

Empowering Global Research: Strengthening Collaboration and Capability for New Zealand's Research Future



REANNZ

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About the Report

In 2024, REANNZ commissioned Collective Strategy to engage with the research sector to identify barriers and explore opportunities to improve access to Horizon Europe and other international funding initiatives, and the role REANNZ could play. This report was shaped by insights from interviews with 28 stakeholders in a wide range of roles.

Chief Executive's Foreword

The global research landscape is evolving rapidly, with initiatives like Horizon Europe (the European Union's flagship funding programme for science and innovation) offering exciting opportunities for New Zealand researchers to collaborate internationally. Horizon Europe offers unparalleled access to world-class research infrastructure, including the European Open Science Cloud. New Zealand's participation is supported by the Ministry of Business, Innovation and Employment (MBIE).

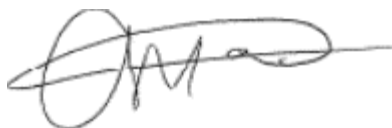
As part of REANNZ's role to support this work, the organisation is leveraging Global Research and Education Networks (GRENs), connecting local researchers to European networks like GÉANT and providing equitable access to world-leading research infrastructures.

This report will help inform REANNZ's strategic direction and roadmap, including exploring new initiatives to strengthen support for data governance and management. This may include, for example, establishing GDPR-compliant data repositories and frameworks, allowing researchers to securely store, share, and analyse data in accordance with global standards.

REANNZ remains committed to finding ways to better support Aotearoa's research sector. The organisation is proud to partner with the local research community to unlock new opportunities for innovation and collaboration on the global stage.

I deeply appreciate the contributions of researchers and stakeholders who shaped this report – particularly the report's author Angela Davis from Collective Strategy.

Amber McEwen



Chief Executive Officer,
REANNZ
29 January 2025

Introduction

International collaborations enable New Zealand researchers to partner on some of the planet's most complex and critical problems; and gain access to some of the world's most advanced research, technology and thought leadership to solve them.

“Simple problems can be solved with small collaborations, but complex problems need large-scale, multi-disciplinary collaboration.”¹

Technology infrastructure plays a critical role in the advancement and delivery of science and research. The European Commission's new strategy launched in 2023 makes it clear that technology infrastructure will be required to work at pace to keep up with its ambitious vision, which is to steer the next technological transition that focuses on the enhanced interactions between humans and technology with seamless connectivity and immersive experiences.²

This report builds on the REANNZ 2023 Research Engagement report that states “collaboration both nationally and internationally is increasing, along with the desire to move large datasets seamlessly across a wider range of institutions. This includes movement between traditional academic settings but also increasingly with industry, public sector institutions and open access/data domains.”³

New Zealand's association with Pillar 2 of Horizon Europe has opened an unprecedented opportunity to collaborate and receive funding from one of the world's largest future-focused innovation funds. New Zealand researchers and institutions need to be equipped and enabled with the right technology infrastructure to enable kiwi researchers to collaborate on and solve the complex problems facing the world today and tomorrow.

This report presents what participants see as the critical barriers to be addressed and potential opportunities for REANNZ to future-proof technology infrastructure to meet the needs of New Zealand researchers, and support their increased access and involvement with Horizon Europe and beyond.

New Zealand's association with Horizon Europe is young. As at November 2024, there were 13 research programmes underway, most at the early stages. Therefore the scope of this report was expanded to include researchers actively working on international collaborations with large data and technology infrastructure requirements in Australia, the UK and USA.

¹ All quotes in this report are from research participants and have been kept anonymous to maintain impartiality and remove bias.

² Towards the next technological transition: Commission presents EU strategy to lead on Web 4.0 and virtual worlds, European Commission, 11 Jul 2023, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3718

³ Research Engagement Report, REANNZ, Jul 2023

The insights in this report were gathered through interviews and emailed responses from 28 researchers, research support staff, institutional leadership, sector advisors and MBIE appointed Horizon Europe National Contact Points. A full list of participants is included later in the report.

This report is exploratory in nature. It is intended to provide greater awareness and understanding of the technology infrastructure barriers and opportunities that are emerging as a result of New Zealand's association with Horizon Europe and other international collaboration opportunities.

Executive summary

This report identifies four key focus areas that highlight the most significant technology infrastructure barriers and opportunities facing New Zealand's research community. These areas are critical for maximizing the potential offered by Horizon Europe and other international research collaborations.

The insights gathered from interviews and responses from 28 stakeholders – including researchers, research support staff, institutional leaders, sector advisors, and Horizon Europe National Contact Points – provide suggestions for REANNZ to support the future of research through advanced, fit-for-purpose technology infrastructure.

The four key areas of focus are:

1. Enhancing Data Governance and Digital Connectivity for researchers

- Establishing national data guidelines
- Centralised data management and storage
- Ensuring sufficient capacity for data transfer and storage
- Developing data security compliance and complying with EU regulations

2. Positioning REANNZ as a strategic partner for international collaboration

- Enabling New Zealand to contribute on the global stage
- Leveraging large-scale digital collaboration tools
- Connecting researchers to international digital tools and resources
- Connecting researchers to REANNZ products and services

3. Advancing research opportunities through collaboration, technology and skill development

- Fostering collaboration over competition among New Zealand institutions
- Using technology to unlock greater access to Horizon Europe Funding Calls
- Developing future skills and capability

4. Honouring Indigenous Data Sovereignty

- Recognising and respecting the importance of Indigenous Data Governance in international collaborations

These focus areas provide guidance for addressing emerging challenges and opportunities as New Zealand researchers engage with Horizon Europe and beyond. By aligning with these themes, where appropriate, REANNZ can play a key role in future-proofing the nation's technology infrastructure and enhancing New Zealand's global research presence.

Further details and participant feedback on these areas of focus are discussed in the subsequent sections of this report.

Seizing the Horizon Europe Opportunity

Association to Horizon Europe opens new pathways for New Zealand researchers to take part in or lead significant research consortia and gain access to world-leading expertise and technology infrastructure. New Zealand became an associated county in Pillar 2 in 2023, making it the first country outside of the EU to associate with the programme.

Association enables equal access to programme funding in return for a government financial contribution. In a complex geopolitical environment, the EU is seeking research partners it can trust.⁴ Canada and South Korea will soon be joining Horizon Europe Pillar 2 with the same status as New Zealand.

Total funding for Horizon Europe is approximately NZD\$160 billion (€90 billion) making it Europe's largest research funding programme. Total funding for Pillar 2 is NZD\$90 billion (€53.5 billion).⁵ New Zealand's investment in Horizon Europe between 2023 to 2028 will be approximately \$50 million, matching the funding New Zealand researchers receive from the programme. New Zealand has been a partner on previous EU funds such as Horizon 2020, however, this is the first time we have been able to access funding on an equal basis.

Participation in Horizon Europe is open to any legal entity. This means that New Zealand businesses can also join consortia to develop new high-tech products, grow new markets and networks and further the commercialisation of research. Given the complexity of the bid process and heavy compliance and reporting requirements, most New Zealand institutions are seeking to be collaborators rather than leading bids, although this could change as this country's involvement in the programme matures.

Many countries in the Pacific are automatically able to apply to Horizon Europe under the low-middle-income country status. This is an opportunity for New Zealand to elevate existing research partnerships in the Pacific.

⁴ How New Zealand's association could change Horizon Europe, Science Business 14 Feb 2023 <https://sciencebusiness.net/news/Horizon-Europe/how-new-zealands-association-could-change-horizon-europe>

⁵ New Zealand's Association to Horizon Europe: Twelve Months On, MFAT, Mar 2024, <https://www.mfat.govt.nz/en/trade/mfat-market-reports/new-zealands-association-to-horizon-europe-twelve-months-on-march-2024>

Horizon Europe Structure: Clusters and Destinations

Pillar 2 seeks to address the United Nations Sustainable Development Goals through science and technology. Within Pillar 2 there are six clusters or areas of focus:

- Cluster 1: Health (€8.2 billion, NZ\$14.6 billion)
- Cluster 2: Culture, Creativity and Inclusive Society (€2.3 billion, NZ\$4.1 billion)
- Cluster 3: Civil Security for Society (€1.6 billion, NZ\$2.8 billion)
- Cluster 4: Digital, Industry and Space (€15.3 billion, NZ\$27.2 billion)
- Cluster 5: Climate, Energy and Mobility (€15 billion, NZ\$26.7 billion)
- Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment (€9 billion, NZ\$16 billion)⁶

MBIE has appointed a National Contact Point (NCP) for each Cluster to provide guidance and support to researchers applying to the fund. Within each Cluster, there are several Destinations or subject areas that align with the EU’s policy priorities and outcomes.⁷

Figure 1. Horizon Europe – Pillar 2 Clusters and Destinations

Cluster 1 - Health	Cluster 2 – Culture, Creativity and Inclusive Society	Cluster 3 – Civil Security for Society	Cluster 4 – Digital, Industry and Space	Cluster 5 – Climate, Energy and Mobility	Cluster 6 – Food, Bioeconomy, Natural Resources, Agriculture and Environment
<ol style="list-style-type: none"> 1. Staying healthy 2. Living & working in a health-promoting environment 3. Tackling diseases & reducing disease burden 4. Innovative, sustainable and high-quality healthcare 5. Unlocking the full potential of new tools, technologies and digital solutions for a healthy society 6. Maintaining an innovative, sustainable & globally competitive health industry 	<ol style="list-style-type: none"> 1. Democracy and Governance 2. European Cultural Heritage and the Cultural and Creative Industries 3. Social and Economic transformations 	<ol style="list-style-type: none"> 1. Better protect the EU and its citizens against Crime and Terrorism 2. Effective management of EU external borders 3. Protected infrastructure 4. Increased Cybersecurity 5. A Disaster-Resilient Society for Europe 6. SSRI (Strengthened Security Research and Innovation) 	<ol style="list-style-type: none"> 1. Climate neutral, circular and digitised production 2. Increased autonomy in key strategic value chains for resilient industry 3. World leading data and computing Technologies 4. Digital and emerging Technologies for competitiveness and fit for the green deal 5. Open strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data 6. A human-centred and ethical development of digital and industrial technologies 	<ol style="list-style-type: none"> 1. Climate science and responses 2. Cross-sectoral solutions for the climate transition 3. Sustainable, secure and competitive energy supply 4. Efficient, sustainable and inclusive energy use 5. Clean and competitive solutions for all transport modes 6. Safe, Resilient Transport and Smart Mobility services for passengers and goods 	<ol style="list-style-type: none"> 1. Biodiversity and Ecosystem services 2. Fair, healthy and environmentally-friendly food systems from primary production to consumption 3. Circular economy and bioeconomy sectors 4. Clean environment and zero pollution 5. Land, oceans and water for climate action 6. Resilient, inclusive, healthy and green rural, coastal and urban communities 7. Innovative governance, environmental observations and digital solutions in support of the Green Deal

New Zealand’s Active Horizon Europe Projects

Below is a list of 13 publicly listed Horizon Europe projects with current New Zealand involvement.⁸ This number will increase in time with at least 30 further bids underway or planned. Some New Zealand institutions have committed considerable resources to increase their involvement in Horizon Europe while others are still getting up to speed with the requirements and how to make the most of this opportunity.

⁶ New Zealand’s Association to Horizon Europe: Twelve Months On, MFAT, Mar 2024, <https://www.mfat.govt.nz/en/trade/mfat-market-reports/new-zealands-association-to-horizon-europe-twelve-months-on-march-2024>

⁷ Horizon Europe – How to apply, European Research Executive Agency, Oct 2024, https://rea.ec.europa.eu/horizon-europe-how-apply_en#:~:text=The%20European%20Commission%20publishes%20calls,impact%20of%20the%20EU's%20funding

⁸ See the cordis.europa.eu for the latest projects using their filtered search: <https://tinyurl.com/5bkcb73v>

Table 1. List of active Horizon Europe research projects and the New Zealand partners as at November 2024

#	Project	Description	New Zealand Partners
1	d@rts	dialoguing@rts – Advancing Cultural Literacy for Social Inclusion through Dialogical Arts Education	University of Auckland
2	ERDERA	Improving the health and well-being of rare-disease patients through better prevention, diagnosis and treatment	University of Otago
3	EU-CIEMBLY	Creating an Inclusive European Citizens' Assembly	Victoria University of Wellington University of Waikato
4	GuardIAS	Guarding European waters from invasive aquatic species by applying AI and new data workflows to systematically query multiple biodiversity databases for species distribution, environmental tolerances, biological traits, and genetic information	Sequench and Nelson Artificial Intelligence Institute Limited (NAII)
5	INTRACOMP	Developing methods, digital resources and frameworks for advancing intercultural and transcultural competence in lifelong learning in cultural awareness and expression	University of Auckland
6	MINORITY REPORT	Mitigating environmental disruptive events using people-centric predictive digital technologies to improve disaster and climate resilience	University of Auckland University of Canterbury Urban Intelligence Limited Wellington City Council
7	OneSTOP	OneBiosecurity systems and technology for people, places and pathways biodiversity and ecosystem services: Understand and address direct drivers of biodiversity decline	Lincoln University
8	PROTID	Randomised Controlled Trial of Preventive Treatment of Latent Tuberculosis Infection in Patients with Diabetes Mellitus	University of Otago
9	REDESIGN	Supporting the transformative food value networks reshaping resilient urban landscapes	Lincoln University
10	STELLA	Digital technologies for plant health, early detection, territory surveillance and phytosanitary measures	Lincoln Agritech Ltd
11	UPWEARS	Contribute to a sustainable economy by unlocking the potential of bio-based and hybrid fabrics	SCION

#	Project	Description	New Zealand Partners
12	VALPOP	Valuing Public Goods in a Populist World: A Comparative Analysis of Network Dynamics and Societal Outcomes	Auckland University of Technology
13	VITAL	Virtual Twins as tools for personalised clinicAL care	University of Auckland

Key Areas of Focus

This report identifies four overarching areas of focus that provide insights on technology infrastructure barriers and opportunities for REANNZ to consider. Work on these areas should enable New Zealand to increase its involvement with Horizon Europe and other international research opportunities.

The four overarching areas of focus that emerged from the engagement with participants for the report are:

1. Enhancing data governance and digital connectivity for researchers
2. Positioning REANNZ as a strategic partner for international collaboration
3. Advancing research opportunities through technology, collaboration and skill development
4. Honouring Indigenous Data Sovereignty

These themes can guide where REANNZ focuses its efforts to enhance New Zealand's place in the international research landscape and accelerate active participation in international collaborations.

1. Enhancing Data Governance and Digital Connectivity for Researchers

Data is an increasingly valuable and strategic resource. New Zealand needs to have the capacity and capability to appropriately store, manage and govern this data in a systematised and efficient way to enable seamless access and interactivity for federated users both locally and globally. REANNZ could be well placed to play a lead role in providing national oversight and international connectivity for New Zealand's research data.

“Data on its own is not useful, we need the tools alongside the data to enable practical use.”

Almost all participants expressed a desire for New Zealand to implement a collective approach to ensuring New Zealand maintains and develops its capacity to store, transfer and manage data effectively and efficiently both now and into the future. This will become increasingly important as data complexity grows and it becomes easier to generate large volumes of data. All participants agreed that REANNZ could play a key leadership role in this area, which includes establishing national data guidelines, centralising data management and storage, ensuring sufficient capacity for data transfer and storage, and finally, developing data security compliance.

Establishing national data guidelines

Many participants noted that it would be desirable to have in place a standardised set of national data guidelines. Horizon Europe mandates data guidelines that all research partners must sign up to.⁹ These guidelines could provide a useful model for New Zealand to use.

Participants noted that national guidelines would need to be well structured at a high level but flexible in how they are applied. Participants also asked for exemplars or case studies that step through from frameworks and guidelines to practical examples, including how to address hurdles that might be encountered. Indigenous data sovereignty is a key consideration for data governance in New Zealand. Horizon Europe data guidelines enable data to be as open as possible and as closed as necessary, an approach that could work well in the New Zealand context.

Participants noted that some sectors, such as Genomics, have international standards that govern how data is stored, named and handled, which has been successful in maintaining common access among many users.

Several participants noted it would be helpful for REANNZ to play a role in developing standards for significant emerging areas such as remote sensing and large language models / AI. It was felt that a lack of norms or standards in the data sector would lead to challenges later but if addressed now, could have significant benefits for science in New Zealand and the ability of its research sector to collaborate internationally.

Centralised data management and storage

Most of the participants providing feedback for this report noted that central storage and management of data would reduce duplication of effort and provide long-term gains for the research sector. Currently, there is no central data repository in New Zealand. This makes it difficult for researchers to access existing data and often results in duplication of effort.

⁹ Horizon Europe General Model Grant Agreement, European Commission, Nov 2024
https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/agr-contr/general-mga_horizon-euratom_en.pdf

Examples of centralised data repositories from Europe include:

- data.europa.eu, the official portal for European data that has over 1.7 million data sets from 35 countries,¹⁰ and
- the European Open Science Cloud that provides a federated and open multi-disciplinary environment where researchers can publish, find and reuse data, tools and services for research, innovation and educational purposes under well-defined conditions to ensure trust and safeguard the public interest.¹¹

Several researchers saw a potential role for REANNZ as an institution-agnostic facilitator that brings together infrastructure such as archive storage, cloud terminals, big data sets and practices that can be shared across the community.

Many participants were keen for REANNZ to consider taking a lead role in data management in New Zealand. Some expressed a desire for national data storage because there is a disparity of capability to manage data effectively, and individual institutions can have their own agenda and approach to data ownership.

There is some mistrust of data storage offered by institutions because many researchers have experienced loss or degradation of data in the past. As a result, several researchers back up data on physical hard drives. This was more common among researchers who use large data sets.

Secure storage and access are a priority for both large and small data users. One participant gave an example of sensitive Māori disability data, which was a relatively small data set with a small number of users. However, they couldn't access a system that stored data securely within New Zealand that allowed secure access for multiple parties.

Researchers said that a national data storage system needs to have:

- a central collaborative environment,
- be institution-agnostic to allow for broad and unbiased access to a space for both active storage and long-term storage,
- guidelines covering what can be stored and how long it can be stored,
- a simple and effective high-level structure with the ability for it to be flexible to meet the needs of users,
- support non-siloed research environments and be flexible and adaptive to user needs,
- the ability to make more datasets, calculations and results open source for others to use to reduce replication of effort in collecting and processing data.

Ensuring sufficient capacity for data transfer and storage

All participants in this report use commercial platforms for sharing and storing data, with Dropbox being the most prominent due to its usability and low cost.

¹⁰ European Data, <https://data.europa.eu/en>

¹¹ European Open Science Cloud https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en

Dropbox worked as a portable desktop as it is device agnostic and served many researchers well when needing to collaborate on datasets. Other platforms used include Google Drive, Microsoft Teams, GitHub, and WeTransfer, depending on the requirements from the collaborating partner.

Only some participants used their secure institutional systems, with many criticising the research sector's reliance on common commercial platforms – seen as unreliable for sharing data and collaboration. Participants estimated these platforms are used in New Zealand for between 80% – 90% of data transferred. Researchers reported that these systems did work well for smaller amounts of data with lower security requirements.

While these systems work well and are highly reliable, there were concerns raised about the security and privacy of the entry and egress of data, and uncertainty around which countries the data is routed through and stored in due to concerns of data scraping as it was being transferred.

“The way you store data now is not the same way it will be stored in ten years time.”

Several researchers who transfer large amounts of data had either begun to use REANNZ's FileSender or were very interested in using it. They wanted to know where the data was being stored and could non-technical partners upload data for the researcher to access.

Globus had also been used successfully in many cases. However, for one-off data transfer, it was found to be time-consuming and complicated. Some reported losing several days on the set-up. Other researchers found Globus was too slow for large data transfer. It was seen as most useful for smaller data transfers that require ongoing or many incidences. One researcher noted that data can get from an overseas site to New Zealand quickly, but then can take many hours to download into their local system.

Several researchers noted that they aim to move and store as little data as possible, deleting unnecessary or easy-to-replicate data. This approach will be important going forward as the collection of big data becomes increasingly scalable and the financial and environmental costs of data transfer and storage become more significant.

Length of storage was mentioned by some researchers who are required to provide a digital object identifier (DOI) that provides a persistent link to the location of the original dataset used for the research paper, which must be held for 15 years. Others noted that some datasets need to be actively accessed while others can be archived for occasional access. Some participants expressed a duty of care to make sure data is properly looked after. There is no point letting it gather dust as that does not honour the data.

Developing data security compliance and complying with EU regulations

Some participants highlighted differences between New Zealand and EU compliance requirements and were concerned that they couldn't confirm if they met the General Data Protection Regulations (GDPR) or not. Researchers who had worked in the UK and Europe were surprised by the lack of focus on data security in New Zealand and expect data security practices and requirements will need to improve as local researchers work more with the EU. This includes mandatory training at the institutional level on how to meet both international and local compliance requirements.

REANNZ could play a leadership role in developing a national approach to New Zealand data security compliance to ensure we keep up with international regulations, particularly in the EU.

2. Positioning REANNZ as a strategic partner for international collaboration

Many researchers, research office staff and institutional leaders were looking to REANNZ as a strategic partner to both support opportunities in Horizon Europe and other international research funds, and to assist New Zealand in becoming a valued and sought-after research partner.

Participants suggested several priorities for REANNZ in this area including as an enabler for New Zealand to contribute on the global stage, leveraging large-scale digital collaboration tools, connection to international digital tools and resources, and greater connectedness to current REANNZ products and services.

“REANNZ is well placed to facilitate conversations that move beyond access and towards full collaboration so that the best researchers, best connections, best data and the best networks deliver excellent science.”

Enabling New Zealand to contribute on the global stage

Through the global community of National Research and Education Networks (NRENs) REANNZ is uniquely placed to identify what is working well internationally and apply it to the New Zealand context. REANNZ can play a key role in brokering collaborative research environments to provide open pathways for researchers to connect with significant research programmes and data sets internationally.

Often much of the data processing for Horizon Europe projects is carried out in the EU where there is greater computing power and resources. REANNZ can play a key role in connecting researchers to High-Performance Computing across the EU and provide a common way of accessing them.

Several participants suggested that REANNZ could partner with them to strengthen their applications. This could be as an infrastructure partner, or as an active party in the consortium.

In addition, some funding applications require researchers to respond to how they will manage their data. Being able to provide information on how REANNZ supports the management of data could strengthen their application.

Other participants suggested that REANNZ could support institutions through connections and international networks and asked if REANNZ could be more internally networked and represent New Zealand more strongly overseas.

“REANNZ needs to be very active in joining/participating in international networks that comprise similar organisations - we are seeing these as powerful in shaping research programmes and accessing funds.”

Looking locally, several institutions were keen to be kept up to date with the services and capability offerings REANNZ is looking to provide in the future to help inform their own digital strategies and policies.

Leveraging large-scale digital collaboration tools

One researcher playfully asked if REANNZ could develop teleportation technology as the distance from potential partners is the biggest hurdle to collaboration for New Zealand-based researchers. While teleportation is not likely a viable option any time soon, it’s worth considering how powerful collaboration platforms can assist with this challenge.

Horizon Europe requires a minimum of three countries in each partnership, but consortia are typically made up of at least 10 – 14 partners in each programme, with staff turnover adding another layer of complication. This makes collaboration a central challenge for New Zealand’s participation in Horizon Europe projects.

One solution, found in Genomics, is Lifebit. Lifebit enables researchers to securely collaborate on globally distributed data. Lifebit states that you can “manage, utilise and analyse your data in one place, in one single experience.”¹² The experience was described by one New Zealand researcher as being like “everyone is in the same organisation”, even though collaborators were from different institutions around the globe. Lifebit can also automate the way data can be tested and processed, further enhancing the potential benefits such systems could bring to New Zealand.

The cost of platforms like Lifebit is prohibitive for a single institution to adopt. However, if viewed as a national New Zealand-wide solution, led by REANNZ as an

¹² Lifebit, <https://www.lifebit.ai/>

institution-agnostic agency, the scale and benefits could justify the expense. An off-the-shelf digital collaboration platform could enable more effective and efficient research collaboration and seamless sharing of data between large research institutions both locally and globally.

Connecting researchers to international digital tools and resources

The scale of processing power will always be much greater internationally than what is available in New Zealand. For most researchers involved in Horizon Europe, data is processed in Europe, for example through sites such as the Copernicus Data Space Ecosystem.¹³ This has implications for data sovereignty which is discussed later in this report.

Participants suggested that REANNZ could play a role in facilitating connections to large scale data platforms including:

- European Open Science Cloud¹⁴
- Zenodo EU Open repository for EU-funded research (pilot)¹⁵
- Nectar Cloud¹⁶

Many researchers who collaborate with Australia spoke highly of their experience with Nectar Cloud. The Australian Research Data Commons Nectar Research Cloud is Australia's national research cloud that provides "self-service access to large-scale computing infrastructure, software and data. It is a powerful platform for collaboration, as it allows researchers to access compute resources, software and data from anywhere and share them with collaborators at other institutions."¹⁷ This is an example of the type of data infrastructure that could be implemented in New Zealand.

Connecting researchers to REANNZ products and services

Most researchers were only moderately aware of the products and services REANNZ offers including how to find out more information or where to ask questions.

Most participants successfully used eduroam while travelling, although several people had encountered problems with connecting while travelling. Researchers asked if there was some way of troubleshooting while on the go, either through a helpline or a set of FAQs on the REANNZ website. Typically, users found their institution's IT support has not been able to effectively resolve eduroam issues.

¹³ Copernicus Data Space Ecosystem is an open ecosystem that offers immediate access to large amounts of open and free Earth observation data from the Copernicus Sentinel satellites to empower users with tools and resources they need to unlock the full potential of this data. The Copernicus Data Space Ecosystem supports users in accessing, viewing, using, downloading, and analysing data.

<https://dataspace.copernicus.eu/>

¹⁴ European Open Science Cloud, https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en

¹⁵ Zenodo EU Open Research Repository, <https://zenodo.org/communities/eu/>

¹⁶ ARDC Nectar Research Cloud, <https://ardc.edu.au/services/ardc-nectar-research-cloud/>

¹⁷ Ibid.

Researchers were keen for more clarity on the role of REANNZ in international research collaboration and to be kept up to date with new service offerings directly, with the most current example being FileSender which was of great interest to a number of researchers.

3. Advancing research opportunities through collaboration, technology and skill development

New Zealand's involvement in Horizon Europe provides an opportunity for REANNZ to support greater collaboration among New Zealand institutions in the way they access and collaborate on international research projects. To support this, an opportunity to use technology to unlock greater access to Horizon Europe funding calls through commercial AI platforms was identified, and the need to ensure this country continues to develop future skills and capabilities among researchers in high-performance computing environments.

Fostering collaboration over competition among New Zealand institutions

Almost all participants noted that the New Zealand science and research system would benefit from increased collaboration among universities and research institutions.

Horizon Europe has created new opportunities for institutions to collaborate within New Zealand. For example, CRIs have set up a national Horizon Europe Community of Practice. However, it was noted by several participants that New Zealand institutions are still in competition with each other. New Zealand partnerships with Horizon Europe are predominantly mainly made up of only one New Zealand partner and multiple EU partners.

Digital collaboration within New Zealand is not an even playing field, with different scales of resources and capability across the sector. REANNZ could potentially facilitate increased collaboration and access to digital data infrastructure across the sector.

One example is in the area of high-performance computing (HPC). Participants indicated there is a strong desire for institutions to work more closely together on HPC and for services to be institution-agnostic. HPC is seen as a key resource for the future that needs to be flexible across disciplines. Several researchers noted that when HPC is based at one institution, users based at that institution are seen as having an advantage both locally and internationally, while others will be able to gain good access only once they had secured a New Zealand-based research grant.

Using technology to unlock greater access to Horizon Europe Funding Calls

Several research office staff noted that finding the right information and locating relevant funding calls through the Horizon Europe portal was time-consuming due to the complexity, size and manual nature of the portal.

One participant who had worked at a European research institute noted that commercial European-based companies provide AI platforms to extract relevant information on Horizon Europe opportunities, reducing labour costs, increasing access, and making the likelihood of finding the right calls much higher. The expense of these commercial platforms would likely be difficult to justify for a single New Zealand institution, however, there could be benefit to a national AI-powered platform system being deployed to enable greater access to Horizon Europe funding calls and reduce hours of manual searching that is currently being replicated at each institution.

Developing future skills and capability

“International research is a different playing field and without the necessary technical ability, it will be a challenge for New Zealand to be involved.”

Participants noted the need to have New Zealand-based researchers who are looked to internationally as experts in High-Performance-Computing (HPC). New Zealand should be actively developing the skill-based infrastructure required to utilise HPC both now and in the future.

“If we can’t develop our own expertise, we won’t be able to take up the international opportunities in the future.”

Typically, PhD students and Research Fellows start learning and experimenting with smaller data processing in HPC environments, but New Zealand needs to support them to scale up and ensure the local research sector has the skills to utilise the bigger international HPC environments. This capability needs to be available across institutions and not siloed within one institution or one discipline.

4. Honouring Indigenous Data Sovereignty

The importance of Indigenous data sovereignty was discussed by almost every participant as an important consideration and guide for their work with New Zealand-sourced data in Horizon Europe and other international collaborations.

“You can’t sell someone else’s story without their permission.”

Often data in Horizon Europe projects is required to be transferred to European-based institutions for processing and storage, which could present challenges for Indigenous data in the future. It was noted that this does not seem to be an issue with New Zealand’s current involvement in Horizon Europe projects. Horizon Europe data

guidelines support both open data and open science while respecting the need for data sovereignty.

There were differences in approach to data management among researchers, however, most participants were consistent with the view that Indigenous data should have Indigenous governance and that it should not leave New Zealand.

A strong national data ethics policy could be incorporated into national data guidelines and will be increasingly relevant as New Zealand's data and international collaboration grows and evolves. Some requirements for the policy could include a transparent and iterative approach that promotes trust that personal data is respected as a taonga.

To assist in the protection of Indigenous data, some researchers aim to move data as little as possible even within New Zealand.

Several participants pointed to the work of the Data Iwi Leaders Group and Stats NZ in developing the Māori Data Governance Model. The model provides guidance on creating a trusted and sustainable data system to ensure positive outcomes for Indigenous peoples.¹⁸

Methodology

Information for this report was gathered through interviews, both in-person and online, and through emailed responses to a short set of questions. Interviews were undertaken between September and October 2024.

A brief literature review was undertaken to identify relevant reports and presentations relating to New Zealand's involvement in Horizon Europe. In total 28 stakeholders were interviewed or provided feedback.

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¹⁸ Te Kāhui Raraunga, Māori Data Governance Model, <https://www.kahuiraraunga.io/>

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- Dr John Creech, Horizon Europe Programme Manager, Ministry of Business, Innovation and Employment
- Dr Kate Muise, Chief Executive Officer, Science New Zealand
- Dr Bronwen Kelly, Deputy Chief Executive (Funding & Research), Universities NZ

List of participants

Horizon Europe Cluster National Contact Points

- Cluster 1 (Health) – Dr Rachael Taylor. Research Professor, Head of Department (Medicine) and Karitane Fellow in Early Childhood Obesity – University of Otago.
- Cluster 3 (Civil Security and Society) – Dr Stephen MacDonell, Professor of Engineering and Computer Science and Co-Director of Te Whiri Kawe - Centre for Data Science and Artificial Intelligence - Te Herenga Waka, Victoria University of Wellington.
- Cluster 4 (Digital, Industry and Space) – Dr John Cater. Professor of Aerospace Engineering and Director of the Aerospace Research Institute – University of Canterbury.
- Cluster 5 (Climate, Energy and Mobility) – Dr Iain White. Professor of Environmental Planning – University of Waikato.
- Cluster 6 (Food, Bioeconomy, Natural Resources, Agriculture and Environment) – Dr Cecile de Klein. Principal Scientist, Environmental Science, Ethical Agriculture Group – AgResearch.
- Māori NCP – Andrew Sporle. Managing Director – iNZight Analytics. Deputy Director – Healthier Lives National Science Challenge. Associate Professor (Honorary) of Statistics – University of Auckland.

Horizon Europe researchers

- Dr Lara Greaves, Associate Professor, School of History, Philosophy, Political Science and International Relations, Victoria University of Wellington
- Dr Yi Chen, Material Scientist, Project Leader, SCION
- Dr Rob Kelly, New Materials Group Manager, Lincoln Agritech
- Dr Matt Raskovic, Associate Professor and Deputy Head of Department, School of Marketing & International Business, Auckland University of Technology
- Dr Armin Werner, Manager of research group on Precision Agriculture, Lincoln Agritech

Researchers collaborating internationally (outside of Horizon Europe)

- Dr Brendan Harding, Lecturer, School of Mathematics and Statistics, Victoria University of Wellington
- Dr Jess Robertson, Chief Scientist High-Performance Computing and Data Science, NIWA
- Dr Catherine Watson, Professor, Department of Electrical, Computer and Software Engineering, University of Auckland
- Dr Paul Hume, Post Doctoral Research Fellow, School of Chemical and Physical Sciences, Victoria University of Wellington.
- Dr Patricia Hunt, Professor, School of Chemical and Physical Sciences, Victoria University of Wellington
- Dr Nicholas Knowlton, Senior Research Fellow, Obstetrics, Gynaecology & Reproductive Sciences, University of Auckland
- Dr Cristin Print, Professor, Molecular Medicine and Pathology, University of Auckland

Institutional Leadership and Research Support Staff

- Dr Simon Holdaway, Associate Deputy Vice-Chancellor Research, Horizon Europe Working Group lead, University of Auckland
- Joanna Costello, Business Development Manager, Lincoln Agritech
- Liz Prendergast, Director, Research Office, Victoria University of Wellington
- Catherine Redmond, Director Research Operations at the Research & Innovation Office, Auckland University of Technology
- Donato Romanazzi, Senior Strategic Partner- Research Funding & Strategy, Victoria University of Wellington
- Richard Waldin, Chief Information Officer, SCION
- Dr Graeme Inglis, Chief Science Officer, Marine Biosecurity research, NIWA