The City of Ashland Municipal Utility Comprehensive Conservation Programs
Profile #115

Executive Summary

The City of Ashland, Oregon has developed one of America's premier resource conservation initiatives in a small community. Not only has Ashland implemented a range of energy efficiency programs, but the City's approach with resource conservation has encompassed a broad array of activities including energy efficiency of electricity, gas, and firewood; regional air quality; recycling; composting; water saving initiatives; and an emphasis on land-use planning.

Electricity savings form the basis of the Conservation Division's initiatives. Ashland's programs have fortunately been supported by the Bonneville Power Administration, the region's wholesale supplier. Since 1982, BPA has provided over $5 million in funding for energy efficiency programs in Ashland. As a result, the City has created nearly 10,000 MWh in total annual savings and 66,000 MWh in cumulative electricity savings. Over half of the savings have been generated in the residential sector, lowering customers' bills and improving occupants' comfort.

Ashland has also addressed the land-use implications of development and the interconnections between land, water, air, and energy resources. The City realizes that developments not only impact their immediate surroundings, but the community as a whole. Thus the City developed a comprehensive set of land-use ordinances to minimize negative aspects of development. Some of these are highly visionary: In 1980 Ashland pioneered solar access rights. The City rewards resource-efficiency in new developments by issuing "conservation bonuses" that allow developers to build more units than normal, easing travel, sprawl, and thus demands on gasoline and air quality. Site design requirements, such as those that address landscaping, encourage homeowners to plant shade trees, creating a win-win solution as trees not only are attractive amenities but can save on air conditioning and lawn watering.

Water conservation is another area where Ashland has excelled. Rather than building a new reservoir in an area marked by old-growth forest and fragile granule soil or building a 13-mile water supply pipeline to the City, after analyzing its options the City implemented a four-point water efficiency program addressing system leak detection and repair, realignment of its water rate structure, a showerhead replacement program, and toilet retrofits and replacement. These initiatives have resulted in daily savings of over a quarter million gallons of water, and have also saved energy used for heating hot water, reduced demands on the City's waste water facility, and have significantly extended the date that the City will have to invest in additional supply capacity.

In essence, Ashland has employed a holistic approach to resource conservation, acknowledging that such an approach is critical for its quest to resource sustainability as well as enhancing the current quality of life. Thanks to a conservation ethic that has been developed and nurtured in Ashland, this small Oregon community serves as a model of comprehensive resource efficiency.

THE CITY OF ASHLAND
Comprehensive Conservation Programs

Sector: *All sectors*

Measures: *Range of measures for both new construction and retrofits which conserve electricity, gas and water, and reduce waste, including weatherization, Good Cents new homes, showerheads, and composting*

Mechanism: *Local utility and government work together to deliver a collection of programs, including BPA programs, designed to increase customers' awareness of and access to resource conservation measures*

History: *Land use ordinances passed 1980; first BPA program implemented 1981; water conservation program implemented 1992*

1994 PROGAM DATA

Electricity savings:	*1,303 MWh*
Lifecycle savings:	*32,584 MWh*
Capacity savings:	*0.15 aMW*
Cost:	$226,752

CUMULATIVE DATA 1980-1994

Electricity savings:	*65,806 MWh*
Lifecycle savings:	*244,672 MWh*
Capacity savings:	*1.12 aMW*
Cost:	*$5,120,626*

CONVENTIONS

For the entire 1994 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.

OVERVIEW OF THE CITY OF ASHLAND

Just fifteen miles north of the California border, cradled in the Rogue Valley, lies the City of Ashland, Oregon. This community of about 17,500 prides itself on diversity and an enriched quality of life. The Cascade Range provides a spectacular backdrop to the east and Mt. Ashland to the south with the orchards of "pear country" spreading out through the valley. Ashland's wilderness surroundings lends itself to a multitude of outdoor activities which attracts both visitors and new residents. Ashland itself is expected to grow to 20,000 by the year 2005.[R#19]

Sitting at 2,000 feet above sea level, Ashland enjoys mild weather with average highs around 87 degrees in the summer and average lows around 30 degrees in the winter. Contrary to Oregon's rainy reputation, Ashland averages just under 19 inches of rain annually with about 10 inches of snow in an average winter. Summers are relatively dry at 52% humidity which climbs to an average humidity of 83% in the winter.[R#19]

Ashland is best known for its Oregon Shakespeare Festival which runs nine months from mid-February though October. Beginning in 1935 as a production of just three performances and two plays, the festival now encompasses three theaters as venues for over 700 performances and 10 plays. Attracting over 100,000 visitors annually to Ashland, this world renowned festival has evened earned a Tony Award. Ashland's cultural profile is rounded out with a variety of musical events and the Southern Oregon State College with an enrollment of 4,300.[R#19]

There is a strong sense of community which shapes the City of Ashland. The power of community action was well illustrated in 1992 when the Mt. Ashland Ski Area, the local ski resort, was facing closure. The City responded with local fundraising efforts which produced enough capital to purchase the resort. This same community strength is the key to Ashland's progressive approach to conservation and land-use guidelines which are an integral part of its government and citizenry. These measures were put in place to preserve Ashland's resources, environment, and quality of life.

ASHLAND MUNICIPAL UTILITY 1994 STATISTICS

Number of Customers	*8,385*	
Number of Employees	*20*	
Electric Revenues	*$7.24*	*million*
Energy Sales	*166,000*	*MWh*
Winter Peak Demand	*38*	*MW*
Average Electric Rates		
Residential	*5.5*	*¢/kWh*
Commercial	*5.1*	*¢/kWh*
Industrial	*5.1*	*¢/kWh*

OVERVIEW OF THE CITY OF ASHLAND MUNICIPAL UTILITY

The City of Ashland Municipal Utility has been providing electricity for its citizens since 1909, making it the second oldest municipal utility in Oregon. The utility serves approximately 7,300 residential and 1,000 commercial and industrial accounts. In February of 1982, Ashland changed its power supplier from Pacific Power and Light (PP&L) to Bonneville Power Administration (BPA). Ashland's contract to purchase wholesale electricity from BPA is in effect until 2001. (Although Bonneville is currently renegotiating all of its contracts as a result of an overall restructuring taking place, it is expected that Ashland will continue to be a BPA customer.) Power purchased from BPA is wheeled to Ashland on PP&L lines. In addition to the power purchased from BPA, Ashland uses the City's water supply at the Reeder Gulch Hydroelectric Plant to generate a small amount of power, about 2% of its total load. The City purchased this 800 kW hydroelectric plant in 1985.[R#1,2,14]

The City of Ashland's electrical customers numbered 8,385 in 1994, with the residential sector accounting for 86% of the customer base. Electricity sales revenues from sales of 166,000 MWh totaled $7.24 million in 1994. Residential revenues accounted for 48% of the total and 49% of the power sold, with commercial accounting for 49% and 48% respectively. The City of Ashland's utility is a winter peaking utility which had a winter peak demand of 38 MW in 1994.[R#1,14]

Utility DSM Overview

When Dick Wanderscheid and John Fregonese joined the City's Planning Division in 1979, they brought with them their perspective that development and environmental awareness are not separable. Their firm belief that "everything is intertwined" became the undercurrent for a community which has become known as a leader in conservation in the Pacific Northwest. They found like-minded individuals within the City's Planning Department, as well as in its utility and government. Together the City leaders applied these broader views by focusing on the need to develop their community in harmony with its resources and environment. Fifteen years later, Ashland continues to refine ways to conserve its resources and build a better community.[R#1]

Ashland's efforts began with attention to land use, focusing not only on the community's aesthetic appeal but also the development of a functionally more livable city in terms of resources, costs, and accessibility. This awareness instigated the development of Ashland's first policies addressing sustainability through energy-efficient design and resource-conscious land use: The Solar Access Ordinance and the Performance Standard Development Ordinance. While the City's requirements regarding site design and land use have evolved over the years, they have always served the purpose of reducing adverse effects of development, promoting energy and water conservation, and enhancing civic benefits. Design aspects regulated by the City include the amount of landscaping on the property, the amount of irrigation it will require, and even pedestrian accessibility.[R#3]

In 1982, Ashland became a Bonneville Power Administration customer, making the City of Ashland one of 124 municipalities which purchase their electricity from BPA. Bonneville, the largest electricity supplier in the Pacific Northwest, is an arm the U.S. Department of Energy established for the purpose of marketing hydroelectric power generated by 28 federally owned dams in the Northwest region. As a Bonneville customer, Ashland has been eligible to receive funding from BPA for the purpose of promoting customer energy efficiency as directed by the Pacific Northwest Electric Power Plant and Conservation Act of 1980. This legislation holds BPA responsible for meeting the power needs from future growth in its territory and calls for investment in measures which improve the efficiency of its customers. This mandate has resulted in an array of BPA-sponsored DSM programs. In turn, Ashland has aggressively pursued every opportunity presented by Bonneville by incorporating all possible BPA programs into its conservation efforts. Ken Keating of Bonneville's Marketing Department acknowledges Ashland as, "one of the brightest stars in the Bonneville program."[R#2,24]

By 1982, Dick Wanderscheid had been appointed to the position of Manager of the newly formed Conservation Division within the City government. At that time Ashland adopted a Comprehensive Plan containing energy elements outlining specifically the goals and policies for conservation in the City of Ashland. The City has realized most of these goals to some extent. Ashland's partnership with BPA has contributed to their progress in energy efficiency. This plan, however, goes far beyond those programs available from BPA and the City's cooperative efforts with the Oregon Department Of Energy (ODOE). Ashland's conservation efforts have evolved to include not only energy efficiency but water efficiency also, and addresses the protection of other resources through policies and programs for land use, air quality, and recycling.[R#1]

In 1991, BPA invited program operators, including those from Ashland and other purchasing electric utilities to participate in the conservation planning to help determine how much electricity could be saved through demand-side management. As a part of this effort, BPA hired a consultant for the City of Ashland to help develop a conservation plan and project savings. Ashland's City Council unanimously adopted and submitted to Bonneville a ten-year "aggressive" plan calling for a $10.7 million investment to save a projected 22,704 MWh of electricity. While this plan, submitted in 1992, never received the backing needed by Bonneville, it is a testimony to the City's commitment to energy conservation.[R#2,4]

For over ten years the City of Ashland Municipal Utility's partnership with Bonneville provided the bulk of the capital for several of the energy efficiency programs which Ashland has

conducted. Then in 1992, Ashland found itself looking for other sources of capital, or at least means to finance its efficiency initiatives. Without Bonneville's commitment to the financial demands of Ashland's 1992 proposed conservation plan, Ashland was forced to find alternative financial resources. In January of 1994, Ashland along with six other Oregon Municipal Utilities, formed an intergovernmental agency called the Oregon Municipal Electric and Conservation Agency (OMECA).

Members of OMECA entered into a partnership with the BPA under the Conservation Project Agreement which secured conservation funding for the municipal utilities through the issuing of municipal bonds. Bonneville will pay the principle and interest on the bonds which provide capital for conservation at a much lower cost to the BPA than traditional program sponsoring from the federal treasury. The two-year contract, calling for total savings of 4.2 aMW with the acquisition of $11.4 million from the bonds, was signed in September of 1994. Revenue from bonds sold by OMECA will provide Ashland's conservation budget with some $410,000 for 1995 and an additional $510,000 in 1996 when the program will be completed.[R#14,16]

This schedule works in Ashland's favor since BPA funding for conservation is expected to disappear, if not be greatly diminished, in 1995. In an effort to remain competitive, Bonneville is undergoing a "Conservation Reinvention", due to take effect in October of 1995. This will put the onus of funding conservation programs on purchasing municipal utilities. Bonneville will encourage continued energy efficiency efforts from these utilities through power sales contract requirements.

Since Ashland has secured funding for its conservation programs until November of 1996, their programs will not immediately be affected by BPA's conservation reinvention. In fact, Ashland will have the advantage of studying means to finance its efficiency initiatives for another year before it needs to replace the revenue it receives through OMECA.

Program Design and Delivery

THE CITY OF ASHLAND'S CONSERVATION PROGRAMS

Since 1980, the City of Ashland has developed an extensive and impressive portfolio of programs and services aimed at resource conservation and enhanced community development. Many of these programs target energy efficiency, but savings of heating fuels including natural gas and firewood, land-use planning, air quality, recycling, and saving water have also been important objectives of Ashland's overall initiative. In some of these other resource areas demand-side management models have been effectively applied. All of Ashland's programs serve the purpose of minimizing the impact of development and conserving resources through efficiency and waste reduction.

ENERGY EFFICIENCY PROGRAMS

In addition to regulating and encouraging energy efficiency within the community's development, the City of Ashland provides several services to its electricity customers that enable them to lower their utility bill by conserving energy. The City draws its revenue for these programs from three sources: their rates, Bonneville Power Administration, and the State of Oregon.

Ashland's decision to purchase power from Bonneville Power Administration in 1982 not only provided the City with low cost power, but also gave it access to BPA-sponsored conservation programs. Bonneville has a strong and well-deserved reputation for working with its retail utilities to promote energy conservation and has implemented some of the best DSM programs in America. Clearly this has been an asset that Ashland has used for its benefit. On the other hand, BPA's support has not supplanted Ashland's own efforts. The City has played a key and very active role in delivering BPA's programs to its customers. Ashland's role in delivering these efficiency efforts has ranged from raising awareness of energy efficiency opportunities through education and marketing; providing audits, energy efficiency installations, and rebates; to arranging loans to cover the marginal costs of efficiency upgrades for citizens.

Water Heater Wrap Program: The first BPA-sponsored program was adopted by Ashland in late 1981 and was the Water Heater Wrap program in which the City installed R-11 water heater blankets for residential and commercial customers free of charge. The City was reimbursed by Bonneville for the 1,120 blankets installed through the program and an estimated annual electricity savings of 199 MWh was achieved.[R#1,2]

Street and Area Lighting Program: Beginning in 1982, the City converted its street and area lighting from mercury vapor to high pressure sodium lights. Funded by Bonneville, this program replaced 1,263 lights including City lamps and lamps for the Ashland School District and Southern Oregon State College for an estimated annual energy savings of 379 MWh annually.[R#2,15]

Residential Weatherization Program: In 1982, Ashland also began to implement BPA's Residential Weatherization Program under which BPA purchases the first year's electric savings at 32¢/kWh. The City provides free energy audits to determine the necessary weatherization measures. Qualifying measures for installation include ceiling, wall, floor, and duct insulation; storm or replacement windows; clock thermostats; caulking and weatherstripping. In 1983, the Water Heater Wrap program was incorporated into this program, making water heater blankets a qualifying installation as well. A cash grant covering up to 60% of the total installation costs for the project is provided through the program with up to 100% funding available for low-income residents. Additionally, the City provides a loan program in cooperation with the Valley of the Rogue Bank, whereby the City will buy-down the interest on loans obtained to fund the balance of the installation costs. The City conducted weatherization installations on 2,387 residences between the years of 1982 and 1994 for an estimated total annual savings of 4.703 GWh.[R#2,15]

Similarly, beginning in October 1992, Ashland offered free energy analyses for mobile home residents, making them eligible for weatherization rebates as well for up to 45% of measure costs including insulation, air and duct sealing, jalousie window replacements (jalousie windows are inexpensive and inefficient windows – best for mild climates – that have horizontal glass panels operable with a window crank), and clock thermostats. Again, BPA low-income guideline cover a larger percentage of total costs for this weatherization program.[R#2]

Electric Water Heater Rebate Program: Ashland and Bonneville offered $60 rebates for customers who replace their old electric water heaters with new energy-efficient ones through the Electric Water Heater Rebate Program which is part of BPA's Appliance Efficiency program. In addition, the

City conducted a market test for Solar and Heat Pump Water Heaters from November of 1985 to September of 1987, awarding $300 dollar rebates to customers who replaced their electric water heaters with qualifying solar or heat pump water heaters. Through the program seven heat pump water heaters and 106 solar water heaters were installed. Rebates totalled $33,900 with a City administrative cost of $12,035 which was also reimbursed by BPA. Total estimated annual energy savings are 248 MWh.[R#1,2,15]

Commercial Audit Program: Free energy audits were conducted for 69 businesses under BPA's Commercial Audit Program in 1984 and 1985. This program provided the energy audits only. No grants were available through the program for the execution of recommended measures nor was a follow-up study conducted to see if any of measures suggested by the free audits were installed.[R#2]

Super Good Cents New Homes Program: In May of 1985, the City implemented Super Good Cents (SGC) program for new homes. This BPA-sponsored program has been intended to capture the "lost opportunity" possible if new homes are built without efficiency features. Super Good Cents takes advantage of the fact that at the time of new construction, efficiency can be employed for only the marginal cost of measures, rather than the full cost for retrofit programs. Thus Super Good Cents encourages new homes to be built in excess of the energy-efficient levels of the Oregon Building Code. These residences use one-third to one-half less electricity for space heating than a standard home. Compliance with SGC criteria earns builders cash incentives and SGC certification which adds to the home's market value. The City provides technical assistance to builders for meeting the SGC standards. (See also The Results Center Profile #7, Bonneville Power Administration, Super Good Cents program.)[R#2]

Long Term Energy Smart Design Program: This Bonneville program was adopted in 1991. Cash grants are awarded to commercial building owners who install energy-efficient measures, such as advanced lighting systems, for both new construction and retrofits. This program represents the first time that Ashland had the financial means, thanks to Bonneville, to help their business community to save electricity. Through this program energy conservation advice through audits and technical assistance is available for businesses.(See also The Results Center Profile #18, Bonneville Power Administration, Energy Smart Design program.)[R#2]

Resource Conservation Manager: Beginning with the 1993 school year, the City of Ashland participated in a pilot program aimed at waste reduction in the municipal school districts. A cooperative effort between Bonneville, the Oregon Department of Energy, the Oregon Department of Education, and the school districts, the program called for the hiring of an Energy Conservation Manager for the school district who would be responsible for energy and water conservation and conservation education. Bonneville was responsible for program expenses and any portion of the Resources Conservation Manager's salary which was not covered by the savings. (This position has a full-time equivalency of 40%.) So far the program has been a huge success with savings greatly exceeding the Resource Conservationist's salary and has spread to several school districts in Oregon. (See also The Results Center Profile #68, Portland General Electric, Energy Smarts for Schools)[R#1,15]

Ashland Sponsored Energy Conservation Assistance: In August 1989, Ashland sponsored a program providing energy information to customers considering any heating system change. Through this program the City provides an energy audit, heat loss calculation, heating system sizing calculation, and an operational costs comparison of various types of heating systems. Additionally, personal loans from the Valley of the Rogue Bank are available for those citizens who install electrical zonal heating or retrofit heat pumps and associated weatherization as required for the heating system upgrade.[R#21]

Assistance for developers wanting to utilize solar energy is also provided by Ashland, through educational materials and assistance in evaluating solar access or planning a solar addition. The City will help the builder by providing computer simulations of the building designs which are necessary for participation in the Super Good Cents program. This program provides the owner with financial incentives for energy-efficient homes, such as solar homes, and a Super Good Cents certificate, validating the property's value as an energy-efficient residence. Finally, Ashland also protects the builder's right to solar access, facilitating this form of energy.[R#21]

CONSERVATION OF ALTERNATIVE HEATING FUELS

Although the City embodies Ashland's Municipal Utility, its focus goes well beyond conserving only electrical energy. Ashland provides assistance as well to those citizens who heat their homes with alternative fuels and are not considering

switching to electric heat. While weatherization of wood and gas heated homes in no way benefits the utility, Ashland's consciousness of resource use has given rise to further conservation programs.[R#2,21]

C.P. National Gas Company, Ashland's natural gas supplier, helps to conserve natural gas by providing free energy audits to gas-heated homes. C.P. National provides financial assistance for weatherization projects recommended by the audit in the form of a $350 cash rebate or a 6.5% loan. Financing is also available for gas water heaters and furnaces for customers.[R#2]

Ashland also provides free home energy analysis for residences heating their homes with wood stoves. This is the first step for participation in the Oregon Department of Energy's (ODOE) program providing financial assistance in the weatherization of wood-heated homes. Ashland also provides free inspections of completed weatherization measures in these homes. Furthermore, financing for weatherization measures is provided by the Valley of the Rogue Bank.[R#2,21]

Conservation of other heating fuels such as oil, propane, butane, kerosene is also facilitated by the City of Ashland. Programs sponsored by ODOE provide financial incentives including 50% rebates for total weatherization costs and 6.5% loan financing for the remaining expenditure. Likewise, ODOE provides tax credits for citizens who install alternative energy water heating systems, up to $1,500, and tax credits for businesses using renewables. Similarly, Small-scale Energy Loan Program (SELP) loans are also available from ODOE for conservation retrofits.[R#2]

LAND USE AND DESIGN STANDARDS

When considering land use and site design, Ashland aims to minimize the adverse impacts which development can have on the use of resources as well as on the surrounding area and the community as a whole. To assure that new construction enhances the community whenever possible and does not create unreasonable or unnecessary impositions, the City has established a battery of Land Use Ordinances which regulate development. These ordinances and standards consider many aspects of community development including energy and water efficiency.

Solar Access: In 1980, Ashland pioneered the provision for rights to solar access for its land owners. The Solar Access Ordinance provides protection of one's rights to a certain amount of sunlight to fall on his or her property and dwelling. This assures homeowners that residences built with the sun in mind for solar energy and water heating or as an environmental element will always have access to sunlight, preserving property values and ability to utilize the sun as a source for space or water heating. To this end, the City provides free technical assistance for anyone wishing to incorporate solar energy into new or existing buildings.[R#7]

The right to solar access is protected by restricting the distance to which a shadow can be cast by structure or vegetation onto neighboring property. This is done through the use of a planning tool called a "solar envelope." Stringent guidelines for calculating structure height and contours of the land are available for developers so that buildings can be designed in compliance with the ordinance. Since its implementation in 1980, over 30 communities in the Northwest region have adopted similar programs.[R#7]

Performance Standards and Energy Density Bonuses: The City passed its Performance Standards Development Ordinance in 1981 to encourage energy-efficient housing by awarding allowances for increased density building. Ashland was ahead of its time in this area, encouraging infill strategies and increased density as a positive attribute of community design. Through this provision the inclusion of efficiency measures and designs in new construction earns the developer "energy bonuses." Bonus points are awarded for measures which conserve electricity or gas. Water use efficiency was added to the program in 1992. These bonuses translate into an increment by which density can be increased for a given site. This model effectively maintains the load impact which a new development represents by making density a function of resource efficiency. For example, a multifamily site which has been designated for ten units can be increased to twelve if the builder earns enough conservation bonus points. The number of points awarded by each energy and water ef-

ficient measure, and the number of points needed to increase the building density, are listed in tables within the ordinance. Energy bonuses have been a positive and successful means of encouraging energy-efficient development. In fact, nearly all developers utilize density bonuses, since dwellings which lack these promoted measures would suffer in Ashland's conservation-oriented market.[R#5,6]

Site Design and Use Standards: Ashland adopted site analysis and landscaping standards as a means of ensuring development which would not sacrifice the region's attributes, but rather work in concert with them and enhance the community both functionally and visually. Requirements and recommendations are made with both energy and water efficiency in mind, as well as crime prevention, accessibility, and screening visual and noise impact. The Land Use Ordinance designates the percentage of the site which must be landscaped according to how it is zoned. Consideration is also given to the use of landscaping for shading to increase energy efficiency and to limit the amount of irrigation needed for various vegetation. In fact, the City's Municipal Code includes mandatory policies governing the levels of irrigation permissible for a designated site. Consideration of walking, biking and mass transit is also encouraged during the design of development projects.[R#3,5]

The site design and use standards include a site review of all developments prior to its approval. The City of Ashland requires that the developer consider energy usage during the pre-planning stages. A written summary of the intended energy use strategy is mandatory, including the type of energy to be used for heating, cooling, and lighting, and the projected annual amount of energy used. If there is no architect or contractor involved in the development, the City will assist in any way it can with the compilation of information on energy use strategies for the building. Although the builder is not required to use a particular strategy, Ashland's staff believe that requiring this sort of a design process will help developers and owners assess the benefits of wise energy use and encourage incorporating resource efficiency in building designs.[R#3]

Open Space Ordinance: Furthering Ashland's emphasis on quality of life in community developments and pedestrian access was the adoption of the Open Space Ordinance in 1992. The ordinance calls for a public park within walking distance of every home in Ashland and the construction of walkways connecting them. The project is paid for through a food and beverage tax which was passed by Ashland voters on two occasions.[R#17]

AIR QUALITY

Air quality has become an issue of grave importance to Ashland. Situated in a bowl-shaped valley, flanked by mountain ridges on all sides, Ashland sits amid a pool of stagnant air which envelops the Bear Creek Valley. Pollutants emitted by the valley's populous are trapped by a temperature inversion, causing the particulates to settle in the valley as smog. For this reason, the Medford-Ashland area has been designated an Air Quality Maintenance Area (AQMA) by the State Department of Environmental Quality (DEQ).[R#2]

Concern about carbon monoxide (CO) emissions is focused mainly on Ashland's larger neighbor, Medford, which is the only city in Jackson County suffering from a CO problem. The case is similar for PM10, particulate pollution caused in part by burning wood in fireplaces and stoves. In response to the air quality problem, Jackson County established a Woodburning Task Force in 1985 with the aim of reducing woodburning by the valley residences by 75% on peak PM10 days.[R#2]

While Ashland is a lesser contributor to this air quality problem and enjoys relatively clean air within its own area of the valley, it recognizes that the entire region shares the same airshed, and as such is committed to being part of a regional air quality process and solution. Ashland citizens are aware that they must work towards improving the air quality by decreasing their impact. In 1989, Mayor Catherine Golden, appointed the Ashland Citizen's Air Quality Advisory Committee to develop an overall program for air quality improvement. The resultant program, SOLVE – Save Our Livability Views and Environment – offers low-interest loans for weatherization and replacement of old, inefficient wood stoves with cleaner, more efficient systems. This program also included a $100 reward for the removal of wood stoves. The rebate was

reduced to $75 in 1994. In addition to creating SOLVE, the City has passed four other ordinances pertaining to air quality: 1. regulating the burning of only seasoned wood, no garbage, plastics or green wood; 2. regulating the thickness of smoke which cannot exceed 40% opacity; 3. requiring that stoves be certified as clean burning; and 4. regulating open burning seasons.[R#2,17,21,22]

Attention has also been given to automobiles' impact on air quality. Over the past ten years Ashland has experienced a 10% population growth rate while automobile use has grown by 60% in the same period. To address this situation a citizen's committee on transportation was formed. Civic efforts include subsidizing buses, limiting parking in the downtown core, providing bike lanes, and focusing on pedestrian friendly development. These are all part of "T-PAC's Comprehensive Transportation Plan" for Ashland.[R#17]

WATER CONSERVATION

While Ashland's water use is equivalent to the American average of 150 gallons per capita per day, the City's projected growth posed a real concern given the City's water supply. In 1989, the City of Ashland hired the consultants R.W. Beck to study its water supply situation. The firm concluded that Ashland must increase water supply within 10 years and presented two options to accomplish this: First, the City could build a dam and reservoir on the west fork of Ashland Creek at an estimated cost of $11 million. Second, it could lay 13 miles of pipeline to the Rogue River at an estimated cost of $7.7 million. The study did not give credence to water efficiency as a possible solution; instead it equated water conservation with water rationing.[R#2]

City officials were reluctant to spend $11 million dollars on a new dam. Moreover, passing a bond issue which would effectively allow for more population growth, such as a bond issuance that would enable expanded water supply, would be politically difficult to attain at best. In fact, this option was regarded as impossible in light of the fact that the proposed dam site was in an old-growth forest, home to the endangered spotted owl. Obviously, other options needed to be considered. At that time, Wanderscheid had read an article about the Rocky Mountain Institute which argued the case that water efficiency could eradicate the need for building a dam on the South Platte River in order to augment Denver's water supply. Inspired by this, the City hired Synergic Resources Corporation (SRC) to investigate other solutions to Ashland's pending water problem.

In 1991, SRC presented Ashland City Council with its report on water use efficiency. This report studied eleven water conservation activities and recommended seven for Ashland. After much consideration by the City Council and the citizens advisory committee on water conservation, the City adopted four action steps as an immediate strategy: 1. System leak detection and repair; 2. Conservation-based water rates; 3. Showerhead replacement program; and 4. Toilet retrofit and replacement rebates. SRC determined that these measures could save the City a half a million gallons of water a day at a cost of $825,875, a much lower cost than building a new water supply. With these water efficiency measures, the need for an increased water supply could be delayed until the year 2021.[R#12]

Ashland's Water Conservation Program began in July of 1992 at a time when the City was facing the possibility of water rationing as the result of the prolonged Northwest drought. Using the City's energy conservation programs as a model for its water conservation activities, Ashland began immediately conducting water audits for a long list of customers anxious to participate in these efforts. In its first six months of the Water Conservation Program, the City performed 247 audits. All but 26 buildings installed measures recommended by the audits for a program participation rate of 89.5%. These measures included $75 dollar rebates which were awarded to 69 customers for toilet replacements before funds for the year were used up, and showerheads which were provided free by Bonneville through its Appliance Efficiency's Showerhead and Faucet Aerator program. By the end of 1994 over 850 residences had received a water audit. Because of the tremendous response to the toilet rebate, the rebate amount was reduced to $60 so that more toilets could be replaced.[R#13]

The citizens advisory committee recommended an inverted block structure for the "conservation based rates." Declining block rates have rewarded excessive consumption and were designed in the days when marginal costs were less than aver-

age costs. With demand exceeding supply, inverting the rate structure provides a clear incentive to conserve water as customers must pay a higher rate as usage increases.[R#2,12]

With an average daily savings of 290,000 gallons of water a day, Ashland is well on its way to reaching its goal of 500,000 gallons of water a day, which it expects to reach when the plan is fully implemented. Aside from these savings and deferring the expense of building a new water source, Ashland's Water Conservation program has achieved many other rewards for the community. An estimated 514 MWh of electricity used for water heating have been saved annually, primarily through efficient showerheads. Waste water volume has been reduced by some 43 million gallons a year. Customers enjoy lower water bills than they would if the City had to procure additional water resources. Finally, the City not only avoided costly constructions for a new water supply, but can use the money saved through water conservation to afford a new water source when it becomes necessary.[R#13]

RECYCLING

In addition to its efforts to conserve energy, water, and air quality, the City of Ashland also focuses on recycling and composting as a further means of conserving resources. The Recycling Task Force was another of Ashland's ad-hoc citizenry groups. This committee had the purpose of organizing the recycling center and assisting in solid waste audits for business and organizations. Ashland again is well recognized for its efforts in recycling. The City's recycling center has been used as a model by other Oregon communities.[R#2,20]

Ashland's Recycling Center is also home base for the Backyard Composting Project which sponsors seminars on how to compost vegetation and yard debris. Attendees of these seminars were eligible for a rebate equalling one-third the cost of a composting bin in Phase 1 of the program. Phase 2 attendees can choose between a free bin, book or tool for composting. Lucky students of the Ashland School District were able to get "hands on" experience with composting with worms when a pilot program brought vermiculture to participating schools. The project was part of a composting program sponsored by the State's Department of Environmental Quality.[R#2,20]

MARKETING

As a municipal utility Ashland has enjoyed the benefits of working in close collaboration with local government. Clearly its goals have been aligned with the City and thus joint promotion of new initiatives has been greatly facilitated. For electricity saving programs, the municipal utility's participation in BPA programs includes a marketing budget. These funds are applied toward a joint marketing campaign tying the specific program with Ashland's umbrella plan for conservation. Additionally, the City's contacts with the Planning and Building Departments help target new construction. In addition, a battery of marketing techniques are drawn upon for penetration into the civic core. Installation of retrofit measures which require direct contact are advertised through bill inserts, mailings, media advertisements and events and presentations to local civic groups.

STAFFING REQUIREMENTS

Ashland's Conservation Division is made up of a staff of five. Dick Wanderscheid has been Manager of the Conservation Staff since its formation in 1982. A self-proclaimed "conservation zealot," Wanderscheid has been a driving factor and highly instrumental in Ashland's success. Wanderscheid's staff included two full-time energy analysts, a water conservation analyst, and an administrative assistant. The staff works closely with Mayor Cathy Golden and the City Council, local contractors, and invaluable citizen committees pooling the talents of over 200 civic-minded citizens who focus on various aspects of community developments such as water, transportation, air quality, and recycling.[R#1,17]

Monitoring and Evaluation

MONITORING

Because the City of Ashland is not required to verify savings for a higher regulatory authority, it has not needed to engage in extensive monitoring and verification of its resource conservation programs. Essentially, it has had to track its success with resource conservation to provide a level of confidence to City Council. Since its programs provided numerous indicators of success, program monitoring and tracking has been quite minimal. As BPA customers, however, Ashland is responsible for tracking the implementation of BPA programs within its territory. In the case of Super Good Cents (SGC), for example, Ashland notifies Bonneville of its activity through the SGC home certification process. Bonneville, in turn, verifies this input by conducting on-site inspections of SCG home construction cooperatively with City representatives. Other BPA-sponsored programs, such as Residential Weatherization, require Ashland Municipal Utility to file tracking reports for projects completed through the program. It is the data from these BPA-supported initiatives that constitutes the bulk of the impact data in the next two sections.[R#25,26,27]

EVALUATION

Similarly the City of Ashland lacks the need and budget for extensive program evaluation. Bonneville, however, evaluates all of its DSM programs and this work has been useful to Ashland even though it is not done on a utility-specific basis but rather on a broader regional basis. While these evaluations do not reveal anything about a program's performance in Ashland specifically, their findings do influence the program's structure and how it can be implemented in Ashland.[R#26]

In the case of Super Good Cents, a 1989 BPA program evaluation forecasted a rise in consumer awareness of the program to approximately 75% and consumer interest in energy efficiency to about 70%. Additional findings indicated that a majority of consumers would consider spending up to $4,000 more on a new home which had energy efficiency features. Furthermore, a 1992 program reevaluation resulted in the resetting of SGC home standards, increasing energy efficiency requirements and adding appliance efficiency standards. [R#27]

CASE STUDY: THE PACIFIC NORTHWEST MUSEUM OF NATURAL HISTORY

Many qualities of Ashland are characterized by its Pacific Northwest Museum of Natural History. Offering hands-on learning and exhibits in science and culture, the facility also serves as a research center for the Southern Oregon State College. The Museum was developed for the purpose of cultivating sustainable living in the Pacific Northwest. With this in mind, the facility was designed to take maximum advantage of its natural surroundings, including natural lighting, climate, and scenery. Its highly acclaimed design includes an exciting gamut of energy-efficient components and is a further testament to Ashland's accomplishments.

The construction of the Museum benefited from Ashland's emphasis on resource conservation and BPA's Energy Smart Design program in particular. From the beginning of the project, the facility's architects and engineers worked as a team with BPA technicians and Ashland's Dick Wanderscheid and energy consultant Stuart Smith. The result of this collaboration is an elegant and innovative building which personifies its focus on sustainable living. With the assistance of Energy Smart Design, the project team was able to identify and install energy efficiency measures including double-pane tinted windows with high-efficiency glazing and thermally-broken frames; T8 fluorescent lamps and electronic ballasts; compact fluorescent lamps; electro-luminescent exit signs; outside air controls for the facility's 12 heat pumps; programmable thermostats; and space heating driven by a water-source heat pump.[R#11]

While these installations required an additional $14,228 in construction costs, the Museum's supporting foundation had no qualm with the extra expense. The inclusion of these Energy Smart Designs is projected to save $3,897 annually, resulting in a payback period of a little over three and one-half years, through estimated annual energy savings of 57,263 kWh. With its progressive and holistic design, the Museum has taken its own first steps towards the advancement of sustainable living for the Pacific Northwest.[R#11]

SAVINGS OVERVIEW BY PROGRRAM 1980-1994	TOTAL ANNUAL SAVINGS (MWh)	TOTAL PARTICIPATION	SAVINGS PER PARTICIPANT (kWh)
RESIDENTIAL PROGRAMS			
Residential Weatherization	5,045.56	2,378	2,121.77
Super Good Cents Homes	1,746.63	986	1,771.43
Water Heater Rebate	19.34	75	257.85
Showerheads and Faucet Aerators	303.51	794	382.26
Total Residential Savings	7,115.04		
COMMERCIAL PROGRAMS			
Energy Smart Design	1,642.90	59	27,845.81
Street and Area Lighting	378.90	1,263	300.00
Resource Conservation Manager	650.03	2	325,013.50
Total Commercial Savings	2,671.83		

The conservation efforts of the City of Ashland have addressed a broad range of resources but this section and the next focus on the electricity savings which the City has achieved and the related costs of these efforts. As previously stated, the driving focus behind the efforts of Ashland was sustainable development of the community, not rigorously tracking savings to report to satisfy the requirements of the regulatory commission. However, estimated savings for Ashland's participation in BPA programs were available from Bonneville and are presented herein.

Total annual savings from the City of Ashland's conservation efforts funded by Bonneville from 1980 through 1994 were 9,787 MWh with a cumulative savings for that period of 65,805 MWh and a lifecycle savings of 244,672. The programs have also resulted in cumulative capacity savings of just over 1 aMW. Residential programs represented 73% of the total annual savings from 1980 through 1994 with 7,115 MWh. The commercial sector achieved the balance of savings, 2,672 MWh.[R#14,15]

The program which generated the greatest savings in the City's energy usage was Residential Weatherization, with a total annual savings of 5,046 MWh from 1980 to 1994, over half the total savings realized through these DSM programs. This stands to reason, since this is the longest running of Ashland's conservation programs and includes those savings achieved by the Water Heater Wrap program which was incorporated into Residential Weatherization in 1983. Super Good Cents was next highest with 1,747 MWh in total annual savings. Ashland is well recognized for its high level of participation in new construction having completed nearly a thousand projects which meet SGC energy efficiency standards. Energy Smart Design, which began in Ashland in 1987 and is Ashland's core program for the commercial sector, has resulted in total annual savings of 1,643 MWh.[R#14,15]

PARTICIPATION RATES

While overall participation in City conservation programs is not quantifiable, since there would be potential for overlap in participation in different projects, Ashland is well recognized for its high level of participation. Cathy Higgins, Project Manager at OMECA noted that Ashland is "a leader in marketing for participation and penetration," with an exceptional level in the new construction sector.[R#14]

Participation has been greatest in the Residential Weatherization program and Super Good Cents Programs with 2,378 and 986 participants respectively. The Residential Weatherization had its strongest level of activity in its first few years, 1983-1985, and has dropped and leveled off since 1987. Participation in SGC climbed steadily from its beginning in 1986 to its highest level in 1991, when 271 Super Good Cents homes were constructed and certified.[R#15] ☞

SAVINGS OVERVIEW	ANNUAL ENERGY SAVINGS (MWh)	CUMULATIVE ENERGY SAVINGS (MWh)	LIFECYCLE ENERGY SAVINGS (MWh)	ANNUAL CAPACITY SAVINGS (aMW)	CUMULATIVE CAPACITY SAVINGS (aMW)
1980-82	93.48	93.48	2,337.00	0.01	0.01
1983	1,770.29	1,863.77	44,257.25	0.20	0.21
1984	1,306.26	3,170.03	32,656.50	0.15	0.36
1985	666.66	3,836.69	16,666.50	0.80	0.44
1986	475.68	4,312.37	11,892.00	0.50	0.49
1987	262.87	4,575.24	6,571.75	0.30	0.52
1988	268.15	4,843.39	6,703.75	0.30	0.55
1989	506.82	5,350.21	12,670.50	0.60	0.61
1990	549.82	5,900.03	13,745.50	0.60	0.67
1991	384.84	6,284.87	9,621.00	0.40	0.72
1992	1,020.19	7,305.06	25,504.75	0.12	0.83
1993	1,178.44	8,483.50	29,461.00	0.13	0.97
1994	1,303.38	9,786.88	32,584.50	0.15	1.12
Total	9,786.00	65,805.52	244,672.00	1.12	

The number of participants listed for Resource Conservation Manager represents the number of years that the manager has been employed. For the two years of the program the School District's Energy Conservationist has saved an impressive annual average of 325 MWh.[R#15]

By far the highest savings per participant was achieved through Energy Smart Design program with an average savings of 27.85 MWh. This was to be expected as it is Ashland's major commercial program. Residential Weatherization and Super Good Cents averaged an annual estimated savings of 2.12 MWh and 1.77 MWh respectively.[R#15]

The number of "participants" listed for the Water Heater Rebate, Showerhead, and Street Lighting programs account for the number of units installed through the program.

FREE RIDERSHIP

Since its focus has been to promote resource conservation and sensible development for the purpose of sustainability, the City of Ashland has not concerned itself with determining the level of free ridership. In fact, Dick Wanderscheid and his staff encourage the early adopters for all resource conservation programs to become the grass-roots marketeers for the programs, spreading their effects to solicit additional participants, ultimately an important facet of building awareness of resource conservation that will create free drivership in excess of any levels of free ridership in the programs' early years. Ashland's orientation, in this regard, has been to transform attitudes, to transcend strict economic investments, and to maintain – even enhance – the quality of life in Ashland by creating an ethic in town that respects the role of today's resource use on the future.

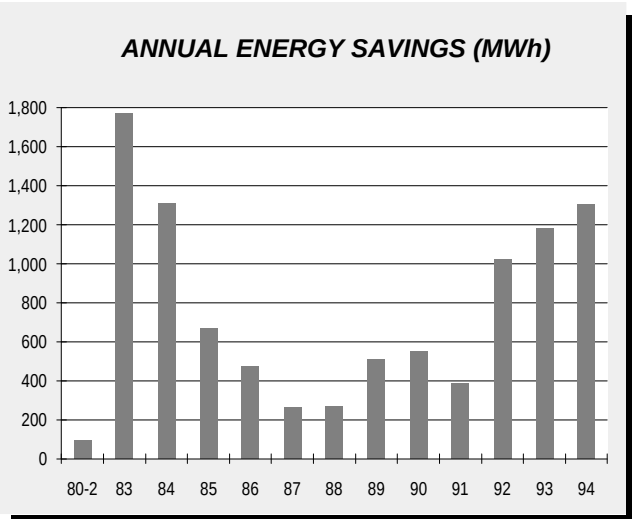
MEASURE LIFETIME

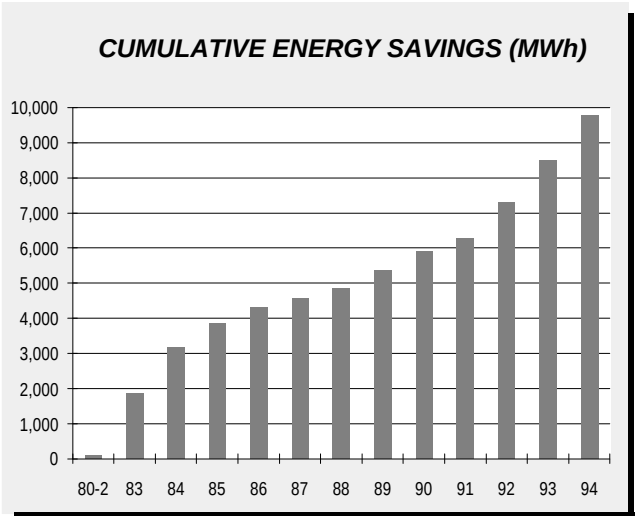
The wide variety of measures delivered by the City of Ashland include an equally wide variety of expected lifetimes. The Results Center has calculated a weighted average lifetime for measure completed by the City of Ashland with BPA funding, using the same estimated lifetime per measure as Seattle City Light, another Bonneville customer. Super Good Cents and

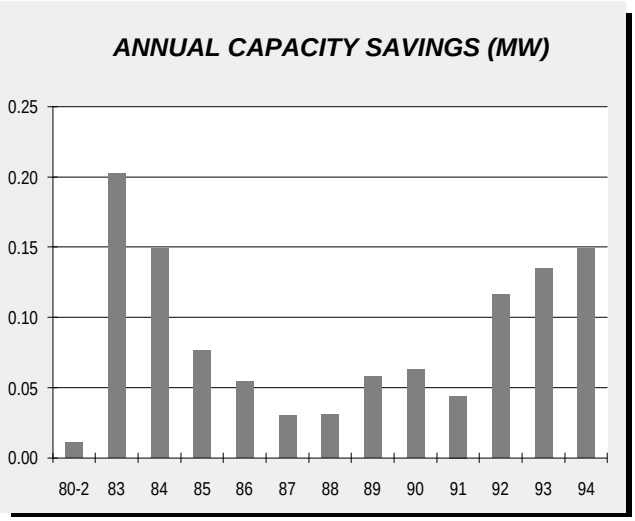
Residential Weatherization have been assigned measure lifetimes of 30 years. All measures for the commercial sector have an estimated lifetime of 16 years and 10 years was assumed for the Appliance Efficiency programs. Therefore, the average weighted lifetime for measures installed through BPA-sponsored programs, based on savings per measure, is 25 years. This figure is used to calculate the lifecycle savings and cost of saved energy presented.[R#23]

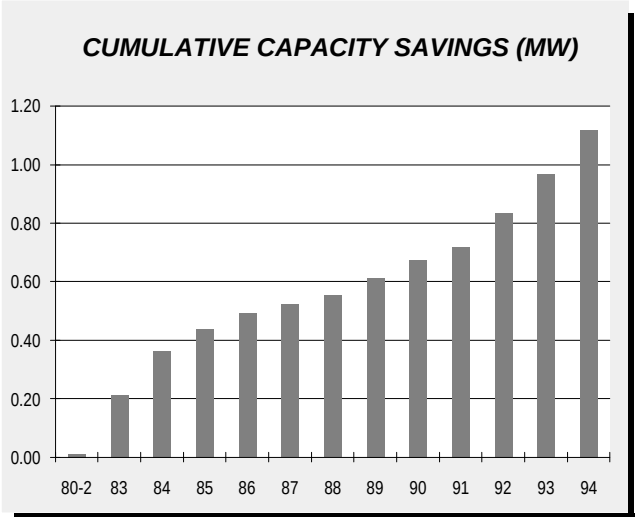
PROJECTED SAVINGS

In its current OMECA contract, Ashland has set a savings goal of nearly .32 aMW by its completion in October 1996. After only five months into the program Ashland was already exceeding its goals and had achieved 38% of its target for 1995 electricity savings by February of 1995. Moreover, Ashland has produced these savings cost-effectively, expending only 30% of the 1995 budget for a cost of saved energy of approximately 15 mills. OMECA calculates that the conservation potential for the City of Ashland by the year 2003 to be on the order of 21,693 MWh. The greatest potential for savings lies in the commercial sector which is estimated to be 10,369 MWh with residential and industrial carrying the savings potential of 9,993 MWh and 1,331 MWh respectively.[R#14,16]









Cost of the Program

Between 1980 and 1994 Bonneville provided a total of $5,120,626 for Ashland's electric efficiency efforts. Fully 90% of this has been devoted to residential programs. A large part of this total expenditure was spent in 1983, when Ashland had 500 participants in the Residential Weatherization program, absorbing $1,169,215 of the total BPA funding. The following year brought a similar level of activity for the Residential Weatherization program with 531 participants requiring $875,464 in BPA funds. Also in 1983, BPA financed $295,458 for the Street Relamping project. These three figures account for 46% of BPA's total expenditure on Ashland programs from 1980 to 1994.[R#15]

The bulk of the BPA funding from 1980 to 1994 has gone to Residential Weatherization with a total expenditure of $3,596,162. Super Good Cents accounted for $994,740 while Energy Smart Design had a total expenditure of $204,463. The $3,710 spent on the School District's Resource Conservation Manager covered non-salaried expenses such as a computer and other supplies and the savings from the program quickly exceeded the salary for the position.[R#15]

Since September of 1994, funding for Ashland's energy conservation programs has come primarily from its partnership in OMECA and the unique bonding/financing mechanism sup-

COSTS OVERVIEW	TOTAL BPA FUNDING FOR ENERGY EFFICIENCY
1980-82	$95,414
1983	$1,480,306
1984	$875,493
1985	$483,404
1986	$356,550
1987	$268,243
1988	$217,852
1989	$224,515
1990	$263,109
1991	$196,126
1992	$166,518
1993	$266,344
1994	$226,752
TOTAL	$5,120,626

COSTS OVERVIEW BY PROGRAM 1980-1994	TOTAL COSTS	TOTAL PARTICIPATION	COSTS PER PARTICIPANT
RESIDENTIAL PROGRAMS			
Residential Weatherization	$3,596,162	2,378	$1,512
Super Good Cents Homes	$994,740	986	$1,009
Appliance Efficiency	$10,186	75	$136
Showerheads and Faucet Aerators	$15,896	794	$20
Total Residential Costs	$4,616,984		
COMMERCIAL PROGRAMS			
Energy Smart Design	$204,463	59	$3,465
Street and Area Lighting	$295,469	1,263	$234
Resource Convervation Manager	$3,710	2	$1,855
Total Commercial Costs	$503,642		

COST OF SAVED ENERGY AT VARIOUS DISCOUNT RATES (¢/kWh)	3%	4%	5%	6%	7%	8%	9%
1982	5.86	6.53	7.24	7.98	8.76	9.56	10.39
1983	4.80	5.35	5.93	6.54	7.18	7.83	8.51
1984	3.85	4.29	4.76	5.24	5.75	6.28	6.82
1985	4.16	4.64	5.14	5.67	6.22	6.79	7.38
1986	4.30	4.80	5.32	5.86	6.43	7.02	7.63
1987	5.86	6.53	7.24	7.98	8.76	9.56	10.39
1988	4.67	5.20	5.76	6.36	6.97	7.61	8.27
1989	2.54	2.84	3.14	3.47	3.80	4.15	4.51
1990	2.75	3.06	3.40	3.74	4.11	4.48	4.87
1991	2.93	3.26	3.62	3.99	4.37	4.77	5.19
1992	0.94	1.04	1.16	1.28	1.40	1.53	1.66
1993	1.30	1.45	1.60	1.77	1.94	2.12	2.30
1994	1.00	1.11	1.23	1.36	1.49	1.63	1.77

ported by BPA. With about one-third of the first year completed, Ashland had expended $122,222, nearly one-third of its $410,000 budget. It is ahead of the game however, given that Ashland has already achieved nearly 40% of its energy savings goal for the year.[R#14,16]

In addition to Bonneville's contribution to funding DSM programs, either directly or through OMECA, the City of Ashland spends approximately $100,000 of its utility revenues on energy efficiency programs annually. A break-out of these expenditures by cost is unfortunately not available.

COST EFFECTIVENESS

As stated previously, the residential programs represented 90% of the total expenditure of BPA funds while generating only 73% of the savings. This indicates that programs servicing the commercial sector which account for the balance of costs and savings, were more cost effective, as generally expected. The cost-effectiveness of delivering Bonneville-sponsored programs has improved dramatically as Ashland has moved forward in its conservation efforts. The cost of saved energy has dropped from 7.24¢/kWh at a 5% real discount rate in 1982 to 1.23¢/kWh in 1994.

COST PER PARTICIPANT

Cost per participant was highest for the Energy Smart Design program at $3,465. While this is over twice as much as the next program, the savings were greater by a factor of thirteen! The Residential Weatherization and Super Good Cents programs had an average expenditure of $1,512 and $1,009 per participant respectively. Cost per unit for the Street Lighting, Water Heater Rebate, and Showerhead were $234, $136, and $20 respectively and include installation and administrative costs as well as unit cost or unit rebate.

Environmental Benefit Statement

AVOIDED EMISSIONS:	***Based on 65,805,440 kWh saved 1980-1994***					
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%	141,877,000	3,366,000	680,000	68,000
B	10,000	1.20%	151,287,000	1,303,000	439,000	326,000
	Controlled Emissions					
A	9,400	2.50%	141,877,000	337,000	680,000	5,000
B	10,000	1.20%	151,287,000	130,000	439,000	22,000
C	10,000		151,287,000	869,000	434,000	22,000
	Atmospheric Fluidized Bed Combustion					
A	10,000	1.10%	151,287,000	398,000	217,000	109,000
B	9,400	2.50%	141,877,000	337,000	272,000	20,000
	Integrated Gasification Combined Cycle					
A	10,000	0.45%	151,287,000	268,000	43,000	109,000
B	9,010		136,086,000	97,000	33,000	7,000
Gas	***Steam***					
A	10,400		82,520,000	0	188,000	0
B	9,224		71,662,000	0	449,000	21,000
	Combined Cycle					
1. Existing	9,000		71,662,000	0	275,000	0
2. NSPS*	9,000		71,662,000	0	130,000	0
3. BACT*	9,000		71,662,000	0	18,000	0
Oil	***Steam--#6 Oil***					
A	9,840	2.00%	119,437,000	1,810,000	214,000	203,000
B	10,400	2.20%	126,675,000	1,795,000	269,000	130,000
C	10,400	1.00%	126,675,000	256,000	216,000	68,000
D	10,400	0.50%	126,675,000	753,000	269,000	41,000
	Combustion Turbine					
#2 Diesel	13,600	0.30%	158,525,000	316,000	490,000	27,000
Refuse Derived Fuel						
Conventional	15,000	0.20%	188,204,000	485,000	638,000	142,000

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 City of Ashland's level of avoided emissions saved through its electric energy efficiency programs 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 City of Ashland provides strong testimony for what can be accomplished through community action: Ashland's comprehensive roster of resource conservation activities are the result of a progressive population, inspired leadership, and an effective set of programs that have pushed the envelope of traditional city planning, and which in turn have continued to enhance Ashland's quality of life. Strength in and of community was clearly illustrated by the town's successful efforts to purchase the Mt. Ashland Ski Area, but a host of less visible and tangible initiatives have been quietly at work creating a watershed of change that is ready for replication.

A local champion, Dick Wanderscheid, has been a major asset to the program: Mayor Cathy Golden considers Dick Wanderscheid a major asset in Ashland and a prime factor in her City's success with resource conservation. Wanderscheid's track record has put Ashland on the map for resource efficiency initiatives. In turn, the efforts of Dick Wanderscheid's Conservation Division have been and continue to be met with full support by City government. In fact, Wanderscheid states that he can't think of a time when one of his proposals for resource conservation in Ashland was not unanimously approved by City Council. Programs in turn have been met with strong participation among trade allies. Some 69 local contractors are now building certified Super Good Cents homes in Ashland. Even greater is the participation from Ashland's progressive citizenry providing a resource for development and implementation of programs through numerous citizen committees. Clearly Wanderscheid has inspired, directed, and thus accelerated Ashland's activities.[R#1,19]

Since the City of Ashland has the dual role of utility and government there were both opportunities and pitfalls to be identified: The joint efforts of the City facilitates communication between the City's Planning and Conservation Departments. Because the City serves the dual role of governing the community and operating the utility, special care has been given to focus on all forms of energy efficiency, not just electrical efficiency. Energy analysts in Ashland give their constituents accurate accounts of all available fuels, not just electricity and try not to influence the customer's choice. This fuel-neutral orientation has strengthened Ashland's efforts, providing the Conservation Division with credibility and a means of serving all customers.

While the City government promotes the conservation of all fuels, in reality it cannot always financially support measures involving other fuels with technical assistance. Because the Conservation Division is funded through utility rates, electrical energy efficiency is its primary goal and its priority. For example, compliance with Super Good Cents requires a computerized heat loss analysis to be performed by Energy Conservation staff. With the current high rate of new home construction, this demands nearly all of the staff's time, leaving little time for conservation measure analyses of gas-heated homes. In addition, it has been Bonneville's incentives for electricity-saving measures that have been most attractive. [R#9]

Ashland's success with energy efficiency has created models for success in other resource areas: The City has realized that what holds true for energy is also true for water when it comes to conservation. When told that it needed to augment its water supply in the next ten years, the City applied lessons learned from its energy efficiency efforts to create a solution to its water problem. Conservation and efficient use have proven a more cost-effective means of meeting increased demands. By becoming water-efficient, Ashland has been able to save enough water to meet the demands during drought years and defer the need for costly development of a new water supply.

The economic benefits of conservation include not only deferred costs and saved expenses, but offer the opportunity for economic development: While ratepayers can enjoy lower utility bills by practicing energy and water efficiency and the City defers large expenses such as building a new dam, practicing energy efficiency offers even more to the community's economy. The installation of efficiency measures and materials required add to the development of the town's economic base, both in labor and in business. This macroeconomic orientation has been well articulated in Ashland and has had the public support, two key ingredients in the transition to resource sustainability.

Sustainability also provides its own market for creative entrepreneurs. Mayor Cathy Golden relates one success story of two young men who started their own business targeting a demand created by one of Ashland's conservation efforts. The situation stemmed from a ban which Ashland placed on the commercial use of packaging made from chlorofluorocarbons (CFCs). This presented a problem for Albertson's Supermar-

ket, which was considering an Ashland location, but used styrofoam trays for their deli items. The two keen businessmen created a solution for Albertson's and a business for themselves by manufacturing paper trays out of recycled materials. If the product is satisfactory in Ashland, Albertson's, one of the country's largest supermarket chains, plans to take it nation-wide![R#17]

Perhaps the biggest lessoned to be learned for the City of Ashland Municipal Utility is yet to come, when a new economic resource is needed for the City's conservation programs: Financing conservation programs has been the greatest challenge in creating a more energy-efficient community. Ashland recognizes that it has been highly fortunate to have had years of BPA support, both technical and financial. Through the good timing of the OMECA program Ashland been able to procure Bonneville funding for its DSM programs through October of 1996. For those utilities which are not a part of OMECA, BPA-sponsored programs will run dry in October of 1995. This gives Ashland the enviable viewpoint of a spectator for a year, enabling it to watch how other municipalities respond to Bonneville's new structure and to potentially benefit from their experiences.

But time is running out! In the future, Ashland will have to develop means to finance its own conservation initiatives. At this point, the challenge may not be as dire as it may seem. Given the awareness of the public of the value of resource conservation that has been developed in Ashland over the past 15 years, the municipal utility may be able to shift gears, using customers' own bill savings to pay for efficiency upgrades. Just as utilities across North America are weaning their customers from financial incentives, Ashland is entering a new era for its programs that will likely be more and more based on education and finance, and less and less on direct cash grants.[R#1,14]

TRANSFERABILITY

Ashland has assumed a leadership role in conservation in the Pacific Northwest region. Ordinances such as the solar access ordinance which was first introduced to the region in Ashland, have been adopted by neighboring jurisdictions, again supporting the importance of Ashland's precedent-setting activities. Furthermore, Ashland's participation rate and success with BPA-sponsored programs has convinced other utilities to participate in programs such as Super Good Cents Homes. Ashland will even provide training for these utilities. In all such correspondences, representatives of the City try to convey the importance of the effect of attitude in the success of a program.

As the utility industry moves towards a competitive structure, it is likely that a community-based effort towards energy efficiency will become increasingly important. Instead of watching DSM programs dwindle and disappear, this is an opportunity for them to shift instead into the municipal sector. Tailoring solutions to local situations and concerns enables communities to improve their quality of life and move towards sustainability.

References

1. Dick Wanderscheid, Energy Conservation Coordinator, Department of Community Development, City of Ashland, personal communication, February - July 1995.

2. "Conservation Element Chapter XI: Energy, Air and Water Conservation," The City of Ashland, 1991.

3. "Site Design and Use Standards," Ashland City Council, August 1992.

4. "City of Ashland Local Conservation Plan," City of Ashland Conservation Division, November 1992.

5. City Ordinance #2689, Chapter 18.72 "Site Design and Use Standards," Ashland's City Charter, November 1992.

6. City Ordinance #2689, Chapter 18.88 "Performance Standards Options", Ashland's City Charter, November 1992.

7. City Ordinance #2689, Chapter 18.70 "Solar Access," Ashland's City Charter, November 1992.

8. "Small Progressive Town Embraces Conservation," Conservation Monitor, November/December 1992.

9. "The Integrated Whole: Ashland Takes Broad Look at Resource Conservation," Conservation Monitor, November/December 1992.

10. "Municipal Electric Utilities BPA Develop Joint Program," League of Oregon Cities Newsletter, July 1993.

11. "Energy Smart Design Case Study: Pacific Northwest Museum of Natural History," Cole & Weber, March 1995.

12. "The Draft SRC Water Demand Side Resource Study Summary: March 1992," Conservation Division, City of Ashland, March 1992.

13. "Memorandum: Water Conservation Program Update," Dick Wanderscheid, January 1993 and December 1994.

14. Cathy Higgins, Project Manager, Oregon Municipal Energy & Conservation Agency (OMECA), personal communication and related materials, March 1995.

15. "Bonneville Power Administration Conservation Program Activities for the City of Ashland," BPA, June 1993 and March 1995.

16. "Management Test for Oregon Municipal Energy & Conservation Agency," OMECA, February 1993.

17. Cathy Golden, Mayor, City of Ashland, personal communication, March-July 1995.

18. "Electric Utility Sales by Customer Class," 1991, 1992, 1993, Dick Wanderscheid, June 1994.

19. "Living and Doing Business in Ashland, Oregon," the City of Ashland and Ashland Chamber of Commerce, undated.

20. Articles from the Ashland Daily Tidings: "Invasion of Vermicomposters", March 16, 1993; "City Weighs Water Alternatives," October 27, 1994; "Report: Ashland Water Planning on Target," December 28, 1994; "Oregon's Leading the Way in Recycling," December 29, 1994; "Panel Wants to Recycle Itself," January 7, 1995.

21. Marketing materials and press releases from the Conservation Division of the City of Ashland, undated.

22. "Save Our Livability, View and Environment (SOLVE): Ashland, Oregon Municipal Electric Utility," Environmental Success Index, undated.

23. "Energy Conservation Accomplishments: 1977-1993," Evaluation Unit, Energy Management Services Division, Seattle City Light, November 1994.

24. Ken Keating, Marketing Division, Bonneville Power Administration, personal communication, March 1995.

25. Becky Clark, Public Utility Specialist, Bonneville Power Administration, personal communication, March 1995.

26. Fev Pratt, Energy Services, Bonneville Power Administration, personal communication, March 1995.

27. "Profile #7: Bonneville Power Administration, Super Good Cents," The Results Center, 1993.

Special thanks to Dick Wanderscheid for his guidance and assistance in the development of this profile.