1. Dan Schnitzer (3rd year)

Schnitzer, D. and J. Apt, *Reserve requirements for primary frequency control at high levels of wind penetration*, In preparation.

Current project: Power system stability following a fault is protected by primary frequency control and also by the inertia of heavy generator rotors like those found in conventional power plants.  Because non-hydro renewable resources provide the power system with much less inertia and frequency response, a large fault could induce damaging oscillations in a system with a high penetration of renewables, resulting in lost load.  Previous research conducted on a small, 14-bus test system indicated that reserve requirements for primary frequency control increase sharply at high levels of wind penetration.  We will use a validated model of the WECC interconnection to investigate whether this effect exists on larger scales, and whether battery storage can be used effectively for primary frequency control.