Market Strategies in Support of the Living Pilot.

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SCE proposes to pilot acquisition of Preferred Resources as a fully utility-grade resource. A successful pilot will be of importance to SCE, and to California, US, and international goals for better grid management and a healthy utility system in a low-carbon future.

The result will depend on understanding *load as a system resource*. That idea is generally understood as an engineering concept, driving technical strategies. But it also underlies a market strategy that has the potential to realign the engineering and financial systems behind the goals.

The market need. Achieving California's goals requires a cost-efficient market strategy to attract billions in investment capital. That's been hard in the efficiency world. The problem is not *value*. The savings and systems value of efficiency is well known to be ample to pay for deep change. The problem has been getting the flow of *cash* to match *the value received.* US and California policy has been based on the understanding that the value, realized in buildings, can be accessed by properly educating and encouraging building owners, who can then borrow to finance the realization – but building owner balance sheets, or access to savings, or just priorities and perception of their own need, have gotten in the way. And the transaction and incentive systems often seem to deliver the benefits to one set of people, and the costs to another. The match has not worked as well as hoped.

Solutions that have stalled. Policymakers often try market strategies that use utility capabilities to get at this market need. Strategies have tried using utilities as billing and collection agents, program funders, outreach platforms, information channels, technology testers, and managers of public funds. Important successes have been achieved. But against the scale of the need and the potential, the solutions are coming up short.

What we haven't tried. One market strategy that has not really been tried is using utilities as *utilities*. The rate compact utility is a capital markets strategy. It's the capital formation engine of the community energy grid. We all know that market strategy works: In less than about 60, utilities largely electrified the earth. So the market strategy can deliver scale. Indeed, utilities are exactly the scale we need. How could we use the same strategy that electrified the built environment, to green it?

Load and the Role of Meters. The utility as a capital markets strategy depends on *load.* The key asset is the aggregate demand of the entire community, and the key revenue source is the payments that flow through the aggregation system to serve it. The key translation, allocation, and billing node for that virtuous cycle, is the meter: Meters deliver the answers SCE uses to pool fourteen million random chaotic individual electrical demands, into the cash flows it needs to keep southern California running.

Failure of Meters. But in measuring many customer-side resources delivered to the grid, meters fail of their essential *capital markets* function. For customer-side resources, *meters run backward*. They aren't recording resource delivery. They're recording the *destruction* of load. People even think of it that way: "we've reduced building load."

Customer Premises Metering as Choice of Market Strategy. This "load destruction" is not an inevitable attribute of customer-premises resources. It's a policy choice that has seemed inevitable because of how meters work. Yet we know we can organize meters for some customer premises resources so they operate properly – forwards – to support particular market strategies. PPAs for PURPA installations and

"solar FITs" for rooftop units are examples. They could have been "net metered," but weren't. They were metered instead to be understood as delivery to the grid for resale.

For the capital markets, that choice defines what the value *is.* If the meter runs *forward,* the value is *resources to serve an unreduced load.* The utility serves as the creditworthy capital markets aggregation point through its own investments and by acquiring power on PPAs. If the meter runs *backward,* the value is *savings that reduce load.* The capital markets get dis-aggregation instead of aggregation: millions of building owner counterparties, who themselves have access to only part of the value (the rest goes to successors or tenants.)

The historical success of utilities on the forward model, and the at best mixed results of customer-premises resources under the backward model, suggest we try running the meter forward.

Metering Energy Efficiency: Dynamic Baseline Meters*.* Metering systems now exist that enable the choice between market strategies for customer side efficiency: *dynamic baseline meters*. Dynamic baseline meter systems mean both generators and efficiency installed in customer premises can be transacted in financial markets, as if they are generation supplied to the grid.

Impact: Open Architectures driving down costs. Since these meter systems work at the whole-facility level, the investment is an open-architecture opportunity. For grid function what matters is the grid's experience at the connection point over the entire duration of the resource. Dynamic baseline meters enable a market strategy that means everyone just pays for that result, as delivered. That has the potential to release creativity, and drive deep retrofits' costs down, not just in design, but in operation.

Market status of Dynamic Baseline Meter solutions. The first dynamic baseline meter on the market (EnergyRM's "DeltaMeter™") is an IPMVP Option D-compliant system with IPMVP Option C simplicity of use and cost. It comes as one application of an analytical engine that, across a variety of solutions, has been tested in more than 5000 buildings. We've developed confidence in it within the energy realm, bolstered by vetting work by the Northwest Energy Efficiency Alliance, by national experts from QuEST, by experts at New Building Institute, and by Seattle City Light's choice of it to meter their "MEETS" (metered energy efficiency transaction structure) pilot.

Market Strategy Status. The Seattle City Light installation means the idea of using utilities as utilities, and choosing to deliver efficiency yield to the grid so it serves load instead of destroying it, is out of the realm of theory and into the realm of pilots.

The Living Pilot. We suggest including a test of this market strategy in the Living Pilot, through a test team assembled in the spirit SCE has articulated –a close collaboration between SCE and experts in this market strategy who will work together to bring this new form of *utility resource* to scale.

Outline of Proposal. As with other aspects of the Living Pilot, this market strategy needs new rigorous methods in how customer-premises Preferred Resources are planned, procured, operated, and monitored for performance. *We see a portfolio of assets designed around SCE's and CAISO's goals for peak and LCR resources on these circuits, that proves out methods for market strategy and load management that can be used throughout California.*

In the market strategy track of the Living Pilot, we suggest the overall goals should be:

1) Portfolio built and tuned specifically to meet peak load requirements for critical substations.
2) Happy utility customers, consuming customer-side preferred resources on a metered energy efficiency (and other customer-side) resources plan to solve LCR needs, under metering solutions that serve both load management and capital markets needs.

3) Happy ratepayers whether or not they are participants.
4) A robust and growing utility that is increasing revenue, and earnings for its investors, by enabling what the community needs - a smart grid, load-centric grid resources, two-way flows of energy, energy attributes, and dollars across the customer meter, and a market strategy that can support a healthy utility in the ZNE future.

We propose the Living Pilot include a Metered Energy Efficiency Transaction Structure demonstration as follows:

A. Resource Targets: 50 MW of peak offset based on deep energy efficiency in commercial buildings, focused on targeted areas for load growth management, based on open-architecture whole building retrofits and focused on key resource types, also taking advantage of opportunities presented to host additional resources in same facilities (solar, dispatchable demand response).
B. Market Demonstration: prove the contribution that deep, rigorously metered energy efficiency can make to meeting local reliability needs and the overall goals of the pilot.
C. Rollout concept: Staged plans for achieving targeted portfolio, with continuous learning and feedback loops incorporating stakeholder charrettes for engineering; for metering, controls, and data aggregation; for transaction fulfillment, documentation sign-on, for marketing, and for O&M and persistence monitoring.
D. Success Measures: Hard, verifiable, auditable, replicable data based on dynamic baseline meter technology, furthering framework of a new utility resource type with potential applicability throughout the WACC (tradeable negawatts/ negawatt hours.)

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Relevant materials:

Seattle City Light project press and impact materials: www.en-rm.com/announcements .

T. Foley and W. Campbell, *Solving the Rate Problem: Fundamentals of the Metered Energy Efficiency Transaction Structure*, Electricity Policy, June 2013 (available at http://www.eq-cap.com/research/).

H. Reichmuth, *A Method for Deriving an Empirical Hourly Base Load Shape from Utility Hourly Total Load Records,* ACEEE Summer 2008.

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We would expect to draw on this body of experience with SCE, along with California industry partners, to execute the project.

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