

See below a response from the Australian Academy of Science's [National Committee for Chemistry](#) to the [Critical Technologies Policy Coordination Office \(CTPCO\) Stakeholder Consultation](#), addressing points across both the agriculture and health sector discussion papers.

If you would like to contact the National Committee for Chemistry for further discussions, please email nc@science.org.au.

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The Committee supports many of the identified priority areas across the agricultural and health sectors, particularly those of diagnostics, biomaterials (health), biological sensors (agriculture), computational chemistry and synthetic biology. The Committee has also identified some key concerns below and recommends overall that underpinning industries must be considered when setting these priority targets.

To realise the goals of these papers, both the agriculture and health sectors would require a domestic chemical manufacturing industry underpinning the technologies, and without support for this capability Australia will be forced to continue its reliance on global supply chains. As evidenced during the COVID-19 pandemic, these supply chains risk disruption from global events and border closures, leaving Australia unable to produce sufficient quantities of key chemical components necessary for both the health and agricultural sectors. Current sovereign manufacturing capability is not adequately established to support many of the critical technology priorities identified in the discussion papers, despite having appropriate skills in the Australian workforce. The support for Australian research and growth of Australia's IP portfolio is of key importance in the development of these technologies.

To realistically progress towards these critical technologies, establishment of chemical manufacturing plants in Australia will be of key importance. Savings on import cost can offset the cost of establishing companies, and may also encourage a culture of entrepreneurship within Australia to attract and retain domestic talent currently being drawn upon by large international companies.

The research workforce must also be supported to receive appropriate training to enable the effective application of these technologies. For example, skills in analytical chemistry are of fundamental importance for the implementation of many of these technologies across the health and agricultural sectors. These skills underpin the use of technology to monitor change and

interpret data, providing insight into climate and disease impacts, waterway health, and efficient therapies and diagnoses in medicine.

Regarding specific priority areas, while there are undeniably good insights provided from computational approaches in chemistry, many of our current technologies provide sufficient computational insight for developments in this area and are being advanced and explored by work done with the national supercomputing facilities. Further, we note that many areas of health rely on fundamental chemical understanding and research, such as the newly described area of “synthetic biology” which is comprised of synthetic chemistry techniques applied to a biological context.

There is some concern that molecular robotics is not a realistic priority area, and that effort by the CTPCO would be better spent supporting other technologies more commercially viable in the next decade.

We also note the lack of critical technologies looking at sustainability measures (such as regenerative agriculture) or for climate change mitigation, which will only become of increasing importance in the coming decade.

We recommend that the CTPCO maintain their focus on current technologies realistically able to impact our economy in the short- to medium-term, and that steps are taken to ensure that these technologies are being supported by underpinning sovereign manufacturing capabilities for Australia’s prosperity and a workforce adequately trained to make best use of the technologies and the insights they can provide. It will be important for Australia to ensure that in times of global crisis we are not left reliant on importing the basic building blocks of these critical technologies, and that our national skillset develops in line with and complementary to our technological advances.