A Competitive Bidding Program to Encourage Industrial Energy Efficiency

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ABSTRACT

In 2004, MidAmerican Energy Company implemented an innovative competitive bidding program to engage large industrial customers in energy efficiency. Through the program, industrial customers submit bids within a competitive RFP process for energy efficiency funding. Bids specify the project to be completed and the financial incentives needed for the project to go forward. MidAmerican then evaluates the bids and funds the best ones received in each bidding round.

The Efficiency Bid® program has been highly successful. Program savings greatly exceed planned goals and have been achieved for less than planned incentive costs. The program has also helped reenergize industrial customers' involvement in energy efficiency, increasing participation in all programs, and improving customer satisfaction with energy efficiency and with MidAmerican in general. Program savings have also been extremely cost-effective. With savings coming in at costs of 0.08 to 0.6 cents per kWh, Efficiency Bid has clearly helped MidAmerican in *Cutting the High Cost of Energy*.

Efficiency Bid is a pilot program designed to operate for two years. After this period, MidAmerican will evaluate program success and decide whether to continue, expand or eliminate the program. At this writing, the program has successfully concluded two bidding rounds and is in the middle of a third round. The program has evolved over time, with lessons learned incorporated into each successive bidding round. MidAmerican hired Nexant, who had extensive experience with bidding programs elsewhere, as its program contractor to design and implement the program.

Background

MidAmerican is the largest utility in Iowa and also provides electric and gas service to customers in Illinois, South Dakota and Nebraska. Across all four states, MidAmerican serves almost 700,000 electric customers and more than 680,000 natural gas customers. MidAmerican's electric generating capability exceeds 4,800 megawatts.

MidAmerican Energy began offering large-scale energy efficiency programs to its Iowa customers in 1991. In 2003, the Iowa Utilities Board approved MidAmerican's latest energy efficiency plan (MidAmerican Energy 2003), which began implementation in 2004. Total energy efficiency expenditures in 2004, were $35.2 million, including $16.9 million on residential programs, $16.2 million on nonresidential programs, and $2.1 million on other programs (tree planting and research). The nonresidential programs include $7.4 million for electric efficiency programs, $1.0 million for natural gas efficiency programs, and $7.8 million for an electric load management program.

While the programs have been modified over time, nonresidential programs offered from 1991 to 2003 fell into one of four areas:

- Prescriptive rebates for efficiency lighting, HVAC, and motors
- A comprehensive new construction program for commercial buildings
- A curtailment load management program
- A set of "custom" programs allowing for projects not specifically addressed by the other three program areas

Programs for Large Manufacturing Customers

Most of MidAmerican's large manufacturing customers receive natural gas via transportation tariffs and therefore only participate in the energy efficiency plan through their electricity service. MidAmerican serves 135 electric accounts that exceed 2 MW and these accounts represent 107 unique customers. The largest sectors served by MidAmerican are food processing and metals industries.

Prior to the program changes implemented in 2004, large customers were very active in the Curtailment program, but did not participate heavily in the other programs. This situation frustrated customers, who felt that they were paying for programs that did not meet their needs; it also frustrated MidAmerican, who saw manufacturing efficiency opportunities that were not being implemented.

MidAmerican addressed this situation in the program development process for its new energy efficiency plan. MidAmerican gathered feedback from its large customers and from trade allies and identified the following market barriers to large customer participation:

- While large customers could participate in the prescriptive programs, customers often felt that the savings and rebates available were not worth the effort since the prescriptive measures did not cover opportunities in their core processes.
- The new construction program, while very effective for meeting the needs of new commercial building owners, was not really structured for manufacturing customers.
- While the custom programs, in theory, provided opportunity to address manufacturing processes, in practice they were not meeting this need. The custom programs were being positioned as a catch-all for projects that did not meet prescriptive program requirements, not as a program specifically targeting manufacturing.
- Manufacturing customers have very specific technical needs. The technical assistance offered through MidAmerican's programs was often geared towards the lighting and HVAC projects common in commercial buildings. Technical needs for large manufacturers can often only be provided from highly specialized consulting firms specific to industry niches or from the customers' own internal personnel.
- Program marketing materials were generally not targeted to the needs of large manufacturing customers. Although program materials were delivered to large customers through assigned Energy Consultants (i.e., key account representatives), they often ended up "on the shelf" and were not being utilized by most large customers.
- Manufacturing customer organizational structures also sometimes impeded efforts to address energy efficiency issues. While most manufacturing customers have structures that effectively address production issues, they are often inadequate to address energy issues, which are cross functional and require decisions that occur outside of normal reporting lines.

Based on this feedback, MidAmerican created the Efficiency Bid program to better meet the needs of large manufacturing customers. Through Efficiency Bid, customers specify their own projects using internal staff or specialty consultants. Customers then provide bids to MidAmerican specifying the financial incentives required to meet their internal financial hurdles. MidAmerican then evaluates all bids and funds the most attractive ones.

Program Features

Figure 1 outlines the key steps in each round of Efficiency Bid.

Figure 1. Efficiency Bid Process

Bid Package Development

Before publicly launching the RFP for each round, MidAmerican first develops a bid package including a program manual and program applications. A copy of the latest program manual, which includes detailed descriptions of all program features, can be found on MidAmerican's web site (MidAmerican Energy 2005). For the most part, the bid package developed for the first bidding round has been maintained; however, it has evolved over the rounds to incorporated lessons learned. Key program features addressed in the package include:

Project eligibility. Project sponsors submit bids, with sponsors being either individual customers or other companies acting as agents for a customer host site (e.g., ESCOs, contractors, equipment vendors, engineering firms, etc.). The customer host needs to purchase retail electricity or natural gas from MidAmerican on an industrial tariff and have a demand greater than 3MW. Hosts can aggregate multiple MidAmerican facilities to meet the 3 MW threshold, but measures proposed must be installed at all sites, where practical.

Projects need to provide a minimum of 200 MWh or 15,000 therms in annual energy savings. In addition, each customer host is limited to a maximum of 25 percent of the incentive budget for any given bidding cycle. Bidders can submit multiple bids or combine multiple projects within a single bid as long as these minimum and maximum size limitations are met.

In order to maximize flexibility for program participants, the program does not define specific eligible measures. However, MidAmerican requires that all measures:

- Produce measurable and verifiable reductions in demand and/or energy
- Produce savings through an increase in energy efficiency or better utilization of energy through the use of improved production equipment or controls
- Have a minimum useful life of 10 years

In addition, MidAmerican excludes from consideration measures that:

- Rely solely on changes in customer behavior and require no capital investment

- Merely terminate existing processes, facilities or operations
- Are required by state or federal law, building or other codes, or are standard industry practices
- Involve plug loads
- Received financial incentives through other MidAmerican programs
- Generate electricity
- Achieve savings through equipment maintenance, commissioning or operational changes, without an equipment efficiency upgrade

Bid prices. MidAmerican defines bid prices relative to annual energy reductions, expressed in $/kWh and $/therm. Bid payments are then calculated as the product of bid prices and annual energy reductions. Bid prices also cannot exceed preset ceiling prices. For the first two rounds, MidAmerican set ceilings at $.06 per annual kWh and $.50 per annual therm. For the third round, ceilings were increased to $.11 per annual kWh and $1.00 per annual therm.

Award payments. Cash payments are awarded in two installments. The first "installation payment" comes upon MidAmerican's acceptance of the post-installation report (see implementation and verification, below) and equals 50 percent of the total bid incentive based on the project's *estimated* savings.

The second "performance payment" comes after project verification. MidAmerican first calculates a total payment as the product of bid price and *verified* annual savings, and then calculates the performance payment as the difference between the total payment and the installation payment.

MidAmerican caps total payments based on the energy reductions offered in the bids. (That is, MidAmerican does not pay for verified energy savings that exceed bid savings.) In addition, payments are capped at actual incremental project costs.

Marketing

Bid rounds one and two employed a two-pronged marketing strategy; one-on-one meetings and customer workshops.

In the one-on-one meetings, Energy Consultants discussed program features and benefits with each eligible account. Energy Consultants were first briefed on the program so that they could effectively discuss its features and answer general questions. Customers with detailed questions were then referred to the program contractor. Energy Consultants also offered to help customers identify attractive projects for bid proposals. Where appropriate, the program contractor was called in to perform facility assessments to help identify attractive projects.

Four customer workshops were held for each bid round. During the workshops, the program contractor described program features and responded to customer questions.

The marketing strategy was changed for the third bid round to blend the best features of the earlier strategy, expanding the one-on-one meetings and eliminating the customer workshops. The expanded one-on-one meetings included the Energy Consultant, the program manager, and the program contractor. This allowed MidAmerican to respond to detailed customer questions immediately, and to help the customer identify and overcome participation barriers. MidAmerican found that with this expanded one-on-one approach, the customer discussed program questions more freely than they did around other customers in the customer workshops.

Bid Submissions

Sponsors submit bids using forms included in the bid packages. The forms document:

- Bidder information
- Bid prices and target energy reductions
- Project descriptions
- Project incremental costs and savings
- Past participation in MidAmerican energy efficiency programs
- Detail on the assumptions and calculations used to estimate proposed energy savings

MidAmerican does not require sponsors to identify specific projects; however, MidAmerican gives preference in the evaluation process to bidders with identified projects. In practice, all bidders to date have proposed specific projects. Bidders must also submit hard-copy bids to MidAmerican's contractor by the bid deadline. No electronic, email or fax bids are accepted.

Bid Evaluation and Selection

MidAmerican considers the following parameters in evaluating bids:

- Cost-effectiveness
- Project specificity (identified projects receive higher scores)
- Overall quality and responsiveness
- Performance in previous programs or other measure of ability to deliver estimated savings

Cost effectiveness is evaluated from a variety of perspectives, but in the end, the key measure used in the evaluation was the net societal benefits delivered per dollar of incentive bid. Beginning with the third round, bids that create a simple payback on incremental project costs (after the requested incentive) of 6 months or less will be placed at the bottom of the ranked list of bids received for that cycle. Based on this evaluation, MidAmerican allocates the available incentive budget to the most attractive projects and then informs successful bidders of their award amount.

Implementation and Verification

Customers complete a "pre-installation report" (PIR) form to confirm that the implementation of the project as bid will begin (i.e., there have been no substantial changes in scope). The PIR alerts the program contractor to carry out preliminary M&V. Upon completion of the project, the customer submits a "post installation report" (POR), detailing the "as-built" status of the project. Upon receipt of the POR, MidAmerican funds the installation payment. Customers must commence installation activities within 9 months of the PIR and must complete installation within 15 total months.

The program contractor develops a verification plan for each awarded project. Verification approaches are customized for project, and can include:

- "Deemed" savings estimates based on industry standards
- Spot measuring of key savings parameters, or
- Full measurement using metering billing analysis or computer simulation

After verifying project savings, MidAmerican funds the performance award.

Program Results

A total of 21 projects from 12 customers were submitted in the first two bid cycles, including 16 projects in Bid Round One and 5 projects in Bid Round Two. All proposals were submitted directly on behalf of customers; no ESCOs or other agents acted as sponsors. The 12 customers represent over 20% of the 56 customers with over 3 MW in peak demand that were eligible for the program. Table 1 lists the projects submitted in each round. As the table shows, the program has been successful at capturing projects integrated within core industrial processes (as opposed to lighting and HVAC projects).

Across both bid rounds, 14 projects are currently moving forward with implementation. The 14 projects provide only electric savings (no natural gas savings) with total savings of almost 13 million kWh per year. This far exceeds the program goals from the Energy Efficiency Plan, which were to achieve 3.4 million kWh from the projects enrolled in the first year.

Table 1. Summary of Submitted Bids

Customer Type	Project Type
Bid 1	
Successful Bids	
Cold Storage Warehouse	Refrigeration system EMS
Consumer Products	Power quality improvement
Consumer Products	Chilled water system study
Food Processing	Hammer mill replacement
Food Processing	Exhaust fan
Food Processing	VSD
Food Processing	Compressed air
Food Processing	Compressed air
Food Processing	Heat revisions
Pharmaceuticals	AHU reduction & cooling
Plastics/Consumer Products	Chillers & reject heat
Wastewater Utility	Rotary drum thickeners
Rejected Bids	
Food Processing	Defrost efficiency study
Food Processing	Fire system compressor
Food Processing	VSD
Transportation Equipment	Compressed air system upgrade
Bid 2	
Successful Bids	
Food Processing	Condenser fan VSD
Food Processing	Defrost efficiency study
Pharmaceuticals	Freezer compressor; lighting; AHU
Pharmaceuticals	Setback on hoods & BSCs
Transportation Equipment	Compressed air system upgrade

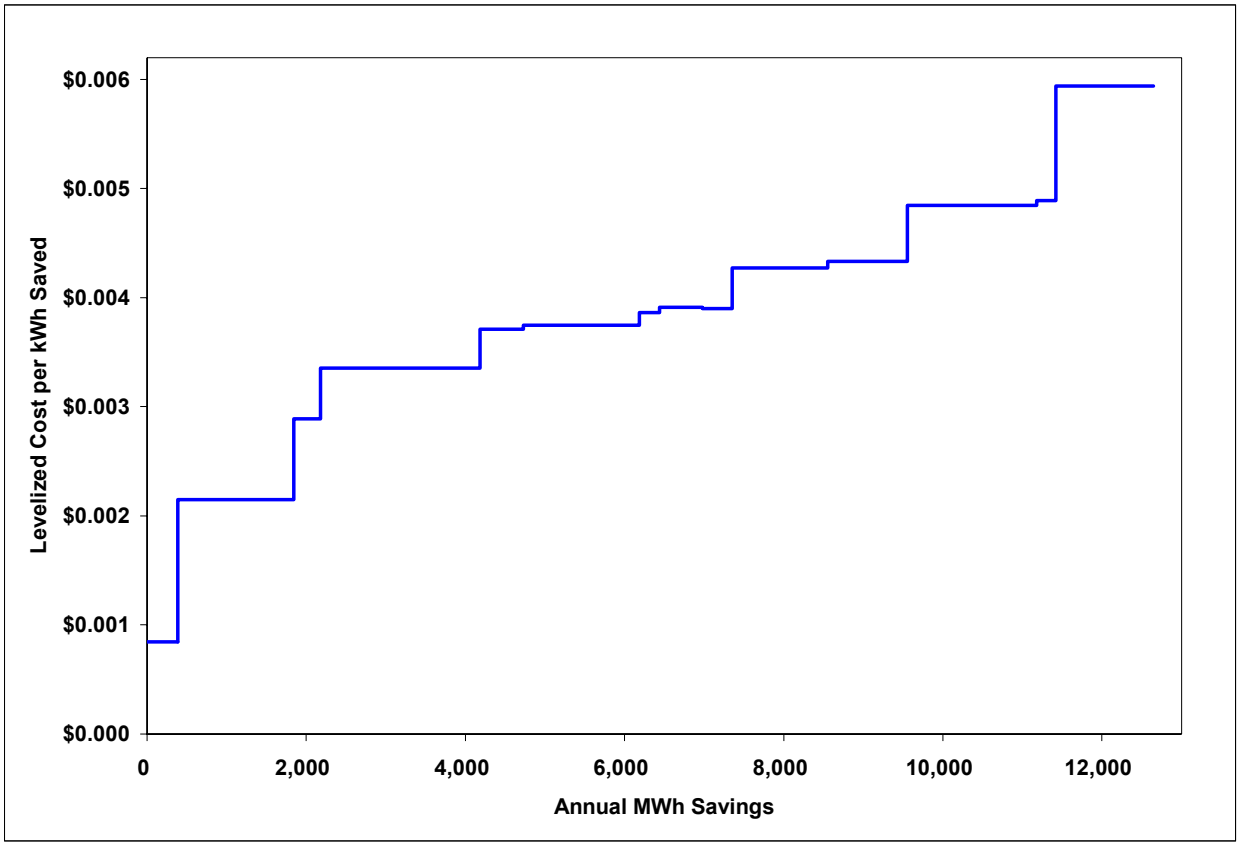
Bid prices ranged from 1 to 6 cents per annual kWh and averaged 4.2 cents per annual kWh. Accounting for measure lifetimes, the projects have levelized lifecycle costs ranging from 0.08 to 0.6 cents per kWh. Figure 2 displays the supply curve for the 13 projects. These results clearly coincide with the theme for the conference: *Cutting the High Cost of Energy*.

In Bid Round One, MidAmerican offered awards to 12 of the 16 proposed projects. Three customers declined to accept incentives after projects had been restructured and no longer met customer or MidAmerican criteria. MidAmerican reallocated the awards for these three projects to future bid cycles.

Of the five projects rejected by MidAmerican in Bid Round One, one was deemed ineligible for being not fully responsive to the bid requirements. The other four projects were informed that they rankest lowest on the evaluation criteria, but were encouraged to restructure their bids for submittal in Bid Round Two. Of these, two resubmitted the bids and both were funded by MidAmerican.

In Bid Round Two, MidAmerican offered awards to all five proposed projects. MidAmerican did not fully expend its incentive budget in Bid Round Two, and so reallocated unspent funds to future bidding rounds.

Figure 2. Efficiency Bid Supply Curve



Customer Satisfaction

Response to the program from large customers has been overwhelmingly positive. They perceive the program as being developed specifically for them and as meeting their unique needs as large, manufacturing customers. The program and related activities have also re-engaged these large customers in the overall energy efficiency process. In 2004, almost 60% of large customers participated in at least one efficiency program and program incentives to these customers increased by 60% over 2003.

The testimonial of one participant gives an example of the kind of customer service impact MidAmerican hopes to have on all Efficiency Bid participants: *"I would say this program helped change the mindset that we had towards our utility company. We view MidAmerican now as a vital partner in our business operations."*

Lessons Learned

MidAmerican has evolved the program design through three bid cycles. Key lessons learned include:

Fit Within Program Portfolio

It is important to ensure that a bidding program falls into synch with other, more traditional, programs that are offered, so that the customer is offered a range of programs with consistent and complimentary risk/reward ratios. At first, customers had trouble deciding whether or not to participate in Efficiency Bid, because it was unclear if the program was "better" than other programs. MidAmerican needed to clearly identify the features, benefits, risks and potential rewards of the program to help customers make this decision.

In better defining program risks and rewards, MidAmerican made three adjustments to the Efficiency Bid program.

- MidAmerican changed the bid evaluation approach to penalize bids that would lower project payback below 6 months. This brought program payback criteria—relative to program risks—more in line with other programs.
- MidAmerican also stopped funding studies and other analyses through Efficiency Bid and instead steered all technical analyses through another program. This removed an inconsistency in funding technical analyses across programs and removed a potential new participation barrier (i.e., analyses bids that did not get funded through Efficiency Bid).
- MidAmerican increased the bid ceiling to encourage customer perceptions of increased reward resulting from participation in the bidding program and to encourage more projects.

Marketing

Although the program has clearly maintained the competitiveness necessary to keep bid prices low and extremely cost effective, the low bid volume in the second round resulted in every bid being funded. In the long term, if this situation continues, competitive pressure might decrease and bid prices might rise. The effectiveness of the marketing strategy is critical to maintaining adequate bid volume.

Technical Assistance

Although customers possess a great degree of technical knowledge regarding their specific processes, it was still beneficial to use walk-through analyses to help identify potential bid projects.

Conclusion

MidAmerican's Efficiency Bid program has been successful at almost every level. Savings exceed program goals by a factor of more than three and incentive costs are below the program's original budget. By leveraging customers' specialty technical expertise, the program has also successfully attracted projects often absent from other utility programs: projects integrated within customers' core manufacturing processes. Marketing strategies specifically geared to large manufacturing customers have been successful at attracting customers to the program and also re-engaging these customers in the overall energy efficiency process. Program efforts have helped increase participation in all programs and also have had a direct impact on customer satisfaction.

References

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