

More power for drones and phones

Advanced Energy Storage Systems

Newcastle Institute for Energy and Resources (NIER)

Teaser / Summary – New energy storage technology created by a research team at the Newcastle Institute for Energy and Resources is helping to solve the problems of a sustainable energy future.



By adding the Advanced Storage System to a drone, it will make it last longer in the air. NIER is trialling this technology with the defence force to boost power performance and longevity of their drones. Image: [Andrew Turner](#)

“The perfect energy storage solution must be portable, stable, powerful and cost effective.” ~ Scott Donne.

What is the technology?

This new thin film electrochemical energy storage greatly improves the performance of electrodes used in electrochemical energy storage and conversion devices, essentially giving power to devices for longer.

“This technology is a lighter, more powerful energy storage system that minimises energy loss and inefficiencies,” research team leader, Prof Scott Donne said.

The form fitting nature of the thin film allows it to unobtrusively coat walls and structures, and can be used as an advanced energy storage system in small spaces or to power portable things, like drones.

This technology can also be used in handheld devices like phones or cameras or to power electric or hybrid electric vehicles. Scaled up, this technology can also be used as a means to complement renewable energy technologies.

Energy storage and conversion devices have to be highly energetic, powerful, and able to last many cycles before replacement. Low cost and environmental compatibility are also important features.

The Advanced Energy Storage system is a single system that addresses all of these criteria. Thin film electrodes, based on nanostructured materials, demonstrate high utilisation and efficiency, delivering high energy and power to satisfy the power requirements of electronic devices.

Who is the project team?

The project team is housed within the Newcastle Institute for Energy and Resources (NIER) at the University of Newcastle. It is led by Professor Scott Donne, and consists of three post-doctoral researchers, 10 PhD students, three honours students, and a number of undergraduate students.

What challenge is this research helping to solve?

Lightweight, portable energy storage and conversion technologies play an important role in our everyday life, and they will continue to do so into the future since we have become used to – and even dependant on - portable electronic devices.

“We need an energy delivery and storage solution for the future that can go anywhere and is powerful enough to meet our modern day energy expectations, while complementing renewable energy generation,” Scott Donne said.

Traditional energy networks are based on energy delivery from coal powered power stations, which is constant. Renewable energy is irregular, even abrupt in nature, and this variability is one of the biggest challenges of the transition to renewable energy sources.

“The perfect energy storage solution must be portable, stable, powerful and cost effective and able to reliably cope with the irregular nature of renewable energy,” Prof Donne said.



A reliable source of energy is paramount. Without it, all the activities we take for granted today would not be possible. Image: [Garry Knight](#)

What is the benefit of this technology?

The inspiration for this research project is to do things more efficiently so there will be less waste and better performing systems.

Technology like this will optimise energy storage and conversion, giving the benefit of quality, cost effective energy.

Efficient energy storage and conversion can be used to mediate the challenges of renewable power generation, and this technology also supports the transition to renewable energy while maintaining the integrity of the energy supply.

For more information, visit <http://www.newcastle.edu.au/nier>

Or contact [Professor Scott Donne](#)

This project was created by

