California’s future ‘Smart Grid’ system will integrate solar, wind, and other renewable electricity generation with energy storage to meet our electricity demands and to support electric transportation. The Sustainable Integrated Grid Initiative at UCR combines these elements so that researchers, utility personnel, regulators, and the public can evaluate a full scale system at work.

This project is timely as California is requiring 33% renewable by 2020 along with some EV infrastructure and Zero Net Energy buildings. California Public Utility Commission (CPUC) is also requiring the Investor Owned Utilities (IOU) to acquire 200 MW of energy storage this year increasing to 1,325 MW by 2020.

2 Important reasons why batteries are important in advancing clean renewable energy and transportation:
1. Clean renewable energy sources like solar and wind are intermittent in nature and may not be available when needed. Electrical energy stored in batteries offer an opportunity to overcome this difficulty, but old batteries have low energy density and limited life. Modern advanced Lithium-ion batteries – the kind we have been using in our cell phones and lap tops, have the potential to overcome these difficulties. For utility scale energy storage applications very large battery cells are needed to be demonstrated in actual real world situations.
2. Increasing number of electric vehicles are also causing extra stress on the fully loaded power network. This is already manifesting itself in the upscale coastal communities of Orange County where many houses have electric vehicles. Large battery system with smart controllers may store energy from the grid when surplus electricity from solar or other sources are available. These large batteries can then quickly charge electric vehicles without causing extra demand on the electric distribution systems.

For more information: http://www.cert.ucr.edu/newgrid/storage/