Moving Beyond Demand-Side Bidding: A More Constructive Role for Energy Service Companies

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Early experience with demand-side bidding suggests that non-utility energy service companies (ESCOs) can manage substantial performance risks, although bid prices are higher than the cost of utility demand-side management (DSM) programs. Program costs, including payments to winning bidders, utility administrative costs, and customer contributions, range from four to seven cents/kWh (levelized) for eight bidding programs examined. This paper explores alternative ways of procuring DSM resources that involve significant roles for ESCOs and which attempt to address problems that have arisen in the first generation of utility DSM bidding programs. These approaches include "replacement" bidding in which ESCOs compete against a utility's own DSM program, "partnership" bidding in which ESCOs offer to provide saved energy or comprehensive services that complement and expand on the type of activities offered by utilities, and DSM "standard offer" contracts which allow energy service providers to sign up customers and receive a specified fixed price for energy savings.

Introduction

With the advent of large-scale utility demand-side management (DSM) programs, there has been increasing controversy regarding the appropriate roles of utilities and energy service companies (ESCOs) in the design and implementation of these programs (Wellford 1991; Chernick et al. 1991). This paper examines the role and potential contributions of ESCOs in procuring and delivering DSM resources in the context of evolving utility program designs and regulatory policy objectives. The context is utility experience with energy performance contracting and DSM bidding programs because they have led to increasing and systematic involvement between utilities and ESCOs.

DSM bidding is an auction in which a utility generally solicits proposals from ESCOs interested in achieving specified amounts of DSM savings (e.g., 1,000 kW of demand reduction). The proposals are evaluated and selected competitively in terms of the price bid and other criteria such as the bidder's experience and qualifications, and its technical, marketing, and financing approach. The utility then pays the price bid (e.g., $500/kW) for DSM savings estimated or achieved within a specified period of time (typically two to three years). If the bidder fails to deliver the promised amount of DSM savings on time, it forfeits a security deposit.

There are many variations on the theme. Eligible bidders can include ESCOs that develop projects with utility customers on an energy performance contracting or "shared savings" basis, other vendors, or the utility's own customers. Bids can be structured as the price to supply a block of kW demand reductions, kWh energy savings, or both. DSM bidding can be undertaken in a fully integrated program with supply-side bidding to acquire independent power resources, or as a stand-alone program. The utility can target certain end use sectors (e.g., commercial and industrial) or allow an all-inclusive program. Payments to bidders can be made once or over time in installments.

This paper briefly reviews trends in utility implementation of the "first generation" of demand-side bidding programs, identifies problems that have been encountered, and explores alternative approaches for engaging ESCOs in the procurement of DSM resources. The goal of defining more constructive roles for ESCOs is based on the underlying premise that they can bring real benefits to utility accomplishment of DSM by overcoming market and institutional barriers in certain sectors and by shifting performance risk from ratepayers.

Trends in Demand-Side Bidding

Table 1 presents summary data on twenty DSM bidding programs in the United States for which awards have been announced at this time. The programs are presented in terms of whether DSM bidding was implemented in an integrated auction with supply-side bidding, as a separate auction, or as a program that engaged ESCOs to provide energy performance contracting services to utility customers. The table shows when requests for proposals

Table 1. Summary of Utility DSM Bidding Programs

Utility	RFP Issued	Amount Requested (MW)	DSM Projects Proposed (MW)	DSM Projects Winning (MW)	DSM Projects Proposed (# Bids)	DSM Projects Winning (# Bids)	C&LM Program Goal
Integrated Auctions							
CMP #1	12/87	100	36	17	13	6	≈65-105
CMP #2	5/89	150-300	30	9	9	2	≈65-105
PSE&G	8/89	200	53	53	8	8	≈360
JCP&L	8/89	270	56	26	8	4	≈200
PSI Energy	12/88	550	78	10	9	2	≈75
Puget	6/89	100	28	10	8	5	≈100
ORU	6/89	100-150	29	18	12	8	≈100
Niagara Mohawk	11/89	350	162	36	32	7	≈350
Con Ed	2/90	200	11.9	10.5	4	3	≈650
NYSEG	7/90	130	98	17	31	9	≈275
Separate Auctions							
LILCO	11/89	150/15	23	9	14	3	≈450
RG&E	9/90	50/20	67	24	19	5	≈50
Cent Hud	11/90	50/20	40	NS	7	NS	≈175
PSColo	12/90	50	131	59	64	NS	≈80
City of Anaheim	4/91[a]	150	77	NS	21	NS	≈60
Northern CA Power Authority	7/91	200	139	NS	12	NS	
BPA	/91	300	116	NS	41	NS	
Performance Contracting (DSM only)							
NEES	10/87	14	N/A	18.8			≈685
BECO	5/88	35	N/A	35			≈326
PEPCO	3/91	6	-	-			≈170

Notes: N/A = Not Applicable
NS = not selected yet

(a) Separate RFPs issued for customers and ESCOs on demand-side at different times in 1991.

(RFPs) were issued, the resource need requested by each utility in MW (including both demand and supply blocks in the case of integrated auctions), and the proposed and winning MW and DSM bids. In the last column of the table is each utility's current estimate of the cumulative load reductions that will occur from its existing or planned conservation and load management programs undertaken during the same time frame that bidders must achieve

their savings targets (i.e., 1994-95). Following is a discussion of some trends that are apparent from these data:

(1) The market response by DSM bidders of almost 1200 MW has been impressive when viewed in the context of the relative "newness" of the energy services industry. The DSM bidding market is growing as evidenced by the increasing number of bids and the magnitude of DSM savings being offered over time. The number of bids submitted recently has ranged between thirty and sixty in response to RFPs issued by Public Service Company of Colorado (PSColo), the Bonneville Power Administration (BPA), and some New York utilities such as Niagara Mohawk Power Corporation (Niagara Mohawk) and New York State Electric and Gas Corporation (NYSEG). In contrast, the number of DSM bids submitted in the 1987-89 time period typically ranged between eight and fifteen bids in RFPs issued by utilities in Maine, New Jersey, and Washington.

(2) Contracted savings from DSM bidding typically represent a relatively small part (ten to fifteen percent) of a utility's overall DSM program. This rather small contribution to overall utility DSM goals is attributable to such factors as the inappropriateness of bidding for all market segments or program types, the pilot nature of many of these programs, skepticism and hostility to bidding by some utilities, and the cautious response by DSM bidders given limited experience and substantial risks (Goldman and Wolcott 1990).

(3) ESCOs submitted the vast majority of DSM bids. Most utilities received only one to three small bids from individual customers, although PSColo was a notable exception. Process evaluations conducted by several utilities suggest that customers find the requirements of most bidding programs too complex, and transaction costs and perceived risks are high compared to opportunities offered through utility rebate programs (ERCE 1990).

(4) Figure 1 shows levelized bid costs that range from 3.5 to 6.5 cents/kWh for eight DSM bidding programs based on an analysis of signed contracts and interviews with utility program managers (the arrows in the figure represent a range of values). The figure also shows the avoided supply cost for each utility and the economic life assumed for DSM measures installed through the programs. The DSM bidding programs presented in this figure are marginally cost-effective in comparison with the avoided supply costs which often serve as a "ceiling price" that define an upper bound for DSM bids. The figure shows interesting variability in bid prices among the utilities. For example, bid prices were lower in the New England Electric System (NEES) program which made upfront payments (2.5 to 4.8 cents/kWh) to ESCOs based on engineering estimates compared to the bidding programs in New Jersey and New York e.g., those of Orange and Rockland Utilities (ORU), Jersey Central Power and Light (JCP&L), and Public Service Electric and Gas (PSE&G) where levelized payments (5.75 to 6.5 cents/kWh) are linked to measured savings over the life of the contract (Goldman and Busch 1991).

(5) There are some limited data on utility administrative costs of DSM bidding programs. In its Power Partners Program, Central Maine Power (CMP) found that its administrative costs are significantly lower (0.7 cents/kWh) compared to that for the company's own commercial/industrial DSM programs (2.0 cents/kWh) (Linn 1992). The bidding program costs to the utility are relatively low (on a per unit saved basis) because ESCOs are bearing a significant fraction of the marketing, administrative, and transaction costs (which include the cost of managing the performance risk that many utilities don't incur for their own DSM programs). These costs for measurement, operations and maintenance, and savings guarantees are estimated to range between 0.5 and 2.5 cents/kWh.

Problems With Demand-Side Bidding Programs

Very few utilities have completed the entire DSM bidding program cycle from initial solicitation to achievement of contract savings goals to maintenance of ongoing projects over the lifetime of contracts. Thus, it is not easy to fully evaluate the success of these programs which are still in the early stages of implementation. For this paper, a "successful" program is one in which goals and design objectives are clearly articulated, the bid selection and evaluation process is perceived as fair and reasonable, and the outcome produces significant benefits to ratepayers. By this standard, most ESCOs and many utility and regulatory staff give the current generation of DSM bidding programs mixed reviews, based on process evaluations and interviews of DSM bidders (ERCE 1990; Goldman et al. 1992; SRC 1992).

In a number of jurisdictions, programs have produced suboptimal results as evidenced by formal complaints filed by those frustrated with utility selection processes, failed contract negotiations, and delayed implementation of DSM measures (NYPSC 1991a and 1991b). Many ESCOs

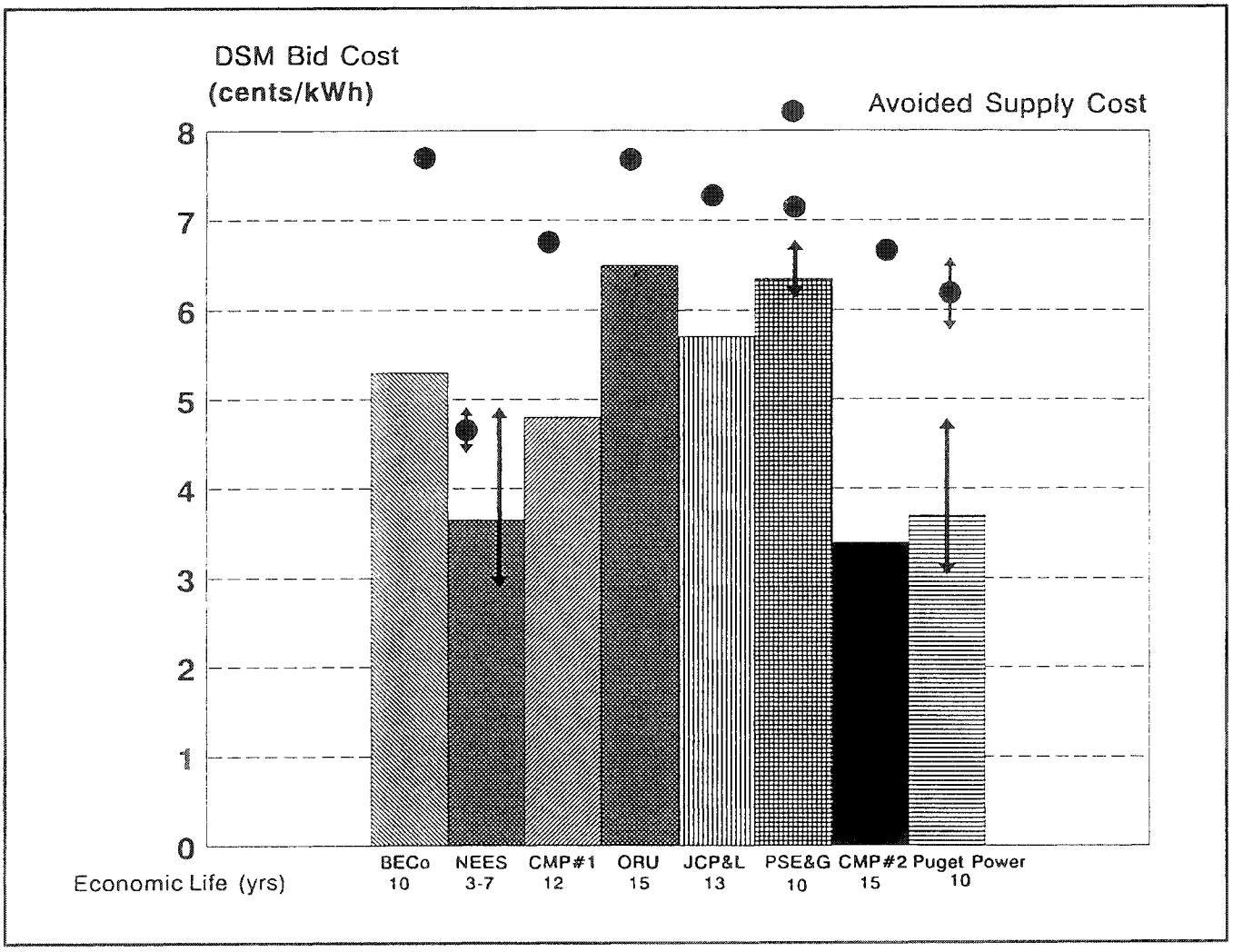

Figure 1. Utility Payments to DSM Bidders

believe that their industry is at a crossroads in terms of involvement in utility DSM programs. There is a fair amount of dissatisfaction with many of the current DSM bidding programs, even as these programs have helped to create a more vibrant, active, and maturing ESCO industry (Wolcott 1992).

Given the diversity among bidding programs, it is difficult to generalize on their limitations. Nonetheless, evidence has accumulated to suggest three program design and implementation issues that are problematic: (1) Limitations of "all-source" bidding; (2) High bid preparation and transaction costs; and (3) "Open-ended" RFPs. Following is a discussion of each of these issues.

Limitations of "All-source" Bidding

Many of the problems identified by DSM bidders are a byproduct of the difficulties of implementing integrated "all-source" bidding programs in which demand-side and supply-side resources are acquired through a single solicitation. These problems include scoring systems that do not establish appropriate weights for non-price factors relevant to DSM resources, measures of cost-effectiveness that do not account for the manifold costs of DSM programs (i.e., utility, customer, non-participant and societal costs), and contract terms and conditions that are not well-suited to DSM resources (Peters et al. 1991). Because of these limitations, it is not particularly useful to

structure competitive bidding processes that literally try to implement the concepts of integrated resource planning (IRP) under the assumption that "negawatts" are equal to megawatts. Requiring DSM providers to participate in auctions that are primarily designed for the procurement of generation resources produces suboptimal results (Goldman et al. 1992). Separate solicitations for DSM and supply-side resources are preferable, given inherent differences in resource characteristics and market structure.

High Bid Preparation and Transaction Costs

Bidding requires ESCOs to incur substantial bid preparation and transaction costs that are difficult to bear given the small size of DSM bids (relative to supply-side bids). ESCOs must specify a bid price, total savings, and a mix and cost of DSM measures based on limited information on the utility's customers. In order to minimize risk associated with preparing its bid, the ESCO has to invest substantial upfront time and resources in marketing and auditing customers.

As previously discussed, the major transaction cost that ESCOs face is the value for managing performance risk. In exchange for a fixed price payment, ESCOs agree to maintain and guarantee a specified level of DSM savings either in aggregate or at each host facility over the length of its contract. This obligation is not typically present in utility rebate programs which becomes an issue when utilities use the cost of their own DSM programs as a screening criterion for accepting or rejecting ESCO bids.

"Open-Ended" RFPs

Many utilities designed bidding RFPs which had minimal restrictions on market segments and eligible measures and provided only general guidance on the utility's expectations regarding cost-effectiveness criteria and requirements for the measurement of savings. Often, these RFPs were intentionally designed to be vague and "open-ended" at the urging of regulators who were interested in fostering innovation and wanted to place as few limits as possible on ESCO response. This approach may have been necessary in early phases, but greater specificity by the utility in carefully articulating its resource needs and constraints in the RFP ultimately benefits all parties (Hamilton and Flaim, 1992). For those utilities that offer comprehensive DSM programs, it is useful if they identify target markets and end-uses, types of services desired, and preferences with respect to geographic location in their bidding RFPs.

Alternative Approaches for ESCOS in DSM

Various approaches and innovative program design concepts that involve ESCOs in the delivery of DSM resources have been proposed or are being tested by utilities. In this section, a typology of ESCO programs is presented as a way of integrating all this emerging variability within a coherent framework. For example, most of the "first generation" DSM bidding programs are characterized as **Replacement Bidding**, either **DSM and Supply** (for integrated "all source" programs) or **DSM** (for stand-alone programs). Replacement bidding refers to the situation where independent power producers (IPPs) and/or ESCOs are essentially competing against the utility to acquire the same electric resources, i.e., their efforts "replace" the utility's efforts.

Of the new "second generation" of ESCO programs, first is the **DSM Standard Offer** which is a competitive DSM contract. This is followed by three types of "partnership" bidding. Partnership bidding embodies the concept that utilities and ESCOs agree to work cooperatively to develop the DSM resource. It can take the form of either peaceful coexistence or real collaboration. In this approach, there is the recognition of a joint mission between utility and ESCO and an accommodation of the operating requirements of the other party. Partnership bidding is examined in terms of three different models that represent varying degrees of this recognition and accommodation: **Partnership Bidding with Open-ended RFPs; Partnership Bidding with RFPs Targeted for Savings;** and **Partnership Bidding with RFPs Targeted for Services.**

Replacement Bidding (DSM and Supply)

Replacement bidding for DSM and supply explicitly defines a linkage between the IRP and resource acquisition processes. In its planning process, the utility identifies a resource need which can be met by either supply-side or DSM options for which IPPs and ESCOs can compete, respectively. The utility must exhaust all qualified offers from the marketplace that offer a price less than its own avoided cost and that are comparable on non-price factors before considering construction of its own power plant. This approach is the one adopted by those utilities that have issued integrated all-source RFPs. One goal of this type of program is to determine if ESCOs can provide DSM resources at a lower cost than IPPs or the proxy utility supply-side unit. Typically, the utility's own DSM programs are treated as committed and nondeferrable resources (Kahn and Goldman 1991).

As discussed previously, this approach has a certain theoretical appeal, particularly to those regulators who believe it provides a way to evaluate all resource options in a consistent IRP framework. Since integrated all-source bidding has been the source of many of the problems in the implementation of DSM bidding, utilities should be allowed to structure competitive acquisition processes for DSM and supply-side resources separately.

Replacement Bidding (DSM)

In DSM replacement bidding, there is explicit competition between a utility's own DSM programs and ESCO activities. A primary objective is to have ESCO bids provide a "price check" on the utility's estimated or actual DSM program costs. In effect, ESCOs serve the functional role that IPPs perform on the supply-side. Competition between ESCOs and the utility's own DSM program could occur at two stages: (1) implementation--explicit competition in the field between utility DSM staff and designated ESCOs in common markets and end uses; or (2) resource acquisition and selection--using an auction to compare ESCO bids to the utility's own planned DSM program and selecting the lowest cost alternative (Schultz 1992).

Madison Gas & Electric's (MG&E) Competition Pilot Program provides a unique example of how the first approach was implemented as a contest in the field between the utility and ESCOs. MG&E competed against individual ESCOs in each of three targeted customer sectors with each entity having a fixed budget. The objective was to determine which entity could achieve the most cost-effective conservation (based on a scoring system) over a defined time period (about one year). The competition was ordered by the Wisconsin Public Service Commission principally because it was dissatisfied with the pace at which MG&E was developing its conservation efforts. This approach was a policy tool that the regulators used to signal their concern to the utility's top management and to motivate them to undertake an aggressive DSM effort (Vine et al. 1992).

In the second approach, the utility would not offer its own DSM program if it determined that an ESCO could deliver comparable services more cost-effectively. This approach is being tested by several California utilities at the insistence of the California Public Utilities Commission. For example, San Diego Gas and Electric (SDG&E) has proposed that its existing electric and gas residential programs be put out to bid by third party firms (SDG&E 1992). Depending on the quality and type of bids received, the utility plans to select between one and three ESCOs to deliver efficiency programs for various residential end-uses (e.g., efficient appliances, compact fluorescent lights, and building envelope improvements). SDG&E will compare bid programs to its own DSM plan for that sector (keeping in mind its other objectives such as providing customer service and fostering innovation). If bidders can achieve greater savings or produce savings for less cost per unit, then they will be given the opportunity to implement the program. In this pilot program, competition between the utility and ESCOs occurs in the acquisition and selection phase and not in the field as was the case with MG&E.

Compared to replacement bidding involving both supply-side and DSM, replacement bidding for DSM offers the following advantages: (1) the regulator or utility can target price competition in DSM markets more precisely; and (2) the timing of DSM replacement bids is not necessarily dependent on a supply-side bid evaluation and contract negotiation process. Therefore, the utility can better coordinate ESCO activities through the bidding program with the pace of planning and implementing its own DSM programs.

DSM replacement bidding will be driven largely by regulatory policy and it is likely that regulators in some other states will follow California and Wisconsin in this regard. Regulators (and some ESCOs) are motivated by two concerns in promoting DSM replacement bids: (1) ensuring that utilities do not gain an unfair monopoly advantage in the energy services market; and (2) using DSM replacement bidding as a way of determining that DSM programs are being delivered in an optimal (not just cost-effective) fashion. The most promising variant of this approach might be to confine ESCO bids to the replacement of relatively mature utility DSM programs in which performance and measurement requirements can be well-specified and the utility's cost and savings estimates are well-grounded in actual experience. However, such explicit competitions between utilities and ESCOs might ultimately prove to be unproductive and will require significant regulatory involvement and oversight.

DSM Standard Offers

ESCOs have raised concerns that some utility DSM bidding programs have created onerous barriers which greatly limit their ability to develop DSM market opportunities. These barriers include artificially low ceiling prices, limits on eligible market segments and measures, restrictive franchising requirements, and unrealistic bid criteria such as requiring signed letters of commitment from specific customers (Wolcott 1992).

In response to these problems, the National Association of Energy Service Company (NAESCO) has proposed that

utilities consider testing another approach to providing DSM services by offering a "competitive conservation contract" (Fitzpatrick 1992). In this program, the utility would set the price it would pay for a measured unit of energy savings over a ten year lifetime. NAESCO recommends that the price be set initially at either eighty percent of the utility's avoided costs or at a level which would allow customers to keep fifty percent of the energy savings if the most cost-effective DSM investments are made. This standard offer contract would be available to any ESCO or vendor that could demonstrate its technical and financial competence to deliver the saved energy. Selected companies would sign up customers and present pre-installation audit results and measurement plans to the utility. Upon utility approval, the ESCO would proceed with the installation, measure the savings, and be paid over the ten year period.

The approach is adapted from the early experience with standard offer contracts for qualifying facilities under the Public Utility Regulatory Policies Act and has a similar rationale to encourage the development of a private energy services industry that delivers performance-based DSM. The program is attractive to ESCOs because they have relatively more control in developing market opportunities compared to bidding in a utility-specified program. In the typical DSM bidding program, ESCOs have to estimate both the aggregate bid price and quantity of demand or energy savings on the basis of limited information on customers in the utility's service territory. In contrast, under a standard offer, ESCOs can present demand reductions from specific host customer facilities after conducting a comprehensive audit, which will certainly reduce the ESCO's uncertainty and upfront bid preparation and marketing costs.

Public Service Electric and Gas (PSE&G) proposed a standard offer program in its DSM plan filed in 1992 before the New Jersey Board of Public Utilities which includes many of the key elements of NAESCO's proposal. Under PSE&G's program, energy service providers (including ESCOs, vendors, and customers) will compete to sign energy savings agreements with the utility's customers prior to a specified deadline (the end of 1993) or until a resource block is filled. PSE&G proposes a resource block of 150 MW of electric demand reduction and six million therms of natural gas savings to be achieved over a two year period. Savings must be delivered by June 1994 (except for savings related to new construction which must be provided by June 1996). Energy service providers would receive fixed payments of 4.0 to 4.5 cents/kWh for verified savings achieved in each year of the contract which would vary in length between five and fifteen years depending on the useful life of the DSM measures. The utility will require an entry fee ($1/kW) and a security deposit, and will specify eligible measures (efficiency, load-shifting, and fuel-switching), minimum project size, and prescribed techniques that must be used to measure savings. In terms of the relationship between utility and ESCO delivery of DSM, PSE&G proposes that it be allowed to compete directly against ESCOs in marketing the programs to customers. To do this, PSE&G will suspend its current DSM rebate programs and establish an ESCO to market its offerings. The program design will limit the "gold rush" phenomenon in that PSE&G will not accept new contracts once the resource block is filled or the deadline has passed.

Partnership Bidding with Open-Ended RFPs

In partnership bidding with open-ended RFPs, solicitations are issued by utilities for DSM resources in which ESCOs are encouraged to bid without restriction. There are no limitations on geographic markets, customer classes, or end-use technologies. Self-scoring systems are generally not used as they would tend to constrain the range of possible responses. Nonetheless, the utility retains substantial discretion in selecting winning bidders. The solicitation is "open-ended" in the sense that any approach that would accomplish the utility's objective can be considered.

For example, while the bidding program implemented by Public Service of Indiana had a specific peak-clipping load shape objective, its selection criteria were sufficiently flexible that a load cooperative was successful in bidding and winning an award. Such a bidding participant is unique in programs implemented so far and reflects the opportunity for creative response that an open-ended solicitation can provide.

Utilities that have used this approach represent an interesting subset of those that have implemented bidding programs. Examples include the City of Anaheim, California and the Northern California Power Authority. These utilities are relatively small and without much DSM program experience. They have implemented bidding programs on their own initiative primarily as a means of gaining experience in acquiring DSM resources and developing DSM programs. They also see that by working with ESCOs, they can determine the market potential for DSM without the risk of prematurely committing resources to implement their own programs. As such, this program concept will work best in a situation where the utility has few of its own programs. Otherwise, the untargeted activity of ESCOs could conflict with the utility's marketing efforts for its own programs.

Partnership Bidding with RFPs Targeted for Savings

A utility can undertake a bidding program to target the acquisition of DSM resources by ESCOs. The "target" can be DSM that complements existing utility DSM programs or that is implemented in customer classes that are not well-covered by the utility's own DSM programs. The implication is that the utility probably offers many of its own DSM programs and the targeting is a conscious effort to introduce unique ESCO capabilities that provide value-added to the utility offering. The targeting can occur at any stage between bid solicitation and program implementation. However, the usual case is an RFP in which the utility is clearly focused on a particular customer class or technical opportunity.

For example, Southern California Edison has proposed pilot DSM bidding programs targeted at schools and small office buildings. Niagara Mohawk experimented with a pilot partnership bidding program for its nonprofit customers which was quite successful. In that case, the utility recognized the fact that there were ESCOs that had made a business of serving specific niche markets in the nonprofit sector. One ESCO, for example, had been a provider of energy services to multifamily apartment buildings through the federal/state weatherization assistance program. Another ESCO had made a specific practice of serving medical clinics and nursing homes. Niagara Mohawk issued a limited RFP to a source list of such firms and invited them to submit their qualifications. All aspects of the contract, including the price for delivered savings, were subsequently negotiated.

Partnership bidding targeted for savings will work best where the utility defines specific ESCO niche markets for which it does not intend to compete with its own programs. The viability of ESCO/utility partnership arrangements with targeted RFPs hinges on the utility's ability to satisfactorily resolve market share conflicts at the planning and implementation stages. ESCOs are unlikely to embrace these programs if they are confined solely to very small and difficult-to-serve niche markets. State regulators would have the responsibility to define equitable approaches, particularly those regulators that direct utilities to conduct comprehensive and full-scale DSM programs. In some cases, explicit policy guidance on the role of bidders will need to be provided.

Partnership Bidding with RFPs Targeted for Services

Partnership bidding for services is an approach where the utility has developed a well-defined program and solicits ESCO bids as it might solicit bids from any other vendor of engineering and construction management services. In such a case, the utility may acquire more comprehensive DSM services and performance risk management by augmenting its program offering with ESCO participation. The utility usually selects firms primarily based on their qualifications.

In such bidding programs, the services can be acquired in either a "bundled" or "unbundled" form. Bundled services include the complete range of a typical ESCO's offering such as engineering, construction management, operations and maintenance, and performance guarantees. The price that the utility is willing to pay for this complete package of services may be fixed in relation to the utility's own rebate levels. For example, in a pilot bidding program, the Potomac Electric Power Company (PEPCO) acquired bundled ESCO services at a price that included a $200/kW premium above the utility's own financial rebate level ($300/kW) to compensate the perceived value-added of ESCO services. PEPCO was then willing to pay an additional $50/kW if ESCOs delivered a comprehensive program of DSM measures to the utility's customers.

Niagara Mohawk is currently considering a similar approach in a general solicitation for bundled ESCO services. While selection would be based on qualifications, the price for services would not be fixed but would be negotiated with each ESCO. Other utilities that are considering or implementing similar programs include Consumers Power, Detroit Edison, and Ontario Hydro in Canada.

In bidding programs that target the delivery of "unbundled" services, the utility seeks a specified menu of services from ESCOs. For example, in Northeast Utilities' Energy Action Program, ESCOs are solicited like any other engineering firm to simply provide engineering and construction management services. When the DSM measures are installed, there are no follow-on operations and maintenance services and no performance guarantees. ESCOs are selected based on a combination of qualifications and price on a time and materials basis. Green Mountain Power has implemented a similar program.

Conclusion

A principal benefit of DSM bidding compared to utility rebate programs is the assumption of many of the risks of DSM by ESCOs and host customers rather than by ratepayers. Based on bid prices in the initial programs, there is quite a range (0.5 to 2.5 cents/kWh) in the embedded cost of ESCOs bearing this performance risk. However, since there is little experience assessing DSM performance

risk over time, there is substantial uncertainty regarding the value of ESCO services. Do long-term contracts with ESCOs that provide payments in return for verified demand or energy reductions provide tangible value-added compared to a utility's own DSM program that includes impact evaluations and program cost disallowances for deficient performance? Does the value of performance guarantees vary by measure or customer class? These questions define a research need that must be addressed to confirm the benefits of ESCO implementation of DSM programs.

Evidence has accumulated from the "first generation" of DSM bidding programs. While there clearly have been positive developments, there also have been ambiguous and frustrating outcomes for both utilities and ESCOs. Nonetheless, many utilities that have had experience with DSM bidding acknowledge that ESCOs can play a constructive role in the delivery of energy services. This recognition has led to an expanding array of "second generation" bidding programs which seek to overcome problems with the current approach while taking advantage of the benefits that ESCOs can provide. The DSM standard offer is attractive to ESCOs because it reduces upfront bid preparation and transaction costs and provides ESCOs significant flexibility to develop market opportunities. Partnership bidding programs are attractive because they explicitly define the most appropriate roles and markets for both ESCOs and utilities. There is a chance that this new generation of DSM bidding programs may provide the best available vehicle for the long-term evolution of stable business relationships between utilities and ESCOs.

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References

Chernick, P., J. Plunkett, and J. Wallach. 1991. "Demand-side Bidding: A Viable Least-Cost Resource Strategy," Resource Insight, Inc.

ERC Environmental and Energy Services Company (ERCE). 1990. "Evaluation of the Orange and Rockland Utilities Competitive Bidding Program for Demand Side Resources." ERCE/PO-66, September.

Fitzpatrick, J. 1992. "Outlook for Bidding." *Proceedings of Conference on DSM Bidding: Status and Results.* Albany, New York, April.

Goldman, C., J. Busch, E. Kahn, S. Stoft, and S. Cohen. 1992. "Review of Integrated Resource Bidding at Niagara Mohawk." LBL-31667, Lawrence Berkeley Laboratory, March.

Goldman, C., and J. Busch. 1991. "Review of Utility Experience with Demand-Side Bidding Programs." *Proceedings of 5th National Demand-Side Management Conference*, Electric Power Research Institute, CU-7394, July.

Goldman, C., and D. Wolcott. 1990. "Demand-Side Bidding: Assessing Current Experience." *Proceedings of American Council for an Energy-Efficient Economy Summer Study.* August.

Hamilton, W., and T. Flaim. 1992. "Acquiring DSM Resources through All-Source Bidding: Lessons Learned." *Proceedings of Conference on DSM Bidding: Status and Results.* Albany, New York, April.

Kahn, E., and C. Goldman. 1991. "Role of Competitive Forces in Integrated Resource Planning." Lawrence Berkeley Laboratory, LBL-30982, October.

Linn, J. 1992. "Once the Bidding is Over, the Hard Work Begins." *Proceedings of Conference on DSM Bidding: Status and Results.* Albany, New York, April.

New York Public Service Commission (NYPSC). 1991a. "Order Denying Petition of Enersave and EUA Cogenex for a Declaratory Ruling with regard to the Commissions guidelines for bidding to meet the future electric capacity needs of the Niagara Mohawk Power Corporation." Case 90-E-1189, March 15.

New York Public Service Commission (NYPSC). 1991b. "Notice Requesting Comments on complaint of Northeast Energy Services against New York State Electric and Gas." Case 91-E-082, November 6.

Peters, J., D. Barry, M. Horowitz, and D. Wolcott. 1991. "A Dual State Bidding Program: Effects of Different Guidelines." *Proceedings of International Energy Program Evaluation Conference.* July.

San Diego Gas & Electric Company (SDG&E). 1992. "SDG&E Request for Proposals: Energy Efficiency and Customer Service Program for Existing Residential Customers (Draft)." I.91-08-002, April 3.

Schultz, D. 1992. "Report on the Demand-Side Bidding Proposals of Southern California Edison, Southern California Gas, and San Diego Gas & Electric." OII91-08-002, California Public Utility Commission, Division of Ratepayer Advocates, April 6.

Synergic Resources Corporation (SRC). 1992. *Proceedings of Conference on DSM Bidding: Status and Results*, Albany, New York, April.

Vine, E., O. DeBuen, C. Goldman, and R. Prahl. 1992. "Mandating Utility Competition: One Option for Promoting Energy Efficiency." *Utilities Policy*. January.

Wellford, W. H. 1991. "Fair Competition for DSM Services." *Electricity Journal*. 4:10, December.

Wolcott, D. 1992. "Why DSM Bidding Has Failed to Live Up to Expectations." *Proceedings of Infocast Conference on DSM Contracting and Financing*. May.