



Australian Government



THE PRIME MINISTER'S
PRIZES FOR SCIENCE

ASSOCIATE PROFESSOR BRETT HALLAM

UNIVERSITY OF NEW SOUTH WALES, SYDNEY

2022 PRIZE FOR NEW INNOVATORS

Associate Professor Brett Hallam is a researcher in the field of renewable energy, specifically solar engineering. He is credited with making one of the most important improvements to photovoltaic (PV) technology in the past 10 years and is recognised as a global leader in the field of hydrogen passivation in solar cells.

PV technology converts sunlight into electricity. Solar panels are a notable form of PV technology and an important contributor to the renewable energy economy in Australia.

Rooftop solar is the biggest contributor to Australia's renewable energy economy, with its impact set to more than double by 2030. More than 30 per cent of households currently have solar panels installed. Ironically, solar performance is reduced when exposed to sunlight. This is known as light-induced degradation (LID) and has impacted solar manufacturers for decades.

Associate Professor Hallam led a research team to develop new technologies to prevent this degradation from occurring and make solar panels more cost effective, efficient and reliable. Associate Professor Hallam's team developed their world-first advanced hydrogenation technology in 2010, which uses light and heat to activate hydrogen and neutralise defects in solar cells put into solar panels.

Associate Professor Hallam's discoveries have improved solar cell performance by 10 per cent, a considerable increase in the industry. He holds eight patents for his technology and has partnered with leading equipment manufacturers to make his discoveries available to solar cell manufacturers worldwide. It now features in more than 95 per cent of solar panels being installed in Australia and around the world.

In 2021, this technology provided benefits to Australian consumers of approximately \$500 million and \$17 billion globally. These figures are rapidly increasing as the industry continues to expand. In 2018, Associate Professor Hallam set a new world record with his technology for open circuit voltage – the maximum voltage available from a solar cell. He went on to beat that record in 2019.

Associate Professor Hallam is also a highly respected researcher. He has published more than 130 research papers, which have received more than 3,900 citations.

Associate Professor Hallam devotes his time to mentoring and training laboratory students from diverse backgrounds, to ensure an inclusive future for Australian engineering. His lab includes students from across Australia and the world, with 60 per cent of the team being women and/or members of the LGBTIQ+ community.

Associate Professor Hallam now divides his time between academia and industry. He began a new role as a consultant with ITP Renewables in Sydney recently, where he is helping to deploy renewable energy solutions around the world.

Career highlights

- 2021 Finalist, Australian Museum Eureka Prizes
- 2020 Stuart R. Wenham Young Professional Award, Institute of Electrical and Electronics Engineers (IEEE)
- 2020 Edgeworth David Medal, The Royal Society of NSW
- 2015-2020 Session Chair, IEEE
- 2018 Engineering Staff Excellence Award, UNSW
- 2018 Finalist, Australian Museum Eureka Prizes
- 2018 Scientia Fellowship, UNSW
- 2017 NSW Premier's Prize for Science and Engineering
- 2017 DECRA Fellowship, Australian Research Council
- 2017 J.G. Russell Award, Australian Academy of Science
- 2016 Ulrich Gosele Young Scientist Award, The Australian National University
- 2015 Finalist, SolarWorld Junior Einstein Award
- 2014 A.F. Harvey Engineering Research Prize, Institution of Engineering and Technology UK
- 2010 UNSW University Medal