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# Two's Company or Crowd?: The Importance of Being Single for Energy Delivery

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### Abstract

Continuous addition of renewable energy, such as solar photovoltaic and wind, to the grid requires an energy storage platform to maintain the resilience of the electric grid. A continuous decline in installation cost and a friendly policy allows rapid expansion of renewable energy installations. Complications associated with the seasonal and diurnal fluctuations of energy production can be handled effectively having an energy storage option attached to the grid.

One of the promising approaches to manage energy efficiently is storing the energy in redox flow batteries. Although matured technologies such as vanadium redox flow batteries are available, their entry into commercial space is prohibited by the cost of vanadium. This situation calls for cheaper local content in place of redox active material.

Our group explores various organic redox active molecules/scaffolds for aqueous and non-aqueous redox flow battery chemistries. Besides, our interest is in exploring various degradation pathways contributing to the capacity decay of the redox flow battery. Once the degradation pathways were identified either by molecular engineering or suitable means, we could stabilize the capacity of the battery.