

REDEFINING CALIFORNIA'S ENERGY FUTURE¹

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California is going where few have gone before. It hopes to deploy renewable energy resources, including distributed generation, on scale. It has already done a remarkable job of promoting energy efficiency on scale and is beginning to make headway toward introducing price-responsive demand in the residential market.

The best way to provide customers and producers the right incentives for action is to provide cost-based pricing signals. The ideal rate design is one that consists of two parts: (a) a fixed charge to recover the costs of operating and investing in the grid, and (b) a volumetric charge that reflects the cost of providing energy.³ The elements of such a rate design are currently the subject of a rate design proceedings at the CPUC.

Not only is such a rate design in accord with the generally accepted principles of rate design, which go back a century, it is also consistent with the best new thinking on the subject, as articulated in interviews that I recently carried out with two dozen pricing experts in the U.S., Australia, Brazil, Canada, France, Hong Kong, and South Africa.

Historically, grid costs have been recovered disproportionately through volumetric charges. Unknowingly, high users have subsidized low users. This has serious implications at a time when load growth has dropped by half. The problem is particularly acute in California where customer charges are virtually non-existent in the investor-owned segment. Of course, municipal utilities and rural cooperatives have had no issues in recovering grid costs through fixed charges. And in France, demand charges have been used to recover fixed costs.

Turning to the volumetric portion of the rate, the best way forward is to levy time-based pricing because it can reduce peak demands, raise load factors, lower customer bills, lead to a cleaner environment by facilitating the integration of renewable energy, and improve reliability. All of this has been known for years. However, legislation (AB 1X) and the lack of smart meters have prevented these benefits from being provided to Californians.

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http://www.gov.ca.gov/s_morethansmart.php.

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³ There is an extensive professionally and trade literature on the ideal rate design, going back a century.

We are now on the cusp of change. Smart meters are in place and new legislation (AB 327) may soon fall into place. The opportunity is there to introduce time-based pricing for residential customers, which account for a large share of peak demand. However, three dragons have to be tamed before time-based pricing can be rolled out on scale.

Dragon 1: Customers Don't Know What It Is.

Yes, they have not seen it being offered for electricity. But they have encountered time-based pricing in other walks of life, whether they are parking a car next to a meter,⁴ driving over the Bay Bridge,⁵ commuting in the fast track lane on I-680,⁶ driving into central London,⁷ booking an airline ticket to New York, a hotel room in Las Vegas, a rental car in San Diego, buying a ticket for a Giants game in San Francisco, a movie theater in Chicago, or the Berlin Philharmonic.

Dragon 2: Customers Don't Want It.⁸

Customer surveys consistently show that they want lower bills, better reliability, and cleaner air. Once they understand that time-based pricing can give them all three, they will want it. Let's recall that consumers did not know that they wanted the Internet, the iPhone, or ATM machines until these came along. But they did want convenience, instant information, and social media.

Dragon 3: Customers Won't Respond.

Evidence from 4 continents, 7 countries, and 163 trials with time-based pricing and various enabling technologies tells us that customers respond to price changes.⁹ Using this evidence, we can trace out an arc of price responsiveness. When customers are told that peak period usage is five times as expensive as off-peak usage, they are likely to reduce their peak period demand by some 13%. Applying the arc to California, with that rate design, we would lower peak demand by about 3,000 MWs, eliminating the need to build 30-50 power plants in the future.

Making the Transition

So how should California make this transition? The approach, which has been recommended by the Australian Energy Market Commission to the Government of Australia is worth reviewing.¹⁰ First, make it mandatory for large customers. Second, make it optional for customers on the

⁴ <http://sf.streetsblog.org/wp-content/uploads/2013/08/Getting-the-Prices-Right.pdf>

⁵ <http://www.uctc.net/research/papers/UCTC-FR-2013-02.pdf>

⁶ <http://www.680expresslane.org/I-680.asp>.

⁷ <http://www.tfl.gov.uk/roadusers/congestioncharging/>.

⁸ http://www.smartgridnews.com/artman/publish/Business_Consumer_Engagement/Consumers-really-don-t-want-dynamic-pricing-An-expert-answers-5918.html

⁹ <http://www.sciencedirect.com/science/article/pii/S1040619013001656>.

¹⁰ <http://www.aemc.gov.au/market-reviews/open/power-of-choice-update-page.html>.

CARE rate and those with medical issues, and third, make it the default tariff for everyone else. After a few years, it should be made the default rate for everyone, but be accompanied by two choices that line up with variations in customer's ability to take risks: for the risk-averse, provide a flat, fully-hedged rate and for the risk takers, provide a real-time tariff.