



Electricity Currents



Maintaining Equity between Solar and Non-Solar Customers

The power industry is undergoing significant change at an accelerated rate. This means that many of the concepts that traditionally made perfect sense, no longer do. Moving forward, many of the time-tested principles need to be examined in view of the changes, mostly but not entirely, taking place on the *customer* side of the meter.

Perhaps the most significant of these developments taking the industry, and its regulators, by surprise is the rapid rise of **customer self-generation**, mostly through **rooftop photovoltaics** (PVs), which are now near, at, or below, grid parity in many high-tariff jurisdictions.

Rooftop PVs make perfect economic sense if the prevailing tariffs are already high and/or rising. In **Hawaii**, where average retail residential tariffs are around 40 cents/kWh, for example, one does not need any subsidies or tax credits to invest in rooftop PVs, provided one has a roof and the means to invest in solar panels.

What makes solar self-generation even more attractive, of course, are generous **feed-in tariffs** (FITs), prevalent in **Europe** and **Australia**, or **net energy metering** (NEM) laws, prevalent in many parts of the U.S.

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Residential Tariffs Are Tiered in California, Meaning Higher Rates at Higher Consumption

Southern California Edison Residential (Domestic) Retail Rate Structure ¹				
	Tier 1	Tier 2	Tier 3	Tier 4
Tiered Rate (\$/kWh)	\$0.1323	\$0.1645	\$0.2737	\$0.3037
Usage Subject to Rate	0% to 100% of Baseline	101% to 130% of Baseline	131% to 200% of Baseline	Over 200% of Baseline
Summer Baseline (Daily kWh): 13.3		Winter Baseline (Daily kWh): 10.8		
Basic Delivery Charge (\$/Meter-Day): \$0.031				

1. Rate design in effect on January 1, 2014. Baselines shown above apply to CEC Climate Zone 9 located east of the city of Los Angeles. Source: www.SCE.com.

Source: Robert Borlick and Lisa Wood, Net energy metering: Subsidy issues & regulatory solutions. Institute for Electric Innovation. Sept 2014

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Complex Transactions Made Simpler, Thanks To Transactive Energy

Debating how to treat solar vs. non-solar customers is mostly focused on calculating the costs and benefits associated with serving the former and whether they impose extra costs on the latter, since they end up consuming fewer kWhs and hence contributing less than their presumed *fair share* to the upkeep of the grid, on whose critical services everyone continues to rely.

If that *were* the full extent of the problem, an analysis such as the one summarized in this month's lead article – if you agree with the methodology and the assumptions – would suffice. But all indications are that

real-time market when reserves get tight.

Tony Bennett, president of **Texas Association of Manufacturers** (TAM), was relieved. TAM had urged the PUCT to resist calls to adopt a centralized capacity market. He said, “Capacity markets subsidize power generators who promise to meet projected future electricity requirements even if we don’t actually need the (capacity),” noting that a recent study of existing capacity market systems showed that well over 90 percent of the capacity payments went to *existing* power plants – not *new* generation facilities – effectively buying consumers nothing. Not everyone is fond of centralized capacity markets.

In the meantime, other markets are improvising with solutions of their own. After experiencing a chaotic and dysfunctional market in 2000–2001, **California** essentially mandates reliability though a

rather straightforward – if primitive – scheme called **resource adequacy**, administered by the state’s regulator. All **load-serving entities** (LSEs) in the state are required to annually file paperwork with the CPUC confirming that they have sufficient resources and/or firm contracts to meet 100 percent of their expected peak demand plus a 15 percent reserve margin. Done! That was easy, as the Staples ads say. Not elegant but effective, and reportedly rather cheap.

Australian Energy Market Operator (AEMO), runs an energy-only market with extremely high offer caps, currently at AUS\$12,5000. With flat or falling demand, AEMO is not much worried about having sufficient capacity on hand. At least for now. ■

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In places like **California**, where residential tariffs are **tiered** – that is they rise with higher consumption levels – the motivation to go solar becomes even more compelling for customers in top tiers. Every kWh generated on the roof means one less expensive kWh bought from the grid, currently 36 cents/kWh for **Pacific Gas & Electric Company** (PG&E) customers on the fourth tier. Under existing NEM law, all kWhs generated in *excess* of domestic consumption can be sold to the utility, which must offer a *credit* equal to the prevailing tariff. That explains why roughly half of all U.S. rooftop PVs are currently in California.

In a September 2014 brief titled **Net Energy Metering: Subsidy Issues & Regulatory Solutions**, published by the **Institute for Electric Innovation** (IEI), **Robert Borlick** and **Lisa Wood** examine the impact of California’s net energy metering laws on

solar and non-solar customers, a highly charged topic.

Focusing on customers of **Southern California Edison Company** (SCE) with tiered residential rates shown in the table on the first page of this section, the authors conclude, among other things, that:

- As currently structured, California’s NEM subsidies are “overly generous,” more than the 30 percent federal solar **investment tax credit** (ITC) and more than is necessary to incent rooftop solar;
- Most of the subsidies go to affluent consumers, paid for by everyone else; and
- Since over 75 percent of solar rooftops in California, and an increasing share elsewhere, are *leased* these days, much of the NEM subsidy is siphoned off by the *leasing companies* – not the intended beneficiaries.

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