Inducing Efficiency Via Collaborative Purchasing: An Examination of Conditions for Success

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This paper explores the collaborative purchase process as it relates to inducing the purchase of energy efficient products, namely appliances.Using a theoretical foundation as a basis, this paper identifies important stake holders in collaborative purchasing efforts and recognizes conditions that motivate these stake holders to participate. A case study is presented to illustrate the conditions for success. All purchase decisions may be different but there is a common thread among them which are examined in this paper.

Collaborative purchasing or joint procurement is certainly not a new concept. Its continued appeal likely stems from a promise of outstanding rewards to those who participate, and the fears of missing out for those who do not.

With regards to energy efficient appliances, purchasers have historically been reluctant to pay a premium despite the promise of decreased energy costs. Through collaborative purchasing, this barrier can be overcome as a high efficiency appliance can often times be purchased at a lower cost than a standard efficiency unit due to volume discounts.

While the concept is simple, its successful application in encouraging the development and use of energy efficient appliances is largely reliant upon the conditions surrounding stake holders and the product at hand. For example, a purchaser is an obvious stake holder in a collaborative purchase. His or her relationship with existing vendors, familiarity and satisfaction with existing quality and other product characteristics, and requirements for customized adjunct services (e.g. financing) can all represent impediments to, or opportunities for participation. From a manufacturer's perspective, the number of competitors, profitability of the product, market share, level of un-depreciated investment in existing manufacturing facilities, etc. can all influence a decision to develop and offer high efficiency products under a collaborative purchasing effort. For example, as the following case study will show, the effect of the regulatory ban on CFC's was a major factor in Maytag Corporations decision to retool and offer a new CFC free product which at the same time is energy efficient.

Using a theoretical foundation as a basis, this paper identifies important stake holders in collaborative purchasing efforts and recognizes conditions that motivate these stake holders to participate. The paper then provides pragmatic considerations resulting from a case study of a joint procurement effort for super-efficient apartment-sized refrigerators.

The Consortium for Energy Efficiency (''CEE'') is a non-profit organization focused on developing and implementing nationwide market transformation initiatives which will improve energy efficiency and environmental quality through market based strategies.[1] These approaches include common efficiency specifications, incentives and bulk procurement. With shrinking utility DSM budgets, CEE hopes to aggregate utility efforts into market pull strategies which will bring super efficient products into the marketplace. The idea is to create a large potential market so that manufacturers will offer product to meet this demand.

To conclude, the paper applies the conditions identified later in the paper to other appliance markets and speculates as to those lending themselves to successful market transformation through collaborative purchasing efforts.

Apartment Sized Refrigerators—A Case Study

This bulk procurement effort was initiated by the New York Power Authority (NYPA) as part of its long term ten year electric supply agreement with the New York City Housing Authority (NYCHA). NYCHA is the largest public housing authority (PHA) in the U.S. with 180,000 apartments in 2,700 buildings. They are also NYPA's third largest customer in south-east New York with an annual electric cost of $80 million. To gain a better perspective of their size it should be noted that the second largest PHA in the U.S. is the Chicago Housing Authority with 40,000 units. As all of NYCHA's buildings are master metered, the resulting savings from a refrigerator program accrues to NYCHA. Through the U.S. Department of Housing and Urban Development (''HUD''), all PHA's receive a yearly subsidy from HUD based on a three year rolling average of the electric costs. Therefore the incentive to save would be lost for the PHA since any resulting savings have to be shared 50/50 with HUD. Therefore, in June,1994, HUD issued their final rule on changes to the performance funding system (PFS)

whereby a PHA could enter into an energy services contract with an outside firm for the purposes of saving energy and keeping the savings.[2]

The impetus for this program was in part due to the success of the SERP program, which resulted in the development of the Whirlpool 22 cubic foot side by side refrigerator which consumes 625 kWh annually. The footprint of the SERP unit exceeds the refrigerator cut-out in NYCHA apartments. The essence of this program was to incorporate the SERP technology into a smaller, 14 cu. ft. unit.

The desire to do so was in the fact that the Whirlpool SERP unit uses 28.4 kWh per cubic foot (625 kWh / 22 cubic foot). Extrapolating this to a smaller 14.8 cubic foot unit would yield 421 kWh per year. Current refrigerators in this size use 620 kWh per year with the best units using 498 kWh per year. Upon realizing this, it was generally agreed that the technology was there, as demonstrated by SERP, but the market was not well formed. In fact, the U.S. Environmental protection Agency (''EPA'') had published a report which had shown that the technology was available.[3] This report addressed an 18 cubic foot top mount refrigerator but it was generally agreed that the same savings could be achieved in a 14 cubic foot model.

In planning this program the New York Power Authority held many meetings with participation from several organizations including the Department of Energy, The New York City Housing Authority, the Environmental Protection Agency, and the Consortium for Energy Efficiency. As a result of these meetings a Request for Proposals (''RFP'') was generated which borrowed language from General Service Administration (''GSA'') solicitations and from past PHA solicitations. By incorporating this ''boilerplate'' it is hoped that other PHA's can use this agreement so as to piggyback onto the NYPA contract with Maytag.

Early information identified a market for this 14 cubic foot size of 1.5 million units annually with 75% of the sales being in bulk purchase. What this means is that 75% of the people who purchase these units are not necessarily the end users.

From these meetings information was conveyed that the DOE planned to introduce a new refrigerator standard effective in 1998. This standard, which had been agreed to by the refrigerator manufacturers association (AHAM), seemed likely to occur.

The goal of the NYPA procurement effort was to entice a manufacturer to develop a refrigerator in 1997 which uses 30% less power than the '93 standard, then in 1998 introduce a unit which uses 40% less energy than the 93 standard and finally in 1999, introduce a unit 50% more efficient.

Due to the legislative changes occurring in Congress over the appropriations process and several amendments such as the Parker amendment which were aimed at stopping the proposed new refrigerator standards, manufacturers were reluctant to commit to a contract into 1999. However, MAYTAG Corp. had proposed under its Magic Chef label to produce a model using 437 kWh / year in 1997. The problems with this bid were three fold: 1) Maytag did not offer a model in 1996 which met NYPA's specifications; 2) the proposed units were one inch wider than the specification of 28''; 3) Maytag was unwilling to commit to units for 1998 and 1999 which met the 40% and 50% efficiency factors.

Learning from this process, a revised RFP was prepared and issued in August, 1995, which only addressed 1996 and 1997 specifications. In this RFP, a life cycle cost benefit analysis would form the basis for unit selection. In addition, NYPA could award a contract to more than one manufacturer. In response, Maytag exceeded the original energy efficiency specification for 1997, and reduced the width of the unit to meet the original specification as well.

For the 1997 Maytag unit, an order window was set up from September 1, 1996, until November 30, 1996. All orders received during this window are to be guaranteed for delivery in 1997. Orders received outside this window may be honored at the decision of Maytag. The minimum order for delivery is 81 units.

Due to the uncertainty involved with other customers ''piggybacking'' onto the NYPA agreement Maytag has chosen to limit the number of piggybacked orders to 40,000 units, plus the NYPA order of 20,000. Maytag will only accept these orders from PHA's, not privately managed housing or from federal GSA customers. Their reason for doing this involves the unknown credit worthiness and payment history of many customers. The refrigerator offered by Maytag under its Magic Chef label will be available for resale through its established distribution network so that all consumers can benefit from this collaborative purchase.

DISCUSSION

For years utilities focused resources on informing consumers of life cycle costing as a means to sell energy efficient technologies. Although significant educational efforts were launched around the concept, the concept had not universally taken hold when it came time to making a purchase decision. As a result, utility rebates and other incentives emerged to buy down first costs of energy efficient applications. With a changing utility and regulatory environment, alternative forms of market transformation have been increasingly called upon as a means to influence energy efficiency. Bulk procurement efforts promise to play an instrumental role.

To varying degrees and in various forms, market transformation efforts have contributed significantly to energy efficiency developments. Case and point is the bulk procurement program currently marketed nationally by the Consortium for Energy Efficiency (CEE) and developed through the collective efforts of the New York Power Authority (NYPA), the U.S. Department of Energy (DOE), and CEE. The benefits already achieved through the Super-Efficient Apartment-Sized Refrigerator Initiative are substantial in terms of obtaining a commitment from a major U.S. manufacturer to produce a new-to-the-market appliance and to make it available at an outstanding price. Once deliveries occur in 1997, the total impact in terms of economic, energy and demand savings are expected to be tremendous.

In order to replicate or transfer the successes of the apartment-sized refrigerator effort to other applications, it is necessary to recognize the conditions and factors in alternative markets that contribute to stakeholder motivations.

One of the most important conditions for a successful bulk procurement effort is developing a request for proposal (RFP) that recognizes the proper balance of requirements for all key stockholders. Manufacturers, distributors, consumers, and external players broadly comprise this group. While a comprehensive understanding of the motivations, desires and necessities of all stockholders would be useful information in formulating a procurement program, the reality is that such information is expensive to come by. However, recognition of influencing factors is not costly and can serve as a framework for screening procurement efforts. Below is an extensive list of factors for consideration:

Market
- Market size
- Project market growth rate
- Stability of appliance market
- Expected and actual life span of appliance

Consumer Factors
- Density of purchase orders
- Minimum procurement order quantity/delivery size
- Relationship of purchaser vs. user
- Importance of appliance settings
- Importance of reliability
- Purchase price per unit
- Consumer price sensitivity
- Breakout of purchase order volume (i.e. average units purchased per order)
- Brand loyalty
- Buying power
- Complexity, cost, and importance of traditional distribution channels
- Expected and actual life span of appliance
- Manufacturer and product reputation
- Level of perceived variation in bulk procurement product quality
- Relationship with distributors
- Operation costs (considers consumption and cost per kWh)
- Responsibility for operation costs
- Maintenance costs
- Opinions of key influencers (e.g. consumer reports)
- Consumer awareness of cost of operation
- Adjunct services (e.g. delivery, set-up, on-site repair, financing, disposal of appliance being replaced, etc.)
- Applicable utility rebates or other incentives
- Timing of appliance need vs. program availability
- Procurement requirements of the procuring organization

Distribution Channels
- Minimum order quantity/delivery size
- Profitability margins
- Complexity, cost, and importance of traditional distribution channels
- Relationship with manufacturers
- Role under a bulk procurement effort

Manufacturer
- Manufacturer and product reputations
- Number of competing manufacturers
- Bulk procurement concept consistent with desired product positioning
- Minimum order quantity/delivery size
- Market share vs. targeted market share
- Stability of appliance market
- Profitability margins
- Expected and actual life span of appliance
- Production economies of scale
- Relationships with distribution channels
- Importance of maintaining positive relationships with traditional distribution channels
- Level of distributor mark-ups
- Applicable utility rebates or other incentives
- Required retooling costs of production facilities
- Planned production facility upgrades
- Ability to control product marketing messages anticipated market share gain for the appliance at hand
- Anticipated negative impact on market share of manufacturer's other appliance lines
- Anticipated revenue loss due to reduced pricing to customers willing to purchase at a higher price
- Anticipated spillover effect on other household appliances of the same manufacturer (due to ease of communicating with a single service company for repairs, warrantees, etc.)
- Sales commission rates
- Level of reduced non-payment risk or expedition of payment
- Avoidance of market risk (lock-in

Magnitude of core purchase order
Anticipated total order versus production capability

External Factors
Efficiency Standards
Environmental Standards
Applicable utility rebates or other incentives

As an example, using the above factors we can develop a collaborative purchase for energy efficient clothes washers. To do so, we must first understand the market. Many questions must first be answered. First, what is the size of the market? Is it a mature market dominated by a few manufacturers? Where are the growth segments located? Who are the largest purchasers of this equipment? Next, we must examine the consumer and understand the decisions which a consumer makes in selecting a clothes washer. Also, we must understand the distribution channels. What happens when a clothes washer leaves a manufacturing plant, but before it arrives in a consumers home? This is an important question since this relationship may be vital as the clothes washer is primarily a consumer oriented product. Just as important is the manufacturer. Here, there are many sensitive issues which are often difficult to answer. By meeting with several manufacturers one will get a sense of their commitment to a collaborative purchasing initiative.

Finally, there are several external factors which will play a key role in the development of a clothes washer procurement. Upcoming efficiency standards, although now delayed, may have a force in prodding a manufacturer to offer a model meeting the specifications. Another strong factor is the resulting savings in sewage costs due to less water being used. In various parts of the country many municipalities are having to invest huge amounts of money in sewage upgrades which could be saved if the discharge was decreased. The key here is to understand these external factors and apply them where it is necessary.

A common thread for all five of these factors (Market, Consumer, Distribution, Manufacturer and External) is economics. Ignoring this is tantamount to failure. All people including consumers, corporations and municipalities are driven by economics. Energy efficiency for energy efficiencies sake is worthwhile but is unlikely to be implemented unless everyone benefits. The key is to develop a ''Win—Win'' situation.

One of the key benefits of taking a lead role in a bulk procurement effort is the ability, within reason, to tailor appliance specifications to the needs of the sponsor organization. Independent of a procurement effort, a market may develop for the exact product specified, but not likely. In successful applications, the value secured by participating exceeds alternative scenarios even though some of the leveraged value is allocated to meeting specific, not necessarily universal, requirements of the specifier. For example, if efficiency characteristics are of the greatest importance to the specifier, but not necessarily other bulk procurers, a percentage of the unit's purchase price is representative of efficiency upgrades. In such case, a portion of the buying power leverage is allocated to efficiency upgrades. As long as the ultimate value of the new appliance exceeds alternative choices (price held constant) rational purchasers will participate and, thus, contribute to transforming the market for energy efficient appliances. If another procurer took the lead specifier role without specifying energy consumption levels, the same or similar buying group could potentially participate in a procurement effort resulting in a completely different, non-efficient, outcome.

Based upon end uses with significant consumption, as well as the conditions that give rise to successful bulk procurement efforts, the following applications may be candidates for future efforts.

Clothes washers
HVAC equipment

Coin operated clothes washers may be appropriate for a bulk purchase due to the fact that there are few buyers who represent a large portion of the market. There is a potential for water utility subsidization as well as from the sewage municipality. Currently there are major U.S. manufacturers entering the market with significant investment in equipment. Besides, the energy saving potential is significant.

High efficiency HVAC units for the hotel / motel industry will be examined further as there are a limited number of players which make up a great percentage of the hotel / motel industry. There are possibly many competing manufacturers such as Trane and Carrier who would want to expand their market in this area.

ENDNOTES

1. Tatsutani, Marika, 1995. ''Market Transformation in Action: A Report From the Consortium for Energy Efficiency.'' *Energy Services Journal.* 109–118.

2. ''Energy Performance Contracting for Public and Indian Housing: a Guide for Participants,'' February, 1992, The U.S. Department of Energy and the U.S. Department of Housing and Urban development.

3. ''Multiple Pathways to Super-Efficient Refrigerators,'' June, 1993, The U.S. Environmental Protection Agency, EPA-430-R-93-008.