

CONSERVATION RESOURCE ENERGY DATA (The RED Book)

INTRODUCTION:

On December 5, 1980 the 96th Congress passed the Pacific Northwest Electric Power Planning and Conservation Act (Act), Public Law 96-501. The overall purpose of the Act is “to assist the electrical consumers of the Pacific Northwest through use of the Federal Columbia River Power System to achieve cost-effective energy conservation, to encourage the development of renewable energy resources, to establish a representative regional power planning process, to assure the region of an efficient and adequate power supply, and for other purposes”.

The Bonneville Power Administration (BPA), in compliance with the Act, has offered various energy conservation programs for the benefit of the Pacific Northwest consumers for the past quarter of a century. These energy conservation programs, sponsored and funded by BPA, have been successful due to the cooperation and assistance of BPA’s electric utility customers.

PURPOSE:

This document summarizes data on costs and savings pertaining to the BPA energy conservation acquisition programs and resources. The document provides information and references for general audiences and for use in preparing general publications.

ORIENTATION

The RED Book consists of six parts. The first and second parts provide the reader with information on the total conservation savings since 1982. The third part of this document presents information on current conservation programs as of 2001. The fourth part offers information on the historical conservation achievements for the period 1982 through 2000. The fifth part of the document presents expended dollars in a table format. The sixth part offers definitions to the terms that are used within the text and tables of the document.

IMPORTANT NOTE FOR THE USER:

This information is sensitive to seemingly unimportant changes in the assumptions surrounding it. *Use data with care* to ensure that the correct characterizations of the monetary and energy figures are communicated.

The RED Book information is presented to the nearest tenth of an average megawatt (aMW) in most of the tables. In the charts and graphs, the information is rounded to the nearest 5 aMW. When presenting this information to the public, however, we recommend using “rounded” numbers because we recognize that these data are not precise and are subject to adjustment over

time. Prior to each support table a narrative is presented. *A glossary of terms is provided herein for readers who are unfamiliar with some of the terminology used in the document.*

This book contains data available through BPA's fiscal year (FY) 2005 as reported on January 17, 2006. These data should be used as "official data" until an updated RED Book is published next year. Adjustments to the data are captured annually in the RED Book as information from evaluations or other sources prove savings estimates should be increased or decreased. Also, dollar amounts may change from one year to the next due to revised utility reports that are submitted for previous years.

If you have any questions about how to represent or use this information, please call one of the individuals listed below:

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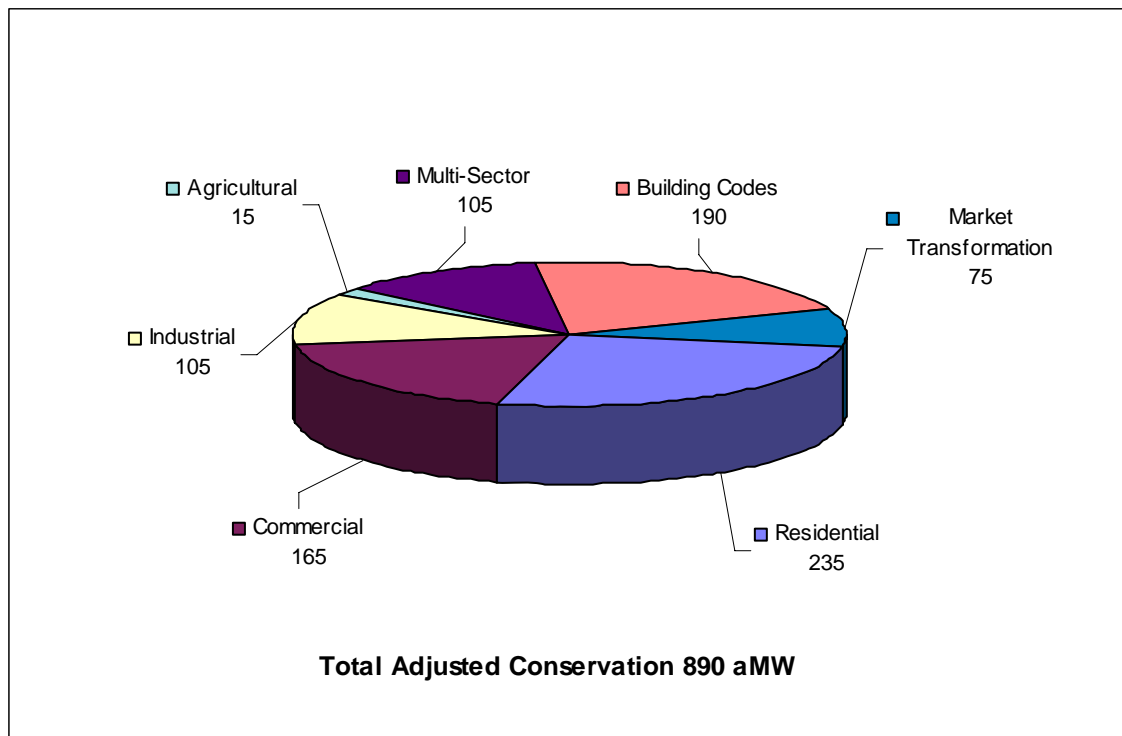
TABLE OF CONTENTS

<u>CONSERVATION</u>	<u>PAGE</u>
<u>A QUICK OVERVIEW (FY 1982-2005)</u>	
Figure 1 Graph of BPA’s Historical Conservation Savings	1
<u>TOTAL ADJUSTED HISTORICAL SAVINGS (FY 1982-2005)</u>	
Figure 2 Graph of Cumulative Adjusted Savings	2
Table A BPA’s Total Historical Conservation Savings	3
<u>CURRENT CONSERVATION PROGRAMS (FY 2001-2005)</u>	
Figure 3 Graph of Cumulative Savings	4
Figure 4 Graph of Incremental Annual Savings	5
Figure 5 Graph by Market Sector of Incremental Savings	5
Table B Conservation Savings by Program	6
<u>HISTORICAL CONSERVATION SAVINGS (FY 1982-2000)</u>	
Figure 6 Graph of BPA’s Cumulative Conservation Savings	7
Table C Annual Conservation Savings	8-9
<u>CONSERVATION COSTS</u>	
Table D BPA’s Total Conservation Costs by Sector	12
Table E Historical Conservation Costs by Sector (FY 1982-2000)	13
<u>GLOSSARY</u>	
Appendix A Glossary of Terms	16-22

A QUICK OVERVIEW (Figure 1)

Figure 1 is a graphic portrayal of BPA's total energy conservation savings (FY 1982 -2005). Some savings reported in the totals have reached the end of the accepted measure life for particular programs and projects. The RED Book includes an adjustment for energy savings or measures where it has been determined that the measure life has expired.

FIGURE 1
BPA's Total Conservation Savings¹
FY 1982 – 2005



¹ All numbers are rounded to the nearest 5 aMW. Previous RED Book versions of this graph contained ConMod Savings. We have removed that component from the RED Book as of the April 2004 production. The Region is no longer receiving conservation benefits from the aluminum industry due to the economic downturn of the industry.

BPA'S TOTAL HISTORICAL CONSERVATION SAVINGS

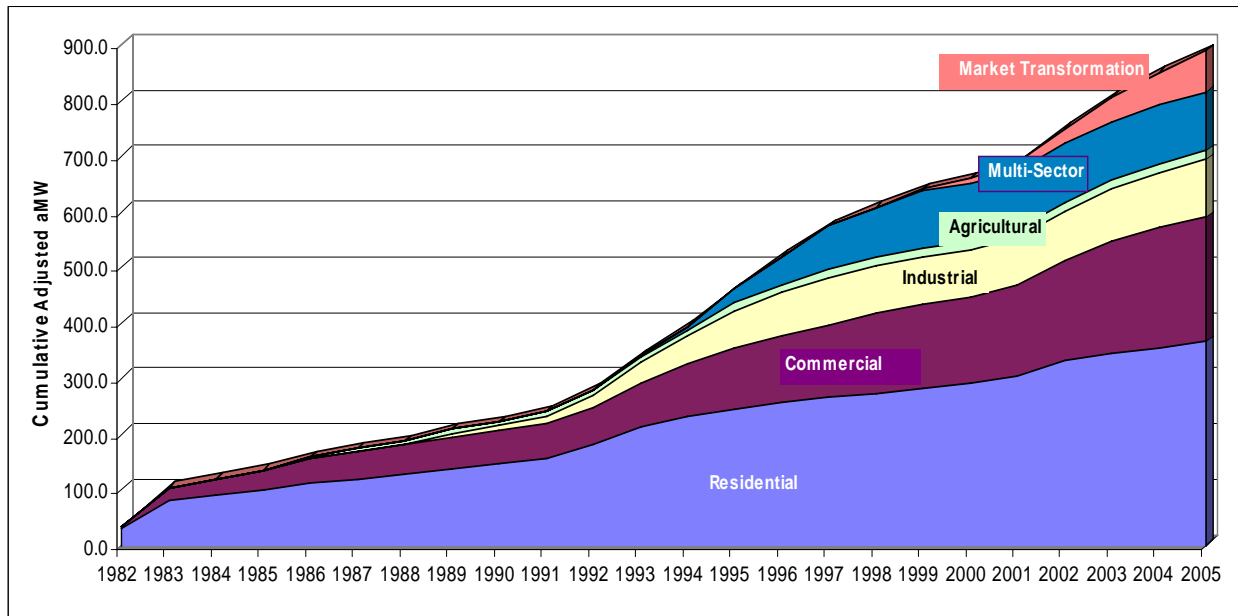
TOTAL CUMULATIVE SAVINGS

Figure 2 represents BPA's total adjusted savings from 1982 – 2005 which are approximately 890 aMWs. (The aMWs in the following paragraphs are rounded to the nearest 5 aMW.)

SECTOR SPECIFIC CUMULATIVE SAVINGS

BPA's adjusted savings from the various energy savings programs (FY 1982 – 2005) resulted in 365 aMWs from the **residential** sector (includes 130 aMWs from residential building codes); 225 aMWs from the **commercial** sector (includes 60 aMWs from commercial building codes); and 105 aMWs from the **industrial** sector. **Agricultural** sector savings are 15 aMWs. **Multi-sector** programs (e.g. Billing Credits, Competitive Acquisitions, Flex Agreements, etc.) have resulted in a total of 105 aMWs. **Market Transformation** contributed 75 aMWs. The total adjusted energy savings from all activities is 890 aMWs through FY 2005.

FIGURE 2²
BPA'S Cumulative Adjusted Conservation Savings
aMW by Sectors
FY 1982 – 2005



² ConMod savings have been removed from the graph. The Region no longer receives conservation savings from the aluminum industry due to the economic downturn of the industry.

Table A provides the reader with information on the total incremental energy savings for 1982 through 2005. The table includes an adjustment column for those savings that have matured and are no longer providing a benefit to the region.

TABLE A
BPA's TOTAL CONSERVATION SAVINGS ³⁻⁴⁻⁵⁻⁶
(FY 1982 – 2005)
Incremental aMW

	FY 82-94	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	SubTotal FY 82-05	Adjustment FY 82-05	Total FY 82-05
Residential	172.6	3.4	1.4	0.6	0.7	0.6	0.3	6.5	20.2	11.4	9.8	10.5	238.1	(0.4)	237.7
Commercial	92.5	9.3	5.3	4.8	6.8	0.5	0.0	2.1	14.3	17.5	11.7	9.5	174.3	(9.8)	164.5
Industrial	53.4	18.2	11.8	6.7	0.2	0.2	0.0	0.4	4.3	6.8	4.9	3.4	110.3	(7.2)	103.1
Agricultural	17.6	3.0	0.6	0.0	0.0	0.2	0.0	5.2	2.5	3.3	2.7	0.1	35.2	(19.0)	16.2
Multi-Sector	6.3	20.1	23.6	27.9	12.9	13.4	0.0	0.0	0.2	0.2	0.2	0.1	104.9	0.0	104.9
Incremental Total	342.4	54.0	42.7	40.0	20.6	14.9	0.3	14.2	41.5	39.3	29.3	23.6	662.8	(36.4)	626.4
Con/Mod	95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95.9	(95.9)	0.0
Incremental Total with Con/Mod	438.3	54.0	42.7	40.0	20.6	14.9	0.3	14.2	41.5	39.3	29.3	23.6	758.7	(132.3)	626.4
Load Reductions from Improved Building Codes:															
Residential	59.0	10.3	8.7	8.8	8.2	8.2	8.4	8.3	8.7	0.0	0.0	0.0	128.6	0.0	128.6
Commercial	10.8	4.6	5.9	6.5	4.9	6.2	4.5	4.1	4.3	4.2	3.9	0.0	59.9	0.0	59.9
Incremental Total	69.8	14.9	14.6	15.3	13.1	14.4	12.9	12.4	13.0	4.2	3.9	0.0	188.5	0.0	188.5
Market Transformation	0.0	0.0	0.0	0.0	0.0	4.0	5.0	7.0	12.0	16.0	14.0	17.0	75.0	0.0	75.0
Incremental Total with Load Reductions and Market Transformation	508.1	68.9	57.3	55.3	33.7	33.3	18.2	33.6	66.5	59.5	47.2	40.6	1022.2	(132.3)	889.9

³ Includes transmission line loss credit savings.

⁴ The savings achieved related to irrigation scheduling are not included in the total column. These are one year savings and do not carry over to other years.

⁵ Market Transformation includes only BPA's share and not regional market transformation savings.

⁶ The numbers may not agree when added vertically and horizontally due to rounding effects and irrigation savings (see Footnote 4).

CURRENT CONSERVATION PROGRAMS

In 2001 BPA offered new conservation programs to utility customers under the Conservation Augmentation (ConAug) and the Conservation & Renewables Discount (C&RD) Programs. Early acceptance by a few utilities provided energy savings of those programs in the summer of 2001 albeit the programs officially started in fiscal year 2002. In addition, the State Low Income Weatherization Program is funded by BPA for the states of Oregon, Washington, Idaho and Montana. Market Transformation continues to be a viable energy savings opportunity for the Pacific Northwest Region. There are Building Code savings through fiscal year 2004 that accounts for savings within the region. BPA only reports savings that is achieved within its service territory.

Figure 3 is a representation of the cumulative effect of the current programs. ConAug has cumulative savings in the amount of 75 aMW; C&RD has provided a total of 55 aMW; State Low Income Weatherization Program achievement is 2 aMW; and Market Transformation has delivered 65 aMW. The Building Code savings accounts for 35 aMW. The total savings achieved during the period 2001 through 2005 is 230 aMW.

FIGURE 3
Current Conservation Programs
Cumulative aMW Savings
FY 2001 – 2005

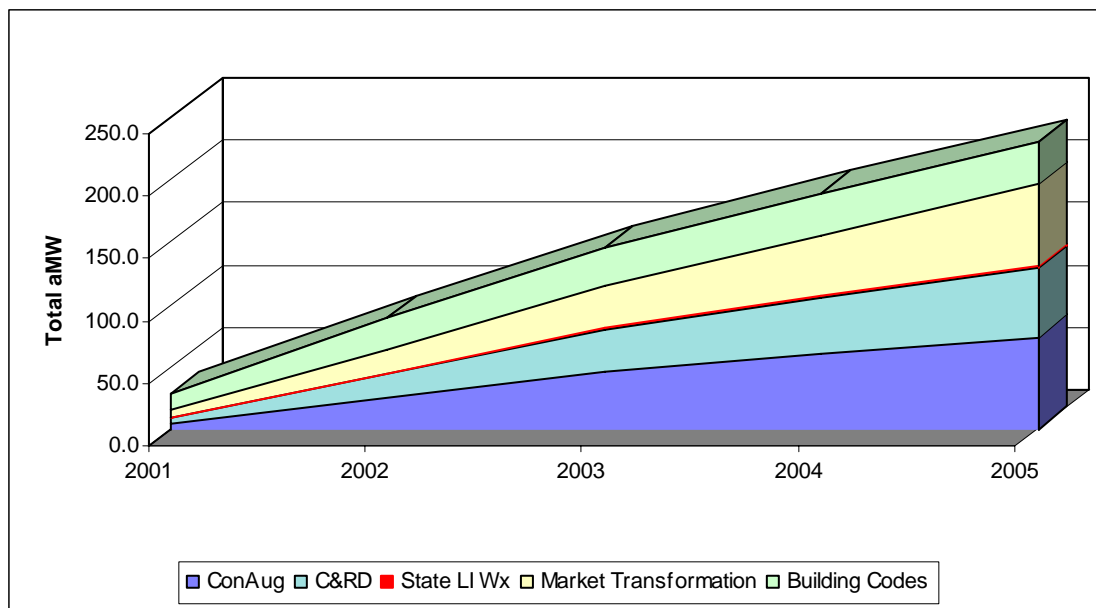


Figure 4 depicts the annual energy savings attained by the current conservation programs for fiscal years 2001 through 2005.

FIGURE 4
Current Conservation Programs
aMW Savings
FY 2001 - 2005

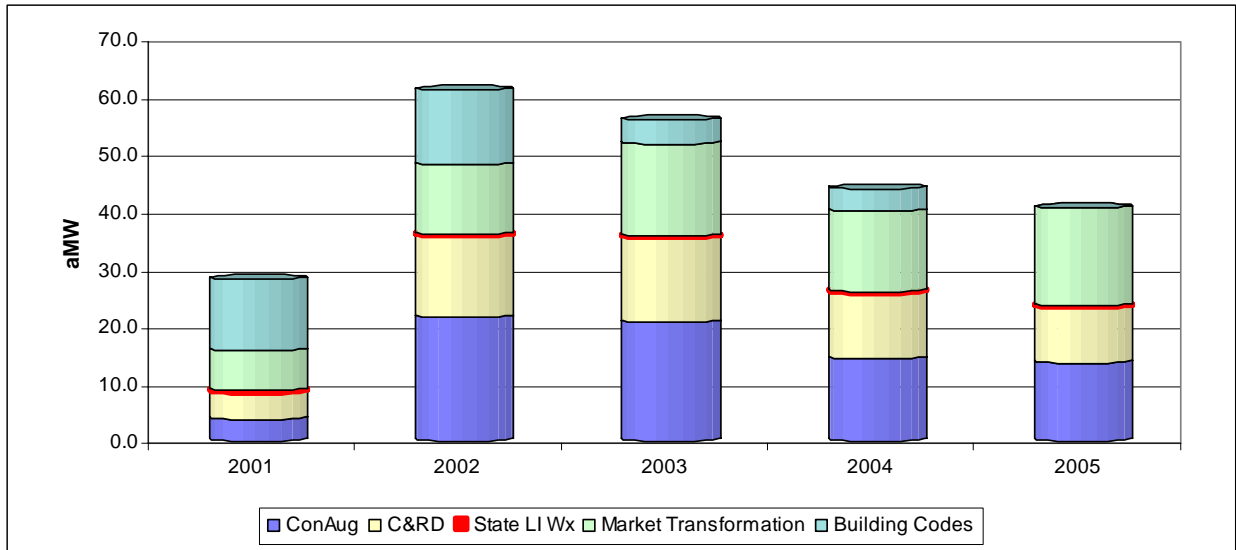


Figure 5 represents the annual acquisition within each market sector for the current programs.

FIGURE 5
Current Conservation Programs
Annual Incremental aMW
FY 2001 - 2005

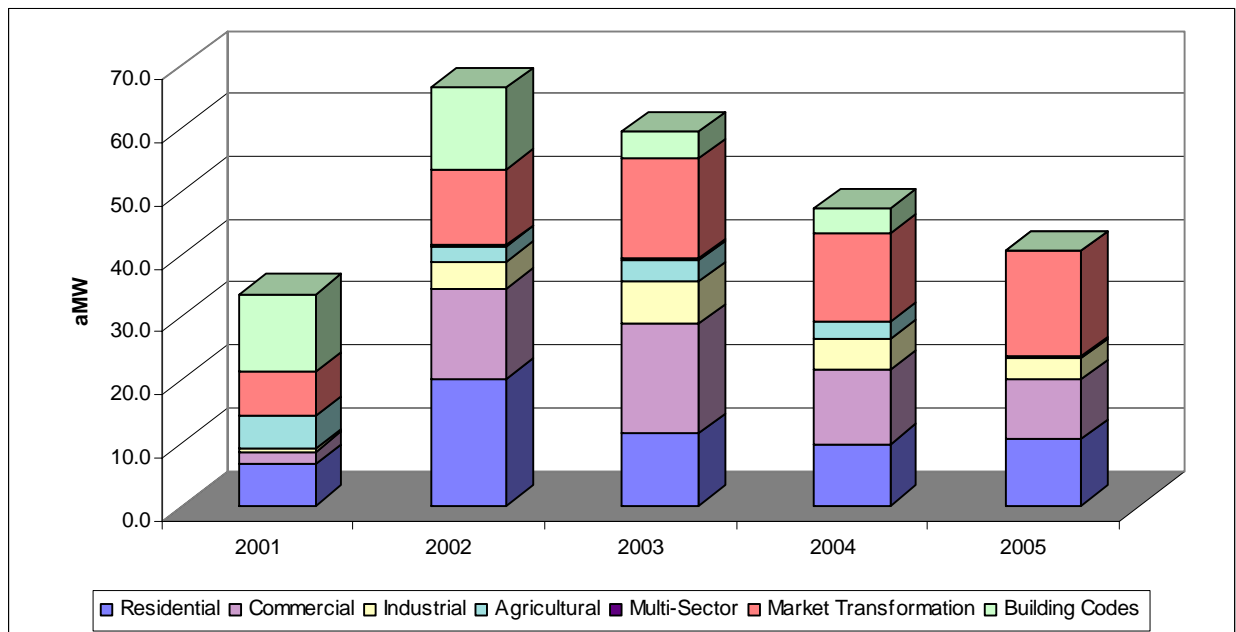


Table B provides the reader with information on the total incremental energy savings for 2001 through 2005. Adjustments to the savings occur on an annual basis. These adjustments are a result of evaluations performed or revised reports submitted by utilities for previous years.

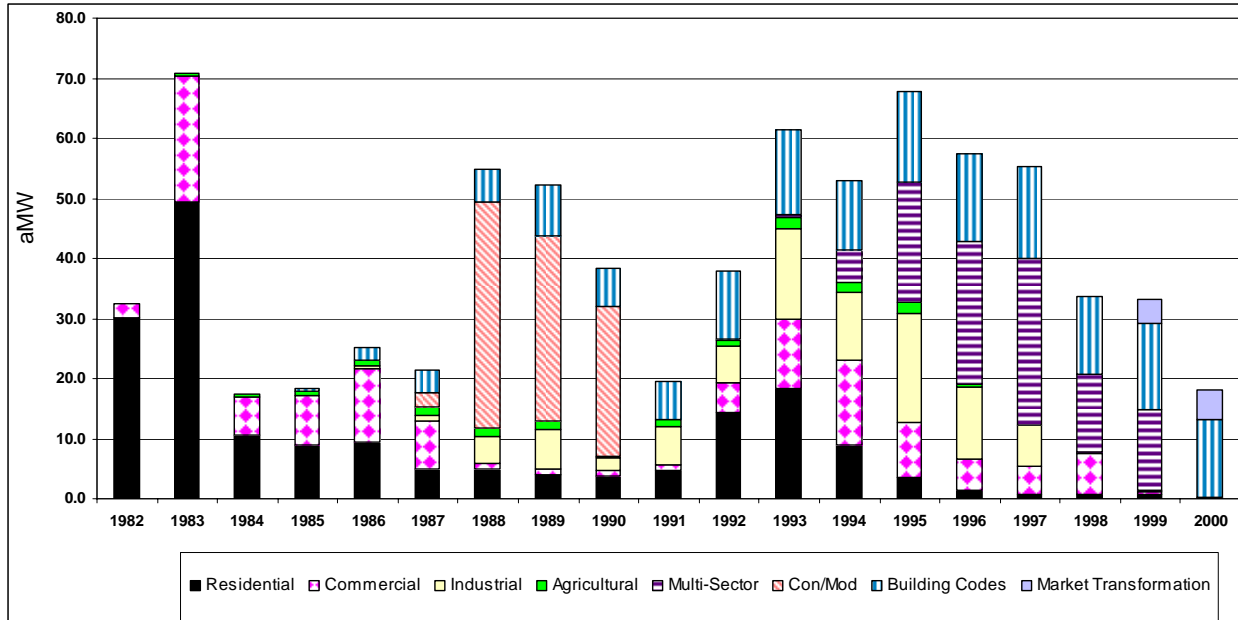
TABLE B
BPA's CURRENT CONSERVATION SAVINGS
BY PROGRAM (FY 2001 – 2005)
Incremental aMW ⁷

	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Adjustment	TOTAL FY 01-05
RESIDENTIAL							
Low Income Residential Weatherization (States)	0.4	0.3	0.4	0.3	0.3	0.0	1.7
C&RD Low Income Weatherization	0.0	0.2	0.2	0.2	0.2	0.0	0.8
<i>Conservation Augmentation (ConAug)</i>							
CFL Program	1.8	4.6	0.0	0.0	0.0	(1.9)	4.5
IRLC	0.7	2.6	2.4	1.8	1.7	(0.1)	9.1
TOTAL RESIDENTIAL CONAUG	2.5	7.2	2.4	1.8	1.7	(2.0)	13.6
Conservation Renewable Discount (C&RD)	3.6	12.5	8.4	7.5	8.3	1.6	41.9
RESIDENTIAL TOTAL	6.5	20.2	11.4	9.8	10.5	(0.4)	58.0
COMMERCIAL							
<i>Conservation Augmentation</i>							
Federal	1.2	3.1	2.5	1.9	1.9	0.0	10.6
LSO & ESO	0.2	2.3	2.5	1.1	1.2	0.0	7.3
Vending Miser	0.2	1.1	0.3	0.0	0.0	0.0	1.6
C&I	0.0	0.2	0.5	0.2	0.7	0.0	1.6
IRLC	0.1	5.9	7.7	7.2	5.3	(0.4)	25.8
TOTAL COMMERCIAL CONAUG	1.7	12.6	13.5	10.4	9.1	(0.4)	46.9
<i>Conservation Renewable Discount (C&RD)</i>	<i>0.4</i>	<i>1.7</i>	<i>3.9</i>	<i>1.3</i>	<i>0.4</i>	<i>(1.8)</i>	<i>5.9</i>
<i>New Initiatives - Institutional Program</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>
COMMERCIAL TOTAL	2.1	14.3	17.5	11.7	9.5	(2.2)	52.9
INDUSTRIAL							
<i>Conservation Augmentation</i>							
Water/Wastewater	0.0	0.3	0.2	1.7	0.0	(1.5)	0.7
C&I	0.0	0.0	0.5	0.1	0.8	0.0	1.4
IRLC	0.0	3.2	4.4	1.7	2.0	(0.2)	11.1
SUBTOTAL INDUSTRIAL CONAUG	0.0	3.5	5.1	3.5	2.8	(1.7)	13.2
Conservation Renewable Discount (C&RD)	0.4	0.8	1.7	1.4	0.6	0.1	5.0
INDUSTRIAL TOTAL	0.4	4.3	6.8	4.9	3.4	(1.6)	18.2
Agricultural							
Conservation Augmentation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conservation Renewable Discount (C&RD)	5.2	2.5	3.3	2.7	0.1	(12.4)	1.4
AGRICULTURAL TOTAL	5.2	2.5	3.3	2.7	0.1	(12.4)	1.4
Multi-Sector							
Conservation Augmentation	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Conservation Renewable Discount (C&RD)	0.0	0.2	0.2	0.2	0.1	(0.1)	0.6
MULTI-SECTOR SUBTOTAL	0.0	0.2	0.2	0.2	0.1	0.0	0.7
TOTAL CONSERVATION AUGMENTATION	4.2	23.3	21.0	15.7	13.6	(4.0)	73.8
TOTAL CONSERVATION RENEWABLE DISCOUNT (C&RD)	9.6	17.9	17.7	13.3	9.7	(12.6)	55.6
BUILDING CODES							
Residential	8.3	8.7	0.0	0.0	0.0	0.0	17.0
Commercial	4.1	4.3	4.2	3.9	0.0	0.0	16.5
BUILDING CODES TOTAL	12.4	13.0	4.2	3.9	0.0	0.0	33.5
Market Transformation	7.0	12.0	16.0	14.0	17.0	0.0	66.0
TOTAL POST LEGACY CONSERVATION	33.6	66.5	59.4	47.2	40.6	(16.6)	230.8

⁷ Under the Agricultural Sector, irrigation scheduling projects have a one-year life cycle. Therefore, 12.4 aMW has been adjusted in order to exclude it from the total column.

Figure 6 represents the annual acquisition within each market sector.

FIGURE 6⁸
Historical Conservation Programs
aMW Savings
FY 1982 - 2000



⁸ Multi-Sector is a term used as a pseudo “sector” that makes no distinction in a specific sector for the savings achieved.

Table C provides information on the historical programs for the period 1982 through 2000. The total energy savings achieved during this time period is 575 aMW.

TABLE C
BPA's CONSERVATION SAVINGS (aMW)
FY 1982-2000

	Total FY 82-94	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	SubTotal FY 82-00	Adjustment FY 82-00	Total FY 82-00
RESIDENTIAL										
EXISTING:										
Weatherization-SF&MF	99.4	1.4	0.0	0.0	0.0	0.0	0.0	100.8	0.0	100.8
Weatherization-MH	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2
Low-Income Wx	0.0	0.0	0.5	0.3	0.4	0.6	0.3	2.1	0.0	2.1
NEW										
Super Good Cents	4.8	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	4.8
New Manuf. Homes	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	1.9
L/T Super Good Cents	1.9	0.5	0.4	0.2	0.2	0.0	0.0	3.2	0.0	3.2
Manuf. Hsg. Acq.(MAP)	6.3	1.1	0.4	0.0	0.0	0.0	0.0	7.8	0.0	7.8
Water Heater Wraps	30.4	0.0	0.0	0.0	0.0	0.0	0.0	30.4	0.0	30.4
Shower Flow Restrictors	9.1	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	9.1
Waterheat/sh-hds/aerators	18.7	0.4	0.1	0.1	0.1	0.0	0.0	19.4	0.0	19.4
RES. SUBTOTAL	172.6	3.4	1.4	0.6	0.7	0.6	0.3	179.7	0.0	179.7
COMMERCIAL										
LTNG. & WTR. HTNG.:										
Water Heater Wraps	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Shower Flow Restrictors	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
Lamps	1.7	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	1.7
Street & Area Lighting	16.9	0.0	0.0	0.0	0.0	0.0	0.0	16.9	0.0	16.9
INSTITUTIONAL BLDG.										
TAS's Tech Assist-Info.	7.6	0.0	0.0	0.0	0.0	0.0	0.0	7.6	(7.6)	0.0
ECM's	26.7	0.0	0.0	0.0	0.0	0.0	0.0	26.7	0.0	26.7
ACQUISITION SUPPORT										
Purch. of Energy Svngs.	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	1.3
Finance (CIPP)	3.2	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	3.2
PSP&L	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.6
PECI - Comm/Ind Lng.	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.4
CREUS End-use Study	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Energy Smart Design	28.5	8.0	4.6	2.1	2.2	0.1	0	45.5	0.0	45.5
Targeted Acq. (TAP)	3.0	0.5	0.5	2.7	4.6	0.4	0	11.7	0.0	11.7
ODOE - Schools	0.1	0.8	0.2	0.0	0.0	0.0	0.0	1.1	0.0	1.1
COM. SUBTOTAL	92.5	9.3	5.3	4.8	6.8	0.5	0.0	119.2	(7.6)	111.6

TABLE C (continued)
BPA's CONSERVATION SAVINGS (aMW)
FY 1982-2000

	Total FY 82-94	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	TOTAL FY 82-00	Adjustment FY 82-00	Total FY 82-00
INDUSTRIAL										
Sponsor-Designed	9.7	0.0	0.0	0.0	0.0	0.0	0.0	9.7	(5.6)	4.1
Energy Savings Plan	31.3	16.9	9.8	3.6	0.2	0.0	0.0	61.8	0.0	61.8
Major Plants	12.4	1.3	2.0	3.1	0.0	0.2	0.0	19.0	0.0	19.0
IND. SUBTOTAL	53.4	18.2	11.8	6.7	0.2	0.2	0.0	90.5	(5.6)	84.9
AGRICULTURAL										
Irrigation Hardware	12.4	1.8	0.6	0.0	0.0	0.0	0.0	14.8	0.0	14.8
Irrigation Scheduling	5.2	1.2	0.0	0.0	0.0	0.2	0.0	6.6	(6.6)	0.0
AG. SUBTOTAL	17.6	3.0	0.6	0.0	0.0	0.2	0.0	21.4	(6.6)	14.8
MULTI-SECTOR										
Billing Credits	1.0	0.5	0.6	0.3	0.0	0.0	0.0	2.4	0.0	2.4
Competitive Acquisition	0.1	0.6	0.0	0.1	0.1	1.1	0.0	2.0	0.0	2.0
BPA Sys Efficiencies	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7
Third-Party Financing	4.9	10.3	12.4	18.1	6.8	4.8	0.0	57.3	0.0	57.3
Flex Agreements	0.0	8.3	10.6	9.4	6.0	7.5	0.0	41.8	0.0	41.8
MULTI-S. SUBTOTAL	6.3	20.1	23.6	27.9	12.9	13.4	0.0	104.2	0.0	104.2
SECTOR										
SUBTOTALS	342.4	54.0	42.7	40.0	20.6	14.9	0.3	515.0	(19.8)	495.2
Con/Mod	95.9	0.0	0.0	0.0	0.0	0.0	0.0	95.9	(95.9)	0.0
SUBTOTAL										
W/ CON/MOD	438.3	54.0	42.7	40.0	20.6	14.9	0.3	610.9	(115.7)	495.2
LOAD REDUCTION FROM BLDG. CODES										
Residential	59.0	10.3	8.7	8.8	8.2	8.2	8.4	42.3	0.0	42.3
Commercial	10.8	4.6	5.9	6.5	4.9	6.2	4.5	28.0	0.0	28.0
Improved Bld Codes	69.8	14.9	14.6	15.3	13.1	14.4	12.9	70.3	0.0	70.3
Market Transformation	0.0	0.0	0.0	0.0	0.0	4.0	5.0	9.0	0.0	9.0
TOTAL HISTORICAL										
CONSERVATION	508.1	68.9	57.3	55.3	33.7	33.3	18.2	690.2	(115.7)	574.5

BPA'S HISTORICAL CONSERVATION SAVINGS FY 1982-2000

NOTES ON TABLE C:

ACHIEVED SAVINGS:

The reported average megawatt (aMW) savings *are first year savings only* and not the true measure life or program life savings. Measure life is the estimated median time a measure will remain in place, or whenever the structure in which a measure is installed ceases to exist.

ADJUSTED SAVINGS:

The adjusted savings reflect, in some cases, the end of a measure life when BPA assumes the measures are no longer producing savings. In addition, the adjusted savings may reflect findings from evaluations that show savings are more or less than expected when the program was initiated.

LINE LOSS:

Reported savings include transmission and distribution line-loss credit savings of 7.5 percent for direct acquisition programs and 2.5 percent for ConMod. This adjustment is made to account for transmission and distribution line losses avoided through the acquisition of conservation.

During the transmission and distribution of electricity, a certain amount of electricity is lost due to electrical resistance inherent in conductors. Since conservation causes less electricity to be consumed by the end-uses, less electricity is transmitted and, therefore, less electricity is lost and less is needed to be generated. BPA credits its conservation with the line-loss savings. This adjustment allows conservation and generation savings to be compared from the same point in the electrical system often referred to as the "bus bar".

FUEL CHOICE:⁹

In 1993, BPA analyzed the following programs for possible fuel choice switching effects: Residential Weatherization, Manufactured Housing Acquisition Program (MAP), New Residential, Energy Smart Design (ESD), and Water Heating. These analyses concluded that the Residential Weatherization program had no fuel choice effect and only a modest effect on the Water Heating program.

However, a fuel choice effect was found in the New Residential sector and MAP. This analysis concluded that the 1993 new residential program incentives from Long Term Super Good Cents (LTSGC), Super Good Cents (SGC), Washington State Energy Code, and/or Northwest Energy Code, and the MAP program do affect fuel choice. The report states that the incentives paid to build energy efficient electrically-heated homes throughout the region appear to be causing approximately 8 percent of the certified LTSGC homes and 6 percent of the new manufactured homes to be built using electricity when, absent the incentives, natural gas would have been the preferred fuel. The fuel choice impacts noted in the report are the result of builders responding to the available incentives from all the programs in their area.

⁹ Fuel choice effects occur when a consumer decides to change fuel sources from what would have been done absent the program. Of concern here is a decision to stay with electricity due to the increased efficiency when the consumer may have decided to use natural gas or another fuel instead.

In the Commercial Sector, a similar fuel choice impact was found in the ESD program where analysis concluded that incentives did effect fuel choice decisions for HVAC equipment and water heating units. The incentives resulted in unintended fuel choice effects that accounted for 3 percent of the program savings occurring because the participants selected electricity instead of natural gas. The above fuel choice effects are incorporated into the program savings for LTSGC, MAP, and ESD.

BUILDING CODES:

Building Code savings are a result of new building codes that were passed in 1985 and MCS (or codes close to MCS) that were implemented in Washington in 1991 and in Oregon, Idaho, and Montana in 1992. Commercial MCS were implemented in Washington in 1994 and in Oregon in 1996. Savings from building codes and MCS are estimated through a backward-looking methodology in the load forecast and, therefore, are only approximate.

Residential Code savings from 2003 forward are no longer counted and the Commercial Code savings are no longer counted as of 2005 since it is likely that codes would have reached current standards by now. In 2003, Idaho adopted a code equivalent to the 1988 MCS. Oregon and Washington codes have gone beyond MCS at this point, and current practice in Montana appears to be equivalent to the MCS. Although the national energy codes and international energy codes upon which Idaho codes were finally based may have been influenced by MCS efforts in the Pacific Northwest, it is appropriate to stop counting additional new benefits due to BPA's efforts in the 1980s and 1990s.

TOTAL BPA CONSERVATION COSTS
(See Tables D & E)

TABLES D & E

BPA spent approximately \$2.1 billion on conservation efforts from FY 1982 – 2005. Acquisition expenditures were: residential, \$1.1 billion; commercial, \$403 million; industrial, \$180 million (includes \$48 million for ConMod); agricultural, \$32 million; and multi-sector acquisitions, \$156 million. Conservation support and other costs make up an additional \$235 million.

Table D
Total BPA Conservation Costs
Dollars (\$000's)

	Carryover						Totals
	1982-2000	2001	2002	2003	2004	2005	
RESIDENTIAL:							
State Low Income Weatherization		\$3,103	\$2,429	\$3,745	\$2,474	\$3,817	\$15,568
C&RD Low Income Weatherization		\$70	\$1,379	\$1,321	\$1,197	\$990	\$4,957
Conservation Augmentation		\$2,694	\$8,526	\$3,050	\$2,883	\$2,431	\$19,584
Conservation & Renewables Discount		\$6,012	\$23,305	\$18,851	\$16,384	\$14,901	\$79,453
Residential Total	\$1,006,407	\$11,879	\$35,639	\$26,967	\$22,938	\$22,139	\$1,125,969
COMMERCIAL:							
Conservation Augmentation		\$747	\$14,603	\$15,143	\$13,259	\$9,715	\$53,467
Conservation & Renewables Discount		\$695	\$2,515	\$5,821	\$1,535	\$920	\$11,486
New Initiatives		\$0	\$0	\$92	\$6	\$0	\$98
Commercial Total	\$338,550	\$1,442	\$17,118	\$21,056	\$14,800	\$10,635	\$403,601
INDUSTRIAL:							
Conservation Augmentation		\$258	\$4,864	\$5,571	\$2,903	\$2,974	\$16,570
Conservation & Renewables Discount		\$105	\$1,676	\$3,014	\$1,619	\$941	\$7,355
Industrial Total	\$156,831	\$363	\$6,540	\$8,585	\$4,522	\$3,915	\$180,756
AGRICULTURAL:							
Conservation Augmentation		\$0	\$16	\$30	\$0	\$0	\$46
Conservation & Renewables Discount		\$1,283	\$953	\$697	\$518	\$119	\$3,570
Agricultural Total	\$28,946	\$1,283	\$969	\$727	\$518	\$119	\$32,562
MULTI-SECTOR:							
Conservation Augmentation		\$0	\$184	(\$342)	\$56	\$99	(\$3)
Conservation & Renewables Discount		\$0	\$290	\$521	\$213	\$140	\$1,164
Multi-Sector Total	\$155,565	\$0	\$474	\$179	\$269	\$239	\$156,726
SUBTOTAL	\$1,686,299	\$14,967	\$60,740	\$57,514	\$43,047	\$37,047	\$1,899,614
Market Transformation							
Market Transformation		\$9,600	\$7,750	\$9,300	\$9,700	\$8,000	\$44,350
C&RD Expense		\$1,007	\$8,400	\$9,264	\$8,026	\$6,910	\$33,607
(Includes Donations/Admin/IT Development)							
Energy Web		\$1,450	\$3,200	\$4,300	\$800	\$600	\$10,350
SUBTOTAL	\$0	\$12,057	\$19,350	\$22,864	\$18,526	\$15,510	\$88,307
CONSERVATION SUPPORT COSTS:							
PBL Conservation Sales/Support	\$0	\$650	\$1,100	\$350	\$1,000	\$900	\$4,000
(Includes Planning & Evaluation)							
Conservation Support Expense	\$111,163	\$5,550	\$6,850	\$7,250	\$7,450	\$7,250	\$145,513
(Includes Staffing and related expenses)							
SUBTOTAL	\$178,113	\$6,200	\$7,950	\$7,600	\$8,450	\$8,150	\$216,463
OTHER COSTS:							
Third Party Financing Costs	\$79,519	\$0	\$0	\$0	\$0	\$0	\$79,519
Debt Service Payment Adjustment	(\$71,508)	(\$4,079)	(\$4,160)	(\$5,273)	(\$5,295)	\$0	(\$90,315)
Various Costs Adjustment	(\$31,748)	\$0	\$0	(\$3,371)	\$0	\$0	(\$35,119)
(e.g. Bond Transaction Costs)							
SUBTOTAL	(\$23,737)	(\$4,079)	(\$4,160)	(\$8,644)	(\$5,295)	\$0	(\$45,915)
Total Incremental Costs		\$29,145	\$83,880	\$79,334	\$64,728	\$60,707	
With Carryover from 1996 Table		\$1,840,675	\$1,869,820	\$1,953,700	\$2,033,034	\$2,097,762	
Total Cumulative Costs	\$1,840,675	\$1,869,820	\$1,953,700	\$2,033,034	\$2,097,762	\$2,158,469	

Table E
BPA Energy Conservation Costs
1982 - 2000
Dollars (000's) ¹⁰

Fiscal Year	Residential	Commercial	Industrial	Con/Mod	Agricultural	Multi-Sector Acq.	Program & Support Costs	Third Party Financing Costs	Debt Service Payments Adjustment	Various Costs Adjustment (e.g. Bond Transaction Costs)	Total Incremental Costs	Total Cumulative Costs
1982	\$50,346	\$11,247	\$0	\$0	\$0	\$0	\$5,321	\$0	\$0	\$0	\$66,914	\$66,914
1983	\$162,114	\$39,892	\$1,409	\$0	\$895	\$0	\$2,689	\$0	\$0	\$0	\$206,999	\$273,913
1984	\$57,374	\$8,656	\$513	\$0	\$1,309	\$0	\$7,242	\$0	\$0	\$0	\$75,094	\$349,007
1985	\$77,907	\$26,553	\$957	\$0	\$2,098	\$0	\$20,232	\$0	\$0	\$0	\$127,747	\$476,754
1986	\$79,898	\$13,007	\$1,013	\$0	\$3,546	\$0	\$7,458	\$2,125	(\$2,048)	\$0	\$104,999	\$581,753
1987	\$60,651	\$7,546	\$2,233	\$0	\$1,918	\$0	\$11,008	\$4,250	(\$2,047)	(\$10,000)	\$75,559	\$657,312
1988	\$40,979	\$14,144	\$3,297	\$1,881	\$2,166	\$3,950	\$8,483	\$4,250	(\$2,045)	(\$10,000)	\$67,105	\$724,417
1989	\$37,269	\$15,467	\$5,889	\$4,726	\$1,428	\$3,000	\$5,479	\$4,250	(\$2,048)	(\$11,748)	\$63,712	\$788,129
1990	\$40,016	\$18,062	\$5,681	\$6,063	\$1,428	\$3,232	\$3,515	\$2,125	(\$2,043)	\$0	\$78,079	\$866,208
1991	\$49,808	\$19,554	\$6,181	\$6,254	\$3,257	\$2,959	\$3,495	\$0	(\$1,983)	\$0	\$89,525	\$955,733
1992	\$80,949	\$25,334	\$8,397	\$4,553	\$2,593	\$6,673	\$4,134	\$0	(\$1,986)	\$0	\$130,647	\$1,086,380
1993	\$89,241	\$32,485	\$13,899	\$4,179	\$2,187	\$7,944	\$8,119	\$0	(\$1,905)	\$0	\$156,149	\$1,242,529
1994	\$77,726	\$45,764	\$22,383	\$6,462	\$2,617	\$17,133	\$8,210	\$6,212	(\$6,453)	\$0	\$180,054	\$1,422,583
1995	\$49,783	\$23,061	\$17,346	\$4,045	\$1,712	\$26,676	\$7,915	\$12,824	(\$7,408)	\$0	\$135,954	\$1,558,537
1996	\$29,071	\$13,540	\$9,839	\$4,595	\$1,227	\$34,330	\$7,863	\$12,824	(\$7,483)	\$0	\$105,806	\$1,664,343
1997	\$10,744	\$7,770	\$3,988	\$2,744	\$338	\$16,373	\$13,700	\$12,624	(\$7,305)	\$0	\$60,976	\$1,725,319
1998	\$5,767	\$10,495	\$3,764	\$2,358	\$173	\$12,857	\$19,200	\$12,023	(\$7,670)	\$0	\$58,967	\$1,784,286
1999	\$4,233	\$5,888	\$1,902	\$280	\$49	\$20,438	\$13,500	\$6,012	(\$11,637)	\$0	\$40,665	\$1,824,951
2000	\$2,531	\$85	\$0	\$0	\$5	\$0	\$20,550	\$0	(\$7,447)	\$0	\$15,724	\$1,840,675
Total	\$1,006,407	\$338,550	\$108,691	\$48,140	\$28,946	\$155,565	\$178,113	\$79,519	(\$71,508)	(\$31,748)	\$1,840,675	

¹⁰ Program and Program Support Costs includes the overhead costs of the Energy Efficiency Group and other conservation support costs.

NOTES ON TABLES D & E:

The costs in the tables are “accrued” expenditures – the amount actually invoiced in a given year. The expenditures reported have been “loaded” to include all direct costs (measure costs, installation, administrative, and program evaluation costs) related to conservation, indirect costs associated with BPA’s Energy Efficiency Program (load forecasting, planning, and economic analysis) and a share of other corporate overhead. The costs reported in the table do not include interest expense on conservation borrowing.

BPA’s historical conservation costs have not always been reported consistently from year to year. Prior to 1988, costs were allocated to specific sectors and to resource planning. Starting in 1988, some resource planning costs were allocated to specific sectors. In addition, two new cost categories were created: multi-sector acquisitions and miscellaneous costs. (Misc. costs have now been replaced with other categories.) Although this change in categories makes it difficult to do a year-by-year comparison of sector costs, the change more accurately reflects expenditures. Multi-sector Acquisitions cover more than one sector and include costs for billing credits, competitive acquisitions, and financial and technical assistance programs. Program and support costs are not sector specific and consist of resource planning costs and various overhead costs associated with conservation activity through FY 1986. Program and support costs shown in FY 1996 are costs related to the new Energy Efficiency organization. In FY 1995, BPA was reorganized and also implemented a new accounting system. This resulted in some changes in how costs were accounted for and reported. Every attempt was made to allocate the appropriate costs to the correct categories.

BPA has performed a thorough review of conservation costs. Third party costs have been realigned to show them consistent with Federal Treasury borrowing (capital costs) which are tracked as the money is spent. Third party financing costs have been reassigned to the first five years after the bonds proceeds were made available.

SPECIAL NOTE:

To get an estimate of per-unit conservation costs, it is tempting to divide the dollars in Tables D and E by the energy savings in Tables A, B or C. This would supposedly yield an “average cost per megawatt”. While this may seem useful, BPA generally considers this to be an inappropriate way to measure resource costs. First, this method of estimation does not take into consideration the varying lifetimes and characteristics of energy resources. For example, 1 aMW of energy savings from a new residential building code program having an expected lifetime of 70 years cannot be equated with 1 aMW of savings from a program having a much shorter life.

Secondly, the simple division method is inappropriate because:

Some savings were achieved in Pay for Performance or Competitive Acquisition contracts. These savings are reported as first year savings while the cost is paid from year-to-year expense budgets over a number of years.

Most savings were paid for from the capital budget and costs were amortized through federal borrowing. Our cost for these projects shows up as the capital cost and not the year-to-year amortization payments. The way we treat savings, therefore, is consistent year-to-year while the costs are a mixture of predominantly capital with a substantial expense component.

Our cost tables make no distinction between capital and expense payments. This means not all year-to-year costs can be directly compared to any single year savings reported.

Glossary of Terms

aMW:	Average megawatts (aMW) refers to unit of energy output over a year, equivalent to the energy produced by the continuous operation of one megawatt of capacity over a period of time; also an average of one million watts transferred over a period of time (often a year, thus average annual megawatts). One aMW is the equivalent of 8,760,000 kWh (24 hrs/day*365 days/year*1000).
Billing Credit	Adjustment to the BPA customer's electric power bill or the equivalent cash payment for a reduction in the customer's net requirement of capacity and energy purchased from BPA resulting from a conservation activity independently undertaken.
C&I:	This refers to the Commercial and Industrial (C&I) sectors and programs that serve both sectors.
C&RD:	The Conservation and Renewable Discount (C&RD) is a component of BPA's 2002 Wholesale Power Rates. C&RD is a credit that is available to BPA's regional wholesale power customers that take action to further conservation and renewable resource development in the region.
CFL:	This refers to an efficient electric light used primarily in residential applications. The initials are from the name compact fluorescent light (CFL), a fluorescent bulb that normally can be screwed into any normal lighting fixture in homes. There are some models that can only be screwed into special fixtures designed to insure the lights are not replaced with normal incandescent light bulbs.
Competitive Acquisition:	BPA's process of soliciting and selecting conservation and generating resources from customers and non-customers for long-term use by means of systematic criteria.
ConAug:	Conservation Augmentation (ConAug) is a resource acquisition component of BPA's system augmentation effort intended to reduce BPA's load obligation through mechanisms for delivering energy savings.
ConMod:	Conservation Modernization (ConMod) is a legacy conservation program designed to save energy in the Northwest aluminum industry. The program was designed to save energy by offering a 5-mill incentive for every kWh of energy saved to produce 1 pound of aluminum.
Conservation	Conservation means any reduction in electric energy consumption resulting from an increase in the efficiency of electric energy use, production, or distribution, or the direct application of a renewable resource.

Conservation activity	A project or program deemed as a conservation effort.
Consumer-owned utility	Consumer-owned utility can include a municipal electric utility, a public utility district, an irrigation district, a cooperative, a mutual corporation or association that is engaged in the business of distributing electricity to one or more retail electric customers.
CREUS:	This was a Commercial and Residential End Use Study (CREUS) that provided electric energy usage information on various types of loads typically found in either commercial or residential buildings. Businesses and homes were randomly selected throughout the region and various end use loads were monitored for several months. The data was collected and analyzed. A few businesses installed some measures during 1989 based on the energy use data.
Direct Acquisition:	This refers to programs that pay for energy efficiency measures that result directly from actions taken, such as installing measures, rather than by paying someone for activities like code enforcement or other programs that indirectly cause conservation to occur. Acquisition is a term from the regional act and is used in conservation where that activity is equivalent to and as reliable as acquiring actual generation produced energy. Under the regional act acquisition of energy, whether through conservation or through generation, must be done under contracts that allow for rigorous verification.
Directly Served Customer	Direct-service industries and also Federal agencies that buy electricity from BPA for their own use.
Direct Service Industries (DSI)	Industrial customers, primarily aluminum smelters, which purchase power directly from BPA.
Energy Conservation Measures (ECMs):	Materials or equipment installed or activities implemented to produce electric energy savings. A specific action or installed device that saves energy. Also referred to as a conservation measure.
Energy Savings Plan (ESP):	A conservation program that acquires energy savings specifically from conservation projects in the industrial sector.
ESD:	Energy Smart Design (ESD) was a legacy program initially designed to award builders for significant savings features in new commercial building. It eventually became a standard design program to increase efficiency above codes and to change building practices to bring about codes enforcing higher building efficiency standards.

ESO	This stands for the Expanded Standard Offer (ESO) for commercial and industrial lighting under ConAug based upon set payments for specific lighting measures that save energy above standard lighting practices.
ESP:	Energy Savings Program (ESP) was a legacy conservation program that provided incentives for improvements in energy efficiency in industrial processes (other than in the aluminum industry, see Con Mod). This program served both new and existing industries. The program depended upon good audits or design reviews to identify potential cost effective savings. Actual savings and the amount of incentive paid were determined through pre and post metering for existing industrial processes or between estimated use and actual metered use in new industrial plants.
Federal	A key principle in Federal is that BPA funds must produce incremental conservation that would otherwise not be delivered. Its start in late January 2001 began to develop load reduction projects at federal properties in Pacific Northwest load following service areas.
Finance CIPP	Commercial Incentive Pilot Program (CIPP) was payment for performance endeavor under BPA sponsorship that provided financial reimbursement to utilities for energy conservation measures installed by commercial customers.
First Year Savings:	Most Bonneville programs are reported in terms of the savings that occur in one year's time. In fact, the cost effectiveness of measures is based on the expected life of the measure. Measures often last 10, 20 or more years. Therefore to calculate total savings one must take the first year savings times the measure life.
Fiscal Year (FY)	A twelve-month accounting period used by the Federal Government that goes from October 1st to September 30th.
Flex Agreements:	This refers to contracts with Utilities to use money "flexibly" from one program or sector to another without seeking approval on each change. This provided utilities with the opportunity to move funds provided by Bonneville from sector to another where there are cost effective opportunities without going through an approval process. The program required that the average cost per kWh saved would be equal to or less than the average cost for conservation were it allocated out into the various individual programs that had been available to the utilities. For example, residential weatherization cost more than industrial so if the utility increased expenditures on residential above the allocated budget it must find other less costly kWh savings or repay the difference to Bonneville.
Fuel Choice:	This term refers to the possible unintended result that someone might choose to use electrical energy rather than gas or another fuel due to incentives for energy efficiency measures for electrically heated homes or electrical industrial and commercial uses.

HVAC:	Heating, ventilation and air conditioning systems (HVAC) include furnaces, ducts, air control system filters, baffles, motors, vents, sensors and chillers. These systems present many different efficiency improvement opportunities. HVAC systems are found in houses and industries but the primary use of the term is associated with cooling, heating and venting of air within large commercial structures.
Incremental Savings:	A certain amount of conservation may take place without Bonneville acquisition. Incremental conservation is that reduction in loads below that which would have occurred due to the actions of others and in the absence of a particular program. The ConAug and C&RD programs are designed to capture incremental savings.
Investor-owned utility (IOU)	Investor-owned utility means a corporation owned by investors that meets the definition of electrical company and is engaged in distributing electricity to more than one retail electric customer.
IRLC:	This refers to the Conservation Augmentation contract that utility customers began signing in FY 2001. It stands for “Invitation to Reduce Load through Conservation” (IRLC). Various energy conservation measures are authorized for installation through the IRLC portion of contracts. The umbrella contract for each utility is a Purchase of Conservation Agreement (PCA).
Irrigation Hardware:	Conservation measures to reduce operating pressure, pipeline and pump modifications. The equipment can include items such as sprinklers, pumping plants, fittings, and mainlines.
Irrigation Scheduling:	By careful measurement of soils for water content, air temperatures, wind speed and other weather information irrigation can be scheduled in such a way that crop growth is optimized and water use reduced. By using less water, electricity is saved and less water must be pumped up to the fields and forced through the sprinkler system.
Legacy:	Legacy refers to all conservation activities started prior to the year 2000, of which, only a few are still operating. Among those are the “Low-Income Weatherization Program”, “The Energy Northwest” pay for performance contract, the “Tacoma Fort Lewis” program and some others with minor savings impacts.
Line Loss:	The electric energy lost (dissipated) in transmission and distribution lines. Varies with the current (amperes) of the line.
Load-following	Load-following generally refers to automatic adjustments in generation which follow changes in customer load in order to maintain a continuous balance between loads and generation.

Long Term Super Good Cents:	This is the final version of the New Residential Construction program that was designed to save energy and to influence code development. The Long Term refers to the fact that this program was increased above the existing code standards and was to be available for some years after codes were achieved.
Low income	Low income means household income that is at or below one hundred twenty-five percent of the federally established poverty level.
Low Income Residential Weatherization (States)	Weatherization of the residences of low-income households helping conserve energy resources in states and reducing the need to obtain energy from more costly conventional energy resources. The program mitigates the rising energy costs that make it difficult for low-income citizens of a state to afford adequate fuel for residential space heat.
LSO	Limited Standard Offer (LSO) was the first Standard Offer made to utilities within the ConAug program. It provided incentives for commercial buildings based upon set payments for specific lighting measures that saved energy above standard lighting practices.
MAP:	This is a program for Manufactured home building. The program requires Super Good Cents building standards be certified at the factory. The home is then subject to a site “set up” inspection as well in many instances. The acronym stands for Manufactured Home Acquisition Program (MAP).
Major Plants	Energy conservation projects that involved industrial plants with significant electric loads.
Market Transformation:	This is a program designed to cause new technologies to be built or accepted as standard practice. The Super Good Cents would be an example of a program designed to change the home building standards and thus the market. The term now refers to a specific programmatic effort that is done by Bonneville, the IOUs and a few large Public Power Utilities called the Regional Forum. The standards for new technologies and the programs to be implemented are designed and approved through the Regional Forum. Each of the member utilities contributes funds for programs and serves on the Forum.
Mill	A unit of monetary value equal to 1/10 th of a cent.

MCS:	This is the abbreviation for the Model Conservation Standards (MCS). These standards were called for in the Regional Power Planning and Conservation Act (The Regional Act.) The Regional Council, the policy group authorized through the act to set standards and plan for future conservation and power acquisition, and Bonneville Power worked to set the Model Conservation Standards and to encourage utilities to create programs to begin promoting such standards. The MCS was designed as an early step in bringing around the Energy Efficiency Code Standards which three of the four Northwest States served by Bonneville eventually adopted.
Multi-sector:	Multi-sector is a catch all term for a pseudo “sector” in contracts that make no distinct identification for application within a specific sector from which the energy savings are achieved.
ODOE - Schools	BPA’s support of the Oregon Department of Energy (ODOE) program for conservation assistance for schools.
Payment for performance	Mechanism wherein payments are made over time as energy savings are verified and gives utilities the autonomy they have requested and builds their capability to be a reliable source of conservation.
PECI	Alternative service provider, Portland Energy Conservation, Inc (PECI) is in the business to assist in the delivery of commercial and industrial lighting conservation.
PSP&L (PSE):	These are initials for Puget Sound Power and Light (now doing business as Puget Sound Energy), an investor owned utility (IOU) that serves some of the larger cities and denser communities in the Puget Sound region.
Sector:	This is a marketing term used to refer to some segment of a market. For example, in Energy Efficiency, this term refers to Residential, Commercial, Industrial and Agricultural customers. Each sector implies a different approach and program design specific to its contents.
Super Good Cents:	This was the very successful marketing and incentive based program that transformed the market for building homes in the Northwest. The program was marketed with award winning commercials and marketing campaigns. Houses built to the standards also were sold with an incentive to encourage more acceptances. This program was a key part of the code programs that followed.
System Efficiencies	BPA’s System Efficiencies refers to transmission line and transformer improvements that save energy, such as lower loss transformers (silicon core), reconductoring distribution lines with higher voltage - lowering losses, CVR - conservation voltage reduction - lowering the voltage on distribution lines during low load time periods to save energy.

Targeted Acquisition:	A contract providing flexibility both to determine the pace of a utility's delivery of conservation and to select the type of conservation produced.
Targeted Acquisition Process (TAP)	Local utilities create and offer commercial conservation programs for their customers and BPA purchases verified energy savings.
TAS's Tech. Assist. Info.	Technical Assistance Information was provided by the various State Energy Offices for the Institutional Program (primary and secondary schools). This was a DOE sponsored effort with support from BPA and the States.
Third Party Financing:	A financial arrangement between BPA and other entities to use sources of capital other than BPA's borrowing authority from the US Treasury or congressional appropriations to fund new capital assets.
Utility	Electric utility that is either a consumer-owned or investor-owned utility.
Vending Miser:	A program to install energy savings controllers called the "Vending Miser" which cycles vending machines off and on during times in which usage has been minimal. The on/off cycle does maintain the necessary refrigeration quality of the products sold.
Water/Waste Water	Bonneville began this program in wastewater treatment plants in locations served by load-following customers in March 2001 to reduce energy use. Water and wastewater facilities are the largest or second largest energy user in a community.
Weatherization	Weatherization means materials or measures, and their installation that are used to improve thermal efficiency.