

2008 Order Instituting Informational  
Proceeding and Rulemaking on  
Load Management Standards

Docket No. 08-DR-01

# Water Agency Comments

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<b>DOCKET</b> 08-DR-1
DATE JUN 10 2008
RECD. JUN 06 2008

presented at:

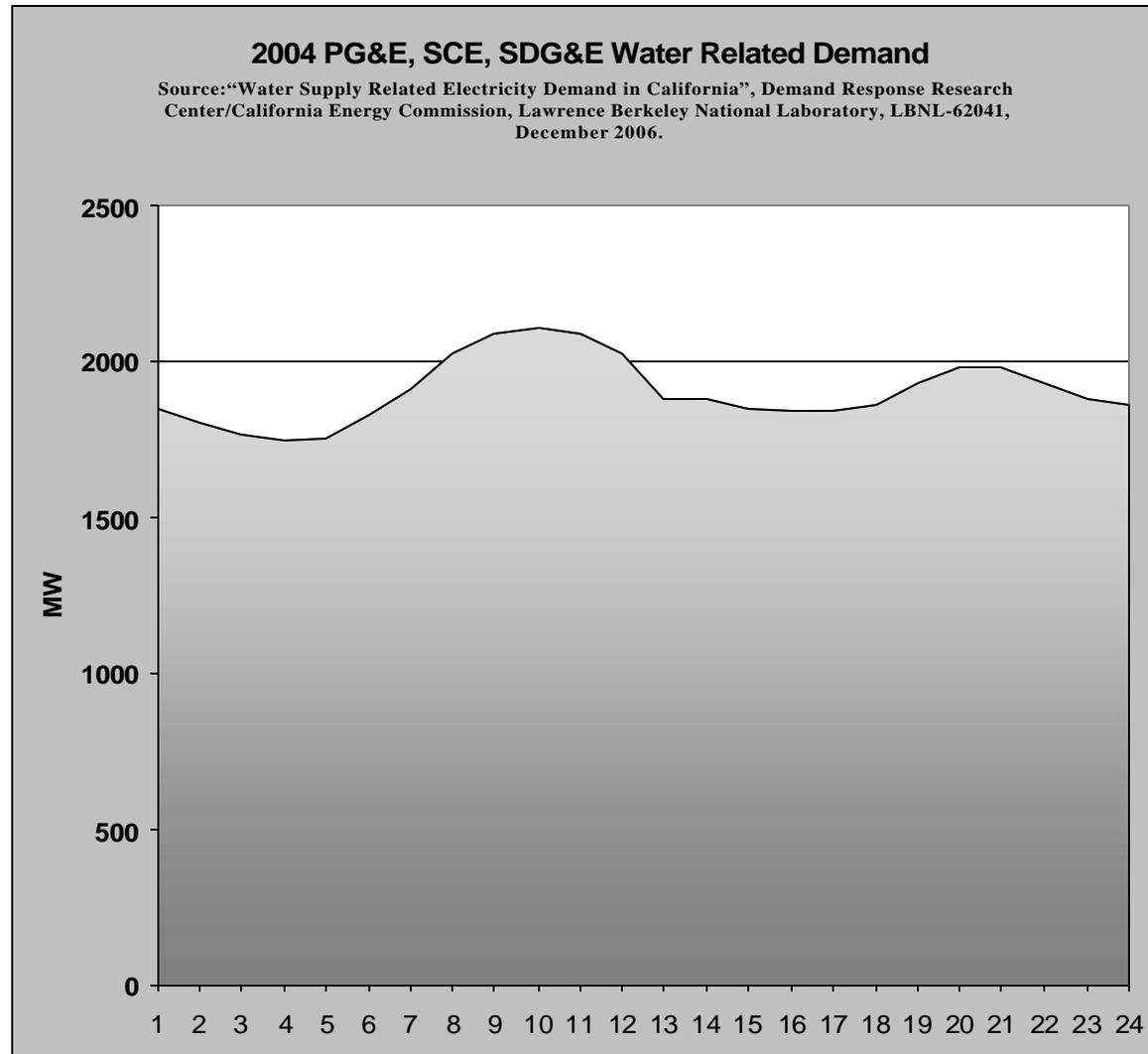
Rate Design, Incentives, Market Integration Workshop

June 10, 2008  
Sacramento, CA

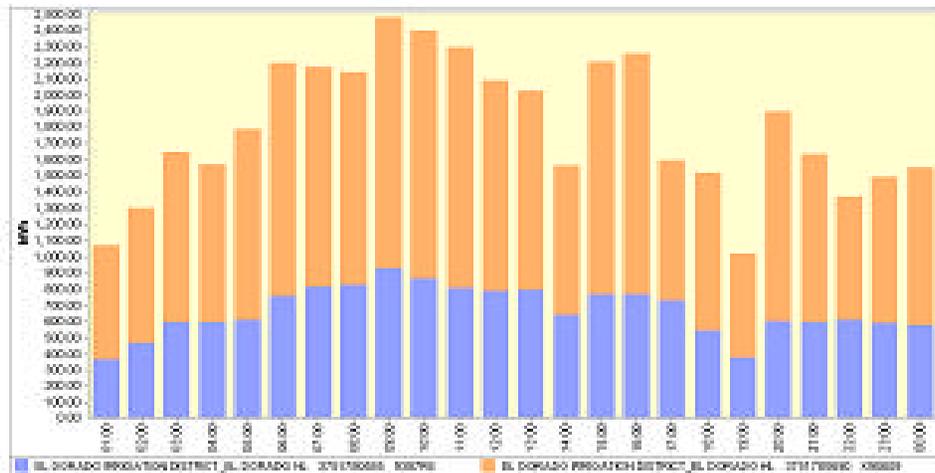
# Water Agency Storage

- All water agencies that supply treated water have some storage
- Storage added to optimize water system - not for on peak demand electrical demand reduction
- There is a limit to on-peak demand reduction from storage
  - “minimal pool” of water kept in storage at all times
    - fire protection water
    - contingency water
    - water for pressure
- Current operation is conservative - “A full tank is a happy tank”

# Water Agencies Currently Drop Hundreds of MW Daily During the On-Peak Period



# Additional Storage Can Yield Huge Results

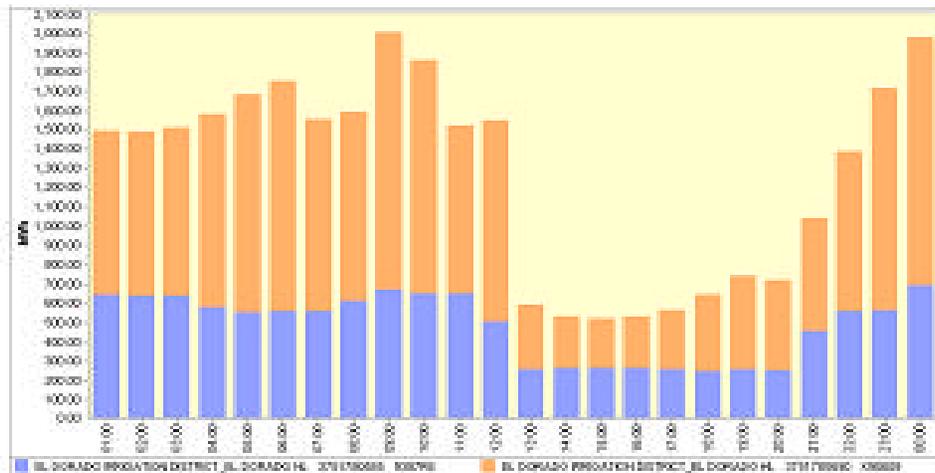


June 14, 2004

11.56 MG

Raw water pump station

Water treatment plant



June 14, 2005

11.03 MG

# Incentives and Decision-making Very Different Between Public and Private Sectors

- “Public Versus Private Customer Perspectives on Participation in Demand-side Programs” Strategic Planning for Energy and the Environment, Winter 2008, Vol. 27, No. 3, pg..59-66 filed with CEC Docket Office in this proceeding.
- Highlights
  - Different decision-making incentives
  - Different risk/reward behavior
  - Different investment criteria
  - Article provides list of characteristics of programs attractive to public sector

# Summary

- There is potential of 500-1,000 MW of additional on peak demand reduction that can be realized within the water community
  - some with more aggressive use of existing storage
  - most with additional storage in the water agencies
- Additional storage will yield additional permanent on-peak demand reductions and additional demand response
- Current and proposed rate design is neither consistent enough nor attractive enough to warrant water storage additions for on-peak demand reduction
- Incentives and decision-making for public agencies are very different from private customers

# Public Versus Private Customer Perspectives on Participation in Demand-side Programs

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## ABSTRACT

This article provides a brief comparison of the public sector vs. private sector in terms of characteristics, applicable incentives, and decision-making criteria for participating in new, untried endeavors like demand-side programs, using water agencies in California as the public sector example. Recommendations on characteristics of utility demand-side programs likely to be attractive to public agencies are provided.

## INTRODUCTION

The government sector has been notoriously slow to participate in new demand-side programs. This article provides a brief comparison of the public sector vs. private sector in terms of characteristics, applicable incentives, and decision-making criteria for participating in new, untried endeavors like demand-side programs. While the public sector example provided here represents public water agencies in California, the same general principles will apply to any public agency.

Water agencies in California are the single largest electricity user in the state. Water pumping and treatment use seven percent of the total electricity consumption in the state, and accounts for five percent of the peak electricity demand\*. This amount is only going to increase, as treatment requirements increase, and desalinization projects are developed.

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\*California Energy Commission, "California Water-Energy Report," CEC-700-2005-011-SF, November 2005.

In conjunction with storage, many water agencies have significant flexibility in their operations. Water stored at an elevation is basically stored energy derived from electricity. Water agency summer on-peak capacity reductions, typically over 400 MW, are due primarily to response to time-of-use tariff pricing\*. However, this on-peak demand reduction has not changed materially since before 2000, despite a plethora of new programs to encourage demand response. The electric utilities spend close to \$1 billion per year on energy efficiency and demand-response programs. The water agencies, in spite of being the single largest consumers of electricity in the state, typically have very little participation in utility demand-side programs, receiving an average of approximately one percent of the utilities' annual expenditures on energy efficiency and demand response since 2002. This article delineates some of the critical differences between public and private sector participants, and recommends some characteristics of programs that will be likely to result in more public sector participation in demand-side programs.

## GENERAL CHARACTERISTICS

### **Private Companies—"Entrepreneurs"**

The private sector companies are selling some good or service. They have competition that they have to keep constantly ahead of, and customers that can either purchase their product or not. They are profit maximizing. The key evaluation criteria is: how profitable are they?

### **Public Sector—"Risk Adverse"**

The public sector agencies also deliver some good or service, but have two key differences—(1) they have no economic competition, are in essence a monopoly, and give the "customers" no choice on whether to use their services or not, and (2) are controlled financially by elected officials, either an elected board of directors or a legislature. The public sector has a responsibility to deliver some public good. Agencies operate with an annual budget with monies derived from rates (or taxes) from the public they serve. A key evaluation criteria is: can they deliver the good or service within the budget that is linked to their revenue source?

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\*House, Lon W., "Water Supply Related Electricity Demand in California," Demand Response Research Center/California Energy Commission, Lawrence Berkeley National Laboratory, LBNL-62041, December 2006.

## RISK/REWARD FRAMEWORK

These fundamental differences result in a different decision-making framework between the two sectors. The symmetry of risk/reward is very different.

### **Inertia (the proclivity to continue with current mode of operation)**

The private sector is concerned with minimizing cost and maximizing profits. If competitors participate in a successful cost reduction program, others will be at a disadvantage. For the public sector, there is little risk if it continues with existing programs and does not make changes. So long as it is providing the good or service within its established budget, things are fine, and the status quo is a comfortable place to remain.

### **Consequences of success (reducing energy costs via participation in an alternative tariff or program)**

In the private sector, reducing energy bills results in an increase in bottom line. The increased money can be used to increase profits, reduce the cost of product to gain market share, or reinvest in the business. In the public sector, reduced expenditures on energy are generally translated into a budget reduction for that item for the next year, so the resultant impact is less money under which to operate in the future.

### **Consequences of failure (increasing energy costs via participation in an alternative tariff)**

The private sector risks being disadvantaged relative to competition if it partakes in an unsuccessful program. In the public sector, the consequences of failure are much greater. Since the criteria for success is the ability to operate within an established budget, making a bad decision that results in exceeding the established budget has profound political and career consequences.

### **Personal decision-maker incentives**

In the private sector, the person responsible for the savings (operations personnel or manager) often is motivated or rewarded by performance bonuses and other measures in which they are rewarded for the money saved. In the public sector, the operations personnel or manager gets paid exactly the same, regardless of whether they have

saved the agency money or not. An important point to make is that the manager/operations person implementing a successful strategy in the public sector doesn't get a chance to realize the benefits personally.

### **Accountability**

Accountability for the private sector is internal to the company. The public sector ultimately is accountable to the voters (the "public") for the money used.

### **Capital investments**

Private companies have tax consequences associated with capital investments. They can take advantage of investment tax credits and accelerated depreciation which can affect their bottom line. The public sector doesn't have tax consequences, so capital investments are viewed in a budget light, which results in a much longer time frame of reference. Incentives that rely upon tax consequences as motivation don't stimulate the public sector.

### **Flexibility**

The private sector often has flexibility not found in the public sector. If costs of operation become too high relative to sales, a private enterprise can suspend operation for a while. Public agencies often cannot do this. A water agency cannot say to its customers—"Sorry, on the program we've signed up for the electricity prices are too high today, so we're not going to be delivering any water to you." They have to operate, regardless of the costs, and if they miscalculate participation in a particular program, they have to bear the increased costs.

In summary, the risk and reward structure is very different for the private and public sectors. The private sector rewards successful risk takers, but there is little personal reward and great risk for public risk takers.

## **DECISION MAKING DIFFERENCES**

### **Decision makers**

There can be significant differences in who is responsible for decision making between the public and private sector. The private sector often has a plant or facilities manager who knows what can be done

in terms of demand response and the financial consequences associated with such changes. This person often is the sole, or major, decision maker in the private sector.

The public sector typically has several individuals or offices that have to be in accord on any decision. In the water agency example, the operations personnel are engineers who are responsible for designing and operating the water system. They will be the ones responsible for implementing any changes in the system to reduce energy use or shed load. A key point is that public agency operations staff never sees the utility bill—it goes to accounting department—so the operations staff has no inherent direct financial feedback on the impact of changes in operations.

The public agency accounting office receives and pays the utility bills, but generally has no idea on what kind of changes in operations would be necessary or could be done in order to participate in demand-side program.

The public agency is generally run by a general manager, who serves at the discretion of the elected board of directors. The decision on participating in demand response programs ultimately rests at this level, but the decision cannot be made without the support and concurrence of the operations staff and an analysis of the financial impact from the accounting department.

### **Comparison of alternatives**

Public agencies typically do not have the on-staff ability to analyze various alternative programs and tariffs, and are reluctant to participate in new programs without an analysis of the impacts upon their agency. As part of the implementation of alternative programs, someone needs to compare the cost of an agency staying on its existing tariffs versus shifting to one of these alternative programs. Without assistance with this type of analysis, the public agency won't even look at alternative programs.

## **CHARACTERISTICS OF PROGRAMS ATTRACTIVE TO THE PUBLIC SECTOR**

### **Limits on risk exposure**

If there is a cap on risk, a public agency can determine how much

its budget is exposed and be much more comfortable participating. Due to the difficulty in public agencies participating in arrangements that obligate them to outside parties, performance penalties need to be reasonable, appropriate, and predictable.

### **Multi-year commitment**

The lack of tax consequences associated with capital investments means that public agencies generally have a much longer time frame reference than the private sector, and investments must be spread over a longer period.

The same perspective works with personnel. The private sector hires and fires with much greater flexibility than the public sector. A program requiring personnel additions in the public sector needs to be several years in duration to warrant the addition of necessary personnel. Programs that have a one- or two-year window will not be attractive to public agencies.

### **Capacity or participation payments**

The savings from participation in a new program by a public agency need to be larger than the increased costs to stay within budget. That is one of the reasons that public agencies find a fixed payment (or equivalent) attractive. They can look at their increased costs and if the fixed payments cover the majority of those costs, then they are putting little of their budget at risk. An emphasis upon operational (energy) payments leaves the public manager dangling, not knowing if the increased participation costs will be recovered.

### **Compatible with public mandate**

Participation in dynamic pricing programs can be contrary to the mandate of the public agency. Water agencies are a public necessity. They provide useable water, sanitary services, and fire protection. When there is a fire, the water agency has to pump water regardless of what the market prices for electricity are. Water agencies' responsibility is to provide adequate supplies of water at sufficient pressure with enough reserves for emergencies. Everything else (including economics) is of secondary importance. Any program that does not have *force majeure* clauses for events that are included in an agency's public mandate will not be embraced by the agency.

### **Contracts**

While the public sector is quite familiar with contracts for goods and services, any contract that obligates the public agency to do something, particularly one that has any penalties for non-performance associated with it, is difficult to get approved. There are a host of legal barriers to public agencies obligating themselves to outside parties.

### **System impacts**

Most demand-response proposals are geared toward a customer with a single account. Water agencies have multiple accounts, often numbering in the hundreds of individual accounts. Because water agencies are operated as a system, what happens at one account has an impact on most of the other accounts in their agency. An evaluation of a water agency's ability to participate in a demand-response program will often necessitate an entire system analysis, particularly if increased use of storage is used to displace on-peak electrical demand.

### **Full disclosure**

Estimates of the full cost of participation in these alternative programs need to be developed. This includes participation costs such as hardware requirements, software and data network costs, and additional personnel requirements, as well as any other infrastructure requirements the customer is responsible for. It is insufficient to merely compare the cost of shifting electricity consumption under the alternative programs with the cost of staying on existing tariffs.

### **Measurement/verification**

Measurement and verification has been a significant point of dissatisfaction with water agencies' past experiences in participating in curtailable programs. Some water agency demands (particularly agricultural) can be quite erratic, depending upon crop demands for water, which can be significantly influenced by evapotranspiration (weather dependent). The good news is that peak demands for such water agencies (and maximum curtailable load) are generally correlated with high system electrical demands. The bad news is that they rarely get paid for what they've curtailed.

A multiple week (and even multiple day) rolling average for the base demand can greatly undervalue actual water agency curtailment. California had an instance in the 2000 summer program where a water

agency dropped almost 20 MW of demand in response to a curtail call but only got paid for 2 MW because of the 10-day rolling average baseline. That water agency was so disgusted that it is not participating in any current programs.

### **Prompt or consistent payment**

Water agencies have had very frustrating experiences in receiving payment for participating in various interruptible/curtailable programs. The payments have been months, seasons, or even years late. A program that results in discounts off the otherwise applicable price or bills (such as current interruptible tariffs) would be much more favorably received by water agencies.

### **Make public participation comparable with private participation**

The inability to access tax benefits puts many public agencies at a severe disadvantage. For example, in California, the California Solar Initiative\* developed rebates and incentives assuming federal and state tax incentives. The result was a dearth of installations by public agencies, which necessitated restructuring the incentives so that public agencies received higher rebates and performance incentives to compensate for the lack of tax incentives and make their economic investments comparable to private sector investments.

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### **ABOUT THE AUTHOR**

Lon W. House, Ph.D., has a Bachelor's, two Master's, and a Ph.D. in engineering and economics from U.C. Davis. He is a Certified Energy Manager (CEM) and a Certified Sustainable Development Professional (CSDP) with the Association of Energy Engineers. He taught engineering in graduate school at U.C. Davis for a number of years. He worked for the California Energy Commission for five years as a utility planner, and he was the chief utility planner for the California Public Utilities Commission for five years. In 1990 he went out into the consulting business, starting his own business (Water and Energy Consulting). He has been the Association of California Water Agencies (ACWA) energy consultant since 1992, representing 500 water agencies which are re-

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\*<http://www.gosolarcalifornia.ca.gov>.

sponsible for over 90 percent of the water delivered in California; the Regional Council of Rural Counties (RCRC) energy advisor since 1999, representing 30 rural California counties encompassing over one-half of the land area of California; and an energy consultant for the Attorney General of the State of California since 2004.

Dr. House has over 20 years experience before the California Public Utilities Commission, almost 30 years before the California Energy Commission, and has testified numerous times California Power Authority, California Independent System Operator, California State Legislature, State Water Resources Control Board, and the Federal Energy Regulatory Commission, as well as in numerous court cases. Dr. House also works for the California Public Utilities Commission as an expert witness, and for the California Energy Commission as a researcher.

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