

A National Residential and Small Commercial High Efficiency Lighting Initiative

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Residential lighting has a great, untapped potential for improved energy efficiency. Therefore, utility DSM programs promoting screw-base compact fluorescent lamps (CFLs) have been popular all across North America. Unfortunately, while individual DSM programs have often been effective in getting consumers to purchase targeted CFLs, this technology has yet to significantly penetrate the residential lighting market. Differing or conflicting utility DSM program requirements are a barrier to CFL manufacturers who cannot focus on a limited set of production objectives. Traditional DSM programs also have failed to encourage effective marketing by manufacturers, distributors and retailers.

Over the last year, a group of non-profit organizations, federal and state governments, electric utilities and other organizations have been working through the lighting subcommittee of the Consortium for Energy Efficiency (CEE) to explore a national residential and small commercial energy efficient lighting initiative. The draft initiative would provide a consistent template that individual participating utilities might use when running individual DSM programs. These programs would be independent, but similar. Two prominent elements of the proposed initiative would be:

- **Manufacturer Incentives.** Participating utilities would individually contract with manufacturers to reduce the wholesale cost of CFLs. Incentives would be awarded by individual utilities upon successful completion of a product sales agreement.
- **Common Product Assessment Approach.** Each participating utility would invite CFL manufacturers to submit technical and marketing proposals for a share of its available incentives. Each participating utility would score the proposals it receives using a common scoring system developed by the subcommittee.

Applying utility incentives to wholesale prices, rather than giving them directly to the consumer, should result in more efficient use of utility DSM resources. Because all participating utilities would select products using the same performance criteria, manufacturers would have a more consistent target for both R&D and production. It may also be possible to realize new opportunities in areas like joint program advertising and evaluation, and product tracking and testing. As this paper is being prepared, the proposal is in draft form and the CEE lighting subcommittee is receiving additional input before completing its next draft. CEE's Board of Trustees has not yet voted on whether to adopt this as a CEE initiative, therefore the authors' comments do not reflect an official position of CEE.

Introduction

Utility Demand Side Management (DSM) programs today are at a crossroads. Despite past successes in acquiring energy savings as a resource, changes in the environment

in which utilities do business have forced many to reexamine the future of their DSM programs. These changes are significant:

- Utility avoided cost, the benchmark against which DSM cost effectiveness is judged, is generally declining. In addition, some new generation technologies offer other advantages which have traditionally been unique to DSM resources: short lead times, small capacity increments, and low environmental impacts.
- The specter (real or imagined) of utility industry deregulation has caused many utilities to focus on short-term retail and wholesale rate impacts. By explicitly reducing energy sales, DSM programs increase rates, even as they cut customer bills.
- Utilities face increasingly diverse regulatory environments. While some commissions have decoupled utility profits from sales and allowed utilities to earn a profit from energy efficiency investments, others continue to pursue commodity based regulation to minimize rates. Authorized rates of return are declining in most jurisdictions.
- Utilities and their regulators are increasingly seeking alternatives to traditional rebate programs, including approaches that strategically reduce the need for future incentives to sustain the widespread use of a given technology.

Under these conditions, the most successful DSM programs will need to become significantly more cost effective by offering more durable savings and encouraging markets to eventually offer a wide range of attractive and efficient products without utility intervention. "Market-pull" programs, which combine the efforts of many utilities to help improve the structure of the market for an energy efficient technology, can serve this need in several ways. Some administrative costs (often significant) for program development and evaluation can be shared. Common specifications send a strong signal to the marketplace. Coordination with the government can make energy efficiency regulation more effective. All of these attributes serve to transform markets and lower costs for individual utilities. Or, as Tom Eckman of the Northwest Power Planning Council puts it, we can "acquire energy efficiency much more efficiently."

The Residential Lighting Market

Lighting now accounts for 6 percent of U.S. primary energy use in the residential sector and \$7.5 billion of America's annual electricity bill. However, residential lighting in North America is largely based on incandescent light sources (light bulbs) and currently available CFLs offer the opportunity to improve the energy efficiency of this sector by 75% over the next decade. Partially as a result of promotional programs run by electric utilities, sales of CFLs have doubled since 1990 (Atkinson, et al. 1992).

However, CFLs still occupy fewer than 2 percent of the nation's residential light sockets (Atkinson, et al. 1992). CFLs are often more than ten or fifteen times as expensive as conventional light bulbs, and most consumers are still reluctant to pay significantly more for a CFL than an incandescent bulb, even when told they will more than recover that expense through longer product life and lower energy bills. CFLs sometimes do not perform to consumer expectations for light bulbs (EPRI 1991 and NLRIP 1993) and remain a specialized niche product whose market appears to be driven by utility DSM programs. However, even a large utility's incentives alone are usually insufficient to persuade a large retailer to carry a CFL product, or to convince a manufacturer to develop a new one. The residential and small commercial lighting market is continental if not global.

There has been a lack of consensus among utilities on what characteristics are desirable in CFL products, and how best to promote the technology. Through their experiences with DSM programs, many utilities have found that reducing the price of CFLs below ten dollars can dramatically increase residential customer purchases. However utilities have found it costly to provide incentives to all residential customers. In addition to the direct cost of the rebates, many utilities have experienced high DSM program overhead expenses.

The draft initiative discussed here is based on the idea that CFLs have a valuable place in the current market for residential lighting services. Its goal is to help pull the residential lighting market towards higher energy efficiency by improving the pricing, performance and marketing of CFLs, and making them attractive to a majority of residential and small commercial consumers. By working through conventional retail channels, the draft initiative aims to help significantly increase North American sales of advanced CFLs to residential and small commercial customers in a short period of time, and give those products an enduring presence in the retail marketplace.

In November 1992, the Natural Resources Defense Council (NRDC) proposed the idea of a national demand-side management program for CFLs to the U.S. Environmental Protection Agency (EPA), which was considering a residential adjunct to its Green Lights program. In 1993, the Consortium for Energy Efficiency formed a subcommittee on lighting, which included representatives from both of the above organizations and a number of electric utilities, and began to further develop the idea. CEE is a national, non-profit organization dedicated to promoting the use of energy efficient technologies. CEE consists of utilities, federal and state government agencies and non-profit organizations. CEE's exploratory subcommittee on lighting has since held a series of meetings across the country attended by more

than 40 lighting DSM experts from 25 different organizations (the authors are all members of this subcommittee). The subcommittee has also actively solicited individual input from all known CFL manufacturers.

The California Experience

Southern California Edison (SCE) pioneered the use of direct manufacturer incentives for CFLs in 1991. After an unsuccessful experience with a traditional consumer coupon DSM program, SCE found the manufacturer incentive approach to be successful both in reducing program administration costs and in selling CFLs. SCE's "CFB" program sold nearly a million CFLs through retailers in 1992 alone. Administrative costs for the SCE manufacturer rebate program were one third of those for the earlier consumer rebate program. The number of retailers carrying CFLs and the amount of shelf space devoted to them in the SCE service territory also increased dramatically during the CFB program (Grimm and Granda 1994).

The draft initiative draws directly from the SCE experience, the experience of three other California utilities that have run similar programs, and the experience of numerous other utilities around the nation. The draft initiative combines the manufacturer incentive idea with a comprehensive product assessment approach and the possibility of realizing significant economies of scale. Although they are combined here in a national level effort for the first time, many of the elements of the draft initiative should be familiar to utilities and to manufacturers.

Overview of the Initiative

Competitive marketing of cost-effective products that meet customer expectations is necessary if CFLs are ever to maintain a significant share of the residential lighting market without utility incentives. The draft initiative has three primary objectives: to invigorate the CFL market by increasing sales, to encourage superior screw-base CFL products, and to make CFL DSM programs more cost effective for utilities. In developing this proposal, the subcommittee attempted to balance the competing objectives of standardization and flexibility. Standardization of certain specifications across utility DSM programs can improve cost-effectiveness and make it easier for manufacturers to develop new products, while flexibility is necessary to enable utilities to maintain commitments to preexisting product specifications, employ different avoided costs in cost-effectiveness calculations, and comply with different measurement and evaluation requirements.

Technologies

The draft initiative has been designed to provide incentives for screw-based compact fluorescent lamps. These include either modular (two piece) or integral units that are alternatives to A-line incandescent. The subcommittee consciously limited the draft initiative's scope to technological parameters that could be easily defined, and to a manageable range of product types to give this new approach the best chance for success. However, if an eventual initiative is launched and is successful, the subcommittee is also interested in exploring the applicability of this approach to other efficient lighting technologies such as high efficiency compact fluorescent fixtures.

From the utility perspective, CFLs pose a challenge to DSM evaluators because consumers exercise a great deal of control over whether and how they are used. Anyone can install (or remove) a CFL and the usage patterns for specific CFLs are difficult to predict using available customer data. Many utilities have found it necessary to decrease their savings projections for CFL DSM programs due to customer removal of program product before the end of its useful life and other consumer related factors.

Recently, some utilities have reoriented DSM programs from screw base compact fluorescent lamps to hard-wired compact fluorescent fixtures. CFL fixtures represent a significant energy efficiency potential and present new opportunities for optimizing the performance of compact fluorescent technologies through a systems approach to lighting. However, CFL fixtures usually offer the opportunity to increase efficiency only when an incandescent fixture is replaced, often after 20 years or more of service. Every time an incandescent light bulb burns out, commonly after 1,000 hours of use, there is the chance of installing a screw base CFL. If the marketplace could provide a sufficient number of screw base CFLs that many consumers wanted to buy, the energy efficiency of the residential lighting sector could be significantly improved in a matter of a few years.

Manufacturer Proposals

Under the draft initiative, participating utilities would individually negotiate directly with manufacturers to decrease the wholesale costs of CFLs. This is because direct manufacturer incentives are potentially more efficient than consumer rebates at lowering the effective cost of a product to the consumer. Retailers typically calculated retail prices by multiplying the wholesale price by some markup percentage. This means that if, for example, the retail markup rate is 67 percent, each dollar reduction

in the wholesale cost yields about \$1.67 reduction in the retail price.¹ A participating utility would decide how much it wanted to spend on incentives for a block of CFLs, and issue a Request for Proposals (RFP) inviting manufacturers to submit product and marketing proposals for those incentives. The proposals would detail the technical performance of products, the number of units that the manufacturer could deliver to retailers in the utility's service area during the program period, the budget the manufacturer is willing to devote to advertising, and the manufacturer's plans for working with distributors and retailers to stimulate the local market for CFLs.

Manufacturers' proposals would also include the amount that each manufacturer is willing to contribute to reducing its wholesale product cost (as compared to some previous sales period). However, the utility would not compare manufacturer bids based on wholesale cost. Although the draft initiative does provide guidance on product characteristics and marketing, an important goal is to allow the market to determine which combinations of price and features make for successful products. The draft initiative would encourage CFLs that sell, not necessarily the lowest priced CFLs. Several aspects of the draft initiative motivate manufacturers, distributors and retailers to keep prices competitive, particularly the dynamic share reallocation concept described below.

All proposals would be scored using a common initiative scoring system. The relative scores received by the proposals would be used to award shares of an individual utility's total incentive pool. For example, a participating utility might award 30 percent of its total incentives to the highest bidder, 20 percent to the second and third highest, 10 percent to the fourth and fifth and 5 percent to the remaining two. Such a system would encourage maximum industry participation by allowing even small manufacturers to compete on a scale that is financially meaningful to them. The subcommittee has assumed that manufacturers are most effectively motivated to deliver high quality products if a participating utility uses the scoring system to allocate program share. A variation that might potentially be selected by a participating utility would be to use the scoring system to decide the level of incentive offered for each product (\$/CFL).

The draft initiative does not specify how many manufacturers would ultimately sign a performance contract with a utility, therefore participating utilities could tailor their use of the manufacturer proposal scores to achieve different program goals. As presented above, a participating utility could award some share of its total incentive pool to all manufacturers who meet the minimum performance criteria and use the initiative to develop a broad program

covering a range of CFL DSM applications. Alternately, a participating utility could also set a minimum total score for participation to develop a program focused, for example, on cutting edge CFL technologies.

Dynamic Incentive Share Reallocation

In order to receive incentive shares awarded through the proposal scoring process, manufacturers would sign agreements with participating utilities that include product sales milestones set at regular intervals during the program (e.g., 30% of units by 12 weeks, the next 30% by 16 weeks, and all product sold by 20 weeks). Utilities would verify sales performance at milestones by requiring manufacturers to furnish a well-defined paper trail that tracks the subsidized product to the retail outlet. Attainment of sales milestones and product compliance could be verified by regular retailer site visits by program personnel.

If a manufacturer does not meet a participating utility's sales milestones, it would forfeit the remaining share of incentives on the unsold allotment for that milestone period. The participating utility would notify the manufacturer in question and then award this unsold program allotment to competing manufacturer(s) who have been successful in meeting sales milestones. No other measures would be taken against manufacturers who miss sales milestones. Manufacturers who miss one milestone would be encouraged to attempt to meet subsequent ones, and to submit more realistic proposals in future program years. In this way, the draft initiative would try to bring market forces directly to bear through utility DSM programs. The dynamic rebate share reallocation process has proven to be an extremely effective tool in SCE's service territory for marshaling manufacturer and retailer energies to market products, and for reducing retail prices.

Product Assessment

Products selected by utilities participating in the draft initiative would be chosen through a three-stage process. First, they would be screened based on seven minimum performance criteria that would apply to all participants. Participating utilities also would be able to set minimum performance levels for an additional four product performance criteria, if they choose to do so. Second, participating manufacturers would provide lumen output test data for all products and products would be classified into incandescent light bulb equivalence classes on that basis. Third, participating utilities would score products using the draft initiative scoring system.

Minimum Specifications for CFL Products

Through DSM programs, utilities have obtained a fairly good and consistent idea of what makes a CFL attractive to their residential customers. However, there remains disagreement among utilities on a definition of a “high quality” CFL. In particular, utilities hold a variety of opinions on the importance of high power factor and low Total Harmonic Distortion (THD). Given this divergence, the draft initiative does not define a simple set of technical specifications for CFL products. The subcommittee held long discussions to decide which performance criteria in the draft initiative should have minimum specifications that would be adopted by all participating utilities, and which should be made optional at participant discretion. Flexibility was necessary to allow utilities with preexisting minimum standards to participate. Essentially, when the subcommittee’s members were able to reach consensus, minimum specifications were written into the draft, when consensus could not be reached, the parameter was made optional or included as a factor in the scoring system (below).

All utilities wishing to participate in a potential initiative would adopt minimum standards that the subcommittee has defined in the draft for rebated products on electrical safety, color temperature and Color Rendition Index, rated average life, and electromagnetic interference as determined by testing at an accredited laboratory. Participants would also be asked to require manufacturers to provide a UPC bar code on packaging and a customer survey card inside packaging. At an individual utility’s discretion, minimum specifications for Power Factor, Total Harmonic Distortion, and Ballast Type may also be set. Participating utilities would also be able to set a higher minimum value for Color Rendition Index than the draft initiative specifies.

Power Factor, Total Harmonic Distortion and Color Rendering Index are also evaluated in the scoring system described below. The draft encourages participating utilities to use the scoring system whenever possible and to not exercise the option to independently set minimum performance levels for these performance criteria.

Lumen Output

In consumer focus groups and in independent testing results, insufficient brightness has consistently emerged as a chief source of consumer dissatisfaction with CFLs (Granda 1993 and NLPPI 1992). CFLs fail to achieve rated lumen output for many reasons, including thermal, optical, ballast, and positioning losses. Under the draft initiative, participating utilities would compare CFL products based on lumen output tests, rather than on manufacturer claims.

Borrowing from an approach developed at New England Electric System, the draft initiative would classify products into incandescent equivalence categories based on testing at accredited laboratories, measured according to standard IES test procedures² Participating utilities would rate and compare products based on their mean lumen output under typical operating conditions. If, for example, a manufacturer claims that a CFL replaces a 75 watt light bulb, but the tested lumen output of the unit does not meet the draft initiative’s cutoff for 75 watt equivalence, the unit would compete against other CFLs that replace 60 watt light bulbs. In addition, the scoring system deducts points for each lumen not delivered as advertised.

A participating utility might use the five categories below to provide customers with CFLs equivalent to the full range of commonly available incandescent. Because most of the incandescent lamps at issue in utility DSM programs are often 60 watts and larger, and because the absolute and percentage energy savings per bulb are highest for the brightest products, the draft initiative would encourage utilities to concentrate their efforts on the three “brightest” product classification categories:

| | |
|-----------|--|
| 25 Watts | 232 initial lumens (typical initial lumen output of standard incandescent bulbs) |
| 40 Watts | 480 initial lumens |
| 60 Watt | 890 initial lumens |
| 75 Watts | 1220 initial lumens |
| 100 Watts | 1750 initial lumens |

The Initiative Scoring System

Appendix A reflects the subcommittee’s members’ consensus on the technical and marketing criteria for CFL manufacturer performance which should be included in the draft initiative. Participating utilities would use the draft’s scoring system to reward manufacturers with superior products and marketing plans with a larger share of the incentives being offered. The scoring system is intended to provide coherent guidance to utilities that participate in the initiative but to recognize, in a way that set product specifications cannot, that there are often tradeoffs inherent in the design and marketing of CFLs. For example, new manufacturers with technically innovative products may not have distribution and marketing networks in place. Models exhibiting excellent power quality characteristics may be larger or heavier than others.

The scoring system would award both positive and (in Section I) negative points for performance above or below target performance levels suggested by the subcommittee for the following performance criteria: (For more detail on specific performance criteria, please see Appendix A.)

(Section I.) -

- Power Factor Product Performance/Characteristics
- Total Harmonic Distortion
- Efficacy
- Modular vs. Integral Configuration
- Fit
- Weight
- Warranty Length and Service Level

(Section II.) -

- Manufacturer Contribution to Cost Reduction
- Incentive Matching
- Manufacturer's Coop. Advertising Contribution
- Manufacturer's Direct Media Advertising Contribution
- Consumer Education Funding

(Section III.) - Distribution System

(Section IV.) - Miscellaneous

Product Testing

Under the draft initiative, manufacturers would submit all products for testing for compliance with specifications and lumen output at independent laboratories accredited through the National Voluntary Laboratory Accreditation Program (NVLAP) operated by the National Institute of Standards and Technology (NIST). Phase one accreditation for lamp testing is already in operation. The subcommittee anticipates the imminent start-up of Phase 2 accreditation (ballasts and other luminaire components). In the event that data from independent lab tests are incomplete, a participating utility could, at its discretion, accept manufacturer data to prevent program delays.

Independent efforts are now underway to develop a national random testing effort for compact fluorescent products. The goal of this effort would be to ensure that test data submitted by manufacturers continues to accurately reflect the performance of products which are distributed and sold. Individual utilities and manufacturers would resolve instances of product performance outside levels contained in the manufacturer's proposal, or the initiative's specifications.

Measurement, Evaluation and Tracking

Under the draft initiative, participating utilities would avoid the costs often associated with conventional consumer rebate programs because there are a limited number of transactions between the utility and manufacturers, instead of many transactions between the utility and each participating consumer, as with a coupon program.

However, coupon programs can easily identify participating customers by requiring consumers to fill out a form before redemption. The initiative would use a combination of customer response and manufacturer product tracking data to provide participating utilities with the information they need to satisfy regulatory requirements for cost-recovery and to assess the overall effectiveness of the draft initiative's approach.

Participating utilities would receive manufacturer sales data as part of the verification of achievement of sales milestones. This tracking would yield information on the movement of gross numbers of products and the rate of sales, which will be valuable for both impact and market transformation evaluations.

Manufacturers would include a customer response card with each product to be rebated. The card would carry a bar code identifying the product and the utility sponsor and would request limited information from the consumer (name and address). The draft initiative currently proposes that the cards would be centrally collected and processed and the data made available to participating utilities. Participants would be able to access the customer response database either to produce their own impact and process evaluations directly, or to identify customers for further surveying.

The return rate for customer response cards is generally low. However, because the potential number of participating consumers is large, it should be possible to obtain statistically significant sample sizes for evaluation purposes. Making the response card also a product warranty registration card may help increase returns. Another suggestion for increasing the return rate, which still needs to be explored further, would be a national (or continental) sweepstakes, in which customers could enter by returning the response cards (no purchase would be necessary for entrance). In all cases it would be necessary to consider the effects of response bias, because customers who return cards may not be representative of CFL purchasers as a whole. Individual participating utilities must decide whether the system outlined above would yield sufficient data to satisfy their evaluation needs, or whether additional, independent data gathering will be necessary.

Although utility participants will be running independent DSM programs under the draft initiative, the programs will be similar enough that it may be possible to do evaluations across participating utilities. In this way, maintaining a single database of customer response information could yield significant efficiencies of scale. To evaluate overall program effectiveness, a generic evaluation of the market transformation effects on the entire continental market for CFLs might be performed. The state of the CFL market prior to implementation of the

draft initiative would be analyzed and data on changes in the market collected to define the market effects of the draft initiative. The subcommittee is currently exploring various possible options for performing this generic evaluation.

Associated Costs

Once launched, there would be certain ongoing costs associated with implementing and marketing the draft initiative. If pursued, there would be costs associated with the central collection and processing of customer response cards, as discussed above. Similarly, there would also be costs associated with any evaluation of the market transformation effects of the entire initiative. The costs for these services might be paid for through a charge on participating utilities, a grant from the federal government, or possibly other means.

Participating utilities would be responsible for the costs of evaluation activities beyond those described above. Under the draft initiative manufacturers would absorb any costs of product tracking as part of their proposals. Participating utilities would pay for retail spot checks, or other monitoring and enforcement tools that they use to verify sales milestones and product compliance. In the case of Southern California Edison's 1992/93 program (500,000 + bulbs), three full-time contract employees made regular retailer site visits to retailers. One potential option would be to design to contract to centrally process and maintain the customer response card database to also include a provision to help utilities to pool data and perform evaluations across multiple service territories.

Program Time Frame

Utility DSM lighting program experience indicates that consumer demand for lighting products is significantly higher in the Fall and Winter than in the Spring and Summer. Thus, if CEE's Board of Trustees decides to approve and launch this draft initiative, participating utilities might take advantage of this natural demand cycle by launching pilot programs during the Fall and Winter of 1994-1995. Utility start-up dates would probably stretch over several months (depending on budget cycles, program development schedules, concurrent DSM commitments, etc.) carrying the proposed initiative into full implementation during 1995. The staggering of start-up dates and implementation phase-ins may also better allow manufacturers to deliver products quickly to meet the expected increases in demand.

Conclusions

If adopted broadly, the CEE initiative is expected to produce the following benefits:

- A stronger, healthier market for CFLs. More consistent product specification and DSM program design across utilities would encourage competition between manufacturers. The proposed scoring system would make it easier for lighting manufacturers to participate in utility DSM programs that, to date, have been widely divergent in structure, goals, and timing.
- Increased sales of CFLs. The CEE initiative would encourage more effective use of utility rebate funds which could result in more products being rebated and/or lower retail prices. Improved availability and pricing would increase demand for CFLs, and stimulate manufacturer investment in R&D and production capacity. Expanding the market for CFLs would also make distribution more efficient, and allow large retail chains to sell efficient lighting products profitably in all their stores.
- Increased DSM program cost-effectiveness. The CEE approach would specifically maximize the impact of each utility rebate dollar on the consumer price of CFLs and minimize administrative costs.
- Economies of scale and reduced duplication. Having similar DSM programs operating in adjoining service territories would also make it easier for retailers to take advantage of available cooperative advertising funds. Many such funds currently go unspent when retailer sales territories fail to coincide with utility service territory boundaries. Coordination of customer response tracking and (when appropriate) of marketing efforts through national entities like CEE and EPA would make it easier to conduct regional and national measurement and evaluation surveys, and regional and national marketing.

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Endnotes

1. A comparison between the effects of a conventional coupon based program and a manufacturer incentive program on retail prices for some generic product “X” might go as follows:

| | | |
|--------------------------------|--|--|
| Direct Consumer Rebate Example | \$80.00 +\$53.60 <u>-\$25.00</u> \$108.60 | Manufacturer wholesale price Retail markup (67% of \$80) Utility incentive (mail-in or point of purchase coupon) Net Retail Price |
| Manufacturer Incentive Example | \$80.00 -\$25.00 -\$7.00 <u>+\$32.16</u> \$80.16 | Manufacturer wholesale price Utility incentive (direct to manufacturer) Manufacturer matching incentive Retail markup (67% of {\$80.00 - \$25.00 - \$7.00}) Net Retail Price |

2. The CEE subcommittee is aware that the existing IES test procedure does not suggest a uniform time period for lumen output to stabilize in the base-down position, and exploring how to develop a usable approach.

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Appendix A

Under the draft initiative, participating utilities would use the scoring system described in Table 1. Table 1 divides manufacturer bid performance criteria into four sections. Sections I, II, and III are all considered equally important to the success of a manufacturer's bid in helping to achieve program goals and each accounts for 30% of the maximum possible score. Section IV would allow 10% of the maximum possible score to be assigned by a participating utility as it chooses on performance criteria not included in the proposed draft initiative.

Section I is the only section that has the potential for earning a product negative, as well as positive, points. Under this section, an awkwardly designed, one piece, heavy CFL with a power factor of .9, THD of 33%, and output of 45 lumens per watt that was not supported by a manufacturer's warranty would earn zero points. Poorer power quality characteristics would earn negative points. Superior power quality, light weight, user-friendly design and manufacturer support would all earn positive points.

Scoring Section II would require a participating utility to have some knowledge of current wholesale prices to accurately assess the true manufacturer contribution to wholesale cost reduction; manufacturers should be discouraged from temporarily raising their wholesale prices in order to be able to offer an artificially large reduction from an inflated base.

The application of Section III would be largely left to individual participating utilities because scoring product distribution requires a knowledge of the retail characteristics of the local residential and small commercial lighting market. For example, rather than quantifying numbers of retail and wholesale outlets, a participating utility might estimate the share of the CFL sales market held by each type of outlet (large retail, small retail, wholesale, lighting specialty, etc.) and then determine each manufacturer's presence in those outlets.

"Maximum Value," "Minimum Value" and the "Percent of Maximum Score" which appear in the third, fourth and fifth columns respectively for each of the four sections in the scoring system would be fixed for participating utilities. In some cases the maximum and minimum number of points correspond to theoretical limits, in others they represent caps established by the subcommittee in the draft initiative to limit the influence of a single performance criterion on the total score. The "Percent of Max. Score" for each factor within Sections I and II would also be fixed. Participating utilities would set the "Percent of Max. Score" for each factor within Sections III and IV as they see fit.

The scoring system was tested on a range of different products to make sure that it would appropriately recognize CFLs with a variety of different designs and operating characteristics.

Table 1. Scoring System for Manufacturer Proposals Under the Draft Initiative

| Performance Criteria | Metric | Maximum Value | Minimum Value | Percent of Max. Score (@ max. value) |
|---|--|---------------|---------------|--------------------------------------|
| I. Product Performance/Characteristics | | | | |
| A. Power Factor | 75 +/- points per each 0.01 PF. 0.90 = 0 | 750 | -3,000 | 3.75% |
| B. Total Harmonic Distortion | 30 +/- points per each 1.0% THD. 33% = 0 | 750 | -3,900 | 3.75% |
| C. Efficacy minus labeling disc. | (i) 75 +/- points per each lpw. 45 lpw = 0 | 1,500 | -1,000 | 7.50% |
| D. Modular? (not a one-piece product) | yes/no | 500 | 0 | 2.50% |
| E. Fit (# of "standard" fixtures unit fits) | 125 + points per each successful fit | 1,000 | 0 | 5.00% |
| F. Weight (lamp and ballast) | 10 +/- points per each 0.1 oz. 6.0 oz. = 0 | 500 | -500 | 2.50% |
| G. Warranty Length + Service Level | (ii) 250 + points each service provision | 1,000 | 0 | 5.00% |
| Section Subtotal: | | 6,000 | -8,400 | 30.00% |
| II. Incentive Matching | | | | |
| A. Mfr. Contribution to Cost Reduction | 10 points per each \$0.01/CFL | 2,000 | 0 | 10.00% |
| B. Mfr. Co-op Advertising Contribution | 10 points per each \$0.01/CFL | 2,000 | 0 | 10.00% |
| C. Mfr. Direct Media Advertising | 5 points per each \$0.01/CFL | 1,000 | 0 | 5.00% |
| D. Consumer Education Funding | 5 points per each \$0.01/CFL | 1,000 | 0 | 5.00% |
| Section Subtotal: | | 6,000 | 0 | 30.00% |
| III. Distribution System | | | | |
| A. Number of Large Retail Outlets | (iii) X number of Retail Chains | 2,500 | 0 | 12.50% |
| B. Number of Small Retail Outlets | (iii) Y number of Retail Stores | 2,500 | 0 | 12.50% |
| C. Number of Wholesale Distribution Outlets | (iii) Z number of Wholesalers | 1,000 | 0 | 5.00% |
| Section Subtotal: | | 6,000 | 0 | 30.00% |
| IV. Miscellaneous (examples of potential factors only) | | | | |
| A. Mfr. CFL Recycling Plan | yes/no | 500 | 0 | 2.50% |
| B. Green Seal Certification | yes/no | 1,000 | 0 | 5.00% |
| C. Disclaimer/Warning on Package | yes/no | 200 | 0 | 1.00% |
| D. Free-standing Merchandise Displays | yes/no | 200 | 0 | 1.00% |
| E. Other | yes/no | 100 | 0 | 0.50% |
| Section Subtotal: | | 2,000 | 0 | 10.00% |
| Grand Total | | 20,000 | -8,400 | 100.00% |

- i. Based on base-up or base-down lumens, whichever is less. One negative point awarded for every lumen difference between tested and labeled lumen output.
- ii. Service Provisions as described in the program description.
- iii. Participating utilities may adjust the numbers X, Y, Z, and the relative weights in Section III to fit the retail characteristics of their service territories. This section may also be scored qualitatively by participating utilities.
- iv. The factors in Section IV are simply examples. Any factors may be used, or this Section eliminated entirely. However, total points for Section IV are capped to maintain consistency across programs under the draft initiative.
- v. The maximum point totals for each Section (I-IV), and therefore, their relative weights, are fixed in the draft program design. The factors in Sections I and II and their relative weights would be fixed for programs run by initiative participants.
- vi. The Scoring System may be used alone or with minimum performance specifications as described in the initiative proposal. Participating utilities would be able to set minimum standards for Power Factor, Total Harmonic Distortion, Color Rendition Index, and ballast type.