# National Science Challenges Performance Framework

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT HĪKINA WHAKATUTUKI newzealand.govt.nz

## Contents

INTRODUCTION	3
Purpose of this document	3
Who it is intended for	3
Parties involved	3
MBIE interaction with the NSCs	4
Investment Drivers	4
NSC policy objective and NSC-specific objectives	4
NSC principles	5
NSC PERFORMANCE MONITORING	6
Key Elements of Performance Monitoring	6
Common Performance Areas	6
Outcomes Framework	7
Key Performance Indicators	7
Common and specific Key Performance Indicators	8
Narrative Reporting on Performance Areas	8
Statistical information	8
NSC MONITORING PROCESS	9
Annual Monitoring Cycle	9
Annual Progress Report	9
Forward-looking Plan	9
MBIE actions	9
NSC REVIEWS AND EVALUATIONS	10
APPENDIX ONE: NATIONAL SCIENCE CHALLENGES OUTCOMES FRAMEWORK	11
APPENDIX TWO: COMMON PERFORMANCE AREAS AND KEY PERFORMANCE INDICATOR FRAMEWORK	12

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## Introduction

The National Science Challenges (NSCs) take a strategic approach to the Government's science investment by targeting a series of objectives, which, if achieved, will have major and enduring benefits for New Zealand. The eleven NSCs provide an opportunity to align and focus New Zealand's research on large and complex issues by drawing together scientists together from different institutions, and across disciplines, to achieve a common goal through collaboration.

The Government has allocated funding for the NSCs for ten years to 30 June 2024. Funding was allocated to each Challenge initially for the period to 30 June 2019 with subsequent funding for the second period of funding subject to a mid-way review of individual NSCs and the NSC policy. As a result of the mid-way review, all NSCs were awarded funding for a further five years until 30 June 2024.

The 2015 Performance Framework guided performance for the first period of funding. This Framework updates elements of the 2015 Framework for the second funding period from 1 July 2019 until 30 June 2024.

### Purpose of this document

The NSC Performance Framework sets out how the Ministry of Business, Innovation and Employment (MBIE) will monitor and evaluate:

- > individual NSCs
- > the NSC policy.

The Performance Framework outlines the key performance elements used to monitor and assess the extent to which each NSC is achieving its objective, and to evaluate whether the intent of the NSC policy is being met.

The Performance Framework supports the collection of transparent, comparable information of progress towards outcomes over time. The performance information will inform MBIE's future investment decisions.

### Who it is intended for

The principal audiences for the Performance Framework are MBIE staff and NSCs.

The Framework provides NSCs with the context for the reporting requirements specified in NSC Investment Contracts and Challenge Programme Agreements with MBIE, and provides high-level guidance on how MBIE monitors and evaluates NSC funding.

MBIE will provide NSCs with more detailed guidelines on annual reporting which will be consistent with this Framework.

#### Parties involved

NSC funding is devolved funding, contracted to a host organisation. Each NSC has its own governance and management structures; decisions about programme funding and activities supported by the NSC are made by an independent governance group in line with the approved Future Strategy. All NSCs employ a Director to oversee NSC activity among the participants.

The **governance group** of each Challenge monitors *performance of Challenge activities*, i.e. research projects and programmes and related activities, to ensure that they are aligned with the Challenge objective and are on track to be achieved.

**MBIE** monitors and assesses overall *performance of each Challenge* based on information provided by the Challenge and other information collected by MBIE. MBIE also evaluates the *performance of the NSC policy* as a whole to test whether the policy intent is being achieved.

### MBIE interaction with the NSCs

MBIE will monitor and assess progress of NSCs regularly over time.

MBIE Investment Managers have **regular informal interactions** with the NSC leadership team, which will allow MBIE to monitor progress of the NSC, outside of the formal reporting process.

An MBIE observer, usually lead Investment Manager, attends **governance group meetings** and receives papers of each Challenge's governance group (see NSC Investment Contract). These papers are not formally submitted to MBIE, but do provide a more complete picture of Challenge performance and present the opportunity for early intervention when required.

It is expected that interactions between MBIE and NSCs take the form of a relationship model, rather than being transactional.

#### **Investment Drivers**

\_ 4

The <u>National Statement of Science Investment 2015-2025</u> (NSSI) is the overarching driver for the Government's investment in science and the <u>Vision Mātauranga policy</u> is an underlying principle of all science investments.

The NSSI sets excellence as one of the two pillars of the science system. The second pillar relates to impact. The vision of the NSSI is that the Government's investments in science make measurable contributions to productivity and the wellbeing of New Zealanders and have a strong line of sight to eventual benefits.

When making funding decisions for the second period of NSC funding, the Science Board was guided by the assessment criteria in the <u>Gazette notice</u> dated 12 September 2017.

Nested below the overarching investment drivers outlined above, NSCs are also guided by the NSC policy objective. NSC performance monitoring and evaluation is linked to the intent of the policy and individual Challenge objectives.

#### NSC policy objective and NSC-specific objectives

The policy objective of National Science Challenge funding is to fund research, science, or technology, or related activities that have the potential to:

- > respond to the most important, national scale issues and opportunities identified by science stakeholders and the New Zealand public
- > promote collaboration across a number of research providers and involve a broad portfolio of multi-disciplinary research activity
- > enable government to take a more long-term strategic approach to managing and coordinating mission-led science investments
- > complement other science priorities and
- > give effect to the Vision Mātauranga policy.

Each NSC is responsible for delivery against a high-level objective determined by the Government and contracted against by MBIE (see <u>Gazette notice</u>).

#### NSC principles

NSCs are guided by a set of establishment and implementation <u>principles</u> available on MBIE's website.

## NSC Performance Monitoring

### Key Elements of Performance Monitoring

MBIE monitors and assesses NSC performance, and evaluates the NSC policy via an annual Progress Report that includes:

- > a set of common and specific Key Performance Indicators
- > narrative reporting against performance areas
- > project-level and Challenge-level statistical information.

Along with other information collected about the Challenge, MBIE uses this information to monitor and assess Challenge performance on an annual basis. Aggregating performance information from individual NSCs (with particular reference to common KPIs) will inform evaluation of whether the NSC policy as a whole is achieving its intent.

The information that MBIE collects is multi-faceted and will allow MBIE to build a comprehensive picture of performance with qualitative and quantitative findings.

#### **Common Performance Areas**

- 6

At the core of the Performance Framework are the following performance areas.

PERFORMANCE AREA	KEY QUESTIONS
1 Impact	To what extent has progress been made towards achievement of the Challenge objective and in delivering benefit for New Zealand?
2 Science excellence	To what extent is the Challenge supporting appropriate and world-leading science?
3 Best research team collaboration	To what extent is the Challenge being delivered by New Zealand's best research team, and benefiting from the expertise, knowledge and resources of national or international collaborators?
4 Stakeholder engagement	To what extent is the Challenge engaging with stakeholders in designing and developing/creating Challenge research and working towards shared goals?
5 Vision Mātauranga	To what extent are effective partnerships with Māori being formed, Māori capability built and mātauranga Māori integrated in Challenge research to address the needs and aspirations of Māori and all New Zealanders?
6 Governance and management	To what extent are governance and management arrangements operating strategically and effectively?
7 Public awareness and participation	To what extent is there effective engagement between the Challenge and the New Zealand public?

The performance areas cover progress towards Challenge impact (performance area 1) and reflect the principles of the NSC policy that contribute to achieving those objectives (performance areas 2-7).

#### **Outcomes Framework**

An Outcomes Framework is a strategic governance and management tool that outlines a clear line of sight from the problem or opportunity that a Challenge intends to address (the Challenge objective approved by Cabinet) and the pathway to deliver on the Challenge objective including inputs, activities, outputs, outcomes through to long-term impacts.

MBIE has developed an Outcomes Framework capturing the NSC policy intent and the collective outcomes and impacts of the NSCs (see Appendix One). Based on this Framework, each NSC will develop an individual Outcomes Framework as the basis for developing KPIs. The Framework will be used to monitor the extent to which the NSC is achieving its objectives and how each NSC is progressing against the objective of the NSC policy. The Framework will also provide a basis for evaluation of the NSC policy as a whole. Each Outcomes Framework should reflect, and be closely aligned to, the NSC's Future Strategy 2019-2024.

The Outcomes Framework should cover all Challenge activities funded through MBIE funding.

#### **Key Performance Indicators**

MBIE uses a KPI-based framework to monitor and assess performance of the NSCs, including the extent to which each Challenge is achieving its objective.

The Outcomes Framework and KPIs form part of the contract with MBIE. Each NSC will agree with MBIE a set of KPIs to measure delivery against the common performance areas and whether the NSC policy intent is being met.

Principles applying to all NSC KPIs are that they:

- > are derived from investment drivers, in particular, the NSSI and NSC-specific fund documentation, to establish line-of-sight to fund objectives
- > demonstrate progress towards achievement of the NSC objective throughout the term of the ten-year investment, as well as achievements at investment maturity and, if appropriate, beyond the term of the investment
- > focus on a few high quality indicators, clearly defined that balance the need for MBIE to account for public funds while minimising the reporting burden for hosts
- > are benchmarked where possible (or referenced to established baselines or targets)
- > meet SMART criteria (specific, measurable, achievable, realistic/relevant and time-bound)
- > provide data to be used for the purpose of performance monitoring and evaluation (consistent with MBIE's data collection policy).

A mix of appropriate "lead" and "lag" (input- and output-related measures) can be used to indicate progression throughout the term of the investment, and or explain attribution by showing a clear result from a specific action.<sup>1</sup>

<sup>&</sup>lt;sup>1</sup> Lead KPIs are typically input oriented and easy to measure and influence. Lag KPIs are typically results oriented and may be hard to quantify or influence. Lag KPIs are a change produced as a result of outputs of an investment, not the outputs themselves.

NSCs may need to revise KPIs in place for the first funding period to align to their Future Strategy 2019-2024, taking into account the principles and considerations above and below, and will need to agree those indicators with MBIE.

#### Common and specific Key Performance Indicators

For all performance areas, a set of **common KPIs** will apply to all NSCs. Some of these indicators will be based on information gathered by MBIE. For others, NSCs will collect (and provide MBIE with) the data. See Appendix Two for more detail on common performance areas, along with a set of common KPIS that apply to all NSCs.

NSCs will include **NSC-specific KPIs** where these are useful to complement common KPIs; the number of NSC-specific KPIs should be the minimum number to enable the Challenge to deliver on its Outcome Framework. NSC-specific KPIs should align to the Challenge objective.

The KPIs that are not common may be changed if necessary, in agreement with MBIE, to reflect changes in research drivers or direction as each Challenge progresses.

#### Narrative Reporting on Performance Areas

To support KPI reporting and tell its performance story more in full, each NSC will provide narrative content against performance areas. Appendix Two highlights examples of narrative information to include in annual Progress Reports.

#### Statistical information

- 8

Each NSC will provide Challenge-level and project-level information which will add context and provide information for MBIE's view of the science system as a whole. In the future, data collected via the New Zealand Research Information System (NZRIS) will provide other measures that can be used as evidence of performance.

MBIE will provide NSCs with more detailed guidelines on statistical information as part of guidelines on annual progress reporting.

## NSC Monitoring process

## Annual Monitoring Cycle

#### Annual Progress Report

Each NSC will provide to MBIE an annual Progress Report no later than **31 August** each year, covering progress against the contract over the previous MBIE financial year. This will include narrative annual Progress Report, data on each KPI against the common performance areas and Challenge-level, and project-level statistical information. This ensures a mixture of both quantitative and qualitative information is provided, covering different dimensions of performance.

MBIE will assess the performance information provided by each Challenge in conjunction with other knowledge gained from its regular interaction with each Challenge's governance group and leadership team, and any other information that it may collect. MBIE will provide written feedback to the NSCs, which may be followed up by a discussion with each NSC.

MBIE expects a Challenge governance group to take remedial action if progress reported in the Progress Report is not reaching MBIE's expectations. Where a change event arises, funding may be suspended.

#### Forward-looking Plan

Each NSC will submit a Forward-looking Plan to MBIE by **31 May** each year that outlines the Challenge's focus and detailed plans for the coming year. MBIE will provide written feedback to the NSCs, which may be followed up by a discussion with each NSC on the focus of future activities if significant concerns are not alleviated.

### **MBIE** actions

MBIE will provide NSCs with more detailed guidelines on annual reporting each year. MBIE will:

- > provide NSCs with Annual Progress Reporting Guidelines early in each calendar year
- > open IMS for the Forward-looking Plan by 1 May each year
- > open IMS for annual reporting by 1 August each year.

# NSC Reviews and Evaluations

- 10

**End of ten years:** Besides monitoring and assessing performance of each Challenge annually, MBIE will also evaluate whether the NSC policy as a whole is achieving its intent. Aggregating performance information from individual NSCs (with particular reference to common KPIs) will inform this evaluation before the completion of the second funding period (30 June 2024). This evaluation will take place in 2022 and precedes a review of individual NSCs in 2023.

**Ad hoc reviews, audits, or evaluation:** Besides any scheduled reviews, MBIE may choose to carry out ad hoc reviews of a Challenge or group of Challenges. MBIE may also audit a Challenge when it considers it necessary.

## Appendix One: National Science Challenges Outcomes Framework

### National Science Challenges Outcomes Framework



## - 12

# Appendix Two: Common Performance Areas and Key Performance Indicator Framework

- Each Challenge will be assessed annually on the basis of the following seven performance areas.
- To tell its performance story, each Challenge will report through a mix of KPIs and narrative content of annual Progress Reports.
- Some indicators will be common across all Challenges. The Challenges will collect (and provide MBIE with) the data for some of these common KPIs; MBIE will collect the data for other common KPIs where a co-ordinated approach is sensible.
- Challenges may include NSC-specific KPIs where these are useful to complement common KPIs; the number of NSC-specific KPIs should be the minimum number to enable the Challenge to deliver on its Outcome Framework and objective. Data collected via NZRIS will provide other measures that can be used as evidence of performance.
- A target for each common KPI (if not specified) is to be set by individual Challenges (see italics).

KEY PERFORMANCE INDICATORS				
Performance area	Key questions	Key Performance Indicators common to all Challenges	Target	Examples of infor Progress Reports conjunction with
1. Impact	<ul> <li>To what extent has progress been made towards achievement of the Challenge objective and in delivering benefit for New Zealand?</li> <li>a) The Challenge is making significant progress towards its objective.</li> <li>b) The Challenge demonstrates a well-considered approach to investment planning, implementation and delivery (pathway to impact).</li> </ul>	NSC-specific key performance indicators agreed between MBIE and each Challenge, based on the Challenge's Outcomes Framework.         Impact case studies (submitted via annual Progress Report) demonstrating that Challenge outputs are valued by stakeholders and are being used (or have the potential to be used) to deliver benefit for New Zealand.	<ul> <li>3 impact case studies annually for NSCs that receive up to \$30m in phase two.<sup>2</sup></li> <li>4 impact case studies annually for NSCs that receive between \$30m and \$50m in phase two.<sup>3</sup></li> <li>5 impact case studies annually for NSCs that receive more than \$50m in phase two.<sup>4</sup></li> <li>MBIE satisfaction with impact case studies.</li> </ul>	Progress made to d performance indicat Major highlights an Reasons for falling b Any future risks of r
2. Science excellence	<ul> <li>To what extent is the Challenge supporting appropriate and world-leading science?</li> <li>a) The Challenge delivers high-quality science of a strategic nature and tests itself with new ideas,</li> </ul>	The number of Challenge publications accepted by the top 25% of journals worldwide, as ranked by field-normalised impact factor (bibliographic analysis undertaken by MBIE of published research papers in the reporting year).	Positive trend continued from baseline established.	Processes in place for quality reviews have advisory group. Actions taken as a r
	<ul><li>approaches, and mechanisms.</li><li>b) Excellence is recognised by scientific peers</li></ul>	The citation score of publications, normalised by field, publication type, and publication year (bibliographic analysis	Positive trend continued from	Major science/resea

<sup>2</sup> Deep South, Ageing Well, A Better Start, Healthier Lives, Building Better Homes Towns and Cities

<sup>3</sup> Resilience to Nature's Challenges, New Zealand's Biological Heritage, Sustainable Seas

<sup>4</sup> High-Value Nutrition, Our Land and Water, Science for Technological Innovation

#### REPORTING

#### prmation (narrative) to include in annual s to support KPI reporting. To be considered in annual reporting guidelines.

date against each Challenge specific key cator.

and achievements in each performance area.

g behind in any area and remedial action taken.

f non-delivery and mitigation action.

for ensuring science excellence, e.g., what science ave been undertaken, role/input from science

result of ISAP report/feedback.

search highlights during reporting period.

3. Best research team collaboration	<ul> <li>and/or key stakeholders.</li> <li>c) The expertise needed to deliver excellent science is available to the research team (in-house or through collaboration).</li> <li>d) Effective processes are in place to ensure excellence.</li> <li>To what extent is the Challenge being delivered by New Zealand's best research team, and benefiting from the expertise, knowledge and resources of national or international collaborators?</li> <li>a) Challenge demonstrates strategic collaboration with other organisations and individuals within, and outside, New Zealand.</li> <li>b) Research team has the capability (multi-, interand trans-disciplinary) necessary to achieve the objective, and expertise gaps are filled.</li> <li>c) International science expertise is used where appropriate.</li> <li>d) A growing and diverse cohort of researchers and stakeholders are working in a culturally responsive, collaborative way.</li> <li>e) Emerging talent has opportunities (in research or leadership roles).</li> <li>f) The team involves relevant stakeholder, end-user and Mãori experts.</li> </ul>	undertaken by MBIE of published research papers in the reporting year). The number of Challenge publications ranked in the year's top 10%, ranked by field- and publication-type-normalised citation (bibliographic analysis undertaken by MBIE of published research papers in the reporting year). Science excellence is independently monitored through Challenge ISAPs (or equivalent). The proportion of publications produced as the result of domestic, or domestic and international, collaboration (bibliographic analysis undertaken by MBIE of published research papers in the calendar year). Effectiveness of team, e.g. science leadership, skill and expertise mix, collaborations with Māori, stakeholders and end-users (survey conducted by MBIE).	baseline established. Positive trend continued from baseline established. Evidence that the ISAP annually reviews part of the research portfolio to provide the governance group with input on science strategy and assurance of science excellence. Positive trend continued from baseline established. Biennial survey conducted by MBIE. Positive trend continued from baseline established in phase one.	Achievements (e.g. etc.). Rationale for selecti Quality control and Any quality failures Any emerging risks What teams are work Evidence of linkages agreements entered Processes to invite r What were the outo Challenge? What has been don Risks associated wit other, e.g. equipme How teams are brow disciplinary approad
4. Stakeholder engagement	To what extent is the Challenge engaging with stakeholders in designing and developing/creating Challenge research and working towards shared goals?a) Timely opportunities are provided for stakeholders to inform and influence Challenge	Satisfaction among stakeholders with their involvement in research priority setting and co-design and co-delivery of research projects (survey conducted by MBIE).	Biennial survey conducted by MBIE. Positive trend continued from baseline established in phase one.	What has been achi a) who are the key b) Agreements or c) plans for knowle
	<ul><li>priorities and research direction.</li><li>b) Stakeholders take up and use research results.</li><li>c) Challenge influences activities and investments</li></ul>	Satisfaction among stakeholders with knowledge exchange and technology development and access to research delivered by the Challenge (survey conducted by MBIE).	' Biennial survey conducted by MBIE. Positive trend continued from	<ul> <li>d) how research is</li> <li>e) other arrangem secondments et</li> <li>f) co-funding and</li> </ul>

evidence of peer recognition such as awards

- ction of journals for publications.
- nd assurance processes applied.
- es and remedial steps taken.
- ks to science excellence.

orking across organisations and/or disciplines.

- es with international research partners, e.g. MoUs, ed into.
- e new parties and researchers into the Challenge.
- tcomes of new parties or researchers joining the
- one to support early-career researchers?
- vith capability and competencies (personnel and nent) action taken to address risks.
- ought together and inter- and/or transaches are applied/developed.

hieved with key stakeholders, e.g.: ey stakeholders?

- or MoUs entered into
- wledge exchange and technology development
- is being used and strategies for uptake
- ments, e.g. joint board meetings, staff etc.
- nd non-cash support, external revenue earned

	of external stakeholders.		baseline established in	g) future stake
	<ul> <li>d) Challenge research is supporting outcomes that are relevant to and/or address areas of current or future value, growth or critical need.</li> </ul>		phase one.	How stakeholde development/c
	e) The investment delivers results (e.g., service, data, information) that are valued by			Relationship iss have been reso
	stakeholders and used to deliver benefit for New Zealand.			Role/input from Growth in numl
	f) Impact is accelerated through end-user uptake			improvements generated know
	and application of results.			Adoption rate, i research output
5. Vision Mātauranga	To what extent are effective partnerships with Māori being formed, Māori capability being built and Mātauranga Māori being integrated in	It         Satisfaction among Māori stakeholders with their influence on, engagement with, and value received from the Challenge (survey conducted by MBIE	conducted by MBIE.	Demonstrate ho the Challenge.
	Challenge research to address the needs and	conducted by MBIE).	Positive trend continued from	How is the Cha
	<ul><li>aspirations of Māori and all New Zealanders?</li><li>a) Effective partnerships with Māori recognise</li></ul>		baseline established in phase one.	Research projec Mātauranga.
	contribution and aspirations and work collaboratively towards giving effect to the	Māori involved in Challenge research.	Headcount. Annual increase from baseline	Examples demo capability and o
	<ul><li>Vision Mātauranga policy.</li><li>b) Mātauranga Māori is integrated into Challenge</li></ul>		set by Challenges.	Initiatives to bu researchers.
	<ul><li>research, where appropriate.</li><li>c) Māori capability is built through opportunities to</li></ul>	Māori in positions of leadership within the Challenge (e.g. governance and management, programme leadership).	Headcount. Annual increase from baseline	
	engage in Challenge research.		set by Challenges.	
		Challenge funding invested in Māori-led or Kaupapa Māori research.	Annual increase from baseline set by Challenges - % of annual total Challenge budget.	
6. Governance and management	To what extent are governance and management arrangements operating strategically and effectively?	Qualitative assessment* of governance effectiveness and management including structure, processes, and relationships with Challenge host, Kāhui (if in operation), and advisory groups	Annual survey conducted by Challenges (at least one	Evidence of the overall approac rationale for res
	a) Governance entity ensures that Challenge research portfolio maintains a strategic focus on	(if in operation). *Self- or external assessment	external assessment before 2022).	identified. If risks are iden
	<ul><li>Challenge objective.</li><li>b) Effective processes are in place (such as</li></ul>		MBIE satisfaction with	implemented.
	performance reporting and monitoring, financial management, audit).		results of governance assessment.	Significant char management m
				Results of asses external Challer
				Demonstrate ad deliverables.

older engagement plans.

- s have been involved in co-design, ation and implementation of Challenge research.
- es and risks emerging risks or how existing risks ed.
- stakeholder advisory group (if this exists).
- er of stakeholders reporting significant their operations as a result of Challengeedge and technology.
- % of industry or target market that adopts

mātauranga Māori has been embedded across

- enge is adopting a Te Ao Māori approach?
- s achieved/under way using Māori resources or
- strating how Māori involvement is building Māori pacity.
- Vision Mātauranga capability across all Challenge

uality of the Challenge's strategic leadership and e.g., results of horizon scanning; ISAP report; arch prioritisation; technical or uptake risks

ied what mitigation action is planned or

- es (current or planned) in governance and mbership or arrangements.
- ment of governance group performance and any je reviews or audits.
- ve management of contract milestones and key

7. Public awareness and participation	<ul> <li>To what extent is there effective engagement between the Challenge and the New Zealand public?</li> <li>a) The Challenge undertakes an appropriate programme of communication targeted to the New Zealand public to encourage shared aspirations.</li> <li>b) Opportunities are provided for members of the public to be actively involved in the Challenge, where appropriate.</li> </ul>	Targeted outreach activities transferring information to the public.	Communications strategy developed/revisited by June 2020. <i>Challenge-specific</i> <i>targets</i> .	Major activities unde participation, results Upcoming events. Risks – how resolved
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ndertaken, details of activity, target group, ılts etc.

ved, emerging risks.





