



Legislative Energy Commission

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REPORT

Research Visit: San Francisco Bay Area

September 30-October 2, 2015

Legislative Energy Commission (LEC) members visited the San Francisco Bay Area for meetings and tours focused on the theme of emerging technologies, how they are changing energy systems, and how policy and regulation are adapting. The visit was organized by the LEC executive director under the direction of the co-chairs and funded by the LEC.

The following individuals participated in the visit: Senator Scott Dibble, Senator John Marty, Senator David Osmeck, Senator Julie Rosen, Representative Pat Garofalo, Representative Chris Swedzinski, Annie Levenson-Falk (staff).

The following is a summary of the group's meetings and tours.

California Manufacturers and Technology Association

Michael Shaw, VP of Government Relations, provided an overview of California's energy and climate policies – including the new SB 350, requiring 50% renewable electricity and a doubling of building energy efficiency by 2030, and the state's cap and trade program – and shared the perspectives of the large consumers that he represents.

Google

Google staff shared the Makani prototype they are developing for wind power generation. Similar to a small airplane tethered to the ground, Makani is designed to generate power at low wind speeds and in places where it is difficult to install a traditional turbine. Google has projected the system could generate power at \$35 per MWh and plans to test a model soon.

Next, the group heard about Google's energy procurement for their 12 data centers located around the world. Google has a goal of using 100% renewable electricity; the company is currently at 35%, and offsets the remainder by purchasing Renewable Energy Certificates (RECs). Google prefers to purchase renewable power as directly as possible. In places where the regulatory doesn't allow direct purchase, Google may itself sell green power on the market and assume the associated risk, then apply the RECs from that power to their own consumption.

Finally, the group took a tour of the Google campus with Northfield native and Google employee Steve Grove, and discussed the Silicon North Stars program that he created. The program brings 8th graders from underrepresented communities in Minneapolis and St. Paul to tour Silicon Valley each summer.

October 26, 2015

Lawrence Berkeley National Laboratory

The group heard from a half dozen scientists and senior staff about the Lab's Energy Technologies Area, Global Partnership Alliance and Small Business Vouchers Pilot, energy storage technologies for the grid and transportation, its technology accelerator Cyclotron Road. They toured the building efficiency simulator FLEXLAB, and had a discussion of how state legislators can utilize DOE national labs.

Pacific Gas and Electric Company

A panel of PG&E staff met with the group, including experts on electric vehicles, demand response, renewable energy, and state policy. Much of the discussion revolved around how the utility is integrating high levels of intermittent power generation – solar, in particular. The utility is already facing a significant “duck curve” – because of midday solar power generation, net demand drops substantially during the day, then ramps up quickly in the evening when the sun sets and people returning home begin to use more power at the same time. PG&E is also working on some innovative demand response programs, including a pilot that is integrating 100 electric BMWs to increase or reduce demand when needed, and beginning programs to fully integrate demand response into the wholesale electricity market.

California Public Utilities Commission

The group met with five staffers from the policy and planning division, the energy division, external relations, and a commissioner's office. Presenters discussed California's loading order, its energy storage requirement, smart meters, and a number of other topics.

Tesla Motors

The final visit was a tour of the Tesla Motors factory, led by Twin Cities resident and Tesla VP of Investor Relations, Jeff Evanson. Jeff led the group through the entire plant, from the battery components through the finished vehicles. He discussed what the company has learned in its first years of manufacturing vehicles and its vision for the future, including the more affordable Model 3 and Tesla's vision for autonomous driving.