

The recent decision of the California Energy Commission to [require the inclusion of rooftop solar](#) photovoltaics on most new homes has engendered praise from some quarters, and criticism from others. Some see this new policy as a positive force, helping to reduce the cost of solar and contribute to a reduction in greenhouse gas emissions. Others despair policy makers' tendency to choose technology winners and losers, and argue that the least cost choices are usually the best.

There is no disputing that the state's new policy is a landmark event that may or may not set the stage for broader solar adoption across the country. Regardless of where you might find yourselves in the cheering section, allow me to offer several red flags to watch for, when considering critical perspectives on the topic of requiring rooftop solar:

1. When someone argues that rooftop solar is foolish because central station solar is cheaper, they are ignoring, or at least minimizing the import of, the difficulty in siting central station solar, the decade-long process of making such a project happen, the direct land use impacts of that technology, the need for more transmission lines and all of the related land-use impacts, the reduced reliability resulting from concentrating so much solar generation in one area as clouds roll by and nighttime falls, the potential of local grid benefits from local generation, and the way onsite generation can contribute to a broader strategy to make the use of energy more efficient and less impactful.
2. Beware of critics who still might reject rooftop solar by saying that central station solar is a better deal. There are strong arguments in favor of central station solar, but it is not credible to suggest that we will meet all of our electricity needs with big solar farms in the desert. It isn't an either/or situation. We need both.
3. When someone criticizes the use of renewables by suggesting it could lead to higher bills, what is implicit is that we should continue relying on fossil generation that appears to be cheaper, even though much of that apparent price advantage results from the fact that the generators are not paying for environmental externalities such as air and water pollution and greenhouse gas emission.
4. When people argue that requiring rooftop solar is bad because it will reduce grid-based electricity sales and thereby leave the remaining customers with higher rates in order to cover fixed costs, think about what they are saying: a policy is bad if it reduces the demand for electricity from the grid. Should we stop encouraging more efficient use of energy? Should we be providing incentives for people to use more, just because doing so will help spread fixed costs over more sales?

5. Beware of arguments that point to the [Duck Chart](#). This is a graph, produced by the California independent grid operator, suggesting that with the introduction of more solar, grid operators are stuck with more renewables than they can use during certain hours, and therefore need to curtail its use. If our current grid can't handle more solar generation, there are at least three ways to respond: (1) stop adding solar, (2) manage solar generation better with energy storage strategies, more strategic deployment of renewables, and demand response techniques to better shape customer demand, or (3) fix the grid. When the grid operators curtail solar power, it isn't because there is more solar generation than there is demand. It is because so much of the grid-based generation is too inflexible to respond to changes in solar output. What should we rather do - cut back on clean solar power in order to accommodate inflexible generators, or modify the grid so that it can accommodate more clean power?

6. Be careful when critics raise the specter of economic inequity. The suggestion is that a program is unfair if anybody other than low income customers might benefit from a policy. Does the possibility that middle income or higher income end-use customers who adopt solar might save money mean that a policy should be rejected? Especially when the benefiting customers paid for that benefit by buying a new home with rooftop solar?

7. When people argue that putting solar on all new rooftops won't do much to reduce greenhouse gas emissions, beware of the drop-in-the-bucket argument - a favorite of people who want to dismiss any specific strategy to reduce greenhouse gas emissions. When it comes to reducing greenhouse gas emissions, there is no magic beanstalk that will lead us to the golden egg of a carbon-free life. When it comes to deep decarbonization it's all hands on deck.

Rooftop solar allows for a closer relationship between energy consumption and energy production, and can cultivate more efficiency conscious consumption. How many people think about the relationship between personal energy use and the output of some unnamed gas-fired power plant that they can't see? Rooftop solar can bring energy choices into the consciousness of consumers. It also is consistent with a movement toward electrification - using electricity in lieu of fossil fuels for such things as vehicle transportation and heat. Onsite renewable generation supports that process by making more clean, low-cost power available onsite.

Policies supporting rooftop solar can help bring down the cost of solar - It is cheaper to install solar photovoltaics when incorporated in new construction, and doing so adds to overall demand, which can support further economies of scale. Although there may be no credible way to establish cause-and-effect, and there were many factors in play at the

time, consider the California Solar Initiative. When creating this ten-year program which offered rebates to customers that adopted rooftop solar, one of the Legislature's stated objectives was to help bring down the cost of solar. During the life of that program, we saw unprecedented reductions in the installed cost of solar.

Finally, the development of more customer-sited generation can support the development of micro grids that can enhance local reliability and increase the likelihood of continued access to power after a natural disaster such as an earthquake.

Maybe there is a less expensive way to produce carbon-free electricity. But will enough of that happen to meet long-term greenhouse gas reduction targets? Maybe solar energy technology will improve over time - I certainly hope so. But when do we stop waiting for a better widget? Specific solar installations are not forever. When better technologies come along, there will be plenty of opportunity to deploy them. And when will we stop being affected, in our policy making, by the existence of energy sources that are only appealing because of artificially low cost? Some say that day will come when an appropriately priced carbon tax is imposed on all energy sources. Be sure to let me know when that happens. I will pop the cork on the champagne.