

# **ANNUAL REVIEW**

2021–2022

Australian Academy of Technological  
Sciences and Engineering (ATSE)

Where leading  
engineers and  
applied scientists  
collaborate for  
a better Australia  
and world.

**ATSE**

The Australian Academy of Technological Sciences and Engineering (ATSE) Fellows live and work on Aboriginal and Torres Strait Islander lands and waters across Australia. ATSE's staff work on Ngunnawal, Ngunawal, Ngambri, and Wurundjeri Woi Wurrung countries.

As we work to help Australians understand and use technology to solve complex problems, we remain mindful of the 60,000 years of science, technology and innovation represented by the world's oldest continuing cultures.

We seek always to respect Aboriginal and Torres Strait Islander Elders, both from history and today, and to respect the deep knowledge embodied in their ancient and sustainable cultures .

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**Professor Hugh Bradlow** FTSE  
ATSE President

## President's message

**With a change of Australian Government and as energy security, extreme events, workforce pressures, the pandemic and global uncertainty continue to drive Australia's priorities, this year of challenge and opportunity has highlighted the necessity of ATSE's work.**

Thanks to the exceptional advice and commitment of our Fellowship, working in partnership with the professional staff in the Secretariat, ATSE is increasingly sought by decision-makers for advice, and our timely, evidence-based inputs have supported policy change, priority-setting and decision-making at Australia's highest levels.

Our broad and deep expertise is supporting the Australian Government's welcome focus on urgent action to decarbonise the economy, and take other action to mitigate and adapt to climate change, as evidenced by the uptake of our September 2021 **Net Zero Emissions Position Statement**. Our position secured widespread national media coverage and shortly after, the federal government released its long-term emissions reduction plan ahead of CoP26 in Glasgow, following ATSE's recommendation and committing Australia to net zero emissions by 2050.

In another highlight, we've supported Australia's future sophisticated approach to research data, collaborating with other learned academies and the Australian Council of Learned Academies to ensure Australia can undertake excellent data-enabled research across all fields, through the June 2022 **Australian Research Data Commons (ARDC) project**.

In the same month, Fellows and staff worked with the Department of Industry, Science, Energy and Resources to prepare a report on mRNA vaccine and other technologies, with a focus on short- and medium-term opportunities to develop Australian industry and capabilities.

Our 2022 **federal election approach** began with the release of a pre-budget submission, election promise tracker, and extensive budget night media. ATSE followed up with more targeted discussions based on our priorities and position statements, and after the election concluded we briefed new Ministers, Shadow Ministers and key cross-benchers, recommending further actions in areas where applied science, technology and engineering have a key role to play.

We are increasingly sought for our independent expert advice; our impact is growing. I'm grateful to ATSE's Fellows and staff for the work they've done this year to support our important mission, and am proud to have been President of this exceptional Academy.



**Kylie Walker**  
ATSE Chief Executive  
Officer

**ATSE's reputation is growing, for our excellent, timely, independent expert advice that supports Australia to address complex challenges.**

## Chief Executive Officer's message

Thanks to the deep credibility conferred by our expert Fellows, supported by dedicated professional staff, ATSE has been invited to influence policy settings and advise decision-makers this year on a broad range of issues, from critical minerals to advanced manufacturing, commercial-ready science, addressing engineering and IT workforce stress, and improving gender equity in our sector.

This reputation has also catalysed two major new projects in 2021-22: we are delighted to be entrusted as the sole implementation partner for the Australian Government's seven-year, \$41.2 million investment in growing women's participation in STEM, via our new scholarships program **Elevate: Boosting women in STEM.**

We're also the lead delivery partner for the **Global Science and Technology Diplomacy Fund – Strategic Element,** a new \$18.2 million competitive grant program which will promote international collaborative research and development between Australia and key partner countries, in partnership with the Australian Academy of Science.

These welcome investments have come alongside growth in our own **core work** – this year we've made 21 submissions to government inquiries and consultations; given evidence at two Parliamentary hearings; published three major research reports, held 47 events bringing together more than 2,100 people, featured in more than 350 mainstream news stories, and directly reached more than 1.82 million people via social media.

Our programs have excelled. Through our **Industry Mentoring Network in STEM,** hundreds of dedicated senior industry leaders have mentored 415 STEM PhD student Mentees, setting them up with the networks and know-how to pursue collaborative careers. We've expanded our IMNIS alumni program, and prepared to launch internships for IMNIS graduates. Our school education programs, **STELR** and **CS in Schools,** have grown from strength to strength, with around 1,000 secondary schools engaged and 132 new hands-on science and engineering kits supplied to schools across Australia. Both programs prioritise schools with barriers to accessing quality education.

All of this is made possible by our engaged, proactive, generous Fellows, and our professional staff who continue to strive for excellence and impact in all that we do. I'm grateful to them, and to our diverse range of collaborators, sponsors, donors, partners and supporters, whose generosity and care amplify our potential many-fold.

## VISION

A sustainable and prosperous Australia where applied science and technology protects our environment, builds resilience, nurtures a skilled workforce, grows competitive industries and enables all Australians to reach their greatest potential.

## MISSION

We celebrate local and global excellence in applied science, technology and engineering, speak with an independent and authoritative voice to government and help all Australians use technology to confront our most urgent challenges.

## STRATEGIC OBJECTIVES

1

### Trusted source of evidence-based advice

Go-to adviser for industry, government and education

Delivering positive influence on key issues for society

2

### Recognised for excellence

Attractor of diverse and outstanding expertise

Highly engaged and mobilised Fellows

3

### Fostering diversity and excellence in the next generation

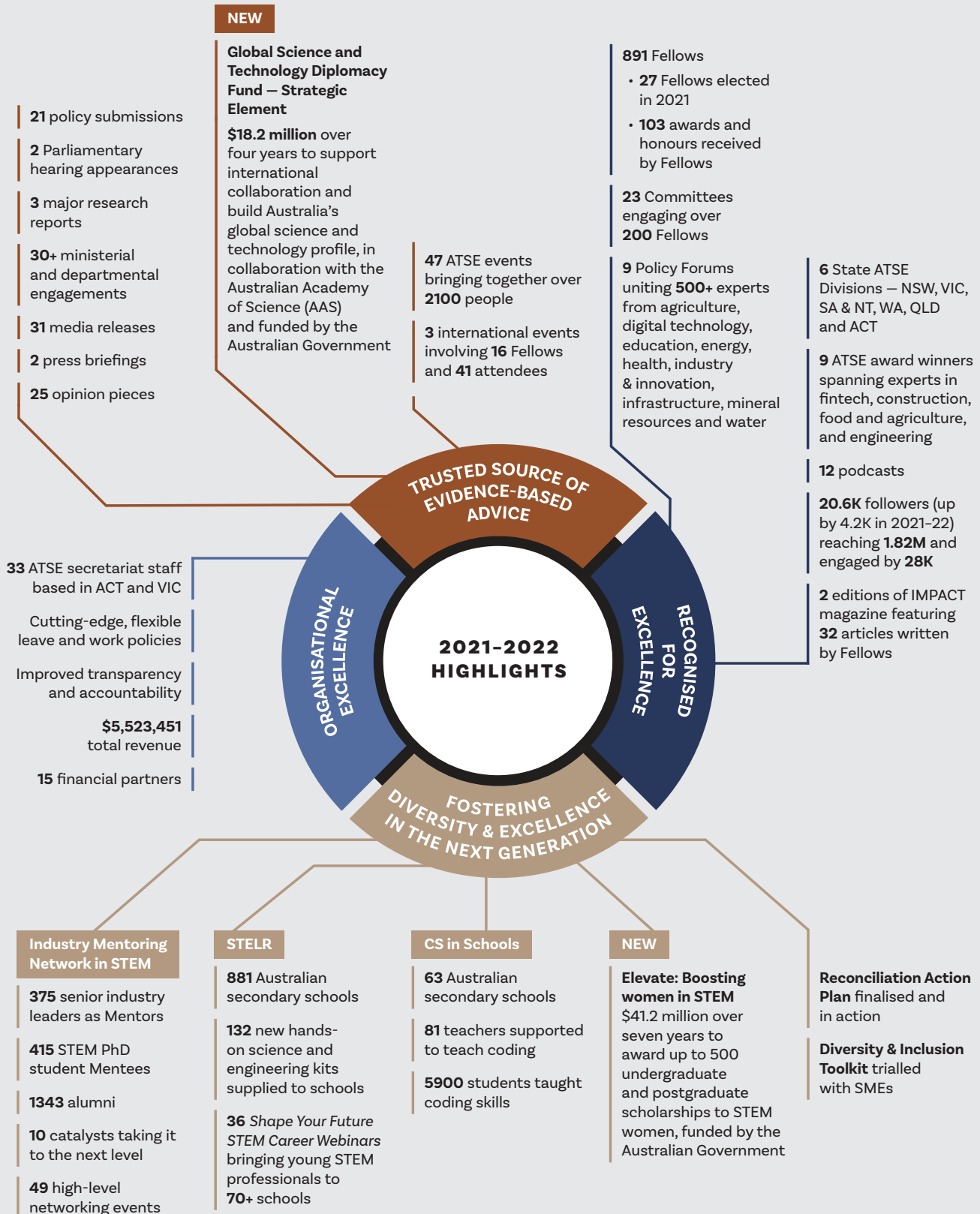
Inspiring and fostering a diversity of young people to pursue careers in engineering, technology and applied science.

4

### Organisational excellence

Operate with integrity, accountability, transparency, respect and independence.

# ATSE at a glance



# Trusted source of evidence-based advice

Drawing on our expert impact network of Fellows, the Academy is a trusted adviser to industry, government, education, and society. We provide timely, proactive and solutions-focused evidence-based advice on key challenges for society in which technology, engineering and applied science have a role to play.

## IMPACTFUL POLICY STATEMENTS AND SUBMISSIONS

ATSE prepared 21 government submissions covering topics ranging from net zero technologies, Australia's data strategy, biosecurity, quantum technologies through to the nation's digital future.

You can read all of ATSE's policy statements and submissions here: [atse.org.au/research-and-policy/publications](https://atse.org.au/research-and-policy/publications)

ATSE's submission on the Australian Research Council (ARC) ministerial veto argued that removal of the veto would be consistent with international best practice in research funding. ATSE President Hugh Bradlow FTSE shared at the hearing that political interference undermines the research system and supported the proposal for an independent review of the ARC.

ATSE's submission to the **National Biosecurity Strategy** endorsed the draft Strategy's priorities and recommended the inclusion of different approaches such as One Health and Traditional Knowledge to develop a comprehensive understanding of biosecurity. Both recommendations were incorporated into the final Strategy.

## PROJECTS DEFINING A TECH POWERED, HUMAN DRIVEN FUTURE

### **Australian Research Data Commons (ARDC) project** June 2022

This project was a partnership between the ARDC, Australia's five Learned Academies and the Australian Council of Learned Academies (ACOLA) to ensure Australia can undertake excellent data-enabled research across all fields of research. Each learned Academy produced a report in its area of expertise. The ATSE report focused on data needs in the sustainability of Australia's water resources, earth observation systems and infrastructure resilience.

### **mRNA project** June 2022

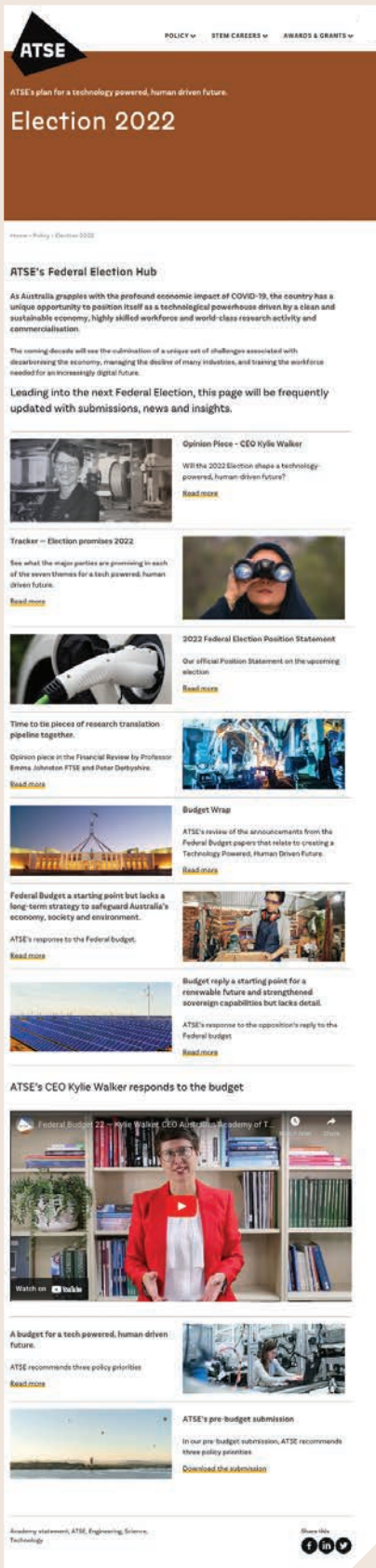
ATSE was commissioned by the Department of Industry, Science, Energy and Resources to prepare a report on mRNA vaccine and other technologies, with a focus on short- and medium-term opportunities to develop Australian industry and capabilities.



ATSE President Professor Hugh Bradlow FTSE at the ARC ministerial hearing. Source: Parliament of Australia website



Australian Research Data Commons (ARDC) project — a partnership between Australia's five Learned Academies and the Australian Council of Learned Academies (ACOLA)



ATSE's [Election hub](#) on the ATSE website

### **Net Zero Emissions Position Statement** September 2021

Having considered the scientific evidence and consulted across Fellowship, ATSE concluded in its influential Position Statement that Australia should:

- Commit to achieve net zero emissions by 2050 at the latest, and set a more ambitious interim emissions target for 2030
- Prioritise the immediate deployment of existing mature, low-carbon technologies which can make deep cuts to high-emitting sectors before 2030
- Develop a national net zero emissions policy and implementation framework

The position statement secured widespread national media coverage and shortly after, the Australian Government released its long-term emissions reduction plan ahead of CoP26 in Glasgow, committing Australia to net zero emissions by 2050.

### **ADVOCACY SUPPORTING EVIDENCE-BASED DECISION MAKING**

ATSE's 2022 federal election advocacy began with the release of our pre-budget submission, which outlined priority areas for a tech-powered, human-driven future. In the lead-up to the election, ATSE continued to advocate strongly, in private and in public, for these priorities. We supported Fellows to keep track of relevant promises with an election tracker, which was updated weekly with science and technology election commitments. Following the election, ATSE provided new Ministers with a Brief recommending further actions. ATSE is continuing to engage with Ministers, Shadow Ministers, cross-benchers and other parliamentarians on policy issues.

A summary of ATSE's 2022 federal election engagement can be found: [atse.org.au/research-and-policy/election-2022](https://atse.org.au/research-and-policy/election-2022)



Coverage in *The Guardian* for our Net Zero Emissions Position Statement.  
Source: *The Guardian*

## STRONG INTERNATIONAL CONNECTIONS

### The Global Science and Technology Diplomacy Fund – Strategic Element

ATSE is the lead delivery partner for a new \$18.2 million competitive grant program which will promote international collaborative research and development between Australia and key partner countries. Delivered in partnership with the Australian Academy of Science, and on behalf of the Australian Government, this flexible and strategic fund provides the opportunity for Australia to boost national capabilities in science and technology, foster deeper diplomatic ties and remain globally competitive in research, innovation and commercialisation.

### Australia-Korea Collaboration

ATSE has been a key partner and collaborator in bilateral activities between Australia and the Republic of Korea. In 2021-22, ATSE led the delivery of two Australian Government supported events with at least 15 Fellows actively participating as chairs, speakers or steering committee members. Both events were aimed at strengthening our existing relationship with Korea and led to tangible outcomes:

- **Australia-Korea TechBridge Workshop** focusing on *Applications of Artificial Intelligence to Counter Infectious Disease*. The TechBridge led to two new collaborative projects between Australian and Korean researchers were funded by the Department of Industry, Science and Resources. Based on its success, ATSE will deliver a second TechBridge on Cube Satellites in October 2022, hosting a delegation from Korea in Sydney.
- **Australia-Korea Innovation Workshop, Hydrogen Futures: Hydrogen Production, Transport and Distribution**, co-hosted with the National Academy of Engineering Korea. The second workshop in a series of three, the presentations and panel discussions brought together research and industry experts in both countries as we move towards decarbonisation and net zero by 2050.



## EVENTS THAT INSPIRE AND INFORM

ATSE Forums and Divisions held over 47 high-impact events covering issues ranging from quantum technologies, alternative proteins, hydrogen, resilience through to robotics.

- Our first Technology Towards Net Zero series webinar *Fast track to a clean future* on 27 October 2021 highlighted how Australia can transition to net zero emissions, in both energy supply and user demand sectors. Featuring Dr Katherine Cleugh AO FTSE, Dr Helen Cleugh FTSE (Former Director of CSIRO's Climate Science Centre), Emeritus Professor Andrew Blakers FTSE (ANU) and Scientia Professor Deo Prasad AO FTSE (UNSW), the speakers highlighted technologies already available to make deep cuts to our emissions.



- In *Feeding a carbon neutral world: Artificial meats and alternative proteins* on 23 March 2022, Fellows and leading scientists Professor Paul Wood AO FTSE and Professor Michelle Colgrave discussed the future of ruminant protein and the cost-effective, resource-efficient and environmentally friendly protein technologies that are finding their way to the global marketplace.

**AGRICULTURE & FOOD FORUM**

**Feeding a carbon neutral world: Artificial meats and alternative proteins**

As the global population surges past eight billion and becomes increasingly wealthy, its demand for animal protein grows exponentially – particularly for red meat and dairy products. How can these consumer needs be fully met in a carbon neutral world?

In response to the growing demand for protein, technologists have been searching for ways to support traditional industries or create new industries. They are exploring cost-effective, resource-efficient and environmentally friendly protein technologies and solutions. This webinar will host a discussion with leading scientists: Dr Paul Wood and Prof Michelle Colgrave about the future of ruminant protein and the alternatives that we increasingly find their way to the global marketplace.

**DATE**  
Wednesday 23 March 2022

**TIME**  
12:00 - 1:00pm AEST (online)

**COST**  
Free

**SPEAKERS**  
Professor Paul Wood AO FTSE  
Professor Michelle Colgrave

**MODERATOR**  
Dr James Ogle PhD FTSE  
Professor Simon Barlow FTSE

**REGISTER**



## MEDIA ADVOCACY

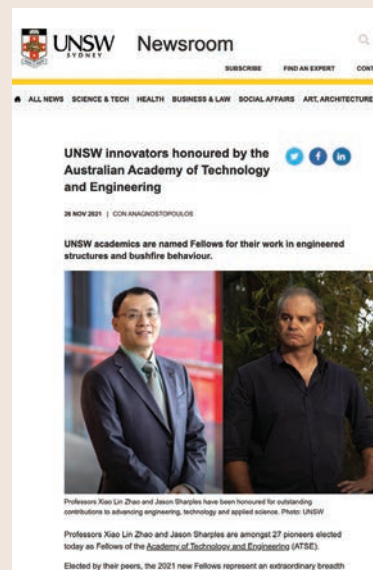
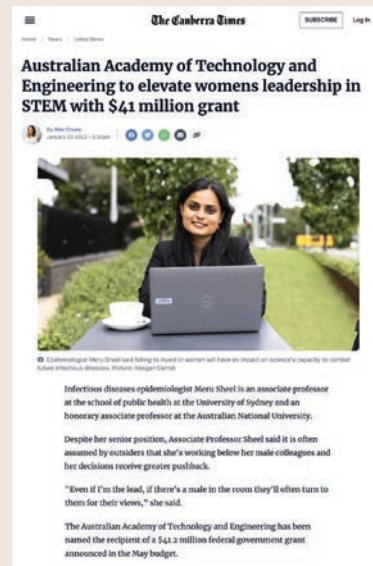
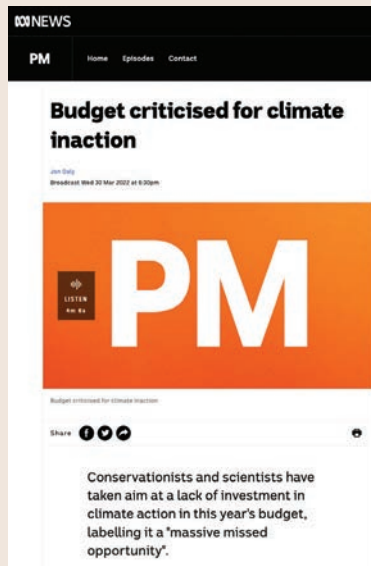
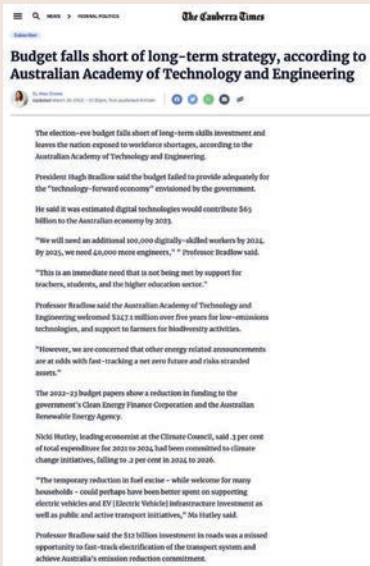
ATSE's media profile increased sharply across 2021/22 with 50 unsolicited media requests for expert commentary on breaking news and over 360 news stories across major national news outlets.

ATSE's Net Zero Position statement and subsequent responses to the government's long-term emissions reductions plan resulted in interviews in the Guardian, ABC AM and PM, Newscorp publications, 7 news and widely across STEM media.

The announcement of the Elevate: Boosting Women in STEM program garnered coverage in The West, Canberra Times, ABC News Radio and Women's Agenda.

ATSE's response to the Federal Budget was covered by ABC PM, the Canberra Times and the Australian Financial Review and syndicated across all local ABC news bulletins.

ATSE supported more than 30 Fellows to provide media interviews on energy, soil carbon, critical minerals, among other topic areas, as well as to share their innovations and life stories.



# Recognised for excellence

With excellence in applied science, engineering and technology at our core, the Academy attracts diverse and outstanding talent to its Fellowship and programs. Our Fellows are highly engaged, mobilised and professionally supported to proactively and positively contribute to achieving a sustainable and prosperous Australia.

## ELECTING AND ATTRACTING AN OUTSTANDING DIVERSITY OF TALENT

### New Fellows 2021



**Louise Adams** FTSE  
Chief Operating Officer, Aurecon  
Louise Adams is an engineer, business manager and a prominent leader in infrastructure.



**Professor Kenneth Baldwin** FTSE  
Director, ANU Grand Challenge: Zero-Carbon Energy for Asia-Pacific  
Professor Ken Baldwin is a leader in the global energy transition and has created significant initiatives to address energy change in response to climate change.



**Kelly Bayer Rosmarin** FTSE  
CEO, Optus  
Kelly Bayer is behind the evolution of Optus as a technology company, with the industry-leading launch of the 'Living Network' to empower and enrich customer experiences and interactions with their mobile network.



**Sandeep Biswas** FTSE  
Managing Director and CEO, Newcrest Mining  
Sandeep Biswas is a global leader in sustainable mining and his company has become a leader in the mining technique known as block-caving, resulting in reduced downtime and increases in productivity and safety.



**Professor Elizabeth Croft** FTSE  
Dean of Engineering, Monash  
Professor Elizabeth Croft is an expert in human-robot interaction and her research seeks to advance the collaboration between people and robots in safe, predictable and helpful ways.



**Professor Wenhui Duan** FTSE  
Director of ARC Nanocomm Hub, Monash  
Professor Wenhui Duan is a structural engineer building a more sustainable and liveable Australia by using the science of the ultra-small to transform construction materials.



**Professor Richard Eckard** FTSE  
Professor of Sustainable Agriculture, University of Melbourne, and Director, Primary Industries Climate Challenges Centre  
Professor Richard Eckard is a world authority on sustainable agricultural production and he developed the first greenhouse gas accounting tools for agriculture.



**Professor Karen Hapgood** FTSE  
Executive Dean of Science, Engineering and Built Environment, Deakin  
Professor Karen Hapgood is a leading chemical engineer whose research on engineering powder particles is used worldwide by the pharmaceutical industry to enhance manufacturing processes for new drugs.



**Distinguished Professor Dayong Jin FTSE**  
**Australian Laureate Fellow, Director, Institute for Biomedical Materials & Devices, UTS**  
 Distinguished Professor Dayong Jin is an acclaimed scientist who develops biomedical, analytical, and imaging devices that detect diseases much earlier, including cancer.



**Dr James Johnson FTSE**  
**CEO, Geoscience Australia**  
 Dr James Johnson is a geologist with over 35 years' experience and is an international leader in applying geoscience to solving society's major economic, social and environmental challenges.



**Dr Sue Keay FTSE**  
**Chief Executive Officer, Queensland AI Hub, and Chair, Robotics Australia**  
 Dr Sue Keay is one of Australia's most influential leaders in artificial intelligence and robotics. She led the development of Australia's first robotics roadmap.



**Dr Dale Lambert PSM FTSE**  
**Chief of Cyber and Electronic Warfare Division, Defence Science and Technology Group**  
 Dr Dale Lambert is a world class scientist in high-level information fusion, using artificial intelligence to integrate and analyse multiple data sources enabling decision superiority for the defence and intelligence communities.



**Professor Chengdao Li FTSE**  
**Professor and Director, Western Crop Genetics Alliance, Murdoch University and Department of Primary Industries and Regional Development**  
 Professor Chengdao Li is a geneticist and breeder who has developed breeding technologies and released world leading varieties to facilitate Australia's barley industry transformation.



**Distinguished Professor Ivan Marusic FTSE FAA**  
**Deputy Dean (Research), The University of Melbourne**  
 Distinguished Professor Ivan Marusic is an eminent researcher on fluid mechanics – Ivan's discovery of 'superstructures' in wall-bounded turbulence was a breakthrough.



**Professor Sally McArthur FTSE**  
**Director, Manufacturing Futures Research Institute, Swinburne University of Technology**  
 Professor Sally McArthur is a leading biomedical engineer and passionate about using engineering principles to improve human wellbeing. At CSIRO she was a team member who developed extended wear contact lenses.



**Dr Graeme Moad FTSE FAA**  
**CSIRO Fellow, CSIRO Manufacturing**  
 Dr Graeme Moad is a renowned chemist at the forefront of polymer science. Graeme was a key inventor of CSIRO's RAFT technology, which has garnered worldwide acclaim.



**Dr Andrew Nash FTSE**  
**Chief Scientific Officer, CSL**  
 Dr Andrew Nash is a global leader in biopharmaceuticals. CSL is one of the world's largest biotech companies and has invested more than US\$4 billion in R&D in the last five years.



**Professor Andrew Parfitt FTSE**  
**Provost and Vice-Chancellor, University of Technology Sydney**  
 Professor Andrew Parfitt is a respected university administrator with a strong background in engineering and technology, including telecommunications and space science.



**Dr Michael Robertson FTSE**  
**Deputy Director, CSIRO Agriculture and Food**  
 Dr Michael Robertson is an outstanding agricultural scientist playing a crucial role in research addressing the existential challenges facing Australian farmers in a changing climate.



**Professor Jason Sharples FTSE**  
**Professor of Bushfire Dynamics, University of NSW**  
 Professor Jason Sharples is a mathematical scientist and internationally recognised expert in dynamic bushfire behaviour and extreme bushfire development.



**Kylie Sproston FTSE**  
Chief Executive Officer,  
Bellberry Limited

Kylie Sproston is a chartered engineer and internationally experienced leader in the pharmaceutical and biotechnology industries with a strong focus on manufacturing.



**Professor Hugh Williams FTSE**  
Enterprise Professor,  
Melbourne Business School and  
The University of Melbourne

Professor Hugh Williams is best known as one of the inventors of Infinite Scroll and leader of Google Maps' product and engineering teams. He also held executive roles at eBay and Microsoft.



**Professor Trish Williams FTSE**  
Cisco Chair and Professor  
of Digital Health Systems,  
Flinders University

Professor Trish Williams is passionate about improving healthcare through technology. Trish led a project to develop a benchmark for hospitals to evaluate their digital infrastructure. This benchmark is now an international standard.



**Distinguished Professor Irene Yarovsky FTSE**  
School of Engineering,  
RMIT University

Distinguished Professor Irene Yarovsky is a world leading researcher. She is co-leader of the Australian Steel Innovations Research Hub where academia and industry work in an integrated, value chain-wide approach on projects including sustainability of iron and steelmaking.



**Professor Xiao Lin Zhao FTSE**  
Associate Dean (International),  
Faculty of Engineering,  
UNSW Sydney

Professor Xiao Lin Zhao leads research into sustainable alternatives to cement, the world's single biggest industrial cause of carbon pollution, including work on concrete utilising seawater, sea sand, recycled aggregate and industrial waste such as slag and fly ash.



**Distinguished Professor Marcia Langton**  
AO FTSE FASSA  
Associate Provost, University of  
Melbourne

Distinguished Professor Marcia Langton is an anthropologist, geographer and public intellectual and is recognised internationally for her groundbreaking work modernising the mining industry's engagement with Indigenous people, particularly in the difficult area of negotiating and settling agreements.

**HONORARY FELLOW**



**Distinguished Professor Menachem Elimelech FTSE**  
Sterling Professor of Chemical  
and Environmental Engineering,  
Yale University

Distinguished Professor Menachem Elimelech is an acclaimed environmental engineer, widely known for his work addressing the global water crisis.

**FOREIGN FELLOW**

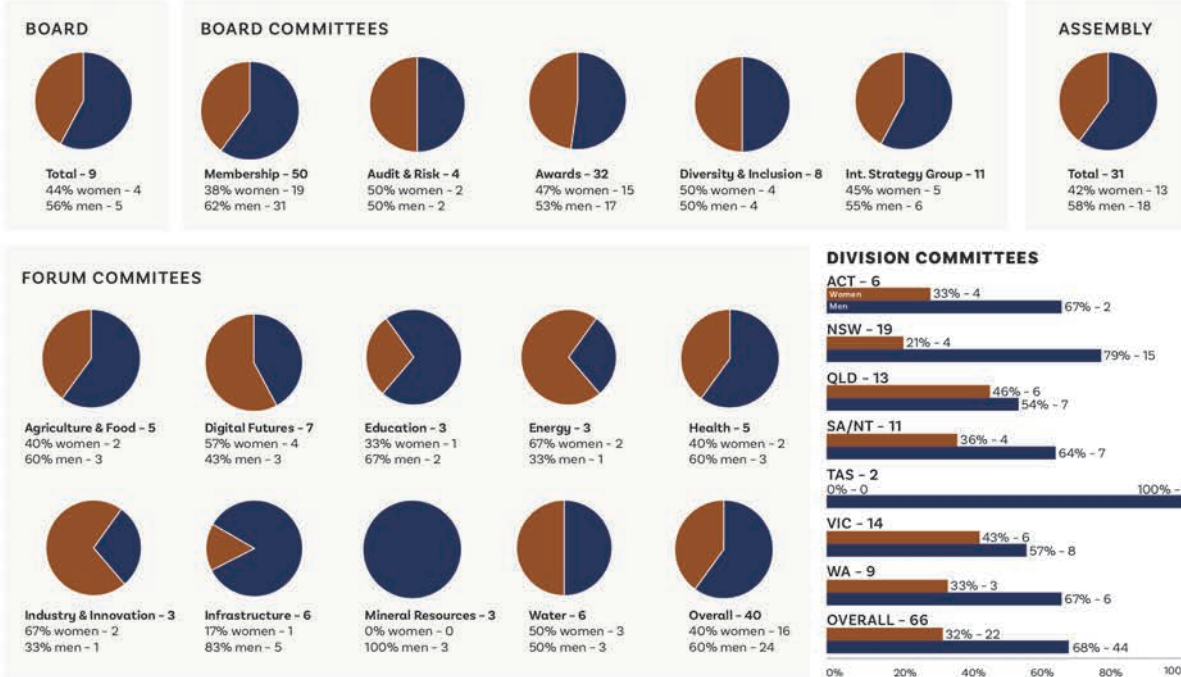
# Diversity & Inclusion



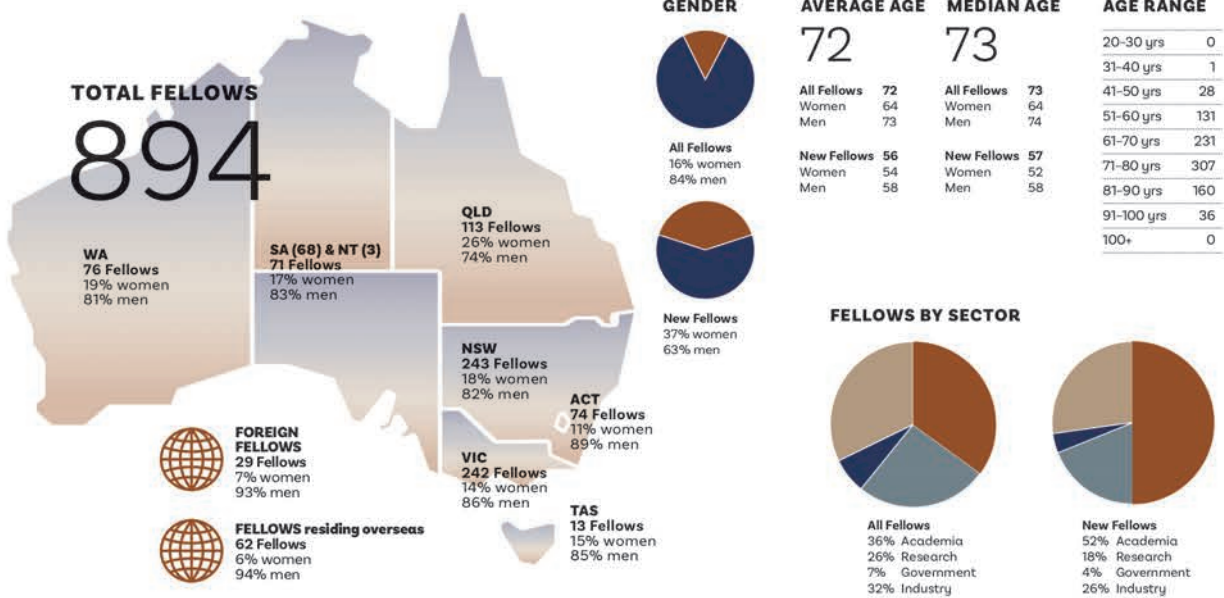
Australian Academy of Technological Sciences & Engineering

The Australian Academy of Technological Sciences and Engineering commits to working proactively for a more diverse and inclusive Academy and STEM sector.

## ACADEMY GOVERNANCE & LEADERSHIP



## FELLOWSHIP



### COMMITMENT TO MEANINGFUL REPRESENTATION

ATSE will not support nor participate in any national or international activities where the organising body has no gender equity policy or where women are not reasonably and meaningfully represented among speakers and panellists.

## PROACTIVE ENGAGEMENT OF FELLOWS THROUGH DIVISIONS, FORUMS, PROGRAMS, ACTIVITIES, AND EVENTS

ATSE Divisions, Forums and Secretariat continued to work collaboratively to showcase the excellence of the Academy and its Fellows. More than 14 Division-Forum collaborative events across the nation, amplifying ATSE policy priorities, were attended by over 600 attendees.

As part of ATSE's commitment to diversity and inclusion, the percentage of women panellists that the Academy hosted across all events increased from 37% in FY20/21 to 51% this year (a 14% increase).



## SOCIAL MEDIA AT A GLANCE

ATSE launched its #FellowFriday campaign in March shining a spotlight each week on one remarkable Fellow and celebrating their individual achievements. The campaign has generated 80,000 social media impressions to date.

**10.4K Twitter followers**

↑ Up by 1.1K in 2021/22

**10.2K LinkedIn followers**

↑ Up by 3.1K in 2021/22

**Engagements = 28,000+**

**Reach = 1.8 million+ people**

# Vale

The ATSE community was saddened to lose treasured friends and collaborators through the year.

We recognise and remember the following late Fellows:

Professor Tom McMeekin AO FTSE	28/08/21	John Landy AC MBE FTSE	24/02/22
HRH Philip Windsor OM AC GBE PC FTSE	04/09/21	Dr Desmond Bright FTSE	26/02/22
Emeritus Professor Alban Lynch AO FTSE	17/09/21	Dr Warren Hewertson FTSE	01/03/22
Professor Eric Wood FTSE	03/11/21	Dr John Pitt FTSE	23/03/22
Dr Neville McCarthy AO FTSE	13/11/21	Dr Trevor Scott FTSE	25/03/22
Professor Michael Miller AO FTSE	30/11/21	Brian Loton AC FTSE	29/03/22
Dr Laszlo Nemes FTSE	01/12/21	John Laurie AC FTSE	02/04/22
Professor Hans Forsberg FTSE	20/12/21	Professor Donald Watts AM FTSE	23/05/22
Professor Barry Thornton AM FTSE	28/12/21	Emeritus Professor Ron Wills FTSE	01/06/22
William Clough AO OBE FTSE	05/01/22	Professor Raymond Jones OAM FTSE	06/06/22
Bruce Kean AM FTSE	28/01/22	Professor James McLeod AO FAA FTSE	27/06/22
Professor James Quirk FTSE	12/02/22		



**Adjunct Professor  
Leanne Kemp**



**Professor Alan Wong**



**Professor Anne Voss, Associate  
Professor Tim Thomas and  
Professor Jonathan Baell**



**Dr Kate Nguyen**



**Dr Anna El-Tahchy**



**Dr Lindsay Bell**



**Georgia Hunter**



**Hayden Robertson**



**Dr Luke Djukic**

## ATSE Awards 2021

ATSE's prestigious national awards recognise an outstanding suite of innovators and entrepreneurs, achieving across sectors and career levels in applied science, technology and engineering. They represent Australia's leaders and emerging leaders in STEM.

### CLUNIES ROSS ENTREPRENEUR OF THE YEAR AWARD

**Adjunct Professor Leanne Kemp** is a leading figure in the technology sector and recognised internationally as an innovator, entrepreneur and leader. She is the founder and Chief Executive of Everledger.

### CLUNIES ROSS INNOVATION AWARD

**Professor Alan Wong** is an inventor and innovator whose new approach to identifying fire risks in power networks has spawned an international business.

### CLUNIES ROSS KNOWLEDGE COMMERCIALISATION AWARD

**Professor Anne Voss, Associate Professor Tim Thomas and Professor Jonathan Baell** have developed an entirely new approach to cancer treatment that essentially puts cancer cells to sleep, without the harmful side effects caused by conventional therapies.

### BATTERHAM MEDAL FOR ENGINEERING EXCELLENCE

**Dr Kate Nguyen** is an early career researcher whose ground-breaking work is making buildings safer and construction more sustainable.

### ICM AGRIFOOD AWARD

**Dr Anna El-Tahchy** is an innovator and respected bio-chemist who is leading efforts to revolutionise the flavour and sustainability of plant-based food.

### ICM AGRIFOOD AWARD

**Dr Lindsay Bell** is a world leader in farming systems research whose innovations have helped dryland crop and livestock farmers manage climate variability.

### EZIO RIZZARDO POLYMER SCHOLARSHIP

**Georgia Hunter** is an outstanding PhD student at Monash University with two STEM degrees – a Bachelor of Engineering and a Bachelor of Science – who is working to improve the properties of multi-polymer materials.

### EZIO RIZZARDO POLYMER SCHOLARSHIP

**Hayden Robertson's** PhD program is improving the current understanding of how stimulus-responsive polymers that are grafted onto a substrate to form a "brush" behave in complex media.

### DAVID AND VALERIE SOLOMON AWARD

**Dr Luke Djukic** is an outstanding aerospace engineer who is improving the safety and efficiency of transporting dangerous goods such as highly corrosive chemicals internationally.

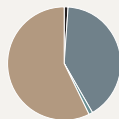
# Fostering diversity and excellence in the next generation

To ensure Australia's future capacity to innovate and use technology, ATSE is committed to inspiring and fostering a diversity of young people to strive for excellence and pursue study and careers in engineering, applied science, and technology.

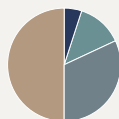


**IMNIS - the Industry Mentoring Network in STEM** - is our award-winning industry engagement initiative, which annually pairs motivated PhD students and early career researchers (mentees) in STEM with influential industry leaders (mentors) in a one-year mentoring and professional development program.

## MENTEES — 347

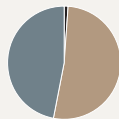


**Gender**  
58% women  
41% men  
<1% non-binary  
<1% prefer not to say



**Career Aspirations**  
5% academia  
13% unsure  
32% industry  
50% mobile between industry & academia

## MENTORS — 330\*



**Gender**  
47% women  
52% men  
<1% non-binary



**Sector**  
84% industry / private  
11% academia / NFP  
5% government

\*Some Mentors took on two Mentees

### LEVEL

Director  
CEO  
Senior Manager  
Manager  
C-Suite  
Managing Director  
Principal  
Head  
Entrepreneur  
Consultant  
Vice President  
Partner

### EXPERTISE

Research & Development  
Strategy / Business Dev  
Executive Management  
Project Management  
IP & Legal  
Clinical  
Regulatory  
HR / Admin / IT  
Manufacturing  
Finance  
Policy  
Media & Advertising

## EXPANDING OPPORTUNITIES ACROSS ALL OF STEM

With its origins in medical research and biological sciences, in 2021-22 the IMNIS Engage program expanded to include all STEM-related research areas, enabling a more inclusive opportunity for early career researchers. ATSE worked closely with participating organisations to guide their Mentee selection process to recruit participants that align with key focus areas for ATSE's Fellows:

- Advanced Manufacturing
- Agriculture
- Digital Futures
- Energy Resources and Renewables
- Health Technologies
- Minerals
- Water Resources

## Developing enabling skills for collaboration and industry careers

In 2021-22 for the first time, the IMNIS Engage program introduced industry-led professional development for mentees, deepening their understanding of and readiness for STEM careers in industry. Workshops included:

- Preparing and Protecting Your IP – FB Rice
- Understanding the Innovation Pipeline – Hydrix
- Job Strategy – MEXEC
- Communicating with Influence – Science & Technology Australia / The Happiness Concierge

## ACCELERATING DEVELOPMENT FOR HIGH-POTENTIAL ALUMNI

In partnership with industry growth centre MTPConnect, IMNIS Engage supported competitively selected mentees to accelerate their professional development through targeted programs to drive workforce growth in Australia. This partnership is powered by MTPConnect's \$32m Researcher Exchange and Development within Industry (REDI) initiative, made possible by the Medical Research Future Fund, and provides experiences and skills development to support early-stage researchers, clinicians, and innovators to be industry-ready. Within IMNIS Engage, ATSE has launched three tailored programs:

- **REDI Connect** – Enabled 10 high-potential IMNIS mentees undertaking research in high job growth areas - including digital health, gene and cell therapy, and regenerative medicine - with additional professional development and networking opportunities.
- **IMNIS International** – Five outstanding PhD students at the vanguard of innovation in health technologies, agriculture and renewable energy met with high-calibre international experts to develop their professional skills and networks and boost their career trajectory.
- **IMNIS Clinical** – Supported 10 IMNIS Engage mentees at the forefront of clinical and health-tech related research to better understand how medical protocols and products can be developed, evaluated, produced, and commercialised, to facilitate translation of innovative technologies from lab-bench to bedside.

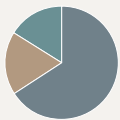




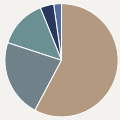
## SUPPORTING CAREERS THROUGH HANDS-ON SCHOOL SCIENCE

Science and Technology Education Leveraging Relevance (STELR) is ATSE's hands-on secondary school science education program. It's a national initiative which aims to boost student participation and achievement in STEM, in which teachers and students apply engineering principles to put the science curriculum into hands-on action, with a focus on environmental sustainability.

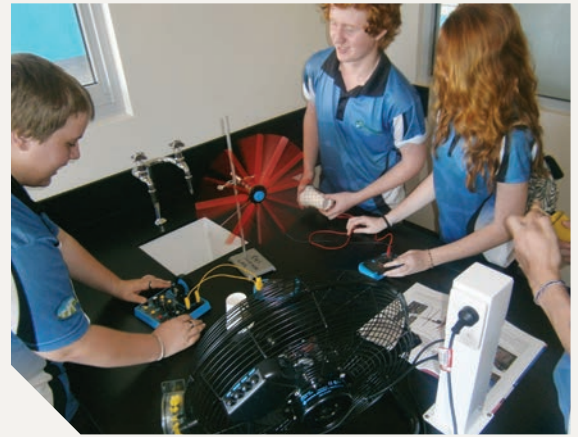
**881** Schools Australia wide



**School type**  
66% Government  
18% Catholic  
16% Non-government



**School location**  
58% Major cities  
22% Inner Regional  
14% Outer Regional  
4% Remote  
2% Very remote



Students at Rosebery Middle School using the STELR Wind Energy kit

STELR's hands-on, inquiry-based classroom kits were in high demand in 2021/22, with a record 132 kits distributed nationally to schools, tech schools and education centres.

- 58 Renewable Energy kits
- 42 Sustainable Housing kits
- 7 Wind Energy kits
- 7 Wind Energy kits
- 25 Electricity and Energy kits
- 34 Solar Cars

STELR's new webinar series, *Shape Your Future: STEM Career Journeys with Australia's Rising Stars*, inspired school students and teachers across the country. With 36 webinars (plus a special event for International Women's Day), the series brought 33 inspiring young STEM professionals directly into classrooms across 70+ secondary schools as well as home-schooling environments, to share their passions and career journeys. Teachers were supported to continue the conversations with resources linking the speakers' career paths to the science curriculum, sparking connections for students between their classroom work and potential careers.

### KITS FOR SCHOOLS

**3** schools received STELR kits that were subsidised

### SCHOOL ICSEA\* VALUE

**408** schools have a value of 1000 or less

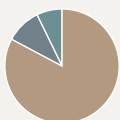
**63** Schools Australia wide

**81** Teachers supported

**5900** Students taught (approx)  
More than half were girls



**School type**  
61% Government  
39% Non-government



**School location**  
83% Metro  
10% Inner Regional  
7% Outer Regional



## CS IN SCHOOLS

### FORGING A STRONG DIGITAL TECHNOLOGY FUTURE

Available free to all Australian secondary schools, CS in Schools builds robust digital technology and coding capabilities for both teachers and students, and aims to set the standard for coding education nationally. Prioritising education for girls and regional schools, it matches computing professionals with teachers, helping them develop their coding skills in the classroom and providing innovative lesson materials.

A new program for Australia's STEM education landscape, CS in Schools has been well received and is growing quickly: by the end of June 2022, CS in Schools was in 63 schools, up from 42 in the previous year.

### SCHOOL ICSEA\* VALUE

**16** schools have a value of 1000 or less

\*ICSEA Index of Community Socio-educational Advantage is a scale of socio-educational advantage. 1,000 is the average score.

# ELEVATE



## ELEVATE: BOOSTING WOMEN IN STEM

In January, ATSE was named the sole implementing partner for the Australian Government's new seven-year, \$41.2 million investment in growing women's participation in STEM, "Boosting the Next Generation of Women in STEM" fund.

The Elevate: Boosting women in STEM program will award 500 undergraduate and post-graduate scholarships to women in science, technology, engineering and mathematics, and:

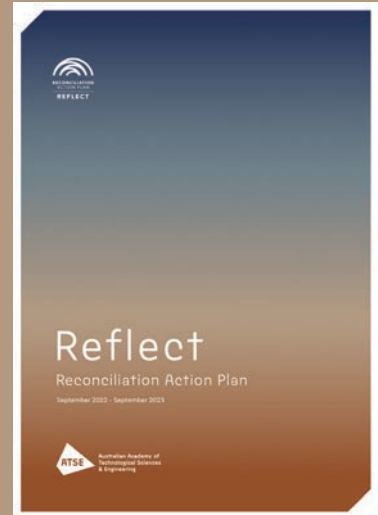
- Encourage women to pursue education and careers in STEM
- Foster industry-academia collaborations in applied research and business
- Extend qualifications and professional skills in STEM and business
- Propel women into senior leadership

Delivered in collaborative partnership across a broad range of industry and academic leadership organisations in STEM, Elevate is funded by the Department of Industry, Science and Resources (DISR). The program aims to redress gender imbalance in STEM through fostering more women-led industry-academia collaborations in applied research and business, growing professional skills of women in STEM and by propelling women into senior leadership.

## ATSE'S RECONCILIATION ACTION PLAN

ATSE's first Reflect Reconciliation Action Plan was developed and finalised through consultation with a broad range of Fellows, Aboriginal and Torres Strait Islander leaders in STEM, and reconciliation experts in STEM. To be officially launched following finalisation of our specially commissioned artwork, the Reconciliation Action Plan prioritises inclusion and opportunity for Aboriginal and Torres Strait Islander peoples in STEM, and respect for and awareness of Traditional Knowledges.

ATSE commits to transparency and accountability as we work to support reconciliation and the Voice to Parliament called for in the Uluru Statement from the Heart. We will report against our commitments in 2022-23.



## BUILDING A DIVERSE WORKFORCE FOR SMALL STEM BUSINESSES

ATSE's Diversity and Inclusion Toolkit for small and medium STEM organisations concluded the pilot stage at the end of June 2022 and evaluations have now been completed. Work is now being done to update the final Toolkit following feedback and evaluation, and we look forward to formally launching the final version in 2022-23.



# Organisational excellence

ATSE Fellows work hand-in-hand with the ATSE Secretariat to achieve our Mission to help Australians understand and use technology to solve complex problems. We work every day, and through our structures, policies and all activities, to apply our values of integrity and transparency, inclusion, collaboration, excellence and independence, sustainability and professional pride. ATSE strives to be an employer of choice and an attractor of outstanding talent to support our people-first approach to developing a high-performance culture.

Following comprehensive reviews of operations, governance, culture, and across activities and programs, ATSE has carried out a full update of operational and strategic policies and practises, aligning our approach with our values of inclusion, collaboration, excellence and independence, sustainability and professional pride. We strive to be independent, inclusive, transparent and accountable in all that we do, and we work to a high standard of excellence.

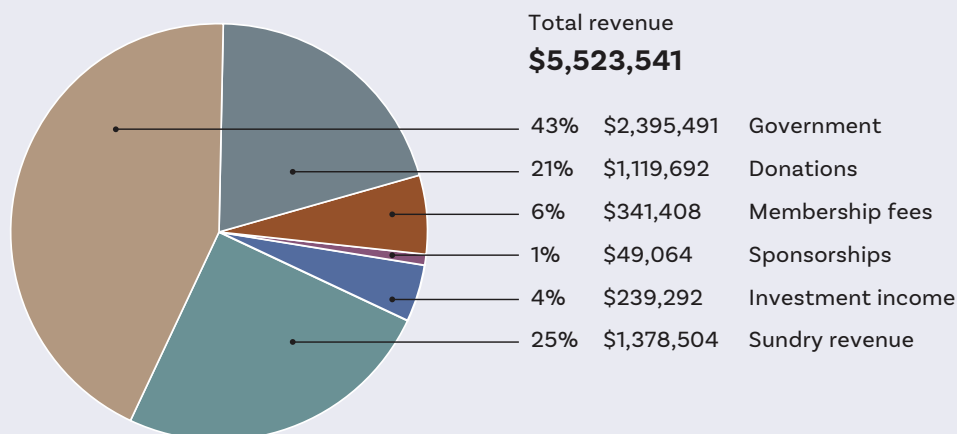
## FINANCIAL RESULTS

Despite the challenges of COVID-19, ATSE has updated its systems and structures, and turned significant attention to how its strategy, operations, budget and investment portfolio work in concert to deliver impact against its mission.

This financial year ATSE has grown its remit, and its operations, with the addition of two major new programs to support education and training for Australian students and STEM professionals, and to support the establishment of a strong international collaborative ecosystem for Australians engaged in the development, application and commercialisation of science, technology and engineering. ATSE has strived to diversify its income and ensure that operations are primed to leverage existing and new income streams to maximise impact while keeping Fellows at our heart.

The full financial report for the Financial Year ended June 30 2022 is available on the ATSE Fellows' website.

	2022	2021
<b>Revenue</b>	\$5,523,451	\$3,943,568
<b>Expenses</b>	(\$5,678,349)	(\$4,852,426)
<b>Operational outcome for the year</b>	(\$154,898)	(\$908,858)



**MAJOR PARTNERS, SPONSORS AND COLLABORATORS**

As a collaborative leader in Australian STEM, ATSE enjoys partnering with values-aligned organisations that recognise and value the critical role of helping Australians understand and use technology to solve our greatest challenges.

ATSE is deeply grateful to our donors, sponsors and partners for their generous support and partnership, without which our evidence-based advice, reports, events, communication activities and programmatic work would not be possible.



**Australian Government**  
Defence



**Australian Government**  
Department of Industry,  
Science and Resources



**Australian Government**  
Department of Education,  
Skills and Employment



**Australian Government**  
Office of the Chief Scientist





ATSE is registered with the Australian Charities and Not-for-profits Commission and is listed by name as a Deductible Gift Recipient (DGR).

### **ACKNOWLEDGEMENT OF DONORS**

The Academy acknowledges and expresses its gratitude to the following individuals, organisations and long-term supporters for their extraordinary generosity. Their donations support our Academy to acquit our important mission.

- Orica
- TDM Foundation
- Professor David and Valerie Solomon
- Alan & Elizabeth Finkel Foundation
- Dr David Brockway
- Dr Alan Bye
- Professor Annabelle Duncan
- Dr Gordon Frazer
- Gita Karwal
- Dr John O'Sullivan
- Dr Ian Poiner
- Kylie Walker
- Tracy & Shaun Watson
- Dr Robert Watts
- Professor Irene Yarovsky

We would also like to knowledge all the generous donors past and present who wish to remain anonymous.

### **ACKNOWLEDGEMENT OF FELLOWS AND MENTORS**

In 2021-22, ATSE Fellows donated significant time to policy and other expert advice, research reports, public awareness and other events, awards selection and governance committees, and ATSE's programs and other initiatives. If Fellows were senior consultants, this work would be worth an estimated \$2.15 million this year. We are deeply grateful for their time, expertise, passion, and commitment. ATSE is also grateful to the 375 IMNIS mentors who donated their time and expertise equalling close to \$1 million this year.

The hours invested by our highly engaged Fellows and other senior industry mentors who bring their expertise and guidance to young STEM professionals and to the Academy, are a cornerstone of ATSE's values-based mission. We thank each and every one of you for your contribution to delivering the Academy's mission.

### **ACKNOWLEDGEMENT OF STAFF**

ATSE's Secretariat staff are committed, values-driven, and professional individuals who invest considerable time and energy into ensuring ATSE's work is highly professional, timely, aligned with our mission, and impactful. We're grateful to the team for a successful year.

## KEY PEOPLE

As at 30 June 2022

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Vice President, Diversity  
Vice President, Membership  
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Director  
Director  
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Director, Communications & Outreach  
Director, International Affairs  
Director, Operations  
Director, Partnerships  
Director, Policy & Government Relations  
Director, STEM Careers Strategy

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Peter Derbyshire  
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The Australian Academy of Technological Sciences and Engineering is committed to sustainable initiatives. Our Reconciliation Action Plan is printed on ecoStar+ made with 100% recycled post-consumer waste and is printed using vegetable based low VOC (Volatile Organic Compounds) inks.