Australian Government

ANSTO

Annual Report
2020-2021

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Letter of Transmittal

Australian Government | ANSTO

11 October 2021

The Hon Melissa Price MP
Minister for Science and Technology
Parliament House
CANBERRA ACT 2601

I am pleased to present the Annual Report of the Australian Nuclear Science and Technology Organisation (ANSTO) for the period 1 July 2020 to 30 June 2021.

This report has been prepared in accordance with the requirements of the *Australian Nuclear Science and Technology Organisation Act 1987* (Cth) ('ANSTO Act') and section 46 of the *Public Governance, Performance and Accountability Act 2013* (Cth) ('PGPA Act').

This report has been approved for presentation to you by a resolution of the ANSTO Board of Directors on 16 September 2021.

Yours sincerely

Honourable Dr Annabelle Bennett AC SC
Chair

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Opening Statement

2020–2021 proved to be a challenging year, with the COVID-19 pandemic continuing to affect the way we all live and work. As we look ahead to life after the pandemic, nuclear science and technology have never been more important. ANSTO's curious and excellent people, our partners, and our world-class capabilities have continued to deliver critical outcomes that improve public health, protect the environment, and deliver inspiring solutions for the nuclear fuel cycle.

I am extremely proud of the contributions ANSTO has made to our nation over the past year, which have ranged from providing prioritised access to infrastructure for COVID-19-related research and contributing to Australia's economic recovery, through to working tirelessly to ensure patients continue to receive life-saving doses of nuclear medicines throughout periods of instability and disruption.

I also would like to highlight ANSTO's contribution to establishing air contamination levels following the national bushfires. ANSTO will continue to undertake work to protect our environment for generations to come.

It is a privilege for us all to serve our nation through outstanding translational research and technological developments. As Australia's national nuclear science and technology organisation, we will continue to deliver on our core mandate to deliver beneficial outcomes for Australians by working collaboratively with domestic and international researchers, universities, industries and governments.

This annual report tells many stories about the outcomes we have delivered over the past year. For instance, CORIS360™, the most advanced radiation imaging solution on the market, was launched in late 2020, following eight years of intensive research and development. This device will help ensure our nation's safety at major air and sea freight ports, where shipments are routinely scanned for radioactivity.

What I hope you recognise throughout this report is the collaborative spirit, hard work, curiosity and excellence of our people. I would like to take this opportunity to thank them all for their continued efforts in delivering impactful and important work — particularly during times of great adversity.

ANSTO is not immune from the financial impacts of the COVID-19 pandemic. I would like to thank my fellow Board members for their dedication, enthusiasm and commitment, as they work tirelessly to address current challenges in external revenue.

I am certain that ANSTO will continue to rise to any and all challenges, so that we continue to deliver the many benefits that nuclear science and technology provide to our nation.

Message from the CEO

As the new Chief Executive Officer of ANSTO, I am proud of the role ANSTO has played in supporting both government and industry in responding to the ongoing challenges presented by the COVID-19 pandemic. In looking towards the future, I am keenly focused on uniting our efforts to continue to deliver great outcomes for Australia.

ANSTO's unique scientific and nuclear infrastructure, combined with the talents of our people, provides the foundation for us to deliver our purpose. Through our flexible work practices, family-friendly programs, safety initiatives and our newly established LGBTIQA+ Network, we are increasingly creating a safe and inclusive workplace that is truly representative of the diverse society in which we live today.

The COVID-19 pandemic has remained a major challenge for our organisation. However, we have demonstrated extraordinary resilience — from ensuring nuclear medicines are distributed to Australian patients through to facilitating over 50 studies into COVID-19 at the Australian Synchrotron. Our focus is now shifting towards how we best support our nation's post-pandemic economic recovery, with a particular focus upon increasing our partnerships with industry.

Over the past year, we have made significant progress on capital expansion at the Australian Synchrotron, which will see eight additional beamlines constructed at the facility, thanks to $95 million of funding contributions from 30 funding partners. Despite the impact of the COVID-19 pandemic on the delivery of components from overseas suppliers, the past year has also seen the completion of important build milestones on the first three BR-GHT beamlines, which will be ready for researcher use in mid-2022.

ANSTO is supporting our nation's economic recovery through the continued development of the ANSTO Innovation Precinct. The new home for the flagship *nandin* Innovation Centre was opened by the Hon Gladys Berejiklian MP, Premier of New South Wales, in June 2021. Impressively, our partners have outgrown the initial home of *nandin* in less than three years. This new facility, which was constructed with funding support from the NSW Government, co-locates start-ups and industry-focused graduate students, who are working to address some of the most pressing issues of our time.

Delivery of nuclear medicines remains a top priority for ANSTO. Nuclear medicine manufacturing is highly complex, and the short shelf-life of our decaying nuclear medicine products renders them susceptible to logistical challenges, such as international flight and freight disruptions. These disruptions were exacerbated by two unplanned maintenance shutdowns of the OPAL reactor which affected the irradiation of nuclear medicine targets. The Australian nuclear medicine community has been instrumental in helping ANSTO manage these disruptions. Their participation in discussion, guidance and assistance has been invaluable over the reporting period and has resulted in minimal supply disruptions for Australian patients. This outcome is also a testament to the passionate and tireless work of ANSTO's staff. Through these collaborative efforts, we will continue to support the health and wellbeing of Australian patients.

I would like to sincerely thank the ANSTO Board for its continued stewardship of the organisation. I wish to also thank our responsible Ministers during 2020–2021, the Hon Karen Andrews MP and the Hon Christian Porter MP, the Department for Industry, Science, Energy and Resources, and the Assistant Minister for Industry Development, Senator the Hon Jonathon Duniam for their support and collaboration at every level of the organisation.

Importantly, I would like to commend our staff on their continued enthusiasm, remarkable efforts and continued adaptability, which have been instrumental in enabling ANSTO to continue to deliver its mandate in these uncertain times.

Section 2: About ANSTO

Our Annual Report

This annual report provides a summary of our activities and performance for the financial year ending 30 June 2021 against the performance measures in our 2020-2021 Corporate Plan and Portfolio Budget Statements.

Vision

To be a global science, research and engineering partner of choice with a reputation for tackling complex problems and delivering outcomes to benefit Australia and support a more sustainable world.

What we do

For over 60 years, ANSTO has been home to Australia's most significant landmark and national infrastructure for nuclear-based research. ANSTO provides a collaborative research environment, bringing together scientists, engineers and graduates from across industry and academia to solve complex problems and deliver outcomes and benefits for Australia.

We manufacture and produce nuclear medicines for Australia and the world, investigate the origins of disease, and develop new diagnostic and therapeutic nuclear medicines. Through this work, we improve human health and enable life-saving outcomes.

We use multidisciplinary nuclear and isotopic techniques to address the world's most challenging environmental problems. Focusing on water sustainability, climate change and the impact of contaminants, we are working together to create a more sustainable world.

As the operator of Australia's only nuclear research reactor, we address key scientific questions in the nuclear fuel cycle and are Australia's knowledge centre for current and emerging nuclear technologies.

As an industry partner, some of our business capabilities include detection and imaging, minerals and radiation protection consulting, irradiation services, environmental monitoring and training.

The ANSTO Innovation Precinct in Southern Sydney is the home of ANSTO's *nandin* Innovation Centre, where start-ups are connected to ANSTO's leading research talent and over 100 graduates to develop the next generation of thinking that will support our industries.

ANSTO is recognised as a global leader in nuclear science and technology. In this regard, we maintain over 50 bilateral relationships with counterpart institutions and represent Australia's interests in several multilateral forums, including the International Atomic Energy Agency (IAEA), the Organisation for Economic Co-operation and Development — Nuclear Energy Agency (OECD-NEA) and the Forum for Nuclear Cooperation in Asia (FNCA).

We manage over
$1 billion
worth of landmark infrastructure and scientific assets, including some of Australia's most sophisticated research infrastructure

We employ just under
1,400
people to tackle complex problems and deliver outcomes to benefit Australia

On average, we facilitate more than
12,000
nuclear medicine procedures that benefit Australians each week

We operate two main campuses in Lucas Heights (NSW) and Clayton (Vic), plus a facility in Camperdown (NSW)

We connect with
over 35
Australian universities through AINSE

In 2020–2021, we welcomed
over 6,000
in-person visitors despite the COVID-19 pandemic and ran more than 130 virtual educational outreach programs for over 3,000 students

We work with
over 500
businesses from the aerospace, advanced manufacturing, energy, defence and health industries

Over 95%
of our publications are with collaborators — one-third of these are domestic, one-third are international and one-third are both.

Values

ANSTO's values underpin our vision, purpose and strategic objectives. They are critical to how we carry out our work. They also describe how our people will engage with one another and external stakeholders. Our values extend to the way we partner with universities, industry, communities and other stakeholders.

ANSTO's Values underpin our work — these were developed by our staff

Celebrating our people

ANSTO's brilliant people are committed to delivering our core mandate. They help us to produce great outcomes not only for Australia, but also for the world. Many of our staff have been commended for their expertise and we are incredibly proud of their achievements during the reporting period. Below is a summary of their recognition over 2020–2021.

Australian Superstars of STEM

ANSTO's Dr Mitra Safavi Naeini, Dr Eleanor Campbell, Dr Emily Finch and Bianca Shepherd are among 60 outstanding women in STEM who were named Australia's official Superstars of STEM by Science and Technology Australia (STA) on 3 December 2020. STA is Australia's peak body in science and technology, representing more than 80,000 scientists and technologists.

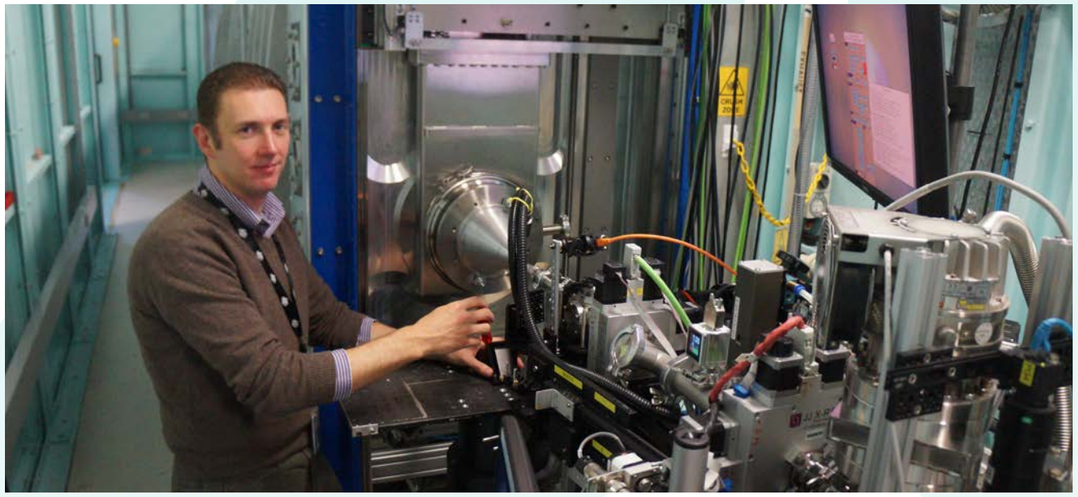
Dr Safavi Naeini is a physicist who has developed a new approach to treat cancer and an innovative COVID-19 management strategy. Dr Campbell is a macromolecular crystallography beamline scientist at ANSTO's Australian Synchrotron who has supported COVID-19 research. Dr Finch is building new instrumentation at the Australian Synchrotron, and Bianca Shepherd is ANSTO's Engineering Support Workshop Manager and oversees the manufacture of specialised components for the OPAL multipurpose reactor.

Left to Right: Dr Mitra Safavi Naeini, Dr Eleanor Campbell, Dr Emily Finch and Bianca Shepherd

Eureka Prize

The Monash Pharmaceutical Milkshake Team, which included ANSTO's Dr Adrian Hawley, was awarded a 2020 Eureka Prize for its development of innovative methods at the Australian Synchrotron to study the interaction of milk and milk-like systems with drugs. The insights from work undertaken at the small angle X-ray scattering beamline at the Australian Synchrotron since 2007, as well as some laboratory-based research, have paved the way for the development of formulations to deliver new, safe and effective drugs to children, including the first single dose treatment for malaria. The Bill and Melinda Gates Foundation has supported the research in association with its anti-malaria work.

Read more about this work here:
https://www.ansto.gov.au/news/eureka-prize-win-for-monash-university-and-ansto



Dr Adrian Hawley undertaking an experiment on a beamline at ANSTO's Australian Synchrotron

Innovation in groundwater research

A collaborative project between Dr Dioni Cendon of ANSTO and researchers from the Royal Melbourne Institute of Technology (RMIT) was awarded an Australian Land and Groundwater Association Annual Industry Excellence Award 2020 for Innovation that has Advanced the Practice of Contaminated Site Assessment. The project applied new and existing isotopic techniques to trace historical impacts on groundwater from the Boneo Water Recycling Plant (south of Melbourne).

Falling Walls winner

Dr Jessica Hamilton, Australian Synchrotron X-ray Absorption Spectroscopy (XAS) Beamline Scientist, won Australia's Falling Walls Lab competition. Her presentation highlighted how stockpiles of mineral waste can be transformed into enriched ore that can be re-mined. The process is now being tested in diamond mines in Africa and Canada.

Bob Cheary Award for Excellence in X-ray Diffraction

Professor Vanessa Peterson was awarded the 2020 Australian X-ray Analytical Association (AXAA) Bob Cheary Award for Excellence in X-ray Diffraction in recognition of her contributions to the field and to AXAA. She is the first female scientist to be awarded since its inception in 2008.

ANSTO NAIDOC Week Award

In November 2020, Dr Vladimir Levchenko, an expert in radiocarbon dating using accelerator mass spectrometry, was presented with ANSTO's inaugural NAIDOC Week staff recognition award. For more than a decade, he has used this technique to contribute scientific evidence to the great antiquity and importance of Aboriginal cultural heritage. He has contributed, for example, to research on 12,000-year-old Aboriginal rock art from the Kimberley region of Western Australia. Dr Levchenko is a member of ANSTO's Cultural Heritage project team and has shared his research highlights on Aboriginal cultural heritage at national and international meetings and conferences.

ANSTO's national leader in ceramic engineering

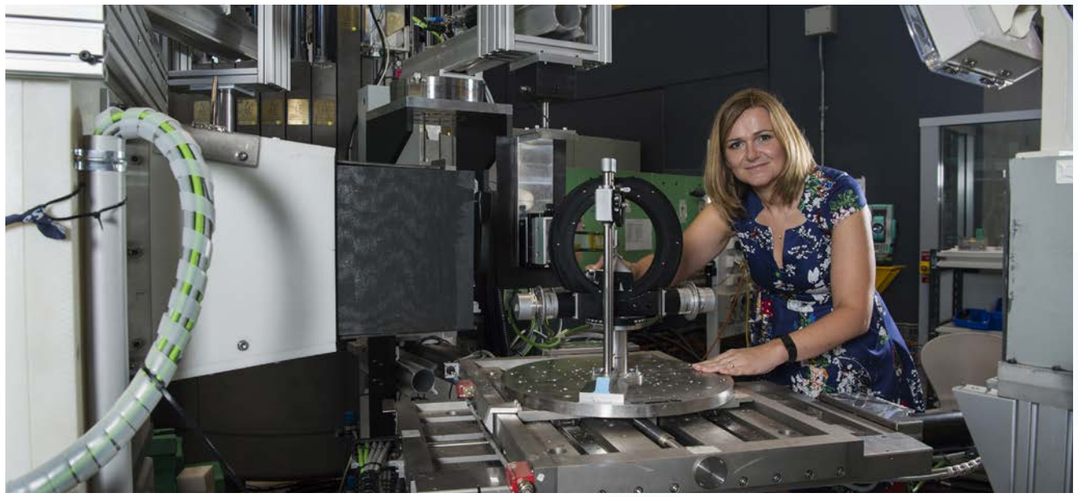
In September 2020, Nuclear Fuel Cycle researcher Dr Inna Karatchevtseva was among those identified by ***The Australian*** in its Research magazine as a national leader in her field of ceramic engineering, working in what is generally a male-dominated profession. Dr Karatchevtseva was among 17 scholars who were named as Australia's leading researchers in each of 17 specialist disciplines under the broad theme of chemical and material sciences. These scholars are the researchers with the highest number of citations from papers published in the last five years in the 20 top journals in their field.

Dr Inna Karatchevtseva conducting an experiment at ANSTO

The best behind the neutron beam

ANSTO's Professor Anna Paradowska won the annual Australian Neutron Beam Users Group Neutron Award at the AINSE Neutron Scattering Symposium. The award was for her work in pioneering industrial engagement at the Australian Centre for Neutron Scattering (ACNS), where she utilises neutron scattering techniques to solve industry problems. Professor Paradowska was also accepted into the 2021 Australian Research Council College of Experts and was the 2020 Sir George Julius Medal recipient. Her paper, titled ***Influences of depositing materials processing parameters and heating conditions on material characteristics of laser-cladded hypereutectoid rails***, was recognised as the best paper in 2020 by the College of Mechanical Engineers Board.

Read more about Professor Paradowska's work here:
https://www.ansto.gov.au/news/best-behind-neutron-beam-awards-announced.



Professor Anna Paradowska undertaking an experiment within ANSTO's ACNS

Michelle Crowther PSM Excellence in Government Legal Service Award

Felicity Dougherty, ANSTO's General Counsel, was awarded a highly commended nomination in the Michelle Crowther PSM Excellence in Government Legal Service Award for 2020.

Appointments and elected positions

- Dr Tim Boyle, Director of Innovation and Commercialisation, was appointed the inaugural Australian Chair of the Global Alliance of Technology Transfer Professionals in September 2020.
- Human Health and Biosciences researcher and program manager, Dr Benjamin Fraser, was appointed to the position of Adjunct Associate Professor in the School of Chemistry at Monash University in September 2020.
- Jennifer Harrison, the leader of ANSTO's Nuclear Stewardship team, was elected President of the South Pacific Environmental Radioactivity Association (SPERA) in October 2020.
- OPAL's Regulatory and Licensing Officer, Dr Jo Lackenby, was announced as the new Australian Nuclear Association President in September 2020.
- Scott Olsen, ANSTO's Scientific Operations Group Leader for ACNS, was elected President of the International Society of Neutron Instrument Engineers in September 2020.
- Ciara Collins, Nuclear Mechanical Project Engineer, was elected President of Australian Young Generation in Nuclear in December 2020.

Key highlights

Developing CORIS360™

In 2020–2021, ANSTO launched a breakthrough Gamma radiation detection system, CORIS360™, a game-changing technology that pinpoints the location of sources of radiation faster and more accurately than before. It is a great example of Australian innovation and excellence with many benefits for multiple industries, including mining and minerals, health, border security and defence, as well as the wider global nuclear industry.

CORIS360™ works by harnessing compressed sensing technology and has the potential to be ranked alongside other Australian world-class technologies for industry. It works to improve worker safety and operational decision making for anyone working in a radiation environment.

More information on this work can be found here:
https://www.ansto.gov.au/products-services/detection-imaging/coris360.

The CORIS360™ gamma radiation detector

ANSTO strengthens its collaboration with the IAEA to support environmental protection

ANSTO has become an International Atomic Energy Agency (IAEA) Collaborating Centre to support IAEA activities using nuclear techniques for development and environmental protection.

Building on two past Collaborating Centre designations, the new centre is focused on a broad work plan that includes: tackling food provenance and authentication of products of illicit trade; the use of isotopes to study water and climate change; the use of nuclear techniques to understand the impact of environmental and atmospheric pollutants; and the use of nuclear and isotopic techniques to investigate art, archaeology and cultural heritage materials.

More information on this work can be found here:
https://www.ansto.gov.au/news/ansto-strengthens-its-collaboration-iaea-to-support-environmental-protection.

ANSTO contributes to new research that could pave the way for safer and more efficient COVID-19 testing

International research led by Monash University and the Peter Doherty Institute for Infection and Immunity, undertaken with the assistance of ANSTO's Australian Synchrotron, has achieved proof of concept for a new, fast and portable saliva screening test that uses an infrared light technology to confirm infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes COVID-19.

The team identified a signature of the infectious agent in the infrared spectra of saliva from 27 out of the 29 SARS-CoV-2-infected human subjects who presented at Royal Melbourne Hospital with COVID-19-like symptoms.

Much of the initial work was carried out using the infrared spectroscopy beamline at ANSTO's Australian Synchrotron. The infrared microscopy experiments on the beamline enabled the researchers to confirm that spectroscopic signatures could be used to identify an infectious agent.

Other contributors to the research included the University of Melbourne, Royal Melbourne Hospital, the Dublin Institute of Technology (Ireland), the University of Strathclyde (Scotland), Elettra-Sincrotone Trieste (Italy) and the Area Science Park Trieste (Italy).

More information on this research can be found here:
https://www.ansto.gov.au/news/ansto-contributes-to-new-research-could-pave-way-for-safer-and-more-efficient-covid-19-testing.

Prototype of saliva test for COVID-19

Section 3: Our purpose and strategic objectives

Purpose

ANSTO's purpose comprises the following core functions, as provided by the ***Australian Nuclear Science and Technology Organisation Act 1987*** (Cth) (ANSTO Act):

- Conduct research and development in relation to nuclear science and technology;
- Produce and use radioisotopes, isotopic techniques and nuclear radiation for medicine, science, industry, commerce and agriculture;
- Encourage and facilitate the application and use of the results from research and development;
- Manage radioactive materials and waste arising from various prescribed activities;
- Provide goods and services related to core activities;
- Provide advice to Government and liaise with other countries on behalf of Australia in nuclear-related matters;
- Make available to other persons, whether or not on a commercial basis, the knowledge, expertise, equipment, facilities, resources and property of the organisation, for the purposes of scientific research, innovation and training;
- Publish scientific and technical reports, periodicals and papers, and provide public information and advice; and
- Facilitate education and training in nuclear science and technology, including through granting scientific research studentships and fellowships, in cooperation with universities, professional bodies and other education and research institutions.

Our strategic objectives

ANSTO's six strategic objectives as captured in our 2020–2021 Corporate Plan are to:

1. Provide a safe, sustainable and inclusive environment that empowers our people and supports a culture of collaboration and engagement.
2. Undertake research with strategic partners that is translational and serves users.
3. Provide platforms and development pathways to enable world-class research that creates economic impact and benefits.
4. Provide expert advice, education and services to support Australian policy and strengthen Australia's nuclear science knowledge base.
5. Support better healthcare for all Australian and international customers with nuclear products.
6. Innovation Precinct, partnerships and services, delivering impactful and sustainable outcomes.

ANSTO's 2021–2022 Corporate Plan is the enabling document for the organisation to achieve its purpose and implement its strategic objectives and vision. The plan, approved by the Board, presents ANSTO's new strategy and is a public document available here: *https://www.ansto.gov.au/corporate-plan.*

Section 4: Annual Performance Statement

Introductory statement

We, the ANSTO Board, as the accountable authority of ANSTO, present the 2020–2021 Annual Performance Statements of ANSTO, as required under paragraph 39(1)(a) of the ***Public Governance, Performance and Accountability Act 2013*** (Cth) (PGPA Act). In our opinion, these Annual Performance Statements are based on properly maintained records. They accurately reflect the performance of ANSTO and comply with subsection 39(2) of the PGPA Act.

Summary of performance

Strategic objective	Performance criterion	Measure and target	Result (2020–2021)
1	Strengthening ANSTO's commitment to providing a safe work environment for its staff by improving its proactive safety reporting	Demonstrated increase in the ratio of reported opportunities for improvement (OFI) to incidents in ANSTO's Governance Risk and Compliance Reporting System	**Not achieved** (2019–2020 ratio = 7:10) (2020–2021 ratio = 6:10)
	Achieving greater gender diversity in ANSTO's workforce, with the goal of reaching equal representation of male and female identifying staff by 2030	Leadership team — Male 40% | Female 40% |	**Achieved** (Male 48% | Female 52%)
		ANSTO-wide — Male 40% | Female 40% |	**Not achieved** (Male 67% | Female 33%)
2	Delivery of research outcomes that have scientific and industry impact, with a focus on health, the environment and the nuclear fuel cycle	Eight case studies per annum demonstrating the impact of our research	**Achieved**
		90% of publications undertaken with national and international collaborators	**Achieved**
3	OPAL	280 days	**Not achieved** (253 days)
	Australian Synchrotron	95% utilisation	**Not achieved** (80%)
	Australian Centre for Neutron Scattering	85% utilisation	**Not achieved** (65%)
	Centre for Accelerator Science	65% utilisation	**Achieved** (66%)
4	Providing reliable and trusted advice to Ministers, Parliament, and Government departments and agencies Engaging with key international nuclear organisations, policy discussions and bilateral partners	≥ Four case studies per annum	**Achieved**
	Increase in STEM engagement Share with the general public research outcomes enabled by ANSTO	≥ 36 science stories published on the ANSTO website per annum	**Achieved** (86)
		Deliver ≥ six national programs per annum	**Achieved** (Eight)
		Deliver teacher professional development days in all states and territories	**Achieved** (100%)
		> 5,000 visitors to ANSTO's campus	**Achieved** (6,381)
5	Supply of human health products	2,765,179 radiopharmaceutical doses (potential doses)	**Not achieved** (1,645,273)
	Maintain our ISO 9000 Quality Management System certification	Maintain certification	**Achieved**
6	Increase in overall stakeholders engaged in the Precinct (industry partners, universities, ***nandin*** tenants)	10% growth per annum	**Achieved** (263%)

Strategic objective 1: Provide a safe, sustainable and inclusive environment that empowers our people and supports a culture of collaboration and engagement

People

Performance criterion	Measure	Result (2020–2021)
Achieving greater gender diversity in ANSTO's workforce, with the goal of reaching equal representation of male and female identifying staff by 2030	Leadership teams — representation — at a minimum Male 40% | Female 40%	**Achieved** Male 48% | Female 52%
	ANSTO-wide — representation — at a minimum Male 40% | Female 40%	**Not achieved** Male 67% | Female 33%

Over the past year, there has been a strong focus on achieving our Male 40% | Female 40% target for the hiring of external candidates, which has in turn increased the proportion of female staff. Increasing gender diversity in interview panels has supported the hiring of new personnel and has become an embedded practice.

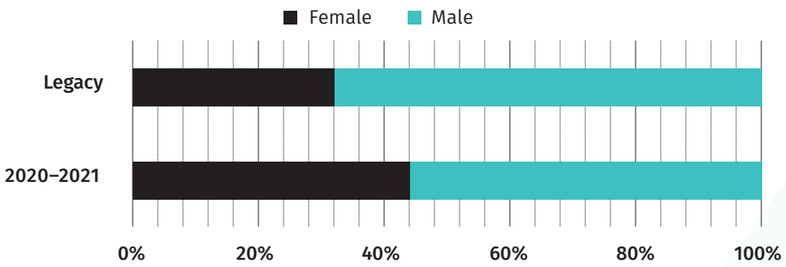


Figure 1: Gender split comparison in new and legacy recruits

The Male 40% | Female 40% performance measure was established in 2018, and targeted initiatives have resulted in a significant increase in female intake. This continued over 2020–2021, during which time the female representation in external recruitments has increased from 32% to 44%.

ANSTO's complete diversity data can be found in ***Appendices and Index — Reporting under the Equal Employment Opportunity Act 1987.***

The establishment of policies and guidelines has seen an increase in flexible work practices. This has further supported care-giver responsibilities and promoted increased gender diversity. In particular, part-time arrangements are used by 7% of ANSTO personnel, of which 82% are females. Further analysis over the last three years has shown that the average rate of promotion for part-time employees is 9% versus 7% for full-time employees.

A Parental Maternity Leave Framework that provides business areas with a headcount and financial support for any staff going on maternity leave has been implemented. This demonstrates ANSTO's strong commitment to supporting staff through their parental career phase, with the majority uptake from female staff.

With previous initiatives on inclusive leadership to cultivate an inclusive culture, growth mindsets and behaviours implemented, ANSTO has commenced a recruitment disruption initiative. This initiative aims to drive change in how we recruit to achieve greater diversity in the organisation. The recruitment disruption will review all steps in a recruitment cycle to better understand what changes can be implemented to drive an outcome that aligns with the Male 40% | Female 40% performance measure. This will include training hiring managers on how to achieve this measure more effectively.

ANSTO has implemented numerous initiatives, policies, and practices to support a flexible and diverse workforce, but still has room to maximise its gender diversity target. This important work will continue to create ANSTO's diverse and inclusive workforce of the future.

ANSTO Graduates Conor Gould, Raya Tasnim, Dean Sedger and Juniper Bedwell-Wilson

Safety

Performance criterion	Measure	Result (2020–2021)
ANSTO will strengthen its commitment to providing a safe work environment for its staff by improving its proactive safety reporting	Demonstrated increase in the ratio of reported opportunities for improvement (OFI) to incidents in ANSTO's Governance, Risk and Compliance Workplace Health and Safety Management System (WHSMS)	**Not achieved** 2019–2020 ratio = 7:10 2020–2021 ratio = 6:10

ANSTO continually seeks to ensure a safe and healthy workplace through planned strategies to prevent work-related injury, ill health and death. We are very conscious of the increased need to care for, and monitor the wellbeing of, our people throughout the COVID-19 pandemic.

We each are responsible for our own safety, that of our colleagues and of the public. ANSTO continues to promote the reporting of all environmental, health and safety-related incidents, including:

- near misses, general hazards and observations (otherwise known as leading incidents); and
- injuries and personal radiation contamination incidents (otherwise known as lagging incidents).

These incidents are tracked and trended to support evidence-based decision making and initiatives.

During most of 2020 (including the latter half) on campus operations were limited to essential activities as a result of the COVID-19 pandemic, resulting in a reduction in the number of incidents reported. However, when this number was assessed against the number of employees on campus, it was found that the incident reporting rate had not decreased. The majority of reported safety incidents had a potential impact rating of low significance or minor.

ANSTO continues to measure opportunities for improvement (OFI) as a leading safety measure, with a target of 70%. OFIs are events that do not result in any adverse effects to people or the environment, but could have resulted in minor damage to plant and equipment. Even though ANSTO did not meet this target, the reporting rate of OFI has been steady over the past 12 months.

Despite not meeting our safety performance criterion in 2020–2021, the similarity in the ratio of reported OFI to actual incidents when compared to the previous year highlights the ongoing positive reporting culture in ANSTO.

ANSTO Graduate Conor Gould and Health Physics Surveyor Nardean Eskander

Financial year	Total number of incidents reported	Total number of reported safety matters	% OFI of the total number of reported safety matters	Number of OFI	Ratio of number of OFI/number of actual incidents
2019–2020	1,055	634	68	428	7:10
2020–2021	766	674	64	429	6:10

Table 1: ANSTO's safety data for the past two financial years

Our commitment to a safe, secure and healthy workplace is driven by the ***ANSTO Work Health and Safety Policy*** and the ***ANSTO Work Health and Safety Strategy 2018–2022.***

ANSTO continues to support the health and wellbeing of our people by providing programs, initiatives and facilities that are fit-for-purpose. Due to the COVID-19 pandemic, alternative methods of delivery for planned initiatives and programs were necessarily deployed. Initiatives that were successfully completed over 2020–2021 to ensure the health, safety and welfare of workers included:

- deployment of the annual flu vaccine program (alternate arrangements were put in place to facilitate increased uptake during COVID-19);
- provision of remote and face-to-face WHS training;
- deployment of women's and men's health screening programs;
- provision of mental health first aid;
- provision of online and onsite physiotherapist support;
- provision of flexible working arrangements;
- provision of Toastmasters online;
- provision of online aerobics during lunch breaks; and
- provision of support for staff who identify as members of the LGBTIQA+ community.

ANSTO continues to support injured staff through an early intervention program and occupational rehabilitation. This provides injured staff with quick and timely access to medical experts and support, helping to achieve better outcomes for ANSTO personnel during times of illness and injury.

COVID-19 introduced unprecedented safety challenges that were addressed through targeted initiatives including: online mindfulness and wellbeing webinars; online support from the Employee Assistance Program and a physiotherapist; keeping in touch strategies; and the development of the ANSTO COVID-19 self-reporting tool. ANSTO minimised the impact of the COVID-19 pandemic on our people by supporting flexible working arrangements.

ANSTO takes a proactive approach to achieving our overriding safety goal of zero tolerance for harm to anybody, anywhere, anytime. In September 2020, Comcare conducted the Federal Employer Work Health Safety Management System Initial Assessment of ANSTO's Workplace Health and Safety Management System (WHSMS), delivering an assessment score of 97%. The report for this assessment has been finalised and provided to ANSTO. While ANSTO performed positively against the 30 criteria, there were a small number of continuous improvement opportunities, one non-conformance and five observations. The non-conformance related to ANSTO's WHSMS referring to the Model Codes of Practice rather than the Commonwealth Codes of Practice. The non-conformance and observations are being tracked and monitored towards resolution. Comcare also noted several examples of good practice during the assessment, most notably the strength of ANSTO's WHSMS documents.

Injuries during 2020–2021

Our staff are encouraged to report all injuries and illnesses, irrespective of how minor the impact may be to the individual. For this reason, we analyse all injuries against specific classes of injury that reflect the actual impact the injury has had on the worker. Injuries are classified as:

Class	Impact to employee
1	Damage that permanently alters a person's life. Examples: death, paraplegia, amputation of limb, severe psychological damage or ≥ 90 days/shifts off work.
2	Damage that temporarily alters a person's life. Examples: fractured leg that repairs with no lasting impediment, deep laceration that has no underlying tissue damage and repairs without significant scarring; or six to 89 days/shifts off work.
3	Inconveniences in a person's life or one to five days/shifts off work.
4	Minor inconvenience with no time taken off work.

In 2020–2021, there were 115 injuries reported. The majority of injuries were Class 4, with six Class 3 injuries and no Class 1 or 2 injuries being recorded.

ANSTO also measures and classifies Lost Shift Injury Frequency Rates (LSIFR) and Lost Time Injury Frequency Rates (LTIFR). Over 2020–2021, there were three Lost Time Injuries (LTI) requiring five or more days/shifts off work and three Lost Shift Injuries (LSI) requiring fewer than five days/shifts off work. Overall, there has been a decreasing trend in the number of LSI reported, which demonstrates a continuous improvement in our safety culture and practices.

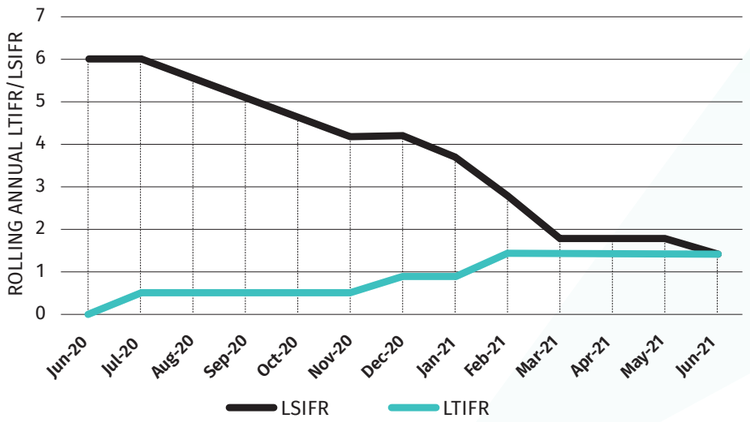


Figure 2: ANSTO's rolling annual LSIFR and LTIFR

Workers' compensation

The ANSTO premium is dependent on the aggregate premium pool (the total premium to be charged across all Commonwealth agencies) and ANSTO's claim performance. ANSTO premiums are summarised below.

Financial Year	ANSTO Premium
2019–2020	$1,208,000
2020–2021	$764,000
2021–2022	$646,056

Table 2: ANSTO premium on insurance cover

The final 2019–2020 premium increased from the original costing of $1,017,560 due to claims performance. Conversely, the final 2020–2021 premium decreased from the indicative amount of $795,665 due to claims performance. The 2021–2022 indicative premium of $646,056 is lower again than the actual 2020–2021 premium.

Regulator engagement — Comcare

The main safety regulator that ANSTO engages with for non-radiation safety-related work, health and safety (WHS) oversight is Comcare. During 2020–2021, Comcare was notified of the following ANSTO incidents:

Work area	Description	ANSTO action
Tenants (Building 02)	Dangerous incident (Oct 2020): ANSTO workers and a contractor attended a plant room in the roof space of the building for a quote on some work. A grey flexible conduit was found resting on top of a tank. When it was moved, the unterminated and unrestrained live end met the roof sarking, resulting in a small arc flash. No one was injured. It was identified that previous works done at an unknown time had left the cable live and unsafe.	· Strengthened accountability and responsibility for site assets to enable better control of potential legacy issues that are still present onsite. · Improved training on immediate response to emergency situations.
Silicon Receiving Area (Building 75)	Dangerous incident (Feb 2021): During the routine unloading of trolleys carrying silicon ingots from a truck, a trolley of silicon (weighing approximately 300kg) rolled rearwards off the loading platform, falling off the truck onto the ground. No one was injured; however, a worker was in the immediate vicinity.	· Installation of brakes on the rear wheels of the trolley so that the brakes are accessible from both ends of the trolley. · Investigation of a modified tailgate and new truck options that might provide better safety features.
ANSTO Minerals Pilot Plant (Building 21H)	Dangerous incident (April 2021): While housekeeping in the area, a worker picked up a disconnected transfer line which was no longer in use. Upon doing so, a small amount of liquid was released and came into contact with the worker's arm. Ultimately, the worker experienced mild itching and heat where the liquid had contacted the clothing and skin.	· Design and implement upgrade for a dedicated waste treatment operation. · Define a clearly marked zone for waste treatment operations and remove all equipment not related to waste treatment operations from defined waste treatment zone. · Provide a standard operating procedure and training for the dedicated waste treatment operation and review the Safe Work Method and Environmental Statement. · Determine a system for verifying the decontamination of hoses used in minerals operations.

Table 3: ANSTO incidents notified to Comcare in 2020–2021

Radiation safety

Everyone in the world is exposed to ionising radiation from natural sources. In addition, people may also be exposed to radiation from non-natural sources, including nuclear medicine procedures for the diagnosis and treatment of certain illnesses. Personal radiation exposure ('dose') is measured in sieverts (Sv). However, typical annual exposures are so small that they are usually expressed in units of one-thousandth of a sievert, known as a millisievert (mSv). Equivalent dose and effective dose are specific units used for radiological protection purposes.

ANSTO has a demonstrated capacity to safely manage its diverse nuclear and radioactive activities. During routine operations, ANSTO workers and members of the public are exposed to miniscule levels of radiation. This low level of exposure is achieved through good management practices, which also allows for the delivery of the significant societal benefit associated with ANSTO's nuclear activities.

Occupational exposures

According to the most recent data from Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), Australia's primary authority on radiation protection and nuclear safety, the average effective dose an Australian receives from natural background radiation (excluding medical sources) is 1.5 mSv per year. Federal, state and territory regulations require that a member of the public should receive no more than 1 mSv effective dose per year from radiation sources, in addition to background radiation and medical procedures. Effective dose is a central feature of radiological protection. It sums up any number of different exposures into a single number that reflects, in a general way, the overall risk. The concept may be complex, but it makes radiological protection practical to implement.

The regulatory annual limits for radiation workers (occupationally exposed persons) are:

- 20 mSv effective whole-body dose (averaged over five years, with no more than 50 mSv in any one year);
- 20 mSv equivalent lens-of-the-eye dose (averaged over five years, with no more than 50 mSv in any one year);
- 500 mSv equivalent dose to the skin; and
- 500 mSv equivalent dose to the hands and feet.[1]

The radiation exposure of ANSTO's workers who are routinely engaged in working with ionising radiation is monitored by our specialist dosimetry service, with records of exposures maintained. Since the legal limit is averaged over five years, the monitoring results for the last five calendar years (Table 4) show that radiation doses received by ANSTO's occupationally exposed workers remain significantly below regulatory limits. The graph in Figure 3 compares the maximum effective dose to a single worker and the average effective dose across all relevant ANSTO occupationally exposed workers.

Table 5 shows the distribution of individual effective doses over the same five-year period, where the average effective dose across all ANSTO occupationally exposed workers was 0.4 mSv. This is equivalent to receiving two chest X-rays.[2]

[1] These are derived from recommendations made by the International Commission on Radiological Protection in Publication 103.

[2] Radiation in Everyday Life | *IAEA: https://www.iaea.org/Publications/Factsheets/English/radlife;* Flying and health: Cosmic radiation exposure for casual flyers and aircrew | ARPANSA: *https://www.arpansa.gov.au/understanding-radiation/radiation-sources/more-radiation-sources/flying-and-health.*

All staff	Calendar year				
Effective dose	**2016**	**2017**	**2018**	**2019**	**2020**
Maximum individual dose (mSv)	5.4	5.2	5.8	5.3	3.3
Average dose — All ANSTO workers (mSv)	0.5	0.5	0.4	0.4	0.4
Collective effective (person-mSv)	529	546	369	351	368

Table 4: Effective whole-body dose

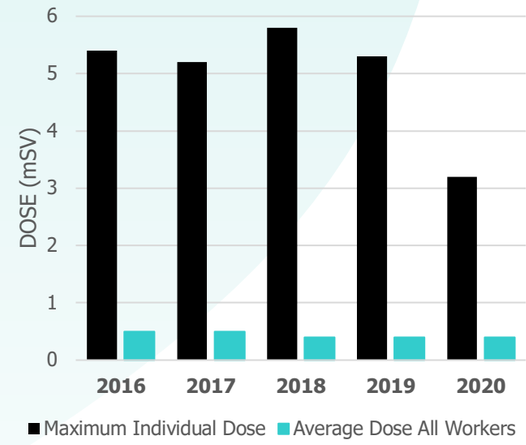


Figure 3: Comparison of maximum and average effective doses

All staff	Calendar year				
Effective dose range	**2016**	**2018**	**2018**	**2019**	**2020**
0 to < 1 mSv	902	918	949	937	912
1 to < 2 mSv	78	71	38	22	40
2 to < 5 mSv	19	27	18	24	13
5 to < 6 mSv	3	2	4	1	0

Table 5: Distribution of individual effective dose

Extremity exposure

The maximum extremity dose to ANSTO's occupationally exposed workers in 2020 was 160 mSv, which equates to approximately 32% of the legal limit. All other workers' extremity exposures were below 40 mSv.

ARPANSA engagement

The main regulator with which ANSTO engages for radiation and nuclear safety is ARPANSA. During 2020–2021, there were no accidents reported to ARPANSA. However, ANSTO was found to be in breach of its licence conditions on eight occasions, as follows:

Facility	Breach	Action taken
ANSTO Camperdown Facility	Breach of subsection 30(2) of the ***Australian Radiation Protection and Nuclear Safety Act 1998*** (the Act) — ***Operating at levels outside the safe working envelope of the facility*** During a desktop review of the Camperdown safety case, ARPANSA identified that manual radiochemistry work had been performed at levels outside those documented in the Safety Analysis Report for a prolonged period without approval or justification.	ANSTO undertook corrective action because of the improvement notice issued on 9 October 2020, reviewed the risk from the operations and provided a response to ARPANSA. No formal enforcement action was taken by ARPANSA.
Instrument Calibration Facility ANSTO Sources	Breach of subsection 31(2) of the Act — ***Failure to revise Source Security Plan*** An assessment of ANSTO's performance at the Instrument Calibration Facility and associated calibration activities involving radioactive sources undertaken across the site against regulatory and licensing requirements identified that the Source Security Plan for Source Licence S0045 had not been revised since its original issue in October 2013, contrary to licence conditions.	ANSTO is revising the ANSTO Source Security Plan.
ANSTO Health Products	Breach of licence condition — subsection 60(1) of the ARPANSA Regulations — ***Take all reasonably practicable steps to manage the safety of the facility*** ANSTO did not effectively managed or stay within the facility's safety case as it relates to Lu-177.	ANSTO has undertaken an investigation to identify the root causes of the incident, the lessons learnt and mitigations to prevent reoccurrence. ARPANSA also has undertaken an investigation, in the form of an augmented inspection, with the consequence being the finding of a breach.
ANSTO Waste Management Services	Breach of licence condition- subsection 30(2) of the Act – ***Failure to comply with operational limits and conditions*** Waste Management Services has four Operational Limits and Conditions identified in its Safety Analysis Report with which it must comply. An ARPANSA inspection found that two Operational Limits and Conditions relating to calibration requirements for radiation monitoring equipment for hot cells and documentation of testing to verify compliance were not always complied with.	ANSTO has investigated the conclusions reached in the inspection report and has identified short and long-term strategies for improvements associated with the calibration of in-cell radiation detectors and annual verification of interlock functionality.
NSTLI — ANSTO Source	Breach of subsection 31(2) of the Act – ***Failure to notify of source transfers*** ANSTO notified ARPANSA on 24 December 2020 it had failed to inform the CEO within seven days of two transfers of Molybdenum-99 (Mo-99) to the Australian National University (ANU) that occurred on 18 and 19 November 2020.	ANSTO is reviewing its internal processes to identify improvements and ensure lessons learnt are shared across ANSTO.
Secondary Standards Dosimetry Laboratory (SSDL)	Breach of subsection 31(2) of the Act – ***Failure to perform maintenance and testing;*** ARPANSA found a failure to perform the maintenance and testing as required in RHS24 at the Secondary Standards Dosimetry Laboratory (SSDL). These tests were also required under local arrangements and the facility's Safety Analysis Report.	ANSTO is in the process of removing (disposing) of the radioactive sources located within the SSDL.
Airborne discharges	Breach of section 30(2) of the Act — ***Failure to report quarterly and annual airborne discharges*** ANSTO's reporting of airborne discharges across four facilities did not meet the reporting requirements as outlined in those facility licence conditions.	ANSTO identified a number of corrective measures to ensure that it is able to provide airborne discharge reports to ARPANSA in a timely manner, including changes to procedures and improved reporting platforms.
ANSTO Gamma Technology Research Irradiator (GATRI)	Breach of licence condition- subsection 30(2) of the Act – ***Failure to undertake a self-assessment against applicable codes and standards*** ANSTO had not undertaken a self-assessment, at least once every 3 years, against each applicable code and standard to comply with licence condition 2 of Facility Licence F0243.	ANSTO has taken steps to ensure self-assessments against all relevant codes and standards are reviewed within the three-year period.

Table 6: ARPANSA licence breaches in 2020–2021

ANSTO's progress in responding to the ARPANSA Safety Review (2018)

ANSTO's comprehensive implementation plan responding to the 2018 ARPANSA Safety Review of the ageing Nuclear Medicine Production Facility (otherwise known as Building 23) has provided a basis for changes and improvements to the facility. ANSTO is committed to a culture of continuous improvement and welcomed the review's recommendations as an opportunity to implement important safety improvements in the facility. A robust governance process to support the delivery of the various recommendations and actions in the plan continues. Officers at the highest level of the organisation (including the CEO, Group Executives and the Chief Nuclear Officer) have all prioritised resources to address these important actions.

ANSTO provides periodic reports to ARPANSA on the implementation of the plan. Approximately 77% of the actions under the plan have now been completed, with the remaining actions estimated to be completed by the end of calendar year 2021. The Budget funding ANSTO received in 2019–2020 and 2020–2021 supports the implementation of the plan.

Strategic objective 2: Undertaking research with strategic partners that is translational and serves users

Analysis of performance

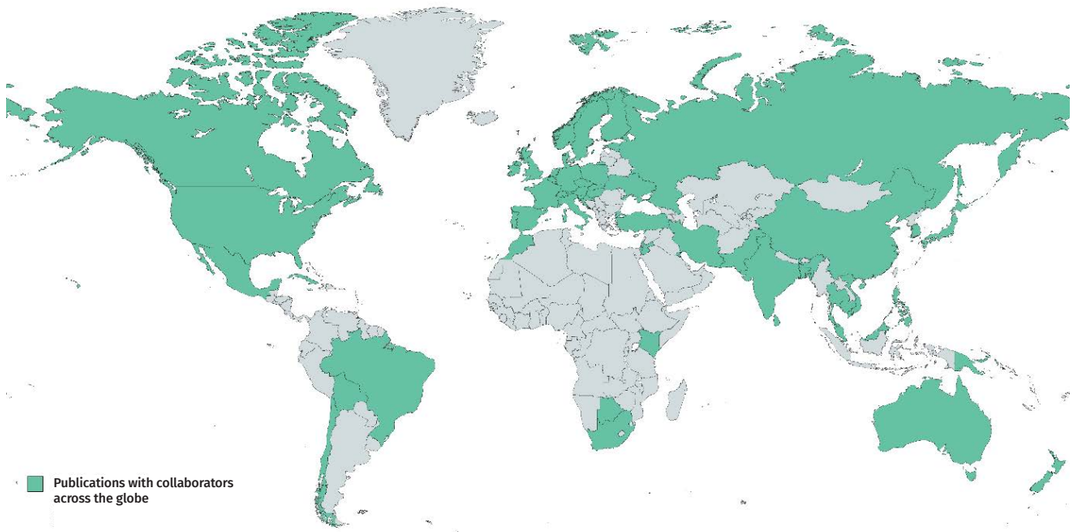
Performance criterion	Measure	Result (2020–2021)
Delivery of research outcomes that have scientific and industry impact, with a focus on health, the environment and the nuclear fuel cycle	Eight case studies per annum demonstrating the impact of our research	**Achieved** See below for outcome-focused case studies.
	90% of publications undertaken with national and international collaborators	**Achieved** 98%

Collaboration

Translational research outcomes are central to our purpose and represent the value we create for Australia. To achieve these outcomes, we collaborate with other researchers and partner with industry and government bodies around the world. This collaborative approach enhances our impact.

In 2020–2021, ANSTO produced over 98% of its journal publications with collaborators from more than 60 countries.

In addition, ANSTO supported over 50 experiments into the COVID-19 virus and potential treatments, through a rapid access program at the Australian Synchrotron.



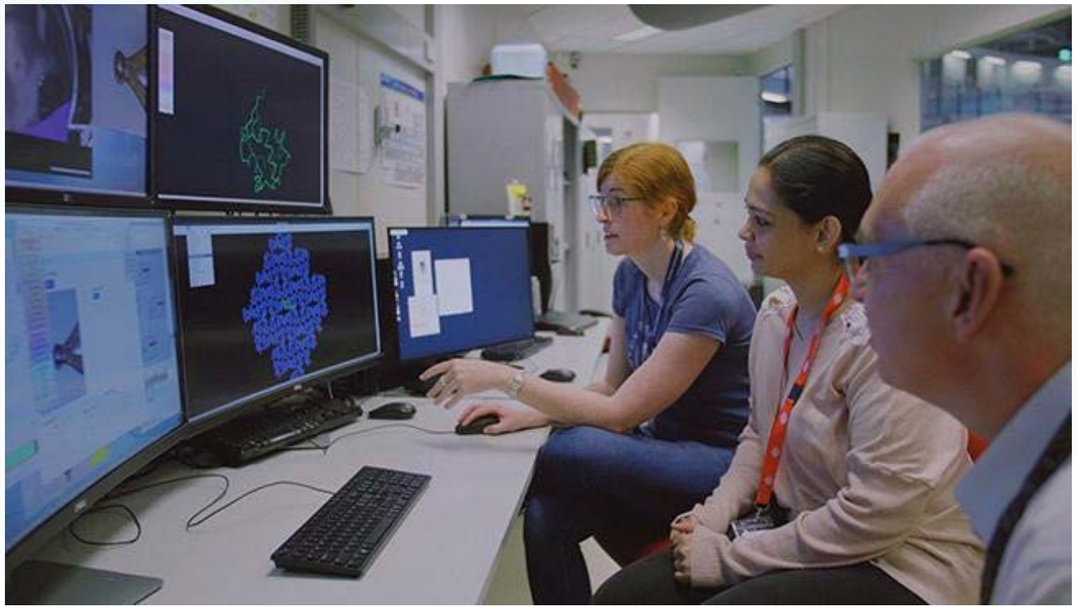
ANSTO collaborating countries for publications

Case studies

To evaluate the diverse benefits from our research activities, ANSTO utilises an in-depth case study approach. The case studies outlined below capture some of our most beneficial and diverse research activities over 2020–2021.

Case study 1: ANSTO has been central to the fight against COVID-19

Outcome	The Australian Synchrotron's rapid access program for COVID-19-related research resulted in more than 50 experiments. Both Australian and international researchers worked to characterise the virus and track how it spreads within human bodies and interacts with the immune system. Notably, a team of Monash University researchers was able to determine the 3D-structure of a COVID-19 protein at atomic resolution, using the macromolecular crystallography (MX) beamlines at ANSTO's Australian Synchrotron.
Impact	Proteins are the 'building blocks' of the COVID-19 virus. This finding will assist scientists in their work to develop drugs that specifically target COVID-19 proteins, blocking the virus' ability to infect and reproduce in human cells
Research	Monash University researchers used the MX beamlines at the Australian Synchrotron to produce a molecular map of non-structural protein 9 (NsP9), one of the lesser understood proteins produced by COVID-19. Determining the shape of a protein is a key step in understanding its function and role in the replication of the virus. This finding could be used in drug screening and targeted experiments to disrupt the replication of the virus within the human body. The Australian Synchrotron fast tracked access to the MX-2 beamline for COVID-19-related research. In addition, the new Australian Cancer Research Foundation Detector on the beamline further accelerated progress: it took just 18 seconds to acquire a data set, which was then used to quickly construct a crystal structure of NsP9.
Collaborators	Monash University



Scientists at the Australian Synchrotron gaining insights into the structure of proteins (left to right) Dr Eleanor Campbell, Sukritee Bhaskar, Alan Riboldi-Tunnicliffe

More information on this research can be found here: *https://www.ansto.gov.au/news/australia%E2%80%99s-nuclear-science-capabilities-have-been-central-to-our-fight-against-covid-19.*

Case study 2: Protecting Australia's valuable aquaculture industry

Outcome	ANSTO is developing a portable scanning technique so as to advance current laboratory-based methods used to determine seafood provenance (origin) and prevent food fraud.
Impact	Aquaculture is a major industry in Australia, with the nation's seafood consumed both domestically and exported globally as a high-value premium product. As Australian seafood is considered to be of high value, its import and export has led to food fraud. This is a practice whereby a specific product is substituted with one of lower quality or value. It also includes situations in which a product claims to be Australian but actually comes from another country, in order to increase profit margins. The portable scanning technique is able to validate the origin of an unprepared seafood sample in the marketplace in minutes. If a product is suspicious, additional samples can then be taken for in-depth analysis in the laboratory. The scanner will act as a first line of defence against fraudulent activity in the supply chain and will eventually be applied to other types of food.
Research	A doctoral student from UNSW worked with the seafood provenance team at ANSTO to develop the first seafood provenance model using laboratory-based techniques to verify origin with greater than 80% accuracy. The science behind the technology relies on X-ray fluorescence (XRF) scanning to generate a profile of the elements in a seafood sample that serves as a fingerprint. Each type of seafood has a unique fingerprint that relates to the specific environment in which it was bred and fed.
Partners	UNSW, Macquarie University, the National Measurement Institute, Sydney Fish Market and other industry collaborators.

(left to right) Dr Jagoda Crawford, Karthik Gopi, Prof. Henk Heijnis, Andrew Taylor of Olympus Australia, Dr Debashish Mazumder, Patricia Gadd and Arda Lepedjian of Olympus Australia. Olympus is providing a portable XFM scanner on loan for the project

More information on this research can be found here:
https://www.ansto.gov.au/news/funding-supports-seafood-traceability.

Case study 3: Improving the additive manufacturing process

Outcome	Research undertaken at ACNS has revealed that the build orientation during an additive manufacturing process has an impact on the formation of stresses in the finished product.
Impact	The development of an accurate tool to assess how stresses introduced during advanced manufacturing affects nickel-based super-alloys will contribute to the use of additive manufacturing for the production of metallic parts in an accurate and predictable manner. These nickel-based super-alloys are often used in aero and gas turbine engines, especially for high-pressure turbine blades and hot section components, and assurance of the components' reliability and durability is essential.
Research	A high level of tensile residual stresses can lead to a crack during printing, while at the same time stresses can contribute to deformation in the part over time. The material has to be scrapped if dimensional tolerance/distortion is compromised or cracking occurs. Three experimental approaches were used to characterise the residual stresses in L-shaped parts made of Inconel 781, a material that is important in the energy and aerospace industries. X-ray diffraction measurements were used to characterise surface stresses, while laser scanning techniques measured overall distortions associated with separating the samples from the base plate. Neutron diffraction, using the Kowari strain scanner at ACNS, was also used to measure residual stress in the interior of the samples. In all orientations, there was a general tendency for compressive stress at the centre of the part, while tensile residual stress was observed near the surface in all samples, which appears to be potentially problematic.
Partners	Linkoping University in Sweden

Prabhat Pant and Victor Pacheco Gimon at the Kowari strain scanner for the residual stress measurements

More information on this research can be found here:
https://www.ansto.gov.au/news/approach-to-improve-additive-manufacturing-processes-developed.

Case study 4: ANSTO evaluates the impact of nanomaterials on health and the environment

Outcome	ANSTO has put together a robust multidisciplinary approach to investigate a common food additive, E171 titanium dioxide, used primarily as a colouring agent in everyday foods.
Impact	Nanomaterials are increasingly being used in a wide range of products, including foods and food packaging, and there is a growing regulatory need to understand their potential impacts throughout their whole life cycle — in particular, in terms of human health and environmental impact. This will assist researchers in understanding the potential effects of nanomaterials on human health and the environment during their entire life cycle.
Research	Employing a unique set of capabilities and range of specialist expertise, ANSTO scientists are using radiotracers to assess the long-term accumulation of titanium dioxide nanomaterials in animals. The work brings together toxicology, materials science, radiochemistry and ion beam analysis; areas in which ANSTO has significant expertise and landmark infrastructure. In designing this study, ANSTO researchers selected an exotic radioisotope, vanadium-48 (48V), with the appropriate half-life and emission to radiolabel the titanium for bioimaging and quantification studies. ANSTO researchers then characterised the radioactive particles to confirm their suitability for biological studies. Using gamma emissions, daily and weekly measurements were made of the quantity of titanium retained in the animal and where it was distributed. The initial findings were presented as an invited talk at the 12th International Particle Toxicology Conference in Austria and as an invited plenary lecture at the PATROLS Annual Assembly in Switzerland.

ANSTO researchers who worked on this project. Back row (left to right): Attila Stopic, Henri Wong, Inna Karatchevtseva, Paul Callaghan, Frederic Sierro, Charmaine Day. Front row (left to right): Grant Griffiths, Vu Nguyen, Katie Sizeland

More information on this research can be found here: *https://www.ansto.gov.au/news/evaluating-impact-of-nanomaterials-on-health-and-environment.*

Case study 5: Understanding the impacts of wastewater on groundwater quality

Outcome	ANSTO is developing a new approach to distinguish between sources of groundwater contamination that could have significant benefits for the monitoring, management and remediation of groundwater globally.
Impact	Around 5.3 billion people benefit from waste treatment plants. However, this benefit comes at an environmental cost in which potential leaks could affect groundwater sources for many generations to come. This research helps to characterise how wastewater leaks affect the underlying groundwater. This is particularly important in Australia, where finite groundwater resources are the primary source of water in many arid areas.
Research	Researchers used a combination of isotopic and conventional techniques to fingerprint the source of pollutants at a Victorian site. The site was complex due to the close proximity of a sewage treatment plant and agricultural sites. Radioactive isotopes enabled researchers to pinpoint how long it had taken the water to be recharged into groundwater. Contaminants and emerging contaminants of concern (linked to industrial or human activity in the last 50 to 80 years) were fingerprinted, enabling researchers to identify the source of the contamination.
Partners	Royal Melbourne Institute of Technology (RMIT)

Bird's-eye view of a wastewater treatment facility

More information on this research can be found here: *https://www.ansto.gov.au/news/new-approach-can-improve-monitoring-of-contaminants-groundwater.*

Case study 6: MABI black carbon detection technology licensed

Outcome	The multi-wavelength absorption black carbon (MABI) instrument, a technology designed and built at ANSTO to measure the concentration of carbon in the atmosphere and to determine its source, is now commercially available. Thomson Environmental Systems in Caringbah NSW, located in close proximity to ANSTO's Lucas Heights campus, has been licensed to sell MABI, which is now available for purchase in more than 40 countries.
Impact	The modular desktop technology can be used to distinguish black carbon particles from two primary sources: diesel vehicles and biomass burning, such as bushfires or crop burning regimes. This information can provide environmental managers and researchers with valuable information about the source of pollution, as well as its short and long-term effects on climate change.
Research	The instrument uses a multi-wavelength technique, measuring seven different wavelengths ranging from 405 to 1,050 nanometres. It can measure seven different types of particles (those wavelengths correspond to the size of the black carbon particles). The instrument works by inserting a filter paper into a beam of light. This light goes through the filter and into a detector. A measurement is taken for an unexposed filter and then an exposed filter. By taking the log of the unexposed reading subtracted from the exposed reading, the amount of black carbon on the filter can be calculated. The process is fast, taking less than 35 seconds to complete the seven-wavelength measurement. The idea for the instrument came from ANSTO's fine particle pollution sampling program, which has been running for over 40 years.
Partners	Thomson Environmental Systems

The MABI device

More information on this research can be found here: *https://www.ansto.gov.au/news/distinguishing-black-carbon-sources.*

Case study 7: Understanding how ventilation might affect blood flow in ventilated pre-term babies

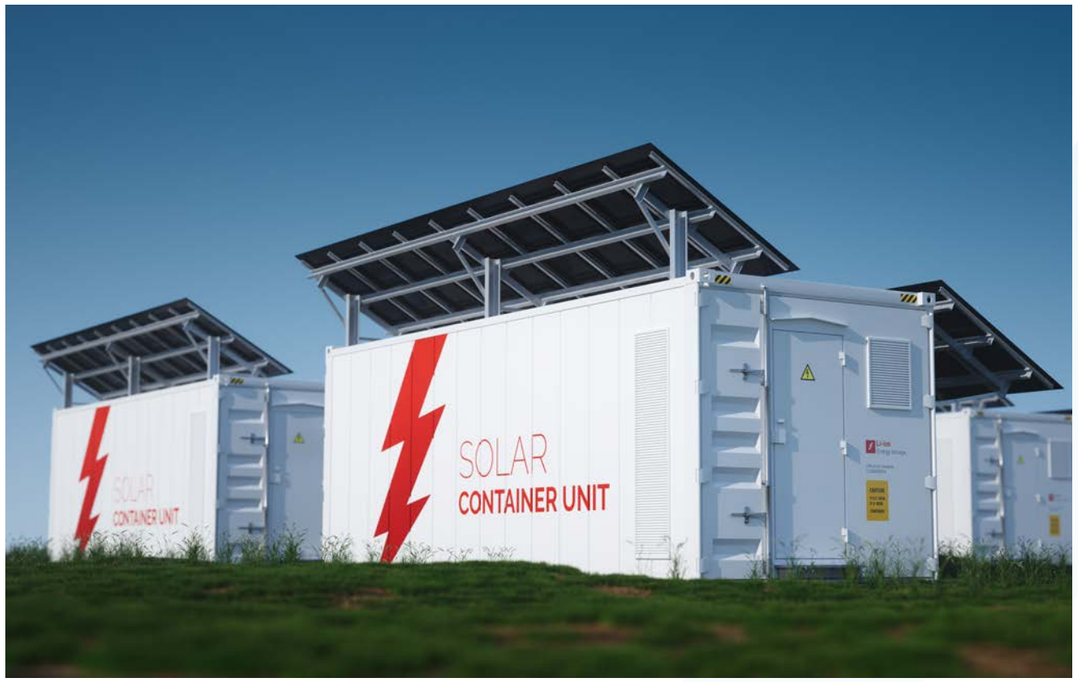
Outcome	A large international collaboration that utilised ANSTO's Australian Synchrotron has revealed that the ventilation of pre-term babies to prevent lung collapse could create a risk of brain injury.
Impact	This research has shown that higher lung pressure causes engorgement and stretching of blood vessels in the brain, which could slow down blood flow in the brain. This may play a role in pre-term brain injury. Because of the findings, hospitals have been alerted to carefully monitor their ventilation of pre-term babies, who now survive after as few as 23 weeks' gestation.
Research	In vivo CT imaging, undertaken on the Imaging and Medical beamline (IMBL) at the Australian Synchrotron, was used to generate extremely clear and detailed images of blood vessels during the dynamic physiological process of blood flow. During the experiment, the instrument took 16 images per second and the images were pieced together to create 40 seconds of video. Using the video, the investigators were able to quantify changes to the vasculature based on blood vessel diameter. The experiment represents the first time a pre-term brain of a large preclinical model has been imaged in this way. These results could not have been obtained using conventional brain imaging methods.
Partners	Hudson Institute for Medical Research and Monash University

Dr Daniel Hausermann standing next to the IMBL at ANSTO's Australian Synchrotron

More information on this research can be found here: *https://www.ansto.gov.au/news/understanding-how-ventilation-might-impact-blood-flow-ventilated-preterm-babies.*

Case study 8: Investigating advanced materials for large-scale energy storage

Outcome	ANSTO contributed to a large international collaboration on advanced sodium ion batteries led by French researchers, which provides a direction for the design of high-performing sodium ion electrodes.
Impact	Advanced sodium ion batteries could be used for large-scale energy storage.
Research	The Echidna high-resolution diffractometer at ACNS was used to show the distribution of metals in the ion structure. The data, which reveals the position of the metal atoms during charge cycling, was combined with other experimental and computational techniques to reveal that a sodium-rich layered oxide does not show voltage fading on cycling. This is a promising development.
Partners	University of Sydney, the College of France, Research Network on Electrochemical Energy Storage (France), Sorbonne University (France), Renault Technocentre (France), Paul Scherrer Institute (Switzerland), Skolkovo Institute of Science and Technology (Russia), Advanced Light Source Berkeley National Laboratory (US), University of Orleans (France), University of Pau and Pays de l'Adour (France), University of Illinois at Chicago (USA) and the University of Montpellier (France).



Large scale energy storage

More information on this research can be found here: *https: //www.ansto.gov.au/news/investigating-advanced-materials-for-large-scale-energy-storage.*

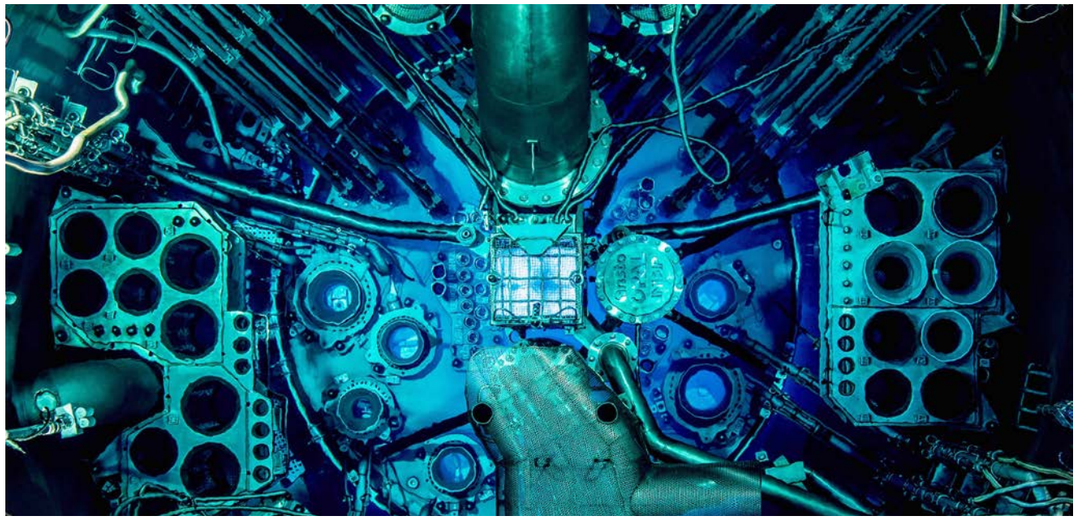
Strategic objective 3: Provide platforms and development pathways to enable world-class research that creates economic impact and benefits

Analysis of performance

Performance criterion		Measure	Result (2020–2021)
OPAL	OPAL continues its strong record of performance, retaining its status as one of the hardest working and most reliable multipurpose reactors in the world.	280 days	**Not achieved** 253 days
Australian Synchrotron	The Australian Synchrotron is one of the leading synchrotron facilities of its kind, maximising utilisation to deliver beneficial research outcomes for Australia. ANSTO measures the Australian Synchrotron's performance by percentage availability. This is the delivered number of hours available out of the scheduled number of hours available.	95% utilisation	**Not achieved** 80%
Australian Centre for Neutron Scattering	ACNS remains a world-leading facility, capitalising on the high availability of the OPAL reactor to support Australian researchers and industries. ANSTO measures the performance within ACNS by percentage utilisation. This is the number of actual operating days out of the number of scheduled operating days.	85% utilisation	**Not achieved** 65%
Centre for Accelerator Science	CAS maximises utilisation of the available capacity of Australia's accelerator technologies and expertise. ANSTO measures the performance within CAS by percentage utilisation. This is the number of actual operating days out of the scheduled operating time.	65% utilisation	**Achieved** 66%

2020–2021 presented ongoing challenges to the operation and utilisation of ANSTO's landmark infrastructure as a result of the COVID-19 pandemic and the unplanned shutdown of key infrastructure. A range of initiatives were implemented in 2020–2021 to maintain user engagement and throughput, including a focus on granting access to a higher proportion of local early career researchers, as well as the implementation of a wider program of mail-in experimental services. Accordingly, the last 12 months have also seen the deployment of new capabilities, capital upgrade and programs, as outlined in the 2020–2021 Corporate Plan, to deliver greater reliability, better user experiences and increased utilisation. These initiatives will continue into 2021–2022, to enable our operational targets to be met while recognising that the ongoing COVID-19 pandemic will continue to have an impact.

OPAL



- OPAL is one of the world's leading multipurpose reactors and uses proliferation-resistant low-enriched uranium for a wide range of applications.
- OPAL produces 80% of Australia's nuclear medicines, which will benefit, on average, two out of every three Australians during their lifetime.
- OPAL supplies neutrons for research at the ACNS.
- OPAL processes over 50% of the world's neutron transmutation doped silicon used by the semiconductor industry in high-reliability and high-precision applications, such as power transmission infrastructure, fast trains and hybrid cars.

In 2020–2021, the OPAL reactor operated for 253 days with a reliability of 80%. During the 2020–2021 financial year, the reliability of OPAL was less than that targeted due to the unplanned extension of two shutdown periods, resulting in a total of approximately eight weeks of unplanned shutdown time. These shutdowns were related to:

- a discontinuity identified on the OPAL riser, which sits above the reactor core and acts as a structural support and coolant boundary — OPAL remained inoperative for several weeks beyond its scheduled restart in order for this discontinuity to be investigated and addressed; and
- the OPAL automatic shutdown system being triggered a number of times upon an attempt to return to power. Although there were no safety implications, this required some significant investigative work with global reactor experts.

ANSTO places safety as its highest priority and therefore seeks to ensure that the reactor's design and operation meet safety requirements.

Despite the aforementioned challenges, sustained safe operations have been achieved through the expertise of ANSTO's staff and robust asset management. ANSTO's investment in OPAL has enhanced safety and reliability, with optimised realisation of asset value through the renewal of key infrastructure. These investments have enabled:

- an upgrade to OPAL's safety critical ventilation system;
- completion of an in-service inspection program; and
- the replacement of a neutron guide shutter to expand neutron science capabilities.

A focus on increasing the capacity and capability of the reactor has resulted in a greater level of irradiated products and services being provided to our stakeholders and users, particularly the supply of critical medical radioisotopes.

OPAL has continued to be used for the irradiation of neutron transmutation doped (NTD) silicon, as well as radioisotope products, including novel theranostic products that combine diagnosis and treatment. ANSTO is increasing the capacity for OPAL's irradiation of these products through optimised target configuration within existing facilities. ANSTO's collaboration with researchers to produce the irradiated products supports the global development of targeted treatments that minimise damage to healthy tissue and are better tolerated by patients.

Australian Synchrotron

- The Australian Synchrotron uses accelerator technology to produce a powerful source of light, a million times brighter than the Sun.
- Synchrotron light is guided into beamlines that are used for a wide variety of research purposes, including in the fields of human health, energy, agriculture and manufacturing.
- Experiments with synchrotron light provide unique advantages in terms of accuracy, level of detail and faster results that complement a wide range of other experimental techniques that ANSTO offers.
- The Australian Synchrotron typically hosts more than 5,000 researcher visits annually.
- The Australian Synchrotron is undergoing a significant expansion. More details can be found under Section 5: Update on major projects – Australian Synchrotron: Project BR-GHT.

Over two-thirds of all protein structures solved in Australia and lodged in the worldwide protein data bank come from the Australian Synchrotron. This data, which is generated by the Australian Synchrotron, contributes to drug developments that undergo a rigorous period of testing through clinical trials before getting to market. In addition to the Walter and Eliza Hall Institute of Medical Research (WEHI)-developed Venetoclax, which combats chronic lymphocytic leukaemia and has delivered more than $400 million to the Australian economy, at least seven other drug candidates related to structural work undertaken using the beamlines at the Australian Synchrotron have reached the clinical trial phase. This is testament to the world-class platforms managed by ANSTO.

Notwithstanding the COVID-19 pandemic-related lockdowns and travel restrictions that saw only 1,860 researcher visits (instead of the more than 5,000 expected visits), all beamlines delivered at least 50% of their normal, non-COVID-19-effected beamtime load. This was due largely to the support of mail-in and remote access programs.

Accordingly, the impact of COVID-19-related restrictions was mitigated and 80% utilisation of the facility was able to be achieved. This is a relatively minor reduction from the 95% target, especially considering less than 40% of the usual number of researchers were able to physically visit the facility.

The strength of the user support provided ensured that over 50 COVID-19-related experiments were undertaken during the year. This resulted in high-impact outcomes, helping to piece together the biochemistry of the virus and support vaccine development and other treatments, which were published in world-leading journals, such as ***Science***.

User input to the continued development of ANSTO platforms including the Australian Synchrotron is sought through a variety of mechanisms. These include user meetings, advisory committee and stakeholder committee meetings, and roadshow programs at which new beamline capabilities are discussed. In the first half of the reporting period, almost all of these meetings were conducted remotely — resulting in higher attendance numbers and a more democratic input process.

Australian Centre for Neutron Scattering

- ACNS uses neutrons from the OPAL reactor to enable scientists and industry to solve complex questions and problems.
- Neutron scattering enables research into areas of national importance, including health, food, materials engineering, quantum materials, energy, cultural heritage and environmental science.
- ACNS is a global leader in neutron science, is home to 15 neutron beam instruments and is partially funded by National Collaborative Research Infrastructure Strategy (NCRIS).

During 2020–2021, ACNS hosted more than 200 users, supporting in excess of 330 user projects.

Unplanned OPAL outages and unplanned infrastructure maintenance activities affected ANSTO's ability to achieve its ACNS utilisation target for 2020–2021. Travel restrictions imposed by the COVID-19 pandemic also affected the ability of users to undertake experiments at ACNS. Nevertheless, a sample mail-in program enabled a number of user experiments to proceed without the need for travel.

ANSTO's technical and scientific research support staff played an important role in the training and development of post-graduate students, post-doctoral fellows and early career researchers over the reporting period. In 2020–2021, ACNS supported over 190 postgraduate students, with over 70 postgraduate students participating in experiments at ANSTO as part of their studies.

ANSTO has been providing additional support to early career researchers, including Honours, PhD and MSc students, as well as AINSE Early Career Grant holders. ANSTO has been prioritising discretionary beamtime proposals from early career researchers to backfill experiment cancellations due to COVID-19 and has supported 51 discretionary proposals supporting early career researchers.

Centre for Accelerator Science

- CAS offers expertise in accelerator applications, accelerator systems and development and sample preparation chemistry.
- CAS operates four mega-electron volt accelerators, a suite of 12 chemical laboratories, and electrical and mechanical support facilities to support research and innovation communities with accelerator science applications in materials characterisation, analysis, modification and testing.
- CAS outcomes are deepening our understanding of climate change and cultural heritage, supporting a sustainable environment, revealing the sources of atmospheric pollution, driving development in advanced manufacturing capabilities, space and quantum technologies, and next generation cancer treatments, and detecting and preventing nuclear proliferation.
- CAS has world-class expertise in high-sensitivity trace element analysis, surface characterisation, ultrasensitive isotope dating, micro-scale irradiation, and nano-scale ion positioning.
- CAS is the largest centre of its kind in the southern hemisphere and welcomes several hundred users annually, collaborating with Australian and international universities, local industries, the IAEA, state environmental protection agencies, and Publicly Funded Research Agencies. CAS is partially funded by NCRIS.

ANSTO has met its utilisation target for CAS for this year. This is despite ongoing restrictions with regard to international travel, along with interstate travel restrictions throughout the year, which have affected the ability of our users and collaborators to collect samples and/or send samples for allocated experiment access.

CAS was closed to external users for one month of the reporting period, in July 2020, and between April and June 2020 all operations were suspended due to the COVID-19 pandemic. ANSTO recovered from this down-time by prioritising user projects that were disrupted or not completed because of the shutdown period.

COVID-safe protocols are now in place and the ongoing recovery to full operations is supported by the ability of ANSTO to deliver remote access for users by carrying out measurements on mail-in samples.

The utilisation figure is the result of over 75 projects being conducted at CAS with more than 100 users from Australian and international universities, government agencies and industry.

Strategic objective 4: Provide expert advice, education and services to support Australian policy and strengthen Australia's nuclear science knowledge base

Analysis of performance

Performance criterion	Measure	Result (2020–2021)
Effectively facilitate ANSTO's role with Government and internationally as Australia's centre of excellence on nuclear science and technology by: • providing reliable and trusted advice to Ministers, Parliament and Government departments and agencies; and • engaging with key international nuclear organisations, policy discussions and bilateral partners	Case studies to highlight and assess the impact of our engagement with political and international stakeholders	**Achieved** Refer to below case studies

Case study 1 — Advice to Government

During 2020-21, ANSTO maintained ongoing engagement with the Minister for Industry, Science and Technology. ANSTO also worked closely with the Assistant Minister for Industry Development, Senator the Hon Jonathon Duniam.

ANSTO continued to adopt a proactive approach to keeping the Minister informed of its activities, including as required under section 19 of the PGPA Act. ANSTO provided over 20 briefs on operations and activities to its responsible Minister and advised on key organisational milestones and challenges. Additionally, ANSTO made 14 submissions to both federal and state parliamentary inquiries on topics including: health in rural and regional NSW, emerging medical technologies, growing Australia's space industry, Australia's aquaculture sector, the environment, energy generation and storage, and university research commercialisation. ANSTO staff also provided expert evidence at five parliamentary inquiry hearings.

ANSTO continued to act as the secretariat for both the Nuclear Agencies Consultative Committee (NACC) and the Research Agencies Meeting (RAM):

- NACC is a forum for senior representatives from agencies of Government who are involved or interested in nuclear matters to exchange information, coordinate activities, and discuss policy development and international engagement. Nine Government departments and agencies regularly participated in NACC meetings during the reporting period.
- RAM brings together approximately 50 representatives from more than 20 Government departments, agencies and research institutes each quarter for important science policy discussions.

In addition to these forums, ANSTO responded to numerous requests from other departments and science agencies for expert advice regarding nuclear science and technology, and provided input into the development and revision of science and research policy.

Case study 2 — Ensuring the continued supply of nuclear medicine in Australia

Nuclear medicine production is one of the major services ANSTO provides to the Australian community on behalf of the Government, contributing significantly to Australia's sovereign capability in healthcare. Effective engagement and partnership with Government is vital for the ongoing reliable supply of nuclear medicines, particularly during the challenges imposed by the COVID-19 pandemic. This partnership is evidenced by the Government's strong support for ANSTO's nuclear medicine manufacturing capability through the provision of over $150 million in funding in the 2019–2020 (and 2020–2021 Mid-Year Economic and Fiscal Outlook (MYEFO)) and 2020–2021 Budgets. This funding will improve the reliability of nuclear medicine production in ANSTO's ageing Nuclear Medicine Production Facility (Building 23).

ANSTO provides regular briefings to its responsible Minister on nuclear medicine production and, in April 2021, the then Minister, the Hon Christian Porter MP, visited ANSTO and saw first-hand the vital work that ANSTO's nuclear medicine manufacturing workers undertake. Throughout 2020–2021, ANSTO increased its engagement with the Department of Health regarding the supply status of nuclear medicines to ensure that alternative arrangements could be made, where possible, during times of prolonged disruptions.

ANSTO contributed to policy discussions regarding healthcare and health research in Australia through submissions and contributions to federal and state parliamentary and other inquiries. Contributions include:

The Hon Christian Porter MP, the then Minister for Industry, Science and Technology, during his visit to ANSTO in April 2021

- a submission to, and appearance before, the House of Representatives Standing Committee on Health, Aged Care and Sport inquiry into approval processes for new drugs and novel medical devices in Australia;
- a submission to Cancer Australia's consultation on the National Pancreatic Cancer Roadmap;
- a submission to the New South Wales Parliament's Portfolio Committee No. 2 — Health inquiry into health outcomes and access to health and hospital services in rural, regional and remote New South Wales; and
- a submission to the Medical Research Future Fund's 2020–2022 priorities.

Case study 3 — IAEA Collaboration Centre

In March 2021, ANSTO was formally designated an IAEA Collaborating Centre on New and Advanced Techniques and Applications of Nuclear Science and Technology Towards a Sustainable Environment. The Centre will run for four years and it is just the third time that ANSTO has received designation under this program.

Collaborating Centres are prestigious designations conferred by the IAEA to laboratories around the world, recognising the unique capabilities and expertise they provide in a particular area.

For many years, ANSTO has been particularly active in engaging with the IAEA on environmental matters, working with both IAEA programs on Nuclear Science and Applications and on Technical Cooperation. The new centre developed a work plan that drew on this experience, focusing on four thematic areas:

1) food provenance;

2) isotope hydrology;

3) nuclear and isotopic techniques in art, architecture and cultural heritage; and

4) environmental change and radioecology.

The work plan will provide ANSTO with greater access to a number of the IAEA's programs and databases, facilitate international conferences and workshops, and enable exchange of knowledge and personnel in mutually beneficial areas.

Representatives from the IAEA carrying the ANSTO collaboration centre plaques

Case study 4 — Provision of expert advice on nuclear energy continues through participation in a major international study

ANSTO is a member of, and represents Australia in, numerous international and multilateral projects focused on the research, development and assessment of advanced nuclear energy platforms. This is through the IAEA and the Generation IV International Forum (GIF), the latter of which is administered by the OECD-NEA.

In November 2020, ANSTO was informed that its proposal to join the IAEA's new coordinated research project on the economic appraisal of Small Modular Reactors (SMRs) was successful. ANSTO has assembled a team of its own and other Australian experts to:

- develop a systematic approach to the economic appraisal of SMRs;
- produce a methodological tool for assessing the technological readiness and financial viability of SMR designs;
- prepare a case study on Australia's potential to adopt SMR technologies in the future (should Government policy change);
- analyse financing options for SMRs;
- develop a topology for the most efficient legal, regulatory and licensing regimes; and
- investigate a framework to build and test the social acceptability of SMRs.

Participation in the coordinated research project will enable Australia's experts to connect with international vendors, technology developers, economists, social scientists, legal experts and researchers in order to ascertain the facts regarding the likely future costs of SMR development and deployment. This will be valuable in the context of the Australian Government's September 2020 First Low Emissions Technology Statement, which included SMRs as a 'watching brief' technology. Participation in the project will also enable ANSTO to continue to play a lead role in providing expert advice on nuclear energy to the Australian Government and other domestic stakeholders so as to assist in evaluating the viability and feasibility of the technology in an Australian context.

Education, engagement and entrepreneurship

Performance criterion	Measure		Result (2020–2021)
Share with the general public research outcomes enabled by ANSTO	Science stories to highlight ANSTO's research outcomes	≥ 36 science stories published on the ANSTO website per annum	**Achieved** 86 science stories published
Increase STEM engagement	Offer a range of resources for teachers and students to support the national science curriculum outcomes for years 3 to 12	Deliver ≥ six national programs per annum	**Achieved** Eight programs delivered
	Increase accessibility of STEM teacher training programs	Deliver teacher professional development days in all states and territories	**Achieved** Delivered to 936 teachers in all states and territories.
	Conduct educational tours and science experiences at ANSTO's Sydney and Melbourne campuses	≥ 5,000 visitors to ANSTO's campuses	**Achieved** 6,381 visitors to ANSTO's campuses

ANSTO aims to inform and engage Australians about the benefits of nuclear science and technology. We also seek to support national science education objectives and inspire young Australians to take up a STEM career, to ensure Australia's pipeline of STEM talent is maintained.

Despite the COVID-19 pandemic leading to ongoing necessary adjustments across all communications and engagement programs, we experienced strong audience reach and engagement, with an increase 22% in online engagements through our website and social media activities, and overall audience growth of 25%. ANSTO has leaned into offering parents, students and teachers support via our online programs throughout the COVID-19 pandemic. We have also been increasingly successful in securing mainstream news coverage for ANSTO's research activities and advocacy through social media.

ANSTO's secondary school education program continued to be affected by the COVID-19 restrictions. At the start of the reporting period, all education engagement was delivered online, with a gradual return to physical events and tours in calendar year 2021. Although a challenging year, the pivot to online learning meant that ANSTO's reach in the education sector has increased with more participation across a greater number of new national programs.

Our videoconferences have continued to be a strong tool for engaging school students, reaching more than 3,600 students during 157 sessions. Even as face-to-face tours recommenced, demand was still strong for online engagement.

Our engagement with teachers has tripled when compared to the previous financial year, reaching more than 900 teachers via online professional development programs.

ANSTO and Swinburne University, our education partner for the Australian Synchrotron, played an important role in supporting year 12 physics students who were preparing for their final examination while still home schooling. Online resources were created that replicated the experience that is normally delivered in the Synchrotron education labs, using equipment not found in school labs. Two-hundred and sixteen students from 25 schools used data from these online resources.

ANSTO delivered the first ever Kid's Hackathon for secondary school students during National Science Week. Thirty-five teams from 16 schools participated in the week-long competition, supported by 31 mentors. The success of the Hackathon will see this become an annual event. ANSTO also continued to run the hugely popular online 'STEAM Club' for primary school age children, with this year's program attracting over 2,500 registrations.

The very popular campus tours programs recommenced at Lucas Heights in February and Clayton in April. The volume of tours is around 75% of pre-COVID periods.

Australia is perceived as a global leader in effective communication and education on nuclear science and technology. During 2020–2021, ANSTO was invited by the IAEA to develop and run a two-week virtual training course for 60 female educators and communications professionals from across the globe. The training aimed to assist participants in learning to effectively communicate or teach how nuclear science and technology is helping to achieve many of the United Nations Sustainable Development Goals. This training was deemed highly successful by the IAEA, with the participants' post-course feedback being overwhelmingly positive. The course will be run again in 2021.

Strategic objective 5: Support better healthcare for all Australian and international customers with nuclear medicine products

Analysis of performance

Performance criterion	Measure	Result (2020–2021)
Radiopharmaceutical doses (potential doses)	2,765,179	**Not achieved** 1,645,273
Maintain our ISO 9000 Quality Management System certification.	Maintain certification	**Achieved**

Nuclear medicine production

The ANM facility located at ANSTO's site in Lucas Heights, Sydney

Molybdenum-99 (Mo-99) and Technetium-99m (Tc-99m) Gentech Generators

ANSTO delivered approximately 1.65 million radiopharmaceutical doses over the reporting period. Delivery of doses was affected by both internal and external (including market) factors.

The ANSTO-operated export-scale Mo-99 Production Facility, ANM (owned by ANSTO's subsidiary, ANM Pty Ltd), restarted exports of Mo-99 in August 2020 after being absent from the international market for just over one year. ANM has subsequently increased its output and reliability month-on-month, and is progressively seeking additional volume commitments from its overseas customers. The two OPAL outage events that occurred in November 2020 and March 2021 have slowed new orders, but ANSTO has continued to engage in proactive communications and subsequent opportunities to bid for export volume for future years.

ANSTO's Nuclear Medicine Manufacturing and Distribution Facility (known as Building 23), placed new limits on its Tc-99m Gentech Generator volume capacity to better ensure safe, sustainable supply. This primarily affected international market engagement in the short to medium-term due to the reduced number of generators available for export.

Demand in the domestic market altered as customers adjusted their buying patterns in line with changing patient demand due to the COVID-19 pandemic. Supply was also affected by a significant reduction in the number of flights both within Australia and internationally.[3] Prior to the COVID-19 pandemic, cargo space was readily available on both domestic and international passenger flights, as well as dedicated freight aircraft. As the number of passenger flights decreased, available cargo rapidly shifted to dedicated freight space, causing prioritisation of freight, potential delays and shortage of available flights. This shift affected ANSTO's ability to both receive and supply product in Australia and with its international partners.

To address the challenges presented during 2020–2021, ANSTO is prioritising maintenance projects as well as forecasting and planning activities to drive better performance outcomes for the organisation. ANSTO's detailed plans for the forward period are contained within our 2021–2022 Corporate Plan.

Iodine-123 MIBG and Iodine-131 MIBG

On behalf of the Australian nuclear medicine community, ANSTO sources Iodine–123 MIBG and Iodine-131 MIBG from international partners. The products are used for the detection and treatment (respectively) of rare forms of cancers in both adults and children. Due to their radionuclide profile, both products have short activity life and, if not quickly delivered, become inactive and unsuitable for clinical use. Throughout the COVID-19 pandemic, ANSTO continued to work closely with the nuclear medicine community to find ways to maintain the sustainable supply of these critical nuclear medicine products. In particular, this involved funding a charter flight from Japan for Iodine-123 MIBG to ensure delivery to meet patient needs. ANSTO's close work with airline companies has enabled patients to continue to receive treatment despite significant disruptions to air freight and travel.

Provision of Lutetium-177 in clinical trials

ANSTO continued to provide nuclear medicines to clinical trials in Australia and to support diagnosis and treatment of patients with life-threatening cancers and other conditions in the full clinical setting. The TheraP trial, led by Professor Michael Hoffman, and published in the ***Lancet*** in February 2021,[4] was the first multi-centre prospective clinical trial to test Lutetium-177 PSMA-617 (Lu-PSMA) head-to-head with chemotherapy, the current standard of care. ANSTO is acknowledged in this publication for its funding contribution to this important trial. This practice-changing study, which sourced Lu-177 from ANSTO, enrolled men all of whom had prostate cancer that had progressed after initial treatment. In the trial, men were randomised to receive either Lu-177 PSMA or cabazitaxel (used in chemotherapy). The trial results indicated that the men who received Lu-177 PSMA were more likely to show tumour shrinkage as measured on a follow-up CT scan. Shrinkage due to Lu-177 PSMA treatment was 49%, versus 24% for cabazitaxel. Patients were also more likely to show a 50% (or more) reduction in PSA levels, a blood marker for prostate cancer — at 66%, compared to 37% from cabazitaxel. A year after treatment, 19% of men who received Lu-177 PSMA treatment had cancers that had not progressed, compared to just 3% for cabazitaxel. At large, the clinical trial demonstrated that Lu-177 PSMA offers men greater quality of life and better response rates than chemotherapy. The Peter MacCallum Cancer Centre has also led several clinical trials using Lu-177 PSMA over recent years, and Professor Hoffman has stated that this treatment is likely to be available globally within the next two years.

ANSTO will continue to support the availability of Lu-177, which offers hope to many patients in Australia and New Zealand.

[3] See *http://www.oecd.org/coronavirus/policy-responses/covid-19-and-the-aviation-industry-impact-and-policy-responses-26d521c1/#figure-d1e239.*

[4] Published online February 11, 2021 *https://doi.org/10.1016/S0140-6736(21)00237-3.*

Quality Management System certification

ANSTO strives to be an organisation renowned for its highly reliable supply of products and services, in particular, nuclear medicine products. Over 2020–2021, we have continued to place a high priority on achieving quality excellence. ANSTO's Quality Management System (QMS) is a certified system with documented processes, plans and established responsibilities for achieving excellence, in addition to our quality objectives. The system aligns with the ANSTO Corporate Plan and Quality Policy. It provides a framework for strategic planning and continuous improvement, as well as for ensuring customer satisfaction and compliance with legislative, regulatory and organisational requirements. The high-level structure of the QMS provides a flexible platform for integrating quality with the Oliver Wight Integrated Business Planning and ISO management systems, such as ISO14001 and ISO45001.

An integrated recertification audit for ISO9001 and surveillance audits for ISO14001 and ISO45001 were conducted during August to October 2020 for the ANSTO Lucas Heights and Clayton campuses, as well as for the Camperdown site. Certification was successfully maintained for the integrated systems, with no major non-conformances identified.

Strategic objective 6: Innovation Precinct, partnerships and services, delivering impactful and sustainable outcomes

Analysis of performance

Performance criterion	Measure	Result (2020–2021)
To grow knowledge incubation, collaboration and connectivity within ANSTO's Innovation Precinct	10% increase in overall stakeholders engaged in the precinct	**Achieved** 263% increase 11 new Graduate Institute scholars, university and industry partners 12 new nandin members

The ANSTO Innovation Precinct, at our campus in Lucas Heights, is driving Australian innovation through collaboration between science, research and business. The Innovation Precinct is co-locating knowledge-intensive businesses, high-tech industry, STEM graduates from Australian universities, and scientific partners. Support from all levels of government has facilitated the early stages of the Precinct's development.

Major project developments in 2020–2021 have include the expansion of the ***nandin*** Innovation Centre and Graduate Institute, enabled by the $12.5 million NSW Government investment, which was reported in ANSTO's 2018–2019 Annual Report.

nandin welcomed 12 new members over the reporting period and has now grown to 27 companies and created over 50 new jobs. The NSW Government-funded FutureNow top-up scholarship scheme and now the FutureNow Plus stipend scheme have seen applications increase steadily. The inaugural cohort of five Graduate Institute scholars increased to 16 in the last year.

ANSTO has seen an uplift in members and job creation due to the COVID-19 pandemic, with several businesses established during the pandemic choosing to become members of ***nandin***. CoUSpace, GAIA Pod, Elavo and eNucleo all came from solutions as a result of ***nandin's*** Design Factory activities, with the start-ups being established to commercialise the outputs. ***nandin's*** Design Factory activities are supported by the NSW Government.

Section 5: Update on major projects

Delivering a strong future for Australia's nuclear medicine production

The ANM facility located at ANSTO's site in Lucas Heights, Sydney

ANSTO is responsible for the manufacture, production and distribution of radiopharmaceuticals, radiochemicals, cold kits and accessories for use in healthcare and research globally.

The COVID-19 pandemic provided some unique challenges for these activities. This was largely due to the short half-life of nuclear medicines and the reduced availability of staff, as well as cuts in the number of flights available for the distribution of products around Australia and the importation of niche nuclear medicine products from overseas.

ANSTO worked intensely with its partners, freight and logistics companies, as well as international manufacturers to ensure continuity of supply of nuclear medicines to Australian patients.

As logistical challenges around supply grew, ANSTO made a carefully considered decision to postpone the preventative maintenance shutdown of its ageing Nuclear Medicine Manufacturing and Distribution Facility (Building 23), originally scheduled for November 2020, until August 2021. This decision enabled continuity of supply during a very critical period of change for the Australian health landscape, which was responding to the demands of the pandemic.

As ANSTO, its customers and patients continue to emerge from the restrictions of the COVID-19 pandemic, there will be an added need to adjust to evolving patterns in the demand and supply of nuclear medicine.

ANSTO is committed to working with the nuclear medicine community to make critical adjustments where needed to meet the needs of Australian patients. ANSTO wishes to acknowledge the significant contributions made by the Australian Government, the Nuclear Medicine Working Group and its Advisory Board; the support, guidance and assistance from these partners has been invaluable over the last 12 months.

Expanding ANSTO's Innovation Precinct: Putting science to work

The Premier of NSW, Gladys Berejiklian, visiting ANSTO to open the ***nandin*** Innovation Centre — pictured with the ANSTO CEO, Shaun Jenkinson

The Hon Gladys Berejiklian MP, Premier of New South Wales, officially opened the new home of the ***nandin*** Innovation Centre on 16 June 2021. The original home of ***nandin*** was launched in late 2018, but in just two short years had outgrown the facility.

The new home includes:

- a prototype lab for 27 member start-ups to build and test products;
- a creation lab for producing digital content;
- multiple collaboration zones; and
- room for 50 additional on-site businesses as the centre continues to grow.

It is also home to the ANSTO nodes of the Design Factory Global Network and the Sydney Landing Pad.

The new Innovation Centre represents a major milestone for the continued development of the ANSTO Innovation Precinct and was delivered as part of the NSW Government's $12.5 million contribution for the Precinct project.

ANSTO's focus now shifts towards fitting out laboratory spaces for next-generation nuclear medicine companies, as well as continuing to work with the Greater Sydney Commission to deliver on the objectives set forth in the ANSTO Collaboration Place Strategy, including to enhance transport links to the site.

Digital transformation

ANSTO's digital transformation pathway is accelerating our productivity and further improving the agility of our organisation.

Over the reporting period, Microsoft Teams and Office 365 were fully deployed across ANSTO, laying the foundation for the continual evolution of our modern workplace. Moreover, ANSTO's provisioning of remote computing and collaboration facilities made a significant contribution to staff engagement and collaboration over the past financial year and during the COVID-19 pandemic. These capabilities are a major shift in technology delivery for ANSTO, enabling the organisation to move away from purely on-premise delivery into cloud offerings. Significant effort has also been underway to improve ANSTO's SAP platform to better leverage our investment and ensure a smooth transition path to S4/HANA — a complete enterprise resource planning (ERP) system — by 2027.

ANSTO's Cyber Security Uplift program has progressed well. The next major phase, which has been initiated, is the redesign of the ANSTO network to support the varying levels of security requirements required across our complex environment. The network program will provide protections and freedoms as appropriate and in line with the Australian Cyber Security Centre's (ACSC) Essential Eight Mitigation Strategies.

Leveraging the Microsoft ecosystem, ANSTO is building an enhanced reporting and analytics platform. ANSTO has commenced a project to establish a scalable data repository with a user-friendly analytics platform. Pilot work is already in use, and the enterprise-wide implementation is anticipated to be live by 2022–2023.

Australian Synchrotron: Project BR-GHT

With $95 million secured through the support of 30 funding partners, ANSTO's BR-GHT program is enabling the construction of an additional eight beamlines at the Australian Synchrotron, nearly doubling its capacity to support research.

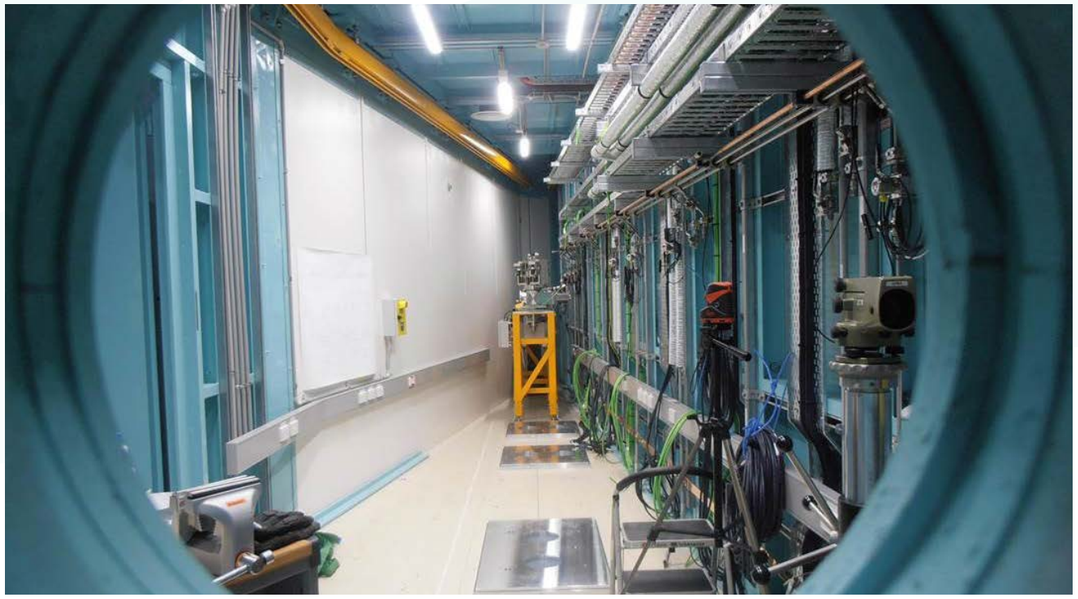
The last year has seen the completion of important build milestones on the first three BR-GHT beamlines. The lead and steel radiation shielding hutches, which create a safe working environment, were delivered and installed on the technical floor.

Support infrastructure, including expanded sample laboratory space and controlled environment stores, were also completed in preparation for the expanded BR-GHT user offering.

The BR-GHT program experienced several challenges in 2020–2021 due to the COVID-19 pandemic. International vendors contracted to provide large beamline components were impacted by closed factories, slowed production, delayed shipping and reduced ability for international travel and expert installation. As a consequence, and in close consultation with funding partners, the schedule for first users on the Microcomputed Tomography beamline and Medium Energy X-ray Absorption Spectroscopy beamlines (MEX1 and MEX2) has been postponed to mid-2022.

Despite these challenges, and those imposed by COVID-19-related lockdowns, the integrated project teams of engineers, scientists and project managers have continued to work with optimism and flexibility, endeavouring to deliver what can be undertaken in the absence of the required beamline components.

The project delivery teams have developed remote ways of working with international vendors that include new approaches for undertaking factory acceptance testing so as to minimise delays where possible. Additional focus is being directed towards developmental pathways for software and control systems to compensate for reduced commissioning times.



The first-optical enclosure of the Microcomputed Tomography beamline — the view (taken in early July 2021) is looking upstream from the first experimental station

Developing world-leading innovative radioactive waste treatment and management technologies

ANSTO employees Brad Davis and Raya Tasnim in ANSTO's first-of-a-kind Synroc Waste Treatment Facility, which is under construction

Construction of ANSTO's first-of-a-kind Synroc Waste Treatment Facility made significant progress this year, with the building being completed. Key components, including the Hot Isostatic Press, which will be used to form the Synroc cans, were delivered during the year. The project now shifts into the fit-out and licensing phases, with cold commissioning and, subsequently, hot commissioning to follow. While the Synroc Waste Treatment Facility is under construction, ANSTO continues to engage with potential international customers of Synroc technology and has undertaken research and development of other applications of Synroc technology and processes so as to be able to apply our expertise, products and services to clients with intractable wastes.

Over the past year, ANSTO has provided extensive technical expertise and advice to the Australian Radioactive Waste Agency in support of the National Radioactive Waste Management Facility (NRWMF) program. This support has included work on the concept design and costings, community engagement and communications, national radioactive waste inventory development, site planning, regulatory submissions, safety case and support for project scheduling. ANSTO has now been engaged to provide expert support through the current design development phase.

Separate to the commercial services that ANSTO has provided, ANSTO has also delivered expert advice to Government and other Commonwealth entities on radioactive waste matters, including on workforce planning and capability mapping, as well as national reporting of our obligations under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Over the past year, ANSTO has provided radioactive waste characterisation services and other commercial advisory services to support Australian organisations that hold or produce radioactive waste. These have included the Department of Defence, CSIRO, state regulators, health departments, hospitals and universities. This work has involved characterising, consolidating, conditioning and facilitating disposal with third-party providers. ANSTO has increased its number of commercial clients over the past year.

ANSTO received $59.8 million in Budget 2021–2022 for the construction of an interim intermediate-level solid waste storage facility. The current interim facility will reach capacity for certain waste streams from 2027, and the construction of a new facility will enable ANSTO to bridge the gap in storage capacity required until the NRWMF becomes available, which is not expected until after 2030. The provision of the funding was the culmination of several years of options analyses and other investigations and was the result of extensive engagement and collaboration with the Department of Industry, Science, Energy and Resources and the Department of Finance.

ANSTO has undertaken significant planning activities in preparation for the return of waste from the United Kingdom, which now is expected to occur in 2022. This has included extensive engagement with Commonwealth, state, and community stakeholders. The waste is the result of the reprocessing of used fuel from the High Flux Australian Reactor, which was shut down in 2007.

Next generation accelerator technologies

ANSTO is Australia's custodian of both reactor-based and accelerator-based nuclear technologies, providing Australia's most significant suite of accelerators and accompanying expertise. ANSTO operates the largest accelerator in Australia, the Australian Synchrotron, at our Clayton campus, four linear accelerators at the Centre for Accelerator Science at Lucas Heights, and the National Research Cyclotron at Camperdown.

In 2020–2021, CAS commissioned a novel beamline for irradiation of samples in air or other ambient conditions, and is Australia's only facility with this capability. The Enclosed External Ion Beam on the ANTARES 10MV tandem accelerator in CAS can deliver a wide variety of ion species with customised dose rate conditions over sample areas ranging from the micron to millimetre scale. The new beam has biological and materials applications, such as controlled irradiation of cell cultures for radiobiology research, and radiation hardness testing of semiconductor devices designed for space technologies.

ANSTO was a foundation member of Australian Collaboration for Accelerator Science (ACAS), a network of the major accelerator operating institutions in Australia. ANSTO is engaged with partner universities to renew ACAS, with an expanded remit to include applications such as particle therapy and space research.

Accelerators will play an increasing role in nuclear medicine production and cancer treatment with particles. Australia's first proton therapy facility, the Australian Bragg Centre for Proton Therapy, is under construction in Adelaide and additional proposals are at various stages of development in New South Wales, Queensland and Victoria. ANSTO is engaged in the National Particle Treatment and Research Centre Steering Committee, providing expertise on accelerators and the broader research applications in the fields of space, materials testing and nuclear physics.

ANSTO's research strategy includes a focus on future compact high-energy accelerators, which are expected to have direct applications for future synchrotron radiation sources and for health applications. In support of this strategy, ANSTO has approved the construction of the Australian Accelerator Test Facility at the Australian Synchrotron. It will be capable of operating experimental accelerator components such as compact accelerator structures manufactured by CERN, one of which has been delivered to Melbourne as part of the ACAS collaboration with the University of Melbourne.

ANSTO's ANTARES accelerator

Section 6: Our organisation and people

Our people

Our people are our greatest asset. They are committed to creating a more sustainable world through science and technology, and they produce all our outputs.

Our scientists, engineers and researchers are world-leaders in their field, and are trusted advisors in academia and to industry and Government. ANSTO's staff work across the entire spectrum of science and technology, including in research translation and commercialisation. ANSTO's staff in various support services are also critical in enabling our organisation to continue to conduct our important science, engineering and technology-focused activities.

Staff numbers

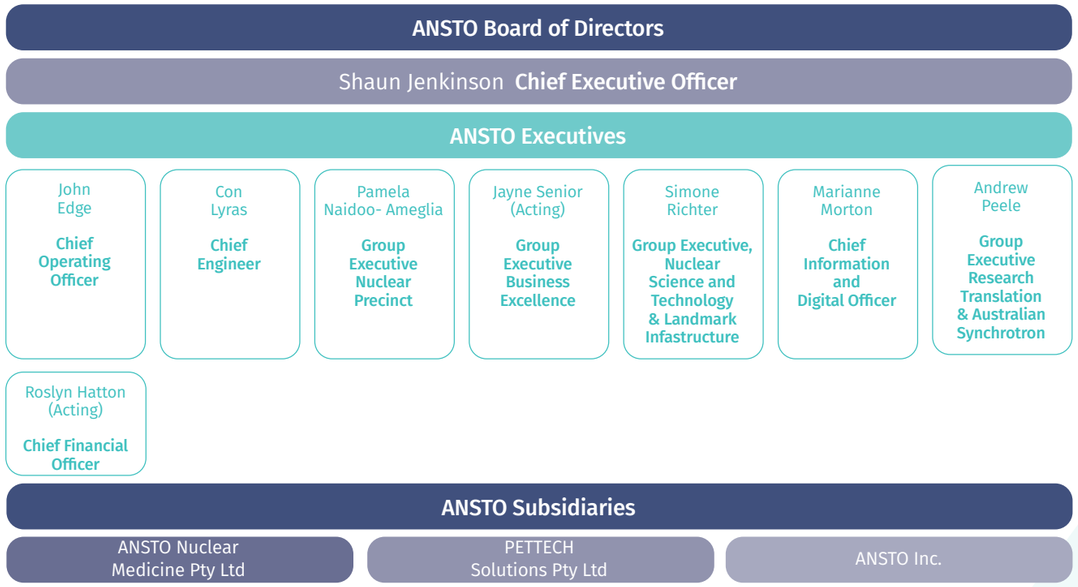
As at 30 June 2021, we employed 1,382 people across New South Wales, Victoria and overseas, the equivalent of 1,352 full-time employees, where full-time equivalent figures refer to our salaried staff (permanent and term contract). Over 62% of our people work directly in science, research and engineering roles.

Division	ASL (as at 30 June 2021)
Nuclear science technology & landmark infrastructure	314
Business excellence	41
Nuclear precinct	400
Asset management and engineering	179
Chief Operating Officer group	131
Research translation & Aust. Synchrotron	161
Information technology	62
Office of the CEO	64
Total	**1352**

For more information on our staff numbers, refer to *Appendices and Index — PGPA Rule section 17BE(ka) — Management of Human Resources.*

Our campuses

Our organisational structure as at 30 June 2021



Subsidiaries

ANSTO subsidiaries	Jurisdiction of operation	Achieving our purpose
PETTECH Solutions Pty Ltd	New South Wales	PETTECH Solutions Pty Ltd (PETTECH) is a wholly-owned ANSTO subsidiary that owns a cyclotron facility. On 2 January 2019, the business of this company was sold to Cyclotek NSW Pty Ltd. PETTECH Solutions Pty Ltd remains the owner of the major facility assets (building, cyclotrons and hot cells) and is entitled to a share of profits from the Cyclotek NSW business in connection with this arrangement. Provide platforms and development pathways to enable world-class research that creates economic impact and benefits ***(Strategic objective 3)*** Support better healthcare for all Australian and international customers with nuclear medicine products ***(Strategic objective 5)***
ANSTO Nuclear Medicine Pty Ltd	New South Wales	ANSTO Nuclear Medicine Pty Ltd (ANM) is a Public Non-Financial Corporation of which ANSTO and the Minister for Industry, Science and Technology (on behalf of the Commonwealth) are shareholders. ANSTO is the operator of the ANM Molybdenum-99 Production Facility, which produces of one of the world's most important nuclear medicines. Through ANM, ANSTO is able to supply Mo-99 to the Australian and global markets. Support better healthcare for all Australian and international customers with nuclear medicine products ***(Strategic objective 5)***
ANSTO Inc.	Delaware, USA	Inactive.
Other Companies*	***where ANSTO possesses a material interest***	
Applied Molecular Therapies Pty Ltd	Victoria	Contract development and manufacturer of radiopharmaceutical products. Support better healthcare for all Australian and international customers with nuclear medicine products ***(Strategic objective 5)***

Management and accountability

During the 2020–2021 financial year, the Board worked closely with management on continuing to improve ANSTO's corporate governance, accountability and risk management practices to ensure ANSTO is able to deliver essential research, nuclear medicines, other products and services, as well as expert advice, safely and sustainably for the benefit of all Australians.

Minister and governing legislation

ANSTO is an agency within the Industry, Science, Energy and Resources portfolio. From 30 March 2021 and as at 30 June 2021, the Minister with responsibility for ANSTO was the Hon Christian Porter MP, Minister for Industry, Science and Technology. ANSTO also worked closely with the Assistant Minister for Industry Development, Senator the Hon Jonathon Duniam.

The Hon Christian Porter MP

Senator the Hon Jonathon Duniam

The Hon Karen Andrews MP, then Minister for Industry, Science and Technology, was the Minister responsible for ANSTO from 1 July 2020 to 30 March 2021.

Statement of Expectations

In February 2020, Minister Andrews provided the ANSTO Board with a Statement of Expectations in which she requested ANSTO's support in resolving national challenges and advancing the Government's policy priorities around nuclear medicines, collaboration with Australian industry, management of research infrastructure, the digital economy and pursuing STEM equity. In addition, the Minister set clear expectations for ANSTO to continue to enhance organisational performance, including around sustainable operations and governance, and workplace health and safety. In August 2020, the ANSTO Board responded to the Statement of Expectations with a Statement of Intent, which sets out how the ANSTO Board seeks to meet the Minister's expectations.

These statements can be found here: *https://www.ansto.gov.au/about/how-we-work/governance.*

Ministerial Directions and Notifications

Under the ANSTO Act and the PGPA Act, ANSTO's responsible Minister and the Finance Minister may provide the ANSTO Board with Directions with respect to the performance of the functions or the exercise of the powers of the Board or the organisation. No such Ministerial Directions were received in 2020–2021.

ANSTO Board

The ANSTO Board is comprised of up to eight part-time, non-executive members drawn from the broader community and ANSTO's full-time Chief Executive Officer. Detailed information about the ANSTO Board, including appointment and cessation dates, is contained in the ***Appendices and Index — PGPA Rule section 17BE(j), (i)–(v) — Accountable Authority.***

As at 30 June 2021, there were seven part-time non-executive members in addition to the CEO. All non-executive members are appointed by the Governor-General. Under the ANSTO Act, the CEO is appointed by the ANSTO Board. As a significant appointment, Cabinet endorsement also is required.

On 8 September 2020, then CEO, Dr Adrian (Adi) Paterson, announced he would extend his leave (extended leave commenced on 10 August 2020) until 31 December 2020, at which point he would resign. Mr Shaun Jenkinson was acting CEO between 10 August 2020 and 30 March 2021. He was appointed CEO effective 31 March 2021, following a global search to fill the position.

Board members have a broad range of skills, knowledge and experience that cover ANSTO's diverse range of responsibilities. This is necessary in order for the Board to provide the guidance and stewardship needed to ensure ANSTO's sustainability and to determine and monitor the achievement of its strategic direction. The Board's Remuneration and Nomination Committee reviews the Board skills matrix at least annually; the skills matrix is used as the basis for making recommendations to Government concerning the appointment/reappointment of Board members. The remuneration and allowances payable to members of the Board, including the CEO, are determined by the Australian Government Remuneration Tribunal.

Board access to information

Board members have access to all information required to fulfil their role. Although information is primarily provided through Board papers and presentations at Board meetings, the Board is also provided with opportunities to gather information through other means. Board members have direct access to the CEO, other members of the Executive and, as required, other managers and subject matter experts. They also receive regular CEO updates and regular media reports along with all Ministerial briefings and submissions.

Site tours are arranged, when practicable, to coincide with Board meetings to offer further opportunities for information gathering and to support engagement between the Board and the wider ANSTO staff. Board members also participate in individual site visits and meet both formally and informally with different divisions and groups of staff. Site tours during the reporting period included SyMo, ANSTO's world-first Synroc Waste Treatment Facility and the ***nandin*** Innovation Centre. There was also a 'Meet the Board' open session for staff held at the Lucas Heights campus during the year.

In 2020–2021, there were no newly appointed Board members. Newly appointed Board members are inducted in the organisation's operations and activities, as well as their duties and responsibilities as a member of the Board of a corporate Commonwealth entity.

To improve oversight and to increase the flow of information from ANSTO Nuclear Medicine Pty Ltd to ANSTO, the ANSTO Board Chair and the ANSTO Risk and Audit Committee Chair, along with the CEO and Group CFO, meet with the ANM Chair and the ANM Risk and Audit Committee Chair regularly. They discuss opportunities, risks, finances and other material matters. During 2020–2021, three ANSTO and ANM Chair meetings were held.

Board members are able to seek independent professional advice in accordance with their duties, responsibilities and obligations as members of the Board.

Board meetings

The Board holds six formally scheduled meetings and a strategy session each year, with additional meetings held as required. Of the formally scheduled meetings, four are usually held at the Lucas Heights Campus, one is held at the Clayton Campus and one is held in Canberra. However, due to the COVID-19 pandemic and various travel restrictions, all meetings were hybrid, with members and invitees either at Lucas Heights or participating remotely. Despite these restrictions, the Board ensured its meetings continued to be effective and interactive through the use of video technology.

At the invitation of the Chair, members of the Executive and subject matter experts attend Board meetings as required to report on matters relevant to their individual areas of responsibility and expertise. The Secretary of the Department of Industry, Science, Energy and Resources, or a delegate, also attends regularly scheduled Board meetings at the invitation of the Chair as an observer.

ANSTO has a Company Secretary who assists with the running of the Board and advises on governance matters. The Company Secretary attends all Board meetings, except those meetings or parts of meetings where that attendance is precluded by the ANSTO Act, and is accountable directly to the Board, through the Chair, on all matters to do with the proper functioning of the Board.

Nine Board meetings were held during the 2020–2021 financial year. The details of the number of Board meetings attended by each member during the 2020–2021 financial year are outlined in the ***Appendices and Index — PGPA Rule section 17BE(j), (i)– (v) — Accountable Authority.***

Board committees

The Board is assisted by two standing committees which meet regularly:

- Risk and Audit Committee (RAC) — provides independent oversight, advice and assurance to the Board on the appropriateness of ANSTO's systems of risk oversight and management, financial reporting processes, performance reporting arrangements, systems of internal control, and systems to ensure compliance with relevant laws and policies; and
- Remuneration and Nomination Committee — assists the Board in fulfilling its responsibilities with regard to overall remuneration policy and strategy; performance and remuneration of the CEO; the approach to performance and remuneration of the Executive Team; and succession planning and nominations for Board Members and the CEO.

The role, purpose and responsibilities of each of the committees are set out in the relevant committee Charter. All Charters are reviewed annually. A review of the Charters, as part of the Board Charter review, was conducted during the 2020–2021 financial year. The Board approved the amended Charters at its meeting in August 2020. The Risk and Audit Committee Charter was further amended at the June 2021 Board meeting, to better reflect the operation of the committee and to provide greater clarity on the responsibilities of the committee. All committee Charters are available here: *https://www.ansto.gov.au/about/how-we-work/governance.*

The Board is also supported by a Commercial Committee, which provides independent oversight, review and evaluation of particular commercial activities and meets on an ad hoc basis as required by the Board. In addition, other committees and working groups are established on an adhoc basis as required by the Board. For example, during the year, working groups were established to assist the Board in reviewing Board policies and the terms of reference for a strategic science review. All material commercial matters were considered by the full Board and, consequently, the Commercial Committee did not meet during the 2020–2021 financial year.

Risk and Audit Committee

All committee members, including the RAC Chair, are appointed by the Board. During the 2020–2021 financial year, the RAC consisted of at least three non-executive Board members who had the required qualifications, knowledge, skills or experience to assist the RAC in performing its functions, including an understanding of systems of risk oversight and management, finance and internal control. In accordance with changes to the RAC Charter during the 2020–2021 financial year, there are currently:

- two committee members with accounting or related financial management experience and/or qualifications, commensurate with the scope of ANSTO activities, and one of those members has a comprehensive understanding of accounting and auditing standards; and
- one member with an understanding and experience of nuclear and radiation contexts and the associated risks and controls.

The Chair of the Board, the CEO, and the Chief Financial Officer cannot be members of the RAC.

Membership of the RAC is reviewed periodically against a skills matrix in order to ensure that there is a suitable mix of qualifications, knowledge, skills and experience on the committee. During the 2020–2021 financial year, the composition of the RAC was considered and as a result, two external representatives were appointed. Mr David Antaw brings strong financial experience to the committee while Mr Stephen Ludlam brings strong nuclear and risk management experience.

The two external representatives were inducted into the organisation's operations and activities, as well as their duties and responsibilities as a member of the RAC of a corporate Commonwealth entity. The induction consisted of site visits to both Lucas Heights and Clayton and meeting with different Executives, members of Management and subject matter experts.

Site tours for committee members are arranged, when practicable, to coincide with committee meetings so as to offer further opportunities for information gathering. Site tours during the reporting period included HIFAR, ANSTO's first research reactor which was operation between 1958 and 2007, and other buildings slated for decommissioning.

The Chair of the Board and other Board members may attend RAC meetings as observers. Members of the ANSTO management team (including the Chief Operating Officer, Chief Financial Officer, Head of Internal Audit and the General Counsel) attend meetings of the RAC as advisors and observers, by invitation of the RAC Chair. The Company Secretary is the secretary to the RAC and attends all RAC meetings.

Representatives from the Australian National Audit Office (ANAO) and their contracted service provider (currently Ernst & Young) also attend RAC meetings, by invitation of the RAC Chair.

The Risk and Audit Committee met on eight occasions during the 2020–2021 financial year. Details of the number of RAC meetings attended by each member during the year are provided at ***Appendices and Index — PGPA Rule section 17BE(taa) — Audit Committee.***

Remuneration and Nominations Committee

The Remuneration and Nominations Committee consists of the Board Chair, the CEO and one or more non-executive Board members appointed by the Board. The Board Chair is the Chair of the Committee. The Chief Operating Officer, who has responsibility for people-related matters, attends committee meetings by invitation, as do other relevant persons by invitation of the Chair. The Company Secretary is the secretary to the committee and attends all meetings, except those meetings or parts of meetings where that attendance is precluded by the ANSTO Act.

The Remuneration and Nomination Committee met on four occasions during the 2020–2021 financial year.

Member	Eligible to attend	Attended
The Hon Dr Annabelle Bennett, AC SC (Chair)	4	4
Dr Adrian (Adi) Paterson[1]	0	0
Mr Shaun Jenkinson[2]	4	4
Emeritus Professor Stephen Buckman, AM	4	4
Ms Penelope J Dobson	4	4

[1] On extended leave between 10 August 2020 and 31 December 2020. On 8 September 2020, Dr Paterson resigned from ANSTO effective 31 December 2020.

[2] Acting CEO between 10 August 2020 and 30 March 2021. Appointed CEO on 31 March 2021.

Board performance

In order to ensure its ongoing effectiveness and performance, the Board, along with its committees and its individual members, are evaluated regularly. During 2020–2021, an external evaluator conducted an independent review of the Board. The findings of the review were presented at the February 2021 Board meeting. The recommendations were accepted and an implementation plan was later approved. The plan is expected to be fully implemented by December 2021.

The Board frequently discusses its operation, including the structuring of agendas and development of Board papers, and its performance during Board meetings.

Disclosure of interests and related entity transactions

Board members declare material interests in accordance with the ANSTO and PGPA Acts as appropriate.

ANSTO follows the Commonwealth Procurement Rules and has a system of delegated powers and authorisations for all procurement transactions so as to ensure that transactions are appropriately considered. The ANSTO Board, as its accountable authority, approves the operational and capital budgets of ANSTO under a policy of the Board. Where there are operating expenses of $5 million or more, these transactions are approved by the Board. The Board also approves expenditure on capital projects of $5 million or more. For transactions under $5 million, the CEO will approve the transactions or delegations are provided to management. This process applies regardless of the counterparty.

During the reporting period, there were 35 transactions to Government entities or companies for goods and services above $10,000, which came to a total combined value of $10.3 million.

ANSTO executive management

The CEO is accountable for managing the affairs of the organisation in accordance with the strategy, plans and policies approved by the Board, as well as any Board Directions.

The CEO is supported by an Executive team. As a team and through their individual roles, the Executive leads, directs, coordinates and controls ANSTO's operations and performance.

Following the appointment of a new CEO on 31 March 2021, a number of high-level structural changes occurred across ANSTO:

- it was determined that a single Group Executive would be appointed to lead our Nuclear Science and Technology area, bringing together what was previously our Nuclear Science Technology and Landmark Infrastructure cluster with our Research Translation and Synchrotron cluster;
- the recruitment process for a new Group Executive for Commercial Products and Services is underway (as at 30 June). This new role replaces the former Group Executive, Business Excellence, and brings all of our commercial activities together; and
- recognising the importance of the Security and High Reliability functions, these two divisions now report directly into the CEO.

The Executive is supported by some key input committees and expert forums, including the Capital Committee, which makes decisions regarding the prioritisation and allocation of capital funding to projects to ensure their efficient delivery, and the Work, Health, Safety and Environment Committee, which is responsible for providing oversight and direction of ANSTO's safety and environment strategies, initiatives, incident management processes, targets and reporting. The Executive further receives support in the areas of risk oversight and security and safeguards oversight.

The Executive has continued to focus on increasing ANSTO's governance maturity and recently created a new Regulatory and Governance team in the Chief Operating Officer Group to integrate a number of related functions which had different reporting lines. This is intended to deliver a more integrated approach to regulatory, compliance, quality management and broader organisational governance.

ANSTO recognises the important role of managers in the sharing of information. ANSTO's Managers' Forums are designed to ensure managers driving strategy, as well as planning and leading teams, are equipped with the right information at the right time so they are in a position to take responsibility for core strategic and operational projects. The Forums provide managers with information on ANSTO's strategy and an opportunity to ask questions of the CEO and other Executives, as well as the opportunity to converse with peers on troubleshooting and problem solving. There were six Managers' Forums held during 2020–2021.

Integrated Business Planning Framework

ANSTO's Integrated Business Planning (IBP) process ensures ANSTO delivers on its purpose and strategy. It is a data-driven process led by senior management, which, on a monthly basis, evaluates and revises aggregate, time-phased projections for demand, supply, new products or services and capabilities, strategic projects and the resulting financial plans. It is a decision-making process that realigns the tactical plans for all organisational functions in support of ANSTO's goals and targets.

A primary objective of IBP is to monitor performance against the organisational strategy and the plans that underpin the strategy. The process ensures integration of activities and prioritisation of resources against an approved operating plan, to which Executives and managers hold themselves accountable.

Internal control

The ANSTO Board oversees ANSTO's system of internal control. This system has been designed to provide 'reasonable assurance' that ANSTO's objectives will be achieved, and encompasses the control environment, risk assessment, control activities, information and communication, and monitoring activities.

Risk management framework

Management is accountable to the ANSTO Board for designing, implementing and continuously improving the ANSTO Enterprise Risk Management (ERM) framework. The ERM framework is aligned with relevant best practice and has been designed to support the achievement of business goals and objectives, support decision making, and standardise risk management processes and guidance. ANSTO recognises that risk management is essential not only to preserve, but also to create, value. This means that there is a need to engage with risk or to exploit opportunity while also managing uncertainty on an ongoing basis. ANSTO further recognises that effective risk management requires appropriate risk behaviours. In this regard, the ANSTO Board has set clear expectations for the management of risk at ANSTO.

The ANSTO Board determines the nature and extent of the risk it is willing to accept in achieving the organisation's strategic objectives, consistent with ANSTO's risk appetite as well as the effective, efficient, ethical and economical use and management of public resources. The ANSTO Board takes a particular interest in those risks that may affect the safety of ANSTO staff and its operations and/or negatively affect the sustainability and reputation of the organisation.

The RAC receives regular reports and briefings on ANSTO's top risks and significant risks associated with operations and major capital programs.

Fraud control

ANSTO has specific obligations under section 10 of the PGPA Rule to take all reasonable measures to prevent, detect and deal with fraud.

The ANSTO Fraud Control Plan (2019–2021) reflects the 'better practice' principles and practices articulated within the Commonwealth Fraud Control Framework.

In addition, ANSTO operates a public interest disclosure scheme in accordance with the ***Public Interest Disclosure Act 2013*** (Cth). Complementary to this scheme, ANSTO has a confidential, independent and externally-hosted reporting service (FairCall), which provides another avenue for staff and contractors to report any concerns about unacceptable, unethical or illegal activities in the workplace.

Ethics

Business ethics play a key role in the proper governance of an organisation. The Code of Conduct is aligned to ANSTO's values and provides ANSTO employees with a framework for ethical decision making. It articulates the standards of behaviour, values and actions expected of all individuals who work for ANSTO.

ANSTO's values and ethical standards are reinforced through various means, including training and awareness, staff engagement surveys and the ANSTO Enterprise Agreement.

Business resilience

Operational continuity is a focus area of the Board, the CEO and Executives. ANSTO's leadership is keenly aware that a range of ANSTO's products and services, notably, radiopharmaceuticals, are important to the economic and social wellbeing and health of the Australian community.

ANSTO's Business Resilience Framework is implemented through the Business Continuity Management System, through which all business areas are required to regularly review their disruption risks, business impact assessments and continuity plans. While most issue response and recovery actions are handled along routine lines of management, the Business Resilience Framework has provision for activating an Incident Management Team and the Executive Crisis Management Team, if required. ANSTO has adopted the Australian Inter-Service Incident Management System for internal control and coordination with external agencies. The Emergency Operations function is responsible for the coordination, preparation and resourcing of, as well as operational response to, incidents and emergencies.

Managing through the COVID-19 pandemic has seen an uplift in ANSTO's capability to maintain operations with flexible approaches to working. There is a requirement for critical staffing of Landmark Infrastructure, specifically nuclear security, reactor operations and the production of nuclear medicine, in order to meet our regulatory requirements, our work, health and safety and security requirements, support construction and maintenance work onsite, and to ensure the ongoing production of nuclear medicine. Many other functions can proceed remotely, with limited impact, for an extended period of time.

Operational governance — compliance and regulatory affairs

ANSTO operates within a highly regulated environment. In recognition of this environment, ANSTO has established a range of strategies, policies, systems, and responsibility and accountability arrangements to ensure compliance with relevant laws and regulations. The continuing development and improvement of ANSTO's compliance framework remains a key focus.

Pursuant to section 19(1)(e) of the PGPA Act, ANSTO had no instances of significant non-compliance with finance law in 2020–2021.

Internal Audit

The ANSTO Internal Audit function provides the ANSTO Board and CEO with independent and objective assurance and advisory services. The scope of Internal Audit's activities encompasses all financial and non-financial functions, systems, programs, projects, activities and processes across the ANSTO Group.

The Head of Internal Audit prepares risk-based strategic and annual work plans in consultation with the RAC, Executive management and the ANAO. The annual Internal Audit Plan is reviewed by the RAC and approved by the ANSTO Board.

The outcomes of internal audit reviews are presented to the RAC. Follow-up reviews are conducted to ensure that all internal audit recommendations are properly carried out.

In order to ensure the independence of the Internal Audit function, the Head of Internal Audit reports directly to the RAC and has unrestricted access to the RAC Chair and members, as well as to the Chair of the Board.

For administrative purposes, the Head of Internal Audit reports to the Chief Operating Officer.

The role, purpose, scope and authority of the Internal Audit function is set out in the Internal Audit Charter. This Charter is reviewed by the RAC and approved by the ANSTO Board.

External Audit

The Commonwealth Auditor-General, through the ANAO, is the external auditor for ANSTO and its Australian-based subsidiaries. The auditor of ANSTO's United States-based subsidiary, ANSTO Inc., is WIPFLi LLP. For the 2020–2021 financial year, the ANAO contracted Ernst & Young to assist with the external audits of ANSTO and its Australian-based subsidiaries. Ernst & Young did not provide any non-audit services to ANSTO during the period 1 July 2020 to 30 June 2021.

Judicial and Administrative Tribunal decisions

There were no judicial decisions or decisions of administrative tribunals that had a significant impact on the operations of ANSTO during the financial year.

Reports issued by the Commonwealth Auditor-General

There were no specific reports issued by the Commonwealth Auditor-General, other than reports issued in relation to audit of the financial statements of ANSTO and its Australian based subsidiaries, during the financial year.

Office of the Australian Information Commissioner decisions

There were no decisions made or issued by the Australian Information Commissioner in the last financial year.

Parliamentary committees

There were no reports on the operations of ANSTO by a parliamentary committee during the financial year.

Reports by the Commonwealth Ombudsman

There was one decision on the operations of ANSTO by the Commonwealth Ombudsman during the financial year. Following a complaint to the Ombudsman, the Ombudsman decided that, having considered all the relevant circumstances, no further investigation of the case was warranted.

Indemnities

ANSTO's insurance coverage with Comcover includes professional indemnity as well as directors' and officers' liability. Certain sections of the PGPA Act contain prohibitions against ANSTO giving indemnities and paying insurance premiums relating to liabilities arising from conduct involving a lack of good faith by officers, amongst other conduct.

There have been no exceptions to these provisions and no claims were made against ANSTO in respect of such directors' and officers' or professional liability that required a claim on ANSTO's insurer, Comcover. It should be noted that ANSTO subsidiaries are fully covered under ANSTO's overarching Comcover policies. Workers compensation coverage is dependent on whether employees of a subsidiary are Commonwealth Government employees or employed under state labour legislation.

Nuclear liability

ANSTO is provided with insurance coverage for ionising radiation liability from Comcover for up to $50 million. The Comcover policy includes liability arising out of ANSTO's responsibility for:

- managing, storing and conditioning ionising radiation emitting material and waste;
- transporting nuclear waste and materials for disposal both within Australia and overseas; and
- transporting radioactive materials including radioisotopes.

For any liability that is not covered by Comcover, ANSTO has been provided with a Deed of Indemnity by the Commonwealth that commits the Commonwealth to providing an indemnity to cover any loss or liability incurred by ANSTO and ANSTO Nuclear Medicine Pty Ltd, their respective employees and contractors, which arise from a claim for injury to a person or damage to property caused by ionising radiation. The current Deed expires in April 2026.

Privacy

ANSTO is committed to protecting personal information in accordance with the ***Privacy Act 1988*** (Cth) and the Australian Privacy Principles. The privacy function sits within the Chief Operating Officer Group and a Privacy Champion has been appointed as required by the ***Privacy (Australian Government Agencies — Governance) Australian Privacy Principle Code 2017.***

The aim of this function is to enhance existing privacy capabilities within ANSTO, build greater transparency in information handling practices, ensure legislative compliance, and foster a culture of respect for privacy and the value of personal information. To achieve this aim, ANSTO has a documented Privacy Management Plan that identifies specific, measurable privacy goals and targets and sets out how ANSTO will meet its compliance obligations under the Australian Privacy Principles.

ANSTO also conducts privacy impact assessments for all IT systems and projects that involve significant personal information transfer or collection, undertakes regular reviews, and updates its privacy practices, procedures and systems to ensure their currency and adequacy for the purposes of compliance with the Australian Privacy Principles. ANSTO is actively enhancing internal privacy capabilities by providing appropriate privacy education and training to all staff who have access to personal information.

Freedom of information

The ***Freedom of Information Act 1982*** (FOI Act) provides the public with a general right of access to documents held by Australian Government agencies, by requiring agencies, such as ANSTO, to publish the information and provide a right of access to the documents.

This general right is limited by exceptions to protect essential public interests, including the privacy of individuals and the business affairs of those who give information to the agency.

In the reporting year to 30 June 2021, ANSTO received seven (7) requests for information under section 15 of the FOI Act.

ANSTO is required to publish information to the public as part of the Information Publication Scheme (IPS). The IPS is designed to promote open and transparent communication of government information.

Set out below is the information required to be published by ANSTO under Part II of the FOI Act.

1. ANSTO's Agency Plan

ANSTO's Information Publication Scheme plan is currently available on the ANSTO website at: *https://www.ansto.gov.au/access-to-information*

2. Details of the structure of the Agency's organisation

An organisational chart detailing the structure of ANSTO can be found in Section 6: Our organisation and people — Our organisational structure.

3. Details of ANSTO's functions, including its decision-making powers and other powers affecting members of the public

Information in relation to ANSTO's powers and functions can be found in ***Appendices and Index — Functions and powers of the organisation under the ANSTO Act.*** Information about ANSTO's purpose and values, Board composition, Corporate Plan and Service Charters can be found on ANSTO's website at: *https://www.ansto.gov.au/governance*

4. Details of officer appointments at ANSTO

Details of officer appointments can be found in ***Appendices and Index — Details of Accountable Authority during the reporting period (2020–2021)*** and a link to this information can also be found on ANSTO's website at: *https://www.ansto.gov.au/governance*

5. ANSTO's Annual Report

A link to this annual report and annual reports from previous years can be found on ANSTO's website at: *https://www.ansto.gov.au/corporate-publications*

6. Details of arrangements for members of the public to comment on specific policy proposals for which ANSTO is responsible

ANSTO regularly communicates with its stakeholders, which include the local community and councils, relevant federal Ministers, and other Government-related personnel at both state and federal levels to ensure that they are kept up to date about what is happening at ANSTO. The community is kept informed of ANSTO's operations via the website, which publishes news updates and media releases. A link to this information can be found on ANSTO's website at: *https://www.ansto.gov.au/news*

7. Information that ANSTO routinely gives access to in response to requests for access under the FOI Act (excluding documents exempt from production under the FOI Act)

During 2020–2021 there was no requested documentation falling within this category.

8. ANSTO's FOI disclosure log

The FOI disclosure log lists information which has been released in response to a FOI access request.

The disclosure log requirement does not apply to:

- personal information about any person if publication of that information would be 'unreasonable';
- information about the business, commercial, financial or professional affairs of any person if publication of that information would be 'unreasonable';
- other information covered by a determination made by the Australian Information Commissioner if publication of that information would be 'unreasonable'; and
- any information if it is not reasonably practicable to publish the information because of the extent of modification that would need to be made to delete the information listed in the above dot points.

A link to ANSTO's disclosure log can be found on ANSTO's website at:
https://www.ansto.gov.au/access-to-information

9. Information held by ANSTO that is provided to Parliament

A link to the information that ANSTO provides to parliament can be found on ANSTO's website at:

https://www.ansto.gov.au/access-to-information

10. Contact details of ANSTO officers who can be contacted about access to information or documents under the FOI Act

Direct enquiries in relation to FOI process to the (request to be directed to the FOI Coordinator):

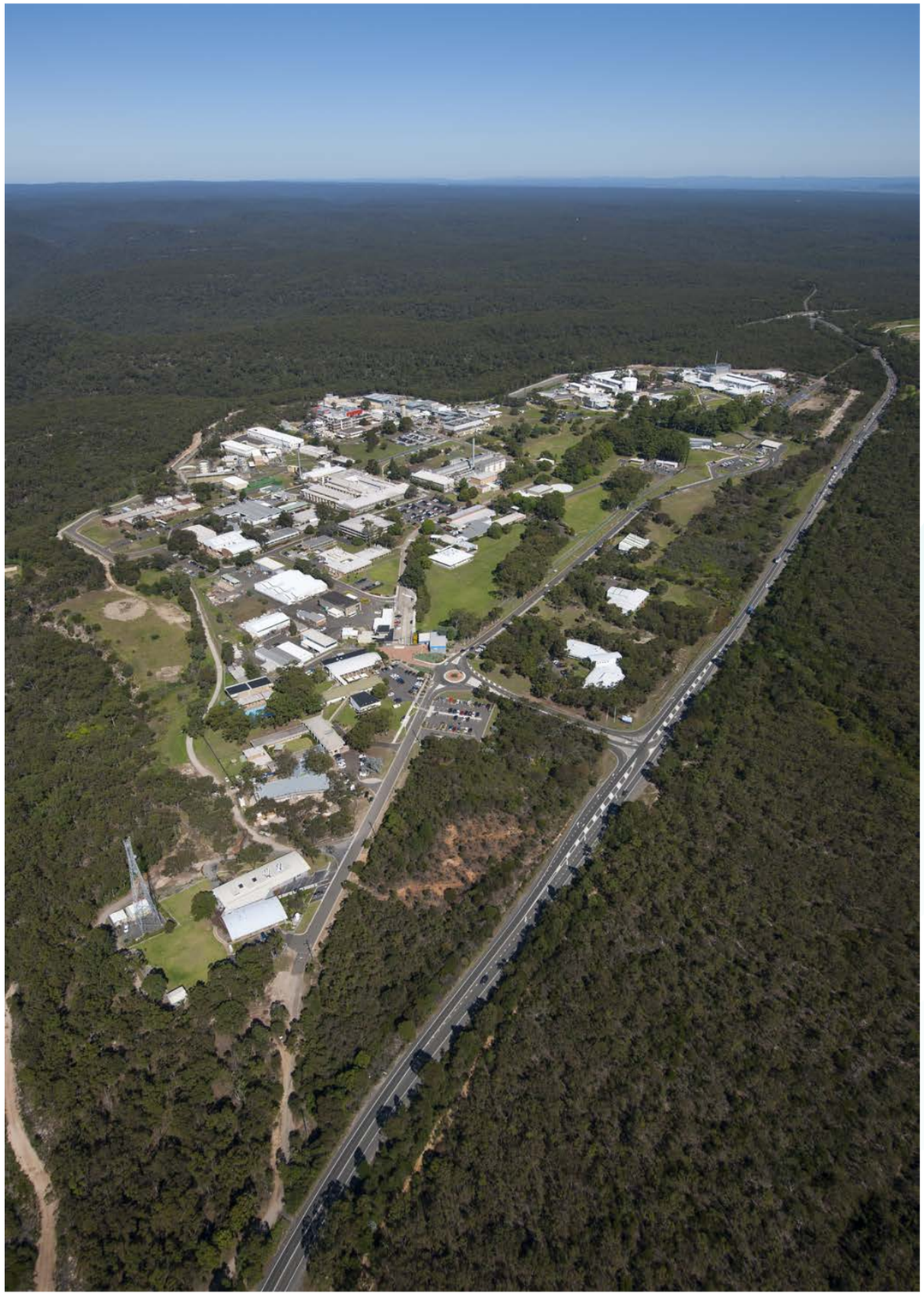
Mail: FOI Coordinator, ANSTO, Locked Bag 2001, Kirrawee DC NSW 2232

Email: *foi@ansto.gov.au* Telephone: +61 2 9717 3111

These contact details can be found on ANSTO's website.

11. Operational information required under section 8 of the FOI Act, that is, information held by ANSTO to assist in the performance or exercise of ANSTO's functions or powers in making decisions or recommendations affecting members of the public.

ANSTO has a range of publications, reports and information available for the public, including our Annual Reports, Corporate Plan, information on safety, research reports, educational books and leaflets, and DVDs. ANSTO also provides access to a searchable database of all of ANSTO's science publications, as well as an online archive for older publications. View the database at:
https://www.ansto.gov.au/research/publications



Birds-eye view of ANSTO's Lucas Heights campus

Section 7: 2020–2021 Financial statements

Australian National Audit Office

INDEPENDENT AUDITOR'S REPORT

To the Minister for Industry, Science and Technology

Opinion

In my opinion, the financial statements of the Australian Nuclear Science and Technology Organisation and its subsidiaries (together the 'Consolidated Entity') for the year ended 30 June 2021:

(a) comply with Australian Accounting Standards – Reduced Disclosure Requirements and the *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015*; and

(b) present fairly the financial position of the Consolidated Entity as at 30 June 2021 and its financial performance and cash flows for the year then ended.

The financial statements of the Consolidated Entity, which I have audited, comprise the following statements as at 30 June 2021 and for the year then ended:

- Statement by the Accountable Authority, Chief Executive and Chief Financial Officer;
- Consolidated Statement of Comprehensive Income;
- Consolidated Statement of Financial Position;
- Consolidated Statement of Changes in Equity;
- Consolidated Statement of Cash Flows; and
- Notes to the financial statements comprising a Summary of Significant Accounting Policies and other explanatory information.

Basis for opinion

I conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. My responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of my report. I am independent of the Consolidated Entity in accordance with the relevant ethical requirements for financial statement audits conducted by the Auditor-General and his delegates. These include the relevant independence requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants* (the Code) to the extent that they are not in conflict with the *Auditor-General Act 1997*. I have also fulfilled my other responsibilities in accordance with the Code. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Accountable Authority's responsibility for the financial statements

As the Accountable Authority of the Consolidated Entity, the directors are responsible under the *Public Governance, Performance and Accountability Act 2013* (the Act) for the preparation and fair presentation of annual financial statements that comply with Australian Accounting Standards – Reduced Disclosure Requirements and the rules made under the Act. The directors are also responsible for such internal control as the directors determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the directors are responsible for assessing the ability of the Consolidated Entity to continue as a going concern, taking into account whether the entity's operations will cease as a result of an administrative restructure or for any other reason. The directors are also responsible for disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the assessment indicates that it is not appropriate.

GPO Box 707 CANBERRA ACT 2601
38 Sydney Avenue FORREST ACT 2603
Phone (02) 6203 7300 Fax (02) 6203 7777

Auditor's responsibilities for the audit of the financial Statements

My objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian National Audit Office Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

As part of an audit in accordance with the Australian National Audit Office Auditing Standards, I exercise professional judgement and maintain professional scepticism throughout the audit. I also:

- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Consolidated Entity's internal control;
- evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Accountable Authority;
- conclude on the appropriateness of the Accountable Authority's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Consolidated Entity's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Consolidated Entity to cease to continue as a going concern;
- evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation; and
- obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Consolidated Entity to express an opinion on the financial report. I am responsible for the direction, supervision and performance of the Consolidated Entity audit. I remain solely responsible for my audit opinion.

I communicate with the Accountable Authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

Australian National Audit Office

Scott Sharp

Executive Director

Delegate of the Auditor-General

Canberra

17 September 2021

Australian Government | ANSTO Science. Ingenuity. Sustainability.

Statement by Accountable Authority, Chief Executive and Chief Financial Officer

In our opinion, the attached financial statements for the year ended 30 June 2021 comply with subsection 42(2) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act), and are based on properly maintained financial records as per subsection 41(2) of the PGPA Act.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Australian Nuclear Science and Technology Organisation will be able to pay its debts as and when they fall due.

Signed in accordance with a resolution of the Board of Directors.

Annabelle Bennett Accountable Authority - Chair	Shaun Jenkinson Chief Executive Officer	Roslyn Hatton Acting Chief Financial Officer
16 September 2021	16 September 2021	16 September 2021

AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION

New Illawarra Road, Lucas Heights (Locked Bag 2001, Kirrawee DC 2232) **T** +61 2 9717 3111 **F** +61 2 9717 9210
www.ansto.gov.au

Consolidated Statement of Comprehensive Income

For the year ended 30 June 2021

	Note	Budget 2021 $'000	Actual 2021 $'000	Actual 2020 $'000
NET COST OF SERVICES				
Expenses				
Employee	1.1A	159,552	157,905	160,737
Supplier	1.1B	184,527	118,346	98,649
Depreciation/amortisation	2.2A	83,008	83,717	81,593
Impairment losses	2.2A	-	54,528	32,719
Write-down of stock and fixed assets	1.1C	-	244	12
Decommissioning provision losses	2.3C	-	109,764	-
Nuclear waste management provision losses	2.3C	-	7,930	-
Nuclear waste management expenses	2.3C	-	4,966	2,997
Grant expenses		2,767	1,693	2,853
Finance costs	1.1D	22,144	10,872	14,061
Foreign currency exchange losses		-	1,369	244
Total expenses		**451,998**	**551,334**	**393,865**
Own-source revenue				
Sales of goods and rendering of services	1.2A	95,763	80,266	65,902
Interest	5.2	1,000	993	2,188
Rental income		6,663	-	-
Grant income		12,735	30,149	18,895
Total own-source revenue		**116,161**	**111,408**	**86,985**
Other income				
Decommissioning provision gains	2.3C	-	-	82,295
Nuclear waste management provision gains	2.3C	-	-	63,819
Foreign currency exchange gains		-	273	3,085
Gains from asset sales		-	126	222
Total other income		**-**	**399**	**149,421**
Total own-source income		**116,161**	**111,807**	**236,406**
Net cost of services		(335,837)	(439,527)	(157,459)
Revenue from Government	3.1	278,819	278,819	281,909
Surplus/(deficit) for the year before income tax		**(57,018)**	**(160,708)**	**124,450**
Income tax benefit/(expense)	1.1E	-	10	(235)
Surplus/(deficit) for the year after income tax		**(57,018)**	**(160,698)**	**124,215**
Other comprehensive income				
Items that will not be subsequently reclassified to net cost of services				
Changes in asset revaluation reserve	2.4A	-	116,872	(2,655)
Total other comprehensive income/(expense) for the year		**-**	**116,872**	**(2,655)**
Total comprehensive surplus/(deficit) for the year		**(57,018)**	**(43,826)**	**121,560**

The above statement should be read in conjunction with the accompanying notes.

Consolidated Statement of Financial Position

As at 30 June 2021

	Note	Budget 2021 $'000	Actual 2021 $'000	Actual 2020 $'000
Assets				
Financial assets				
Cash and cash equivalents	2.1A	4,526	34,288	12,568
Trade and other receivables	2.1B	16,429	17,789	11,860
Investments	2.1C	207,208	192,063	214,918
Total financial assets		**228,163**	**244,140**	**239,346**
Non-financial assets				
Property, plant and equipment	2.2A	1,109,779	1,208,839	1,121,376
Intangible assets	2.2A/B	57,824	67,169	54,756
Inventories	2.2C	40,760	50,230	41,800
Deferred tax asset	1.1E	792	293	283
Prepayments		16,065	9,078	16,116
Total non-financial assets		**1,225,220**	**1,335,609**	**1,234,331**
Total assets		**1,453,383**	**1,579,749**	**1,473,677**
Liabilities				
Payables				
Suppliers		19,983	18,859	11,430
Employees	4.1	6,500	4,882	6,452
Other payables	2.3A	3,442	6,379	7,831
Total payables		**29,925**	**30,120**	**25,713**
Interest bearing liabilities				
Operating leases	2.3D	605	3,646	3,750
Total interest bearing liabilities		**605**	**3,646**	**3,750**
Revenue in advance	2.3B	**31,000**	**32,236**	**36,129**
Provisions				
Employees	4.2	50,293	54,337	50,293
Decommissioning	2.3C	641,196	731,817	616,284
Nuclear waste management	2.3C	-	140,157	129,154
Intellectual property payment	2.3C	38,662	37,105	37,703
Other provisions	2.3C	1,218	259	1,218
Total provisions		**731,369**	**963,675**	**834,652**
Total liabilities		**792,899**	**1,029,677**	**900,244**
Net assets		**660,484**	**550,072**	**573,433**
Equity				
Contributed equity		921,334	921,334	900,869
Reserves	2.4A	396,479	513,341	396,469
Accumulated deficit	2.4B	(657,329)	(884,603)	(723,905)
Total equity		**660,484**	**550,072**	**573,433**

The above statement should be read in conjunction with the accompanying notes.

Consolidated Statement of Changes in Equity

For the year ended 30 June 2021

	Accumulated deficit		Asset revaluation reserve		Other reserves		Contributed equity		Total	
	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Balance at 30 June 2019	**(848,120)**		**389,124**		**10,000**		**819,675**		**370,679**	
Surplus for the year	124,215		-		-		-		124,215	
Other comprehensive income										
Revaluation decrement	-		(2,655)		-				(2,655)	
Total comprehensive deficit for the year	**124,215**		**(2,655)**		**-**		**-**		**121,560**	
Transactions with owners										
Government equity injection	-		-		-		81,194		81,194	
Balance at 30 June 2020	**(723,905)**	**(600,311)**	**386,469**	**386,468**	**10,000**	**10,011**	**900,869**	**900,869**	**573,433**	**697,037**
Deficit for the year	(160,698)	(57,018)	-	-	-	-	-	-	(160,698)	(57,018)
Other comprehensive income										
Revaluation increment	-	-	116,872	-	-	-	-	-	116,872	-
Total comprehensive surplus/(deficit) for the year	**(160,698)**	**(57,018)**	**116,872**	**-**	**-**	**-**	**-**	**-**	**(43,826)**	**(57,018)**
Transactions with owners										
Government equity injection	-	-	-	-	-	-	20,465	20,465	20,465	20,465
Balance at 30 June 2021	**(884,603)**	**(657,329)**	**503,341**	**386,468**	**10,000**	**10,011**	**921,334**	**921,334**	**550,072**	**660,484**

The above statement should be read in conjunction with the accompanying notes.

Consolidated Statement of Cash Flows

For the year ended 30 June 2021

	Note	Budget 2021	Actual 2021	Actual 2020
		$'000	$'000	$'000
Cash flows from operating activities				
Sales of goods and rendering of services		95,763	84,292	76,760
Grants received		43,760	24,433	19,144
Interest received		1,000	1,427	2,225
Receipts from Government		278,819	278,819	281,909
Payments to employees		(159,552)	(155,428)	(155,291)
Payments to suppliers		(184,527)	(126,828)	(109,838)
Payments for decommissioning	2.3C	(1,580)	(4,182)	(2,570)
Payments for nuclear waste management	2.3C	(1,200)	(2,608)	(4,806)
Bank charges		-	(17)	(25)
Net cash from operating activities		**72,483**	**99,908**	**107,508**
Cash flows from investing activities				
Proceeds from sale of property, plant, equipment and intangibles		-	184	313
Proceeds from maturing financial instruments		168,432	480,575	298,720
Purchase of financial instruments		(152,652)	(457,720)	(411,540)
Other		4,910	-	-
Purchase of property, plant, equipment and intangibles	2.2A	(120,678)	(121,551)	(82,664)
Net cash used in investing activities		**(99,988)**	**(98,512)**	**(195,171)**
Cash flows from financing activities				
Government equity injection		20,465	20,465	81,194
Principal and interest payments on lease liabilities	2.3D	(122)	(141)	(141)
Net cash from financing activities		**20,343**	**20,324**	**81,053**
Net increase/(decrease) in cash and cash equivalents		**(7,162)**	**21,720**	**(6,610)**
Cash and cash equivalents at the beginning of the reporting year		11,688	12,568	19,178
Cash and cash equivalents at the end of the reporting year	2.1A	**4,526**	**34,288**	**12,568**

The above statement should be read in conjunction with the accompanying notes.

Overview

Objectives of Australian Nuclear Science and Technology Organisation

Australian Nuclear Science and Technology Organisation (ANSTO) is a not-for-profit Australian Government Corporate Commonwealth Entity. ANSTO's strategic objectives, as set out in its current Corporate Plan, are:

- Putting people first: Equipping and empowering our people to respond to the growing nuclear science and technology needs of Australia and the world;
- World class science and technology outcomes: Creating innovative solutions to complex problems and providing new insights into our world;
- Strategic management of landmark and national infrastructure: Realising opportunities, serving users and creating value;
- Nuclear expertise and advice: Providing expert, science and technology based advice and services to support Australia's nuclear policy; and
- Nuclear business and innovation: Providing services and products to our customers that benefit the broader community.

In the 2021-22 Portfolio Budget Statement ANSTO has only one outcome as reflected below:

Outcome 1: Improved knowledge, innovative capacity and healthcare through nuclear-based facilities, research, training, products, services and advice to Government, industry, the education sector and the Australian population.

ANSTO's activities contributing towards the outcome are classified as departmental. Departmental activities involve the use of assets, liabilities, income and expenses controlled or incurred by ANSTO in its own right. The continued existence of ANSTO in its present form and with its present programs is dependent on Government policy and on continuing funding by Parliament for the entity's administration and programs.

Reference to ANSTO means ANSTO and its controlled entities except in Notes 1.1E and 6.2.

Basis of Preparation of the Financial Statements

The financial statements are general purpose financial statements and are required by section 42 of the *Public Governance, Performance and Accountability Act 2013*.

The financial statements have been prepared:

a) having regard to the provisions of the *Australian Nuclear Science and Technology Organisation (ANSTO) Act 1987* (as amended); and
b) in accordance with:
   i. *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015* (FRR) (as amended) for reporting periods ending on or after 1 July 2017; and
   ii. Australian Accounting Standards and Interpretations – Reduced Disclosure Requirements issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position. Where necessary the comparative information for the preceding financial year has been reclassified to achieve consistency in disclosure with current financial year amounts.

The financial statements are presented in Australian dollars and values are rounded to the nearest thousand dollars unless otherwise specified.

The financial statements were authorised for issue by the Board of Directors on 16 September 2021.

Overview (continued)

Foreign currency

Transactions denominated in a foreign currency are converted to Australian currency at the rate of exchange prevailing at the date of the transaction. At reporting date, amounts receivable and payable in foreign currency are translated to Australian currency at the exchange rate prevailing at that date and any exchange differences are brought to account in the Statement of Comprehensive Income. ANSTO does not enter into speculative forward exchange contracts.

Principles of consolidation

The consolidated financial statements incorporate the financial statements of ANSTO and the entities it controls. Control is achieved when ANSTO has all of the following:

- power over the investee;
- is exposed, or has rights, to variable returns from its involvement with the investee; and
- the ability to use its power to affect its returns.

Consolidation of a subsidiary begins when ANSTO obtains control over the subsidiary and ceases when they lose control of the subsidiary. All intragroup assets and liabilities, equity, income, expenses and cash flows relating to transactions between members of the Group are eliminated in full on consolidation. Profit or loss and each component of other comprehensive income are attributed to the owners of the entity and to the non-controlling interests. Total comprehensive income of subsidiaries is attributed to the owners of the entity and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance. Changes in the Group's ownership interests in subsidiaries that do not result in the Group losing control over the subsidiaries are accounted for as equity transactions. The carrying amounts of the Group's interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiaries. Any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognised directly in equity and attributed to ANSTO.

Significant accounting judgements and estimates

In the process of applying the accounting policies listed in this note, management has made a number of judgements and applied estimates and assumptions to future events. Information regarding judgements and estimates which are material to the financial statements are found in the following notes:

- Notes 2.2A and 5.3: Property, plant and equipment fair value measurement and useful lives;
- Note 2.3C: Decommissioning and nuclear waste management provisions phasing of work and discounted cash flow assumptions; and
- Note 2.2B: Recoverable amount of the intangible asset relating to intellectual property and fair value of the associated liability.

Apart from these assumptions and estimates no other accounting assumptions or estimates have been identified that have a significant risk of causing a material adjustment to carrying amounts of assets and liabilities within the next accounting period.

Overview (continued)

Impact of COVID-19
The COVID-19 pandemic has continued to develop in 2021. Measures taken by various governments to contain the virus have affected economic activity, particularly through social distancing and the closing of borders. ANSTO have taken a number of measures to monitor and mitigate the effect of COVID-19, such as safety and health measures for our people (such as social distancing and working from home) and securing the supply of materials that are essential to our production process.

At this stage, the impact on ANSTO and its results has not been significant and based on experience to date this is expected to remain the case. The impact of the measures taken by government and ANSTO as a result of COVID-19 have resulted in a net decrease in ANSTO's liquidity of $11.7 million (FY20: $10.9 million). The liquidity impacts are primarily driven from the loss of revenue due to both closure of borders and changes in shift patterns to protect staff and secure production.

Adoption of new Australian Accounting Standard requirements

In the current year, ANSTO adopted all new and revised Australian Accounting Standards issued by the Australian Accounting Standards Board that are mandatorily effective for accounting periods that ended on 30 June 2021.

No accounting standard has been adopted earlier than the application date as stated in the standard.

ANSTO has initially applied AASB 2018-7 *Amendments to Australian Accounting Standards – Definition of Material* from 1 July 2020. There has been no material effect on ANSTO's financial statements.

1. Financial Performance

This section details the financial performance of ANSTO.

1.1 Expenses

1.1A Employee

	2021	2020
	$'000	$'000
Wages and salaries	114,873	122,683
Superannuation	24,690	22,305
Leave and other entitlements	17,075	15,604
Separation and redundancies	1,267	145
Total employee expenses	**157,905**	**160,737**

Accounting Policy
Liabilities for 'short-term employee benefits' (as defined in AASB 119 *Employee Benefits*) and termination benefits expected within twelve months of the end of reporting period are measured at their nominal amounts.

Other long-term employee benefits are measured as the total net present value of the defined benefit obligation at the end of the reporting period.

Leave
The provision for employee entitlements encompasses annual leave and long service leave that ANSTO has a present obligation to pay resulting from employee services provided up to reporting date. The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied when leave is taken, including employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The Enterprise Agreement provides under the heading General Leave for an employee entitlement which combines sick leave, carer's leave and leave for 'other' prescribed purposes. No provision has been made for general leave as all such leave is 'non-vesting'.

The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

Separation and redundancy
Provision is made for separation and redundancy benefit payments. ANSTO recognises a provision for termination when it has developed a detailed formal plan for the termination and has informed those employees affected that it will carry out the termination.

Superannuation
ANSTO's staff are members of the Commonwealth Superannuation Scheme (CSS) and the Public Sector Superannuation Scheme (PSS) or the PSS accumulation plan (PSSap), or other superannuation funds held outside of the Australian Government that provide retirement, death and disability benefits to employees. The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap is a defined contribution scheme.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported in the Department of Finance's administered schedules and notes.

ANSTO makes employer contributions to the employees' superannuation scheme at rates determined by an actuary to be sufficient to meet the current cost to the Government. ANSTO accounts for contributions as if they are contributions to defined contribution scheme.

1. Financial Performance (continued)

1.1A Employee (continued)

The staff of the subsidiaries are members of various defined contribution schemes and receive the Superannuation Contribution Charge.

The liability for superannuation recognised as at 30 June represents outstanding contributions for the final week of the year.

1.1B Suppliers

	2021	2020
	$'000	$'000
Goods from external entities	50,646	52,537
Services from related entities	9,575	12,011
Workers compensation premiums - related entities	764	1,208
Services from external entities	57,361	32,893
Total supplier expenses	**118,346**	**98,649**

1.1C Write-down of assets

	Note	2021	2020
		$'000	$'000
Non-financial assets:			
Property, plant and equipment write-down	2.2A	244	12
Total write-down of assets expenses		**244**	**12**

1.1D Finance costs

	Note	2021	2020
		$'000	$'000
Bank charges		17	-
Interest expense on lease liabilities	2.3D	37	38
Unwinding of discount on provisions	2.3C	10,818	14,023
Total finance costs		**10,872**	**14,061**

1. Financial Performance (continued)

1.1E Income tax expense

	2021	2020
	$'000	$'000
Prima facie income tax benefit on results of taxable subsidiaries	28,011	9,739
Under/(over) provision in respect of prior years	13	(226)
Deferred tax asset write off	(27,944)	(8,795)
Effect of non-deductible items	(70)	(953)
Total income tax benefit/(expense)	**10**	**(235)**

ANSTO is exempt from income tax. Unrecognised deferred tax assets in relation to un-recouped tax losses including timing difference in ANSTO Inc., is $680,101 (2020: $574,727) and ANM is $83,043,246 (2020: $54,523,570). The total deferred tax assets recognised as at 30 June 2021 in relation to controlled entities are: $292,981 (2020: $283,178), from PETTECH Solutions Pty Ltd at $292,981 (2020: $283,178), ANM at $nil (2020: $nil) and ANSTO Inc. at $nil (2020: $nil).

Accounting Policy
ANSTO is exempt from all forms of Australian taxation except fringe benefits tax (FBT) and the goods and services tax (GST). ANSTO is not exempt from any foreign taxation laws relative to its overseas operations.

Revenues, expenses, assets and liabilities are recognised net of GST except:

- where the amount of GST incurred is not recoverable from the Australian Taxation Office; and
- for receivables and payables.

Subsidiaries
ANSTO's subsidiaries are subject to normal taxation.

ANSTO Inc. is a USA company and is subject to US tax laws. No deferred tax asset has been recognised at 30 June 2021 (2020: $nil) in relation to ANSTO Inc. as the directors do not believe it is probable that sufficient profits will be generated to utilise the tax losses.

No deferred tax asset has been recognised at 30 June 2021 (2020: $nil) in relation to ANM as the directors do not believe it is probable that sufficient profits will be generated to utilise the tax losses in a reasonable time frame.

In respect of the subsidiaries, current tax assets and liabilities for the current and prior periods are measured at the amount expected to be recovered from or paid to the taxation authorities based on the current period's taxable income. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted by reporting date.

Deferred income tax is provided on all temporary differences at reporting date between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes.

The PETTECH Solutions Pty Ltd directors believe it is probable that sufficient profits will be generated to utilise the tax losses available.

1. Financial Performance (continued)

1.1E Income tax benefit (continued)

Deferred income tax liabilities are recognised for all taxable temporary differences except:

- when the deferred income tax liability arises from the initial recognition of goodwill or of an asset or liability in a transaction that is not a business combination and that, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss; or

- when the taxable temporary difference is associated with investments in subsidiaries, associates or interests in joint ventures, and the timing of the reversal of the temporary difference can be controlled and it is probable that the temporary difference will not reverse in the foreseeable future.

Deferred income tax assets are recognised for all deductible temporary differences, carry forward of unused tax credits and unused tax losses, to the extent that it is probable that taxable profit will be available in the foreseeable future against which the deductible temporary differences and the carry forward of unused tax credits and unused tax losses can be utilised, except:

- when the deferred income tax asset relating to the deductible temporary difference arises from the initial recognition of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss; or

- when the deductible temporary difference is associated with investments in subsidiaries, associates or interests in joint ventures, in which case a deferred tax asset is only recognised to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilised.

Unrecognised deferred income tax assets are reassessed at each reporting date and are recognised to the extent that it has become probable that future taxable profit will allow the deferred tax asset to be recovered.

Deferred income tax assets and liabilities are measured at the tax rates that are expected to apply to the year when the asset is realised or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted at reporting date. Deferred tax assets and deferred tax liabilities are offset only if a legally enforceable right exists to set off current tax assets against current tax liabilities and the deferred tax assets and liabilities relate to the same taxable entity and the same taxation authority.

1. Financial Performance (continued)

1.2 Revenue

1.2A Sales of goods and rendering of services

	2021	2020
	$'000	$'000
Sales of goods		
Radioisotope sales	51,819	37,867
Total sales of goods	**51,819**	**37,867**
Rendering of services		
Service & contract research	11,073	12,203
Silicon irradiation	9,820	8,720
CSIRO site support	1,004	1,004
Training courses	317	243
Land management	6,233	5,865
Total rendering of services	**28,447**	**28,035**
Total sales of goods and rendering of services	**80,266**	**65,902**

Accounting Policy
Sales of goods and rendering of services
ANSTO recognises revenue for the transfer of promised goods and services to customers in an amount that reflects the consideration expected for the exchange of those goods and services.

The following is a description of the principal activities, and their respective revenue recognition treatment, from which ANSTO generates its revenue:

- Revenue from radioisotope sales is recognised at a point in time once control of the products is transferred to the customer. This generally occurs when products are dispatched for domestic customers and from when the products have departed from Australian soil for international customers;
- Revenue for service & contract research is recognised upon completion of the service milestone as per the contract or when the research has been provided if there are no specific milestones other than delivery on the agreed scope;
- Silicon irradiation revenue is recognised once the customer's product has undergone the irradiation process and control of the ingot returns to the customer;
- Revenue from land management includes operating lease revenue recognised on a straight- line basis or another systematic basis; and
- Revenue from training courses is recognised in the period the training course held when the performance obligations have been satisfied.

Receivables for goods and services are recognised at the contractual amounts due less any impairment allowance. Collectability of debts is assessed at invoicing. At this time an assessment is made of the expected credit loss based on life-time expected credit losses. Lifetime expected credit losses represent the expected credit losses that are expected to result from default events over the expected life of the financial asset. This takes into account the company's historical experience, the credit risk for each customer as well as other indicators.

1. Financial Performance (continued)

1.2A Sales of goods and rendering of services (continued)

Accounting Policy (continued)

Grant revenue
Operating grants
Assets arising from operating grants that do not satisfy the criteria to be accounted for under AASB 15 are recognised at fair value when the company obtains control of the asset. Income is recognised at this amount less any related amounts required to be recognised in accordance with applicable Australian Accounting Standards.

Capital grants
A transfer of a financial asset, including cash, to enable ANSTO to acquire or construct a recognisable non-financial asset to identified specifications to be controlled by the organisation is referred to as a capital grant. These grants are initially recognised as a liability and subsequently recognised as income as, or when, the company satisfies its obligation to acquire or construct the specified asset to which the capital grant relates. For the acquisition of specified assets, income is recognised when the asset is acquired and controlled by ANSTO. For the construction of specified assets, income is recognised as the construction progresses on the basis of costs incurred relative to expected costs.

Resources received free of charge
Resources received free of charge are recognised as revenue when and only when a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense.

Resources received free of charge are recorded as either revenue or gains depending on their nature i.e. whether they have been generated in the course of the ordinary activities of ANSTO. Contributions of assets at no cost or for nominal consideration are recognised as gains at their fair value when the asset qualifies for recognition.

2. Financial Position

This section details the financial position of ANSTO.

2.1 Financial assets

2.1A Cash and cash equivalents

Accounting policy
Cash is recognised at its nominal amount. Cash and cash equivalents include:

- Cash on hand; and
- Demand deposits in bank accounts with an original maturity of 3 months or less that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value.

2.1B Trade and other receivables

	2021	2020
	$'000	$'000
Goods and services		
Related entities	1,344	818
External entities	12,222	7,104
Trade receivables	**13,566**	**7,922**
Less impairment allowance	-	-
Net receivables for goods and services	**13,566**	**7,922**
Other receivables		
Interest accrued	124	558
GST receivable from the Australian Tax Office	1,670	1,225
Accrued Revenue	1,835	1,572
Other	594	583
Total other receivables	**4,223**	**3,938**
Total net trade and other receivables	**17,789**	**11,860**

Trade and other receivables are expected to be received within 12 months.

Net receivables are aged as follows:

	2021	2020
	$'000	$'000
Overdue but not impaired:		
Less than 31 days	15,453	10,152
31 to 60 days	552	95
61 to 90 days	562	515
More than 90 days	1,222	1,098
Total net trade and other receivables	**17,789**	**11,860**

Accounting policy
Receivables for goods and services are recognised at the nominal amounts due less any impairment allowance. Collectability of debts is reviewed at reporting date. Allowance is made when collectability of the debt is no longer probable.

2. Financial Position (continued)

2.1C Investments

	Note	2021	2020
		$'000	$'000
Term deposits		191,360	214,215
Joint ventures	2.1D	-	-
Other	2.1E	703	703
Total investments		**192,063**	**214,918**

2.1D Investment in joint ventures

			2021	2020
Name	**Place of incorporation**	**%**	**$**	**$**
Southern Radioisotopes Alliance Inc.	USA	100	625	625
Applied Molecular Therapies Pty Ltd	Australia	45	-	-
Total investment in joint venture			**625**	**625**

Southern Radioisotopes Alliance Inc. investment is USD 600 (2020: USD 600). This company has yet to commence trading.

The investment in Applied Molecular Therapies Pty Ltd is 900 shares (2020: 900). The company is in the establishment phase.

2.1E Investment – other

			2021	2020
Name	**Place of incorporation**	**%**	**$**	**$**
Clarity Pharmaceuticals Pty Ltd	Australia	1.9 (2020: 2.4)	703,306	703,306
Total investment – other			**703,306**	**703,306**

Clarity Pharmaceuticals Pty Ltd. was incorporated in New South Wales, Australia on 17 September 2010. The current shareholding is 179,996 shares (2020: 179,996).

2. Financial Position (continued)

2.2 Non-financial assets

2.2A Property, plant and equipment and intangible assets

	Land	Buildings	Plant and equipment	Intellectual property	Software	Other intangibles	Assets under construction	Buildings Right of Use	Total
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Gross value as at 30 June 2020	115,688	255,074	1,140,720	51,210	29,494	8,756	185,207	3,853	1,790,002
Additions	-	-	-	-	-	-	121,551	-	121,551
Transfers/reclassifications	-	19,627	71,273	151	52,268	(3,153)	(146,453)	-	(6,287)
Revaluation increment/(decrement)	85,812	(6,146)	37,206	-	-	-	-	-	116,872
Transfer of depreciation on revaluation	-	(58,223)	(394,103)	-	-	-	-	-	(452,326)
Assets written-off	-	-	(731)	-	-	(385)	-	-	(3,268)
Disposals	-	-	(325)	-	-	-	-	-	(325)
Gross value as at 30 June 2021	**201,500**	**210,332**	**854,040**	**51,361**	**79,610**	**5,218**	**160,305**	**3,853**	**1,566,219**
Accumulated depreciation/amortisation and impairment losses 1 July 2020	-	145,769	372,549	26,510	8,601	4,316	55,974	151	613,870
Transfers/reclassifications	-	(34,242)	37,945	69	46,370	(455)	(55,974)	-	(6,287)
Depreciation/amortisation	-	10,655	67,249	-	5,309	353	-	151	83,717
Impairment loss	-	25,331	29,197	-	-	-	-	-	54,528
Assets written-off	-	-	(520)	-	(2,119)	(385)	-	-	(3,024)
Released on disposal	-	-	(267)	-	-	-	-	-	(267)
Transfer of depreciation on revaluation	-	(58,223)	(394,103)	-	-	-	-	-	(452,326)
Accumulated depreciation/amortisation and impairment losses 30 June 2021	**-**	**89,290**	**112,050**	**26,579**	**58,161**	**3,829**	**-**	**302**	**290,211**
Net book value as at 30 June 2021	**201,500**	**121,042**	**741,990**	**24,782**	**21,449**	**1,389**	**160,305**	**3,551**	**1,276,008**
Property, plant and equipment	**201,500**	**121,042**	**741,990**	**24,782**	**21,449**	**1,389**	**140,756**	**3,551**	**1,208,839**
Intangibles	**-**	**-**	**-**	**-**	**-**	**-**	**19,549**	**-**	**67,169**

Movement summary 2020-21 for all consolidated assets irrespective of valuation basis. No intangible assets are expected to be disposed of within the next 12 months.

2. Financial Position (continued)

2.2A Property, plant and equipment and intangible assets (continued)

Accounting Policy
Asset recognition threshold
Items of buildings, infrastructure, plant and equipment and major facilities are recorded at cost of acquisition and depreciated as outlined below. Items of plant and equipment with a cost of less than $5,000 (2020: $5,000) are expensed in the year of acquisition (other than where they form part a group of similar items which are significant in total).

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located at the end of its useful life. This is particularly relevant to 'make good' or decommissioning provisions on buildings, infrastructure, plant and equipment and major facilities, taken up by ANSTO where there exists an obligation to restore the property to its original condition. These costs are included in the value of the asset it relates to with a corresponding provision for the 'make good' or decommissioning taken up.

The cost of assets constructed by the entity includes the cost of materials, direct labour and an appropriate proportion of fixed and variable overheads.

Lease right-of-use (ROU) assets
Leased ROU assets are capitalised at the commencement date of the lease and comprise of the initial lease liability amount, initial direct costs incurred when entering into the lease less any lease incentives received. These assets are accounted for by Commonwealth lessees as separate asset classes to corresponding assets owned outright.

Following initial application, an impairment review is undertaken for any right of use lease asset that shows indicators of impairment and an impairment loss is recognised against any right of use lease asset that is impaired.

Revaluations
Following initial recognition at cost, buildings, infrastructure, plant and equipment and major facilities (excluding right-of-use (ROU) assets) are carried at fair value less accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at reporting date. The regularity of independent valuations depends upon the volatility of movements in market values for the relevant assets. Independent valuers are generally used to conduct these scheduled revaluations. Revaluation increases or decreases arise from differences between an asset's carrying value and fair value.

The 30 April 2021 tangible asset valuation of:

- ANSTO's NSW campus has been carried out by Public Private Property Pty Ltd.
- ANSTO's Victorian campus has been carried out by PP&E Valuation Pty Limited.

Both valuers are qualified and independent, with the valuations effective 30 April 2021. The valuation method adopted by the valuers was Depreciable Replacement Cost. The valuers advised that the market is being impacted by the uncertainty caused by the COVID-19 pandemic. As a result their valuation is reported on the basis of 'significant valuation uncertainty' and therefore less certainty exists than normal and a higher degree of caution should be attached to the valuation than normally would be the case. Management have reviewed the carrying value of ANM's tangible assets under the Income Approach, consistent with prior years' methodology, resulting in the assets being fully impaired at year end.

2. Financial Position (continued)

2.2A Property, plant and equipment and intangible assets (continued)

Revaluation adjustments are made on a class basis. Any revaluation increment is credited to equity under the heading of asset revaluation reserve except to the extent that it reverses a previous revaluation decrement of the same asset class that was previously recognised through profit and loss. Revaluation decrements for a class of assets are recognised directly through profit and loss except to the extent that they reverse a previous revaluation increment for that asset class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to the revalued amount except for assets relating to decommissioning that are not subjected to revaluation.

Any revaluation increase to the decommissioning cost included in the initial cost of the asset will be reflected as an increase to the provision for decommissioning and a decrease to the asset revaluation reserve to the extent that there is a sufficient balance in the asset revaluation reserve for this asset class, any residual decrease will be recognised in profit or loss. Any revaluation decrease will be reflected as a decrease to the provision for decommissioning and an increase to the asset revaluation reserve and, to the extent of the decrease reversing a previous revaluation decrease of the related asset class that was previously recognised in profit and loss, the decrease is credited to profit and loss as a reversal. If the decrease in the provision exceeds the Depreciable Replacement Cost of the asset, the excess is taken to profit and loss.

Depreciation
Items of buildings, infrastructure, plant and equipment and major facilities, but excluding freehold land and ROU assets, are depreciated over their estimated useful lives to ANSTO using the straight-line method. The depreciation rates for ROU assets are based on the commencement date to the earlier of the end of the useful life of the ROU asset or the end of the lease term.

The depreciation rates (useful lives), residual values and methods are reviewed during each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate. ROU assets are amortised based on the life of the lease.

Depreciation and amortisation rates applying to each class of depreciable asset (excluding ROU assets) are based on the following useful lives:

	2021	2020
Buildings on freehold land	**5 to 45 years**	5 to 45 years
Plant and equipment	**2 to 45 years**	2 to 45 years
Infrastructure	**20 years**	20 years
Landmark, national and major research facilities	**5 to 45 years**	5 to 45 years

Impairment
All assets were assessed for indications of impairment at 30 June 2021. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs to sell and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if the entity were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

2. Financial Position (continued)

2.2A Property, plant and equipment and intangible assets (continued)

Derecognition
An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

2.2B Intangibles

The useful lives of intangible assets are assessed as either finite or indefinite.

Intangible assets with finite lives are amortised over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. Intangible assets with indefinite useful lives are not amortised, but are tested for impairment annually, either individually or at the cash-generating unit level.

Software
Items of software are recorded at cost and amortised as outlined below. Items with a cost of less than $5,000 (2020: $5,000) are expensed in the year of acquisition. Software and licences are reported at cost. There is no material internal software development, though there are significant internal capitalised costs involved in the implementation of purchased software.

Intellectual property
ANSTO and NTP Radioisotopes (SOC) Limited (NTP) signed the Intellectual Property (IP) Licence Agreement on 15 May 2012 for the provision of NTP's IP to ANSTO to enable ANSTO to build a new Mo-99 manufacturing plant at Lucas Heights.

Under the terms of the IP Agreement NTP granted to ANSTO an exclusive, irrevocable, perpetual licence to use, exploit, reproduce and modify the current IP and the future IP.

ANSTO originally recognised the IP right conveyed, at fair value, as an intangible asset with an indefinite life and a financial liability for the future payments required in relation to the asset. This IP is recognised as its initial fair value less impairment of $24,782,000 (2020: $24,700,000).

Amortisation
Intangibles are amortised over their estimated useful lives to ANSTO using the straight line method.

Amortisation rates applying to intangibles are as follows:

	2021	2020
Purchased software	**2 to 10 years**	2 to 10 years
Licences	**3 years**	3 years
Intellectual property	**Indefinite life**	Indefinite life

Impairment
All intangible assets were assessed for impairment at 30 June 2021. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

Patents
Due to the uncertain commercial value of patents and because benefits extending beyond one accounting period cannot be assured, the costs associated with the development and registration of patents are expensed in the year in which they are incurred, unless recoverability is assured beyond any reasonable doubt. At 30 June 2021 there were 158 patents (2020: 173) registered to ANSTO and no associated costs are recognised as an asset (2020: $nil).

2. Financial Position (continued)

2.2C Inventories

	2021	**2020**
	$'000	**$'000**
Raw materials and stores – not held for resale		
Stores – at cost	30,593	27,866
Cobalt-60 sources – at net realisable value	58	86
Reactor fuel and heavy water – at average purchase price	13,761	8,876
	44,412	36,828
Work in progress – at cost	3,699	3,350
Finished goods – at cost	2,119	1,622
Total inventories	**50,230**	**41,800**
Inventories expected to be realised within		
No more than 12 months	40,133	33,996
More than 12 months	10,097	7,804
Total inventories	**50,230**	**41,800**

In 2021, opening inventories of $33.4M (2020: $31.5M) were recognised as an expense during the year and included in 'cost of sales'.

Accounting Policy
Inventories held for sale are valued at the lower of cost and net realisable value. Costs incurred in bringing each item of inventory to its present location and condition, are assigned as follows:

- Raw material and stores (with the exception of reactor fuel) - purchase cost on a first-in first-out basis;
- Reactor fuel - average purchase price; and
- Finished goods and work-in-progress - cost of direct materials and labour plus attributable costs that can be allocated on a reasonable basis.

2.2D Commitments

	2021	**2020**
	$'000	**$'000**
Infrastructure, plant and equipment	73,847	50,014
Fuel element purchase	9,715	13,961
Mo-99 plate purchase	11,759	23,048
Total commitments	**95,321**	**87,023**
One year or less	69,051	66,963
From one to five years	26,270	20,060
Total commitments	**95,321**	**87,023**

Accounting Policy
Commitments are expenditure contracted for at the reporting date, but not recognised as liabilities.

2. Financial Position (continued)

2.3 Liabilities

2.3A Other payables

	2021	2020
	$'000	$'000
Other payables	6,379	7,831
Total other payables	**6,379**	**7,831**
Other payables expected to be settled within		
No more than 12 months	6,379	7,831
Total other payables	**6,379**	**7,831**

Accounting Policy
Other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

2.3B Revenue in advance

	2021	2020
	$'000	$'000
Grant monies received in advance	28,177	33,892
Revenue received in advance - goods and services	4,059	2,237
Total revenue in advance	**32,236**	**36,129**
Other payables expected to be settled within		
No more than 12 months	28,202	27,505
More than 12 months	4,034	8,624
Total revenue in advance	**32,236**	**36,129**

Accounting Policy
Revenue in advance is recognised if a payment is received before ANSTO performs the related services, the customer has yet to obtain control of the goods or the grant performance obligations, if any, have yet to be met.

2. Financial Position (continued)

2.3C Provisions (other than employees)

		2021	2020
		$'000	$'000
Decommissioning	(a)	731,817	616,284
Nuclear waste management	(b)	140,157	129,154
Intellectual property payment	(c)	37,105	37,703
Other provisions		259	1,218
Total provisions		**909,338**	**784,359**
Provisions expected to be settled within			
No more than 12 months		26,077	22,006
More than 12 months		883,261	762,353
Total provisions		**909,338**	**784,359**

Accounting policy
The initial measurement of the provision for decommissioning and nuclear waste management provisions is the present value of expected expenditures to settle the obligation.

Any adjustment to the provision for decommissioning and nuclear waste management attributable to the timing of expenditure, consumer price index (CPI) and discount rate at 30 June each year will be reflected as an adjustment to the provision and recognised in profit or loss in the reporting year in which the estimates change. The accounting policy relating to adjustments to the provision for decommissioning arising on revaluation of the decommissioning cost included in the underlying asset is disclosed in Note 2.2A.

2. Financial Position (continued)

2.3C Provisions (other than employees) (continued)

	Decommissioning $'000	Nuclear waste management $'000	Intellectual property payment $'000	Other claims $'000
Carrying amount 30 June 2019	**689,297**	**192,705**	**40,312**	**505**
Nuclear waste management expenses	-	2,997	-	-
Additions to provision	-	-	-	795
Amounts used	(2,570)	(4,806)	(147)	(82)
Change in accounting estimate	(82,295)	(63,819)	-	-
Foreign currency movement	-	-	(2,556)	-
Unwinding discount	11,852	2,077	94	-
Carrying amount 30 June 2020	**616,284**	**129,154**	**37,703**	**1,218**
Nuclear waste management expenses	-	4,966	-	-
Amounts used	(4,182)	(2,608)	(1,503)	(959)
Change in accounting estimate	109,764	7,930	-	-
Foreign currency movement	-	-	753	-
Unwinding discount	9,951	715	152	-
Carrying amount 30 June 2021	**731,817**	**140,157**	**37,105**	**259**

Provisions movement reconciliation

(a) This provision includes decommissioning costs relating to property, plant, equipment and infrastructure.

Estimated nominal costs being the estimate of future cash flows required to fund the decommissioning of current facilities and infrastructure (2021: $717.5 million; 2020 $740.7 million):

- An external company, Project Time & Cost LLC (PT&C), was engaged in FY19 to provide a report on the cost of decommissioning facilities at ANSTO's Lucas Heights campus effective 30 June 2019. The estimate provided by PT&C has an expected accuracy range between +50% and -30%. ANSTO has applied the mid-point estimate from the PT&C in their calculation of the decommission provision.

2. Financial Position (continued)

2.3C Provisions (other than employees) (continued)

Phasing of the estimated nominal costs over the expected time period of the decommissioning provision being 57 years (2020: 58 years):

- The cash flows are phased based on when it is expected that the work will be undertaken, which is subject to the use of the asset, the available funding and, where applicable, the licence.
- Decommissioning costs are funded by government and received on a pro-rata basis with the longest funding over 57 years for the decommissioning of infrastructure.

Inflating the nominal costs by expected CPI over time (2021: 2.5%, 2020: 1.5%):

Payments to fund decommissioning are made in the future and need to account for expected increases in the underlying cost of the final outflow due to inflationary pressures. The inflation rate assumption applied by ANSTO is set with reference to the Standard Parameters made available by the Department of Finance.

Discounting for the effect of the time value of money (2021: ranging from 0.06% to 3.00%, 2020: ranging from 0.15% to 3.25%):

- Projected nominal costs are discounted to a present value using risk free rates to reflect the time value of money and are set with reference to the Standard Parameters made available by the Department of Finance.

Given the high degree of judgement required to estimate future cash flows and the phasing of these cash flows, there is inherent uncertainty in establishing the liability, therefore it is likely that the final outcome will differ from the original liability established.

The sensitivity of the decommissioning provision, based on the nominal cost of $717.5 million as at 30 June 2021 (2020: $740.7 million), to changes in the primary drivers are indicated in the table below. Each change has been calculated in isolation and without regard to other driver changes that may occur simultaneously.

		Decommissioning provision increase/(decrease)	
Driver	**Change**	**2021 $'000**	**2020 $'000**
CPI	(1.0)%	(154,718)	(126,055)
	(0.5)%	(83,485)	(67,790)
	0.5%	98,189	79,148
	1.0%	214,062	171,869
Discount rate	(1.0)%	215,578	169,311
	(0.5)%	98,569	78,843
	0.5%	(83,216)	(67,149)
	1.0%	(153,666)	(124,479)
Delaying planned expenditure	1 year	42,155	(12,607)
	3 years	85,001	(36,582)
	5 years	112,064	(55,736)

2. Financial Position (continued)

2.3C Provisions (other than employees) (continued)

(b) The nuclear waste management provision consists of future costs relating to the management of accumulated waste arising from nuclear operations.

Estimated nominal costs being the estimate of future cash flows required to fund the waste management activities (2021: $129.3 million; 2020 $122.9 million):

The legacy nuclear waste relates to the future costs of managing legacy nuclear waste from research and the production of nuclear medicine. The provision also includes the future costs of managing nuclear waste that has arisen from current operations. Also included are the estimated costs of managing the spent fuel from the OPAL multipurpose reactor. The costs of the legacy waste, current waste and spent fuel are based primarily on ANSTO experience and expertise of managing these items over a number of years.

Phasing of the estimated nominal costs over the expected time period of the nuclear waste management activities being 14 years (2020: 14 years):

The cash flows are phased based on when it is expected that the work will be undertaken.

Inflating the nominal costs by expected CPI over time (2021: 2.5%, 2020: 1.5%):

Payments to fund nuclear waste management are made in the future and need to account for expected increases in the underlying cost of the final outflow due to inflationary pressures. The inflation rate assumption applied by ANSTO is set with reference to the Standard Parameters made available by the Department of Finance.

Discounting for the effect of the time value of money (2021: ranging from 0.06% to 1.66%, 2020: ranging from 0.15% to 1.14%):

- Projected nominal costs are discounted to a present value using risk free rates to reflect the time value of money and are set with reference to the Standard Parameters made available by the Department of Finance.

Given the high degree of judgement required to estimate future cash flows and the phasing of these cash flows, there is inherent uncertainty in establishing the liability, therefore it is likely that the final outcome will differ from the original liability established.

2. Financial Position (continued)

2.3C Provisions (other than employees) (continued)

The sensitivity of the nuclear waste management provision, based on the nominal cost of $129.3 million as at 30 June 2021 (2020: $122.9 million), to changes in the primary drivers are indicated in the table below. Each change has been calculated in isolation and without regard to other driver changes that may occur simultaneously.

		Nuclear waste management provision increase/(decrease)	
Driver	**Change**	**2021 $'000**	**2020 $'000**
CPI	(1.0)%	(7,400)	(7,615)
	(0.5)%	(3,754)	(3,873)
	0.5%	3,865	4,007
	1.0%	7,844	8,154
Discount rate	(1.0)%	6,855	5,701
	(0.5)%	3,719	3,736
	0.5%	(3,790)	(3,884)
	1.0%	(7,435)	(7,602)
Delaying planned expenditure	1 year	1,082	568
	3 years	1,912	1,204
	5 years	3,204	1,177

(c) The provision of intellectual property relates to future payments required in relation to the intellectual property asset (Notes 2.2A and 2.2B). The liability is derived from calculating the estimated commission to be paid to NTP based on expected future sales and then discounted back at 3.20% (2020: 5.11%).

2.3D Operating Leases

ANSTO leases property in Camperdown from the Central Sydney Area Health Service under one operating lease. The current lease was entered into in November 2000 and terminates in January 2025. There is an option to renew the lease for a period of twenty years and to purchase the property. The lease enables ANSTO to undertake its principal activities. Lease payments are variable to the extent that they are reviewed every three years in accordance with the market rental valuation clause of the agreement. ANSTO does not have an interest in the residual value of the property but does have a responsibility at the termination of the lease to ensure the property is in good and tenantable condition. At 30 June, the future minimum lease payments under non-cancellable operating leases were payable as follows:

	Note	2021	2020
		$'000	**$'000**
Opening balance		3,750	-
Additions		-	3,853
Lease repayments		(141)	(141)
Interest expense on lease liabilities	1.1D	37	38
Closing balance		**3,646**	**3,750**
Maturity analysis - contractual undiscounted cash flows			
Buildings			
Less than one year		151	108
One to five years		477	588
More than five years		3,018	3,054
Total undiscounted lease liabilities		**3,646**	**3,750**

2. Financial Position (continued)

2.3D Operating Leases (continued)

Accounting policy
ANSTO recognises right-of-use assets and lease liabilities for most leases. However, ANSTO has elected not to recognise right-of-use assets and lease liabilities for some leases of low value assets based on the value of the underlying asset when new or for short-term leases with a lease term of 12 months or less.

2.4 Reserves

2.4A Reserves

	Note	2021	2020
		$'000	$'000
Asset revaluation			
Opening balance		386,469	389,124
Revaluation increment/(realisation)	2.2A	116,872	(2,655)
Asset revaluation reserves	(a)	**503,341**	**386,469**
Other reserves			
OPAL depreciation	(b)	**9,061**	**9,061**
Intermediate low level waste (ILLW) return	(c)	**616**	**616**
Foreign currency reserve			
Opening balance		323	323
Movement		-	-
Foreign currency reserve	(d)	**323**	**323**
Other reserves		**10,000**	**10,000**
Total reserves		**513,341**	**396,469**

(a) Asset revaluation
This reserve represents the revaluation of property, plant and equipment.
(b) OPAL depreciation reserve
This reserve represents unused funding for OPAL depreciation. This was due to a delay in final commissioning of OPAL.
(c) Intermediate low level waste (ILLW) return
This reserve relates to unspent appropriation for ILLW return.
(d) Foreign currency reserve
This reserve relates to foreign currency translation at reporting date.

2.4B Accumulated deficit

	2021	2020
	$'000	$'000
Opening balance	(723,905)	(848,120)
(Deficit)/surplus for the year after income tax	(160,698)	124,215
Closing balance	**(884,603)**	**(723,905)**

3. Funding

This section identifies ANSTO's funding structure.

3.1 Government funding

	2021	2020
	$'000	$'000
Revenue from Government	278,819	281,909
Government equity injection	20,465	81,194
Total government funding	**299,284**	**363,103**

Revenue from government
Funding received or receivable from the Department of Industry, Science, Energy and Resources (DISER) (appropriated to ANSTO as a Corporate Commonwealth Entity payment item for payment to ANSTO) is recognised as Revenue from Government when the entity gains control of the funding unless it is in the nature of an equity injection, such amounts are recognised directly in contributed equity in the year received.

4. People and relationships

This section describes a range of employment and post-employment benefits provided to our people and our relationships with key people.

4.1 Employee payables

	2021	2020
	$'000	$'000
Accrued salaries and wages	3,214	2,552
Incentives	1,668	3,900
Total employee payables	**4,882**	**6,452**

All employee payables are expected to be settled within 12 months.

4.2 Employee provisions

	2021	2020
	$'000	$'000
Annual leave	17,526	16,421
Long service leave	36,811	33,872
Total employee provisions	**54,337**	**50,293**
Employee provisions expected to be settled within		
No more than 12 months	46,885	42,841
More than 12 months	7,452	7,452
Total employee provisions	**54,337**	**50,293**

4. People and relationships (continued)

4.3 Key management personnel remuneration

Key management personnel (KMP) are those persons having authority and responsibility for planning, directing and controlling the activities of ANSTO, directly or indirectly, including any director (whether executive or otherwise) of ANSTO. ANSTO has determined the KMP to be the ANSTO Portfolio Minister, the Board and the Executive Leadership Team. KMP remuneration is reported in the table below:

	2021	2020
	$'000	$'000
Short-term employee benefits:		
Salary	3,909	3,796
Performance bonuses	17	720
Other	27	18
Total short-term employee benefits	**3,953**	**4,534**
Post-employment benefits:		
Superannuation	425	406
Total post-employment benefits	**425**	**406**
Other long-term benefits:		
Long-service leave	169	82
Other	(101)	64
Total other long-term benefits	**68**	**146**
Termination benefits	**260**	**-**
Total key management personnel remuneration	**4,706**	**5,086**

ANSTO had 25 individuals in KMP roles during the year, 21 in ANSTO and 4 in its subsidiaries (2020: 24 individuals, 20 ANSTO and 4 subsidiaries).

These individuals equated to a full time equivalent (FTE) of 18.57 (2020: 16.65). Represented by 9.17 non-executive board members (prorated) (2020: 7.17) and 9.40 FTE (2020: 9.48 FTE) members of the ANSTO Executive Leadership Team. The above key management personnel remuneration excludes the remuneration and other benefits of the Portfolio Minister. The Portfolio Minister's remuneration and other benefits are set by the Remuneration Tribunal and are not paid by the entity.

4.4 Related party transactions

ANSTO is an Australian Government controlled entity. Related parties to this entity are the Key Management Personnel, the Commonwealth cabinet and other Australian Government entities.

Significant transactions with related parties or entities that they are associated with can include:

- the payments and receipt of grants; and
- purchases of goods and services

Giving consideration to relationships with related parties, their associated entities, and transactions entered into during the reporting period by ANSTO, it has been determined that there are no related party transactions to be separately disclosed.

5. Managing Uncertainties (continued)

5.1 Contingent assets and liabilities

At 30 June 2021, ANSTO has accumulated, and will continue to accumulate, nuclear waste that requires characterisation in order to determine the nature and therefore the costs and timing required to manage the waste to final disposal, which is unfunded. The majority of this waste has arisen from the production of nuclear medicine. The underlying assumption is that the ultimate storage of the nuclear waste will be the responsibility of the planned National Radioactive Waste Management Facility. If there is a change in Government policy, ANSTO may need to bear the costs relating to the future management of the waste.

The Clayton campus, which contains the Australian Synchrotron, is situated on land leased from Monash University in Victoria at a peppercorn rate. If, at the expiration of the lease, Monash University does not take ownership of the infrastructure ANSTO may be liable for decommissioning and make good costs. The Camperdown campus located in New South Wales currently leases land that contains a make good clause that ANSTO may need to bear on expiration of the lease as disclosed in Note 2.3D.

At 30 June 2021, ANSTO still has the likelihood of claims in relation to asbestos related diseases. It is not possible to estimate the amounts of any eventual payments that may be required in relation to these claims. However, such claims are covered by the Department of Finance provision dealing with asbestos related claims against any Commonwealth Authorities including ANSTO in the event of any litigation or claim for compensation.

Accounting Policy
Contingent assets and contingent liabilities are not recognised in the Statement of Financial Position but are reported in the Notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

5.2 Financial instruments

Categories of financial instruments

	Note	Carrying amount 2021	Amortised Cost 2021	Fair value through profit or loss 2021	Carrying amount 2020	Amortised Cost 2020	Fair value through profit or loss 2020
Financial assets		**$'000**	**$'000**	**$'000**	**$'000**	**$'000**	**$'000**
Cash and cash equivalents		34,288	34,288	-	12,568	12,568	-
Trade receivables	2.1B	13,566	13,566	-	7,922	7,922	-
Interest accrued	2.1B	124	124	-	558	558	-
Accrued revenue	2.1B	1,835	1,835	-	1,572	1,572	-
Other	2.1B	594	594	-	583	583	-
Investments	2.1C	191,360	-	191,360	214,215	-	214,215
Investments - other	2.1C	703	-	703	703	-	703
Total financial assets (recognised)		**242,470**	**50,407**	**192,063**	**238,121**	**23,203**	**214,918**
Total financial liabilities							
Suppliers		18,859	18,859	-	11,430	11,430	-
Employees	4.1	4,882	4,882	-	6,452	6,452	-
Other payables	2.3A	6,379	6,379	-	7,831	7,831	-
Operating leases	2.3D	3,646	3,646	-	3,750	3,750	-
Revenue in advance	2.3B	32,236	32,236	-	36,129	36,129	-
Total financial liabilities (recognised)		**66,002**	**66,002**	**-**	**65,592**	**65,592**	**-**

Interest revenue from financial assets

	2021	2020
	$'000	**$'000**
Loans and receivables		
Cash and cash equivalents	212	463
Investments	781	1,725
Net income from financial assets	**993**	**2,188**

Interest revenue
Interest revenue is recognised using the effective interest method as set out in AASB 139 *Financial Instruments: Recognition and Measurement*.

5. Managing Uncertainties (continued)

5.2 Financial instruments (continued)

a) Net expenses from financial liabilities

There were no expenses from financial liabilities for 2021 (2020: $nil).

Financial assets

The net fair values of cash, deposits on call and non-interest-bearing monetary financial assets are in accord with their carrying amounts. Loans receivable are carried at cost, which is above their net fair value, because it is intended to hold them to maturity.

Financial liabilities

The net fair values for trade creditors and grants received in advance, all of which are short-term in nature, are in accord with their carrying amounts.

Accounting Policy

ANSTO classifies its financial assets in the following categories:

- Fair value through profit or loss; and
- Amortised cost

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Financial assets are recognised and derecognised upon trade date.

Effective interest method

The effective interest method is a method of calculating the amortised cost of a financial asset or a financial liability and of allocating interest income over the relevant period. The effective interest rate is the rate that discounts estimated future cash receipts through the expected life of the financial asset, or, where appropriate, a shorter period.

Income is recognised on an effective interest rate basis except for financial assets at fair value through profit or loss.

Financial assets at fair value through profit or loss

Financial assets are classified as financial assets at fair value through profit or loss where the financial assets have been acquired principally for the purpose of selling in the near future. Assets in this category are classified as current assets.

Financial assets at fair value through profit or loss are stated at fair value, with any resultant gain or loss recognised in the profit or loss. The net gain or loss recognised in the profit or loss incorporates any interest earned on the financial assets.

Where a reliable fair value cannot be established for unlisted investments in equity instruments, cost is used less impairment if applicable.

5. Managing Uncertainties (continued)

5.2 Financial instruments (continued)

Financial Assets at Amortised Cost

Financial assets included in this category need to meet two criteria:

1. the financial asset is held in order to collect the contractual cash flows; and
2. the cash flows are solely payments of principal and interest (SPPI) on the principal outstanding amount. Amortised cost is determined using the effective interest method.

Investments

Non-derivative financial assets with fixed or determinable payments and fixed maturity dates that the group has the positive intent and ability to hold to maturity are classified as investments. Investments are recorded at amortised cost using the effective interest method less impairment, with revenue recognised on an effective yield basis.

Loans and receivables

Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an active market. Loans and receivables are measured at amortised cost using the effective interest method less impairment. Interest is recognised by applying the effective interest rate.

Effective Interest Method

Income is recognised on an effective interest rate basis for financial assets that are recognised at amortised cost.

Impairment of financial assets

Financial assets are assessed for impairment at each reporting date.

- If there is objective evidence that an impairment loss has been incurred for loans and receivables or investments, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows discounted at the asset's original effective interest rate. The carrying amount is reduced by way of an allowance account. The loss is recognised in the Statement of Comprehensive Income. If there is objective evidence that an impairment loss has been incurred the amount of the impairment loss is the difference between the carrying amount of the asset and the present value of the estimated future cash flows discounted at the current market rate for similar assets. The net fair values of cash, deposits on call and non-interest-bearing monetary financial assets are in accord with their carrying amounts.

Financial liabilities

Financial liabilities are classified as other financial liabilities and are recognised and derecognised upon trade date.

Other financial liabilities

Other financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs. These liabilities are subsequently measured at amortised cost using the effective interest method, with the interest expense recognised on an effective interest basis.

Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

5. Managing Uncertainties (continued)

5.3 Fair value measurement

The following tables provide an analysis of assets and liabilities that are measured at fair value. The different levels of the fair value hierarchy are defined below.

Level 1: Quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at measurement date.
Level 2: Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
Level 3: Unobservable inputs for the asset or liability.

Non-financial assets	Category	Fair value 2021 $'000	Fair value 2020 $'000	Valuation technique[1]	Inputs used[1]
Land	**3**	**201,500**	**115,688**	Market approach	Adjusted market transactions (zoning, access, existing use, size, topography, location).
Buildings	**2**	**-**	**4,579**	Market approach	Adjusted market transactions.
	3	**121,042**	**104,726**	Depreciated replacement cost approach	Replacement cost/consumed economic benefit/ obsolescence of asset.
Infrastructure, plant and equipment	**2**	**12,597**	**3,410**	Market approach	Adjusted market transactions.
	3	**729,393**	**764,761**	Depreciated replacement cost approach	Replacement cost/consumed economic benefit/ obsolescence of asset.

1. The valuation techniques and inputs used in 2021 and 2020 are consistent except for Buildings where the Cost approach has been used for all buildings with a fair value at 30 June 2021.

   The highest and best use of all non-financial assets is the same as their current use.

Accounting Policy
For assets that are recognised in the financial statements at fair value on a recurring basis, the determination is made whether transfers have occurred between levels in the hierarchy by re-assessing categorisation (based on the lowest level input that is significant to the fair value measurement as a whole) at the end of each reporting period.

5. Managing Uncertainties (continued)

5.3 Fair value measurement (continued)

Recurring and non-recurring Level 3 fair value measurements - valuation processes
Public Private Property Pty Ltd undertook a comprehensive valuation of all non-financial tangible assets located at the Lucas Heights campus effective 30 April 2021. PP&E Valuations undertook a comprehensive valuation of all non-financial tangible assets located at the Clayton campus effective 30 April 2021. The entity tests the procedures of the valuation output as an internal management review at least once every 12 months (valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at reporting date). If a particular asset class experiences significant and volatile changes in fair value (i.e. where indicators suggest that the value of the class has changed materially since the previous reporting period), that class is subject to specific valuation in the reporting period, regardless of the timing of the last specific valuation.

Land, Infrastructure, Plant and Equipment
Assets that do not transact with enough frequency or transparency to develop objective opinions of value from observable market evidence have been measured utilising the depreciated replacement cost (DRC) approach. Under the DRC approach, the estimated cost to replace the asset is calculated and then adjusted to take into account its consumed economic benefit/asset obsolescence (accumulated depreciation). Consumed economic benefit/asset obsolescence has been determined based on professional judgment regarding physical, economic and external obsolescence factors relevant to the asset under consideration.

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred and liabilities undertaken. Fixed assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and revenues at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor's accounts immediately prior to the restructuring.

6. Other information

6.1 Deed of indemnity

A Deed of Indemnity between the Commonwealth Government, ANSTO and ANM, under which the government has formally agreed to indemnify ANSTO and ANSTO Officers, and ANM and ANM Officers, from any loss or liability arising from claims caused by ionising radiation, was signed by the Minister for Industry, Innovation and Science in April 2016. It will remain in place until April 2026.

6.2 Information relating to ANSTO (the parent entity)

	2021	2020
	$'000	$'000
Financial assets	235,443	261,397
Non-financial assets	1,327,407	1,208,404
Total assets	**1,562,850**	**1,469,801**
Payables	30,414	26,453
Provisions	824,235	751,596
Revenue in advance	32,236	36,128
Operating leases	3,646	3,750
Total liabilities	**890,531**	**817,927**
Net assets	**672,319**	**651,874**
Contributed equity	921,334	900,869
Asset revaluation reserve	501,818	385,577
Other reserves	9,677	9,677
Accumulated deficit	(760,510)	(644,249)
Total equity	**672,319**	**651,874**
(Deficit)/surplus of the parent entity	**(116,261)**	**149,697**
Other comprehensive income of the parent entity	**116,241**	**-**
Total comprehensive (deficit)/surplus of the parent entity	**(20)**	**149,697**

The lease commitments shown in Note 2.3D only relate to ANSTO.

	Interest rate	Maturity date	2021	2020
			$	$
$15 million unsecured loan facility from ANSTO to ANM	CommSec Variable Rate 6.03% (2020: 6.03%)	31.12.21 (2020: 31.12.21)	10,047,182	5,573,447
Total unsecured loan from ANSTO to ANM			**10,047,182**	**5,573,447**
Interest on unsecured loan facility			**238,004**	**437,448**

On 18 August 2021 ANSTO extended to maturity date of the $15 million unsecured loan facility to 30 June 2023.

6. Other information (continued)

6.2 Information relating to ANSTO (the parent entity) (continued)

There are transactions between ANSTO and its subsidiaries for operating leases, purchases and sales of goods and services. These transactions are on normal commercial terms and conditions no more favourable than those available to other parties.

Investment in subsidiaries
The current carrying value of ANSTO's subsidiaries at 2021 are set out below. Unless otherwise stated, share capital consists solely of ordinary shares that are held directly by ANSTO, and the proportion of ownership interests held equals the voting rights held by the group. The country of incorporation is also their principal place of business.

Name	Place of incorporation	2021 %	2021 $	2020 $
PETTECH Solutions Pty Ltd (a)	Australia	100	2,965,588	2,965,588
ANSTO Inc. (b)	USA	100	-	-
ANSTO Nuclear Medicine Pty Ltd (c)	Australia	99.9	-	13,938,100
Total investment in subsidiaries			**2,965,588**	**16,903,688**

(a) ANSTO continues to own 100% of PETTECH Solutions Pty Ltd (PETTECH). PETTECH's primary activity is the ownership of infrastructure for the manufacture of FDG.
During FY20 PETTECH recognised a right of use asset of $0.5 million resulting from a lease with ANSTO. The NBV as at 30 June 2021 was $0.5 million (2020: $0.5 million).

(b) ANSTO continues to own 100% of ANSTO Inc. its principal activity is to promote the commercialisation of ANSTO Technology in the USA. For the financial year ended 30 June 2021 the financial statement were audited by Wipfli LLC.

(c) ANSTO owns 100% of the B class and C class shares on issue of ANM. The B class shares, 101 are not entitled to any dividends but do have operational control. The C class shares, 110,300,000 were issued as consideration for the Mo-99 manufacturing facility. There was one A class share issued to the Minister of Industry, Innovation and Science on behalf of the Commonwealth. The A class share is entitled to dividends. ANM's principal activities are to own and operate the new Molybdenum 99 (Mo-99) and Synroc Waste Treatment facilities. At 30 June 2021 ANSTO's investment in ANM was impaired by $110.3 million (2020: $96.3 million). On 18 August 2021 ANSTO entered into an Inter-group Supplementary Agreement (Agreement) with ANM for financial support for the period 1 July 2021 to 30 June 2023. Under the Agreement ANSTO agrees to defer payment of payables totalling $15,919,051 (2020: $10,750,957) which will not be within 12 months of these financial statements and to defer costs incurred from 1 July 2021 until ANM has adequate available funds. While there is no dollar value limit to the financial support offered it is forecast to be approximately $11 million per year.
The Mo-99 manufacturing facility had the production restrictions on its operating licence lifted on 27 March 2020, however, the social distancing arrangement in place to ensure that safe and continued production during COVID-19 restrictions resulted in specific export production not commencing until August 2020. Support from ANSTO to pay operating costs ceased in August 2020 following the recommencement of production of Mo-99 for export. ANSTO offered the same support to ANM in March/April 2021 when its OPAL reactor experienced an unplanned shutdown. The total costs borne by parent were $5,080,451 (2020: $21,878,858).
During FY20 ANM recognised a right of use asset of $9,286,067 resulting from a lease with ANSTO. The right of use asset was fully impaired during the year ended 30 June 2021, (2020: Net Book Value $9,045,050).

6. Other information (continued)

6.3 Events after reporting date

The Overview note details the impact of COVID-19 on ANSTO's liquidity to date.

At this stage, the impact on ANSTO and result has not been significant and based on our experience to date it is expected this to remain the case. ANSTO operates in the nuclear medicine and research industries.

ANSTO will continue to follow the various government policies and advice and, in parallel, ANSTO will do its utmost to continue operations in the best and safest possible way without jeopardising the health of our people and safeguarding the supply of nuclear medicine into the Australian market.

Inter-group subsequent events are disclosed in Note 6.2.

6. Other information (continued)

6.4 Budgetary reports and explanations of major variances

The following tables provide a comparison between the 2020–21 Portfolio Budget Statements (PBS) budget and the final financial outcome in the 2020–21 financial statements. The Budget is not audited and does not reflect additional budget estimates provided in the 2020–21 Portfolio Additional Estimates Statements (PAES). However, major changes in budget have been explained as part of the variance analysis where relevant.

The ANSTO PBS does not include ANM, the $168.8 million nuclear medicine initiative, as it is a Public Non-Financial Corporation (PNFC) but does contain ANSTO's other controlled entities. PNFC's do not form part of the General Government Sector and are outside of the scope of AASB 1055 *Budgetary Reporting*. ANM is included in the Actual figures in the financial statements as it is controlled by ANSTO.

A budget has not been provided in the PBS for non-cash items such as asset revaluations, foreign exchange, sale/impairment of asset adjustments and the change in parameters used in the calculation of provisions. Unless the variance is considered to be 'major', no explanation has been provided.

Explanation of major variances

Event impacting financial statements	Affected consolidated statements and line items
The ANM project is reported differently in the Budget compared to the Actual figures. ANM is a subsidiary of ANSTO, it is consolidated into the financial statements and the costs associated with the construction of the ANM facilities are reflected in Property, Plant and Equipment net of impairment, nil (2020: $51.3M). However, for budget purposes ANM does not form part of the PBS and is reflected as an investment. As at 30 June 2021 the value of the ANM Mo-99 production facility is nil. (2020: $18.6M). The nuclear waste management expense and provision includes a component relating to ANM's production of Mo-99. ANM operated under a restricted operating licence until March 2020. Production was limited to ensuring domestic demand for Mo-99 was met. ANSTO holds the inventory of target plates used by ANM to produce Mo-99. As a result of a letter of support, ANSTO paid the costs of ANM until ANM was specifically producing for export. This support was in place from 1 September 2019 to 31 July 2020. Financial support was also given in March/April 2021 during the ANSTO OPAL unplanned shutdown. This resulted in $5.1M of support in FY21.	**Statement of Comprehensive Income:** Supplier expenses Nuclear waste management expenses Sale of goods and rendering of services **Statement of Financial Position:** Investments Inventories Property, plant and equipment Nuclear waste management provision **Statement of Cash Flows:** Sales of good and rendering of services Payments to suppliers

6. Other information (continued)

Event impacting financial statements	Affected consolidated statements and line items
ANSTO have taken a number of measures to monitor and mitigate the effect of COVID-19, such as safety and health measures for staff (social distancing and working from home) and securing the supply of materials that are essential to our production process. ANSTO receives grants from the University sector and grants are usually linked to researchers accessing ANSTO facilities. Both access and the University sector have been adversely impacted by COVID-19. Capital works, such as the Bright project, have also been delayed through the closure of manufacturers of equipment and the closure of borders impacting the installation of equipment. Grants received for the Bright project at the Australian Synchrotron are recognised as revenue when the capital expenditure is incurred. The delay in this expenditure arising from COVID-19 has had a corresponding delay in the recognition of income.	**Statement of Comprehensive Income:** Supplier expenses Sales of goods and rendering of services Grant income **Statement of Financial Position:** Trade and other receivables Investments Property, plant and equipment Suppliers Revenue in advance **Statement of Cash Flows:** Sales of goods and rendering of services Grants received Payments to suppliers Purchase of property, plant and equipment
ANSTO's At Call bank account has been reclassified from Investments to Cash to better reflect the liquidity of the balance.	**Statement of Financial Position:** Cash and cash equivalents Investments **Statement of Cash Flows:** Cash and cash equivalents at the end of the reporting year
ANSTO manages its cash through the use of term deposits. The term of each deposit is dependent on the cash needs of the business and the interest rates prevailing at the time. Changes in either the cash needs or interest rates impacts on the number of times a deposit is 'rolled' in the period.	**Statement of Cash Flows:** Proceeds from investment sales/maturities Purchase of investments
Each year at 30 June ANSTO assesses its obligation to decommission facilities and manage waste from its operations. In accordance with the Australian Accounting Standards, the decommissioning and nuclear waste provision is assessed for the timing of payments, anticipated costs and discount, exchange and inflation rates. The actual inflation and discount rates as at 30 June 2021 varied to those used to calculate the provision when the 2020-21 PBS was completed in April 2020.	**Statement of Comprehensive Income:** Finance costs Decommissioning provision losses Nuclear waste management provision losses **Statement of Financial Position:** Provision – Decommissioning Provision – Nuclear waste management

6. Other information (continued)

Event impacting financial statements	Affected consolidated statements and line items
As at 30 April 2021 ANSTO undertook a full review of property, plant and equipment, and intangible assets in conjunction with an independent valuation. While the review and valuation were planned, the outcomes could not be reliably forecast and were not reflected in the PBS 2020-21 which was completed in April 2020.	**Statement of Comprehensive Income:** Depreciation Impairment losses Write-down of stock and fixed assets Changes in asset revaluation reserve **Statement of Financial Position:** Property, plant and equipment Reserves Intangible assets **Statement of Changes in Equity:** Asset revaluation reserve
Two unplanned shutdowns of the OPAL reactor occurred during the year. During these shutdowns ANSTO only imported nuclear medicine to support domestic demand where possible. Production costs and export sales did not occur in during this period.	**Statement of Comprehensive Income:** Supplier **Statement of Financial Position:** Cash and cash equivalents Inventories Provision – Intellectual property payment **Statement of Cash Flows:** Sales of goods and rendering of services Payments to suppliers

Appendices and Index

Acronyms

Acronym	Description
ACAS	Australian Collaboration for Accelerator Science
ACNS	Australian Centre for Neutron Scattering
AINSE	Australian Institute of Nuclear Science and Engineering
ANAO	Australian National Audit Office
ANSTO	Australian Nuclear Science and Technology Organisation
ANSTO Act	*Australian Nuclear Science and Technology Organisation Act 1987* (Cth)
ANM	ANSTO Nuclear Medicine
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASL	Average staffing level
CAS	Centre for Accelerator Science
CEO	Chief Executive Officer
CERN	European Organization for Nuclear Research
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
ERP	Enterprise Risk Management
ESD	Ecologically Sustainable Development
FNCA	Forum for Nuclear Cooperation in Asia
FOI	*Freedom of Information Act 1982*
FTE	Full Time Equivalent
GIF	Generation IV International Forum
IAEA	International Atomic Energy Agency
IBP	Integrated Business Planning
IMBL	Imaging and medical beamline
IPS	Information Publication Scheme
ISO	International Organisation for Standardisation
LGBTIQA+	Lesbian, gay, bisexual, transgender, intersex, queer/questioning, asexual and other terms (such as non-binary and pansexual)
LSIFR	Lost Shift Injury Frequency Rates
LTIFR	Lost Time Injury Frequency Rate
Lu-177	Lutetium-177
MABI	Multi-wavelength Absorption Black Carbon Instrument
MIBG	Meta-iodobenzylguanidine
Mo-99	Molybdenum-99
MX2	Micro Crystallography beamline
NACC	Nuclear Agencies Consultative Committee
NAIDOC	National Aborigines and Islanders Day Observance Committee
NCRIS	National Collaborative Research Infrastructure Strategy
NEA	Nuclear Energy Agency
NRWMF	National Radioactive Waste Management Facility
NSTLI	Nuclear Science and Technology Landmark Infrastructure
NTD	Neutron transmutation doped
OECD	Organisation for Economic Cooperation and Development
OFI	Opportunities for improvement
OPAL	Open Pool Australian Light-water
PATROLS	Physiologically anchored tools for realistic nanohazard assessments
PGPA Act	*Public Governance, Performance and Accountability Act 2013* (Cth)
PGPA Rule	*Public Governance, Performance and Accountability Rule 2014* (Cth)
PSMA	Prostate-Specific Membrane Antigen
RAC	Risk and Audit Committee
RAM	Research Agencies Meeting
RAP	Reconciliation Action Plan
RMIT	Royal Melbourne Institute of Technology
SC	Senior Counsel
SMR	Small Modular Reactor
STA	Science and Technology Australia
STEM	Science, technology, engineering and mathematics
Tc-99m	Technetium-99m
UNSW	University of New South Wales
UoM	University of Melbourne
UoW	University of Wollongong
WHSMS	Workplace Health and Safety Management System
XPS	X-ray photoelectron spectroscopy

ANSTO's diverse employees based in Lucas Heights, NSW

Reporting under the *Equal Employment Opportunity Act 1987*

Promoting STEM equity and equal employment opportunities continues to be a strong focus for ANSTO in alignment with the Minister's Statement of Expectations. ANSTO's Diversity and Inclusion (D&I) program continues to deliver focused improvements to provide equal employment opportunities.

ANSTO is held publicly accountable for its progress in this space through participation in the Science and Gender Equity (SAGE) program with a Bronze Athena Swan Accreditation, reporting to Reconciliation Australia on progress against ANSTO's Innovate Reconciliation Action Plan, and regularly benchmarking its progress against STEM peers through the Champions of Change Coalition.

These reporting and benchmarking forums, coupled with the ANSTO's internal monitoring and tracking against D&I performance measures, enables ANSTO to continually evaluate the effectiveness of its equal employment opportunities to drive continuous improvement.

Gender and STEM

ANSTO seeks to create a culture of equality and inclusion, where diversity of thought and differing perspectives are a source of agility, resilience and renewal. We will provide empowering and effective work-based policies to support flexibility and the individual needs of our employees, including flexible work and family-friendly programs.

Our inclusive culture enables us to retain talent within a rewarding environment and attract diverse candidates with potential for our future success. ANSTO will give priority to this vision until we have a workforce that is gender balanced across all levels of ANSTO: representing the demographic diversity of Australia in our science, ingenuity and sustainability.

To deliver on our purpose for 2020–2021, we have remained committed to looking at all facets of our pipeline and experience; and taking decisive, positively directed action to ensure our workplace is inclusive and equitable for everyone. In 2020–2021, we continued to deliver on our diversity and inclusion actions as outlined in ANSTO's Athena Swan Bronze Accreditation.

With a focus on developing skills in inclusive leadership, in 2020–2021, all senior leaders were invited to participate in a nine-month program of learning and skill-building. The past financial year also saw the relaunch of ANSTO's female mentoring program — with the first cohort of women mentee piloting the program before its expansion in 2021.

ANSTO's female engineers

Indigenous engagement

ANSTO's two main campuses are located on the traditional lands of the Aboriginal nations of Dharawal at Lucas Heights and Kulin at Clayton. Furthermore, ANSTO's extensive collaborations with universities and industry partners naturally connect it with other Aboriginal and Torres Strait Islander nations on a national scale. We recognise these peoples as Australia's first scientists, navigators, mathematicians and engineers. Their knowledge and skills are an integral part for the future growth of Australia and understanding its unique attributes. In recognition of this connection, ANSTO is enhancing activities to connect with the local and broader Australian Indigenous communities.

2020–2021 also saw significant progress on delivering ANSTO's Innovate Reconciliation Action Plan (RAP) — providing great learning, development and career opportunities is fundamental to our RAP. During Reconciliation week in 2021, we announced the launch of an Indigenous traineeship program, partially funded by our new collaboration with the Sir William Tyree Foundation. Our two new recruits will receive intensive training in a four-year program covering WHS, occupational hygiene, radiation safety and emergency response. This is a great foundational traineeship which could launch them into many different career paths at ANSTO, or into a career in safety across multiple industries.

LGBTIQA+ support

ANSTO launched its LGBTIQA+ Ally Network during a special ceremony on 5 March 2021 at the Mardi Gras parade in Sydney. The launch of the Ally Network is a step forward in ANSTO's journey towards building an inclusive workplace that allows people to be who they are without fear of discrimination. It's about ensuring our LGBTIQA+ community feels safe and has someone in their corner.

The LGBTIQA+ Ally Network provides support by empowering people to stand up for the rights of others visibly and vocally, to call out bias and unacceptable behaviour and to effect change across the organisation.

Disability

ANSTO is committed to creating a workplace where different abilities are recognised, valued and celebrated. We care about providing a workplace where people with physical disability or neurodivergence, carers of people with a disability, and people experiencing and managing mental health issues are supported to thrive.

ANSTO assists people with disabilities by providing workplace modifications or reasonable adjustments to help them perform their job, including:

- changing when, where, and how work is performed;
- providing ergonomic or specialist equipment; and
- making physical changes to access (accessibility parking permits and spaces).

All new buildings and areas being renovated at ANSTO must comply with the relevant disability legislation and we are making ongoing improvements to the accessibility of our campuses including widening footpaths and equipping meeting rooms (above 100m^2) with hearing loops.

In the event that a workplace design has excluded facilities for people with disabilities, or the work environment is unsafe for people with disabilities to fulfil their duties, ANSTO reviews whether the work environment can be modified. ANSTO's policies and procedures align with the requirements of the ***Equal Employment Opportunity (Commonwealth Authorities) Act 1987*** and the ***Disability Discrimination Act 1992***, intended to ensure employees with disabilities working at ANSTO and applicants for recruitment who have a disability are not discriminated against. ANSTO also has procedures and support in place to handle complaints and grievances which may be raised by employees and visitors.

Meditation and multi-faith prayer space

ANSTO's Lucas Heights campus has two dedicated spaces that can be used for meditation and prayer, including a meeting room and silent room. This facility is intended to provide staff with quiet and peaceful place. Rooms for private reflection, meditation and prayer are also available to our staff working at ANSTO's Clayton campus. These spaces accommodate all religious affiliations and denominations and are part of ANSTO's ongoing commitment to provide facilities that enable a balance between personal, work and faith-based commitments.

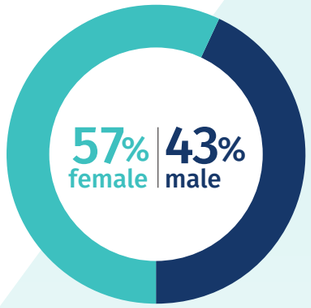
Equipping and empowering our leaders

In 2020–2021 all senior leaders were invited to participate in a nine-month program of learning and skill-building. The past financial year also saw the relaunch of ANSTO's female mentoring program — where 20 women took part in a 10-module career development program over six months.

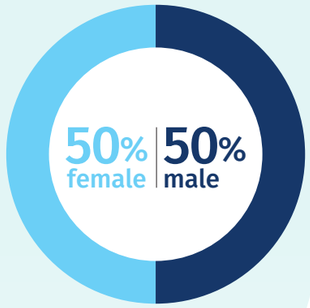
Supporting staff through adversity

ANSTO is continuing the use of flexible working arrangements across the organisation. This will ensure that staff feel supported in returning to work throughout the challenges presented by COVID-19. ANSTO is utilising a blended approach in returning to work to ensure staff will continue to have access to a healthy work-life balance. ANSTO's regular employee surveys demonstrate trust between employees and senior leadership.

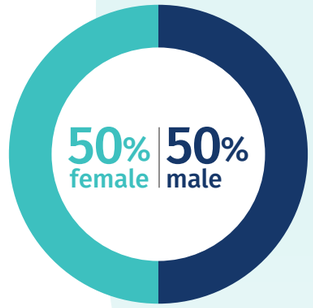
Description	Financial year	Employees (FTE)		% of change 2021–2020	% of Total		% of change 2021–2020	Average Salary		% of change 2021–2020
		2021	2020		2021	2020		2021	2020	
Female		432.90	413.40	4.72	32.01	31.06	4.72	$106,127	$99,458	6.70
Male		919.72	917.75	0.21	67.99	68.94	0.21	$115,655	$111,968	3.29
Total		1,352.62	1,331.15	1.61	100.00	100.00	1.61	$112,606	$107,964	4.30
Workforce diversity										
People with disabilities		5	5	-	0.36	0.38	-	$103,954	$101,324	2.60
Aboriginal and Torres Strait Islander		5	5	-	0.36	0.38	-	$94,113	$84,594	11.25
Non-English speaking background		196	196	-	14.49	14.72	-	$118,185	$113,993	3.68



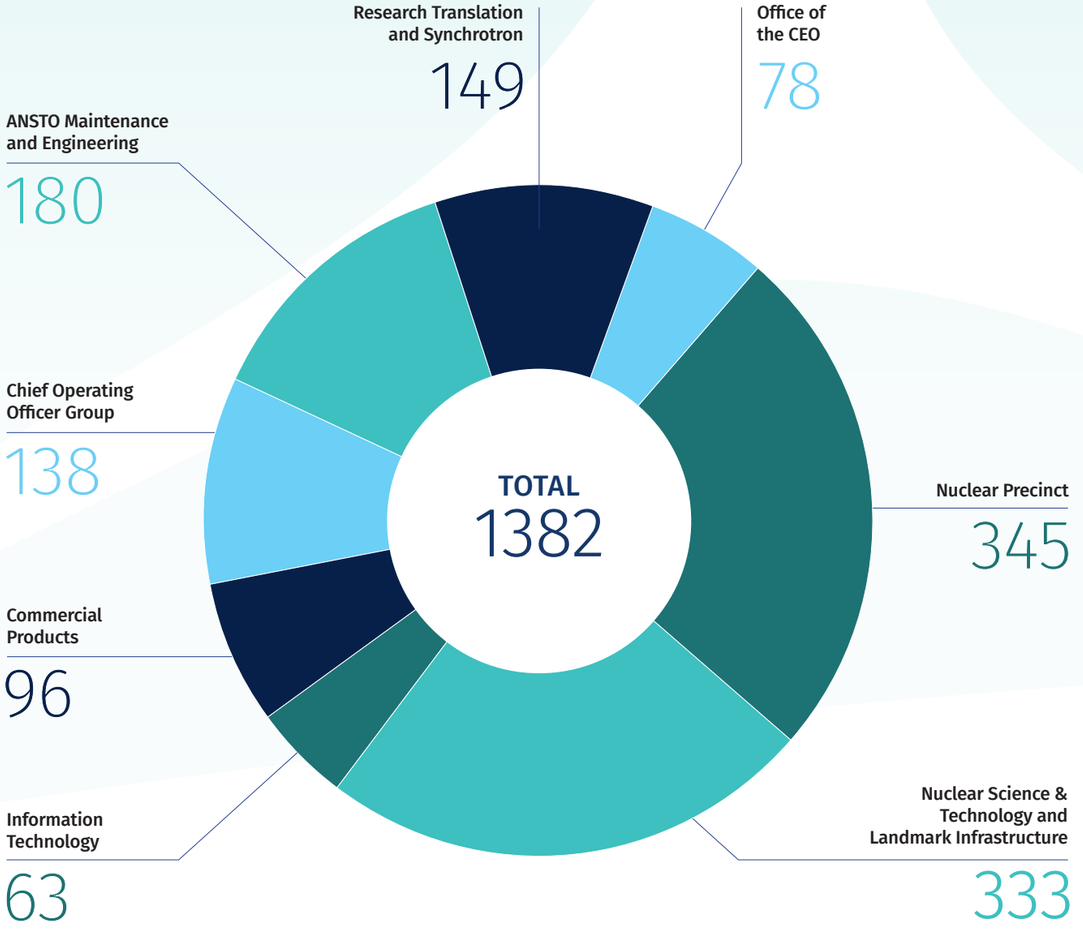
ANSTO Board



ANSTO Executive



Senior People Managers



This chart represents ANSTO's headcount, or number of individuals that worked within the Organisation, as of 30 June 2021

ANSTO graduates Jamie DePiero, Josh Yi, Conor Gould, Raya Tasnim, Juniper Bedwell-Wilson and Alex Boyd

Remuneration Report

Introduction

The categories of officials, employees of ANSTO, covered by the disclosures are:

- Key Management Personnel (KMP): members of the Board, the Risk and Audit Committee and the Executive Leadership team disclosure in Table 1;
- Senior executives: employees who are assigned General Manager or equivalent roles and delegations, disclosed in Table 2;
- Other highly paid staff: employees with total remuneration $230,000 or greater not disclosed in Table 1 or 2, disclosed in Table 3; and
- The remuneration of the Risk and Audit Committee members is separately disclosed in Table 4.

Remuneration policies and practices

The remuneration of the ANSTO Board is in accordance with the Remuneration Tribunal (Remuneration and Allowances for Holders of Part-time Public Office) Determination 2020.

The remuneration parameters of the Chief Executive Officer are determined by the Australian Government Remuneration Tribunal. The ANSTO Remuneration and Nominations Committee assist the Board in fulfilling its responsibilities with regard to overall remuneration policy and strategy, performance and remuneration of the CEO.

Members of the Executive Leadership Team are on individual contracts which are based on market rates at the time of employment. The remuneration reflects qualifications, experience and levels of responsibility for each role. They also participate in the ANSTO Executive Incentive Plan. This plan was developed in conjunction with an independent external organisation, Mastertek Pty Ltd in 2014 to establish a reward plan where all Executives focus on the delivery of the corporate strategy and have shared goals that encourage true collaboration and cooperation and underpin behavioural components that drive a One ANSTO philosophy. It contains a mixture of short-term and long-term incentives. Achievement of these incentives relies on achievement of group and individual key performance indicators (KPIs). The Remuneration and Nominations Committee oversees the approach to performance and remuneration of the Executive Leadership Team.

Senior Manager and high paid positions are remunerated either in accordance with the ANSTO Enterprise Agreement salary tables or under individual contracts. Each role has a Position Description detailing the roles, responsibilities, reporting lines, delegations, qualifications, skills and knowledge required. The role is subject to the Mercer job evaluation system and is benchmarked to ensure the appropriateness of remuneration. The Enterprise Agreement sets out the remuneration and entitlements of employees. All staff, excluding the Executive Leadership team, are eligible to participate in the Enterprise Agreement bonus system linked to the achievement of their KPIs under the annual performance appraisal process. Some Senior Managers and highly paid officers are eligible to participate in a short term incentive program. Recommendations for incentive payments are made by line managers and ultimate approval is by the divisional Group Executive.

Remuneration governance arrangements

The operations of the Remuneration and Nominations Committee for the year are detailed in the Corporate Governance Statement. Internally their operations are supported by the CEO and the Chief People Officer until 8 March and from then the Chief Operating Officer.

Table 1: Key Management Personnel (KMP)

		Short Term Benefits			Post Employment Benefits	Other Long Term Benefits		Termination Benefits	Total Remuneration[1]
Name	Position Title	Base Salary $	Bonus[3] $	Other Benefits $	Super Contributions $	Long Service Leave $	Other Long Term Benefits[4] $	$	$
The Hon Annabelle Bennett, AC SC	Board Chair	102,624	-	76	15,744	-	-	-	118,444
Ms Penny Dobson	Deputy Board Chair; RAC Member to 3 December	76,968	-	639	7,284	-	-	-	84,891
Ms Carol Holley	Board Member and RAC Chair until 11 February. Term ceased on 24 February.	45,596	-	-	4,315	-	-	-	49,911
Dr Gordon de Brouwer, PSM	Board and RAC Member to 10 February. Appointed acting RAC Chair 11 February and RAC Chair on 15 April.	69,265	-	8,812	10,626	-	-	-	88,703
Emeritus Professor Stephen Buckman, AM	Board Member. RAC Member to 3 December	54,976	-	7,067	8,434	-	-	-	70,477
Professor Brigid Heywood	Board and RAC Member	59,477	-	4,331	9,124	-	-	-	72,933
Professor Andrew Scott, AM	Board Member. RAC Member to 3 December	54,976	-	-	5,203	-	-	-	60,179
Ms Andrea Sutton	Board Member. RAC Member from 11 February	51,400	-	1,059	9,083	-	-	-	61,542
Mr David Antaw	RAC Member from 2 December	4,570	-	834	691	-	-	-	6,094
Mr Stephen Ludlam	RAC Member from 30 November	4,729	-	4,074	715	-	-	-	9,518
Dr Adi Paterson	Chief Executive Officer and Board	403,065	(108,204)	-	13,462	2,403	-	260,000	570,726
Mr Shaun Jenkinson	Group Executive, Business Excellence to 10 August. Acting Chief Executive Officer and Board Member from 10 August. Appointed CEO on 31 March	434,708	21,957	-	25,000	105,876	(27,701)	-	559,840
Mr John Edge	Chief Operating Officer	355,145	(12,500)	-	32,430	5,494	34,375	-	414,944
Ms Pamela Naidoo-Ameglio	Group Executive, Nuclear Precinct	317,667	16,186	-	62,259	5,514	(11,169)	-	390,457
Mr Robert Blissett	Chief People Officer to 8 March	225,745	21,142	-	19,661	10,089	(55,722)	-	220,914
Ms Rosanne Robinson	Group Executive, Business Excellence from 10 August to 30 September	31,721	-	-	2,519	975	-	-	35,216
Mr Con Lyras	Group Executive, Asset Maintenance and Engineering and Chief Engineer	322,864	18,986		21,316	7,905	(13,878)	-	357,192
Ms Marianne Morton	Chief Information and Digital Officer	278,457	7,533	-	32,075	4,371	1,500	-	323,937
Dr Simone Richter	Group Executive, Nuclear Science & Technology, and Landmark Infrastructure	289,697	7,537	-	55,038	5,538	(16,444)	-	341,366
Professor Andrew Peele	Group Executive, Research Translation and the Australian Synchrotron	286,328	2,600	-	42,144	11,256	24,877	-	367,207
Ms Jayne Senior	Group Executive, Business Excellence from 1 October	226,912	29,665	-	19,013	7,542	(43,750)	-	239,381
ANSTO KMP		**3,696,893**	**4,903**	**26,892**	**396,135**	**166,962**	**(107,912)**	**260,000**	**4,443,872**
Subsidiary KMP		211,857	12,360	-	28,374	2,035	6,516	-	261,143
TOTAL Consolidated KMP - Financial Statements Note 4.3		**3,908,750**	**17,264**	**26,892**	**424,509**	**168,997**	**(101,396)**	**260,000**	**4,705,015**

Notes:

1. Remuneration is reflected on an accruals basis not a cash basis and has not been annualised.
2. Other long-term benefits reflect long term incentives.
3. The negative figures in the bonus column represents the movement in the accrual from 2019-20 to 2020-21 net of payments.
4. The negative figures in the other long-term benefits column represents the movement in the accrual from 2019-20 to 2020-21.

Table 2: Senior Executives

		Short Term Benefits			Post Employment Benefits	Other Long Term Benefits		Termination Benefits	Total Remuneration[1]
Total Remuneration Bands	Number of Senior Executives[2]	Base Salary $	Bonus[3] $	Other Benefits $	Super Contributions $	Long Service Leave $	Other Long Term Benefits $	$	$
$0-$220,000	3	112,150	803	-	17,312	2,425	-	-	132,690
$220,001-$245,000	2	195,964	(9,181)	-	37,668	7,065	-	-	231,516
$245,001-$270,000	6	218,574	(3,158)	-	35,105	6,479	-	-	256,999
$270,001-$295,000	2	222,698	12,527	-	33,099	6,218	-	-	274,542
$295,001-$320,000	1	258,259	(6,987)	-	38,094	11,522	-	-	300,888
$320,001-$345,000	2	264,135	35,066	-	23,836	5,324	-	-	328,361
$345,001-$370,000	1	282,038	49,260	-	25,424	4,380	-	-	361,103
	17								

Notes:

1. Remuneration is reflected on an accruals basis not a cash basis.
2. Remuneration has only been included for the period the employee is a senior manager.
3. The negative figures in the bonuses column represents the movement in the accrual from 2019-20 to 2020-21 net of payments.

Table 3: Other Highly Paid Officers

		Short Term Benefits			Post Employment Benefits	Other Long Term Benefits		Termination Benefits	Total Remuneration[1]
Total Remuneration Bands	Number of Highly Paid Officers	Base Salary $	Bonus $	Other Benefits $	Super Contributions $	Long Service Leave[2] $	Other Long Term Benefits $	$	$
$230,001-$245,000	12	188,731	286	-	24,694	6,986	-	15,161	235,858
$245,001-$270,000	12	208,538	4,511	20	28,844	3,000	-	13,087	258,000
$270,001-$295,000	5	220,408	6,510	-	28,389	21,367	-	1,257	277,931
$295,001-$320,000	4	265,178	24,085	-	34,199	(18,793)	-	-	304,669
$320,001-$345,000	2	209,042	19,648	-	21,406	43,661	-	55,367	349,124
	35								

Notes:

1. Remuneration is reflected on an accruals basis not a cash basis and has not been annualised.
2. The negative figure in the long service leave column represents the movement in the accrual from 2019-20 to 2020-21.

Table 4: Risk and Audit Committee

		Short Term Benefits		Post Employment Benefits	Total Remuneration
Name	Position Title	Base Salary $	Other Benefits $	Super Contributions $	$
Ms Carol Holley	Chair to 11 February 2021, Member to 12 - 24 February 2021	10,543	-	1,002	11,544
Dr Gordon de Brouwer, PSM	Member to 10 February 2021, acting Chair from 11 February - 15 April 2021, Chair from 15 April 2021.	11,231	-	1,067	12,298
Ms Penny Dobson	Member to 3 December 2020	-	-	-	-
Emeritus Professor Stephen Buckman, AM	Member to 3 December 2020	3,504	-	333	3,837
Professor Brigid Heywood	Member	8,160	-	775	8,935
Professor Andrew Scott, AM	Member to 3 December 2020	3,504	-	333	3,837
Ms Andrea Sutton	Member from 11 February 2021	3,128	-	297	3,426
Mr David Antaw	Member from 2 December 2020	4,570	834	691	6,094
Mr Steven Ludlam	Member from 30 November 2020	4,729	4,074	715	9,518

Notes:

1. Remuneration is reflected on an accruals basis not a cash basis and has not been annualised.

Reporting under the *Modern Slavery Act 2018* (MS Act)

ANSTO understands that ethical conduct and protecting human rights is critical to upholding our values and delivering our core mandate. We are committed to contributing to the eradication of modern slavery through compliant, responsible and ethical business practices. ANSTO's Modern Slavery Statement outlines how we assess and address modern slavery risks in our business and supply chain, and our plans for continuous improvement in the future. This statement can be accessed here: *https://www.ansto.gov.au/media/4133/download*.

ANSTO intends to update this statement for the 2020–2021 reporting period prior to the statutory deadline.

Reporting under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

Achieving ecologically sustainable development (ESD)

ANSTO's commitment to environmental protection and sustainability principles is defined in its Environmental Policy, Corporate Plan and organisational core values. ANSTO's environmental Policy can be found here: *https://www.ansto.gov.au/sites/default/files/2019-11/AE-7100_Environmental_Policy.pdf*.

These values are integral to ANSTO's Business Management System — the framework that defines how business is conducted so as to deliver outcomes to our customers and stakeholders in a safe, consistent and environmentally responsible manner. Objectives and targets for safe, secure and sustainable operations are implemented through documented operational and business plans at all levels of the organisation.

Environmental protection is mandated when planning and undertaking major capital works, and any activities which fall under the EPBC Act are assessed for referral to the Department of Agriculture, Water and the Environment. Proposals for new (or modifications to existing) facilities or activities also undergo a rigorous internal safety, regulatory and environmental assurance processes.

ESD is embedded in ANSTO's core values and in decisions relating to procurement and project activities throughout their planning and development phases. The ANSTO Building Code provides the minimum sustainable design standards with which new and refurbished facilities at ANSTO must conform.

Environmental and quality management systems

To provide assurance that ANSTO is maintaining appropriate environmental protection and management practices we maintain an environmental management system that is certified to the International Standard ISO14001 for all our sites and campuses. This system is a framework that allows ANSTO to achieve its environmental goals through consistent review, evaluation and improvement of our environmental performance and operations. Our extensive environmental monitoring program also operates within a quality framework that is certified to the International Standard ISO9001 for quality management systems.

ANSTO is currently developing a new environmental strategy and roadmap that aims to establish ambitious long-term environmental goals that will ensure ANSTO's operations remain sustainable in the face of future environmental change. The focus of the strategy and roadmap will be to address ANSTO's key interactions with the environment, particularly emissions reduction, responsible resource consumption and landscape integration.

Environmental performance

ANSTO aims to reduce its environmental footprint across all of its operations by implementing efficiency programs to reduce our consumption of energy, water, fuel and other consumables. ANSTO measures and monitors the generation of waste with the aim of diverting as much waste as reasonably achievable away from landfill. ANSTO applies sustainable procurement principles to supplier and service contracts to ensure the full lifecycle is considered when we purchase items or services.

ANSTO monitors and annually reports its carbon footprint through the National Greenhouse and Energy Reporting Scheme and participates in the Sustainability Advantage Program run by the NSW Office of Environment and Heritage, for which we were awarded a silver partnership award in 2019.

A comparison of ANSTO's environmental performance in 2020–2021 to previous years for resource consumption, waste production and transport impacts is published here: *https://www.ansto.gov.au/local-environmental-monitoring#:~:text=ANSTO%20uses%20environmental%20radiation%20data,almost%20completely%20natural%20background%20radiation.&text=ANSTO%20has%20been%20tracking%20and,for%20more%20than%2020%20years.*

Environmental protection in operations

ANSTO has adopted an integrated approach to planning and decision making across the business, so as to optimise the management of all that we do.

Within the ANSTO Building Code, the principles of ESD are mandated through the requirement for all new and refurbished buildings to have an independent ESD consultant involved in the design. ANSTO strives to achieve a minimum 4.5 star National Australian Built Environment Rating System rating and comply with the requirements for the Energy Efficiency in Government Operations Policy. Furthermore, minimum standards for the efficient use of water in offices and laboratories, installation of rainwater tanks, re-use of wastewater and sub-metering are all enforced through the ANSTO Building Code.

Environmental protection principles are mandates for all major project activities through the implementation of project/construction environmental management plans. All capital projects such as construction of buildings, infrastructure and support facilities must have these plans in place to prevent environmental impacts such as soil erosion, dust, noise and discharges to stormwater. Independent oversight of these projects includes the approval of these plans, ad hoc inspections and formal audits. All projects are evaluated on their environmental protection performance throughout their life and on completion.

ANSTO recently completed a project to improve the stormwater and pollution management from the major watercourse leaving the Lucas Heights site.

A new integrated headwall and pollutant trap was installed that will significantly reduce the volume of sediment entering waterways that lead to the Woronora River. During the reporting period, ANSTO also completed a replacement sewer discharge pipeline project that will divert sewers away from a legacy pipeline that crosses the Woronora River and into a modern pipeline, significantly reducing the risk of sewer pipeline leaks.

Refurbishments of existing buildings have included the installation of centralised building management systems to reduce energy costs arising from heating, ventilation and air conditioning operations, energy efficient lighting fixtures, and other energy and water efficient appliances. Integrated landscaping plans have also been applied to these projects, to improve biodiversity outcomes surrounding these buildings.

ANSTO embeds sustainable procurement considerations into all new tenders and contracts awarded, aligning to the Australian Government's Sustainable Procurement Guide. All tenders include environmental specifications and potential suppliers must provide evidence of their commitment to environmental protection plus their capacity to deliver upon relevant environmental outcomes. ANSTO routinely evaluates successful suppliers on their environmental performance.

ANSTO continues to investigate opportunities to divert waste away from landfill through reuse and recycling programs including for construction wastes, soft plastics, metals, e-waste, batteries and green waste.

Supporting research and collaboration for environmentally sustainable outcomes

Leveraging ANSTO's Environment Industry Engagement Strategy, ANSTO will look to build new opportunities to work with industries concerned with product sustainability and mitigating or remediating environmental impact from industrial activity. ANSTO continues to collaborate with other research partners to progress research in the key areas of: air quality, soil erosion, water resource management, wetland health, biodiversity, food provenance, and climate variability and global warming impacts such as rising sea levels and temperatures on marine ecosystems.

Supporting our staff to be environmentally sustainable

Environmental awareness is promoted throughout the organisation via inductions, the staff intranet, training and communication programs. ANSTO encourages staff to cycle, carpool or take public transport to travel to work, and to walk rather than drive around the site. A new shared path connecting the Lucas Heights site to the neighbouring suburb of Barden Ridge was completed in late 2020, further encouraging staff living in the area to walk or ride to work.

ANSTO's chemical management system enables staff in different business areas to share and track chemical resources, which reduces the need to procure new chemicals. ANSTO is also utilising the system to better determine its reporting requirements under the National Pollution Inventory and to improve the identification and control of environmentally hazardous chemicals.

Further advancements in the transition to full digital authorisations and workflows continue, with the aim of achieving a paperless office environment.

Referrals

Within this reporting period ANSTO did not submit any new referrals under the EPBC Act. Construction activities for the SYMO facility (EPBC Referral 2012/6697) have continued and are due for completion in late 2021.

Regular independent inspections have been undertaken throughout the projects to evaluate conformance with the environmental commitments made by ANSTO in the referrals.

Environmental monitoring program

ANSTO conducts an extensive effluent and environmental monitoring program that measures radioactivity in authorised emissions to air and liquid effluent discharges to the sewer; and in samples of air, surface water, ground water, sediment and biota from the local environment. Local environmental radiation and weather conditions are reported here: *https://www.ansto.gov.au/environmental-monitoring/radiation-monitoring.*

Many of the monitoring results are independently verified.

The results of environmental monitoring conducted in 2020–2021 demonstrate that ANSTO's authorised releases of radioactive material to the air and sewer continue to be effectively controlled, comply with regulatory limits, and have minimal radiological impact on humans, wildlife or the environment. Annual summaries of the environmental monitoring results are available here: *https://www.ansto.gov.au/local-environmental-monitoring.*

Functions and powers of the organisation under the ANSTO Act

The ANSTO Act details our functions, powers, Board, Chief Executive Officer's duties, staffing, finance and other roles and responsibilities.

The Act (No. 3 of 1987 as amended) and taking into account amendments up to Act No. 109 of 2017, as prepared by the Office of Legislative Drafting and Publishing, Attorney-General's Department, Canberra (19 September 2017) and can be found on the Federal Register of Legislation.

A summary of the key statutory provisions in relation to ANSTO's functions are outlined below.

Section 3: Interpretation

"scientific research, innovation and training" includes the following, whether or not related to nuclear science and nuclear technology:

(a) any activities in the fields of natural or applied science (including engineering and technology) for the extension or application of knowledge;

(b) any activities that involve innovation or high levels of technical risk for the purposes of creating new or improved materials, products, devices or processes;

(c) the education and training of persons in matters related to activities mentioned in paragraph (a) or (b).

Section 5: Functions of Organisation

(1) The functions of the Organisation are:

(a) to undertake research and development in relation to:

(i) nuclear science and nuclear technology; and

(ia) the application and use of nuclear science and nuclear technology; and

(ii) the production and use of radioisotopes, and the use of isotopic techniques and nuclear radiation, for medicine, science, industry, commerce and agriculture; and

(iii) such other matters as the Minister directs; and

(b) to encourage and facilitate the application and use of the results of such research and development; and

(ba) to condition, manage and store radioactive materials and radioactive waste, arising from:

(i) the Organisation's activities (including the production of radioactive materials for other persons); or

(ii) the activities of companies in which the Organisation holds a controlling interest (including the production of radioactive materials for other persons); or

(iii) the use by other persons of radioactive materials produced by the Organisation or such companies; or

(iv) the activities of other persons who are specified in the regulations; and

(bb) to condition, manage and store radioactive materials and radioactive waste generated, possessed or controlled by the Commonwealth or a Commonwealth entity; and

(bc) to condition, manage and store radioactive materials and radioactive waste at the request of:

(i) a law enforcement agency; or

(ii) a Commonwealth, State or Territory agency responsible for the management of emergencies or disasters; including, but not limited to, radioactive materials or radioactive waste involved in, or arising out of, a radiological incident or a radiological emergency; and

(bd) to condition, manage and store radioactive waste that has been, or is to be, sent to Australia under contractual arrangements relating to the conditioning or reprocessing of ANSTO spent nuclear fuel; and

(c) to produce, acquire, provide and sell goods, and to provide services, that are:

(i) in connection with the production and use of radioisotopes, and the use of isotopic techniques and nuclear radiation, for medicine, science, industry, commerce and agriculture; or

(ia) in connection with the conditioning, management and storage of radioactive materials or radioactive waste; or

(ib) in connection with nuclear science and nuclear technology; or

(ic) in connection with the application and use of nuclear science and nuclear technology; or

(ii) otherwise in connection with matters related to its activities; and

(d) to act as a means of liaison between Australia and other countries in matters related to its activities; and

(e) to provide advice on aspects of:

(i) nuclear science and nuclear technology; and

(ii) the application and use of nuclear science and nuclear technology; and

(iii) other matters related to its activities; and

(ea) to make available to other persons, whether or not on a commercial basis, the knowledge, expertise, equipment, facilities, resources and property of the Organisation by:

(i) providing training and management expertise; or

(ii) selling or leasing equipment; or

(iii) leasing land, buildings and facilities; or

(iv) taking any other action that the Organisation thinks appropriate; and

(f) to co-operate with appropriate authorities of the Commonwealth, the States and the Territories, and with other organisations and institutions in Australia or elsewhere, in matters related to its activities; and

(g) to publish scientific and technical reports, periodicals and papers on matters related to its activities; and

(h) to collect and sell or distribute, as appropriate, information and advice on matters related to its activities; and

(j) to arrange for training, and the establishment and award of scientific research studentships and fellowships, in matters related to its activities; and

(k) to make grants in aid of research into matters related to its activities; and

(m) to make arrangements with universities and other educational research institutions, professional bodies and other persons for the conduct of research or of other activities in matters related to its activities.

(1A) A regulation made for the purposes of subparagraph (1)(ba)(iv) must not have the effect of authorising the premises on which the Lucas Heights Research Laboratories are situated to become a national nuclear waste repository.

(1B) In subsection (1A): "national nuclear waste repository" means a site chosen by the Commonwealth, after the commencement of this subsection, for the storage of nuclear waste with a view to it never being moved to another site.

Section 6A Constitutional limits

(1) The Organisation may perform its functions only:

(a) for purposes relating to activities that are peculiarly adapted to the government of a nation and cannot otherwise be carried on for the benefit of the nation; or

(b) for purposes relating to trade and commerce:

(i) between Australia and places outside Australia; or

(ii) among the States; or

(iii) within a Territory, between a State and a Territory or between 2 Territories; or

(c) for purposes relating to postal, telegraphic, telephonic or other like services; or

(d) for purposes relating to the security or defence of Australia; or

(e) for purposes relating to astronomical and meteorological observations; or

(f) for purposes relating to statistics; or

(g) for purposes relating to weights and measures; or

(h) for purposes relating to copyrights, patents of inventions and designs, and trade marks; or

(i) for purposes relating to the provision of medical and dental services; or

(j) for purposes related to external affairs, including:

(i) giving effect to any international agreement to which Australia is a party; and

(ii) addressing matters of international concern; and

(iii) by way of the performance of its functions in a place outside Australia; or

(k) for purposes relating to the relations of the Commonwealth with the islands of the Pacific; or

(l) in, or for purposes relating to, a Territory; or

(m) in, or for purposes relating to, a Commonwealth place (within the meaning of the ***Commonwealth Places (Application of Laws) Act 1970***); or

(n) for purposes relating to matters incidental to the execution of any of the legislative powers of the Parliament or the executive power of the Commonwealth.

(2) A term used in subsection (1) and the Constitution has the same meaning in that subsection as it has in the Constitution.

Statement of Expectations Index

Minister's Statement of Expectations	Page(s)
Resolving national challenges	
Deliver world-class research and nuclear science services	30–38, 50–53
Conduct a broad spectrum of nuclear-related research and development and possess an expert understanding of global nuclear research, developments and emerging issues and opportunities	30–38
Protect the national interest through the provision of specialist nuclear advice to Government, Australian businesses with nuclear interests, and act as a means of liaison between Australia and other countries	4–48
Advancing the Government's policy priorities	
Continue to make an important contribution to science under the *2017 Science Statement*; the *2016 National Research Infrastructure Roadmap*; and the *2015 National Innovation and Science Agenda*	30–38
Work with the Department on how the science and research capabilities of ANSTO can be harnessed in support of the emerging policy priorities of Government	45–48
Support the health of Australians with nuclear medicines	46, 50–51, 54
Work collaboratively to advance Australian industry	30–38, 53, 55
Manage research infrastructure and national facilities	39–44, 57
Embrace the digital economy	56
Promote STEM equity	20–21, 123–127
Driving ANSTO's performance	
Legislative requirements	All
Sustainable operations and governance	62-71, 133–136
Agency staff and health	22–29
Communication of ANSTO's science and research	48–49
Working with the Department and Ministerial office	45, 63

Compliance Index

PGPA Rule reference	Part of report	Description	Requirement
17BE(a)	137–139	Details of the legislation establishing the body.	Mandatory
17BE(b)(i)	137–139	A summary of the objects and functions of the entity as set out in legislation.	Mandatory
17BE(b)(ii)	16	The purposes of the entity as included in the entity's corporate plan for the reporting period.	Mandatory
17BE(c)	63	The names of the persons holding the position of responsible Minister or responsible Ministers during the reporting period, and the titles of those responsible Ministers.	Mandatory
17BE(d)	63	Directions given to the entity by the Minister under an Act or instrument during the reporting period.	If applicable, mandatory
17BE(e)	N/A	Any Government policy order that applied in relation to the entity during the reporting period under section 22 of the Act.	If applicable, mandatory
17BE(f)	N/A	Particulars of non-compliance with: (a) a direction given to the entity by the Minister under an Act or instrument during the reporting period; or (b) a Government policy order that applied in relation to the entity during the reporting period under section 22 of the Act.	If applicable, mandatory
17BE(g)	18–53	Annual performance statements in accordance with paragraph 39(1)(b) of the Act and section 16F of the rule.	Mandatory
17BE(h), 17BE(i)	N/A	A statement of significant issues reported to the Minister under paragraph 19(1)(e) of the Act that relates to non-compliance with finance law and action taken to remedy non-compliance.	If applicable, mandatory
17BE(j)	144–147	Information on the accountable authority, or each member of the accountable authority, of the entity during the reporting period.	Mandatory
17BE(k)	62	Outline of the organisational structure of the entity (including any subsidiaries of the entity).	Mandatory

Compliance Index – continued

PGPA Rule reference	Part of report	Description	Requirement
17BE(ka)	150–153	Statistics on the entity's employees on an ongoing and non-ongoing basis, including the following: (a) statistics on full-time employees; (b) statistics on part-time employees; (c) statistics on gender; (d) statistics on staff location.	Mandatory
17BE(l)	8, 61	Outline of the location (whether or not in Australia) of major activities or facilities of the entity.	Mandatory
17BE(m)	63–73	Information relating to the main corporate governance practices used by the entity during the reporting period.	Mandatory
17BE(n), 17BE(o)	67	For transactions with a related Commonwealth entity or related company where the value of the transaction, or if there is more than one transaction, the aggregate of those transactions, is more than $10,000 (inclusive of GST): (a) the decision making process undertaken by the accountable authority to approve the entity paying for a good or service from, or providing a grant to, the related Commonwealth entity or related company; and (b) the value of the transaction, or if there is more than one transaction, the number of transactions and the aggregate of value of the transactions.	If applicable, mandatory
17BE(p)	54, 68	Any significant activities and changes that affected the operation or structure of the entity during the reporting period.	If applicable, mandatory
17BE(q)	70–71	Particulars of judicial decisions or decisions of administrative tribunals that may have a significant effect on the operations of the entity.	If applicable, mandatory
17BE(r)	70–71	Particulars of any reports on the entity given by: (a) the Auditor-General (other than a report under section 43 of the Act); or (b) a Parliamentary Committee; or (c) the Commonwealth Ombudsman; or (d) the Office of the Australian Information Commissioner.	If applicable, mandatory
17BE(s)	N/A	An explanation of information not obtained from a subsidiary of the entity and the effect of not having the information on the annual report.	If applicable, mandatory

Compliance Index – continued

PGPA Rule reference	Part of report	Description	Requirement
17BE(t)	71	Details of any indemnity that applied during the reporting period to the accountable authority, any member of the accountable authority or officer of the entity against a liability (including premiums paid, or agreed to be paid, for insurance against the authority, member or officer's liability for legal costs).	If applicable, mandatory
17BE(taa)	66, 148–149	The following information about the audit committee for the entity: (a) a direct electronic address of the charter determining the functions of the audit committee; (b) the name of each member of the audit committee; (c) the qualifications, knowledge, skills or experience of each member of the audit committee; (d) information about each member's attendance at meetings of the audit committee; (e) the remuneration of each member of the audit committee.	Mandatory
17BE(ta)	129–132	Information about executive remuneration.	Mandatory
17BF	Disclosure requirements for government business enterprises		
17BF(1)(a)(i)	75–119	An assessment of significant changes in the entity's overall financial structure and financial conditions.	If applicable, mandatory
17BF(1)(a)(ii)	75–119	An assessment of any events or risks that could cause financial information that is reported not to be indicative of future operations or financial conditions.	If applicable, mandatory
17BF(1)(b)	75–119	Information on dividends paid or recommended.	If applicable, mandatory
17BF(1)(c)	N/A	Details of any community service obligations the government business enterprise has including: (a) an outline of actions taken to fulfil those obligations; and (b) an assessment of the cost of fulfilling those obligations.	If applicable, mandatory
17BF(2)	N/A	A statement regarding the exclusion of information on the grounds that the information is commercially sensitive and would be likely to result in unreasonable commercial prejudice to the government business enterprise.	If applicable, mandatory

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PGPA Rule section 17BE(j), (i)–(v) Accountable Authority

Details of Accountable Authority during the reporting period (2020–2021)

Period as the accountable authority or member within the reporting period						
Name	**Qualifications of the Accountable Authority**	**Experience of the Accountable Authority**	**Executive/ Non-Executive Position Title/ Position held**	**Date of commencement**	**Date of cessation**	**Number of meetings of accountable authority attended/total number of meetings of accountable authority eligible to attend**
The Hon Dr Annabelle Bennett AC SC	BSc (Hons), PhD, LLB, D Univ (Hon Causa), D Laws (Hon Causa)	Chancellor of Bond University and practising consultant Senior Counsel, mediator and arbitrator. See full bio at *https://www.ansto.gov.au/ansto-board*	Non-Executive Board Chair	21 March 2019	20 March 2024	9/9
Ms Penelope (Penny) J Dobson	Dip Pharm, MPS, MBA, GAICD	Global pharmaceutical executive and businessperson. See full bio at *https://www.ansto.gov.au/ansto-board*	Non-Executive Deputy Chair	Appointed: 24 April 2014 Appointed Deputy Chair: 14 March 2018 Appointed Acting Chair: 1 September 2018 — 20 March 2019 Reappointed: 24 April 2019	23 April 2024	9/9
Dr Adrian (Adi) Paterson	BSc, PhD	Chief Executive Officer and materials engineer	CEO	Appointed: 1 March 2009 Reappointed effective: 1 March 2017	Dr Paterson was on extended leave between 10 August 2020 and 31 December 2020. On 8 September 2020, Dr Paterson resigned from ANSTO effective 31 December 2020.	0/0
Mr Shaun Jenkinson (CEO)	BSc (Hons), GAICD	Chief Executive Officer and commercial business person See full bio at *https://www.ansto.gov.au/ansto-board*	CEO	Acting CEO between 10 August 2020 and 30 March 2021. Appointed CEO on 31 March 2021.		
Emeritus Professor Stephen Buckman, AM	BSc (Hons), PhD, FAPS, FAIP, FinstP	Academic and researcher at ANU. See full bio at *https://www.ansto.gov.au/ansto-board*	Non-Executive Board Member	Appointed: 23 July 2015 Reappointed: 23 July 2020	22 July 2023	9/9
Dr Gordon de Brouwer, PSM	BComm (First Class Hons), MComm, PhD	Senior leader in the Australian Government. See full bio at *https://www.ansto.gov.au/ansto-board*	Non-Executive Board Member	Appointed: 4 April 2019	3 April 2024	9/9

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PGPA Rule section 17BE(j), (i)–(v) Accountable Authority – continued

Details of Accountable Authority during the reporting period (2020–2021)

Period as the accountable authority or member within the reporting period						
Name	**Qualifications of the Accountable Authority**	**Experience of the Accountable Authority**	**Executive/ Non-Executive Position Title/ Position held**	**Date of commencement**	**Date of cessation**	**Number of meetings of accountable authority attended/total number of meetings of accountable authority eligible to attend**
Professor Brigid Heywood	BSc (Hons), PhD	Vice-Chancellor of the University of New England. See full bio at *https://www.ansto.gov.au/ansto-board*	Non-Executive Board Chair	Appointed: 28 June 2016 Reappointed (acting): 28 June 2021	Term concludes: 27 September 2021	8/9
Ms Carol Holley	BA, FCA, FAICD	Non-Executive Director and Chair of various Risk and Audit Committees.	Non-Executive Board Member	Appointed: 25 February 2016	Ms Holley's term concluded on 24 February 2021	6/6
Professor Andrew M Scott, AM	MBBS (Hons), MD, FRACP, DDU, FAICD, FAANMS	Nuclear medicine physician, scientist and academic.	Non-Executive Board Member	Appointed: 26 September 2007 Reappointed: 29 September 2011 Reappointed: 29 September 2016	28 September 2021	8/9
Ms Andrea Sutton	BEng Chemical (Hons), GradDipEcon	Senior executive in the mining industry. See full bio *https://www.ansto.gov.au/ansto-board*	Non-Executive Board Member	Appointed: 30 April 2020	29 April 2025	9/9

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PGPA Rule section 17BE(taa) — Audit Committee

Audit Committee

Member name	Qualifications, knowledge, skills or experience (include formal and informal as relevant)	Number of meetings attended/total number of meetings	Additional information
Ms Carol Holley (Chair)	BA, FCA, FAICD Non-Executive Director and Chair of various Risk and Audit Committees.	5/5	Ms Holley stepped down as Chair on 11 February 2021. Her term on the committee concluded on 24 February 2021.
Dr Gordon de Brouwer, PSM (Chair)	BComm (First Class Hons), MComm, PhD Senior leader in the Australian Government. See full bio *https://www.ansto.gov.au/ansto-board*	8/8	Dr de Brouwer was appointed acting Chair on 11 February 2021 and was appointed Chair on 15 April 2021.
Mr David Antaw	B.Bus, M Com, FGIA, FCPA Strategic consultant, COO, CFO, Audit and Risk Committee member and interim executive	3/5	Mr Antaw was appointed on 2 December 2020
Emeritus Professor Stephen Buckman, AM	BSc (Hons), PhD, FAPS, FAIP, FinstP	4/4	Professor Buckman stepped down from the committee on 3 December 2020.
Ms Penelope J Dobson	Dip Pharm, MPS, MBA, GAICD Global pharmaceutical executive and businessperson. See full bio *https://www.ansto.gov.au/ansto-board*	4/4	Ms Dobson stepped down from the committee on 3 December 2020.
Professor Brigid Heywood	BSc (Hons), PhD Vice-Chancellor of the University of New England. See full bio *https://www.ansto.gov.au/ansto-board*	8/8	
Mr Stephen Ludlam	MSc Nuclear Engineering, FREng, FAICD MD and CEO, Nuclear Engineer and Major Complex Program Management, Risk Management, Global Submarine expert.	5/5	Mr Ludlam was appointed 30 November 2020.
Professor Andrew M Scott, AM	MBBS (Hons), MD, FRACP, DDU, FAICD, FAANMS Nuclear medicine physician, scientist and academic.	4/4	Professor Scott stepped down from the committee on 3 December 2020.
Ms Andrea Sutton	BEng Chemical (Hons), GradDipEcon Senior executive in the mining industry. See full bio *https://www.ansto.gov.au/ansto-board*	3/3	Ms Sutton was appointed 11 February 2021

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PGPA Rule section 17BE(ka) — Management of Human Resources

All ongoing employees current report period (2020–2021)

	Male			Female			Indeterminate			Total
	Full-time	Part-time	Total male	Full-time	Part-time	Total female	Full-time	Part-time	Total indeter-minate	
NSW	750	19	769	299	72	371	–	–	–	1,140
Vic	93	2	95	28	1	29	–	–	–	124
Overseas	1	–	1	–	–	–	–	–	–	1
Total	**844**	**21**	**865**	**327**	**73**	**400**	**–**	**–**	**–**	**1,265**

All non-ongoing employees current report period (2020–2021)

	Male			Female			Indeterminate			Total
	Full-time	Part-time	Total male	Full-time	Part-time	Total female	Full-time	Part-time	Total indeter-minate	
NSW	35	3	38	39	–	39	–	–	–	77
Vic	24	–	24	15	1	16	–	–	–	40
Total	**59**	**3**	**62**	**54**	**1**	**55**	**–**	**–**	**–**	**117**

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PGPA Rule section 17BE(ka) — Management of Human Resources

All ongoing employees previous report period (2019–2020)

	Male			Female			Indeterminate			Total
	Full-time	Part-time	Total male	Full-time	Part-time	Total female	Full-time	Part-time	Total indeter-minate	
NSW	752	11	763	297	63	360	–	–	–	1,123
Vic	95	2	97	25	2	27	–	–	–	124
Overseas	1	–	1	–	–	–	–	–	–	1
Total	**848**	**13**	**861**	**322**	**65**	**387**	**–**	**–**	**–**	**1,248**

All non-ongoing employees previous report period (2019–2020)

	Male			Female			Indeterminate			Total
	Full-time	Part-time	Total male	Full-time	Part-time	Total female	Full-time	Part-time	Total indeter-minate	
NSW	35	2	37	34	–	34	–	–	–	71
Vic	24	–	24	12	1	13	–	–	–	37
Total	**59**	**2**	**61**	**46**	**1**	**47**	**–**	**–**	**–**	**108**

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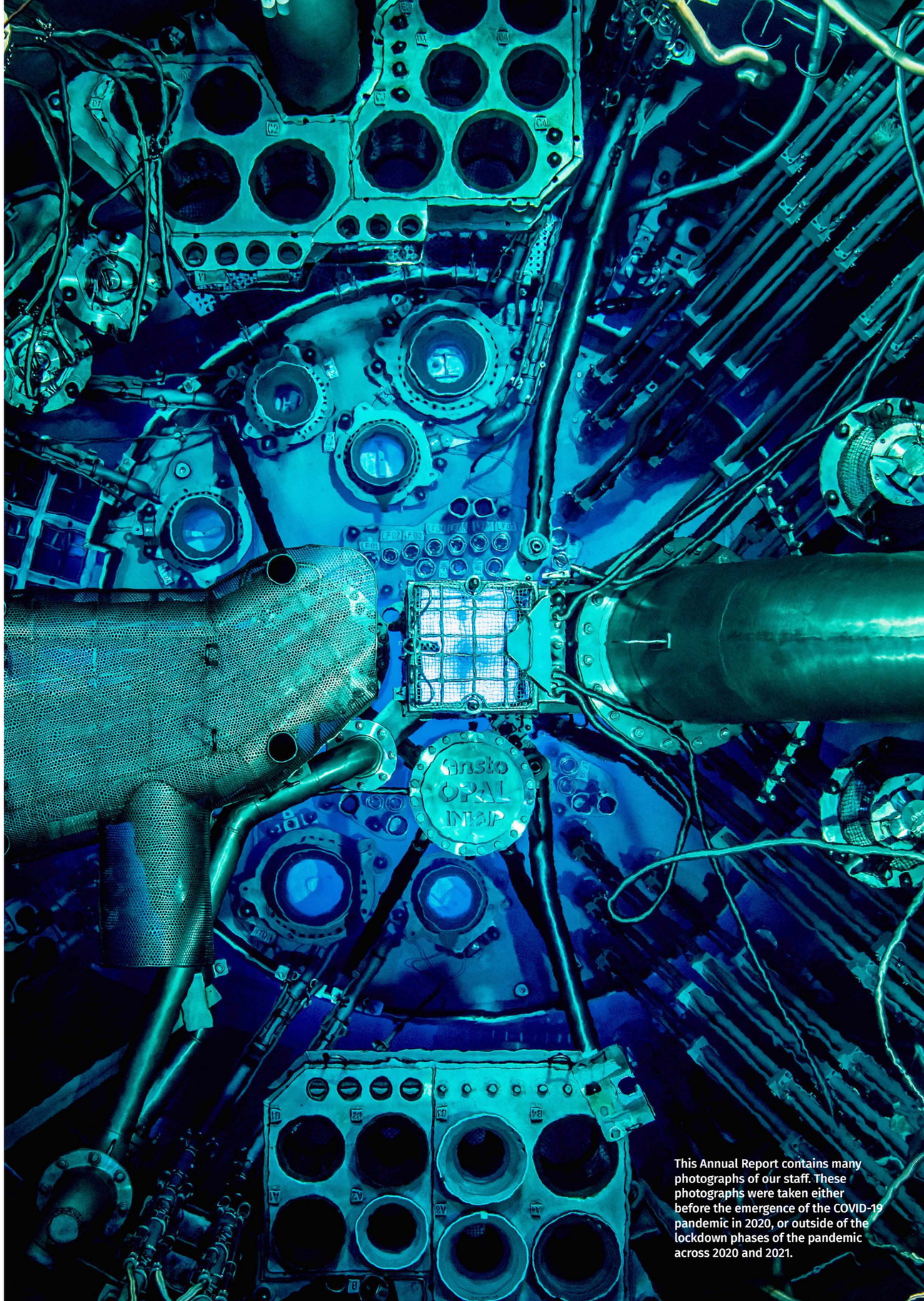

This Annual Report contains many photographs of our staff. These photographs were taken either before the emergence of the COVID-19 pandemic in 2020, or outside of the lockdown phases of the pandemic across 2020 and 2021.

Locations

Lucas Heights | Camperdown | Clayton

www.ansto.gov.au

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