



ENI AWARD 2019

Energy Frontiers

**Michael Aziz and
Roy Gordon**

Winners

Organic Aqueous Flow Battery for Massive Electrical Energy Storage

Research Description

The cost of wind and photovoltaic (PV) electricity has dropped so much that the greatest technical obstacle to getting the vast majority of our electricity from wind and sunshine is their intermittency. This problem could be solved by the mass deployment of batteries that safely and cost-effectively store large amounts of electrical energy. Flow batteries have the potential to store electrical energy cost-effectively for discharge over long durations when the wind isn't blowing and the sun isn't shining.

Aziz and Gordon have introduced organic molecules that are made of abundant and inexpensive elements as energy-storage species into aqueous flow batteries. Their work pointed out the untapped potential of aqueous-soluble organic molecules for electrical energy storage – the ability to chemically modify the molecule introduces a vast new set of possibilities – and started the field of organic aqueous flow batteries.