Puget Power

Commercial & Industrial Electricity Conservation Services

Profile #74

Executive Summary

Puget Sound Power and Light's Commercial and Industrial Electricity Conservation Service (CIECS) has been available since late 1978 and as such was one of the first DSM programs of its kind to be offered to the commercial sector. Puget's philosophy behind the service is based on the utility's strong commitment to the installation of cost-effective conservation measures in commercial and industrial facilities, in new and existing applications in its service territory to control load growth and to provide valuable customer services.

The conservation service originated out of a small staff of professional engineers who had the technical expertise necessary to analyze commercial and industrial facilities and the communication skills needed to discuss their results with customers. Their analyses emphasized a whole facility approach that addressed all facets of electricity use. The program's intent was and continues to be to focus on and promote tried-and-proven technologies that provide cost-effective energy savings.

Beginning in 1993 Puget began to screen measures for installation using the total resource cost for cost effectiveness. Measures that pass this criteria are then eligible for incentives based on the utility's avoided cost, a value that reflects the lifetime and characteristics of the specific measures installed. For the most part the utility has steered clear of prescriptive rebates for specific products, favoring a case-by-case customized approach for each project with typical incentive payments equal to 60-80% of customers' total installation costs, a level significantly exceeding more traditional prescriptive rebate programs for commercial and industrial customers. Typically the utility pays about half of its avoided cost. For instance according to the utility in 1992 the commercial and industrial programs cost an average of 3.3¢/kWh while its avoided cost for measures with an average measure life of 15 years was 6.5¢/kWh.

Like all of Puget Power's DSM programs, the CIECS program was dramatically ramped up in 1991 when Puget was given the opportunity to reap shareholder incentives for meeting aggressive DSM targets. As this profile describes, Puget succeeded in beating its overall energy savings target of 16 aMW, but also in controlling its direct administrative costs for which it was additionally rewarded. In 1991 CIECS capacity savings increased to 6.3 aMW from the 1990 level of 3.1 aMW. In 1992 the programs' capacity savings grew to 13.9 aMW, and the 122 GWh that were saved through energy conservation in participating commercial and industrial facilities in 1992 fulfilled 50% of the utility's entire conservation savings. For 1994, Puget expects CIECS to contribute an even greater proportion of savings, fully 65% of its overall energy savings.

Commercial & Industrial Electricity Conservation Service

Utility:	Puget Sound Power & Light
Sector:	Commercial and industrial
Measures:	Building envelope, process systems, space conditioning, lighting applications, and water heating improvements
Mechanism:	Funding assistance based on cost effectiveness of installed measures and Puget's avoided cost
History:	Started in 1978, ramped up in 1991

1992 Program Data

Annual energy savings:	122 GWh
Lifecycle energy savings:	1,823 GWh
Cost:	$25,467,100

Cumulative Data (1978 - 1992)

Energy savings:	2,037 GWh
Lifecycle energy savings:	6,356 GWh
Cost:	$101,247,900

Conventions

For the entire 1993 profile series all dollar values have been adjusted to 1990 U.S. dollar levels unless otherwise specified. Inflation and exchange rates were derived from the U.S. Department of Labor's Consumer Price Index and the U.S. Federal Reserve's foreign exchange rates.

The Results Center uses three conventions for presenting program savings. **Annual savings** refer to the annualized value of increments of energy and capacity installed in a given year, or what might be best described as the first full-year effect of the measures installed in a given year. **Cumulative savings** represent the savings in a given year for all measures installed to date. **Lifecycle savings** are calculated by multiplying the annual savings by the assumed average measure lifetime. **Caution:** cumulative and lifecycle savings are theoretical values that usually represent only the technical measure lifetimes and are not adjusted for attrition unless specifically stated.

Puget Sound Power & Light Company (Puget or Puget Power) is an investor-owned electric utility serving the fastest growing area in the State of Washington. The company's service area encompasses 4,500 square miles throughout eight counties in Western Washington and portions of one county east of the Cascade Range. Puget does not serve the larger cities of Seattle and Tacoma but does provide electrical service to their rapidly expanding suburbs.

The region has enjoyed solid economic growth above that of much of the rest of the country over the past years due to its diversified economy that includes such high-technology firms as Microsoft. However, the economy is still strongly based in traditional areas such as timber and textile products. Additionally, The Boeing Company remains the region's largest employer. The steady growth of the Pacific Northwest has been reflected by Puget's own expansion and in 1992 the utility had record revenues of $952,300,000.[R#4]

The utility serves approximately 787,000 customers of which slightly over 84,000 are commercial or industrial users. The number of customers has increased 38% or by 215,000 over the past ten years. In 1992 alone an additional 19,500 customers were added to the utility's system. Although customer growth is expected to moderate it will still be a factor in resource planning.[R#4]

To meet this growth Puget has relied on purchased power that comprised 64% of its electricity in 1992. Since Puget is not a public utility is does not have the distinction of being one of Bonneville Power Administration's "preference customers." Therefore, unlike most other Northwestern retail utilities, very little of Puget's purchased power comes from Bonneville, the federal power marketing agency. Puget does however, purchase small quantities of non-firm, surplus power from BPA at very attractive rates, and both Puget and BPA do wheel power over each other's lines.[R#10]

Currently Puget owns and operates 1,870 MW of generating capacity and has a total capacity including power purchases of 5,105 MW. In 1992 peak demand was 3,906 MW. Approximately 51% of Puget Power's total energy resources are hydroelectric. The remainder of the power is provided by coal, oil, and natural gas power generation. In addition to its energy efficiency initiatives, Puget intends to add nearly 600 MW of firm power by 1995 primarily through purchases from gas-fired industrial cogeneration to fulfill its resource requirements.[R#4]

Commercial customers comprise 10% of Puget Power's customer base but currently account for 33% of electricity consumption. While less than one percent of the customers are in the industrial class they account for 20% of total electricity consumption. Residential customers consume the remaining 47% of Puget's electricity sales with an average use of 11,989 kWh per customer.[R#4] ■

PUGET POWER 1992 STATISTICS		
Electric Customers	787,000	
Employees	2,775	
Electricity Sales	18,350	GWh
Electric Revenue	$952.30	Million
Peak Demand	3,906	MW
Purchased Power Capacity	3,235	MW
Generating Capacity	1,870	MW
Total Capacity	5,105	MW
Reserve Margin	31	%
Average Electric Rates		
Residential	4.9	¢/kWh
Commercial	5.4	¢/kWh
Industrial	4	¢/kWh

Utility DSM Overview

With the filing of Puget Power's first conservation tariff in 1978, called "Schedule 83," the company became one of the first utilities in North America to offer conservation services for commercial and industrial facilities in addition to more common residential energy services. At that time the focus of Puget's programs was primarily residential and commercial lighting applications. Funding assistance came in the form of zero-interest, 10-year loans.

From 1978 to 1990 the Company invested in nearly 100 average megawatts of energy efficiency and renewable resources in its service territory while capturing an average of 6-7 aMW per year. Programs included solar water heating grants, heat pump loans and grants, low income weatherization, weatherization services for senior citizens, water heater rentals, working with major accounts, and a range of design assistance programs. By the end of 1992 the Company had racked up 88.04 average megawatts from the residential sector, 52 aMW from the commercial and industrial sectors, for a total of 140.04 aMW overall.[R#8]

Many utilities in the Northwest have been able to fund most if not all of their demand-side management efforts by selling energy savings to Bonneville. Unlike other Northwestern utilities whose programs have been profiled by The Results Center (see Profiles #20,27,71), Puget has not been able to reap significant dollar values for conservation sold back to Bonneville since BPA generally only buys back conservation savings from firm power customers. However, at one point when Puget purchased 2% of its total electrical demand from BPA it was entitled to sell back conservation to BPA at 75% of the power purchase cost. This arrangement has since been terminated.[R#10]

In 1990, The Washington State Utilities and Transportation Commission (WUTC) asked for proposals to address regulatory barriers to conservation. The utility initiated a collaborative process with its traditional interveners to focus on the WUTC's questions. The collaborators examined ways to pursue acquisition of cost-effective resources outlined in Puget Power's Integrated Resource Plan and to dramatically ramp up Puget's DSM efforts.[R#15]

PUGET POWER CURRENT DSM SERVICES

Residential

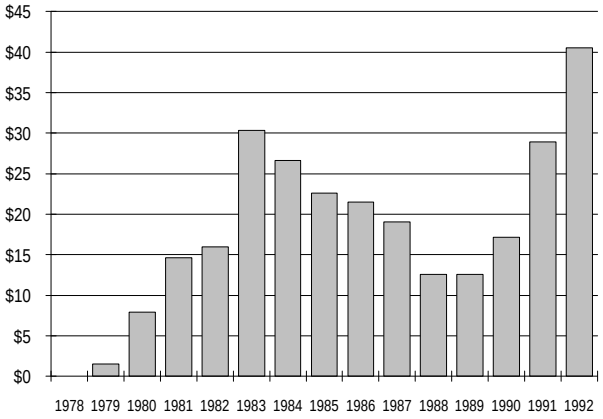
Weatherization Retrofit
Water Heating
Lights and Appliances
Low-Income Retrofit
New Construction
Manufactured Housing Acquisition (MAP)

Commercial & Industrial

Commercial New Construction
Commercial Retrofit
Industrial New Construction
Industrial Retrofit
C&I Motor Funding

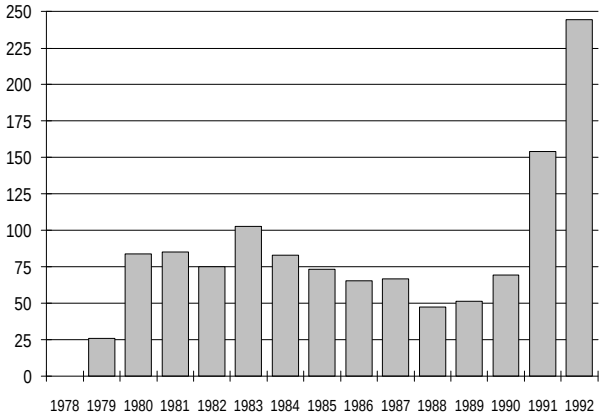
The result was a proposal to the Commission to effectively "decouple" revenues from sales to align Puget's Integrated Resource Plan with growing customer needs. Decoupling removed the disincentive for utility investments in energy efficiency and squarely addressed the issue of utility lost revenues. In short, Puget would be compensated for sales it would have made in the absence of its DSM efforts. This decoupling mechanism was approved for a three-year test period and effectively removed the major financial barriers to conservation, ☞

ANNUAL DSM EXPENDITURE ($1,000,000)

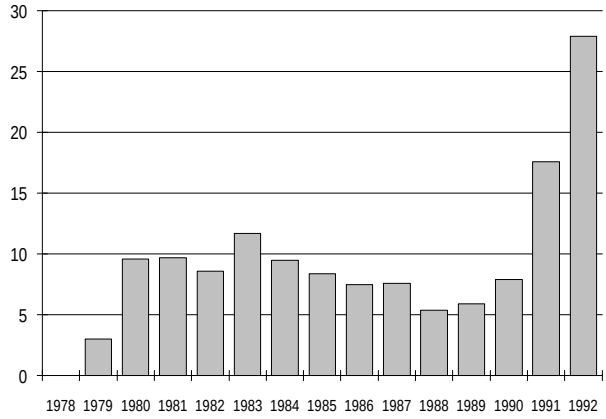


DSM Overview	*Annual DSM Loan Funding Provided (x1000)*	*Annual DSM Grant Funding Provided (x1000)*	*Total DSM Funding Provided (x1000)*	*Annual Energy Savings (GWh)*	*Annual Capacity Savings (aMW)*
1978	$2	$0	$2	0	0.0
1979	$1,456	$38	$1,494	26	3.0
1980	$7,561	$398	$7,959	84	9.6
1981	$13,303	$1,359	$14,662	85	9.7
1982	$9,325	$6,645	$15,970	75	8.6
1983	$11,409	$18,913	$30,322	103	11.7
1984	$7,291	$19,389	$26,680	83	9.5
1985	$5,325	$17,323	$22,648	74	8.4
1986	$4,665	$16,818	$21,483	66	7.5
1987	$3,483	$15,603	$19,086	67	7.6
1988	$1,872	$10,667	$12,539	48	5.4
1989	$1,152	$11,397	$12,549	51	5.9
1990	$108	$17,081	$17,189	69	7.9
1991	$0	$28,907	$28,907	154	17.6
1992	$0	$40,574	$40,574	245	27.9
Total	$66,952	$205,112	$272,064	1,230	140.4

ANNUAL ENERGY SAVINGS (GWH)



ANNUAL CAPACITY SAVINGS (aMW)



marking the beginning of a significant ramp-up of conservation activity at the utility. In fact with the incentives in place (discussed at length in the Regulatory Incentives and Shareholder Returns section) Puget achieved record levels of conservation in 1991. In 1990 for comparison, Puget saved 7.9 aMW, a figure that was dwarfed by the 1991 level of 17.6 aMW and the 1992 level of 27.9 aMW.

In a September 21, 1993 rate case order, the WUTC extended the decoupling mechanism for an additional three years and convened a collaborative process to fully evaluate the mechanism. Puget Power continues to work with the collaborative group on an advisory level to set conservation direction and annual performance targets.

Long-range conservation needs are established by the company's Integrated Resource Plan (IRP) which determines the appropriate resource mix and the cost associated with each of those resources. Puget filed its first IRP in 1987 and updates this plan every two years. The mix of resources required over the next 20-year period, assuming medium customer growth, includes about 300 aMW of conservation or slightly less than one-fifth of anticipated growth of 1,600 aMW.[R#5]

Puget moved to a total resource cost (TRC) perspective to account for the benefits and costs incurred by the company and all other contributing parties in conservation programs. The TRC was implemented early in 1993. When applying the TRC to specific customers' potential energy improvements, the total benefits of the conservation measures, including electricity savings and other benefits, must exceed the total costs of installation in order to be eligible for funding assistance. Using the TRC has been viewed as a more comprehensive screen of society's costs and benefits of conservation, moving beyond a singular focus on utility costs and benefits.

The utility has focused its conservation efforts on energy rather than capacity savings. That said, Puget calculates average megawatts (aMW) from its energy savings for reporting purposes. One average megawatt equals 8,760,000 kilowatt-hours of electricity.

Since the inception of its DSM activities, Puget has saved 1,229,702 MWh with the largest savings of 244,606 MWh in 1992. Puget saved a total of 28 aMW in 1992 from its DSM activities and has saved 140 cumulative aMW since beginning conservation efforts in 1978. In 1992 Puget spent approximately 4.3% of its gross revenues on conservation, though this level is conservative since the costs identified only relate to direct measure costs and omit other administrative costs. (Eric Hirst of Oak Ridge National Laboratory calculated that Puget spent 4.4% of its gross revenues on demand-side management in 1991.)[R#4,18]

Puget Power's conservation services as a whole have received several awards. In the past the company received an award from the State of Washington for Energy Innovation in Washington State and a nomination for a National Award for Energy Innovation, a U.S. Department of Energy Award for Energy Innovation, and a citation from the President's Citation Program for Private Sector Initiatives for Outstanding Service to the Community and Finding Innovative Private Solutions to Public Problems. Recently, Puget's conservation services received the 1992 Northwest Conservation Act Coalition Conservation Eagle Award for Outstanding Achievement in Promoting Regional Energy Efficiency.

While Puget continues to implement a range of programs, the breadth of Puget's Commercial and Industrial Electricity Conservation Service (the focus of this profile) has expanded to cover nearly all aspects of cost-effective energy management in commercial and industrial facilities. It includes funding options of cash grants, product rebates, and electric billing credits. Since the program's onset there has been no attempt to restrict conservation services to very large customers. In addition to the requirement that the facility use electricity for the major portion of its energy systems, the only other factor for funding assistance is cost-effectiveness. The contribution to overall energy savings of the Commercial and Industrial Electricity Conservation Service has grown steadily over the years to where it now is expected to provide approximately 65% of the energy conservation savings targeted for 1994.[R#14] ■

The Commercial and Industrial Electricity Conservation Service (CIECS) is available to owners or tenants with appropriate owner consent of permanently-located, new or existing, commercial and industrial facilities. All customers may receive services as often as they care to participate providing that the installation of conservation measures meets Puget Power's Total Resource Cost (TRC) test for cost-effectiveness.

Funding for cost effective measures is allocated on a case-by-case basis rather than using a prescriptive approach. The amount of funding that Puget will provide to its customers is based on the relationship between the cost of the measure and the utility's avoided cost, which Puget defines as the cost the utility would otherwise incur to provide power from another resource plus credits for externalities, fuel diversity, and line losses.

Puget does not enjoy the low avoided costs that dominated the Northwest years ago in times of surplus. (While Bonneville Power Administration is able to provide the nation's lowest cost power to public retail utilities, which Puget is not, in the Northwest avoided costs have climbed steeply in the past decade.) Avoided costs for Puget's DSM initiatives are based on the types of efficiency measures that are to be put in place and their average weighted lifetimes. For instance, Puget's avoided cost for typical, 15-year industrial retrofits is on the order of 6.5¢/kWh. For similar 20-year measures, the avoided cost climbs to 8.0¢/kWh; but it falls for shorter measure lifetimes. The utility's overall DSM avoided cost, reflected in a proxy combined-cycle natural gas-fired baseload power plant, is on the order of 6.6¢/kWh. Puget typically grants its customers 50-60% (or 3-4¢/kWh) of its avoided cost, a far more generous incentive than typical 15-20% rebates.[R#7,10,15]

The Commercial and Industrial Electricity Conservation Services include the preparation of an energy analysis report with proposed recommendations, installation bid criteria and oversight, inspections and verification. Grant funding is available for building thermal improvements, space conditioning system improvements, water heating improvements, and process improvements, and lighting system improvements when they are determined to be cost-effective. The bulk of the savings from the CIECS program have been in lighting and space conditioning applications. Approximately 45% of total savings have come from each of these areas.[R#14]

Under the larger umbrella of the Commercial and Industrial Electricity Conservation Service are several more focused sub-programs. The Commercial and Industrial Retrofit service provides energy analysis and funding assistance for retrofits of existing facilities. The Commercial and Industrial New Construction service (DesignPlus), established in 1988, offers energy design analysis and funding assistance for the incremental cost of energy-efficient measures that exceed State Building Code requirements. Lighting Conservation services also are marketed to commercial customers by a network of participating contractors. Until 1989 most of the conservation activity was in the commercial sector. Then, because of the specialized nature of industrial facilities, additional staff was added and a separate service was established for industrial customers. In addition, a vendor rebate was provided for motor dealers for high efficiency motor sales.[R#15] ■

MARKETING

Puget has chosen to market its commercial and industrial programs primarily through direct contact with trade allies and customers. The utility works closely with trade allies to leverage the marketing of its programs as trade allies typically work with customers at the time they are considering making changes to their facilities, an excellent time to pursue energy efficiency. Puget also believes working with trade allies helps improve the efficacy of installation of conservation measures and provides information about current energy-efficient technologies. Networking with trade allies is accomplished in several ways. Puget staff make presentations to consulting firms and at meetings of engineering societies. Puget also sponsors technical seminars and participates in select trade shows to network with customers, vendors, and trade allies.[R#10,11]

CIECS has generally been marketed to customers through personal communication. Contact by Puget Power energy management engineers, seminars, and presentations and program brochures and information sheets form the core of marketing techniques used to promote the program. The utility has also employed advertising on the radio featuring mini case studies to promote the program, as well as the "Northwest Currents" customer newsletter.

DELIVERY: THE STEP BY STEP PROCESS

Prescreen: Customers interested in conservation retrofits contact the energy management engineer (EME) in their local regions. (Ten regions cover Puget's service territory.) The EME and the customer discuss the services that Puget has available for the customer's facility and to enhance its operating characteristics. If the EME determines that there is potential for an energy efficiency retrofit a prescreening of the facility is conducted at no cost to the customer.

Assuming that the preliminary findings of the prescreen indicate suggested conservation measures are indeed cost-effective, the EME and customer determine whether to proceed with an in-depth energy analysis paid by Puget. If it is determined to move forward with the analysis, the customer is not obligated in any way other than to give serious consideration to the energy conservation measures identified by the energy analysis.[R#9,14]

Analysis: Provided that cost effective efficiency improvements have been identified in the walk-through audit, and provided that the customer has the intent to implement retrofits if confirmed for effectiveness through the analysis, the customer's facility is analyzed in detail, again at no charge to the customer.[R#14]

In most cases the EME performs the analysis using computer modeling software. In special cases where in-house expertise is limited an energy management consultant may be utilized. Lead times for scheduling the analysis vary depending on the complexity of the project.

Proposal: Once the analysis is complete the EME uses software developed in-house to determine the funding levels available to the customer. Then the EME presents a funding proposal outlining estimated funding assistance to the customer. If the customer decides to install the recommended measures then a funding application is signed.[R#9]

Although some customers may not receive funding assistance for their conservation projects, they are able to receive the benefits of considerable energy management expertise and assistance with specification and bid preparation for customer-funded projects from the CIECS program. Furthermore, where commercial and industrial customers cannot install conservation measures cost-effectively in their facilities, Puget Power still offers engineering services and education in reducing energy consumption through improved maintenance or operating practices. In addition to advising individual customers the company sponsors seminars and trade shows, often in conjunction with neighboring electric

utilities, workshops focused on specific technologies, and a customer newsletter, all intended to assist customers with improving their overall energy efficiency.

Competitive Bid: Typically, competitive bids are requested by the customer for the installation of the conservation measures. The EME assists the customer with the bid process by preparing bid specifications and evaluating contractor proposals, but the customer makes the final selection of contractors. Puget does not have a list of prescreened contractors eligible to participate in the CIECS program.

Funding Agreement: Once the customer selects a contractor the EME finalizes the funding assistance. A conservation funding contract is prepared for managerial and customer approval. Until 1989 both loans and grants were available but today Puget provides only grants to its customers.

As discussed in the Program Overview, funding is allocated on a case-by-case basis up to a maximum level of the utility's net avoided cost for specific measures, with no funding provided for any measure that does not meet Puget's TRC test. The level of incentive is based on the cost of the measure as compared to the utility's avoided cost as described in the Program Overview section.

For retrofit projects the utility will pay a varying percentage of the installation costs. When the measure cost is less than or equal to the avoided cost, Puget will fund the lesser of 80% of the measure cost or the full net avoided cost. The full net avoided cost is defined as the avoided cost minus direct administrative costs associated with audits, analysis, customer proposals, oversight and inspection, management and supervision, training, and promotion.

If the measure cost is between the avoided cost and 1.5 times the avoided cost, Puget will fund less than the net avoided cost on a linear sliding scale from the net avoided cost (when the measure cost equals the avoided cost) down to a prescriptive minimum payment (when the measure cost equals 1.5 times the avoided cost). The minimum payment is calculated as the present value of the cost of saved energy and ranges from 2.9¢/kWh to 16.17¢/kWh for measures with lifetimes of 2 to 30 years. For measures that cost more than 1.5 times the utility's avoided cost, Puget will pay the minimum payment.

For new construction Puget pays a varying percentage of the incremental cost of efficiency in much the same manner as for retrofit projects. The only difference is that Puget will fund the lesser of 100% of the measure cost or the net avoided cost for those measures less than or equal to the company's avoided cost.[R#7,14]

Construction: At this point the contractor is authorized to proceed with the installation. The EME provides construction oversight at the customer's request.[R#9]

Verification: Once project construction is complete the EME verifies the proper installation of all measures to assure delivery of the conservation resource.[R#9]

Payment: When construction has been verified funds are released to the customer in the form of a check for the funding assistance previously committed. The customer is responsible for paying the contractor or contractors directly.[R#9]

MEASURES INSTALLED

Because the program is not based on prescriptive rebates and incentives on standard classes of technologies, the program has been involved in a wide variety of technologies which are categorized below. On the commercial side, retrofits have included lighting systems; heating, ventilating, and air conditioning improvements; and some shell measures.

By 1990 Puget had begun to ramp up its industrial efforts by focusing on key industries such as refineries and working with The Boeing Company (an airplane manufacturer), food processors, and some pulp and paper mills. Puget also began to offer more sophisticated ☞

energy management for industrial customers at that time as well, beginning to hone in on industrial process efficiencies. For industrial measures installed to date, Puget assumes a weighted average measure life of 12 years.[R#14,15]

STAFFING REQUIREMENTS

Currently the Commercial and Industrial Electricity Conservation service staff includes approximately 38 professionals, primarily consisting of energy management engineers that work full-time on the program. Puget Power's Conservation Services utilizes field and staff employees as a team and "cross-assignments" occur frequently on a project basis to take advantage of special skills or to provide cross-training. Occasionally, for projects requiring specialized technical knowledge, such as industrial processes, contractors still provide assistance. For the industrial energy management aspect of the program, required staff has increased from one full-time equivalent in 1989, to three in 1990, to five in 1991 and 1992.[R#14] ■

CASE STUDY: ONE BELLEVUE CENTER

An energy-retrofit project at One Bellevue Center, a 22-story, 344,715 square foot office building in Bellevue, Washington, has resulted in significant energy savings by replacing a ten-year old pneumatic control system for the building's heating, ventilating, and air conditioning with direct digital controls (DDC) and a specially-designed, terminally-regulated variable air volume system software package. Even before the project was complete a limited test on one floor showed the new controls helped cut HVAC electric consumption in half when compared to that recorded with the building's pneumatic controls. Now complete, the retrofit has won the building's owner Energy User News' Efficient Building Award for Building Automation.[R#14,19]

Fully 84% of the total project cost of $965,104, or $814,793, was granted to the owner by Puget Power, the building's anchor tenant. The owner will have a payback on his investment of $150,311 of one year and eleven months as the annual projected utility bill savings are $79,111, based on energy savings of just over two million kWh (2,052,391) and a demand reduction of 234 kilowatts. The controls were replaced because their retrofit coupled with the utility's incentive met the building owner's two-year payback criteria.[R#14,19]

The retrofit included installation of 7,000 new microprocessor-based controls throughout the business office tower and removal of the existing pneumatic controls. Furthermore, the retrofit entailed the installation of variable speed drives on air handler motors. Work also involved revamping related HVAC control panels and wiring circuits for new zones in the DDC system.[R#14,19]

Each zone in the system has a programmable control board connected to sensors which help automate HVAC decisions and help control lighting as well. Compared with the former system that used fewer thermostats to monitor temperatures, the DDC system integrates the sensor data, providing better zone control, improved ventilation, and quicker response to tenant needs. The digital controls also allow for outside air movement in the building during off hours.[R#14]

One Bellevue Center's new control system flashes overhead lighting to warn tenants when lighting and HVAC will soon adjust to off-hours operation. If a tenant needs to occupy an area during those periods, he or she simply pushes a button on the DDC thermostat to override the off-hours programming.[R#14]

As part of the retrofit the facility also changed the fans that supply air to each floor in the building. Adjustable-speed drives replaced the existing constant-speed fans to allow the fans to match their speeds to the exact ventilation loads required by each floor. Improvement in air pressure supply was observed even before all the digital controls were placed on-line.

MONITORING

Energy management engineers (EMEs) provide construction oversight and inspection during project implementation. When construction is complete the EME performs an on-site inspection and verifies the proper installation of the energy conservation measures.

Information about conservation projects is maintained in a tracking system developed in-house. The system manages information about program participation, project characteristics, projected energy savings, energy conservation measures recommended and installed, and funding provided. Data entry is centralized at the utility.

EVALUATION

With regulatory reform decoupling revenues from sales, Puget Power has placed increased reliance on conservation and on quantifying energy savings. In 1991 the utility developed a "Demand-Side Management Measurement and Evaluation Plan" to establish a framework for assessing energy savings, persistence of savings over time, program costs, and cost-effectiveness. This plan was developed in conjunction with the collaborative convened to propose regulatory reform. In 1992 the plan was updated and work began on the Commercial Energy Management Services Evaluation (CEMS). Cambridge Systematics is performing the evaluation to address both process and impacts of the program.[R#2]

Impact and process evaluations of the commercial retrofit component of the CIECS program are scheduled to be complete in late 1993 or early 1994. The evaluation includes billing analysis of energy savings, telephone surveys, and site visits of participants and non-participants, and interviews with program staff. The impact evaluation is focused on the 1987-1991 program years while the process evaluation is focused on 1992 efforts.

Preliminary results suggest energy savings to average about 90% of engineering estimates with no significant decline over the first five years after installation. Phone surveys and site visits support this high level of persistence found by the billing analysis. Free rider and spillover effects (what Puget terms free drivers), though difficult to quantify, appear to be relatively small and offsetting. Customer satisfaction levels are high with 95% of the participants satisfied with program procedures and 85% satisfied with the overall performance of the measures installed.

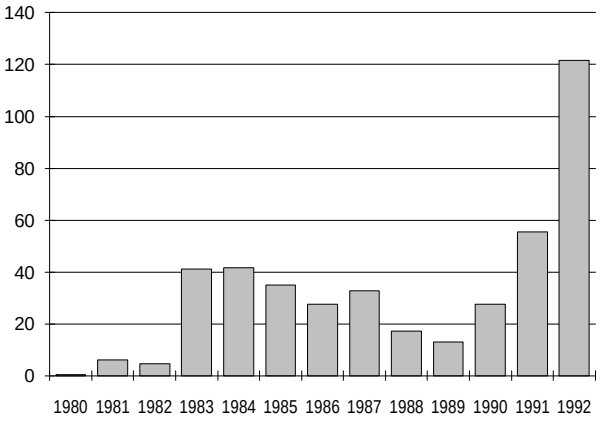
An evaluation of the industrial component of the program is currently underway and is expected to be completed in late 1993. This evaluation will be based on case studies measuring energy and demand savings. Puget views the value of the case study approach to be in providing lessons learned for procedures currently used to estimate savings from similar applications, rather than providing average program savings to date.

An impact of the commercial new construction component was begun in 1993 and is expected to be complete in 1995. This study is being undertaken in a collaborative with other large Northwestern utilities and the Electric Power Research Institute. ■

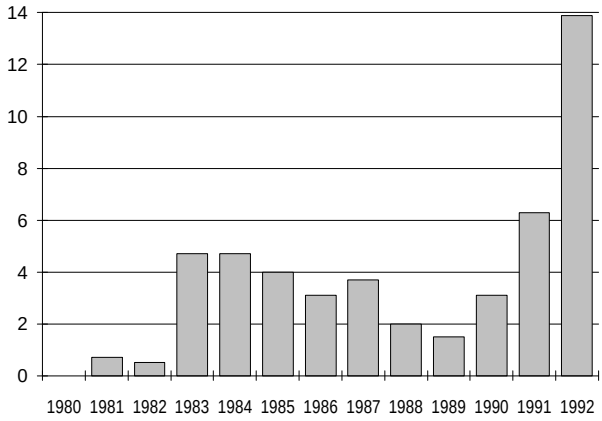
Program Savings

Savings Overview	*Annual Energy Savings (MWh)*	*Cumulative Energy Savings (MWh)*	*Lifecycle Energy Savings (MWh)*	*Annual Capacity Savings (aMW)*	*Cumulative Capacity Savings (aMW)*
1980	416	416	6,240	0.0	0.0
1981	6,168	6,584	92,520	0.7	0.8
1982	4,731	11,315	70,965	0.5	1.3
1983	41,136	52,451	617,040	4.7	6.0
1984	41,553	94,004	623,295	4.7	10.7
1985	34,847	128,851	522,705	4.0	14.7
1986	27,520	156,371	412,800	3.1	17.9
1987	32,652	189,023	489,780	3.7	21.6
1988	17,105	206,128	256,575	2.0	23.5
1989	12,939	219,067	194,085	1.5	25.0
1990	27,545	246,612	413,175	3.1	28.2
1991	55,551	302,163	833,265	6.3	34.5
1992	121,560	423,723	1,823,400	13.9	48.4
Total	423,723	2,036,708	6,355,845	48.4	

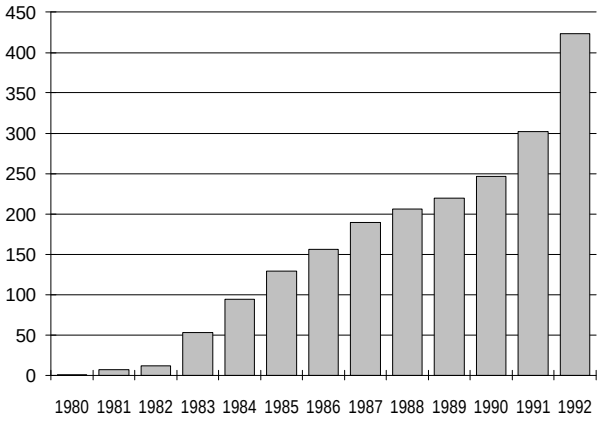
ANNUAL ENERGY SAVINGS (GWH)



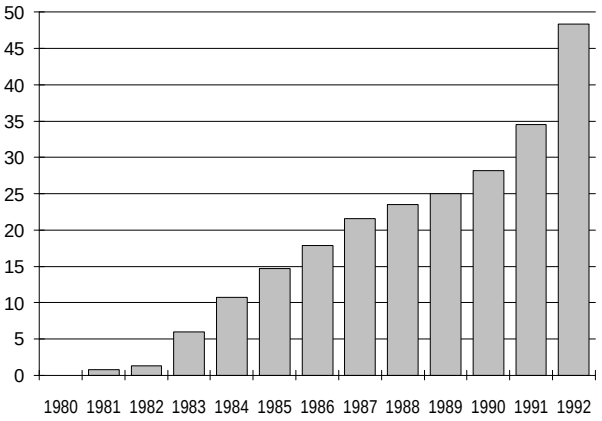
ANNUAL CAPACITY SAVINGS (aMW)



CUMULATIVE ENERGY SAVINGS (GWH)



CUMULATIVE CAPACITY SAVINGS (aMW)



DATA ALERT: Energy savings numbers are based on engineering estimates and have not been adjusted. Savings from projects where an energy analysis was performed but which were customer-financed only are included in the savings figures but not the participation figures.

Although the Commercial and Industrial Electricity Conservation Service program began in August of 1978, no projects were completed until 1980. Program implementation during the first 18 months was focused on program development and establishing working relationships with trade allies, contractors, and customers. Since 1980, 5,670 projects received funding assistance resulting in annual energy savings of 423,723 MWh. Cumulative energy savings for the same period were 2,036,708 MWh. In terms of average megawatts the program has resulted in total capacity savings of 48.4 aMW with 42% of the program total saved in 1991 (6.3 aMW) and 1992 (13.9 aMW).

Like all of Puget's DSM efforts, energy savings from the program doubled between 1990 and 1991 and again the following year. The savings in 1992 of 121,560 MWh are equivalent to slightly more than one-quarter of the program's total savings. Similarly, the program's 1992 capacity savings of 13.9 aMW represents fully 29% of the total capacity savings since the program's inception. Puget attributes this increase to the regulatory reform in Washington that allows the utility to decouple revenues from sales.[R#10,11]

Prior to 1989 Puget had not attempted to disaggregate commercial and industrial savings. In 1989 industrial savings accounted for 1,736 MWh or 13.4% of the total program activity. This was followed by 13,094 MWh of industrial activity in 1990 or 47.5% of the programs' total savings, then 24,213 MWh in 1991 for 44% of the total, and 37,653 MWh in 1992 or 31% of total program savings. Note that in 1992 Puget sold 3,704,450 MWh to industrial customers. Thus its industrial DSM programs that year saved approximately 1% of total sales to that customer class.[R#14]

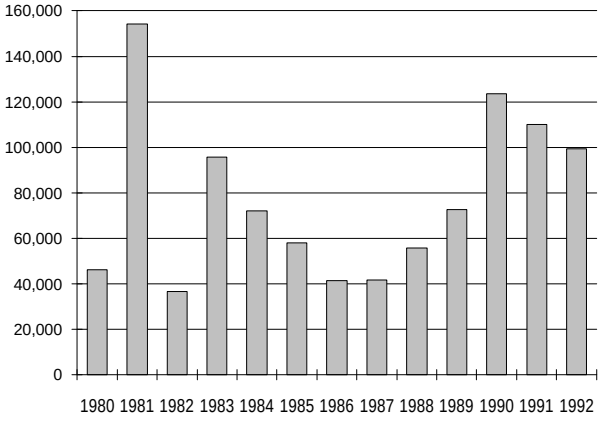
PARTICIPATION RATES

Puget calculates participation on the basis of completed projects rather than on a customer basis as customers may choose to participate in the CIECS program more than once. The utility tracks participation on a completed project basis for those projects that receive funding assistance for energy conservation under the CIECS umbrella. Note the difference from the methodology used to calculate savings where self-financed projects were included provided the utility had performed an audit of the facility.

Participation	*Projects Receiving CIECS Funding Assistance*	*Annual Energy Savings per Project (kWh)*
1980	9	46,222
1981	40	154,200
1982	129	36,674
1983	430	95,665
1984	576	72,141
1985	602	57,885
1986	663	41,508
1987	785	41,595
1988	307	55,717
1989	178	72,691
1990	223	123,520
1991	505	110,002
1992	1,223	99,395
Total	5,670	

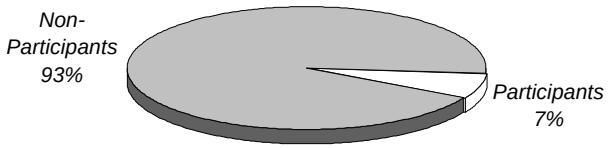
As with energy savings, participation in the program has roughly doubled each of the past two years to reach a total of 1,223 projects in 1992. A total of 5,670 projects have received funding assistance under the CIECS umbrella over the life of the program. ☞

ANNUAL ENERGY SAVINGS PER PROJECT (KWH)



Although the utility is not able to track multiple participation in the program by the same customer due to the inputs used in the tracking system, it is certain that there have been customers that have participated more than once. Thus the 5,670 completed projects represent a maximum of 7% of the total eligible C&I market of 84,622 in 1992. Average annual energy savings per project over the life of the program are 74.7 MWh.[R#6]

PARTICIPATION



Beginning in 1989 Puget began to track the number of industrial customers who had engaged in the program. In 1989, one industrial customer participated in the CIECS program, then nine in 1990, followed by 30 in 1991, and 80 in 1992. As such the industrial side of the program has resulted in a simple participation level of 3.3% with 120 customers participating out of 3,659 total industrial accounts.[R#14]

SAVINGS ADJUSTMENTS

As noted in the Evaluation section, Puget believes the levels of free ridership and free drivership in the CIECS program cancel each other out. Therefore no adjustments have been made to the savings data.

MEASURE LIFETIME

Puget Power assigns maximum lifetimes to its eligible energy conservation measures in both retrofit and new construction applications. Actual lifetimes may be adjusted based on specific site conditions. In general, lighting improvements have maximum measure lives ranging from 15 to 20 years depending upon the measure. Space conditioning system and water heating improvements are expected to last 15 years with the exception of low-flow devices at 10 years. Process improvements are credited with a 15-year retrofit life or a 20-year effective life in new construction applications. Building thermal envelope improvements are considered viable for 15 to 30 years depending upon the specific measure.[R#7]

To calculate lifecycle savings and the cost of saved energy, The Results Center has assigned an average fifteen-year effective life to the savings achieved under the CIECS program as this figure approximates the industry convention. Thus lifecycle savings from the program to date have reached a total of 6,355,845 MWh. ■

DATA ALERT: Puget Power only began to track administrative costs for CIECS in 1991. As such the administrative cost values presented for 1978-1990 are approximate values and represent 25% of the total program cost.

The dramatic increase in participation in the program in 1991 and 1992 has resulted in a corresponding increase in program costs, most notably in funding allocations. In 1991, $9,274,600 was provided to customers in the form of conservation cash grants, a better than three-fold increase over the $2,961,000 awarded in 1990. By 1992 increased participation had driven grant payments to $21,227,700. Total incentives have reached $78,134,700 since 1980.

COST EFFECTIVENESS

Prior to April 1, 1993 an energy conservation measure was determined to be cost-effective if the total cost of the measure was less than the cost the utility would otherwise incur to secure the resource from another source. With the recent filing of Puget Power's conservation tariff, Schedule 83, in April of 1993 the company now employs a total resource cost test (TRC) that takes into account both the benefits and the costs incurred by the company and all other contributing parties. Puget applies the TRC to each project to determine its cost-effectiveness by measuring the total benefits of the conservation measures, including electricity savings and other benefits against the total costs of installation. Only projects passing the TRC test receive funding from the utility.

As discussed in the Program Overview, Puget pays incentives to its customers based on its avoided cost. Typically the utility pays 60-80% of the measure cost, and about half of its avoided cost. For instance in 1992 the commercial and industrial programs cost Puget an average of 33 mills or 3.3¢/kWh while its avoided cost for measures with an average measure life of 15 years was 6.5¢/kWh. All of Puget's 1992 DSM programs combined cost the utility 2.7¢/kWh, while its overall avoided cost was 6.6¢/kWh. Note that in each case the utility's costs include grant payments plus "page one" administrative costs including marketing and advertising, audits, engineering, supervision, overhead, etc. "Page two" costs were calculated by Puget to be 0.5¢/kWh for its overall DSM programs and include indirect costs such as staff development and program evaluation.[R#15]

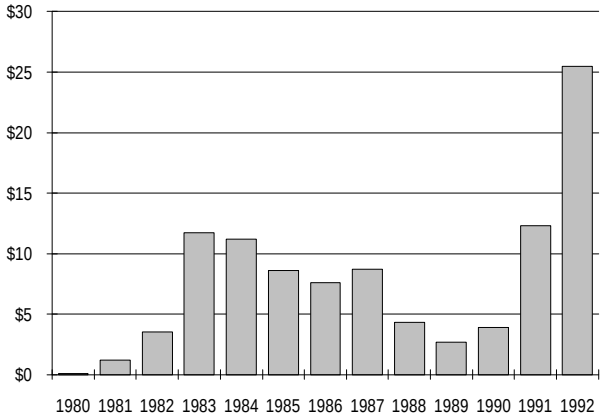
The Results Center has calculated the cost of saved energy for the program to range from 1.38 ¢/kWh in 1990 to 7.05 ¢/kWh in 1982 at a five percent real discount rate. This cost at the same discount rate for 1992 was 2.02 ¢/kWh. This assumes a standard fifteen-year life for installed measures. Note that the values prior to 1991 are approximations, based on proportionate administrative cost values as described in the Data Alert above.

COST PER PARTICIPANT

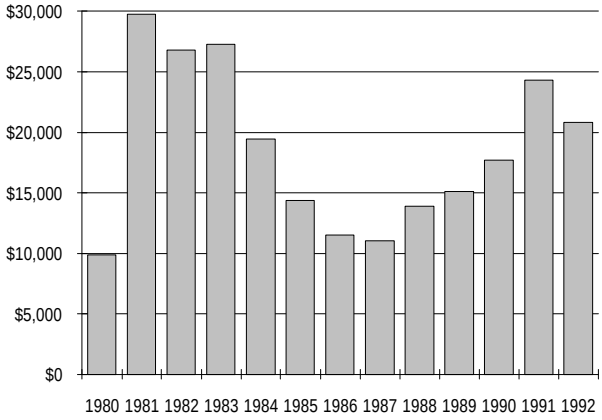
The Results Center has calculated an average cost per project of approximately $18,000 over the life of the program, ranging from an all-time low of under $10,000 in 1980 to a high of just under $30,000 in 1981. The average project cost in 1992 was $20,823. Of course these values reflect only the utility cost for the retrofits. Most, if not all, of the participants in the CIECS program pay some portion of the total project costs, however, Puget has not explicitly tracked these costs. ☞

Costs Overview	*Grants (x1000)*	*Loans (x1000)*	*Total Funding Provided (x1000)*	*Total Administrative (x1000)*	*Total Program Cost (x1000)*	*Cost per Project*
1980	$0.0	$66.6	$66.6	$22.2	$88.8	$9,869.47
1981	$0.0	$892.9	$892.9	$297.6	$1,190.5	$29,763.37
1982	$1,144.5	$1,450.6	$2,595.0	$865.0	$3,460.1	$26,822.10
1983	$6,036.3	$2,755.7	$8,792.1	$2,930.7	$11,722.8	$27,262.23
1984	$7,850.8	$547.2	$8,398.0	$2,799.3	$11,197.3	$19,439.84
1985	$6,135.4	$347.4	$6,482.8	$2,160.9	$8,643.7	$14,358.29
1986	$5,677.6	$50.1	$5,727.7	$1,909.2	$7,636.9	$11,518.68
1987	$6,464.8	$34.5	$6,499.3	$2,166.4	$8,665.8	$11,039.21
1988	$3,122.2	$78.4	$3,200.7	$1,066.9	$4,267.5	$13,900.80
1989	$2,016.4	$0.0	$2,016.4	$672.1	$2,688.5	$15,103.85
1990	$2,961.0	$0.0	$2,961.0	$987.0	$3,948.0	$17,704.04
1991	$9,274.6	$0.0	$9,274.6	$2,996.4	$12,270.9	$24,298.89
1992	$21,227.7	$0.0	$21,227.7	$4,239.4	$25,467.1	$20,823.46
Total	$71,911.2	$6,223.5	$78,134.7	$23,113.3	$101,247.9	

TOTAL PROGRAM COST (x1,000,000)

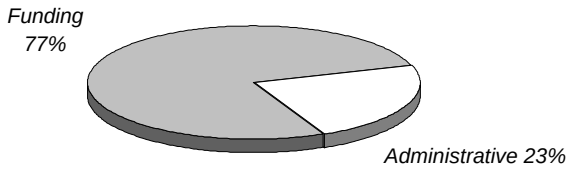


COST PER PARTICIPANT



COST COMPONENTS

Puget's DSM program costs are defined as incentive costs (grants and loans) and administrative costs. While administrative costs are presented as "total administrative costs" in the costs overview table, they are derived from a rather complex source. Direct administrative costs, or what Puget calls "page one" costs are costs including marketing and advertising, staff costs, and traditional forms of overhead. The distinction was created for shareholder incentive purposes in 1991 when the Washington Utilities and Transportation Commission sought to ramp up Puget's overall DSM savings, while controlling "page one" costs. (This results are explained in the Regulatory Incentives and Shareholder Returns section.)



Puget also tracks indirect administrative costs or what have become known as "page two" costs. When amortized over Puget's DSM portfolio, these costs, which include evaluation costs that the UTC certainly did not want to minimize, have been on the order of 5 mills (0.5¢) per kWh and are included in the Costs Overview Table as part of the total administrative costs.[R#15]

When using total program costs as presented from 1980 to 1992, grant payments have totalled $70.9 million and have thus accounted for 71% of total program costs; loans total $6.2 million or 6% of the program total; and total administrative costs have been $23.1 million, or 23% of the total program costs. ■

Cost of Saved Energy (¢/kWh)	*Discount Rates*						
	3%	4%	5%	6%	7%	8%	9%
1980	1.79	1.92	2.06	2.20	2.34	2.49	2.65
1981	1.62	1.74	1.86	1.99	2.12	2.26	2.39
1982	6.13	6.58	7.05	7.53	8.03	8.54	9.07
1983	2.39	2.56	2.75	2.93	3.13	3.33	3.54
1984	2.26	2.42	2.60	2.77	2.96	3.15	3.34
1985	2.08	2.23	2.39	2.55	2.72	2.90	3.08
1986	2.32	2.50	2.67	2.86	3.05	3.24	3.44
1987	2.22	2.39	2.56	2.73	2.91	3.10	3.29
1988	2.09	2.24	2.40	2.57	2.74	2.91	3.10
1989	1.74	1.87	2.00	2.14	2.28	2.43	2.58
1990	1.20	1.29	1.38	1.48	1.57	1.67	1.78
1991	1.85	1.99	2.13	2.27	2.43	2.58	2.74
1992	1.75	1.88	2.02	2.16	2.30	2.45	2.60

Environmental Benefit Statement

AVOIDED EMISSIONS: Based on 2,036,708,000 kWh saved 1980 - 1992

Marginal Power Plant	*Heat Rate BTU/kWh*	*% Sulfur in Fuel*	*CO2 (lbs)*	*SO2 (lbs)*	*NOx (lbs)*	*TSP* (lbs)*
Coal	**Uncontrolled Emissions**					
A	9,400	2.50%	4,391,142,000	104,178,00	21,060,000	2,106,000
B	10,000	1.20%	4,682,392,000	40,327,000	13,599,000	10,082,000
	Controlled Emissions					
A	9,400	2.50%	4,391,142,000	10,418,000	21,060,000	168,000
B	10,000	1.20%	4,682,392,000	4,033,000	13,599,000	672,000
C	10,000		4,682,392,000	26,885,000	13,442,000	672,000
	Atmospheric Fluidized Bed Combustion					
A	10,000	1.10%	4,682,392,000	12,322,000	6,721,000	3,361,000
B	9,400	2.50%	4,391,142,000	10,418,000	8,424,000	632,000
	Integrated Gasification Combined Cycle					
A	10,000	0.45%	4,682,392,000	8,289,000	1,344,000	3,361,000
B	9,010		4,211,912,000	3,002,000	1,010,000	202,000
Gas	**Steam**					
A	10,400		2,554,032,000	0	5,825,000	0
B	9,224		2,217,975,000	0	13,890,000	656,000
	Combined Cycle					
1. Existing	9,000		2,217,975,000	0	8,513,000	0
2. NSPS*	9,000		2,217,975,000	0	4,033,000	0
3. BACT*	9,000		2,217,975,000	0	560,000	0
Oil	**Steam--#6 Oil**					
A	9,840	2.00%	3,696,625,000	56,009,000	6,609,000	6,273,000
B	10,400	2.20%	3,920,663,000	55,561,000	8,312,000	4,033,000
C	10,400	1.00%	3,920,663,000	7,931,000	6,676,000	2,106,000
D	10,400	0.50%	3,920,663,000	23,300,000	8,312,000	1,281,000
	Combustion Turbine					
#2 Diesel	13,600	0.30%	4,906,430,000	9,768,000	15,167,000	829,000
Refuse Derived Fuel						
Conventional	15,000	0.20%	5,824,985,000	15,011,000	19,760,000	4,391,000

In addition to the traditional costs and benefits there are several hidden environmental costs of electricity use that are incurred when one considers the whole system of electrical generation from the mine-mouth to the wall outlet. These costs, which to date have been considered externalities, are real and have profound long term effects and are borne by society as a whole. Some environmental costs are beginning to be factored into utility resource planning. Because energy efficiency programs present the opportunity for utilities to avoid environmental damages, environmental considerations can be considered a benefit in addition to the direct dollar savings to customers from reduced electricity use.

The environmental benefits of energy efficiency programs can include avoided pollution of the air, the land, and the water. Because of immediate concerns about urban air quality, acid deposition, and global warming, the first step in calculating the environmental benefit of a particular DSM program focuses on avoided air pollution. Within this domain we have limited our presentation to the emission of carbon dioxide, sulfur dioxide, nitrous oxides, and particulates. (Dollar values for environmental benefits are not presented given the variety of values currently being used in various states.)

HOW TO USE THE TABLE

1. The purpose of the accomanying page is to allow any user of this profile to apply the Puget Power's level of avoided emissions saved through its Commercial and Industrial Electricity Conservation Services to a particular situation. Simply move down the left-hand column to your marginal power plant type, and then read across the page to determine the values for avoided emissions that you will accrue should you implement this DSM program. Note that several generic power plants (labelled A, B, C,...) are presented which reflect differences in heat rate and fuel sulfur content.

2. All of the values for avoided emissions presented in both tables include a 10% credit for DSM savings to reflect the avoided transmission and distribution losses associated with supply-side resources.

3. Various forms of power generation create specific pollutants. Coal-fired generation, for example, creates bottom ash (a solid waste issue) and methane, while garbage-burning plants release toxic airborne emissions including dioxin and furans and solid wastes which contain an array of heavy metals. We recommend that when calculating the environmental benefit for a particular program that credit is taken for the air pollutants listed below, plus air pollutants unique to a form of marginal generation, plus key land and water pollutants for a particular form of marginal power generation.

4. All the values presented represent approximations and were drawn largely from "The Environmental Costs of Electricity" (Ottinger et al, Oceana Publications, 1990). The coefficients used in the formulas that determine the values in the tables presented are drawn from a variety of government and independent sources. ■

*** Acronyms used in the table**

TSP = Total Suspended Particulates
NSPS = New Source Performance Standards
BACT = Best Available Control Technology

LESSONS LEARNED

The Commercial and Industrial Electricity Conservation Service was initiated in 1978 at a time when the need for additional and reliable power sources became critical to Puget Power in the face of rapidly increasing customer growth. Puget claims that the program was greatly aided by the relationships it had developed and maintained with both trade allies and customers.

Puget Power focused on long-term relationships with customers which has led to multiple projects with some customers either in the same facility or in multiple facilities. The strength of these relationships has been particularly important in new construction or in major remodels where lost opportunities are a prime concern. These relationships have also helped the company provide significant customer education in efficient energy-management.

Both customers and trade allies provided help in marketing Puget's commercial conservation services. Customers communicate the successes of conservation projects in their facilities through word-of-mouth and trade allies have often recommended energy-efficiency considerations when their customers were initiating other changes in their facilities. Inversely, trade allies also helped bring information about emerging and current technologies to the utility.

The network of trade allies and customers also provides feedback about overall program design allowing Puget to continuously fine-tune its services to encourage participation while increasing cost-effectiveness. As changes occurred in the utility's services, trade allies also helped communicate those changes to customers.

Initially, financial aid to customers was offered in the form of ten-year, no-interest loans secured by the property where conservation measures were installed. Cash grants for a portion of the installation costs were added beginning in 1982. Grants became so widely accepted that in 1989 loans were discontinued, although it is possible that they may be offered again as a customer option, perhaps as a debit to the customer's electricity bill in a fashion similar to Pacificorp's Energy FinAnswer program. (See Profile #46)

Currently Puget is also piloting an option of conservation credits to the customer's electricity billing. It is too soon to gauge the level of customer acceptance. Under this scenario customers who receive funding assistance may choose between a cash incentive or credits applied to their electricity bills. If billing credits are chosen, generally, the conservation incentive is applied to the bill in twelve monthly credits. Thus customers must pay the entire first cost of the measures and reap monthly savings in addition to monthly rebate payments, or bill reductions.

TRANSFERABILITY

Since the implementation of the Commercial Conservation Service in 1978, Puget Power has come to be recognized as a national leader in conservation as evidenced by the numerous awards the program has reaped. Puget believes these awards to be justified on the basis of the savings secured at a cost well below the cost of new generation, in fact on the order of half Puget's avoided cost.

Both longevity and the customer participation point to the success of the service, particularly as it has been able to meet the needs of the customer through its case by case application. While regulatory and customer requirements vary among utilities, most aspects of the service are readily transferable and Puget's innovative approach to funding will likely be carefully examined by utilities keen on fulfilling significant amounts of their resource demands through energy efficiency. ■

Traditional utility ratemaking, where each and every kilowatt-hour sold provides profit, is a major barrier to utilities' implementation of energy efficiency programs. Several state regulatory commissions and their investor-owned utilities have been pioneers in reforming ratemaking to: a) remove the disincentives in utility investment in DSM programs, and b) to provide direct and pronounced incentives so that every marginal dollar spent on DSM provides a more attractive return than the same dollar spent on supply-side resources.

The purpose of this section is to briefly present exciting and innovative incentive ratemaking mechanisms where they're applied. This we trust, will not only provide some understanding to the reader of the context within which the DSM program profiled herein is implemented, but the series of these sections we hope will provide useful snapshots of incentive mechanisms being used and tested across the United States. (Note that the dollar values in this section have not been levelized.)

THE WASHINGTON OVERVIEW

The Washington Utilities and Transportation Commission (UTC) passed a rule in 1987 requiring all electric utilities in the State of Washington to apply least-cost principles and submit integrated resource plans. In 1990, the UTC issued a notice of inquiry titled "Examining Whether There are Regulatory Barriers to Least Cost Planning for Electric Utilities." In response, Puget proposed much of the regulatory framework discussed below.

In its 1990 NOI the Commission noted that any changes to the regulatory process designed to incorporate IRP should address four criteria. First, the reformed rules must be measurable and as such contain performance-based provisions. They must also be reasonably simple to administer and intuitive enough to allow customers to understand. Fourth, they should represent an improvement over (then) current regulation.[R#12]

PUGET POWER OVERVIEW

Puget has been involved in conservation activities since 1978. Prior to the national focus on reformulating utility regulation to remove barriers to conservation, electric utilities in Washington were able to ratebase their conservation investments. In addition, utilities in Washington have been able to earn a bonus two percentage points return on conservation investments in programs for new residential construction as well as elderly and low-income customers. This allowance was granted by a 1980 law which has subsequently been amended to restrict the equity bonus to only elderly and low-income programs.[R#12]

From the onset of its conservation activities Puget used the utility cost test to screen energy efficiency programs. In September, 1992, the UTC adopted the total resource cost test for Puget's programs as a result of the utility's work with its Technical Collaborative Group on defining a TRC test that was practical to implement. This Group was formed in 1990 as a subgroup of the existing Advisory Group for Least-Cost Planning to develop annual conservation targets and review evaluations of conservation programs.[R#15]

Prior to this change the TRC had been used at the planning level, but programs were funded for implementation up to the utility's avoided cost. The use of the TRC was viewed as a mechanism to address cost-effectiveness questions. For purposes of regulatory treatment the savings and costs of all of the utility's programs are ☞

aggregated, however, each is separately delineated on Schedule 83 for budgetary purposes.[R#13]

TREATMENT OF DSM EXPENDITURES

Utilities in Washington are allowed to capitalize their DSM expenditures. Puget capitalizes (or ratebases) expenditures by amortizing them over a ten-year period. According to Mary Smith, Puget has a "forever history" of capitalizing its DSM program costs. A 20-year amortization period for Puget's expenditures was proposed by an intervener during the utility's most recent rate case, which was filed at the end of October of 1992. However, the UTC chose to remain with a ten-year amortization period.[R#12,15]

Puget ratebases all demand-side costs possible including administrative and evaluation costs, except conservation advertising costs. In October of 1993 Puget received an order from the UTC instructing the utility to expense future conservation advertising. Costs are currently recovered by the utility from all customer classes through Puget's cost of service as a system resource.[R#12,13]

TREATMENT OF LOST REVENUES

A mechanism to decouple Puget's revenues from its electricity sales was approved in April, 1991. This mechanism was intended to be a three-year experiment, with a general rate case every three years and annual revenue adjustments using a Periodic Rate Adjustment Mechanism (PRAM) proceeding.

Under PRAM, revenue requirements are divided into base and resource revenues. The former costs are set at a preauthorized level per customer, with allowed revenues reconciled with actual revenues the following year when the utility files its yearly rate adjustment. About 50% of revenues are base revenues, which are set in a general rate case by dividing base costs by the total number of customers rather than the kWh sold.[R#15] Resource revenues, encompassing hydro costs, purchased power, and conservation, are recovered on a dollar-for-dollar basis annually.[R#12]

Rates are adjusted annually in a PRAM proceeding. Puget also has the ability to recover deferred amounts within two years using a First In First Out tracking system for revenue undercollection as a result an October, 1992 adjustment to PRAM.[R#12]

Puget recently completed the first general rate case since PRAM was adopted. The UTC approved another three years of the mechanism with modifications relating to the allocation of base and resource costs.[R#13]

SHAREHOLDER INCENTIVES

No mechanism exists for DSM programs after 1991 for Puget or any other Washington utility. In the April 1991 order establishing PRAM, the UTC directed Puget to propose an incentive mechanism by working within a collaborative of interested parties. In addition to the utility and Commission staff, the Northwest Conservation Act Coalition, Northwest Power Planning Council, Public Counsel, The Boeing Company, the Washington State Energy Office, and several large industrial users participated in the discussions leading to a June 1991 filing on incentives for 1991 programs. Note that Puget's overall DSM efforts were to be dramatically ramped up from 7.9

aMW in 1990 to 17.6 aMW in 1991 and to 27.9 aMW in 1992.[R#12,15]

The 1991 agreement had three major components. The first component was an energy saving reward based on an overall energy savings result and allowed Puget to earn $1 million for each average megawatt saved between 12 and 16 MW, rising to $1.25 million each above 16 MW. This was balanced by penalties of $1 million for each megawatt below 10, which also increased to $1.25 million below 6 MW.[R#12]

The second component was designed to reward the utility for cost control. This was a tough component to develop because the utility was being asked to control its administrative costs while ramping up the program. Nevertheless, if the average cost of conservation resources was at the targeted cost, Puget would receive $0.5 million. (The targeted cost for Puget's mix of programs was $2.267 million/average megawatt. Note that some of its low income programs cost on the order of $4 million/aMW; while industrial programs cost much less, on the order of a half a million dollars per aMW.) If the utility was able to secure the resource at a lower cost, it could earn an additional 10% of cost savings up to a maximum of $1 million. However, the cost control mechanism only kicked in if total savings were above 13 MW.

Puget was able to beat the cost control target and did receive its additional incentive. Note that the target amount included all of Puget's grant payments plus "page one" costs (direct administrative costs defined in the Cost section) but excluded "page two" costs including evaluation as the collaborators did not want Puget to cut costs such as evaluations that were considered critical. Note also that Puget was not able to "game" costs and savings between programs, in other words trying to optimize savings through the cheapest programs, because the utility was required to ramp up and deliver all of its programs at "full throttle" to reach its performance targets at all.[R#12,15]

The final component of the 1991 incentive mechanism was to pay the utility an additional 10% of the energy saving reward on a sliding scale based on the results of a verification of the measures installed in 1991 for continued operation and persistent savings in 1994. However, no payment plan to address this verification has yet been filed.[R#12,13,15]

Puget was able to earn incentives of $6.5 million for its 1991 DSM programs. The utility was notably successful in some program areas, such as water heating applications including showerheads and water heater wrapping. This success balanced shortcomings in other areas and allowed the utility to meet its overall targets as all programs were aggregated for incentive purposes. It should be noted that this incentive replaced previous earnings under the 2% equity bonus mechanism that had been in place, and was a much more substantial reward.[R#13,15]

When the incentive was proposed to the UTC, the issue of whether the utility would be rewarded by incentive payments in pre-tax or post-tax dollars was raised. The Commission ultimately ruled that Puget's incentives would be awarded in pre-tax dollars. Thus the shareholder incentives that Puget earned were subject to taxation in the same manner as other income.[R#12] ■

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