

August 16, 1991

Dear Retreat Participants:

We are pleased that you will be attending the policy retreat being convened by the Northeast-Midwest Institute at the Wye Center, from September 4 to September 6.

During the retreat sessions, we will discuss and debate various policy alternatives to encourage more direct utility involvement in economic development activities--notably, options that focus on industrial modernization and adaptation of new, more energy-efficient technologies for manufacturing operations. We also will consider different investment incentives, as well as a process by which state leaders can mold a utility/economic development partnership that meets the needs of their particular economic base, and in a way that is sensitive to utility concerns.

We intend these discussions to be informal, and we hope they will be candid. While factual information will be provided to frame each of the sessions, there will be no formal presentations (other than at the opening session Wednesday evening). Because it is important to examine a broad range of perspectives on these issues, we may ask individual participants for their opinions as the discussions evolve.

The agenda for the retreat is attached. We also have included information on recreational facilities available at the Wye Center and a list of participants. The "dress code" is casual and comfortable the entire time. The draft policy paper on which the agenda is based will be sent to you in about a week. Final information on ground transportation and logistics will be forwarded in late August; meeting and lodging room information will be available at check-in. Please do not hesitate to call either of us if you have any questions. We look forward to seeing you at the Wye Center.

Sincerely,



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Director of Policy
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Final 9/3/91

NEW PARTNERSHIPS FOR INDUSTRIAL EFFICIENCY AND GROWTH:
Policy Retreat

Manor House at the Wye Center
September 4 to 6, 1991

A G E N D A

September 4

4:00 pm. -- Rooms available for check-in at the Wye Center

5:00 pm. -- Informal cocktail reception

6:00 pm. -- Dinner

7:30 - 9:30 pm. -- Opening Session: The Need for a "Best Practices" Approach

- Overview of the retreat and its objectives
- Participant introductions
- Utilities and economic development--recognizing mutual interests and opportunities for productive partnerships
- Briefing on manufacturing competitiveness and technological modernization, highlighting areas where improvement is needed
- Discussion of industrial energy efficiency needs and initiatives

September 5

8:00 am. -- Breakfast

9:00 - 11:00 am. -- From Goals to Program Design

- Demand side management (DSM) initiatives being implemented by utilities which could serve as vehicles for economic development-oriented partnership efforts
- Expanding the utility role in local economic development activities in both small towns and large cities--discussing utility concerns that inhibit active involvement
- Goal setting for partnership programs to improve industrial competitiveness--integrating energy efficiency, facility modernization, and environmental concerns
- Criteria for targeting program beneficiaries (i.e., type of industry, location, or size)
- Options for carrying out industrial assessments--how are they done, who does them, and who pays for them

11:00 -- Break

11:30 am. - 12:30 pm. -- Defining Utility-Business Partnerships

- Determining the parameters and appropriate mechanism for implementing a utility-business partnership program tailored to individual firms and modernization needs, in both rural and urban communities
- Strategies for broadening the partnership, (i.e., the utility as liaison between businesses and state technical assistance, public and private approaches to technology transfer, and financial resources)

12:30 - 1:30 pm. -- Lunch

1:45 to 3:00 pm. -- Incentives for Businesses and Utilities

- How utilities could provide practical financial incentives to business to implement improvements recommended in the industrial assessments
- Nature and level of financial incentives, and the appropriate utility role in administering them
- Type and level of regulatory-related incentives needed to prompt utilities to establish partnership programs

3:00 - 5 p.m. -- Free time for recreational activities

5:00 pm. -- Happy hour

6:00 pm. -- Dinner

7:30 - 9:30 pm. -- Overcoming Obstacles

- Potential procedural and political obstacles to utility-business partnerships--from the perspective of industry, utilities, regulatory commissions, and state and local economic development agencies
- Overcoming these obstacles, and the benefits of doing so

September 6

8:00 am. -- Breakfast

9:00 - 10:30 am. -- Evaluating Program Effectiveness

- Evaluating partnership programs--determining how the program meets its goals, how its impacts can be measured (e.g., reduced energy use per unit of production) and if investments are cost-effective and warranted

10:30 am. -- Break

11:00 am. - 12:30 pm. -- First Steps for Iowa and Pennsylvania

- Crafting implementation strategies for state-wide programs
- Identifying utilities, industrial sectors, public agencies, and development organizations to focus attention on
- Pinpointing problem areas and special opportunities
- Defining issues and next steps for these states

12:30 - 2:00 pm. -- Lunch and wrap-up

**New Partnerships for
Industrial Efficiency and Growth:**

Selected Best Practices

Jeff Hanissian

September 1991

Introduction

Utilities have developed considerable expertise in crafting and administering industrial demand-side management (DSM) programs since the late 1970s when the first simple programs appeared. The number of industrial programs grew steadily through the last decade. The Electric Power Research Institute's 1990 Survey of Industrial-Sector Demand-Side Management Programs uncovered 417 industrial DSM programs offered by 154 electric utilities. This booklet presents four of the most progressive industrial energy-efficiency programs. These programs are Central Maine Power's Power Partners Program and Efficiency Buy Back Program, Bonneville Power Administration's Energy Savings Plan, New England Electric System's Energy Initiative Program, and Pennsylvania Power and Light's Environmental and Energy Efficiency Improvements Program. Five sections comprise the study of each program. The sections are Advertising, Eligibility, Program Operations, Contract Issues, and Subsidy Determinations. Charts that compare energy-assessment programs, subsidy guidelines, and program funding levels follow the case studies. The booklet makes comparison of the five programs easy. Their virtues can be incorporated into future efforts, and their stumbling points can be discarded.

Central Maine Power

Central Maine Power (CMP) began an industrial demand side management (DSM) program in 1987 which has saved 140 million kilowatt-hours of electricity and avoided the need for 31 megawatts of peak demand annually. Two of the various options offered under CMP's DSM program, the Power Partners (PP) and the Efficiency Buy Back (EBB) programs, encourage improvements in process technology.

The establishment of CMP's first DSM programs in 1986 required long negotiations between utility officials and the Maine Public Utility Commission (MPUC) staff. At first CMP suggested that an unregulated subsidiary energy services company could reduce the energy requirements of their large commercial and industrial clients effectively. That suggestion was rejected. Finally CMP and MPUC agreed on an internal program, which at first took the form of an interest-rate buydown on energy-efficiency loans for qualifying customers. Subsequent negotiations for new programs progressed more smoothly. For example, in August 1987 CMP envisioned the Power Partners program; by September MPUC had changed the public utilities code to accommodate the program. Chapter 36 was changed to include energy-management projects as qualifying facilities under PURPA. By December CMP had issued the first request for proposals.

Power Partners Program

Under the Power Partners program, CMP pays a customer industry to save energy. The utility solicits DSM proposals from energy services companies (ESCO), industries, and others who can save energy. ESCO have proposed all but one Power Partners project. These proposals compete against proposals from conventional power generators. Comparing proposals for saving energy with proposals for generating energy makes sense because saving a kilowatt-hour and generating a kilowatt-hour both result in more available electricity. The client companies selected pay for the installation of the efficiency measures and CMP pays them for the energy savings as they occur. As of 1989 the utility had signed contracts for savings of 98 million kilowatt-hours and 16.7 megawatts annually at a cost of \$69.4 million. The benefit-cost ratio over the lifetime of the six existing contracts as was 1.5 to 1, which is expected to raise the cost of electricity by 0.9 percent.

CMP's need for generating capacity determines the size of the Power Partners program. It has no strict budgetary limits. The program has been dormant since 1989. Last year for the first time in a great while kilowatt-hour sales shrank. In the past two years, CMP's avoided cost has fallen. The avoided cost is the amount of money a utility saves by not building new generating capacity. It also can mean the short-term marginal cost of generating capacity. Falling avoided costs lower the cost utilities will pay for savings. CMP pays more than the current avoided cost for power delivered under contracts signed in 1989. No requests for proposals will be issued in the foreseeable future.

Advertisement

CMP introduced the Power Partners program in 1988 by sending information to 575 firms. Some firms were CMP customers, but many were ESCOs operating in CMP's service territory. It also put advertisements in the Wall Street Journal, the Boston Globe, local Maine newspapers, and independent power producer trade journals. The advertising campaign in 1989 was similar.

Eligibility

The mailing and advertisements solicit proposals for DSM projects that will save at least 100,000 kilowatt-hours per year or reduce demand by 100 kilowatts and produce efficiency improvements to existing and ongoing electric end uses at facilities within CMP's service territory. The projects must also be in place for at least five years, have a simple payback of one year or more excluding the CMP payments and be cost effective such that the total cost per unit to the utility and the participant would not exceed the total cost per unit cost of the power supply avoided. Project savings could come from more than one of the customer's facilities. CMP would not pay for lower consumption due to reduced production.

Program Operations

If CMP is short on capacity and avoided costs are high, they may decide to issue a RFP. The initial mailing contains all the documents needed to file a bid: a glossy introductory brochure, a four-page general information letter from Jonathan Linn, the project manager, a project-requirements form, a preapplication form, a bid document, and a standard energy-management agreement. A bidder's conference is held one month after the initial mailing. The conference is an informal two to three hour meeting. CMP administrators field questions about the program's process and about specific requirements of questions on the application. The preapplication is to be filed within a week of the bidder's conference. Interested firms respond within 90 days of the initial mailing with a completed request for proposal form.

The Power Partners program includes a competitive bidding process; remedial help for bidders is not part of the program. There is little contact between the utility and the client before the bids are filed. Nearly all proposals are made by ESCOs, so companies usually do not need help.

Because the DSM projects are in direct competition with supply-side projects, the documentation required of the projects is nearly identical. Part of the proposal describes a project's financial and engineering feasibility, and the reliability of the construction schedule and committed savings. Proposals are ranked by comparing the numerical index compiled at the end of the document. The index assesses a project's cost of power, price stability, and operating flexibility, the amount of equity the sponsor will commit to the project, and the amount of security the sponsor will provide if the project failed, as well as the meterability of the proposed measures.

Contract Issues

CMP enters contract negotiations with firms whose proposals show the best scores on the index. Negotiations usually take six months from bid acceptance to contract signing. The most difficult negotiations involved the amount of securities and verification of savings. Supply-side options offer no precedent on these issues. A utility can complete and operate a supply-side project scuttled by the private power producer with few concerns over security. A single meter placed at a private power producer's busbar measures delivery accurately. In contrast, a utility cannot recover contracted savings from a bankrupt demand-side bidder, or one that fails to produce the promised savings for other reasons. Because savings often are physically disbursed and difficult to separate from other factors that affect demand, verification of such projects can be more involved than reading a meter each month.

The utility and the client must agree on the amount of potential liquidated damages before deciding on the size of the securities required. The Power Partners standard contract details the liquidated damages exacted from defaulting firms. Liquidated damages assessed for projects that fail to come on line, projects that end before the contracted date, or projects that fall behind in their savings deliveries (annual aggregate savings deliveries less than 35 percent of contracted annual savings) scale with the committed capacity and the NEPOOL capability reliability adjustment charge. The charge is currently \$72 per kilowatt-year and rising. Liquidated damages for shortfalls in delivered energy equal the product of the shortages and the short-term energy-only rate set by the utility commission. CMP is obligated to accept, but not to pay for, production of savings above the contracted amount.

An irrevocable letter of credit established in favor of CMP secures funds with which the client could meet the liquidated damages. Although the standard agreement states the potential damage amount, it does not specify the size of the necessary security. Client companies have complained that the requested amounts are too high, but CMP must ensure their investors need not feel the cost of scrambling for extra generating capacity if a client defaults.

The Power Partners management agreement does not deal with the measurement of energy savings because the projects differ so widely. Sometimes payment is based on estimated savings and later adjusted by measuring actual savings; other times payment is based on monthly meter readings. The payment basis is well established before the contract is signed.

For example, one Power Partners client produces paper plates and trays. The firm switched feedstocks from logs to secondary fiber. One meter records the repulping systems's energy use. The company's savings equals the product of tons of production and the historical kilowatt-hour use per ton less the meter reading. CMP considers this calculation of savings simple and accurate; it is based on one actual meter reading each month. In the same plant another Power Partners contract deals with the paper-drying equipment. Six meters, one for each machine, are read each month and the results are compared with the old machines' use to determine savings.

Verification is not always so easy. For example, several PP projects in the commercial sector approximate savings with readings from a representative sample of run-time meters on retrofitted lighting circuits. Savings are never measured directly. For their residential projects CMP reads meters and calculates savings for virtually every house. Often agreement upon a fair method of verification and determination of the size of the necessary security lengthen negotiations to six months.

Subsidy

CMP pays PP contractors with a check each month for their energy savings. The amount is the product of cost per kilowatt-hour and kilowatt-hour savings. CMP rates the initial proposals by their cost of energy, among other factors. The price per unit is agreed to during contract negotiations, and is always less than the avoided cost at the time of the contract is signed. Contracts also include an agreement on the method of metering savings, which are as diverse as the projects they monitor. Some savings are measured directly from one meter reading, while others are approximations based on representative readings and calculations.

Efficiency Buy Back Program

The Efficiency Buy Back (EBB) program offers grants of up to 50 percent of the installed cost of worthy energy-efficiency measures. Even though the programs do not compete, the EBB program shrank when the Power Partners program got underway because it absorbed much of the limited management and advertising resources from the earlier EBB effort. CMP is working to revitalize the EBB program.

The program has a spending limit of \$3 million annually which it has never reached. The program has generated only eight to ten signed contracts since 1987, so one large contract in a given year could push the program over budget. This situation almost occurred in 1990, when three smaller contracts and one large contract were under serious consideration. The large contract alone stretched the limits of the program budget. When the three smaller projects were accepted, the large project was rejected. However, if the large project, which involved an industrial process change, had shown a larger return on the investment it might have been accepted as well even though the program would have gone over budget.

Advertisement

About 300 of CMP's largest customers receive information on the EBB program when CMP makes a request for proposals. The program usually is not advertised in newspapers or trade journals. Until recently, it was operated from the large customer energy-services office. Workers in that office are familiar with the program and look for plans or opportunities for conservation measures at their client's facilities. If they learn of an appropriate measure, they will recommend the program to the client.

Eligibility

The mailing requests bids for projects that cut consumption through increased efficiency rather than lower production; save at least 500,000 kilowatt-hours or 500 kilowatts annually; have a simple payback of two to ten years; are cost effective over the life of the project; and operate for at least three years. Clients that sell cogenerated power to CMP cannot use their subsidized savings to augment their power sales to CMP; the utility caps sales at preproject levels.

CMP reviews proposals on the basis of the cost-per-unit savings, meterability of savings, and the capability and future viability of the customer. Projects with lifetimes of more than ten years are given preference; CMP continues to accrue the savings of their one-time investment as long as the project is in place. Meterability is less important in the EBB program because future payments are not directly based on recorded savings.

Program Operations

If CMP identifies an opportunity for energy savings or decides to issue a general RFP, firms receive a packet of information. A packet contains an introductory letter, a glossy general information brochure, a schedule of important deadlines, a preapplication form, a bid form, a standard agreement, and a statement of terms and conditions. A bidders conference is held one month after the mailing. Potential bidders meet with CMP administrators in an informal meeting which gives them a chance to ask questions about proposal requirements. A preapplication is due a week after the conference. A month later proposals are due; bidders are notified one month later. Once the utility accepts a bid, it delivers 40 percent of the promised subsidy up front.

50 percent with the work schedule, and 10 percent at the final inspection of the installed project.

CMP staff are available to the bidders for advice at all times between the conference and the proposal due date. They help bidders pull together good proposals through informal phone conversations.

Although EBB and PP have specific bidding periods, PP's timetables are more strictly enforced. CMP requests Power Partner's bids specifically to fill a decrement of its projected demand. Though no ceiling exists on program expenditures, bids are accepted only as they are needed to fill CMP's demand. In contrast, EBB bids are generated outside bidding periods.

Contract Issues

Firms must prove their financial health during contract negotiations so that CMP can be reasonably sure they will deliver the promised savings. Power Partners participants are required to establish letters of credit in favor of CMP. In drafting the letter of credit, a bank takes the responsibility for determining the bidder's solvency. In this way, the utility delegates the determinations of creditworthiness. At first EBB contracts did not require letters of credit, so the utility had to determine its clients solvency on its own. Because CMP felt uncomfortable playing the role of the banker, standard EBB contracts now require letters of credit. Verification of energy savings is less important in EBB projects than in PP projects, so less time is spent discussing it during contract negotiations.

Subsidy

The EBB subsidy usually comes to 50 percent of the installed project cost. The utility delivers 40 percent of the subsidy up front, 50 percent with the work schedule, and 10 percent on final inspection. CMP will not allow paybacks to go below two years.

Bonneville Power Association

The Bonneville Power Administration (BPA) encourages conservation in Washington, Idaho, Oregon, and northern California through its Energy Savings Plan. Bonneville sells low-cost federal hydropower wholesale to western utilities and directly to some aluminum smelter companies. The energy held in the water above Bonneville's turbines can be converted quickly to meet spikes in the region's demand. However, the amount of water behind the dam limits the total kilowatt-hours Bonneville can produce. For this reason BPA focuses on saving energy rather than reducing demand.

The 1980 Pacific Northwest Power Conservation Act mandated that "conservation should be treated as a generating resource." In the following years, Bonneville crafted residential and commercial demand side management programs. In 1985 it developed the Sponsor Design Program to address the needs of industrial customers. It attracted eight participants. In November 1987 the Pilot Energy Savings Plan, an improved industrial program, emerged to attract nearly 50 participants over the next three years. Bonneville administrators established a permanent Energy Savings Plan (ESP) program in November 1990.

The ESP program improved over the pilot program in several areas. The new program includes subsidized energy assessments. BPA will pay an amount of \$0.0005 times a plant's annual kilowatt-hour use for energy audits up to \$50,000 or the cost of the audit. If an ESP project results from the audit, the payment is deducted from the project subsidy. Under the pilot program an industry was responsible for developing its own efficiency measures. Subsidies are no longer capped at \$250,000 per project. Local utilities, not just BPA area offices, now offer the program. Last, grants are made available for efficiency in new construction.

Program Operations

Each of BPA's area offices offers its own form of the program with different proposals, standard contracts, and processes. Administrators value the freedom to adapt the program to the circumstances of their region. However, all program guidelines include the same requirements for participants and payments.

In the Walla Walla, Washington, area office, the process begins when a utility indicates a potential for savings at an industrial site. An administrator from the Walla Walla office visits the site to see if the suggestion makes sense. Assuming the project is well conceived, the firm is asked to file a proposal with the local BPA office. Usually, the proposal shuttles between the BPA office and the firm for about a month before it is accepted. The office then reviews the proposal and approves or rejects it. Since November 1990, all proposals reviewed in the Walla Walla area office have been approved.

Once a project is approved, contract negotiations begin. The Walla Walla office asks the firm to order the equipment while the two parties discuss the terms of the agreement. Contract negotiations have lasted anywhere from a day to one month. Discussions may consist of filling in the blanks on the standard contract and signing. The firm already has done most of the work on the proposal, which is included as an attachment to the contract.

When the new electrical energy-saving equipment or redesigned facility is operational, the industry submits a completion report to the office. The project then is ready for inspection; office personnel visit the plant to verify the energy savings. A successful project inspection triggers the

"acquisition payment" --monies payed on the basis of kilowatt-hours acquired. The amount of the payment is linked directly to electricity saved. BPA also scales its acquisition payment to the percentage of the local utility's supply mix that Bonneville power comprises.

Advertisement

The ESP program is advertised mainly by word of mouth. Local utility officials inform their client industry managers. BPA representatives attend trade meetings for various industries to present the program and distribute pamphlets. BPA buys advertising space in trade journals. When the program first began, the Portland BPA office sent a business reply card with a pamphlet describing the program to thousands of large industrial customers in its service area. BPA officials are pleased with the program's acceptance rate by their customers.

Eligibility

Projects must meet several requirements before they are eligible for BPA funds. Firms may not receive funding for the project from any other federal or Bonneville program, and the equipment to be upgraded must be capable of operating. Bonneville also stipulates that projects must comply with applicable historical preservation guidelines.

Bonneville will not fund free riders --projects that could have been implemented without ESP. Bonneville believes it must understand a firm's capital budgeting process and its criteria for investment to determine how much the ESP is saving. A proposal for a project with a two and one-half year payback from a firm with an investment horizon of two years would be eligible, while the same proposal from a firm with an investment horizon of three years would be ineligible. Another stipulation is that new equipment may not be installed until after the rebate agreement is signed. In a sense, this stipulation restates Bonneville's aversion to paying for what would have or did happen without the program incentive.

BPA couches its simple payback limits in a complicated equation. The simple payback requirements are inversely proportional to the cost of BPA's power. Assuming customers must pay 5 cents per kilowatt-hour for Bonneville electricity, payback limits go from two-thirds to one-half of the project life. The equation also indicates that a project is only eligible if the savings cost no more than between 2.5 and 3.5 cents per kilowatt-hour.

Contract Issues

A full application has eight parts: the cover sheet; a project description sheet; an eligibility-criteria checklist; an energy savings estimate sheet; a savings verification sheet in which BPA asks the firm to provide a detailed plan to monitor energy consumption after the project is installed; a project cost sheet; an implementation schedule sheet; an environmental-effects information sheet, and an applicable environmental permits sheet. If a potential participant doubts a project is eligible, the firm can first submit an optional project summary. The process allows it to test the water without committing excessive labor to the effort. The project summary requires only the cover sheet, the eligibility-criteria checklist, a simplified project description sheet, and the two environmental sheets.

Bonneville requires no security against shortfalls in delivery or plant closure. The only reservation expressed in the contract is BPA's right to

negotiate payment over time. In fact, one BPA administrator expressed doubt that industries would enter contracts with large security requirements. He thought interest in the program would diminish rapidly if such securities were required in his area.

Without securities issues, firms do not need estimates of liquidated damages and letters of credit are not established. The absence of these issues accounts in part for BPA's short negotiations period. Initial contact to contract signing takes only two months for Bonneville, while it takes over six months for Central Maine Power to get as far.

Participating firms verify their own savings under the ESP program. BPA administrators trust the integrity of the meter readings used to calculate the savings. BPA could obtain the readings from the local utility. They do check the industry-performed calculations based on those readings.

BPA generates figures on kilowatt-hours per throughput for the industries it serves. Bonneville's program aims to cut these values. The administration has no problem with increased production leading to greater demand. Lower kilowatt-hour-per-throughput figures are the hallmark of a successful program. Iowa Electric, on the other hand, views this snap-back or take-back effect in the same way Bonneville views free riders (which are not popular with Iowa Electric, either).

Subsidy

The amount of the acquisition payment is the lower of 80 percent of the project cost or the product of the first-year energy savings in kilowatt-hours and the acquisition rate, which is listed and examined in Table 2. As with the project cost-ratio test in the project-eligibility requirements, the acquisition rates only establish guidelines for project administration to follow. Most projects are funded at 80 percent of the estimated costs or 10 to 15 cents per first-year kilowatt-hour saved, whichever is less.

Often payments are spread out over time. Installation of each part of a measure triggers a partial payment. Because some parts of a measure might be installed only during equipment downtime, the payments may be spread out.

Table 1
BPA's Energy Savings Program
Simple Payback Limits

Project Life (years)	Simple Payback Limit (years) ¹	Ratio of Project Life to Payback Limit
1	0.67	0.67
2	1.32	0.66
3	1.94	0.65
4	2.53	0.63
5	3.11	0.62
6	3.66	0.61
7	4.18	0.60
8	4.69	0.59
9	5.18	0.58
10	5.65	0.57
11	6.11	0.56
12	6.54	0.55
13	6.96	0.54
14	7.37	0.53
15	7.76	0.52

¹ Simple payback calculations assume Bonneville charges their customers 5 cents per kilowatt-hour. Simple payback is inversely proportional to the customer's cost of power.

Short-lived projects require shorter simple paybacks. Enduring projects enjoy longer payback periods. Payback periods fall from two-thirds to one-half of the project life as it increases from 1 year to 15 years.

Table 2
BPA's Energy Savings Program
Acquisition Rate Derivatives

Project Life (years)	Acquisition Rate	Change	Change in Change
1	1.30		
2	2.55	1.25	
3	3.75	1.20	-0.05
4	4.89	1.14	-0.06
5	6.00	1.11	-0.03
6	7.07	1.07	-0.04
7	8.09	1.02	-0.05
8	9.07	0.98	-0.04
9	10.00	0.93	-0.05
10	10.90	0.90	-0.03
11	11.80	0.90	0.00
12	12.60	0.80	-0.10
13	13.50	0.90	0.10
14	14.20	0.70	-0.20
15	15.00	0.80	0.10

Even though the acquisition rate determinations are too precise and the rates' second derivatives are discontinuous, they provide a guideline for program administrators. Usually, BPA pays 10 to 15 cents per first-year kilowatt-hour saved.

Energy Savings Plan Totals from Jan 1988 to April 1991

Totals from 20 completed projects

Expenditures	\$	1,612,850
KWH Savings		48,422,929

Totals from 12 pending projects

Expenditures	\$	1,224,250
KWH Savings		29,557,638

Data supplied by the Walla Walla regional office.

New England Electric System

New England Electric System's (NEES) Energy Initiative Program (EIP) encourages efficiency improvements in the commercial and industrial sectors. EIP is one of several NEES demand-side management programs. It saves far more kilowatt-hours than the other programs. NEES puts efficiency opportunities into seven groups. The groups are lighting (standard and custom), motors, variable-speed drives, HVAC systems, custom non-lighting, and energy-efficient process measures. The program has a worksheet for each use. Both custom non-lighting and energy-efficient process measures address process technology retrofits.

The Energy Initiative Program began in the summer of 1989. It combined three existing programs: the Customized Program, the Customer Designed Program, and the Government Facility Program. In December 1989, the Lighting Rebate Program joined the other three groups. Most EIP savings come from lighting retrofits.

The program avoided the need for 27 megawatts of generating capacity and saved 67 million kilowatt-hours of electricity production during 1990. The projects installed to date are expected to save 522 megawatts and 1,239 kilowatt-hours during their lifetime. It is so popular with customers that they flooded NEES offices with applications in early 1991. By March 25, the utility declared a moratorium on applications because it had received subsidy requests far above the program budget.

Program Operations

NEES and energy services companies (ESCO) deliver the Energy Initiative Program together. Utility representatives or ESCO salespeople visit the offices of potential customers to introduce the program. They speak to company managers and give them pamphlets to read. Interested companies and ESCO identify potential projects and file the appropriate worksheets and an incentive application form with a utility representative; one person handles a client from start to finish.

The energy services company completes the worksheets and the company files the incentive application form. ESCO indicates on the worksheet the number of installations of a particular measure and then multiplies by the subsidy per installation to arrive at the subsidy. The first five worksheets deal with savings measures that lend themselves well to menu-style subsidies. The sixth, the custom-measure worksheet, is far more involved. It asks the ESCO to detail the electric demand of a measure in different time slots. A Lotus 1-2-3 program uses the data to determine the subsidy. NEES developed the energy-efficient process measures worksheets from data and experiences gained by repeated custom applications for the same measure. The product of a per-unit incentive and the number of units determines the subsidy for all eight measures listed in the energy-efficient process worksheet. Usually the worksheets shuttle between the customer and the utility a few times before they are finally accepted.

The service company retains contractors to install the project after the NEES representative accepts the worksheets and conducts a pre-installation tour of the project site. Usually, the customer pays ESCO to oversee the entire energy review and installation. It charges around 15 percent more than the cost of installation for this service. The utility representative also tours the site midway through the installation and after completion. A successful post-installation tour triggers payment from the utility to the customer. Usually the customer stipulates that the final payment to the service company

follows the receipt of the subsidy. Because most of the ESCO's profit comes from the final payment, it finishes the installation on schedule.

Large customers already familiar with the Energy Initiative Program may choose to implement a smaller project internally. The utility representative is always available to help with the worksheets. The customer thus avoids paying the ESCO and its contractors.

Eligibility

EIP is available to all nonresidential customers. The program has no minimum or maximum simple payback limits, program incentive sizes, or kilowatt or kilowatt-hour requirements. However, the company reserves the complete discretion to reject any proposed energy-conservation measures.

Advertising

NEES sends mailers to potential customers describing the program with business reply cards. Interested customers received a larger mailing including a list of maximum incentives for various measures, descriptions of past program successes, a floppy disk with the spreadsheet used to calculate incentives for custom measures, the seven worksheets, and an incentive application form.

Newspaper advertisements increase awareness of the program. NEES releases items for news stories to the papers. Equipment dealers and contractors also market the program. The most important boost comes from ESCO salespeople and utility representatives, who spread news of the program directly to the customers. Fifty-nine percent of the program's participants claim their participation was based on direct contact with the utility representative.

Subsidy

The utility pays the customer after a post-installation check of the efficiency measures. The amount of the subsidy for many measures covered under the program is simply the product of the quantity of a particular measure and the listed incentive for that measure added over all measures. A Lotus spreadsheet determines from demand data the subsidy for custom measures. NEES usually pays 65 cents for each watt, or \$650 for each kilowatt, removed from a building's lighting load. For custom measures it pays up to \$2,000 for each kilowatt of load reduction. The incentive cannot exceed the project cost.

NEES program incentives dwarf those of other programs. It pays up to \$650 per avoided kilowatt of lighting demand and up to \$2,000 per avoided kilowatt of custom-process demand, compared to about \$200 offered by other utilities offer. Factors such as incremental cost of installation, the adjusted payback period, and the utility's avoided cost usually limit the size of the subsidy. Even within these boundaries, which change from utility to utility, NEES limits its subsidies less than others. For example, while Bonneville Power Administration will only buy a payback down to one year and Central Maine Power and Iowa Electric down to two years, NEES will buy it down to nothing. NEES will subsidize 100 percent of the incremental cost of installation, compared to only 50 percent or 70 percent elsewhere.

Contract Issues

Negotiations between NEES and clients have so far progressed smoothly. The standard contracts are simply measure worksheets that ESCO workers complete for the client. Its worksheets are well constructed. A corps of customer

service representatives for load management and conservation ensures that the customer will understand the requirements of the contract. Because the rules are well understood and the subsidies are very generous, customers are able and willing to participate and negotiations are limited.

Worksheet six for custom-approach non-lighting measures is more demanding to complete than the others. In it NEES requires clients to complete a large matrix detailing the hours of operation and demand during the morning, afternoon, and night of weekdays, weekends, and holidays of all seasons for existing and the proposed equipment. The custom-measures non-lighting form also asks for complete descriptions of the existing and proposed systems. Client staff spend hours completing the form, and utility staff spent hours determining fair incentives from the data supplied.

EIP has progressed to the point that subsidies for process-efficiency changes are printed in menu form. Process improvements common to the industries with a strong showing in NEES's client base were repeated. As bodies of data about these measures grew, NEES developed guidelines concerning the amount and temporal distribution of energy savings. These rules eliminate the need for the client to make detailed estimates about a measure's energy-saving profile as required by the custom approach non-lighting worksheet. The eight process-efficiency measures included in the energy-efficient process-measures worksheet are insulating blankets for injection molding machines; variable-volume hydraulic pumps; chilled water free winter cooling; efficient compressor stations; engineered nozzles and jets; outdoor air inlets for reciprocating air compressors; insulation for vulcanizers; and insulation for plating or degreaser tanks.

The work of carefully crafting the energy-efficient process-measures form simplifies contract negotiations for the eight measures listed. The menu form requires less time and money for the client to complete than the custom-approach non-lighting form. It lists conditions and requirements and incentive calculations for commonly occurring process-efficiency measures, which include a project description and some combination of the following topics: necessary prior conditions; installation requirements; operations and maintenance requirements; and cost, design, and engineering documentation guidelines. Subsidies for each unit installed are listed in a menu at the top of the page. The sheets also show the multiplication of installed units with subsidy per unit and the total over all installation sites to arrive at the total subsidy. The worksheet displays the incentive beside program costs at the bottom of the page.

Pennsylvania Power and Light Company

The Environmental and Energy-Efficiency Improvements (EEEI) program promotes efficiency improvements and reduced environmental impact through the installation of more efficient electrical equipment. The program is one of 18 demand-side management programs Pennsylvania Power and Light (PP&L) offers, seven of which target industrial customers. The other industrial programs are the interruptible rate program, the business energy assessments program, the energy conscious construction program, the lighting retrofit program, the private/public energy-efficiency partnership, and the area light conversion program.

PP&L expects to spend one \$1 million during 1991 to save 17 million kilowatt-hours and avoid the need to generate 3.3 megawatts. It will spend \$13 million on all its demand-side management programs. Two-thirds of that total is spent on programs that target the residential sector. PP&L spent \$36 million on its demand-side management programs from 1985 to 1989.

PP&L aspires to augment their total electricity sales. Goals for 1991 include a 773 million kilowatt-hour increase in sales due to aggressive marketing, new job creation, and switches to electric technologies from those using other fuels. The utility also hopes to avoid loss of sales to customer on-site generation. PP&L's excess generating capacity has made these goals necessary.

At the same time PP&L is spending \$13 million, or 0.5 percent of its operating revenue, on energy-efficiency programs. This expenditure does not conflict with the goal of expanding sales. Marketing energy-efficient electric technologies actually increases electric demand if the technology replaces a system based on another fuel. Moreover, energy efficiency can prevent loss of sales by securing a utility's industrial clients, and it can increase electricity sales by helping expand old industries and attracting new ones to a utility's service area.

In March 1991, PP&L filed a demand-side management plan for 1991 to 1993 in response to an order from the public utility commission. Some programs in the plan continue unchanged from past programs, some programs are expanded, and others are new or pilot programs. The plan proposes to expand EEEI over the three-year period.

Advertising

The utility maintains close contact with the large industrial customers that the program targets. Information about the program spreads naturally due to this relationship. PP&L industrial consultants inform industry managers of the program's availability.

Eligibility

PP&L will consider any high-efficiency electrotechnology. Fuel switching projects and cogeneration projects are not eligible. High intensity discharge lighting, industrial heat pumps, freeze concentration, thermal storage, infrared drying and electric materials handling systems all qualify.

Subsidy

PP&L determine subsidies case-by-case according to their field representative's project analysis. The utility places a ceiling on the subsidy of 50 percent of the cost of installation.

Final Comments

Every utility stands to benefit from a demand-side management program, because it can be tailored to suit different needs. The four utilities whose programs this report discusses have different program goals. For example, BPA can rise to meet any spike in demand, but worries that by 2000 its region's total need for electric energy will outstrip nature's ability to move water above its dams. Consequently, the ESP targets measures with the largest energy savings potential, regardless whether the savings occur in the middle of the night when few people need power. The utility does not lower rates in exchange for the right to discontinue service at a moments notice, or pay to move a need for electricity from the daytime to the night. Generating capacity is traditionally scarce for CMP and NEES, so they fund projects that shave watts from their maximum demand, regardless of whether the need for that watt is eliminated or arises again off-peak. These utilities intend to slow growth in sales and flatten the demand curve through their programs. PP&L seeks to increase its kilowatt hour sales; it has more capacity than it needs in the short term. By promoting electro-technologies that compete with gas, oil, and coal-based technologies, the utility can at the same time increase its electricity sales and the efficiency of its client companies. Strong local industry means predictable demand futures, which is a boon to any utility.

Industrial-efficiency demand-side management programs must be flexible because the methods of savings are diverse. Easy-to-use menu rebate forms handle non-process measures such as lighting and motor switches. Retrofitted light bulbs and motors produce repeatable savings that allow the development of generic contracts suitable for many jobs. Switching feedstocks from wood chips to recycled paper in a paper products plant has little in common with installing an electric-induction heating system in a foundry, though they are both changes an industrial demand-side management program would deal with. Utility staff cannot at first use standard forms and operations for these projects. The only recourse is to consider projects case by case. Later, when an industry common to a utility's client base requests a process change repeatedly, the experience and data gained from previous installations can speed future ones. Utility staff can use the data and experience to make a standard process form tailored to the specific project. Projects will then require only a fraction of utility and client staff time to complete.

A strong advertising campaign is essential to the success of a program. Most program evaluations find that lack of knowledge about a program is the main reason for non-participation. If they have at heard of the program, often they do not understand what it offers well enough to realize they could benefit from it. Direct, one-to-one contact between utility field engineers and client-company managers is the remedy to the information problem. At the same time the utility representative presents the program to a firm, he can walk through the firm and spot potential applications for the program.

Visits from field representatives improve the chances that company management will choose to implement efficiency improvements from the multitude of other tasks that require their attention. Managers will rarely approach a utility with a project as the result of a general mailing. The utility needs to make first contact.

Many utilities must produce demand-side management programs at the request of public utility commissions. Planners can learn much from past efforts that will help them construct new programs that work.

Table 3
Subsidy Guidelines
for Six Utilities

Utility	Subsidy per KW (dollars)	Subsidy per KWH (cents)	Minimum Adjusted Payback (years)	Maximum percent of installation cost	Maximum percent of avoided cost
Bonneville Power Admin.		1.0 to 1.3 ²	1	80	
Iowa ¹ Electric	20 to 280		2	70	80
Central Maine Power			2	50	
New England Electric System	15 to ⁶ 500		0	100	
Wisconsin Electric Power Company	up to 300 avg. 200 ⁷	up to 20 avg. 2 ⁷	under 2 ⁸	50	

¹ Demand is not an issue for Bonneville, due to the easily tapped power latent in the water above its turbine.

² Based on non-levelized acquisition rates. Levelized rates would yield a range of 1.30 - 1.35 cents/KWH.

³ Blank cells mean the utility did not use the guideline to determine the subsidy.

⁴ The IE program is still under review. These numbers come from the draft program plan.

⁵ Projects are considered case by case; there are no guidelines. CMP has not computed averages empirically.

⁶ From the Electric Power Research Institute's 1990 Survey of Industrial-Sector Demand-Side Management.

⁷ Ballpark estimates on average subsidies from a program administrator.

⁸ Inferred from a project example given in the "Smart Money is on Your Business" Brochure.

Table 4
Summary of Utility Energy Assessment Programs

Utility	Program Description
Central Maine Power	CMP will provide a trained energy advisor to inspect a customer's place of business free of charge through the Energy Audit Program. In most cases a walk-through audit conducted by one of CMP's 40 field representatives suffices. Personnel from A&C Intercom's Grey, Maine, office are retained at \$65 per hour for larger projects. The audit may take from a few hours to a few weeks. Sometimes even A&C lacks the ability to do the audit well. In these cases, CMP has spent up \$10,000 or more for an industry expert's advice.
New England Electric System	NEES provides free process-efficiency audits through its Technical Assistance Program. Outside consultants spend from a month to several months reviewing a facility at a cost of \$5,000 to \$50,000. The client or the utility can initiate the process. Through its Energy Experts program, NEES targets an entire industry for review rather than a specific facility. The utility has run this program only in the paper-pulp industry. NEES, an energy services company, or client staff usually devise efficiency projects on their own.
Bonneville Power Admin.	Bonneville will pay the product of \$0.0005 and a plant's annual kilowatt-hour consumption up to \$50,000 to a firm for an energy assessment. Energy experts--consulting firms, state energy offices, or other qualified groups--do the review. If a project results from the review the payment is deducted from the project subsidy.
Pennsylvania Power and Light Company	PP&L consultants recommend high-efficiency lighting, HVAC, and other equipment-related improvements to their commercial and industrial customers free of charge. Assessments occur by request or informally during regular meetings with large customers. PP&L projects it will conduct 180 assessments during 1991.

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