Yesterday, the California Energy Commission's Public Interest Energy Research (PIER) program released a strategic assessment of energy storage technologies in California by 2020. The report was prepared by a three-campus University of California team, including Berkeley Law, UC Los Angeles, and UC San Diego. Along with co-blogger Steve Weissman and Jessica Intrator (who did the bulk of the research and drafting on the policy side), I served as principal investigator and co-author for Berkeley Law, in my joint capacity as a UCLA Law fellow. UCLA and UCSD performed the technical analysis on energy storage technologies, making for a nice partnership between technical researchers and the legal team.

Energy storage technologies — such as batteries, flywheels, molten salt, pumped hydro, and compressed air — hold the promise of storing excess renewable energy to smooth output and cover for times when the sun doesn't shine and the wind doesn't blow. Studies indicate that California may require between 3,000 to 4,000 megawatts of fast-acting energy storage by 2020 to integrate the projected increase in renewable energy. Among other benefits, these technologies can dispatch stored energy during times of peak demand, thereby reducing greenhouse gas emissions from peaker power plants and saving electricity infrastructure costs. Berkeley and UCLA covered the topic in a 2010 white paper called The Power of Energy Storage.

This report assesses current technologies, finding that many of the advanced ones require additional technological breakthroughs and cost reductions to become feasible in grid applications, while some technologies, such as pumped hydro and some battery technologies, already have been successfully deployed around the world. Many technologies will also need more demonstration projects to provide data about how they function in new roles. Potential breakthroughs could come from increased production of electric vehicles, which could lower the cost of lithium-ion batteries and provide a source of "second life" batteries that can work in various grid services. Overall, California is likely to see cost decreases on many of these technologies by 2020.

On the policy side, California could accelerate deployment of these technologies by 2020 by

- working with the federal government and state agencies to remove market barriers that prevent the technologies from competing fairly with traditional, fossil fuel-based generation;
- developing a valuation methodology to quantify the costs and benefits of each technology in specific roles or applications, thereby ensuring more certainty of cost recovery for investors;
- using proceedings at the California Public Utilities Commission to encourage energy

storage research and deployment, such as by allowing energy storage technologies to count toward each load-serving entities “resource adequacy” obligations; and
- considering setting energy storage procurement targets, as contemplated in AB 2514 (the 2010 energy storage bill), for specific grid applications to encourage utility investment.

The lead authors (including me, if I don’t have jury duty) will present findings from the report at the California Energy Commission this Tuesday. Webcast is available for those who can’t travel to Sacramento.