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Science System Advisory Group

via e-mail: info@ssag.org.nz

Submission on the Science System Advisory Group Consultation – Phase II

Introduction

1. Energy Resources Aotearoa is New Zealand's peak energy sector advocacy organisation. We represent participants from across the energy system, providing a strategic sector perspective on energy issues and their adjacent portfolios such as science, research and innovation. We enable constructive collaboration to bring coherence across the energy sector through and beyond New Zealand's journey to net zero carbon emissions by 2050.
2. This document constitutes our submission for the Science System Advisory Group (SSAG) Phase II consultation, addressing questions relating to the funding tools and mechanism and broader aspects of the science, technology and innovation system in New Zealand.

Key Messages

3. We recommend:
 - a. streamlining of the current science system. New Zealand's energy research is slowed by fragmented oversight and multiple agencies. The science system should be streamlined, retaining what works well while redeveloping new investment criterion and mechanisms where appropriate;
 - b. New Zealand must invest in a broad range of energy solutions rather than selectively funding certain technologies which can put all our eggs in few baskets. Investing in alternative fuels, energy storage, and AI-driven energy management will foster competition, resilience, and long-term energy security;
 - c. urgent attention and investment in New Zealand's STEM skills pipeline and research and Science Innovation (R&SI) workforce is essential. Our R&SI investment falls well behind other OECD countries, putting our competitive edge at risk. Attracting and retaining top R&SI talent should be top priority alongside delivering stronger STEM education, clear career pathways, and long-term investment to drive innovation and prevent further skill loss; and

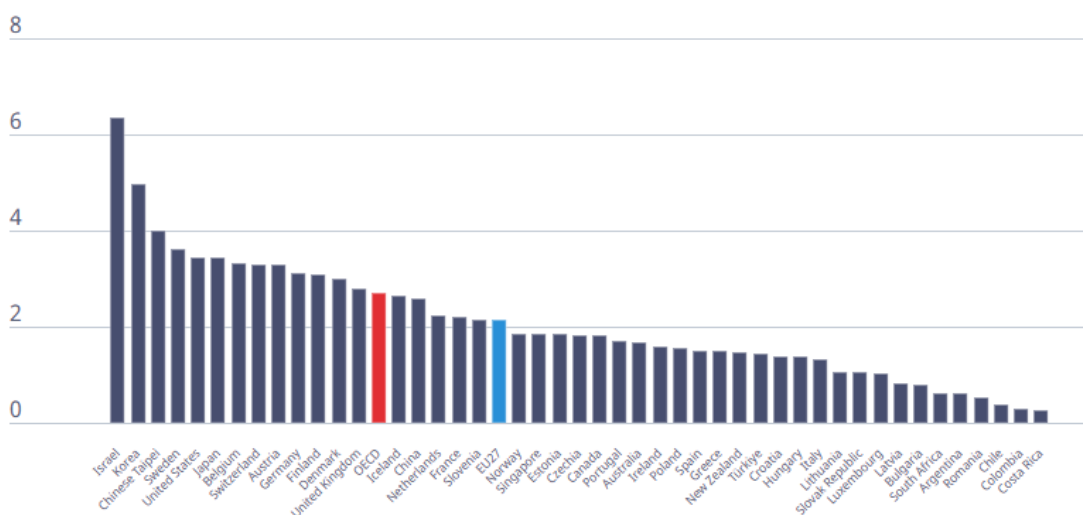
- d. ultimately, we want to see science and innovation efforts aligning with a robust national energy strategy, that drives secure, reliable and affordable progress, ensuring research translates into real-world benefits for energy users.

Summary

- The energy sector is a vital element of the strategic and operational future of New Zealand’s science, innovation, and technology systems. A strong energy sector is essential for economic prosperity. Therefore, national science priorities must align with the sector’s needs, ultimately benefiting all energy users.
- New Zealand needs a clear plan for energy innovation as part of a wider energy strategy. This plan should connect research with business opportunities and regional strengths. To make it work, we need focused funding, strong partnerships, and better coordination between agencies to ensure everything is clear, accessible, and aligned with national energy goals.
- According to the OECD’s statistical release dated 31 March 2025¹, New Zealand’s investment in scientific research and development stands at just 1.46% of gross domestic expenditure, significantly below the OECD average of 2.7%. This underinvestment underscores the pressing need for increased funding in R&D. While the report notes a general slowdown in overall R&D growth, it highlights a notable increase in OECD governments support for spending on energy and environmental research. Without a substantial boost in energy research funding, New Zealand risks compromising its future energy security and supply. Furthermore, our nation may become increasingly reliant on imported intellectual property, rather than fostering innovation and technological development domestically.

Gross domestic expenditures on R&D as a percentage of GDP

%, 2023 or latest year available



Source: OECD, Main Science and Technology Indicators (MSTI) Database, March 2025, <https://oe.cd/msti>

¹ [OECD Statistical release 31 March 2025](#)

7. This raises concern that the government's restructuring of Crown Research Institutes into Primary Research Organisations (PROs) has not been accompanied by any clear commitment to increased investment in this critical area. Furthermore, the proposed structure risks fragmenting energy-related research across multiple PROs, potentially hindering the ability to effectively coordinate research efforts and align them toward a unified strategic objective.
8. Research, Science & Innovation (RS&I) must align with securing New Zealand's position as a competitive trading nation by ensuring access to secure, affordable fuels that support economic growth and emissions reduction. RS&I strategies should be consistent with the government's objectives of fostering abundant energy supply to drive innovation and competition within the sector.
9. Investment in energy innovation, such as advanced subsurface research and AI-driven energy management will be integral to securing New Zealand's energy future. Innovations such as Carbon Capture, Utilisation, and Storage (CCUS) has the potential to support both emissions reduction and long-term energy security.
10. Addressing energy storage challenges, particularly by developing alternatives to batteries must also be a national priority. New Zealand should leverage its unique geological advantages to expand deep geothermal energy and explore scalable storage solutions that enhance grid reliability, ensuring a resilient and sustainable energy system.
11. New Zealand possesses vast natural resources, and funding should focus on unlocking the potential of all energy sources rather than selecting winners and losers. This includes accelerating the development of alternative fuels such as e-methanol, e-Sustainable Aviation Fuel (e-SAF), renewable LPG, biofuels, hydrogen and renewable diesel, ensuring a diversified and resilient energy mix.
12. By investing in a broad range of energy solutions, New Zealand can foster a dynamic market where competition determines the most effective and sustainable pathways for the country's energy transition.
13. New Zealand must restore certainty in the energy sector to retain a world-class workforce, foster STEM talent from an early age, and implement structured career pathways. A stable investment environment, targeted education initiatives, and industry-government collaboration are essential to preventing skilled worker loss and sustaining innovation-driven growth

Submission

In what areas must New Zealand have or develop in-depth research-based expertise over the next two decades?

14. Investment in energy innovation is essential to securing New Zealand's energy future. AI driven energy management and advanced subsurface research, particularly in energy storage solutions, could be prioritised to ensure long-term

stability. Addressing energy storage challenges, beyond batteries is critical for grid reliability and resilience. Leveraging New Zealand's geological advantages, such as deep geothermal energy, presents an opportunity to enhance sustainability while supporting the transition to a low-emissions future.

15. New Zealand possesses vast natural resources, and funding should focus on unlocking the potential of all energy sources rather than selecting winners and losers.
16. To build a diversified and resilient energy mix, investment should accelerate the development of alternative fuels such as e-methanol, e-Sustainable Aviation Fuel (e-SAF), renewable LPG, hydrogen, biofuels and renewable diesel. Supporting a broad spectrum of energy options is more likely to ensure market-driven innovation and energy security.
17. CCUS is a key technology that can help balance energy security, emissions reduction, and economic growth. CCUS enables the continued use of gas resources while significantly reducing emissions, ensuring that climate commitments are met without compromising energy reliability.
18. New Zealand's depleted gas fields and potential onshore storage formations present an opportunity for CO₂ storage, reducing the need for costly new infrastructure investments. Strategic research in this area will be essential to unlocking these opportunities and supporting a sustainable energy transition.

At what levels should research prioritisation occur and how could a criterion for research selection work?

19. While this consultation is not specific to national industry strategies, we feel it prudent to strongly advocate that government develop a robust national energy strategy that can be used to inform future policy decisions including supporting research prioritisation. The development of which will require collaboration across key stakeholders, including government, industry, research and development institutions, and energy users. The process must ensure that these groups routinely engage to align priorities, particularly in determining public research investments in energy value chains and maintaining accountability.
20. A structured innovation framework could be embedded within a national energy strategy to drive collaboration while ensuring transparency and accountability in setting and funding energy research priorities. By incorporating insights from policymakers, industry leaders, technical experts, and energy consumers, New Zealand can develop a balanced, future-focused strategy that upholds sustainability, affordability, and security. This framework should feature targeted funding, structured partnership programmes, and clear pathways for scaling research into practical, real-world solutions.
21. We believe the system should enable prioritisation at multiple levels. At an industry level, collaboration between energy companies, research institutions, and

international partners is essential to drive the commercialisation of new opportunities. Strengthening these partnerships will accelerate innovation and ensure research translates into real-world applications.

22. The system should support regional research tailored to specific energy needs. For example, Taranaki will play a key role in advancing CCUS and other emerging technologies. A regionally focused approach can often be the most effective, and the system should enable this to make the most of local strengths. However, to achieve the best results, regional research should also access the best national expertise and resources when needed.
23. Research selection should prioritise projects that strengthen New Zealand's energy industry and therefore economy. This is critical to ensure energy security, reducing emissions, and maintaining economic stability during the transition to a low-emissions future.
24. Projects should also be feasible and scalable, leveraging existing infrastructure (where possible) and technological advancements to ensure practical implementation. Economic impact should be a key consideration and energy research would drive job creation, industry growth, and regional development, particularly in energy hubs like Taranaki.

Does New Zealand need to rationalise its funding mechanisms?

25. We want to see New Zealand's energy research funding streamlined by enhancing coordination across agencies, ensuring clarity, accessibility and alignment with national energy priorities.
26. Given the goal of streamlining energy research funding, and the current system being dispersed across multiple agencies, we are naturally inclined to pursue a single funding source. However, our primary focus is ensuring that any proposed funding mechanisms and sources are clearly defined in terms of their purpose and alignment with the needs of the energy sector.
27. Clarity, accessibility, targeted investment and an accountability framework will provide a fundamental structure to support energy research.
28. A specialised energy innovation funding mechanism or funding roadmap is needed to prevent parts of the energy sector being overlooked. Structure and transparency will ensure that emerging technologies like CCUS and AI driven energy solutions receive adequate and sustainable investment.
29. There are already several well-functioning research funds in New Zealand. Any changes should build on what is working while addressing areas for improvement. The new system must ensure a transparent funding structure with clear priorities aligned to New Zealand's energy sector. It should also incorporate a mix of funding instruments tailored to the stage of development and sector-specific needs, including but not limited to grants, partnerships, investigatory and commercialisation support such as:

- a. Grants suitable for early-stage research into new energy technologies, feasibility studies such as CCUS and foundational AI integration, such as the Smart Idea fund;
- b. public-private co-funding to encourage industry investment in large-scale projects such as the Endeavour fund;
- c. regulatory support and market mechanisms to align with industry investment;
- d. start-up investment funds for new regional initiatives in science and technology;
- e. investigator initiated research seed funding so researchers can secure funding for projects they propose rather than only responding to predefined government and industry priorities;
- f. mainstream research investment to support research into widely recognised issues that are unique to New Zealand. This should be material and relevant to provide tangible outcomes and make a real impact; and
- g. global alignment investment to compliment and build upon international innovations.

What does New Zealand need to do to improve workforce retention and develop the research workforce from the early career to the mature?

- 30. Uncertainty breeds fear. New Zealand boasts a world-class energy workforce capable of driving long term innovation and sustainability. However, poor policy decisions causing investment instability and deindustrialisation have led to job insecurity, causing skilled workers to leave our sector and our country.
- 31. We wish to highlight that this year, Energy Resources Aotearoa is conducting an update to its 2022 energy workforce report “Building energy’s talent pipeline”², which will provide a comprehensive analysis of the workforce challenges, including the drain of skilled professionals. The report aims to bring together insights from a range of stakeholders across the energy sector, industry leaders, government agencies, educational institutions and future talent to better understand the skills gaps and trends affecting the workforce. Through collaborative efforts the report will offer practical solutions and strategies for developing a resilient, skilled workforce that can continue to meet the evolving demands of the energy sector, even amidst deindustrialisation.
- 32. Re-establishing certainty in our energy sector for both investors and the workforce will provide the foundation needed to build and retain a strong world-class energy research workforce.

² 2022 Energy Workforce report – [Building energy’s talent pipeline](#).

33. To build a resilient and skilled workforce in New Zealand's science and innovation sectors, a proactive approach to retention and development is essential. A key strategy is fostering engagement with STEM from an early age.
34. Introducing targeted STEM initiatives at the primary school level can ignite interest in scientific fields, ensuring a steady pipeline of talent progressing through secondary education, tertiary studies, and into research or industry roles. At Energy Resources Aotearoa we do this via an initiative, [STEMFest Taranaki](#) which has seen thousands of students develop an interest in STEM research and development.
35. A structured pilot programme could be implemented to track students who express interest in STEM subjects at an early age, monitoring their progression through the education system. This would allow policymakers and educators to assess the impact of early interventions and refine strategies to improve engagement, particularly among underrepresented groups such as Māori and Pasifika students. By identifying key transition points, such as the shift from secondary school to university, support mechanisms can be strengthened to reduce dropout rates and encourage more students to pursue STEM careers.
36. Additionally, retention strategies should extend beyond the education system into the workforce. Providing clear career pathways, mentorship opportunities, and professional development programmes can help retain talent in research institutions, industry, and government roles.
37. Addressing barriers such as job security, funding stability, and work-life balance will also be crucial in ensuring that highly skilled professionals choose to stay in New Zealand, rather than seeking opportunities overseas. Strengthening the entire STEM pipeline, from early education to long-term career sustainability, will be vital for New Zealand's future as an innovation-driven economy
38. Energy Resources Aotearoa and the energy sector leads the way in sector workforce development having the first and only director in workforce development with an industry-wide strategic and operational approach. This has seen significant workforce development initiatives delivered to support the sector through times of growth and transition. These types of roles could be supported by an industry/government funding approach and could be across all sectors that have a vested interest in science innovation research and development.

How can New Zealand support the retention of research/innovation leaders?

39. New Zealand can support the retention of research and innovation leaders by implementing strategies that provide long-term stability, career development opportunities, and strong industry connections. A key approach is ensuring stable and competitive funding. This can be achieved by increasing long-term research grants, which reduce uncertainty and allow researchers to focus on impactful projects.

40. Another important strategy is creating clear career pathways and incentives. Offering attractive salaries and benefits for researchers, as well as providing funding for PhD positions, can help retain top talent. Establishing clear career progression opportunities from research roles to leadership positions can prevent a brain drain, while promoting international collaboration and exchange programmes to further expand expertise.
41. Strong clear policy and regulatory support are essential for retention. Stable energy policies, for instance, would reduce uncertainty and make the sector more attractive to potential leaders. Additionally, fast-track immigration programmes for top researchers would make it easier for international talent to work in New Zealand, strengthening the country's research capabilities.
42. New Zealand should look outside itself. Several countries have successfully implemented strategies to retain their research leaders. Germany, with organisations like the Fraunhofer Society and Max Planck Institutes, provides stable funding and clear career pathways. Sweden's Vinnova Innovation Agency invests heavily in R&D and fosters collaboration between industry and academia. Singapore's A*STAR provides strong funding, research infrastructure, and global partnerships, while Canada's Canada Research Chairs program offers competitive salaries and long-term funding for top researchers.
43. By adopting similar but suitably scalable models for New Zealand, we can strengthen our research and innovation leadership, ensuring that we remain competitive on the global stage.

Concluding remarks

44. We appreciate the opportunity to offer insight into our areas of interest through this submission for Phase II of the SSAG consultation process.
45. We are committed to supporting the SSAG as it addresses challenges and strategic priority areas and look forward to participating further once the SSAG releases its recommendations.