

Could California make deep cuts in carbon by 2050 (80% below 1990 levels)? Are the economics feasible? Those are important questions for California, but they also have a lot to say about what's feasible for the U.S. and other developing countries as a whole.

Last December, UC Davis hosted a [forum](#) on the models that researchers use to address these models. The modeling work has been done in various places, including UC Berkeley, Lawrence Berkeley National Laboratory, UC Davis and the E3 environmental consulting firm. The answers are encouraging. Here are the main takeaway points:

The electricity sector. The exact energy mix depends on how much use is made of nuclear and of carbon capture and sequestration (CCS) for fossil fuel plants. But wind, solar, and other renewables are 40-80% of the mix. Natural gas plays an important role until 2020 but virtually disappears by 2030 unless CCS is perfected. Major upgrades are needed to the grid, energy storage, and demand management to handle the increased renewables.

Transportation. Heavy use of electric, plug-in hybrids, and fuel cells. Biofuels may represent up to 50% of transportation energy, but are not used at all in some scenarios.

Cost. The bad news: electricity rates rise substantially by 2050, maybe as much as 80%. The good news: much if not all of the additional cost is offset by reductions in air pollution and by cost-savings from energy efficiency. As a result, the net economic cost should be bearable.

2050 is now 36 years away. There's a lot of work to be done between now and then, but at least we're starting to have a road map.

[If you're interested in learning more, the full presentations are [here](#), and the Feb. 28 white paper summarizing the findings is [here](#).]