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Local Government and Demand-Side Bidding

E. Vine

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LOCAL GOVERNMENT AND DEMAND-SIDE BIDDING

Edward Vine
Energy Analysis Program
Applied Science Division
Lawrence Berkeley Laboratory
University of California
Berkeley, Ca. 94720

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ABSTRACT

As part of Lawrence Berkeley Laboratory's (LBL) technical assistance to the Sustainable City Project, the issue of DSM bidding was examined as a possible option for local government. The recent interest and activity in DSM bidding around the country presents an opportunity for local government. Potential benefits for local government include increased installation of energy efficiency measures in municipal facilities and in the community, economic development, an additional source of revenue to help pay for municipal programs (including additional conservation efforts), and an enhanced local image.

Local government will most likely participate in DSM bidding as a customer or as a client of an energy service company (ESCO). The exact role will depend on local government's response to key issues associated with DSM bidding, such as performance guarantees, quality assurance procedures (measuring savings and providing financial security), and the administrative burden. In addition, local government will have to weigh the advantages and disadvantages of working with an ESCO.

While local government has not yet participated in DSM bidding, local government is in a unique position to take advantage of energy efficiency opportunities as owner-operators of municipal facilities which consume significant amounts of energy, planners and regulators of new development, and general providers of services and assistance to their communities. Furthermore, local governments have lower risks (in terms of program success) than small businesses, and local governments' credibility and experience in dealing with customers may reduce high transaction costs associated with DSM bidding. Despite these advantages, local governments should take a cautious approach in participating in DSM bidding processes, and should carefully examine other strategies for promoting energy efficiency (including participation in conventional utility programs) prior to participating in DSM bidding.

INTRODUCTION

THE SUSTAINABLE CITY PROJECT

This paper was prepared for the City of Portland, as part of Lawrence Berkeley Laboratory's (LBL) technical assistance to the Sustainable City Project. The Sustainable City Project is a collaborative effort by the cities of Portland, San Francisco, and San Jose, assisted by LBL and the Washington State Energy Office. The Project is funded by the U.S. Department of Energy, and managed by the Energy Task Force of the Urban Consortium. The cities are developing local plans and projects that increase control over their energy future, promote long-term economic prosperity, and improve environmental quality.

In the first year of the project, each city worked with key individuals in local government and the community to identify policy options that would contribute to solving local problems in selected priority areas (e.g., economic development and transportation) while also improving overall energy efficiency. As part of its planning process, the City of Portland asked LBL to examine the issues surrounding demand-side bidding, in case the City decides to participate in a competitive bidding system.

COMPETITIVE BIDDING

Competitive bidding typically refers to the solicitation of capacity and energy supply or load reduction from sources which may include cogenerators, independent power producers (IPP), other utilities, utility subsidiaries, and demand-side participants (customers, third parties, other utilities, and utility subsidiaries). Competitive bidding normally consists of the following steps: (1) a utility, and sometimes its state regulatory commission, determine needs for future electric resources; (2) a formal call for proposals for meeting these needs is sent to IPPs, qualifying facilities (QFs), energy service companies (ESCOs), and/or bulk power producers; (3) proposals are submitted to the utility for competitive evaluation; and (4) power contracts are negotiated between the utility and suppliers with the highest-ranked evaluations.[†] One of the purposes of competitive bidding programs is to let the market determine the price of new resources and the proper mix of program efforts, including the mix between demand and supply-side resources and/or the mix of utility sponsored programs relative to the efforts of nonutility parties (Nadel, 1990).

[†] IPPs are entities that sell from facilities that are not regulated on a cost-of-service basis, that do not control transmission facilities essential to the buyer, and, if they are a franchised utility, sell to buyers outside their retail service territory (Kahn *et al.*, 1989). QFs are typically cogenerators or small power producers that, unlike IPPs, qualify under PURPA.

One of the key reasons for the recent interest in competitive bidding is the experience of utilities in the last decade in the way they buy and sell energy, and how they plan for electricity generation (Kahn *et al.*, 1989). Specifically, nonutility power production has emerged as a major new source of new electric generating capacity, principally as a response to the 1978 Public Utility Regulatory Policies Act (PURPA). The regulations promulgated pursuant to Section 210 of PURPA by the Federal Energy Regulatory Commission (FERC) stated that QFs be paid the full amount of the utility's avoided costs as a result of the QF's performance.† As a result of these regulations and significant changes in technologies and the underlying economics of large utility-owned central station generation facilities, a new independent power production industry consisting of nonutility-owned generators was created and has expanded over the years. Thus, another reason for implementing competitive bidding programs is to establish a structured process for evaluating and prioritizing offers from nonutility generators.

Competitive bidding is also seen as one option for increasing competition, furthering the deregulation of electrical generation, and securing new electric capacity. FERC has proposed a model "all sources" competitive bidding system in which any independent power producer can compete to supply electricity to a utility and its customers (FERC, 1988). The FERC proposal is a model for state public utility commissions. It is expected to prompt many states to review their regulatory system and lead to changes in federal and state regulations and/or legislation. Although interested in the concept, FERC has remained officially neutral regarding the means and feasibility of including demand-side resources in competitive schemes.

At the same time, least-cost and integrated resource planning and load management activities have led to a great deal of interest and activity in demand-side management (DSM) programs. This type of planning relies on an integrated framework to develop the least expensive electricity resources -- whether they are on the demand side (e.g., energy efficiency) or the supply side (e.g., natural gas and hydroelectricity). An important aspect of this type of planning is that demand-side and supply-side resources should be able to compete evenly for a utility's investment capital. Recent activity has centered on allowing DSM programs to compete in bidding to meet utility resource needs. The reasoning is that a utility should consider all sources of power on an equal basis, whether they be megawatts or "negawatts". The bidding programs are used for both energy-saving projects and peak demand reduction.

Finally, regulators in some states have been frustrated at utility reluctance to aggressively pursue DSM, and particularly end-use efficiency improvements (Goldman and Wolcott, 1990). Some regulators have apparently concluded that utilities are unable or unwilling to deliver DSM services and, therefore, see DSM bidding as one method for introducing nonutility groups into a utility's service area to provide these services (*ibid*).

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† Avoided cost is the cost the utility would have incurred either by generation or purchase from another source.

LOCAL GOVERNMENT AND DSM BIDDING

Competitive bidding processes are not new to local government (Raab, 1990). If a municipal government wants someone outside of government to implement parts of a conservation program, bidding will be used to determine which contractor(s) will implement a specific portion of a program such as marketing, installation, quality control, evaluation, or monitoring. The contracts between the local government and the contractor are usually the traditional time and materials, cost-plus, or fixed price arrangements. The majority of local government (and utility) DSM programs include this traditional type of bidding for services. Also, while local governments have experience with performance contracting (see below), they have not participated in demand-side competitive bidding (hereafter, referred to as DSM bidding).

Local government is interested in DSM bidding for the following potential benefits:

- reduced energy costs to users, stemming the flow of dollars out of the city, increasing local spending, and retaining and attracting households and businesses in the community;
- reduced payback levels, increasing the number of installations of energy-efficiency measures
- an additional source of revenue to help pay for city programs (including additional conservation efforts), while keeping the costs of doing business lower in the community than in competing cities or suburbs;
- increased experience in design and management of conservation programs; and
- enhanced local image to residents and businesses as a problem-solving local government willing and able to deal with new opportunities.

Local government has the choice of participating in a conventional utility conservation program (e.g., an appliance rebate program) or in a utility DSM bidding process (as a customer or as a client of a third party contractor). When considering participation in DSM bidding, local government needs to recognize and understand the key features that distinguish DSM bidding processes from conventional utility DSM programs (Goldman and Wolcott, 1990). First, DSM bidders often assume some of the performance risk and marketing costs; in a conventional utility DSM program, these risks and costs are typically borne by the utility and its ratepayers. Second, in DSM bidding, financial incentives offered by the utility to promote DSM options are not always provided upfront and are often tied to measured performance over time. In contrast, utility conservation programs often rely upon one-time, upfront rebates to stimulate participation by customers, and the rebate level is unaffected by the actual performance of the retrofit over time. Third, DSM bids are flexible: bidders can propose almost any kind of energy-efficient measure that is cost-effective. In contrast, most utility conservation programs are prescriptive: they offer rebates for specified types of measures and, therefore, constrain the type of proposed program. The

option of participating in DSM bidding or a conventional utility program is discussed later in this paper.

OBJECTIVES OF PAPER

The objective of this paper is to examine the role local government can play in DSM bidding. DSM bidding represents an opportunity for local government to participate in, and benefit from, utility investments in demand-side resources. However, the advantages and disadvantages of participating in DSM bidding must be evaluated prior to committing local government to such an action. Hopefully, the discussion of the key issues associated with DSM bidding and with the use of energy service companies (ESCOs) will help clarify the tradeoffs that are involved in participating in DSM bidding.

This paper draws on the experience of utilities in bidding programs, rather than municipal governments, since the latter have not been participants in DSM bidding. Also, the local government perspective taken in this paper is that of a direct participant (customer) or an indirect participant (client of an ESCO) in DSM bidding. A third local government role, but not addressed in this paper, is that of a municipal utility that sponsors its own bidding program.

DSM BIDDING EXPERIENCE

Actual experience with DSM bidding is limited, although bidding programs are proliferating rapidly. Public utility commissions and/or utilities in 27 states are in the process of developing bidding processes, and utilities in 17 states have already conducted bids (NIEP, 1990). Of the states that have bidding processes, only 7 either allow or require electric utilities to include DSM bidding in their bidding processes (Connecticut, Florida, Maine, New Jersey, New York, Vermont, and Washington State). More broadly, 15 utilities have conducted either an integrated bidding process including DSM bidding or a more narrowly construed performance-contracting bidding process (Raab, 1990). A few utilities (especially in New England) have conducted pilot bidding programs for demand-side resources (e.g., Central Maine Power (CMP), New England Electric System (NEES), Boston Edison).

Typically, there have been between 5-15 DSM bids submitted by ESCOs or individual customers (usually large commercial and industrial (C&I) customers) in a bidding program (Goldman and Wolcott, 1990). Thus far, ESCOs constitute the vast majority of bids; few individual customers are participating directly in these programs. Projects proposed by DSM bidders have a relatively strong likelihood of being selected by the utility for the final award group (40-100% in the six all-source solicitations). The amount of DSM savings proposed by bidders normally represents about 20-25% of the total amount requested by the utility. Lighting retrofits (e.g., efficient lamps, ballasts, and controls) typically account for about 60-75% of the electricity savings in those programs that have the most field experience (NEES, Boston Edison, and CMP). The amount of DSM savings proposed by winning bidders, while significant (e.g., ranging from 10 to 46 MWs over a 3-5 year period for the six integrated bidding programs), represents a relatively small part of a utility's overall DSM program (ranging from about 10-20%). At NEES, which has very aggressive DSM program goals, the performance contracting program accounts for only about 4-5% of the utility's expected DSM resource savings.

DSM BIDDING ISSUES

Because most bidding programs are pilot programs, and may be discontinued after a trial period, it is important that local governments interested in participating in DSM bidding programs be aware of the key issues surrounding bidding systems, so that they can be prepared to act quickly and effectively in response to a proposed bidding program. The issues discussed in this paper are based on a review of the literature cited at the end of this paper; excellent overviews of DSM bidding are presented in Cole and Wolcott (1988), Goldman and Hirst (1989), Goldman and Wolcott (1990), Gordon and Weedall (1988), Onofry and Cole (1989), and Raab (1990). In the following pages, examples of utility programs are mentioned, and a few detailed case studies are highlighted in boxes. The key design, implementation, and evaluation issues examined in this paper are the following:

1. Choice of auction format
2. Bid evaluation
3. Performance guarantees and quality assurance procedures
   a. Screening of bidders
   b. Measuring savings
   c. Financial (performance) security
   d. Site inspections
   e. Screening of technologies
4. Cream skimming and free riders
5. Payment stream
6. Market design and coverage
7. Cost of resource
8. Administrative and liability burden on the utility
9. Program overlap
10. Type of bidders

Many of the issues and concerns raised about DSM bidding are not unique but are applicable to other utility investments in demand-side resources. Also, because this paper is directed to local government, additional issues important to utilities (e.g., the reliability of nonutility capacity and DSM, the value of dispatchability, impact on system operating costs, impact on power quality, and long-term effect on utility profitability) are not reviewed, but should be examined in detail if a municipal utility decides to sponsor DSM bidding.

CHOICE OF AUCTION FORMAT

The choice of auction format is relevant to utilities sponsoring DSM bidding, but the format is also relevant to local government in providing the framework in which DSM bidding is placed. DSM bidding can be integrated with supply-side bidding (one auction) or conducted separately. For a utility, either approach requires a comparison of demand-side and supply-side investment opportunities: the integrated (all-source) auction conducts this comparison during the bid evaluation process, while under the separate auction approach, the comparison is made by the utility either before or after the individual bids have been evaluated within their respective auctions. The separate auction does provide the utility with a greater ability to focus on the characteristics of demand-side resources in designing the bid package and reviewing bids. It also prevent bidders from artificially inflating the cost of demand-side resources (which are generally less expensive) up to the cost of supply-side resources. Also, separate bidding programs for conservation and generating capacity would, in effect, allow for greater control by the utility and regulators over the proportions of total capacity requirements to be met by each source. An all-source program would essentially leave these proportions to the decision of the market. Separating demand-side from supply-side bidding only postpones the inevitable: reconciling the results and creating a resource plan for the utility. Therefore, the utility should have a method by which to perform this reconciliation.

In the integrated auction, all proposed projects can be evaluated at one time in a consistent fashion and thus promote integrated resource planning objectives; however, it is difficult to consider the unique features of each type of resource in the bid process. These include differences in market structure and level of development (e.g., the energy services industry is immature compared to the QF industry; well-defined product on supply-side compared to greater difficulties in defining and quantifying DSM resources; and DSM projects are much smaller than supply-side resources) and differences in evaluating the economics of each option and the quality of the resource (e.g., inclusion of DSM customer costs, measurement of savings, and assuring customer acceptance of DSM delivered by a customer or ESCO) (Goldman and Wolcott, 1990). Furthermore, the joint consideration of conservation and generation proposals within a single program may complicate the bidding process (bid solicitation, evaluations, and selection for just supply alone often requires Request for Proposals (RFPs) in excess of 50 pages (WEPCO, 1989)).

To date, most bidding programs have been limited to soliciting proposals for generating capacity. A few commissions have embraced all-source bidding: Maine, New Jersey, Washington. Few utilities have developed experience with all-source bidding. Several utilities that have solicited bids for conservation have done so through separate auctions.

CMP's Power Partners Program, a two-year long pilot program, is one auction system that integrates supply and demand. In this program, customers and third-party demand-side providers can submit bids to compete directly with supply-side developers on an avoided-cost basis. The New York and Washington Public Service Commissions have endorsed the integrated approach. Demand-side only auctions have been conducted by NEES, Northeast Utilities, Bonneville Power Administration (BPA), Boston Edison, and Commonwealth Electric. The former three restrict market coverage (typically to large commercial/industrial customers) while the latter two are potentially available to all demand-side bidders.

Central Maine Power (CMP)

CMP conducted an all-source bidding program by coordinating demand and supply-side solicitations. CMP started its two-year long pilot program in the winter of 1987-88, and bids were received on Feb. 8, 1988. The program is viewed as an experiment; CMP is not yet committed to doing this on a continual basis. Projects or packages to be bid were required to total at least 100,000 kWh per year and 100 kW demand reduction. The key criteria in selecting bidders were: price (percent of avoided cost), capacity (price based on set price or tied to short-term energy prices), willingness to provide liquid security as an assurance against performance of the measure, security (an escrow for those customers wanting a disproportionate front-end payment to cover construction costs), and compatibility of the bid with CMP's load shape. The product of the above criteria were used to develop an overall rating index. In addition, CMP used a subjective index as a tie-breaker, to determine the order in which CMP worked on the contracts.

Demand-side proposals generally ranked higher on the criteria, so the negotiations for them were initiated first. CMP received bids from 4 industrial facilities, 1 municipal lighting proposal, 2 industrial lighting proposals from a performance contractor, and 6 multi-site proposals from performance contractors (3 for residential retrofit and 3 for commercial/industrial retrofit). These bids would supply 36 MW of demand-side resources and 188.3 GWh/year of energy (this represented about 4% of the total resource offered from demand and supply bids combined). CMP has signed contracts with 6 bidders, amounting to 16 MW. A second RFP was issued in 1989, and CMP is negotiating with those projects that ranked high in an initial screening.

Contact: Jonathan Linn, CMP, 207-623-3521

BID EVALUATION

There are often several steps in evaluating bids. Price is usually the predominant selection criterion to assure that lowest-cost resources are contracted for, and that lowest-cost providers are hired. Then, qualifications of the bidders (and sometimes their work plans) are examined to carefully screen firms for their capability (sometimes this is done before a bidding system is even designed), as well as other nonprice factors (see below). Utilities can disclose evaluation criteria and the relative weight assigned to each feature in different ways: (1) in an "open" bid evaluation system, where the utility develops an explicit scoring system and bidders self-score their projects based on clearly stated evaluation criteria; or (2) in a "closed" bid evaluation system, where the utility reveals project selection criteria in qualitative terms only, providing only general guidance as to its preferences (Goldman and Wolcott, 1990).

Thorough bid evaluation is especially important for conservation resources since they often promote beneficial nonprice factors. A price-only bidding system will not fully value these attributes. Accordingly, the competitiveness of demand-side bids is sensitive to an auction system's inclusion or exclusion of nonprice factors, such as dispatchability, reliability, fuel mix diversity, environmental impacts, likelihood of project completion, jobs, load shape and timing differences, and utility revenue impacts.

Some commissions and utilities will set minimum operating and financial requirements for bids and then make a price-based comparison for all bids that are at least minimally qualified. The minimum standards approach is easier and less controversial, but permits fewer levels of gradation. Other bidding systems will add "bonus points" or "adders" to bids exhibiting desired characteristics -- establishing such a scoring system will permit comparison based upon points, not just dollars. While conceptually quite appealing, a point system is operationally quite difficult since it is difficult to quantify nonprice factors. And some bidding systems (e.g., Virginia Power) include weights in their bidding system: 70% of the bid is price-weighted, and 30% is nonprice weighted.

Unreliable savings and inexperienced ESCOs remain important concerns for utilities: for the former problem, the utility must provide for backup sources of power, and for the latter, the utility must confront the risks of customer dissatisfaction or perhaps liability for the failure of savings to accrue. Some assurances are needed, as discussed in the next section.

PERFORMANCE GUARANTEES AND QUALITY ASSURANCE PROCEDURES

Assurances are needed for reducing the risk of unreliable savings and poor performance by ESCOs. In addition to requiring deliverables and reports as quality control steps during the performance of the contract, bidding systems have incorporated one or more of the following features to reduce this risk (in no particular order):

a. Screening of bidders

b. Measuring savings
c. Financial (performance) security
d. Site inspections
e. Screening of technologies

In all of these cases, the DSM bidders assume the performance risk, in contrast to a conventional utility DSM program in which the utility bears most of the risk (although there are usually some performance clauses whenever a utility puts out services to bid).

Screening of Bidders

It is important to find firms that can deliver the energy savings and satisfy customers. Such assurances are most important if utility payments are made on the basis of estimated savings (versus measured savings). Bidders are usually asked to prepare a detailed description of their project, including the following: project engineering, project financing, management expertise, and likelihood of obtaining necessary government permits and licenses. Eligibility requirements are also set (e.g., minimum bid size, minimum lifetime for retrofit measure, and entry fees). However, too high eligibility requirements may result in few bidders.

Measuring Savings

From a quality assurance perspective, it is critical that savings be accurately measured. If engineering estimates are used, it is important to specifically delineate conservation measures, as exemplified by NEES (Nemtow, 1988):

> In it's Performance Contracting Program, NEES selected 26 efficiency measures that were frequently available, typically cost-effective from the utility perspective, and that had a consistent and predictable pattern of savings (e.g., measures such as high-efficiency fluorescent lamps and ballasts, window film, and high-efficiency motors). By integrating data from its C&I audits on the performance of these measures (over time, and by type of facility) with its avoided cost schedule, NEES could determine the economic value of these measures. While NEES bidders must demonstrate that the approved measures were installed, there was no obligation to document actual savings.

Alternatively, energy savings may be measured before and after installation of demand-side equipment (correcting for exogenous variables, such as weather and vacancy rates). Payments can be based partially or entirely on the amount of measured savings. Furthermore, a utility can require savings be measured prior to the award of their payments. Boston Edison Company requires measurements of electricity use and hours of operation for the affected systems before

and after the installation of measures. Difference in kW demand is multiplied by the annual hours of operation to estimate the annual savings. Measurements are adjusted for weather-sensitive options (e.g., space heating). CMP is also measuring savings. Finally, BPA permits the bidder to choose between engineering estimates and measured savings, but makes a larger payment for the latter.

Issues related to measured savings, but not discussed in this paper, are: (1) one-time measurements vs. periodic measurements, (2) billing data vs. submetered data, and (3) procedures for adjusting for weather, business activity, and modifications of the building or plant. For a more detailed discussion of measurement issues in DSM bidding, see McDonald (1990).

Financial (Performance) Security

NEES, CMP, and Boston Edison Company require some form of security from winning bidders (such as a bond, letter of irrevocable credit, escrow account, third party guarantee (insurance or surety bonding), and/or first or second mortgage lien on the proposed project or on other appropriate assets or insurance), pending successful installation and/or performance of the conservation measures. Under this approach, if the savings do not occur, the incentive payment for those savings can be refunded to the utility. The NEES security provisions cover both failure of measures and failure of the firm to reach the contracted level of market penetration. CMP requires an expense account as assurance against failure of the savings to accrue, and also includes provisions for liquidated damages if a customer should abandon the agreement.

Site Inspections

Site inspections of installed measures may be conducted of all or a sample of the installations as a way of assuring savings. The utilities that allow engineering estimates of savings have retained the right to perform on-site inspections.

Screening of Technologies

Utilities can also control the reliability of savings, as well as reduce the potential for cream skimming and free riders (see below), by opening the program up only to technologies that are proven and that address the demand-side objectives of the utility.[†] However, limiting measures to a specified list and not accepting other measures where engineers judge them to be reliable, may

[†] Cream skimming refers to the practice of designing and implementing only the lowest cost conservation measures while leaving behind other cost-effective opportunities for energy efficiency. Later implementation of these "lost opportunities" is often more costly due to marketing, administration, project management and other transaction costs.

diminish the opportunities for contractors to create packages of measures which will be attractive to consumers and financially rewarding.

New England Electric System (NEES)

NEES conducted a separate auction for demand-side and supply-side resources, and the eligible market was customers over 500 kW. Payments were based on engineering estimates of savings, and the key criteria in selecting bidders were: amount of savings, demand reduction, cost to NEES, and the qualifications of the bidder. For performance security, bidders had to be willing to offer a substantial bond (capped at $1 million per company). The performance bond requirements significantly reduced the number of bidders, but it did sharpen the interest of the bidders in completing work for NEES. NEES received bids supplying 14 MW of demand-side resources, and signed 16 contracts (three with ESCOs), amounting to 1.2 MW. So far, installed projects amount to 0.5 MW.

In the Spring of 1988, NEES implemented a Custom Rebate Program (now called the Energy Initiative) to all C&I customers in New Hampshire and Rhode Island over 100 kW as well as to government facilities and largest 60 customers in all NEES retail service territories. The incentive per kW in this program was initially $500 kW, and NEES pays for any conservation investment. Customers apply directly for incentive payments, and no third party is required. Most measures installed to date have been predominantly lighting measures.

Contact: Elizabeth Hicks, NEES, 508-366-9011

CREAM SKIMMING AND FREE RIDERS

Some utility customers will invest in DSM measures without utility incentives. Thus, an additional payment by the utility may be unnecessary to develop these measures; the beneficiaries of these payments are called free riders. In addition, short-payback measures may be the target of conservation programs (referred to as "cream-skimming" if they are installed to the exclusion of other measures). In addition to requiring customers to undergo complete energy audits in order to identify all cost-effective projects, several options are available for minimizing cream skimming and free riders (as well as for encouraging long-term maintenance relationships between customers and bidders).

First, payments for the least expensive and easiest to install measures may be limited to be no more than the installed cost of the measure, regardless of how much it saves (BPA). Payments for inexpensive measures are minimized, and the installation of longer payback measures are encouraged through their incentive structure, which pays just enough to equalize the payback or rate-of-return of different measures

(i.e., the customer finances the cost of the program associated with a less than 2-3 year payback).

Second, different incentives may be offered for various energy efficiency measures, based on the payback of each measure in a typical building. For example, Northeast Utilities and BPA deliberately encourage investments in longer payback measures by offering large payments for such investments. A variation is to offer payments for all measures with a bonus payment for "mid-range" measures - those with a payback between two and six years. Under this approach, the very short payback measures, most of which still have not achieved complete market penetration to date, are included.

And third, measures with a payback of one year or less may be excluded (e.g., CMP). These measures can be installed by customers and/or ESCOs by themselves.

PAYMENT STREAM

The issue is whether to provide payments at one point in time (lump-sum payments) or payments over time (payment stream). Under the first option, a utility provides a cash payment as soon as measures are installed and inspected (Northeast Utilities and NEES provide payments as soon as installation of conservation measures is verified by the utility). Under the second option, installment payments are made to winning bidders over several years (e.g., CMP, Commonwealth Electric, and BPA). Upfront payments are preferable from the bidders' perspective and, therefore, may result in lower priced bids and/or a greater willingness by bidders to install longer payback measures. However, upfront payments may impose a financial burden on the utility, lessen the incentive of the bidder to maintain the conservation equipment, and/or require the use of estimated (rather than measured) savings. Payments over several years provide contractors and consumers with more incentive to maintain energy efficiency measures, and limit the financing burden on the utility. However, since either the customer or the ESCO must finance the initial cost of the measures, utilities either must make a larger financial contribution, or bidders will limit their investments to measures with a very short payback.

MARKET DESIGN AND COVERAGE

Programs can be designed to apply only to certain markets, typically large commercial/industrial customers, where transaction costs are often lower and where absolute savings are often substantial. For example, NEES and CMP payments targeted large (over 500 kW) customers, with the former utility soliciting bids from ESCOs on pre-selected "segments" of approximately 25 to 50 customers each.

For smaller customers, the credentials of the applicant (or third party) and the level of service that they provide are extremely important. In contrast to larger customers, different incentives, simplified audits, standard rebates, and simplified procedures can be used for these customers.

Orange and Rockland Utilities (ORU) (New York and New Jersey)

ORU conducted an all-source bidding program by coordinating demand and supply-side solicitations). Because it serves customers in both New York and New Jersey, ORU issued demand-side bid solicitations for each state in June 1989 for a total of 150 MW capacity. The eligible market was large institutional, commercial, and industrial customers (but open to bids to provide efficiency improvements from other customers). ORU used ESCOs as the primary vehicle for the program (but keeps the program open for direct bids from large customers). ORU provided exclusive market franchises for groups of customers for successful bidders. ORU specified measures that were pre-qualified for installation (but allowed for qualification of other measures that impacted the utility's summer peak). ORU required financial security against the delivery of savings under the contracts. The key criteria for selecting bidders were: price, reliability, and compliance with security provisions. Secondary criteria were: verifiability of load reduction impacts for measures that are not pre-qualified

In its DSM bid solicitation, ORU received 15 bids accounting for approximately 28 MW of demand-side resources; all but 3 MW was targeted to C&I customers. Emphasis was placed on lighting retrofits and motor upgrades. Overall, 157 MW were awarded to supply-side and demand-side providers on Dec. 1, 1989.

Contact: Jim Cuccaro, ORU, 914-577-2489

COST OF RESOURCE

While DSM resources are often less expensive than supply-side alternatives, it appears, in some cases, that the same resource as in a bidding program could have been acquired at a lower cost through other types of programs (e.g., a rebate program). The increased cost may be associated with the expense of using a performance contractor to arrange the deal. While performance contractors make it possible to work with some customers who otherwise lack the financial or organizational resources to pursue energy efficiency, there is a cost in terms of complexity of the transaction and profit margin. The key question is did the performance contractor play a crucial role in bringing the customer to the utility, or might the customer have come to the program on its own in time, or as a participant in one of the utility's programs (e.g., a rebate program). The increased cost may also reflect a tendency for bidders to place demand-side bids at just under the price of supply-side resources, which has occurred in some integrated auctions. Thus, when deciding to participate in DSM bidding, local governments should examine all cost-effective energy efficiency strategies. This issue is discussed in more detail later in the paper.

ADMINISTRATIVE AND LIABILITY BURDEN ON THE UTILITY

Administrative procedures are needed to minimize risks with contractors and assure program reliability. However, these procedures should not be too burdensome to customers and ESCOs, otherwise the number of bidders will be low. Programs where the utility deals primarily with one party are likely to be simpler to administer than programs where there are relationships among all three parties (the utility, customer, and ESCO).

A simple bid process may result in the utility paying a higher price for inexpensive resources. This is because the program offers the same price for inexpensive vs. expensive efficiency measures (i.e., the design of the incentive structure is simple). If the utility helps arrange a bid process for selecting contractors, the program becomes more complex. Hence, many tradeoffs need to be made between administrative simplicity and flexibility.

Green Mountain Power (GMP) (Vermont)

GMP conducted a bidding program for residential water heating in 1988. The key criteria for evaluating bids were: unit price (primary criterion); durability, reliability and safety of materials; thoroughness and quality considerations of work specifications; reasonableness of market penetration estimates; soundness of proposed communications plan; GMP costs for providing marketing information for communications plan; reasonableness of installation and project management plan; reasonableness of project work schedule; soundness of financial and insurance plan; qualifications and experience of the bidder; extent of service territory to be served under proposal; and the degree of risk undertaken by GMP with respect to the terms of the payment. A security deposit was required to hold the proposers to their market penetration estimates and their schedule for implementation.

GMP has also proposed a DSM bidding program. The proposed criteria for reviewing bidders are: maximum savings at below the utility's avoided cost, low price for the given amount of savings from the customers, feasibility and reliability of the proposed installation, experience and qualifications of the proposers, and capability of the contractor to provide security against the performance of the efficiency measures. Security will be required if contractors request a one-time front-end payment (if a stream of payments over the life of the measures is taken, then security will be less important).

Contact: Mike Weedall, GMP, 802-864-5731

PROGRAM OVERLAP

Utilities must decide if they wish for new programs to compete with existing efficiency programs or not. If not, provisions must be made to exclude the potentially overlapping service territories or measures from one program or the other. On the other hand, some utilities have placed restrictions on DSM bidding eligibility by not allowing other utility-sponsored programs.[†]

Local governments may want to pursue ways to co-exist with utility's energy efficiency programs as they participate in DSM bidding (Raab, 1990). Local government may find more effective ways to market demand-side services to nonparticipants (although this may not be cost-effective or financially possible if the utility already provides attractive incentives). Or local government might focus on potential market niches - certain geographic areas, subsectors, or technologies. Where utility-sponsored DSM programs may be less comprehensive in terms of covering all cost-effective conservation in all customer sectors, or where utility incentives fall far short of paying the full incremental cost of energy efficiency measures, greater opportunities for DSM bidding may exist for local government.

TYPE OF BIDDERS

Utilities must decide on who is allowed to bid: individual customers (including local governments), third-parties only, or both. As mentioned before, ESCOs constitute the vast majority of bids, and customers (including local government) have not been active in DSM bidding.

[†] Self-generation and cogeneration are also not typically eligible.

DSM BIDDING PERSPECTIVES

One of the defining features of DSM bidding is that they involve customers or third parties (e.g., ESCOs) competing for long-term contracts with utilities which specify amounts of DSM savings to be achieved by a winning participant over a defined time period (Goldman and Wolcott, 1990). ESCOs often conduct their business on an energy performance contracting or shared savings basis. Performance contracting transactions typically involve the provision of a package of services including: engineering analysis of the customer's facility, acquisition and construction management of energy efficiency improvements, operation and maintenance of the equipment over long-term (five to ten year) contracts, and financing for the whole enterprise. They also often include the guarantee of a minimum level of achieved savings.

Operating within given areas of specialty (e.g., residential, commercial, and industrial), ESCOs develop menus of conservation measures that can be applied at different ranges of costs per kWh or kW conserved. Normally, ESCOs conduct energy audits and then detailed engineering analyses of facilities in order to understand and knowledgeably exploit energy efficiency opportunities. The depth of the measures actually installed at a given location will depend on the utility's level of payment for conservation, as determined through the bidding process. Installation of conservation measures may be carried out by ESCO personnel or by subcontractors hired by the ESCO.

Since ESCOs have been the principal bidders in DSM bidding, local governments should recognize the advantages and disadvantages of ESCO participation in DSM bidding, in case municipal government wishes to become a client of an ESCO in DSM bidding. Similarly, local governments should understand how utility regulators perceive ESCO participation in DSM bidding.

ESCOS AND DSM BIDDING

ESCOs participate in DSM bidding for at least two reasons (Goldman and Wolcott, 1990). First, ESCOs are attracted to the financial incentive that the utility is willing to pay for the energy savings achieved. The ESCO can use the utility payments to (1) leverage additional financing, (2) undertake longer payback measures, or (3) pass through a portion of the benefit, giving the customer a better deal than it would otherwise have received and, therefore, make deals happen that might not have been possible. Second, ESCOs are attracted to the prospect of reduced marketing costs, if the utility is willing to aggressively work with the ESCO to market the program. For example, utilities may provide a list of of utility customers that represent good prospects for performance contracting, a list of customers with the right person to contact, and/or customer load data. Working through the utility's program will also give ESCOs credibility they might not otherwise have (for those utilities that have a favorable relationship with their customers).

Not all ESCOs are willing to participate in DSM bidding. Their level of participation in DSM bidding is constrained by a number of factors (Goldman and Wolcott, 1990). First, the performance guarantees may be onerous in some programs. For example, the $15/kW liquidated damages requirement for nonperformance by the ESCO (if it does not meet its contractually agreed upon demand reduction) for New York's programs is generally acceptable to ESCOs; however, the requirement in NEES's performance contracting program was 10-20 times that amount, and was felt to be too high by many ESCOs. Second, ESCOs usually prefer one-time, upfront payments to minimize transaction costs and maximize the net present value of the utility subsidy, versus payments over time. Third, ESCOs do not like intrusive impact evaluation requirements (e.g., submetering). Fourth, ESCOs do not like limits on eligible technologies or customer classes. Fifth, ESCOs want a utility that is fully committed to the successful implementation of DSM bidding. Utility commitment is difficult to measure; however, incorporating DSM bidding as an integral component of its strategic DSM delivery plan (rather than being ordered by a regulatory commission to undertake the program), extending the bidding program to 3-5 years (rather than a one year pilot), and obtaining rate incentives from the regulatory commission to promote DSM (rather than having profits depend on energy sales) help promote utility commitment to DSM bidding.

Sixth, ESCOs are concerned that DSM bidding may force them to do business unnaturally. For example, many bidding programs require ESCOs to specify the magnitude of energy savings at a competitively bid cost, for which it must make a security deposit, all without benefit of analyzing the customers' facilities as they are accustomed. And this is made even more troublesome when an ESCO has to make a bid for an entire service territory rather than an individual facility. It is very difficult to accurately estimate technical and market potential of energy savings in a utility's service territory, unless the ESCO incurs substantial upfront marketing costs and has access to information that only the utility may possess. These tasks can be reduced somewhat if the utility supplies load data, detailed electricity sales data, and existing audit data that can be used by ESCOs in bid preparation. Finally, stringent eligibility requirements, high upfront costs of bid preparation (for individual customers), and low ceiling prices (reflecting avoided costs) that do not adequately reflect performance and marketing risks by ESCOs may also constrain ESCOs from participating in bidding programs.

REGULATORS AND ESCOS

Some utility regulators see a number of advantages of using ESCOs in DSM bidding (Goldman and Wolcott, 1990). First, ESCOs' long-term contractual relationships with customers and the explicit obligation to monitor performance are incentives for ensuring energy savings are reliable and persist over time. For example, in a shared savings arrangement, the ESCO has strong motivation to operate and maintain the equipment at a high level of efficiency in order to make a profit. As noted previously, this long-term motivation contrasts with many conventional DSM programs in which customers simply

receive a grant (or a rebate) to install efficiency equipment and are then left to their own resources (often lacking and poorly motivated) to operate and maintain the equipment. Furthermore, performance contracting by ESCOs attempts to overcome a number of the perceived market and institutional barriers affecting customer investment in improved end-use efficiency options (Goldman and Wolcott, 1990). ESCOs are a source of one-stop shopping for a range of capabilities that utility customers often do not have. For example, ESCOs provide engineering and project management expertise which help customers assess and implement an optimal set of energy efficiency improvements, and ESCOs may arrange project financing. ESCOs also assume significant technical, financial, and operational risk in many projects because they typically receive a fee that is proportioned to the savings achieved. If there are no savings, there is no payment, and most ESCOs are willing to guarantee certain levels of savings. By using ESCOs in DSM bidding, these capabilities (engineering expertise, project and risk management, financing) are delivered to utility customers.

On the other hand, some regulators have reservations about using ESCOs in DSM bidding (Goldman and Wolcott, 1990). First, because of their interest in maximizing profits, it is generally perceived that ESCOs favor installation of short payback measures and seek to minimize their transaction costs. The predominance of efficient lighting retrofits in pilot bidding programs is often cited as an example of ESCO tendencies toward cream skimming and their inadequate attention to implementing a comprehensive package of efficiency options in the customer's long-term interest. Measures with long paybacks and/or requiring more difficult and costly investments are left by the ESCO to the utility to implement and finance through its own conservation efforts. Also, in some instances, ESCOs have reduced their marketing costs by concentrating on only the largest C&I customers, leaving the smaller C&I and residential utility customers unserved.

Second, reliance upon ESCOs may make the entire process of using ESCOs too complex and burdensome for the utility and its customers. For example, the potential difficulty of arriving at a method mutually satisfactory to the utility and the ESCO for estimating conservation savings is a problem. Even given agreement on weather normalization techniques, disputes may arise between the parties on the impacts of factors other than conservation (e.g., new equipment or processes, increases in space and/or employees, and changes in business conditions) on load changes. Massachusetts has noted this difficulty in agreeing on measurement techniques in negotiating with ESCOs (WEPCO, 1989). The necessary metering and measurement costs per facility are also likely to be significant, which may prevent bidding for smaller load customers, such as small C&I establishments or residential households. Also, the ESCO must negotiate relatively lengthy and complicated performance contracts with utility customers, many of whom are inexperienced in these types of transactions which require a difficult mix of technical, financial, and legal expertise to sufficiently negotiate. This problem often translates into extensive time required to move the projects to full implementation. ESCOs are very aware of this problem as the release of their security deposit is almost always a function of delivering their bid amount within a specified period of

time.[†]

Third, regulators are also concerned about the unfavorable image of ESCOs as fly-by-night operations that are in it for the money and not for good engineering. Fourth, in certain regions, regulators are concerned that the industry is underdeveloped and unable to provide enough ESCOs with a track record to ensure a competitive response to bidding solicitations. Fifth, while utilities usually pay only for measured conservation, the payments are, in general, based on measurements conducted over a relatively short period of 1-3 years. As a consequence, the long-term durability of conservation savings provided through ESCO projects past this time period may suffer.

Sixth, regulators, and utilities in particular, are concerned that ESCOs may get between the utility and its customers. Utilities want to make sure that their relationships with customers are not jeopardized. Involvement by ESCOs in a given utility service territory is generally over a limited period (1-3 years) covering the installation of conservation measures and immediate followup. Without the revenues from a continuing utility program, ESCOs cannot be expected to be available over the long run to address customer problems or to assist in meeting additional customer needs. Furthermore, during a bidding program, a customer can view the ESCO as an independent vendor of energy efficiency services or as an agent of the utility. If the former, the utility may be legally liable for deficiencies of the ESCO, in addition to possible harm to its public relations. If the latter, the utility can use ESCOs as an extension of its sales force and market the ESCOs as a customer service.

[†] This situation could be improved if a utility provides technical assistance to its customers in negotiating performance contracts; or assistance could come from state energy offices to procure performance contracts (see below).

STATE GOVERNMENT AND DSM BIDDING

Although local government has not participated in DSM bidding, the recent experience of the Washington State Energy Office as a bidder in Puget Sound Power and Light's (Puget) DSM bidding process provides at least one model of how a government agency can get involved in DSM bidding. In 1988, the Washington Utilities and Transportation Commission required Puget and other investor-owned utilities to develop and implement a least-cost planning process for the acquisition of additional generating resources (Chapter 480-107 WAC). Washington State's first competitive bidding process was one of the outcomes of this decision. In June 1989, Puget issued a RFP seeking 100 MW from demand or supply resources; the demand customers were to be from the C&I sector (Puget, 1989). In its RFP, Puget sought (1) long-term resources that would produce savings for at least 10 years and (2) 20-year contracts or more. Puget also desired projects that yielded annual electricity savings of 100,000 kWh or more (for one or more customers). Forty proposals were submitted by 29 developers, and, in 1990, Puget chose 8 nonutility sources to supply it with 137 MW of electricity within two years (5 of which were conservation programs).

The Washington State Energy Office (WSEO) responded to Puget's RFP in October 1989. WSEO felt that it was uniquely qualified for participating in Puget's bidding process due to: WSEO's experience in implementing conservation programs; its contacts with, and understanding of, diverse client groups; and its ability to target its conservation efforts to address client concerns. WSEO offered to sell 4.5 million kWh/year to Puget Power for 10 years, at an annual levelized price of $160,000 (WSEO, 1990). The energy savings would be obtained from conservation projects at a four-year college, two public school districts, and a group of Washington National Guard armories (Hirsch, 1990).

In its search for identifying willing and "high quality" candidate institutions, WSEO used the following criteria (Hirsch, 1990):

- ability to decide quickly whether to participate
- identification of electrical conservation project(s)
- successful track record in conservation project implementation
- ability to maintain and operate projects over at least the proposed 10-year term
- recognition of the value in sharing monetary project benefits with WSEO

Once the candidate institutions were identified, WSEO conducted the required technical analysis and made presentations to school board and college decision makers. Project funding was readily available from oil overcharge funds and state funds as loans (*ibid*).

Three challenges confronted WSEO (Hirsch, 1990). First, WSEO had to select a bid price. In this case, the bid ceiling was related to Puget's projected avoided costs over the next 20 years; WSEO assumed it needed only to bid below what would likely be the lowest cogeneration bid (90-99% of the bid

price ceiling), and WSEO selected a 90% bid price. Second, WSEO had to decide on the term of sale. Puget required sales to extend for a minimum of 10 years, and WSEO selected 10 years. Third, WSEO had to decide on the specificity of its bid. WSEO made their bid as specific as possible (identifying participants, technologies, and costs) because they wanted to be successful and establish a credible track record with the state's investor-owned utilities.

WSEO prepared a professional-looking, comprehensive bid package (Hirsch, 1990). WSEO is currently preparing a verification plan which centers on energy accounting and extensive, ongoing communication with the participating facilities. Energy accounting software will be used to determine a baseline and monitor ongoing energy consumption. Energy savings alone are expected to repay all loans within 6 years, and utility revenue will make it possible to repay these loans in 5 years, the traditional ceiling on loan repayment terms (*ibid*).

WSEO was one of the winning bidders in Puget's bidding process. An umbrella contract between WSEO and Puget was approved that allowed WSEO to install energy efficiency measures up to .5 MW in public facilities. This limit was set by WSEO because it wanted to go ahead with specific projects in the first solicitation and to earn credibility (personal communication from Gary Hirsch, Energy Program Manager, WSEO, Nov. 6, 1990). WSEO may be more ambitious at the time of Puget's next bid (May 1991) by offering 5-10 MW of conserved energy.

DSM BIDDING OPPORTUNITIES

Based on recent regulatory and legislative activities in Oregon and California, it is very likely that DSM bidding will be available soon to the cities participating in the Sustainable City Project. BPA is expected to offer its DSM bidding solicitation in early 1991 as part of an all-source competitive acquisition process (with a goal of 100 MW) (BPA, 1990). The acquisition and evaluation processes for conservation and generating resources will be conducted separately. All conservation and generation proposals will be combined into a single ranking for selecting proposals for negotiation. Nonutility sponsors (customers, ESCOs, local and state government energy office, etc.) are permitted in the DSM bidding process: they have to receive and provide to BPA a letter of endorsement from the serving utility, except for institutional buildings (government buildings, hospitals, schools, universities, etc.).

In BPA's DSM bidding process, bidders need to achieve a minimum annual electric energy savings of 2 million kWh and must sign 10 year contracts (energy savings must last that long). Payments will be performance-based, and energy savings must be verified through inspections. Bidders will have to provide performance security through replacement energy or a negotiable security (e.g., bonds, irrevocable letter of credit, certified check, or escrow deposit). BPA's program will have an early termination penalty (the balance of the total estimated energy savings not delivered will be used to calculate a one-time damage amount to be paid to BPA by the bidder). BPA prefers comprehensive packages of energy efficiency measures (some measures that are not considered cost-effective on an individual basis may be cost-effective when combined with other measures having relatively short payback periods). Bidders may be asked to specify recommended commissioning, operations and maintenance procedures to ensure achievement of the energy savings for the useful life of each measure to be installed. Bidders may also be asked to explain how the specified procedures will be implemented and continued over the useful life of the measures. Bidders may submit proposals to replace BPA conservation programs that they already operate. In such cases, the bidder must install energy efficiency measures that achieve at least the quantity of energy savings estimated for the existing program.

The Oregon Public Utility Commission (OPUC) is currently considering competitive bidding and would like to see how state and local governments could bid in bidding programs. If competitive bidding is pursued in Oregon, the process will need to satisfy the following general criteria:

- provide the opportunity to reduce overall energy costs, subject to economic, legal, and institutional constraints;
- complement Oregon's least-cost planning process;
- not unduly constrain utility management's prerogative to acquire resources through means other than competitive bidding; and

- should be considered an understandable and fair process by all participating parties.

The Oregon Department of Energy (ODOE) recommended that the OPUC adopt its proposed competitive bidding guidelines (ODOE, 1990). In addition, ODOE recommended that if BPA or utilities pursue DSM bidding, the State of Oregon should develop a conservation package and make bids (*ibid*).

The Portland Energy Office recently created task forces to assist the development of a new energy policy for the year 2000. The Transportation and Telecommunications Task Force recommended in its report that Portland coordinate and facilitate the sale of conserved energy coming from city-run energy-savings programs (Johnson, 1989). The task force's recommendation is consistent with the OPUC staff recommendation that bidding be used to decide which energy provider will supply power to the state's electric and gas utilities.

California recently passed a law ordering the California Public Utilities Commission (CPUC) to require one or more electric utilities to implement pilot projects for (1) DSM bidding before June 30, 1991 and (2) integrated auctions at the earliest practical time (Senate Bill 539). Similarly, gas utilities are required to test DSM bidding as a pilot project. The CPUC will prepare a report on the results of the pilot projects and on whether or not the state should adopt either, or both, (1) an integrated auction, or DSM bidding, for electric customers, and (2) DSM bidding for gas customers. The final report is expected in January 1993.

The California Legislature's Joint Committee on Energy Regulation and the Environment is developing energy efficiency recommendations for legislative action (California Legislature, 1990). One of the committee's draft recommendations is to require the CPUC to include, as part of its DSM bidding pilot projects, a component for bidding by local governments (Recommendation No. 26). Under this recommendation, the CPUC would be required to notify local governments of the availability of pilot bidding projects, and the California Energy Commission would be directed to provide technical assistance, upon request, to local governments in preparing their bid applications. A final report to the Legislature and the Governor, containing the final recommendations for legislative action, is expected in January 1991.

In addition to the near-term availability of DSM bidding in these regions of the country, local governments in general (and particularly those participating in the Sustainable City Project) are in a unique position to take advantage of energy efficiency opportunities as owner-operators of municipal facilities which consume significant amounts of energy, planners and regulators of new development, and general providers of services and assistance to their communities. Furthermore, some utilities see local governments as having lower risks (in terms of program success) than small businesses (personal communication from Jonathan Linn, CMP, Nov. 26, 1990). Small business customers may fail and leave the area while local government rarely leaves the community. As an example, CMP insists on liquid security for businesses, which, under the right circumstances, may be waived for local government (*ibid*). A

similar waiver was previously noted in the description of BPA's proposed DSM bidding program: local governments do not need a letter of endorsement from their utility. Finally, local governments' credibility and experience in dealing with customers may reduce high transaction costs associated with DSM bidding (especially for residential and small commercial sectors).

For local governments to participate in DSM bidding, they should have demonstrated the capability to produce efficiency achievements both in municipal facilities and in the provision of energy-related services in their communities. Cities can promote energy efficiency through education, technical assistance, financing assistance and investments, infrastructure and community improvement programs, and regulations. Recent reviews of the experience of implementing these kinds of programs are contained in Vine and Harris (1989) and Nadel (1990).

Specific energy efficiency programs that local governments might consider in DSM bidding include the following:

- Establish least-cost energy planning and implementation, including: (1) the establishment of energy efficiency performance goals that would represent the total amount of future energy efficiency which local government should strive to achieve; and (2) a comprehensive, comparative evaluation of energy efficiency options available to achieve these goals.
- Conduct extensive educational and training efforts to help support changes to new technologies in the building and construction industry.
- Develop a stronger local building code than state standards. Under existing law, local governments in California have the authority to adopt efficiency standards for new buildings which are more strict than the minimum state standards.[†]
- Ensure compliance with existing residential and commercial building codes, through training workshops and material for educating the building community.
- Require home energy rating and labeling guidelines for new and existing homes, in order to allow owners to make cost-effective decisions regarding options for improving the energy efficiency of their homes, and to encourage new home designers and builders to go beyond the minimum standards.
- Improve the energy management of existing and new facilities through building monitoring, commissioning, and operation and maintenance methods.
- Test new, high efficiency technologies in demonstrations and install measures with longer paybacks than would normally be attractive to private customers.

[†] On the other hand, for reasons of uniformity and economy of scale in researching and compiling standards, the state could provide a model code of energy efficiency standards which could be voluntarily adopted by local governments.

CONCLUSIONS

The recent interest and activity in DSM bidding around the country presents an opportunity for local government. Potential benefits for local government include increased installation of energy efficiency measures in municipal facilities and in the community, economic development, an additional source of revenue to help pay for municipal programs (including additional conservation efforts), and an enhanced local image. Accordingly, local governments should prepare themselves for DSM bidding by conducting the following steps:

- compare utility acquisition programs and proposed bidding processes
- examine the technical potential of City buildings for saving energy
- evaluate the advantages and disadvantages of participating directly as a customer or indirectly as a client of an ESCO
- make sure that participating in DSM bidding is compatible with the long-range interests of a sustainable city (especially in promoting economic development and environmental quality)
- ensure that expertise (inside or outside local government) is available to respond quickly to DSM bidding programs

Local governments need to view DSM bidding as one strategy among several for acquiring DSM resources. In particular, local governments should compare utility acquisition programs with proposed bidding processes because each approach has its own advantages and disadvantages, as previously mentioned. Because DSM bidding experience is limited, evaluations of DSM bidding will be of great value. For example, Niagara Mohawk plans to evaluate all aspects of its DSM bidding process: from the inception of the bidding program to identification of the final award group, contract negotiations, and DSM program implementation (Niagara Mohawk, 1990).

Local government will most likely participate in DSM bidding as a customer or as a client of an ESCO. ESCOs have been the primary participants in DSM bidding and will most likely continue to participate in DSM bidding, but with a cautious approach (due to the risks associated with guaranteeing the savings and their limited experience with DSM bidding (Goldman and Wolcott, 1990)). Local governments that plan to work with ESCOs will also need to be cautious, due to the perceptions of ESCOs mentioned previously and because of difficulties experienced in performance contracting (Weedall *et al.*, 1986).

Competitive bidding may provide a means to identify resource alternatives that would not otherwise be considered by local government. In addition, the results of the bidding process may be used to assist in the evaluation of the cost-effectiveness of resources that are acquired by other methods. Accordingly, DSM bidding should be best viewed as an additional means for developing new demand-side resources,

rather than the only one. The focus of most DSM bidding is on the short-term. Long-term objectives, especially with regard to sustainability, are often excluded in DSM bidding. For example, building codes, appliance standards, customer education, design assistance, and new pricing strategies offer cost-effective investment opportunities, but they are often excluded in bidding systems.

The complexities of filing DSM bidding applications will require expertise in legal, technical, and financial matters, some of which may require the use of outside consultants. Most local governments lack specialized technical expertise to participate in DSM bidding, and will require assistance from utilities and state energy offices. On the other hand, some cities have experience in collaborating with utilities on promoting energy efficiency programs. As an example, the City of San Jose and the Pacific Gas and Electric (PG&E) Company have agreed to enter into a joint marketing program where the City will be paid for marketing PG&E's new construction rebate program.

Another role that local government could provide in DSM bidding is more traditional: offering technical assistance to businesses that want to participate in DSM bidding. For example, to facilitate the use of performance contracting, local governments could develop educational materials, such as manuals, case studies, model legal documents, and computerized analysis models. To overcome the shortage of trained legal, engineering, and financial consultants in the community, local governments could develop specialized information services for these professionals including performance contracting seminars, guidebooks, and customer surveys. And to communicate with and attract local, state, and national contracting firms to the community, local governments could prepare a bidders' list and conduct liaison activities with contractor associations. The type of assistance offered by local government to its businesses could also be provided by utilities and state energy offices.

In closing, the cities of Portland, San Jose, and San Francisco have an opportunity to affect the type of DSM bidding process in their areas. By preparing for DSM bidding and actively participating in the development of utility regulatory rulemaking and utility bidding programs, these cities can make sure that (1) the option for customers participating in DSM bidding is not foreclosed (instead of being limited to ESCOs), and (2) technical assistance will be provided to local governments by utilities and state government.

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LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA
INFORMATION RESOURCES DEPARTMENT
BERKELEY, CALIFORNIA 94720