

## ACLM Program Conversion to Smart Thermostats

### SUMMARY

MADRI recognized that in PJM there are aged utility managed demand response programs that are deteriorated due to lack of maintenance and/or cost justification to continue. This proposed pilot has been developed to properly align incentives and risk such that these programs can be revitalized and cost justified with positive benefits to all of a utility's customers. The best candidate program to be implemented first is the New Jersey based PSE&G 125MW Air Conditioning Load Management (ACLM) program. The PSE&G system is a one-way direct load control (DLC) program for residential and small commercial central air conditioners using digital cycling units. This proposal is to upgrade the PSE&G system and others like it to web programmable smart thermostats and shift the operating responsibility to a 3<sup>rd</sup> party. This pilot will answer the following questions:



- Will a 3<sup>rd</sup> party invest to utilize a utility owned infrastructure?
- Will a 3<sup>rd</sup> party guarantee MW reductions?
- How does a 3<sup>rd</sup> party cooperate with a utility to dispatch based both on price and reliability?
- What are the resulting distribution benefits for a peak load reduction program?
- What will be the market acceptance of smart thermostats?

### HOW?

The 3<sup>rd</sup> Party would first pay the utility a fee in return for rights to operate the system and use an already established brand name for marketing materials. The 3<sup>rd</sup> party would then assume operating responsibility for the program maintaining all necessary aspects for verifiable load reduction. Because the ACLM currently uses older equipment, the 3<sup>rd</sup> party will install smart thermostats as the older equipment fails and participant "churn" is managed. In return for operating the ACLM program, the 3<sup>rd</sup> party would receive payment for O&M services that is paid based on performance of the system. Performance will be measured on actual and verified load reductions. In this way the 3<sup>rd</sup> party will be given incentive to operate and maintain a verifiable working system that is performing as well as possible. The utility will continue to have dispatch control for reliability (roughly 20 hours per year) while the 3<sup>rd</sup> party will additionally dispatch for economics (40-80 hours per year).

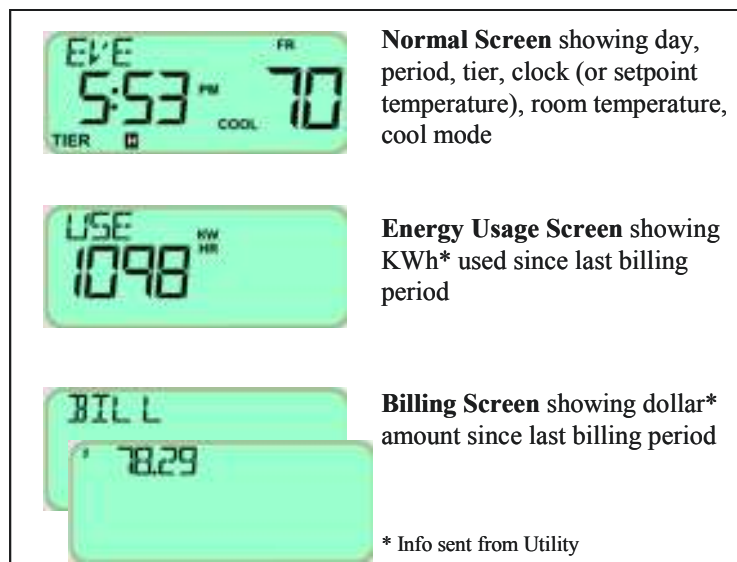
### BENEFITS / COSTS

<u>Benefits</u>	<u>Value*</u>	<u>Costs</u>	<u>Value*</u>
Energy Market Savings (60 hours)	\$19.3	3 <sup>rd</sup> Party Services Cost (\$35/kW-yr)	\$37.6
Substation Deferral Savings	7.4	Thermostat & Installation	15.0
Other Distribution Deferral Savings	12.3		
3 <sup>rd</sup> Party Payment to PSE&G	5.0		
Generation Capacity Value	15.5		
Transmission Capacity Value	7.4		
Thermostat Energy Savings	15.7		
LMP Benefits	???		
Reliability Benefits	???		
Program Size Stabilization	???		
Real-Time Measurement & Verification	???		
User-Friendly Web Enabled Thermostat	???		
Reduced Legacy Incentives (switch to thermostats)	5.9	Elimination of Legacy Incentives (receipt of thermostat in lieu of cash)	5.9
Continued Payment of Legacy Incentives (Benefit to those still receiving annual incentive)	17.5	Continued Payment of Legacy Incentives (Cost of paying annual incentive to those not switching to thermostat)	17.5
<b>TOTAL BENEFITS</b>	<b>\$106.0</b>	<b>TOTAL COSTS</b>	<b>\$76.0</b>
<b>BENEFIT TO COST RATIO = 1.4</b>			

\*All values are in millions of dollars, NPV at 6% over 10 years

## SMART THERMOSTAT DETAIL

The smart thermostats have DLC capability (provide same A/C cycling as older DCUs) and can be easily upgraded to respond to price signals if the utility decide to migrate to a price responsive program. New participants and those identified as having inoperable DCUs would receive the new thermostat and use it to manage and reduce electric and natural gas bills. DOE research indicates that consumers may save 10% or more on their heating and cooling bills if a programmable thermostat is used in place of a manual one. Above and beyond a standard digital thermostat the web programmability feature allows for remote control of heating and cooling and a user-friendly programming interface which can show a variety of customer data. This feature will promote consumer energy management. The value of the thermostats means that program participants will be willing to accept the new devices in lieu of any cash incentive they might have previously been receiving under the ACLM program.



## RECOMMENDATIONS TO COMMISSIONERS

### 1) Consider role that 3<sup>rd</sup> parties can play throughout the MADRI region in developing and implementing ACLM programs, starting with PSE&G.

Guaranteed demand reductions can have a very real impact on peak load requirements and prices. If these reductions are not operated efficiently and not fully taken into consideration, the effect will be a masking of true market conditions. If ACLM programs are optimized and guaranteed by a non-utility 3<sup>rd</sup> party, it will reduce suppliers' peak resource needs and thus have a positive impact for all consumers. This process should begin now to have a result in place by October 2006 so that suppliers may consider the peak load reduction for 2007. In New Jersey where PSE&G has an active ACLM program, we believe that the bidders have not considered such peak load reductions in their bids.

### 2) Allow long term contracts for demand response.

Long term contracts on the order of ten years, with fixed prices, are recommended for demand response assets because fixed prices will hedge the volatility and expected increases of energy and fuel costs.

### 3) Consider that Portfolio approach include demand response.

The commission should consider the NJ Ratepayer Advocate position that a "portfolio approach" outside the BGS auction process would be beneficial and should include demand response resources.

### 4) Permit Utilities to earn a rate of return on new investments in ACLM programs

Because of the deregulated nature of PJM, when ACLM programs are dispatched the benefits of the programs flow to suppliers rather than the utilities. The commission should consider giving utilities the proper incentive to encourage ACLM programs.