

Conservation Resource Energy Data The RED Book



Fiscal Year 2012



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Introduction

On Dec. 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 was to:

- Assist the electrical consumers of the Pacific Northwest through use of the Federal Columbia River Power System to achieve cost-effective energy conservation,
- Encourage the development of renewable energy resources,
- Establish a representative regional power planning process, and
- Assure the region of an efficient and adequate power supply.

Since then, the Bonneville Power Administration (BPA), in compliance with the Act, has sponsored and funded various energy conservation programs for the benefit of Pacific Northwest consumers. These programs have been successful due to the work of BPA's utility customers.

Purpose

The Resource Energy Data (RED) Book summarizes data on the savings pertaining to the BPA energy conservation acquisition programs. The document provides information and references for general audiences and for use in preparing general publications.

IMPORTANT NOTE ON USING THE DATA

The data contained in the RED Book are sensitive to changes in the assumptions surrounding them. Use data with care to ensure that the correct characterizations of the data are accurately used and communicated.

The RED Book information is presented to the nearest tenth of an average megawatt (aMW) in most of the tables. The reported aMW savings are first year savings only and not the measure-life or program-life savings. Measure life is the estimated median time a measure will remain in place or the time until the structure in which a measure is installed ceases to exist.

Reported savings include transmission and distribution line-loss credits to account for transmission and distribution line loss savings resulting from 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 generated and transmitted and, therefore, there is a corresponding reduction in line losses. The inclusion of line-loss savings allows conservation savings and generation to be compared at the same point in the electrical system often referred to as the "busbar." The line-loss savings factor has varied over time. Through FY 2005, all conservation savings include a line-loss factor of 7.5 percent (2.5 percent for the aluminum Direct Service Industry Conservation Modernization program). For FY 2006 - FY 2009, the line loss credit was 7.625 percent. Beginning in FY 2010, the line loss credit was revised to 9.056 percent.

The data in this edition of the RED Book are as reported by June 2014. These data should be used as "official data" until the next annual publication of the RED Book. Adjustments to the data are captured annually in the RED Book if information from evaluations or other sources indicate savings should be revised.

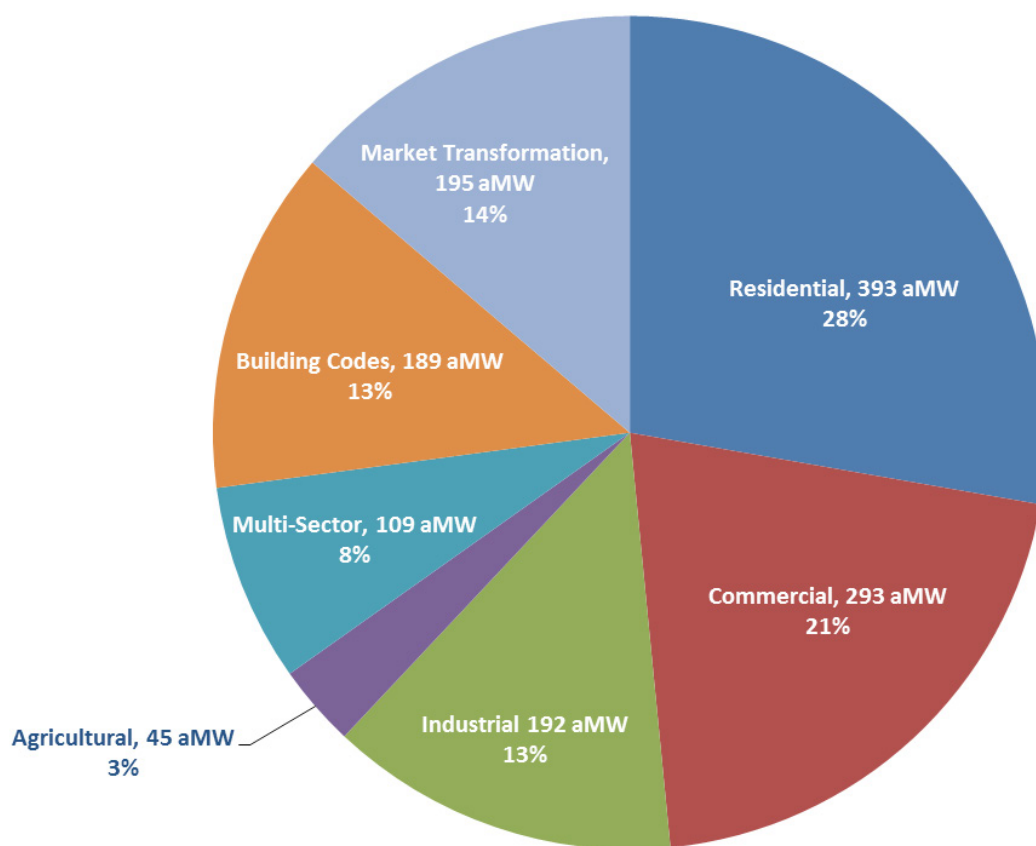
If you have any questions about how to represent or use this information, please contact – Allie Mace, 503-230-5871, arobbins@bpa.gov.

Overview

BPA estimates a cumulative total of 1,346 aMW of energy have been achieved from BPA's and BPA's utility customers' conservation programs since FY 1982. This cumulative total includes adjustments to some of the incremental energy savings reported in previous editions of the RED Book. These adjustments account for changes in the reported number of installed conservation measures in previous fiscal years, changes in estimated energy savings for certain measures based on subsequent program evaluations, and installed measures that have "expired" or are no longer delivering energy savings. For example, energy savings from the Conservation Modernization (ConMod) legacy program (see glossary) are not included in the current total due to the closing of some aluminum industry plants where conservation projects were implemented.

Figure 1 illustrates the relative contributions from various sector and program categories toward BPA's cumulative energy savings.

¹FIGURE 1: BPA's Cumulative Conservation Savings (aMW) by Sector, FY 1982-2012



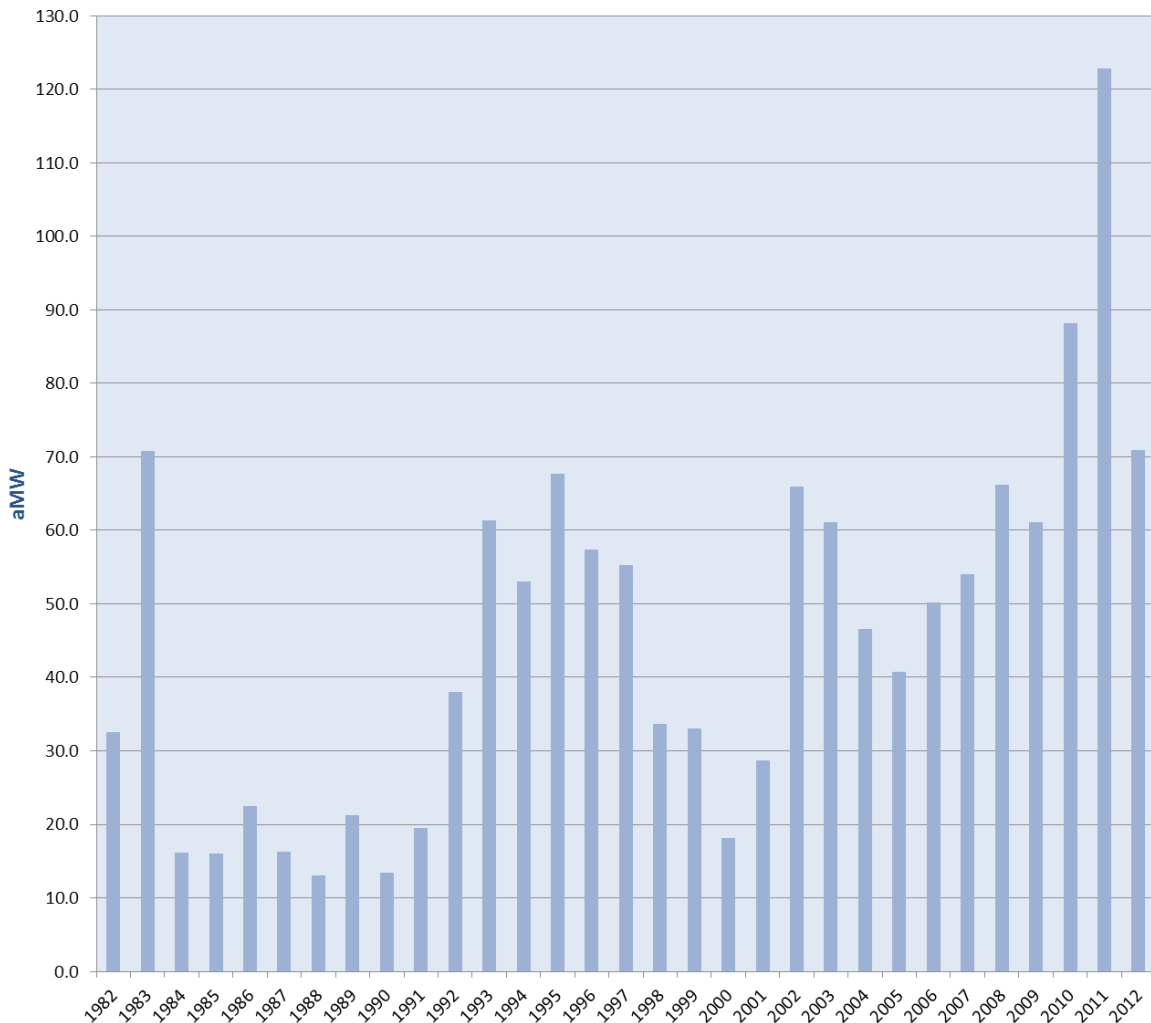
¹Beginning in FY 2007, utility-funded conservation savings are included in the RED Book (in addition to BPA-funded conservation savings).

The Multi-Sector² savings include, for example, billing credits, competitive acquisitions and flex agreements. The 189 aMW of building codes consist of 129 aMW for residential building codes and 60 aMW for commercial building codes. Building code savings are a result of new building codes that were passed in 1985 and model conservation standards (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 Commercial code savings are not counted as of 2005 because it is estimated that these codes would have reached current standards by those dates. In 2003, Idaho adopted a code equivalent to the 1988 MCS. Oregon and Washington codes had gone beyond MCS by this time, and current practice in Montana was equivalent to the MCS. Although the national energy codes and international energy codes on which Idaho codes were finally based may have been influenced by MCS efforts in the Pacific Northwest, it was appropriate to stop counting additional new benefits due to BPA's and the region's conservation efforts in the 1980s and 1990s.

BPA's Total Historical Conservation Savings

Figure 2: Annual Conservation Achievements, FY 1982-2012³

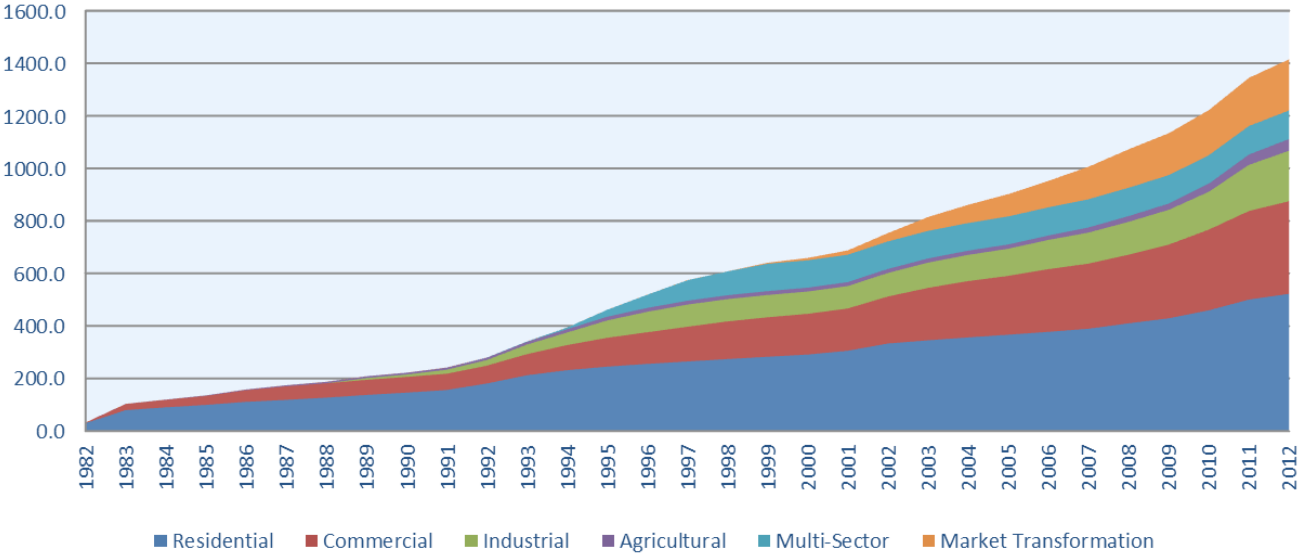


² Multi-Sector is a "pseudo sector" that makes no sector distinction for the savings achieved.

³ Building code savings are included in the Residential and Commercial savings.

Figure 3 illustrates the yearly contributions from each sector toward BPA's total savings for FY 1982-2012.⁴

FIGURE 3: BPA's Cumulative Conservation Savings (aMW) by Sector, FY 1982-2012



⁴ Building code savings are included in the Residential and Commercial savings

Table A summarizes the cumulative energy savings for FY 1982-2000, FY 2001-2006 and the incremental energy savings for each fiscal year from FY 2007 through 2012.

TABLE A: BPA's Total Conservation Savings⁵⁻⁶ (FY 1982-2012) Incremental aMW

	Total FY 82-00	Subtotal FY 01-06	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Subtotal FY 07-11	FY 2012	Total FY 82-12
Residential	179.6	69.2	11.9	20.8	18.9	30.6	40.9	123.1	21.7	393.6
Commerical	111.5	67.3	9.3	13.3	19.4	26.6	30.2	98.8	15.5	293.0
Industrial	84.9	26.6	6.7	7.0	7.4	11.8	31.1	64.0	16.6	192.1
Agricultural	14.8	1.8	3.0	2.0	2.1	6.9	8.7	22.6	5.5	44.7
Multi Sector	104.2	3.2	0.1	0.4	0.4	0.2	0.2	1.4	0.0	108.9
Sectors Subtotal	495.0	168.1	31.0	43.5	48.1	76.1	111.1	309.9	59.2	1,032.3
Residential Building Codes	111.6	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	128.6
Commercial Building Codes	43.4	16.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.9
Building Codes Subtotal	155.0	33.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	188.5
Market Transformation Subtotal	9.0	91.8	23.0	22.6	13.0	12.1	11.7	82.5	11.6	195.2
TOTAL SAVINGS	659.0	293.4	54.1	66.2	61.1	88.2	122.8	392.5	70.9	1415.7
CO2 Reduction (tonnes)	2,261,341	1,006,707	185,486	227,125	209,780	302,759	421,526	1,346,677	243,206	4,857,931

Carbon Dioxide Reduction From Conservation

For any given amount of conservation, there is a reduction in CO₂ (carbon dioxide) emissions relative to the average generation resource mix in the region ⁷ For FY 2012, the conservation savings of 70.9 aMW reduces annual CO₂ emissions by over 243,000 tonnes (metric tons). This is equivalent to having approximately 47,000 fewer automobiles on the road. For the period FY 1982-2012, the cumulative conservation savings of 1,416 aMW reduces annual CO₂ emissions by over 4.8 million tonnes. This is equivalent to having approximately 940,000 fewer automobiles on the road.

⁵ Expired measures are not included as they are no longer delivering savings.

⁶ The market transformation savings contained in Table A reflects the approximate level of funding that BPA and utilities provided to the Northwest Energy Efficiency Alliance (NEEA).

⁷ 3,431 tonnes of CO₂ emissions are avoided for every 1 aMW of conservation savings

Conservation in FY 2012

Table B below provides additional information on the FY 2012 conservation savings. All savings are BPA-funded except where indicated as utility self-funded.

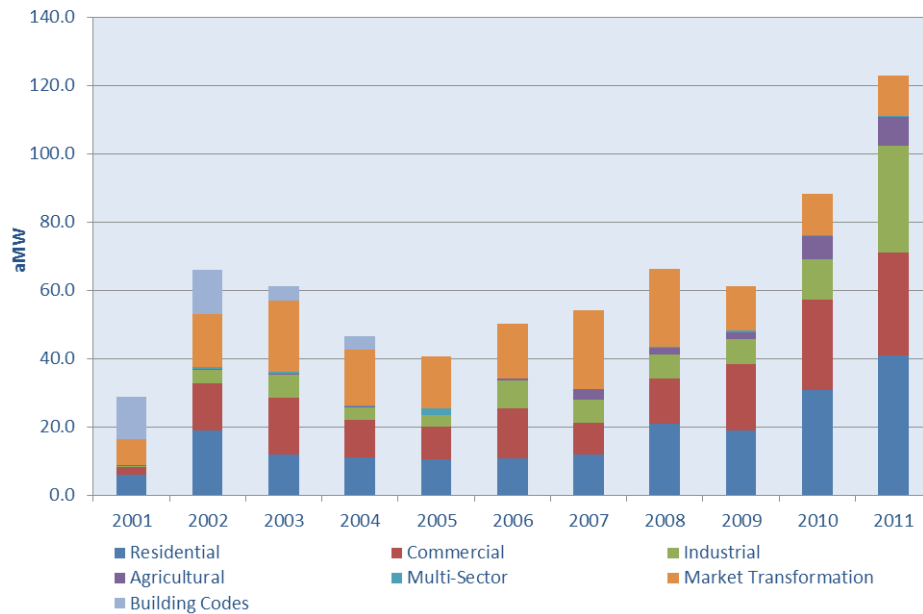
TABLE B: BPA's Annual Conservation Savings (aMW), FY 2012

RESIDENTIAL	
Low Income Weatherization, State Implemented	0.3
Low Income Weatherization, Utility Implemented	0.5
Low Income Weatherization, Utility Self-Funded	0.2
Utility Implemented	14.1
Third-Party Implemented	1.8
Utility Self-Funded	4.9
RESIDENTIAL SUBTOTAL	21.7
COMMERCIAL	
Utility Implemented	10.8
Third-Party Implemented	1.2
Federal	0.0
Utility Self-Funded	3.5
COMMERCIAL SUBTOTAL	15.5
INDUSTRIAL	
Utility Implemented	14.0
Third-Party Implemented	0.1
Utility Self-Funded	2.5
INDUSTRIAL SUBTOTAL	16.6
AGRICULTURAL	
Utility Implemented	4.4
Third-Party Implemented	0.0
Utility Self-Funded	1.1
AGRICULTURAL SUBTOTAL	5.5
MULTI-SECTOR	
Utility Implemented	0.0
Third-Party Implemented	0.0
Utility Self-Funded	0.0
MULTI-SECTOR SUBTOTAL	0.0
MARKET TRANSFORMATION	
BPA Direct-Funded	11.1
Utility Self-Funded	0.5
MARKET TRANSFORMATION SUBTOTAL	11.6
TOTAL UTILITY IMPLEMENTED	43.7
TOTAL THIRD PARTY IMPLEMENTED	14.4
TOTAL UTILITY SELF-FUNDED	12.8
BUILDING CODES	
Residential	0.0
Commercial	0.0
BUILDING CODES SUBTOTAL	0.0
TOTAL CONSERVATION	70.9

Conservation Programs from FY 2001-2011

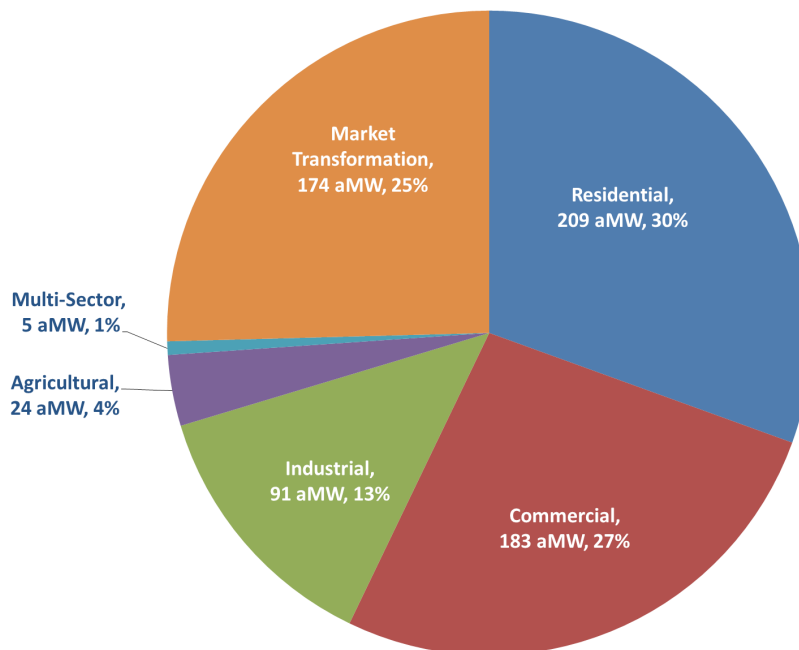
Figure 4 illustrates the annual incremental savings by market sector for FY 2001-2011.

FIGURE 4: Conservation by Sector – Annual Incremental Savings (aMW), FY 2001-2011



The average annual savings for FY 2001-2011 were 62.3 aMW. The total cumulative savings shown in Figure 4 for the 11-year period FY 2001-2011 are 686 aMW, surpassing the 660 aMW achieved during the preceding 19-year period of FY 1982-2000. Figure 5 summarizes the energy savings and share of total by market sector, FY 2001-2011.

FIGURE 5: Conservation Programs – FY 2001-2011 Savings and Share by Market Sector



During the FY 2001-2011 period, BPA used a variety of new programmatic approaches to conservation. In FY 2001, BPA offered new conservation programs to utility customers under the Conservation Augmentation (ConAug) and the Conservation & Renewables Discount (C&RD) programs.⁸ Two other new programs that began that year were a State Low-Income Weatherization program funded by BPA and a program for federal facilities. Market Transformation continued to be a viable energy savings opportunity for the region. There were building code savings through FY 2004 (BPA only reports savings that were achieved primarily within its service territory). The FY 2002-2011 data also include conservation savings from the Irrigation Rate Mitigation Product (IRMP).

In FY 2006 BPA began a transition from ConAug and C&RD to new conservation opportunities under Conservation Acquisition Agreements (CAA) and Conservation Rate Credit (CRC) initiatives. In FY 2007, BPA began various direct-funded initiatives such as compact fluorescent light bulbs (CFLs) and grocery stores (Energy Smart Grocer). Also in FY 2007, utility self-funding for credit toward the conservation adjustment to the Contract High Water Mark credit began as a new category of savings. Credit toward the High Water Mark stopped at the end of FY 2010; however, utility self-funded savings continued after FY 2010. In FY 2010, BPA began the transition from CAA to the Energy Conservation Agreement (ECA).

Table C below provides detailed information on total incremental energy savings for FY 2001 through 2011. Revisions to the savings occur on an annual basis and are a result of evaluations performed, expired measures or revised reports submitted by utilities for previous years.

TABLE C: BPA's Annual Conservation Savings (aMW) by Program, FY 2001-2011

	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 01-06	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	TOTAL FY 01-11
RESIDENTIAL													
Low Income Residential Weatherization (States)	0.4	0.3	0.4	0.3	0.4	0.3	2.1	0.3	0.3	0.2	0.2	0.2	3.3
C&RD Low Income Weatherization	0.0	0.2	0.2	0.2	0.2	0.1	0.8						0.8
CRC Low Income Weatherization						0.3	0.3	0.0	0.4	0.3	0.5	0.1	1.6
ECA Low Income Weatherization											0.0	0.8	0.8
Utility Self-Funded Low Income Weatherization									0.0	0.1	0.0	0.0	0.1
Conservation Augmentation (ConAug)	2.0	5.8	2.4	1.8	1.7	1.9	15.5	0.0	0.0	0.0	0.0	0.0	15.6
Conservation Renewable Discount (C&RD)	3.6	12.8	9.0	8.7	8.3	3.9	46.2						46.2
Conservation Acquisition (CAA)						0.2	0.2	0.3	0.2	1.9	0.0		2.7
Conservation Rate Credit (CRC)						0.7	0.7	7.0	10.3	8.2	10.3	5.9	42.4
Energy Conservation Agreement (ECA)										0.0	8.3	30.6	38.9
BPA Direct Funded Initiatives						3.4	3.4	1.6	1.0	0.6	0.6	2.0	9.2
Utility Self-Funded								2.7	8.6	7.6	10.7	1.2	30.6
RESIDENTIAL SUBTOTAL	6.0	19.0	11.9	11.0	10.5	10.7	69.2	11.9	20.8	18.9	30.6	40.9	192.3
COMMERCIAL													
Conservation Augmentation (ConAug)	0.5	9.4	10.8	8.4	7.2	9.5	45.7	0.2	0.0	0.0	0.0	0.1	45.9
Conservation Renewable Discount (C&RD)	0.3	1.1	3.3	0.6	0.4	0.6	6.4						6.4
Conservation Acquisition (CAA)						0.6	0.6	1.8	0.6	1.2	0.2		4.4
Conservation Rate Credit (CRC)						0.2	0.2	3.1	4.3	5.3	5.1	1.3	19.3
Energy Conservation Agreement (ECA)											2.9	18.4	21.3
BPA Direct Funded Initiatives			0.1	0.0			0.1	0.0	0.4	2.5	5.8	4.7	13.6
Federal	1.2	3.1	2.5	1.9	1.9	3.7	14.2	3.0	4.1	3.0	4.1	5.2	33.5
Utility Self-Funded								1.3	3.9	7.3	8.5	0.6	21.6
COMMERCIAL SUBTOTAL	2.0	13.6	16.7	10.9	9.5	14.6	67.3	9.3	13.3	19.4	26.6	30.2	166.0

⁸ Early acceptance by a few utilities provided energy savings for those programs in the summer of 2001 prior to the programs' official start in FY 2002.

TABLE C (aMW), continued

	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Subtotal FY 01-06	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	TOTAL FY 01-11
INDUSTRIAL													
Conservation Augmentation (ConAug)	0.0	3.2	5.0	2.2	2.8	5.3	18.6	0.0	0.0				18.6
Conservation Renewable Discount (C&RD)	0.4	0.8	1.7	1.6	0.6	2.6	7.7	2.2					9.9
Conservation Acquisition (CAA)						0.3	0.3	0.6	0.5	0.7			2.2
Conservation Rate Credit (CRC)								3.1	3.3	5.0	5.2	1.5	18.1
Energy Conservation Agreement (ECA)											3.4	28.6	31.9
BPA Direct Funded Initiatives									0.0	0.0	0.1	0.2	0.3
Utility Self-Funded								0.7	3.3	1.6	3.1	0.9	9.6
INDUSTRIAL SUBTOTAL	0.5	4.0	6.7	3.8	3.4	8.2	26.6	6.7	7.0	7.4	11.8	31.1	90.6
AGRICULTURAL													
Conservation Augmentation (ConAug)		0.0	0.0			0.1	0.2	0.1					0.2
Conservation Renewable Discount (C&RD)	0.3	0.4	0.3	0.2	0.1	0.0	1.3						1.3
Conservation Acquisition Agreements (CAA)						0.2	0.2	0.1	0.1	1.4	0.2		2.0
Conservation Rate Credit (CRC)						0.1	0.1	2.9	1.7	0.6	1.3	0.1	6.7
Energy Conservation Agreement (ECA)										0.0	1.2	7.9	9.1
BPA Direct Funded Initiatives										0.0	0.0	0.0	0.0
Utility Self-Funded								0.0	0.2	0.0	4.2	0.7	5.1
AGRICULTURAL SUBTOTAL	0.3	0.4	0.4	0.2	0.1	0.5	1.8	3.0	2.0	2.1	6.9	8.7	24.4
MULTI-SECTOR													
Conservation Renewable Discount (C&RD)	0.0	0.2	0.2	0.1	0.0	0.0	0.5						0.5
Irrigation Rate Mitigation Product (IRMP)		0.3	0.2	0.2	1.9	0.2	2.7	0.1	0.4	0.4	0.2	0.2	4.2
MULTI-SECTOR SUBTOTAL	0.0	0.4	0.4	0.2	1.9	0.2	3.2	0.1	0.4	0.4	0.2	0.2	4.6
Market Transformation													
BPA Direct-Funded	7.5	12.9	17.2	15.1	13.6	14.6	81.0	18.5	19.2	10.8	11.4	11.0	151.9
Conservation Renewable Discount (C&RD)	0.0	2.6	3.6	1.5	1.8	0.6	10.1						10.1
Conservation Rate Credit (CRC)						0.8	0.8	3.0	1.5	0.8	0.3	0.6	6.9
Utility Self-Funded								1.5	2.0	1.4	0.4	0.1	5.4
MARKET TRANSFORMATION SUBTOTAL	7.6	15.5	20.8	16.6	15.4	15.9	91.8	23.0	22.6	13.0	12.1	11.7	174.3
TOTAL CONAUG	2.5	18.4	18.2	12.4	11.7	16.8	80.0	0.3	0.0	0.0	0.0	0.1	80.4
TOTAL C&RD	4.7	18.0	18.2	12.9	11.3	7.7	72.9	2.2	0.0	0.0	0.0	0.0	75.1
TOTAL CAA	0.0	0.0	0.0	0.0	0.0	1.3	1.3	2.8	1.4	5.3	0.4	0.0	11.2
TOTAL CRC	0.0	0.0	0.0	0.0	0.0	2.1	2.1	19.0	21.5	20.3	22.8	9.4	95.1
TOTAL ECA										0.0	15.7	86.3	102.1
TOTAL BPA DIRECT-FUNDED	7.5	12.9	17.4	15.1	13.6	18.0	84.5	20.2	20.6	13.9	18.1	18.2	178.4
TOTAL UTILITY SELF-FUNDED								6.2	17.9	17.9	26.9	3.4	72.4
BUILDING CODES													
Residential	8.3	8.7	0.0	0.0	0.0	0.0	17.0	0.0	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	0.0	0.0	0.0	0.0	0.0	16.5
BUILDING CODES SUBTOTAL	12.4	13.0	4.2	3.9	0.0	0.0	33.5	0.0	0.0	0.0	0.0	0.0	33.5
TOTAL CONSERVATION	28.8	66.0	61.1	46.6	40.7	50.2	293.4	54.1	66.2	61.1	88.2	122.8	685.5

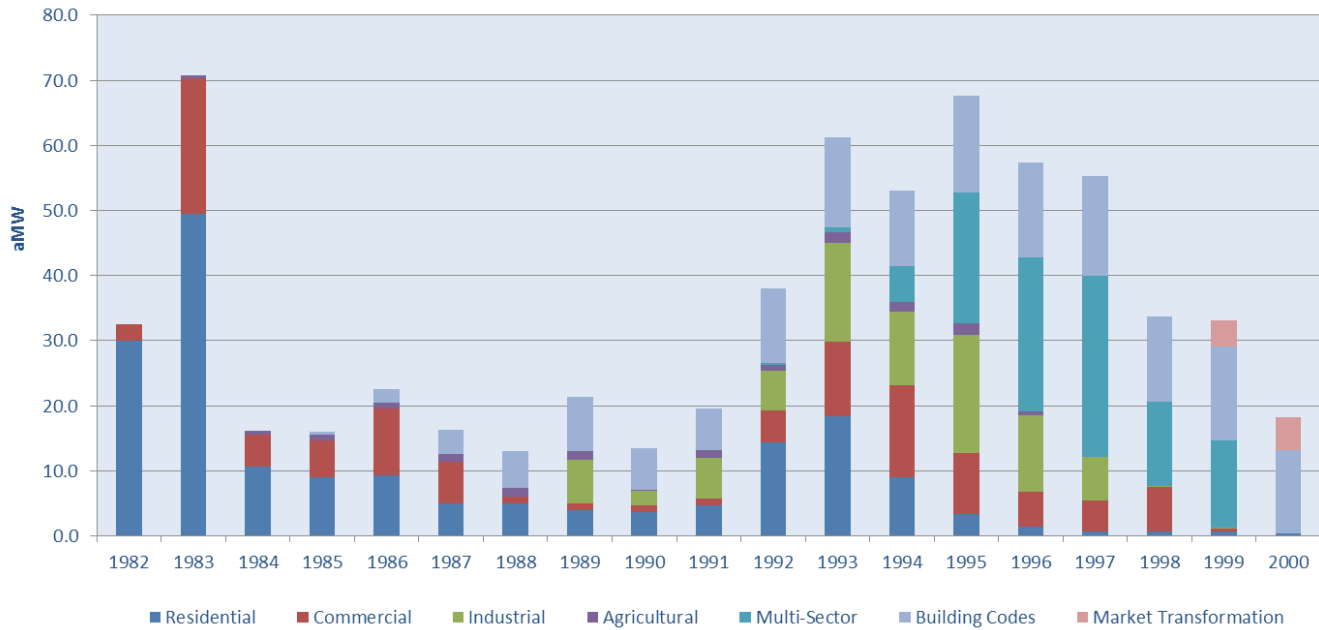
NOTES FOR TABLE C

- In FY 2007, a new funding category began – utility self-funded.
- The Energy Smart Grocer initiative can be funded through CRC, CAA, BPA direct-funded, or utility self-funded.
- IRMP is located under multi-sector, as many of the measures are not necessarily agricultural in nature.
- The C&RD savings shown in FY 2007 for the industrial sector were for the completion of a single, large industrial project funded in FY 2006, the final year of the C&RD program.
- Under the commercial sector's BPA direct-funded initiatives, the initiatives include the Institutional Building Program, grocery, computer savings (Energy Star 4, Energy Star 5, 80 Plus), CFL's, rooftop unit HVAC and turnkey lighting.
- Multi-sector makes no sector distinction for the savings achieved.

BPA's Historical Conservation Savings FY 1982-2000

Figure 6 shows the annual acquisitions within each market sector for the historical period of FY 1982-2000.

FIGURE 6: Historical Conservation Savings (aMW), FY 1982-2000



NOTES FOR FIGURE 6

- The savings from expired measures are excluded from Figure 6.
- Multi-sector makes no sector distinction for the savings achieved.

Figure 7 shows those measures that have expired and are not included in the preceding figures and tables.

FIGURE 7: Expired Historical Conservation Savings, by Year of Installation
Cumulative Total Expired Savings = 129.4 aMW

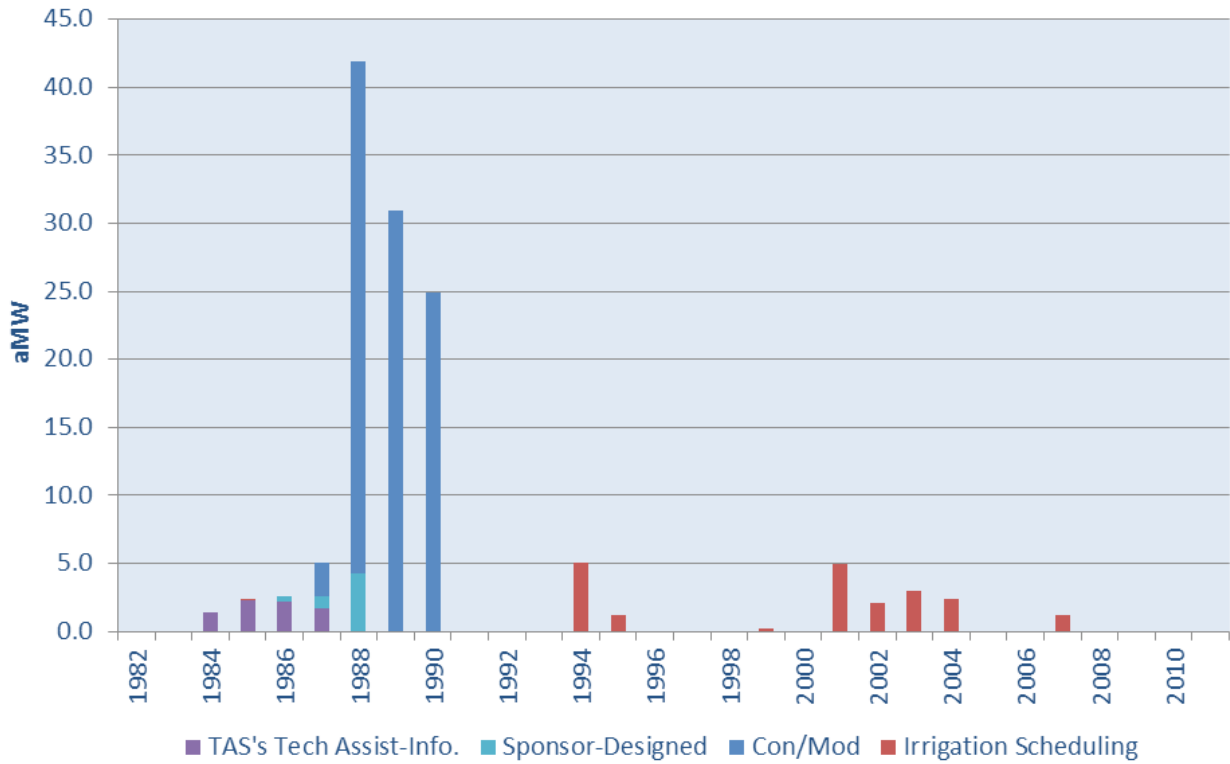


Table D provides information on historical programs for the period FY 1982 - 2000. Total cumulative energy savings achieved during this time period are 660 aMW.

TABLE D: BPA's Historical 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 Ltng.	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
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

TABLE D (aMW), continued

	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
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	-	-	-	-	-	-	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	111.6	0.0	111.6
Commercial	10.8	4.6	5.9	6.5	4.9	6.2	4.5	43.4	0.0	43.4
Improved Bld Codes	69.8	14.9	14.6	15.3	13.1	14.4	12.9	155.0	0.0	155.0
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	774.9	(115.7)	659.2

NOTES ON TABLE D

- **ADJUSTED SAVINGS:** The adjusted savings reflect, in some cases, the end of a measure's 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 or reflect revised reports submitted by utilities.
- **FUEL CHOICE:**⁹ In 1993, BPA analyzed the following programs for possible fuel 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 effect on fuel choice and only a modest effect occurred in 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 did 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.

In the commercial sector, a similar fuel choice impact was found in the ESD program when analysis concluded that incentives did affect 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

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.

Momentum Savings

The RED Book has historically documented only programmatic conservation savings. However, savings can also occur in another category known as momentum (formerly referred to as non-programmatic savings). Momentum savings can occur as a result of state/federal tax credits, state/national codes and appliance standards, unmeasured effects of programmatic conservation and/or the adoption of efficient technologies by non-participants in utility programs or for reasons beyond energy efficiency, such as aesthetics, productivity and special features.

An analysis examined BPA's share of the Northwest region's momentum savings for the 2005-2012 planning period. The results of the analysis, indicating BPA's shares of momentum savings from these measures, are summarized below.

TABLE E: Momentum Savings

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	Total FY 05-12
Total Momentum Savings	4.2	5.6	10.2	16.6	14.1	14.4	22.3	36.6	123.7

Glossary

Term	Definition
Average megawatt (aMW)	aMW refers to a 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. It is also an average of one million watts transferred over a period of time (often a year, thus average annual megawatts). One aMW is therefore equivalent to one megawatt produced continuously for 8,760 hours (the number of hours in a year) for a total of 8,760 megawatt-hours.
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 an independently undertaken conservation activity
BPA direct funded	Various savings fall under this category of funding and include BPA contributions for market transformation, one-time grants for pilot projects (agricultural) and direct installations of measures during BPA-funded audits under the Energy Smart Grocer program.
Commercial Incentives Pilot Program (CIPP)	CIPP was a payment-for-performance endeavor under BPA sponsorship that provided financial reimbursement to utilities for energy conservation measures installed by commercial customers.
Commercial and Residential End Use Study (CREUS)	CREUS 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 were collected and analyzed. A few businesses installed some measures during 1989 based on the energy use data.
Compact fluorescent light (CFL)	A CFL is an energy efficient electric light used primarily in residential applications. The CFL is a fluorescent bulb that normally can be screwed into any standard lighting fixture. Some models can only be used with special fixtures designed to insure the lights are not replaced with inefficient incandescent light bulbs.
Competitive acquisition	BPA's process of soliciting and selecting, by means of systematic criteria, conservation and generating resources from customers and non-customers for long-term use.
Conservation	Conservation means any reduction in electric energy consumption resulting from an increase in the efficiency of electric energy use, production or distribution; the direct application of a renewable resource; or modifications in consumer behavior that decrease energy consumption.
Conservation Acquisition Agreement (CAA)	CAA is a resource acquisition contract with utility customers intended to reduce BPA's load obligation through mechanisms for delivering energy savings. This contract was the successor to the expired ConAug contract.
Conservation and Renewable Discount (C&RD)	C&RD was a component of BPA's 2002 - 2006 wholesale power rates. C&RD was a credit available to BPA's regional wholesale power customers that took action to further conservation and renewable resource development.

Term	Definition
Conservation Augmentation (ConAug)	ConAug was a resource acquisition component of BPA's system augmentation effort intended to reduce BPA's load obligation through mechanisms for delivering energy savings
Conservation Modernization (ConMod)	ConMod was 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 (0.5 cent) incentive for every kWh of energy saved while producing one pound of aluminum.
Conservation Rate Credit (CRC)	CRC was a component of BPA's wholesale power rates. CRC is a credit that is available to BPA's regional wholesale power customers that take action to further conservation development.
Direct acquisition	Programs that pay for energy efficiency measures that result directly from actions taken, such as installing measures, rather than from paying someone for activities, such as code enforcement, or employing other programs that indirectly cause conservation to occur. Acquisition is a term from the Northwest Power Act used when conservation activity is equivalent to, and as reliable as, acquiring actual generation-produced energy. Under the Power 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 (DSI), primarily aluminum smelters, and federal agencies that buy electricity directly from BPA for their own use.
Energy Conservation Agreement (ECA)	ECA is a resource acquisition contract with utility customers intended to reduce BPA's load obligation through mechanisms for delivering energy savings. This contract was the successor to the expired CAA contracts.
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 acquired energy savings specifically from conservation projects in the industrial sector. ESP was a legacy conservation program that provided incentives for improvements in energy efficiency in industrial processes (other than in the aluminum industry). This program served both new and existing industries. The program depended on 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.
Energy Smart Design (ESD)	ESD was a conservation program initially designed to reward builders for significant savings features in new commercial buildings. 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.

Term	Definition
Energy Smart Grocer (ESG)	ESG is a regionwide refrigeration program for the region's public utilities that is delivered by a third-party contractor, PECl, and directly funded by BPA. This program provides refrigeration energy audits, installs marketing measures and facilitates retrofits in hard-to-reach markets such as supermarkets, grocery stores, convenience stores, schools and other end-use refrigeration in the commercial market sector.
Expanded Standard Offer (ESO)	The ESO for commercial and industrial lighting under ConAug was based on set payments for specific lighting measures that save energy above standard lighting practices.
Federal	In late January 2001, BPA began to develop load reduction projects at federal properties in the Pacific Northwest load-following service areas. A key principle in federal projects is that BPA funds must produce incremental conservation that would otherwise not be delivered.
First-year savings	BPA programs are reported in terms of the savings that occur in one year, although the cost effectiveness of measures is based on the expected life of the measure. Measures can last 10, 20 or more years. Therefore, total savings are calculated by multiplying the first-year savings by the measure life.
Flex agreements	These were contracts with utilities to use money "flexibly" from one program or sector to another without seeking approval on each change. From FY 1995-1999, this provided utilities with the opportunity to move BPA funds from one sector to another without going through an approval process when there were cost-effective opportunities to achieve. 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 were available to the utilities. For example, residential weatherization costs more than industrial, so, if the utility increased expenditures on residential above the allocated budget, it had to find other less costly kWh savings or repay the difference to BPA.
Fuel choice	A possible unintended result that a consumer 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.
High Water Mark	See utility funded.
HVAC	Heating, ventilation and air conditioning systems include furnaces, ducts, air control system filters, baffles, motors, vents, sensors and chillers. These systems present many efficiency improvement opportunities. HVAC systems are found in houses and industrial facilities, but the primary use of the term is associated with cooling, heating and venting of air within large commercial structures
Investor-owned utility (IOU)	An IOU is a corporation owned by investors that meets the definition of an electrical company that is engaged in distributing electricity to more than one retail electric customer.

Term	Definition
Invitation to Reduce Load through Conservation (IRLC)	IRLC refers to ConAug contracts that utility customers began signing in FY 2001. 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	Equipment that includes items such as sprinklers, pumping plants, fittings and mainlines used to reduce operating pressure
Irrigation Rate Mitigation Product (IRMP)	The Irrigation Rate Mitigation Product was a rate reduction provided to utilities with large irrigation loads during May through August of the irrigation season.
Irrigation Scheduling	By careful measurement of soils for water content as well as evaluation of air temperature, wind speed and other weather information, irrigation can be planned (scheduled) in such a way that crop growth is optimized and water use reduced. Using less water saves electricity because less water must be pumped up to the fields and forced through irrigation systems.
Legacy	Legacy refers to the conservation activities started prior to FY 2000 that are still operating. These include low-income weatherization, the Energy Northwest pay-for-performance contract, the Tacoma Fort Lewis program and some others with minor savings impacts.
Limited Standard Offer (LSO)	The LSO was the first standard offer made to utilities within the ConAug program. It provided incentives for commercial buildings based on set payments for specific lighting measures that saved energy above standard lighting practices.
Line loss	The electric energy lost (dissipated) during transmission and distribution of electricity.
Load following	Load following generally refers to automatic adjustments in generation that follow changes in customer load in order to maintain a continuous balance between loads and generation.
Long-Term Super Good Cents	The final version of the new residential construction program that was designed to save energy and to influence code development. 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 Residential Weatherization (states):	This program mitigates the rising energy costs that make it difficult for low-income citizens to adequately heat their homes. The program helps conserve energy resources in state programs (for example, Community Action Partnership) and thereby reduces the need to obtain energy from more costly conventional energy resources. Low income means household income that is at or below 125 percent of the federal poverty level.
Major plants	Energy conservation projects that involved industrial plants with significant electric loads. The top 100 industrial energy users were targeted for this program.

Term	Definition
Manufactured Home Acquisition Program (MAP)	MAP required Super Good Cents building standards certification at the manufactured home factory. A site “set-up” inspection followed factory certification in many instances.
Market transformation	A program designed to cause new technologies to be built or accepted as standard practice. Super Good Cents is an example of a program designed to change the home building standards and the market. Market transformation now refers to a specific programmatic effort operated through the Northwest Energy Efficiency Alliance (NEEA) that receives funding directly from BPA and additional funding from utilities.
Model Conservation Standards (MCS)	MCS were called for in the Northwest Power Act. The Northwest Power and Conservation Council, authorized through the NW Power Act to set standards and plan for future conservation and power acquisition, and BPA worked together to set the MCS and to encourage utilities to create programs to begin promoting such standards. MCS was designed as an early step in energy efficiency code standards, which three of the four Northwest states served by BPA eventually adopted.
Multisector	Multisector is a catchall term for savings that don't fit into a single sector.
ODOE – Schools	BPA's support of the Oregon Department of Energy (ODOE) program for conservation assistance for schools.
Payment for performance	Mechanism through which payments were made over time as energy savings were verified. This mechanism gave autonomy to utilities and built their capability to acquire conservation savings.
PSP&L	Former name of Puget Sound Energy, an IOU that serves some of the load in the Puget Sound region of Washington.
Savings with a Twist™ (SWAT)	SWAT is designed to help transform markets by encouraging consumers to buy compact fluorescent lights. SWAT is a buy-down program that involves manufacturers. SWAT-discounted CFLs are sold at retail stores throughout the Pacific Northwest through seasonal campaigns, typically fall and winter.
Sector	Sector refers to a segment of a market, such as residential, commercial, industrial and agricultural end users. Each sector employs a different approach and program design specific to its contents.
Sponsor- Designed	Implemented during the 1980's, this was BPA's first regular industrial sector conservation acquisition program. Industries submitted proposals for conservation and BPA contracted directly with the industries whose proposals were accepted.
Super Good Cents	See listing for Long-Term Super Good Cents.

Term	Definition
System efficiencies	System efficiencies refer to improvements in transmission, distribution and transformers that save energy. Examples include lower-loss transformers (silicon core), reconductored distribution lines with higher voltage and conservation voltage reduction, which lowers the voltage on distribution lines and saves energy during low load time periods.
Targeted Acquisition Program (TAP)	Under this legacy program, local utilities created and offered commercial conservation programs for their customers, and BPA verified energy savings. The contract provided flexibility to determine the pace of a utility's delivery of conservation and to select the type of conservation produced.
Technical assistance information	During the 1980's, this was a Technical Assistance Studies (TAS) program whereby technical assistance information was provided by the various state energy offices for the Institutional Program (primary and secondary schools). This was a Department of Energy 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 U.S. Treasury or congressional appropriations to fund new capital assets.
Utility	Utility refers to an electric utility that is either consumer-owned or investor-owned. A consumer-owned utility can be a municipal electric utility, a public utility district, an irrigation district, a cooperative, a mutual corporation or an association that is engaged in the business of distributing electricity to one or more retail electric customers.
Utility self-funded	Beginning in FY 2007 and continuing through FY 2010, utilities can choose to self-fund conservation and achieve credit towards the conservation adjustment as described in the Tiered Rates Methodology, which went into effect in FY 2012. To be eligible, conservation activities must meet the same requirements as BPA-funded activities.
VendingMi\$er®	A program to install energy savings controllers that cycle vending machines off and on during times in which usage has been minimal. The on/off cycle maintains the quality of the products sold.
Water/waste water	BPA began this program in March 2001 to make the water/wastewater treatment process more energy efficient. Plants in locations served by load following customers were eligible. These facilities are one of the largest energy users in a community.
Weatherization	Modifying a building envelope to reduce energy consumption for heating or cooling. Weatherization measures can include adding insulation, installing storm windows and doors, caulking cracks and adding weather stripping.

