To the University Advisory Group

31 May 2024

Kia ora,

Thank you for the opportunity to contribute to Phase 1 of the University Advisory Group's review of the University sector. I'm writing on behalf of the New Zealand Institute of Chemistry (NZIC).

NZIC is the professional society of chemists that operates throughout Aotearoa, representing chemists from industry, Crown Research Institutes, Independent Research Organisations, business, government, legal, analytical and educational sectors (secondary and tertiary staff and students). We hold that fundamental disciplines such as chemistry, biology, geology and physics are of utmost importance in building a technology- and science-based economy, enabling mission- and application-focussed outputs.

Please find our responses below to some of the questions posed by the University Advisory Group.

Question 1 *What should be the primary functions of universities for a contemporary world?*

Universities should continue to be centres of intellectual pursuit – providing sources of both educational excellence and research prominence.

Strong tertiary education in science is crucial for a high-capability workforce that will sustain and grow the technology and innovation sectors. These are essential to enhance New Zealand's domestic and export economy, and our ability to contribute meaningfully to humanity's greatest challenges in combatting and coping with climate change, feeding the world's population and avoiding environmental and health catastrophes.

Well-supported tertiary education across the disciplines also provides the source of secondary educators. STEM subjects, including chemistry, need particular support due to the nationwide shortage of secondary science and maths teachers that particularly impacts rural and socioeconomically disadvantaged areas.

Question 2 *What should be the long-term shape of the university sector in New Zealand so that it meets these primary roles?*

The importance of healthy, well-funded universities to a successful knowledge-based economy cannot be overstated. A stronger level of baseline funding is needed to avoid destructive downsizing and loss of expertise, as seen recently at several universities,

which were caused by short-term drops in student numbers. Lower sensitivity to demographic shifts is necessary to provide stability in university disciplines.

Incentivising decreased bureaucracy and reduced competition, together with increased interconnectedness between the tertiary institutes, is essential to successful tertiary education, research and commercialisation.

Question 3 *What are the barriers (excluding fiscal) that limit the universities from operating efficiently and effectively for the benefit on New Zealand?*

Corporatisation of the universities has led to competition between these institutes at the business level. This discourages the cross-sector collaboration that is needed to achieve effective implementation and positioning of important discoveries.

In reality, the universities do work together at all levels, from the Vice Chancellors to teaching staff. Indeed, educators and researchers still manage to collaborate collegially in both teaching and research, including through the auspices of groups such as our NZIC and the CoREs. However, such collaborations could be enhanced if the system was set up less for competition and more for the betterment of society. Improved baseline funding is needed to achieve this.

From a system perspective, universities would benefit if measures of success were based less on short-term financial profit-making and more on education and knowledge value. Decreasing the corporate over-management of tertiary institutes and minimising bureaucracy and competition should be goals of this review.

Question 4 *Can the eight universities function better as a holistic system to meet New Zealand's needs? If so, how to establish a more differentiated yet cooperative sector?*

The current group of universities have been maintaining effective core teaching and research in mainstream subjects, while each institute has developed particular specialities. For instance, while Otago and Auckland have medical schools, Victoria has a health policy and biomedical science strengths. Retaining diversity in specialist subjects has been a good system where individual institutions' specialties have generally been respected by other institutions.

Fundamental disciplines such as chemistry and physics have a place at all/most universities to provide central scientific knowledge and application. These underpin the more specialist subjects offered at both undergraduate and research levels that add individual "flavours" to each institution.

Question 5 *How research-intensive do New Zealand universities have to be? Do they need to be research intensive in all subjects?*

A key distinguishing feature of universities as educational facilities is the presence of research-led teaching. Therefore, it is necessary that research occurs in key disciplines to underpin teaching. We strongly support the retention of fundamental and central sciences such as chemistry in all (or most) universities, because such core disciplines underpin the more specialist subjects that attract students to vocational studies. It is not pragmatic or economic for all NZ universities to teach (or research) across all topics, but they should all retain the central disciplines that uphold the individual specialties that differentiate our universities.

Question 6 *What is the appropriate mix of offerings in teaching, research, and knowledge transfer across the system to meet economic, environmental, and social challenges?*

The combination of research with teaching and innovation that uniquely occurs at universities places tertiary institutions in a strong position to contribute to economic, social and environmental goals. Therefore, it is essential that funding mechanisms for universities strongly support research. From fundamental and translational research come innovation and knowledge transfer that will better our nation.

Subjects such as chemistry are essential to train the workforce, and society in general, in an understanding of the world. Chemistry enables us to understand all matter. For example, combatting climate change requires policy makers, manufacturers, environmental analysts and scientists that understand the chemical composition of the atmosphere and exhausts, and can measure the quantities and model behaviours of greenhouse gases. Adding value to NZ export products such as wood and milk requires in depth chemistry knowledge.

Our secondary education system desperately needs more teachers confident in STEM subjects. Currently, more teachers are retiring than are entering the workforce. Enthusing the younger generation is needed to increase the number of school leavers keen to engage in further study in these subjects, which in turn will enhance the science-literate workforce.

Question 7 *What are the most appropriate approaches to ensure excellence in teaching, research, knowledge transfer and community engagement?*

Foremost is the need to provide enhanced funding to financially support tertiary institutions. Excellence in teaching, research, innovation and public engagement are already integral to the sector and actively pursued. The greatest risk to this excellence is the diminishment of funding, leaving staff fighting for their jobs and over-stretched. The sector is continuing to provide excellence in all these areas but at a huge cost to staff due to their damaging workloads. Tertiary staff at institutions that have faced redundancies in recent years are working under huge stress and unhealthily long hours. Furthermore, as staff numbers decrease, time and energy for research and innovation is diminished because teaching commitments still need to be upheld. Engagement with external stakeholders such as school students and the public is an early casualty of increased workload.

Secondly, the increasing over-management and corporatisation of universities removes staff from the coal-face where excellent teaching and research occurs and drags them into administrative roles. This decreases the emphasis on teaching and research excellence, and thereby demotes the inherent innovation, knowledge transfer and community engagement that stem from such pursuits.

Question 8 *How to ensure universities play their role in advancing all segments of NZ society without compromising on the goals of excellence?*

This question is misaligned, as it is their excellence in teaching, research, innovation and community engagement that enables our universities to enhance NZ society. Without the fundamental education and research that leads to translational discoveries, and ultimately applications, universities lose their capacity contribute to

the world. Therefore, strong funding and system support for universities is needed to better our society and economy.

Ngā mihi nui,

Joanne Harvey, NZIC President.