Quarterly reports will be provided confidentially to our shareholders and will state financial performance for the quarter and year-to-date against budgets, provide updated year-end forecasts, and provide a commentary on performance for the period. The commentary will focus on material variances and how these are being addressed. The reports will also comment on major achievements for the period and the outlook for the next period.

The half-yearly report will be delivered to shareholders within two months of the end of the first half of each financial year and will include:

- a commentary on performance for the period
- a description of scientific and technological highlights for the period
- unaudited income statement, balance sheet, and statement of cash flows, with notes
- certification by the Board that the Company has operated in accordance with the Crown Research Institutes Act 1992 and Companies Act 1993 during the period.

### 11.2 Annual Report

The annual report will be delivered to shareholders within three months of the end of each financial year. It will report on the operations during the financial year of the consolidated Company and, separately, of any subsidiaries. It will comply with the reporting provisions of the Public Finance Act 1989, the Companies Act 1993, the Crown Research Institutes Act 1992, and the Crown Entities Act 2004.

The report will include

- performance against financial targets in the SCI for the year, and the comparative figures for the previous year, together with reporting on science performance in both metric and narrative form
- a commentary on performance for the period
- an account of deployment of Direct Crown Funding
- a description of scientific and technological highlights for the period
- a description of other highlights for the period
- audited income statement, balance sheet, statement of cash flows, and accounting policies together with notes to the accounts
- the auditor's report on the financial statements
- a statement of responsibility to accompany the financial statements
- certification by the Board that the Company has operated in accordance with the Crown Research Institutes Act 1992 and Companies Act 1993 during the year.

### 11.3 Other information to be reported

We will supply any other information required by the shareholders, pursuant to Section 20 of the Crown Research Institutes Act 1992.

## 12 Commercial Value, Dividend Policy, and Compensation

### 12.1 Commercial value

Section 16(3) of the CRI Act requires the Company to furnish an estimate of the current commercial value of the Crown's investment. The GNS Science Board is satisfied that the net asset position (or total equity) as at 30 June 2014 is a reasonable proxy for the commercial value of the Group. The net asset position as shown in accordance with the company's accounting policies for 30 June 2014 was \$29.0 million.

### 12.2 Dividend policy

Our dividend policy is that funds surplus to the Company's investment and operating requirements, as determined by the principles outlined below, will be distributed to the shareholders. In determining surplus funds consideration will be given to

- providing for capital investment requirements (including equity investments) without recourse to the Crown for equity injections to the Company
- opportunities for internal development expenditure
- the Company's working-capital requirements (including subsidiaries and businesses in which equity is held)
- the short, medium, and long-term financial viability of the Company, including its ability to repay debt and the level of revenue in advance
- risks of meeting our financial targets
- the obligations of the Directors under the Companies Act 1993 and other statutes.

The Board will detail, in a submission to shareholding Ministers, within two months of the end of each financial year

- the amount of dividend (if any) recommended to be distributed to the shareholders
- the percentage of tax-paid profits that the dividend represents.

**Table 9: Forecast levels of shareholders' equity and proposed dividends**

<b>Year ending 30 June</b>	<b>2015 forecast</b>	<b>2016 budget</b>	<b>2017 outlook</b>	<b>2018 outlook</b>
Equity (\$000)	30,724	32,049	34,024	36,586
Dividends (\$000)	250	250	250	250

### 12.3 Compensation

Where the Crown wishes us to undertake activities or assume obligations that will result in a reduction of our profit or net worth, the Board will seek compensation sufficient to allow the Company's position to be restored.

No compensation is currently being sought from the Crown.

## **13 Accounting, Investment, Procurement of Services, and Other Business Policies**

### **13.1 Accounting policies**

The Institute of Geological and Nuclear Sciences Limited is established under the Crown Research Institutes Act 1992 and the Companies Act 1993. Its subsidiary companies are established under the Companies Act 1993. The financial statements have been prepared in accordance with the Crown Research Institutes Act 1992, the Public Finance Act 1989, the Companies Act 1993, the Crown Entities Act 2004 and the Financial Reporting Act 1993.

Financial statements for the Institute of Geological and Nuclear Sciences Limited (the “Company”) and consolidated financial statements (the “Group”) are presented. The consolidated financial statements comprise the Company and its subsidiaries.

The principal activities of the Company are to undertake geoscience and isotope science research, development and technology transfer, predominantly in New Zealand.

The financial statements have been prepared in accordance with New Zealand generally accepted accounting practice. They comply with New Zealand equivalents to International Financial Reporting Standards and other applicable Financial Reporting Standards, as appropriate for profit-oriented entities. The financial statements also comply with International Financial Reporting Standards.

The financial statements of the Group and Company have been prepared on an historical cost basis, except that derivative financial instruments are measured at their fair value.

The financial statements are presented in New Zealand dollars, which is the Group’s functional currency. All values are rounded to the nearest thousand.

Subsidiaries are those entities controlled by the Company. Control is achieved where the Company has the power to govern the financial and operating policies of an entity to obtain benefits from its activities.

The financial statements of subsidiaries are included in the consolidated financial statements using the purchase method of consolidation. The effects of intra-group transactions are eliminated in the consolidated financial statements.

Investments in subsidiaries are recorded by the Company at cost.

A joint arrangement is an arrangement whereby the Company or its subsidiaries have joint control over an entity. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities of that entity require the unanimous consent of the parties sharing control. A joint arrangement is either a joint operation or a joint venture. For a joint operation the Company recognises its share of assets, liabilities, revenues and expenses on a line-by-line basis using the proportionate method. For a joint venture the Company recognises its interest in a joint venture as an investment and accounts for that investment using the equity method.

In applying the accounting policies, there is the requirement for judgements, estimates and assumptions to be made about the carrying amounts of some assets and liabilities. The estimates and assumptions are based on historical experience and other relevant factors. Actual results may differ from these estimates.

Further detail in respect of the accounting policies for the Company and Group are set out in the GNS Science Annual Report for the year ended 30 June 2014. No significant changes in accounting policies are envisaged between the above policies and the budget and forecast information included in this document.

### **13.2 Shareholder consent for significant transactions**

The Board will obtain prior written consent for any transaction or series of transactions involving full or partial acquisition, disposal or modification of property (buildings, land and capital equipment) and other assets with a value equivalent to or greater than \$10 million or 20% of the Company's total assets (prior to the transaction), whichever is the lesser.

The Board will obtain prior written consent of shareholding Ministers for any transaction or series of transactions with a value equivalent to or greater than \$5 million or 30% of the Company's total assets (prior to the transaction) involving:

- acquisition, disposal or modification of an interest in a joint venture or partnership, or similar association
- acquisition or disposal, in full or in part, of shares or interests in a subsidiary, external company or business unit
- transactions that affect the Company's ownership of a subsidiary or a subsidiary's ownership of another entity
- other transactions that fall outside the scope of the definition of the Company's core business or that may have a material effect on the Company's science capabilities.

### **13.3 Investments in capital assets**

We will invest in capital equipment and facilities that will enhance our ability to develop our business and provide an appropriate rate of return on the investment. Return on investment will be monitored to provide a basis for future investment decisions.

### **13.4 Procurement of services**

We will assess the procurement of services, facilities and resources that may be shared among the Crown Research Institutes and other related organisations. This assessment will involve working with the other CRIs to identify any duplications of effort where cost savings, efficiencies, or quality improvements may be achievable.

### **13.5 Databases and collections**

The Company has policies on the management of its data and collections.

In managing our data and collections we will comply with applicable legislation, including the Official Information Act 1982, the Commerce Act 1983, the Crown Research Institutes Act 1992, and the Privacy Act 1993.

We will make our scientific datasets and collections publicly available using the suitable Creative Commons license, except:

- when data or collections were obtained or created for a third party; in this circumstance we will maintain any agreed confidentiality or restriction on use until the data or collection has entered the public domain
- when Creative Commons licence terms are not appropriate; for example, where access fees are necessary to sustain our business by giving us a return on investment from our own resources.

Whenever possible we will adopt international, national, or industry standards applicable to the data. When this is not possible, we develop organisational standards.

We allocate a portion of our Direct Crown Funding for maintaining our databases and collections, and facilitating their wider use.

We will not dispose of, without the prior permission of the shareholders, any of the Nationally Significant Databases and Collections for which we have accepted responsibility (see Table

6). We will not dispose of any other database or collection we consider to be of national significance without first discussing this with the shareholders:

- Active Faults Database of New Zealand (AFD - web map also available)
- Strong Motion Database (SMD)
- Petroleum Basin Explorer (PBE)
- New Zealand Stratigraphic Column File (non-digital)
- New Zealand Gravity Station Network (web map also available)
- New Zealand Geothermal Use Database
- Other web maps (6)
- Mineral Resources of New Zealand (3 databases)
- New Zealand Fossil Spores and Pollen Catalogue
- New Zealand Stratigraphic Lexicon
- Cenozoic Mollusca of New Zealand
- New Zealand Geoscience Bibliography
- GNS Science Photo Library
- GNS Science Data Repository

Regard will be held to the CRI Act and the Public Records Act when disposing of any database or collection. We will advise shareholders of any dispute regarding the terms of access and use of any Nationally Significant Database or Collection. The Company will make all reasonable attempts to settle the dispute with the disputing party. We will refer the matter to shareholders in the absence of any agreement within 30 days of notification of a dispute. Any decision by the shareholders will be binding on the Company.

## 14 International Agreements

The co-operation agreements and arrangements that we have with international organisations are set out below. The Company will inform shareholding Ministers in writing should it plan to dissolve any formal international agreement for which we have responsibility.

The Company officially represents New Zealand on the following international bodies to ensure New Zealand input to planning groups and the development of international standards. In some cases, membership is in part financially supported by government agencies (e.g. MFAT, MBIE):

- Australia New Zealand Minerals and Energy Council Chief Government Geologists Conference
- Australian Institute of Nuclear Science and Engineering
- International Atomic Energy Agency Regional Co-operative Agreement (IAEA-RCA)
- Incorporated Research Institutions In Seismology
- International Partnership for Geothermal Technology (GNS Science holds the Secretariat)
- OECD International Energy Agency Geothermal Annex (GNS Science holds the Secretariat)
- Pacific Tsunami Warning and Mitigation System (Intergovernmental Oceanographic Commission, UNESCO)
- United Nations Comprehensive Test Ban Treaty Working Group
- UNISDR Scientific and Technical Advisory Group

We are a Member of, or represent New Zealand, on associations of the International Council of Scientific Unions, and other international scientific committees:

- Integrated Ocean Discovery Programme (IODP)
- International Association of Geochemistry and Cosmochemistry (IAGC)
- International Association of Seismology and Physics of the Earth's Interior (IASPEI)
- International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)
- International Atomic Energy Agency (IAEA)
- International Continental Scientific Drilling Programme (ICDP)
- International Geological Congress (IGC)
- International Panel on Climate Change (IPCC)
- International Union of Geological Sciences (IUGS)
- International Union of Geodesy and Geophysics (IUGG)
- Scientific Committee on Antarctic Research (SCAR)
- Scientific Committee of Integrated Research on Disaster Risk (IRDR)
- Southern California Earthquake Center (SCEC)

In addition, we have Memoranda of Understanding with overseas institutions. These usually provide for the exchange of staff between institutions on collaborative programmes:  
Geoscience Australia:

- Chilean National Commission for Scientific and Technological Research
- China Earthquake Administration (formerly State Seismological Bureau), China
- China Geological Survey
- Hebei Bureau of Prospecting and Development of Geology (China)
- Nankai University (China)
- Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences
- Japanese National Institute of Advanced Industrial Science and Technology
- Japan Marine Science & Technology Centre
- New Energy and Technology Development Organisation, Japan
- Korean Institute of Geology, Mining, and Minerals
- Oxford University (UK)
- United States Geological Survey (USA)
- University College London (UK)
- University of Hawaii (USA)
- Woods Hole Oceanographic Institution

## 15 Signatures



Ken Shirley, Deputy Chairman  
3 July 2015



James Johnston, Director  
3 July 2015

