Proposal of Proctor Engineering Group, Ltd. in Response to CPUC/SCE Request for Projects to Compensate for the Closing of SONGS

October 21, 2013

We cannot keep doing the same things with little tweaks and expect different results. The opportunities to reduce peak energy consumption lie at the source of peak energy consumption, residential and commercial building air conditioning. These opportunities flatten the demand curve rather than lowering the baseline usage.

The California Energy Commission sponsored Central Valley Retrofit Home (CVRH) project shows the enormous potential for peak reduction. That project does not conform to the conventional patterns of retrofits. As a result the outcomes are spectacular. There are four test homes in the project and air conditioning use has been monitored over two summers (pre/post). The test homes are of four different vintages.

Test homes have monitored air conditioner energy consumption reduced by 67%, 70%, 64%, and 25%. These changes are pure retrofits, with no solar panels involved, with no high cost multispeed air conditioners involved.

Implementing a targeted program in the constrained areas is quite possible. It would be direct installations of the most effective measures. Additional discounted measures would be available to participants for less effective measures that are desirable to many homeowners (such as window replacements).

Targeted direct installation has been proven to be effective in a number of areas. Pilot tests have shown their effectiveness in PG&E and SCE's service areas. They have been fully implemented as part of noise reduction programs near airports.

Residences in California's hot areas provide special opportunities for peak reduction. The duct systems in the attic are overly complicated, have too much restriction to airflow, have excess surface area and have insufficient insulation. The air conditioners are oversized compared to the needs of the house contributing to low airflow per ton. We are not talking about minor tweaks to the systems as has been tried with insufficient success. We are talking about very aggressive revisions.

The Model Energy Communities Project of PG&E (aka. Delta Project) implemented Residential Air Conditioner Early Replacement (RACER) in the last year of that project. It was the most effective residential measure for peak reduction. Since that time research has found that in many cases, the air conditioner need not be replaced to obtain savings in excess of the savings from RACER.

The basics of the program would be:

1. Target the impacted areas
2. Potentially target by other variables including house vintage

3. Enthusiastically work the entire neighborhood
4. Do direct install of the most effective items based on a prioritized list (no modeling)
5. Offer additional measures that homeowners desire at a discount
6. Do direct installation of the most effective AC items in small commercial buildings in the impacted area
7. Monitor and modify the program using smart meter data

The advantages of this program are:

1. AC peak electrical consumption reduced by 50%.
2. Transform the HVAC system installation market by overcoming decades of techniques and calculations that are not appropriate to hot dry conditions.

The graph below illustrates the extreme efficiency decrement from typical attic ducts.