

EXTERNAL VERSION

Bonneville Power Administration
Action Plan for Energy Efficiency
2010-2014

March 24, 2010

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Abbreviations & Acronyms

aMW	Average Megawatts
BFTE	Bonneville Full-time Employee
BPA	Bonneville Power Administration
C&I	Commercial and Industrial
CAP	Community Action Programs
CFL	Compact Fluorescent Lamp
CFTE	Contract Full-time Employee
COTR	Contracting Officer's Technical Representative
Council	Northwest Power and Conservation Council
CRC	Conservation Rate Credit
CVR	Conservation Voltage Regulation
DEI	Distribution Efficiency Improvement
DHP	Ductless Heat Pump
DOE	Department of Energy
E3T	Energy Efficiency Emerging Technologies
ECA	Energy Conservation Agreement
EECBG	Energy Efficiency and Conservation Block Grants
EER	Energy Efficiency Representative
EM&V	Evaluation, Measurement and Verification
EMS	Energy Management System
EPRI	Electric Power Research Institute
ESI	Energy Smart Industrial
ESUE	Energy Smart Utility Efficiency
ETAC	Emerging Technology Advisory Committee
ETO	Energy Trust of Oregon
FAP	Federal Agency Program
FTE	Full-time Equivalent Employee
GPM	Gallons per Minute
HPWH	Heat Pump Water Heater
HVAC	Heating, Ventilation and Air Conditioning
HWM	High Water Mark
KAM	Key Account Manager
LDC	Line Drop Compensation

LED	Light Emitting Diode
LIHEAP	Low Income Home Energy Assistance Program
MAP	Manufactured Home Acquisition Program
M&V	Measurement and Verification
NEEA	Northwest Energy Efficiency Alliance
NEEM	Northwest Energy Efficient Manufactured Homes Association
NEET	Northwest Energy Efficiency Taskforce
O&M	Operations and Maintenance
PTCS	Performance Tested Comfort Systems
PTR	Planning, Tracking and Reporting system
PUD	Public Utility District
RC&D	Regional Conservation and Development Council
Recovery Act	American Reinvestment and Recovery Act
R&D	Research and Development
RTF	Regional Technical Forum
SEP	State Energy Program
SIS	Scientific Irrigation Scheduling
SISL	Scientific Irrigation Scheduling Light
TAG	Technology Advisory Group
TAN	Trade Ally Network
TIO	Technology Innovation Office
TSP	Technical Service Provider
USB	Utility Sounding Board
VFD	Variable Frequency Drive
VO	Voltage Optimization
VSD	Variable Speed Drive
WAP	Weatherization Assistance Program

Taxonomy

Customer utility/utility customer: A retail utility or other purchaser of power from BPA pursuant to sections 5(b), (c), or (d) of the Northwest Power Act.

End-use consumer: A retail consumer of electricity served by a BPA customer.

Historic Achievement: Energy savings achieved through BPA's existing opportunities, as reported in 2009. These savings are used to project what BPA's savings *would be* in the absence of improvements to current opportunities and/or development of new activities and emerging technologies.

Incentive: A payment by a public power utility to its end-use customers to encourage them to install high-efficiency measures or projects.

Initiative: May refer to an individual program, an offering or some combination of both.

Offering: A reimbursement offered to customer utilities for measures or actions implemented at the end-user level that lead to an increase in efficiency over existing or baseline conditions.

Opportunity: An umbrella term referring to a collection of programs, offerings and customer support services at the BPA sector level.

Program: An activity or activities that result in direct acquisition of energy efficiency resources at the end-use customer level, typically delivered by a utility or a third party through a turn-key or turn-key/hybrid contract. (e.g., Energy Smart Grocer, ESI). The term "program" also may refer to an activity led by an outside entity, such as a utility or NEEA.

Program Delivery Partner: A third-party contractor competitively selected to provide implementation services related to a specific program.

Project: An action at a building or facility level to increase the efficiency of that structure.

Reimbursement: A payment by BPA to its utility customers to compensate them for incentives paid to end-use customers for measure installation or project implementation.

EXECUTIVE SUMMARY

The Bonneville Power Administration is a leader in promoting energy efficiency in the Pacific Northwest. Since the early 1980s, BPA and its regional wholesale power customers have saved over 1,000 average megawatts (aMW) of electricity through energy efficiency and conservation. From 2005 to 2009, savings from BPA's program initiatives reached 310 aMW.

Today, the challenge for BPA and its customers is to meet the aggressive energy efficiency targets in the Northwest Power and Conservation Council's Sixth Power Plan. The plan, adopted in February 2010, calls for the region to acquire 1,200 aMW of efficiency over the next five years. Public power's share of that target is 504 aMW, a significant increase over past targets and much higher than the savings achieved before in a five-year period. In addition, a change in federal lighting standards over the next few years will limit BPA's ability to count toward the target the megawatt savings offered by compact fluorescent lamps (CFLs). In the past, CFLs have been the largest single contributor to savings.

The ambitious target in the Council's plan, coupled with the loss of CFL credits, means BPA and its customers need to identify and develop new ways to acquire energy efficiency. And they must act as quickly as possible.

BPA began planning for the next five years of energy efficiency by assessing what it offers today and developing a three-pronged strategy to meet the target. The agency will:

- Enhance its current offerings by expanding market reach, adding new measures, increasing reimbursements, and streamlining rules.
- Introduce new opportunities that target market segments and measures that offer significant savings potential.
- Continue to assess savings and cost-effectiveness of new and emerging technologies that could contribute to meeting the target.

The portfolio of programs, offerings, and activities outlined in this Action Plan are designed to assist in meeting public power's share of the Council's target. The plan will help guide BPA's program decisions and its evaluation of progress toward the target. BPA will continue to collaborate with its customers and other stakeholders to update the Action Plan as conditions warrant.

Summary of Savings and Targets

The Council identified cost-effective savings potentials for five consumer sectors from 2010-2014. By far, the largest potential is attributed to the residential sector (670 aMW), followed by commercial (254 aMW), industrial (212 aMW), agriculture (46 aMW), and distribution efficiency (67 aMW).

The Council's plan recognizes multiple ways to achieve savings, which fall into the following primary categories: programmatic conservation, market transformation and non-programmatic conservation.

BPA tracks and accounts for savings related to non-programmatic measures, such as tax credits and codes and standards, but does not offer incentives for achieving them. The Northwest Energy Efficiency Alliance (NEEA), funded by BPA and other public and investor-owned utilities, is the region's primary vehicle for developing and delivering programs to bring about savings related to market transformation. Both existing and new NEEA programs are vital to reaching the conservation targets. BPA expects that non-programmatic and market transformation activities over the next five years will result in considerable savings. Together, these savings account for about 133 aMW (60 aMW from non-programmatic and 73 from market transformation) or 26 percent of what is needed to meet the target from 2010 through 2014.

Programmatic activities offer the largest piece of the energy savings potential. But BPA and its customers must increase the overall programmatic achievement by 68 percent to reach the target in the Council's plan. Savings in the residential sector alone must increase 110 percent over estimates that are based on the potential in current programs.

Several strategies have been developed to increase opportunities to deliver savings. Among these are new measure offerings and programs, and longer-term research and development activities. In addition, BPA will need to make investments to operate and manage new initiatives.

Listed below is a summary of the primary sector activities where BPA will target programmatic savings.

Residential Sector

The residential sector has a five-year program savings target of 132 aMW. The strategy to increase the savings in this sector includes making improvements to existing activities, such as residential lighting; appliances and electric water heaters; consumer electronics; weatherization; heating, ventilation and air conditioning (HVAC); ENERGY STAR new homes; and low-income programs. New activities and measures will include new residential energy-efficient products and programs for manufactured homes, while longer-term activities will focus on lighting and showerhead initiatives for multifamily housing; new measures with consumer electronics and residential lighting; and emerging technologies, such as heat-pump water heaters and ductless heat pumps.

Commercial Sector

The commercial sector has a five-year program savings target of 100 aMW. The strategy to increase savings includes improvements to existing activities, such as the commercial lighting program, trade ally network, and Energy Smart Grocer. New activities and measures include custom projects, such as new and improved savings calculators; a network PC power management initiative; a new suite of measures in commercial kitchens; and commercial electronics. Longer-term research activities focus on a commissioning initiative for commercial buildings modeled after the Energy Smart Industrial Energy Management pilot, as well as emerging technologies research in a number of areas, such as demand-controlled ventilation, and smart monitoring and diagnostic systems for rooftop HVAC systems.

Industrial Sector

BPA's industrial sector has a five-year program savings target of 74 aMW. Improvements to existing activities are focused on implementing projects under the newly launched Energy Smart Industrial (ESI) program. New activities and measures include expanding ESI in a number of ways, e.g., an energy management pilot; trade ally delivered small industrial measures; and BPA-funded technical service providers. Longer-term activities are focused on the energy management pilot.

Agriculture Sector

The agriculture sector has a five-year program savings target of 20 aMW. The strategy to increase savings includes improvements to existing activities, such as adding deemed savings for irrigation hardware and irrigation systems, and funding technical service providers. New activities and measures include collaboration with Resource Conservation and Development Councils and improved marketing to the agriculture sector. Longer-term activities include exploring opportunities to develop a stand-alone turf irrigation program and incorporating new measures, such as impeller optimization and computerized sprinkler heads, for deemed reimbursement.

Federal Sector

The federal sector savings potential is not specifically defined in the Sixth Power Plan. But based on BPA's own assessment, the federal sector can deliver about 25 aMW of savings. The strategy to increase savings includes improvements to implementing the federal sector program and an assessment of whether the program should continue to emphasize large, comprehensive facility-specific projects or focus on individual measures or programs that reach a larger number of end users.

Distribution System Efficiency Sector

The distribution system efficiency sector has a five-year program savings target of 20 aMW. BPA has spent the last year and a half preparing to launch a formal offering for the distribution system efficiency sector called the Energy Smart Utility Efficiency (ESUE) program. The ESUE is focused on two areas for critical improvements: voltage optimization (VO) and system improvements to reduce line losses and increase overall distribution efficiency. BPA has plans to add new activities and measures to the program once it is implemented.

Success Moving Forward

There is no doubt that reaching an energy savings target of 504 aMW over the next five years is daunting. Success depends on BPA's customers and the commitment they have shown to energy efficiency. It will also take collaboration with numerous organizations that make up the energy efficiency delivery system in the region. And it will require the support of many internal BPA functions, including engineering, marketing, contracting, and planning and evaluation.

BPA's energy efficiency team worked with all of these entities to develop this plan, and it will continue to work with them to carry it out. The Action Plan for Energy Efficiency will evolve and adapt as we move into a challenging five years.

1. INTRODUCTION AND BACKGROUND

The Bonneville Power Administration (BPA or the Agency) has been a leading force in promoting energy efficiency (i.e., conservation) in the Pacific Northwest for the past three decades. Since the early 1980s, BPA and its regional wholesale power customers have acquired cumulative electricity savings of more than 1,000 average megawatts (aMW). Over the five-year period from 2005 to 2009, BPA and its customers have achieved 310 aMW of electricity savings through BPA's programmatic initiatives.

In February 2010, the Northwest Power and Conservation Council (the Council) adopted its 6th Power Plan, which establishes energy efficiency targets based on the Council's assessment of long-term achievable potential. The 6th Power Plan calls for acquiring 1,200 aMW of efficiency over the five-year period from 2010 through 2014. Consistent with BPA's objectives in the Regional Dialogue, public power's share of the target is approximately 42%, or 504 aMW of energy savings. This amount is double BPA's previous targets and approximately one and one-half times the energy efficiency savings achieved from 2005 through 2009.

The time period for meeting these increased targets will overlap with a federal phase-out of standard incandescent lamps, which will reduce BPA's ability to count savings from compact fluorescent lamps (CFLs). CFLs account for approximately 39% of BPA's savings in the past few years. To achieve the aggressive goals in the 6th Power Plan and make up for lost CFL savings, BPA and its public power customers will need to significantly increase the acquisition and development of energy efficiency by devising new strategies and expanding their activities as quickly as possible.

BPA's planning began with a careful review of existing opportunities to project customer savings potential over the five-year planning period, based on the most recent historical achievements. The results were used to assess the increase needed to meet the target. BPA next developed a strategy to achieve these savings using a three-pronged approach:

1. Expanding the market reach and savings of existing opportunities by adding measures, enhancing marketing, increasing and/or optimizing financial reimbursements, streamlining and simplifying programs and program rules, and leveraging coordination with regional stakeholders.
2. Introducing new opportunities targeting market segments and energy efficiency measures with significant savings opportunities as identified in the 6th Power Plan.
3. Continuing to assess the savings and cost-effectiveness of new and emerging technologies for their potential to contribute to regional energy efficiency goals.

This Action Plan for Energy Efficiency (Action Plan) describes the portfolio of actions BPA plans to take to achieve its share of the 2010-2014 regional energy efficiency target. The Action Plan quantifies public power's share of the target, identifies priorities, and describes a strategy and sector-specific plans to achieve the savings target.

As a wholesale power marketer with limited access to end-use consumers, BPA's primary role in the development and acquisition of energy efficiency resources is to facilitate delivery of effective savings opportunities and programs by providing the

necessary tools, technical support and financial resources to its regional power customers. These customers play the critical role in developing and delivering programs, and in turn, generating the vast majority of energy savings in the region. BPA, NEEA and its customers operate within a regional energy efficiency market that has multiple participants. Ultimately, achieving the targets set forth in the 6th Power Plan will require collective action and coordinated effort by all of the stakeholders in the region.

1.1. Objectives

The portfolio of programs, offerings and activities outlined in this Action Plan are designed, first and foremost, to assist in meeting public power's share of the energy efficiency targets established by the 6th Power Plan. The Action Plan also serves as a roadmap to guide BPA and its customers in meeting those targets over a five-year opportunity-development and delivery period. In addition to this principal objective, the Action Plan seeks to:

- Outline strategies that meet the Council's targets in a least-cost way.
- Generate a shared perspective and ownership on the regional energy efficiency targets among stakeholders.
- Create alignment within the BPA energy efficiency organization regarding sector- and portfolio-level priorities.
- Define the short- and long-term resources required to achieve the targets.

1.2. How the Action Plan Will Be Used

The Action Plan will serve primarily as an operational tool to help guide BPA's programmatic decision making and evaluate progress toward achieving the savings targets. As implementation of the plan progresses, it will no doubt be necessary to re-evaluate some of the planning assumptions for each sector and make adjustments as needed to adapt to evolving technology and market conditions.

BPA will update the Action Plan in collaboration with its customers. The collaboration will involve the Utility Sounding Board (USB), BPA sector leads, supporting energy efficiency staff and others.

1.3. Guiding Principles

Acquisition of energy efficiency resources is a long-term process, extending beyond the horizon of this five-year Action Plan. BPA is committed to efficiency and is devoting the necessary resources to support this process over the long run. Preparation of this Action Plan was guided by a number of overarching principles, consistent with a long-term vision. The primary principle is from the Long-Term Regional Dialogue Policy:

BPA will work collaboratively with its public utility customers to pursue conservation equivalent to all cost-effective conservation in the service territories of such customers at the lowest cost to BPA.

Other principles help define how the plan will be implemented. They include:

Lowest-cost acquisition. All of public power benefits when conservation is achieved at the lowest cost. BPA continues to evaluate technologies and programs with the greatest

potential to provide energy savings at the lowest cost and strives to acquire energy savings as efficiently as possible. The Action Plan prioritizes activities and resource allocation to achieve this objective.

Leadership and innovation. For nearly 30 years, the Northwest has been a leader in using energy efficiency as a resource to meet the region's power needs. BPA will continue to play an instrumental role in this achievement through cutting-edge research on new technologies, creative savings opportunities, technical vigor and coordination.

Conservation at the local utility level. BPA's role as a regional provider of wholesale electricity dictates its role as a *facilitator*, rather than an implementer of energy efficiency initiatives (with limited exceptions such as the Federal Agency Program discussed in a later section). As such, BPA will continue working with public power customers to acquire energy efficiency and empower them to provide programs and services to their end-use consumers.

Climate change response. BPA is committed to addressing climate change, with the acquisition of cost-effective energy efficiency being a key strategy. In FY2010, the agency will continue to assess and prepare for evolving climate change policies and federal legislation, and promote the implementation of cost-effective strategies to address these changes.

Regional infrastructure. BPA will continue to design and implement programs in coordination with customer utilities where there are economies of scale. Taking energy efficiency to the next level requires closer coordination with regional stakeholders. BPA's strategies include providing a higher level of implementation support and tools such as technical, marketing, project support and trade ally coordination to its customer utilities to assist them in working with their end-use consumers.

Broad and balanced initiatives. BPA continues to offer a broad and balanced set of initiatives and reimbursements to fulfill the unique needs of its diverse utility customers.

Strong relationships. To achieve the aggressive targets established in the 6th Power Plan and foster economic development, BPA will continue working with customer utilities, stakeholders and energy efficiency organizations in the Northwest to minimize redundancy, maximize efficiency and leverage each entity's strengths to make for stronger working partnerships.

Streamlined processes. BPA will continue to focus on increasing transactional efficiency related to administrative processes, particularly when utility customers seek reimbursement for installed measures. Programs and documentation requirements will be streamlined as much as possible.

1.4. Regional Coordination

Pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), the Council prepares a regional power plan every five years. The plan includes a comprehensive assessment of power supply and conservation options to meet future electricity demand in the region. Under the Act, cost-effective conservation is given priority over other resources.

The Council's plan establishes targets for accomplishing conservation in the Northwest. Because BPA supplies much of the region's wholesale public power, it has taken

responsibility for ensuring that the public-power portion of the conservation targets is achieved. BPA does not, however, have a direct relationship with end-use consumers and depends on coordination and support among several entities to meet conservation goals. BPA's staff works to leverage regional efforts, ensure regional organizations focus on priorities, avoid overlaps and redundancy, and maintain collective momentum.

Public Agency Customers. BPA serves about 140 public power customers, which represent the majority of BPA's power supply load obligation. They play a critical role in developing, marketing and delivering conservation programs to end users and their programs produce the great majority of energy savings in the BPA territory. BPA customers span a broad range of geographic conditions, climatic zones and population densities. They may implement programs largely independently, adding their own incentives or services to BPA's offerings, or they may use third-party contractors to manage and administer programs. BPA often looks to the **Utility Sounding Board (USB)**, a group of representatives from utilities BPA serves, for input on programs and ways to capture energy savings and still meet the needs of a diverse customer base.

Northwest Power and Conservation Council (Council). The Council was authorized in the Northwest Power Act and has two members from each Pacific Northwest state. The Council's three primary mandates are to: (1) develop a 20-year electric power plan that will guarantee adequate and reliable energy at the lowest economic and environmental cost to the Northwest; (2) develop a fish and wildlife program to protect and rebuild populations affected by hydropower development in the Columbia River Basin; and (3) conduct an extensive program to educate and involve the public in the Council's decision-making processes.

Regional Technical Forum (RTF). The RTF is an advisory committee established in 1999 by the Council to develop standards to verify and evaluate conservation savings. Members are appointed by the Council and include individuals experienced in conservation program planning, implementation and evaluation. The RTF is also responsible for developing conservation and energy efficiency measures, including deemed savings and protocols for verifying impacts, which are recommended for approval and use by BPA in its conservation programs.

Northwest Energy Efficiency Alliance (NEEA). NEEA supports the development and adoption of energy-efficient products and services primarily through market transformation. BPA provides a significant portion of NEEA's funding. NEEA's success in meeting its goals is critical to the region's ability to meet 6th Power Plan targets. BPA representatives serve on NEEA's Board of Directors and advisory committees.

Regional Emerging Technology Advisory Committee (RETAC) and E3T. There are three closely connected components in BPA's effort to bring new energy efficient technologies to the market: Technology Innovation R&D projects; Energy Efficiency Emerging Technologies program (E3T), including technical advisory groups; and the Regional Technology Advisory Committee (RETAC), a collaboration between BPA and NEEA. In 2008, BPA launched an emerging technology effort through its Technology Innovation office. E3T is focused on identifying energy savings and removing barriers to technologies that have not yet penetrated the market, work that is critical to achieving 6th Power Plan targets.

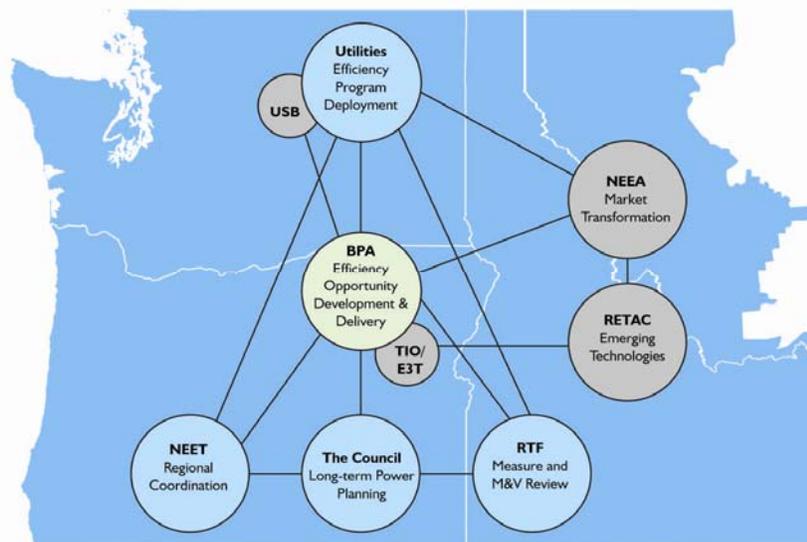
In 2009, through its Technology Innovation Office, BPA launched a regional initiative to refresh its 2006 energy efficiency roadmap. The roadmap process involves regional and

national experts to develop an energy efficiency research agenda for BPA's office of technology innovation, provide regional guidance on emerging technologies and set funding priorities. A more detailed discussion of BPA's E3T and research initiatives is provided in a later section.

Northwest Energy Efficiency Taskforce (NEET). An ad hoc regional body formed in 2008, NEET is an executive-level coordination taskforce. NEET's executive board includes representatives from the RTF, BPA, NEEA and other regional entities that work to promote energy efficiency.¹ NEET's role is to jump-start new initiatives in energy efficiency in the Pacific Northwest; it is not expected to be a permanent organization.

Each of these six stakeholders works along side BPA staff and plays a key role in facilitating acquisition of energy efficiency resources in the Northwest. Figure 1 depicts primary roles and interactions among these entities.

Figure 1. Key Regional Energy Efficiency Stakeholders



1.5. Opportunities, Drivers and Challenges

A number of market, institutional and technological factors will influence the outcomes of energy efficiency initiatives over this five-year Action Plan cycle. The following trends and drivers may support and/or provide opportunities to accelerate increased energy efficiency to meet BPA's targets. Others may hinder BPA's efforts.

- **American Reinvestment and Recovery Act Funds (Recovery Act).** BPA expects to leverage energy savings generated through Recovery Act-funded energy efficiency programs for low-income housing, municipal/commercial building upgrades and other energy infrastructure projects. This creates both opportunity and uncertainty:

¹ Information about NEET can be found in the *Final NEET Report, October 2009*: <http://www.nwcouncil.org/energy/neet/Default.asp>

- Ensuring funds are directed toward projects that complement, but do not compete with BPA's low-income offerings will require energy efficiency staff to work with delivery partners to establish priorities and clarify roles.
- There is considerable uncertainty associated with tracking and accounting for the energy savings resulting from projects receiving Recovery Act funding. BPA is working to develop tracking protocols and reporting procedures that account for Recovery Act-funded activities. This is discussed in greater detail in Section 2.2.2.
- **Federal lighting standards.** Beginning in 2012, after the federal phase-out of standard-efficiency incandescent and T-12 fluorescent bulbs, CFLs will become the baseline for efficiency in the residential market and T-8 bulbs will be the baseline in the commercial sector. These lighting measures will no longer qualify for reimbursement under the BPA offering, which creates a significant gap in BPA's programmatic energy savings potentials in the residential and commercial sectors. In the interim, BPA recognizes that considerable untapped potential for standard CFLs remains in the low-income, multifamily and rural market segments, where penetration rates have historically been lower, and BPA will focus on direct installation in these sectors. This change also offers an opportunity for BPA to develop new sources of savings through other relatively low-cost, untapped technologies such as showerheads. BPA will continue to support market transformation and offer other initiatives to facilitate adoption of new lighting technologies.
- **Limited control over measure uptake.** BPA has limited direct control over utilities' efficiency activities or access to end-use consumers. In addition, many small rural utilities have limited staffing and may have delivery constraints that pose big challenges to deploying energy efficiency services and programs. Over the period covered by the 6th Power Plan, BPA will offer a wider range of "program ready" tools to these customers, while considering the costs and benefits of how its resources are allocated to smaller customers.
- **Planning, tracking and reporting (PTR) system.** A redesign of the PTR system is under way. This enhanced system, still in the early stages of development, will incorporate feedback from stakeholders in the region. The final product will meet the needs of BPA and strive to meet stakeholders' needs as well.
- **Regional Technical Forum.** Measures included in the 6th Power Plan that have not yet been approved by the RTF comprise about 30% of the five-year target. The process of moving emerging technologies through the pipeline from demonstration and savings estimation through RTF approval can take several years and be resource intensive.
- **Economic downturn.** Current economic conditions are not conducive to consumers making discretionary investments in new equipment or infrastructure. Economic forecasts do not show robust economic growth for at least the next two years. But the economy may heighten interest in energy efficiency as a cost-saving measure and boost interest in BPA and utility programs.
- **Changing codes and standards.** A growing trend at the federal level to increase efficiency codes and standards can help the region and BPA meet

targets. Higher efficiency standards can also present a challenge. As higher standards become the baseline and lower-efficiency technologies are phased out (as is the case with standard incandescent light bulbs), a larger volume of more complex, higher-cost measures must be deployed to generate savings.

- **Energy and climate legislation.** Several new federal-level energy and climate-related legislative bills were introduced in Congress during 2009 and continue to be debated. It is uncertain what if any impacts pending legislation would have, if it passed, on BPA's efforts to achieve energy efficiency targets. In most cases, it appears the new laws would benefit BPA by creating new efficiency standards or by promoting energy-efficient technologies. BPA will continue to track federal legislation and adjust its activities and savings assumptions as warranted.

2. PORTFOLIO TARGETS

2.1. 5-Year Targets

BPA's five-year energy efficiency target, defined as the public power share of regional potential under the 6th Power Plan is 504 aMW. This goal is approximately 150%² of the efficiency resource acquisition achieved in the previous five-years and does not allow for savings from standard CFLs after 2012.

The five-year energy savings potentials for each of the five consumer sectors, as defined by the 6th Power Plan, are summarized in Table 1. The total potential is determined to be cost-effective using cost thresholds of \$70/MWh and \$120/MWh³ for retrofit and lost-opportunity measures, respectively. For each sector, BPA targets are calculated based on public power's share of regional electricity sales distribution by sector.⁴

Table 1. 6th Power Plan Regional Achievable Potential and Savings Targets by Sector (aMW, 2010-2014)

	Residential	Commercial	Industrial	Agriculture	Distribution Efficiency	Total
Total Regional 6 th Plan Potential	670	254	212	46	67	1,250*
Public Power Territory % of Regional Sales	44%	38%	47%	47%	42%	42%**
Public Power Territory 6 th Plan Potential	295	97	100	22	28	541
Adjusted to Public Power Target	275	90	93	20	26	504*

* Total potential estimated by the Council exceeds the 1,200 aMW regional target. Therefore, public power share of potential is scaled down to arrive at the public power share of the regional targets

** Overall public power load share is based on EIA load data. This total is not the weighted average of the potential in the previous row because the potential estimates are not distributed by sector proportional to loads.

Note: The 6th Power Plan does not explicitly identify potential estimates for the federal sector.

² Based on preliminary estimate of 2005-2009 non-programmatic savings of 50 aMW.

³ Based on the draft 6th Power Plan, due to timing of Action Plan analysis.

⁴ Note the agriculture sector's percent of sales are not available, so the industrial sector's percent of sales are used as a proxy.

As shown in Table 1, the residential sector accounts for more than half of the savings target. Expected savings in all of the nonresidential sectors together constitute 46% of the target, while the remaining 5% of the target is expected to be met through distribution system efficiency improvements.

The five-year target encompasses program savings as well as savings through non-programmatic sources and market transformation activities. These other sources reduce the overall sector targets as discussed below.

2.2. Sources for Savings

2.2.1. Non-Programmatic Savings Assumptions and Targets

The 6th Power Plan supply curves and targets are indifferent to how conservation is achieved, who pays for it and why efficiency measures are installed. The Council recognizes multiple ways to achieve savings. These fall into two primary categories:

1. Non-programmatic conservation
 - Market induced adoption
 - Results from actions induced by state and federal tax credits
 - Adoption of efficient technologies by non-participants, including installation of energy-efficient equipment without utility rebates and for reasons beyond energy efficiency (non-energy benefits), such as aesthetics, productivity, special features, etc.
 - Unmeasured market effects of programmatic conservation
 - Codes and standards
 - State codes and appliance standards not included in the load forecast
 - National appliance and equipment standards not included in the load forecast
 - Recovery Act-funded programs and activities
2. Programmatic and market transformation conservation
 - Utility funded acquisition programs
 - Market transformation ventures

BPA tracks and accounts for non-programmatic conservation, but does not plan to pay incentives to achieve the savings. Instead, during the 2010-2014 planning period, BPA plans to invest approximately \$3 million on market and engineering research to monitor and validate these savings.

2.2.2. Components of Non-Programmatic Conservation

MARKET-INDUCED ADOPTION

The bulk of energy savings in non-programmatic conservation occurs through market-induced adoption of measures and practices for which BPA pays no reimbursement. This includes savings that accrue from state and federal incentives, such as tax credits, adoption of efficient technologies by non-participants and unmeasured effects of

programmatic conservation. The figure for market-induced adoption is based on industry knowledge and existing studies. It is assumed very little market-induced adoption occurs outside the residential and commercial sectors. In the future, BPA will quantify these effects based on rigorous analysis. This Action Plan assumes 38 aMW will be achieved through market-induced adoption.

CODES AND STANDARDS

All Northwest states are likely to update their energy codes within the next five years. Washington and Montana are expected to adopt new codes starting in 2010; Idaho is expected to have a new code in 2011; and Oregon is scheduled to adopt a new nonresidential code in 2010 and a new residential code in 2012. In addition, standards for televisions will likely be implemented by Oregon and Washington in 2012. In making its load forecast, the Council assumes codes and standards in effect at the time. Updates and new codes are not part of the baseline in the 6th Power Plan.⁵ BPA will work with customer utilities and the state governments to capture these inexpensive and essential savings.

The estimated savings from updates to codes and standards is approximately 9 aMW, with 2.3 aMW resulting from a 2009 amendment to the Energy Policy and Conservation Act. A television standard in Oregon and Washington constitutes another 5 aMW. The 2.0 aMW estimate of savings from code and standard updates are based on state forecasts. The savings are applied to sector-level energy efficiency potentials and distributed based on when codes are adopted.

RECOVERY ACT

The American Recovery and Reinvestment Act of 2009 (Recovery Act) was signed into law Feb. 17, 2009, providing \$32.7 billion to the Department of Energy (DOE) for energy efficiency and renewable energy. The Recovery Act funding in the region is expected to be about \$433 million for the areas listed below. These programs will complement BPA's current reimbursement activities in Montana, Idaho, Washington and Oregon.

Energy Efficiency and Conservation Block Grants (EECBG). The EECBG program provides co-funding for energy efficiency and conservation projects and programs with cities, counties, states, territories and Indian tribes. This may include building retrofits, traffic and street light replacement, and residential and commercial building audits.

State Energy Program (SEP). SEP expands current state energy related efforts. Most emphasize retrofitting public buildings, such as local and state government, K-12 schools and universities.

Weatherization Assistance Program (WAP). Recovery Act funding reinforces existing WAP efforts by increasing the number of low-income homes weatherized and providing additional field training.

State Energy Efficiency Appliance Rebates. This funding will expand current utility appliance programs. The federal documentation required will likely be onerous for small

⁵ The 6th Plan baseline load forecasts include the changes to residential standards which begin in 2012.

utilities and, therefore, only the largest utilities will participate. At this time, participating utilities, eligible appliances, incentives and how saving may be impacted are unknown.

Recovery Act funds may be combined with BPA reimbursements to increase the level of incentive offered to end users.⁶ Customer utilities will work with local and state governments and Community Action Partnership (CAP) agencies receiving funding from the Recovery Act to identify eligible measures/projects. Tracking is a critical component of capturing savings associated with Recovery Act funding. BPA is currently working with entities such as State Energy Offices, CAPs and customer utilities to clarify reporting protocols and requirements. Projects and related savings will be tracked through the PTR system. Protocols are being developed to track savings Recovery Act claims that are not tracked by the PTR system.

Of the \$433 million earmarked for the Northwest, BPA expects \$39.5 million will be allocated to cost-effective Recovery Act projects and activities over the five-year Action Plan period. This adjustment includes the fraction of Recovery Act funding that will be held by the states for administrative and reporting costs, and will likely (1) go to energy conservation projects (i.e., excluding renewable energy projects); (2) go to projects in BPA customer utilities' service areas (i.e., excluding investor-owned utility service areas); (3) deliver electricity savings (i.e., not including other fuel savings); and (4) meet BPA's cost-effectiveness requirements and be tracked in the PTR system or added later based on subsequent evaluations. BPA estimates 13 aMW in savings will accrue as a result of this funding.

2.2.3. Market Transformation

Part of NEEA's mandate is to develop and deliver programs designed to capture savings associated with market transformation. Supported with BPA funding as well as funds from public and investor-owned utilities throughout the region, NEEA has been leading this effort in the Northwest since 1997. From 2005 to 2009, NEEA achieved 102 aMW of savings, of which 64 aMW, or 63%, was acquired from CFLs. NEEA's contribution is critical to achieving the region's collective energy efficiency targets.

The table below shows net savings⁷ expected from NEEA's existing and new programs. BPA will fund approximately 35% of NEEA's five-year operating plan while public power utilities will contribute another 8% of the funding.

Table 2. Public Power Share of NEEA Net Program Savings (aMW, 2010-2014)

	BPA Funding	Other Public Power Funding	Total
NEEA Existing Programs	25	5	30
NEEA New Programs	35	8	43
Total	60	13	73

⁶ See the BPA [Implementation Manual](#) for qualifying measures/projects.

⁷ Savings are net of utility programs; therefore, the net savings figure reported by NEEA represents the additional savings provided by the organization.

NEEA: NEW PROGRAMS

According to its 2010-2014 Business Plan,⁸ NEEA expects to achieve 100 aMW⁹ regionally in new market transformation initiatives primarily targeting consumer electronics, appliances, HVAC measures such as ductless heat pumps, commercial and residential lighting, and new construction. As BPA and other public utilities contribute approximately 43% of NEEA's budget, the public power share of these savings is 43 aMW over the five-year plan period. BPA will work with NEEA and other stakeholders to evaluate current regional efforts against the 6th Power Plan and address any outstanding potential savings shortfalls or measure gaps.

NEEA: EXISTING PROGRAMS

NEEA's programs focus primarily on the residential, commercial and industrial sectors. NEEA's Northwest ENERGY STAR[®] Homes Program encourages homebuilders, manufacturers and retailers to produce and/or sell higher-efficiency new homes. The Commercial BetterBricks program encourages building industry trade allies to incorporate energy-efficient business principles into the design, construction and operation of new commercial buildings. NEEA's Industrial Efficiency Initiative encourages industrial facilities to incorporate Continuous Energy Improvement (CEI) into their routine plant management and operations. BPA's Energy Smart Industrial Program has adopted CEI as one program component offered to customer utilities and end-use customers. NEEA expects its current programs to generate an additional 70 aMW of regional savings, of which BPA and public power's share will be approximately 30 aMW.

2.2.4. Total Targets: Programmatic and Non-Programmatic Savings

Table 3 summarizes BPA's total five-year targets and contributions expected from non-programmatic conservation and market transformation. BPA expects about 38 aMW will be achieved in the residential sector and 22 aMW in the commercial sector through non-programmatic conservation. An additional 73 aMW are expected from NEEA's existing and planned initiatives. Non-programmatic savings and market transformation together account for approximately 26% of BPA's planned savings from 2010 through 2014.

Savings from non-programmatic conservation are counted toward overall regional energy efficiency goals and subtracted from BPA's targets to arrive at the target adjusted for non-programmatic and market transformation. The final program targets were further adjusted for achievability based on individual sectors' past experience, current infrastructure and industry knowledge. For example, the commercial sector has strong existing programs in lighting and grocery that can be capitalized on immediately.

⁸ http://www.nwalliance.org/participate/docs/NEEA_BusinessPlan_Board-Approved.pdf

⁹ Net market effects are expected to be 100aMW, while regional savings are expected to be 200aMW. BPA will only report net market effects, which represent savings over existing programs.

Table 3. Summary of Savings and Targets (aMW, 2010-2014)

Sector	Total Target	Non-Programmatic Savings			Market Transformation		Target Adjusted for Non-Programmatic and Market Transformation	Program Target, Adjusted for Achievability
		Market Induced	Codes & Standards	ARRA Funding	NEEA - New Programs	NEEA - Existing Programs		
Residential	275	26	8	4	18	17	202	132
Commercial	90	12	1	9	14	6	48	100
Industrial	93	-	-	-	12	7	74	74
Agriculture	20	-	-	-	-	-	20	20
Federal	-	-	-	-	-	-	-	25
Distribution Efficiency	26	-	-	-	-	-	26	20
Total	504	38	9	13	43	30	371	371
% of Target	100%	7.5%	1.7%	2.6%	8.6%	6.0%	73.6%	73.6%

2.3. Savings Potential and Required Increases

This Action Plan uses 2009 as a base year for historic achievements, assuming it is the best indicator of current infrastructure and programmatic capacity. The savings by sector are projected over the five-year plan period and compared to the program target (which excludes anticipated non-programmatic savings and market transformation activities). Table 4 shows the percentage increase in savings needed to achieve the public power target from the 6th Power Plan. Overall, energy savings acquisitions must increase by 68% over the 2009 rate, and the residential sector savings must more than double.

Table 4. Sector-Level Savings Increase Required to Meet Target (aMW)

	Historic Achievement (2009 ¹⁰)	2010-2014 Projections Based on 2009 [*]	Program Target	% Increase Required
Residential	19	63	132	110%
Commercial	18	79	100	26%
Industrial	10	49	74	50%
Agriculture	3	14	20	39%
Federal	3	15	25	67%
Distribution Efficiency	0	0	20	NA
Total	54**	221	371	68%

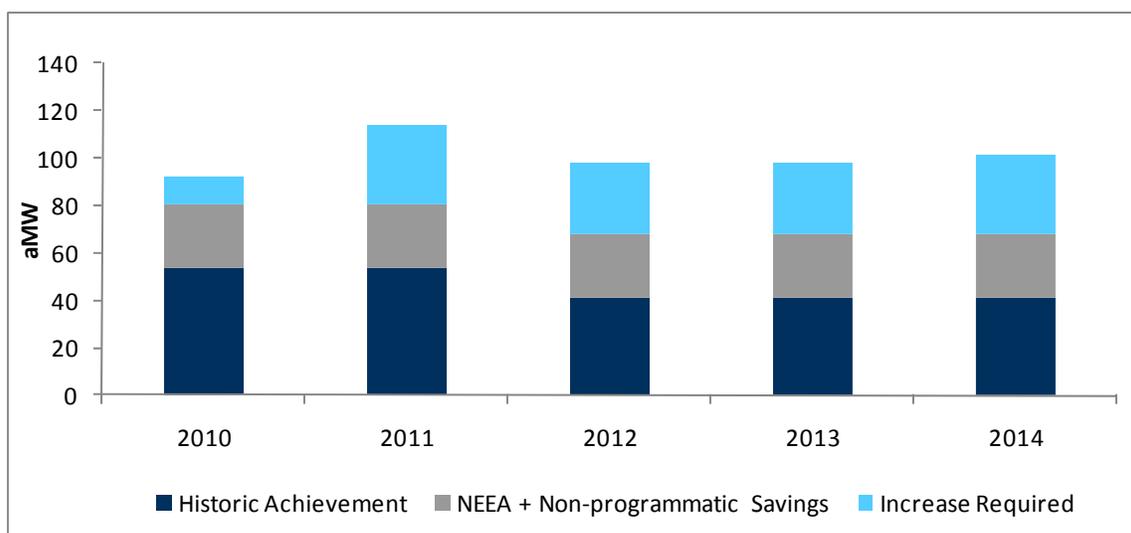
* Residential projections assume no savings from standard CFLs after 2012 due to the new federal standard. Similarly, commercial projections no savings from standard T8s after 2012.

** For consistency with program target, 2009 figure excludes savings achievements from NEEA.

Figure 2 shows BPA's historic achievements, expected non-programmatic savings and market transformation savings (from NEEA), and the required increase in each year of the plan.

¹⁰ Estimated is based on best-available information and will be updated for the final Action Plan.

Figure 2. Portfolio-Level Savings Increase Required to Meet Targets



It is important to note that in 2009 BPA achieved approximately 31% of its energy savings from CFLs through its customer utilities' and NEEA's efforts. Standard (general service) incandescent bulbs are currently due to be phased out in 2012, following which CFLs will become the standard in the market and no longer qualify for reimbursement. BPA expects to see an equivalent drop in its energy savings and will need to fill this gap with other measures. BPA's historic savings projections account for this reduction in energy savings. Similarly, in the commercial sector, T12 lamps will no longer be available to purchase in 2012. Therefore, standard efficiency T8 bulbs become the baseline efficiency and will no longer qualify for reimbursements.

3. PORTFOLIO SUMMARY

3.1. Achieving Savings

To achieve its 6th Power Plan target, BPA's energy efficiency staff has developed several strategies to increase the impact of existing opportunities. They have also identified new measure offerings, program concepts and longer-term research and development activities to accelerate energy efficiency savings acquisition.

3.1.1. Summary of Savings Needed to Achieve Targets

BPA's new opportunity initiatives are designed to help achieve the increased savings required to meet the targets. Table 5 shows the estimated future energy savings by sector. The estimates are a composite of expected achievements from existing and new opportunities, as well as emerging technologies that still require research to become market ready. As discussed previously, BPA expects to review its progress against the goals annually and might revise, eliminate, supplement or add new opportunities as needed to respond to deviations in savings results or changing market conditions.

Table 5. Estimated Future Savings 2010-2014 (aMW)

	2010	2011	2012	2013	2014	Total
Residential	24	41	24	21	21	132
Commercial	18	20	18	21	24	100
Industrial	13	15	15	16	16	74
Agriculture	4	4	4	4	4	20
Federal	5	5	5	5	5	25
Distribution Efficiency	2	3	5	5	5	20
Total	66	88	71	71	74	371

BPA expects approximately 18% (approximately 66 aMW) of its savings in the period 2010-2014 will come from emerging technologies. Many of those will not be available until at least 2012 due to long lead times for research, pilot testing and RTF review.

3.1.2. Summary of Opportunities

BPA's current opportunities rely on a mix of deemed savings and calculated measures, custom projects, third-party programs and market transformation activities, all designed to address the needs and unique characteristics of BPA's diverse utility customers. These opportunities will be enhanced, new measure offerings and programs added, and research conducted to maintain ongoing savings opportunities, as summarized below. Sector-level activities are described in Section 4.

3.2. Resource Requirements

BPA will need to make key investments – primarily in the human resources required to operate and manage its initiatives – to meet energy efficiency targets. The agency has prepared projected budgets and estimates of the human resources needed to reach five-year Action Plan targets.

Budgets were determined by examining historical and projected reimbursement levels for bundles of measures. Once reimbursement budgets were estimated, BPA staff determined the costs associated with achieving savings targets. The portfolio for each sector was examined year by year to estimate costs for initiative development, administration, emerging technologies research and general support. The costs associated with emerging technology research are also included in each sector.

The costs shown in Table 6 include program and technology research and implementation costs (reimbursements, administration and third-party implementation costs), but not staffing (BFTE or CFTE), state and tribal grants for low-income weatherization, legacy, debt service, database development, evaluation and market research, non-programmatic savings tracking or NEEA funding costs.

Table 6. Action Plan Implementation Costs (\$ Millions)

Sector	2010	2011	2012	2013	2014	Total
Residential	\$41.4	\$66.2	\$50.5	\$49.8	\$52.2	\$260.2
Commercial	\$35.8	\$39.7	\$39.4	\$49.5	\$59.0	\$223.5
Industrial	\$25.5	\$29.8	\$30.6	\$31.7	\$32.0	\$149.6
Agriculture	\$7.3	\$7.7	\$7.7	\$7.6	\$7.6	\$38.0
Federal	\$13.5	\$13.5	\$13.5	\$13.5	\$13.5	\$67.5
Distribution Efficiency	\$4.1	\$6.2	\$10.8	\$10.8	\$10.7	\$42.6
Total	\$127.6	\$163.2	\$152.6	\$162.9	\$175.1	\$781.3
\$M/aMW	\$1.95	\$1.86	\$2.14	\$2.28	\$2.35	\$2.11
\$/kWh	\$0.22	\$0.21	\$0.24	\$0.26	\$0.27	\$0.24

3.3. BPA Departments: Cross-Sector Activities

BPA's energy efficiency activities are supported by a range of cross-sector and interdependent business functions and processes. Each of these departments, along with regional stakeholders, plays a key role in facilitating the transition from measure identification through deployment and verification. A discussion of regional stakeholders and their role in regional energy efficiency appears in Section 1.4. Descriptions of BPA's energy efficiency departments and each department's role in delivering energy efficiency measures and programs to the market are provided in the following sections.

3.3.1. Engineering

BPA's engineering services have consistently been highly valued by BPA customer utilities, as reported in customer surveys and other feedback. Engineering assistance has been a key request from BPA customers during post-2011 discussions. Their work primarily falls into three categories:

Technology Research. The E3T team leads BPA's efforts to research new, viable energy efficiency technologies and provide verifiable data to BPA and the RTF to support approval and measure deployment. The goal of E3T is to provide a robust pipeline of energy efficiency technology offerings to BPA's customers that can contribute to meeting the region's energy savings targets. This effort, coupled with those of the Technology Innovation Office, enables BPA to provide emerging technologies and R&D leadership to meet near-term and future technical challenges in energy efficiency.

Implementation Support. The engineering team lends its expertise to energy savings acquisition as part of the implementation team (programs, marketing and engineering), including support for the activities outlined in Section 4. The engineers assess and support the implementation of custom projects (including federal projects), assist customer utilities with measurement and verification (M&V) activities, research deemed measures, provide opportunity development and technical support for pilots, train utility customers and program implementers, and provide engineering input as needed to support initiatives. When BPA offers new deemed measures, customer utilities respond. They call BPA engineers with questions about applications, clarifications about specifications and exceptions.

Because many of BPA's utility customers do not have in-house technical staff, they rely on BPA engineers for technical support. Engineers in field offices across the region support customer utilities with M&V plan development, assist with metering on complex

projects and provide technical assistance. Because of the volume of new measures that must be developed and fielded to meet the 6th Power Plan targets and the expected increase in customer utility conservation efforts, BPA expects and has already begun to see increased customer requests for engineering services.

Technical Support. The engineering team's technical support for the energy efficiency departments covers four major areas:

- Programs: The engineers provide technical leadership for BPA and its customers in acquiring, verifying and facilitating energy efficiency resource acquisition through training, regional and national collaboration, setting standards, conducting M&V, creating tools and calculations, and innovative thinking.
- Contracts: The engineers conduct technical reviews of customers' reported savings claims to verify compliance with contract terms. They also provide technical oversight of opportunity implementation.
- Planning and Evaluation: The engineers provide technical support for planning activities, calculating energy savings and program evaluation.
- Program Marketing: The engineers serve as a technical resource for customer utilities' energy efficiency representatives (EERs).

Individual engineers may support any or all of this work, for any or all sectors, and for a variety of end uses. BPA's higher savings targets have prompted a review to ensure the department is structured to deliver operational excellence and, as noted above, to assess the increase in resources needed to deliver these functions. BPA is currently reviewing the engineering department's structure to determine if a more vertical alignment of engineering staff around specific technology areas or sector expertise would provide greater efficiency. Resource needs will be clearer after the engineering team is restructured. In addition, a customer technical needs assessment is required to better understand utility customers' technical needs.

EMERGING TECHNOLOGIES RESEARCH

It is critical that BPA and the region continuously "fill the pipeline" with innovative energy efficiency strategies and new technologies that promise ongoing energy savings. The E3T team, a subset of the engineering department, leads this effort. E3T assesses potential new technologies to determine their viability and conducts demonstrations and pilot testing for the most promising technologies in preparation for approval by the RTF or inclusion in BPA's energy efficiency opportunities through a non-deemed mechanism.

3.3.2. Marketing

Effective marketing is a critical, foundational component to successfully deploying BPA's energy efficiency initiatives. BPA's marketing activities target two audiences:

Customer utilities. Marketing to BPA's customer utilities is aimed at increasing utility uptake of BPA offerings and programs, which are then passed on to end users. This type of marketing relies heavily on the work of BPA's seven Energy Efficiency Representatives (EERs). The EERs are assigned specific customer utilities based on a geographic division. In many cases, EERs have longstanding relationships with representatives at their customer utilities and play a key role in matching utilities' needs

and program delivery capacities with appropriate BPA opportunities. The EERs also work with programs staff to help target offerings to specific utility segments and identify priorities based on market potential and other factors.

End-use customers. End users drive adoption of energy-efficient technologies and BPA's acquisition of energy savings. Although BPA does not have direct access to end-use consumers, it is advantageous to support marketing and provide marketing resources to customer utilities. This is particularly important for smaller utilities and those in rural areas that may have limited in-house resources to market programs. In general, marketing to end users is focused on providing marketing collateral, sell sheets, Web-ready content, newsletter content, and other materials on individual programs and measure offerings, or initiatives that target specific audiences and end-use sectors (e.g., hospitality and commercial kitchens).

BPA's energy efficiency marketing team has been engaged in a strategic effort to increase the reach and penetration of efficiency savings by more effectively marketing opportunities to utility customers, equipping them to more effectively market to end-use consumers. This process has included an assessment of barriers that inform the strategic approach aimed at overcoming market and internal challenges.

Over the past year, the marketing team has laid a solid foundation to support its approach. Building on past efforts to strengthen collaborative relationships, improve marketing processes and more effectively promote BPA opportunities to utility customers, BPA's FY2010 marketing plan is focused on accelerating marketing to customers and end users.

3.3.3. Contracts

Working closely with programs staff, the contracts team manages many of the supply and demand-side contracts with BPA's customers and third-party program delivery contractors and suppliers. The contracts department supports energy efficiency through three primary contracting vehicles:

- Supply chain contracts, for example with third-party program contractors.
- Intergovernmental agreements with federal agencies, which may be reimbursable or payment-based.
- Utility contracts: the Conservation Rate Credit (CRC) and the Energy Conservation Agreement (ECA).

3.3.4. Planning and Evaluation

The department manages BPA's strategic objective to ensure the development of all cost-effective energy efficiency on the loads the Agency serves. Planning and evaluation supports the energy efficiency acquisition process in various ways, including:

- Reviewing the regional energy savings and load management targets and approximate costs, which are primarily determined by the Council and the RTF, and integrating these measures into BPA's planning and implementation efforts.
- Bringing new measures to the RTF for approval and working with programs staff to not only estimate reimbursement levels for approved measures but also add the measures to the PTR system.

- Managing data and tracking from customer utilities through the PTR and energy efficiency database systems and developing monthly and annual reports on achievements and costs.
- Overseeing process and impact evaluations as well as M&V and integrating the results into future opportunity design.
- Coordinating with regional stakeholders to develop long-range policies that provide a platform for effective conservation acquisition. The planning and evaluation department supports this process in various ways, recognizing that the work overlaps and must be coordinated effectively with opportunity implementation, engineering and contract management staff.

PLANNING TRACKING AND REPORTING (PTR) SYSTEM

BPA's PTR system is the central infrastructure designed to monitor, document and report regional energy efficiency and renewable energy activity. Utilities and other stakeholders, such as trade allies and third-party implementers, access the PTR system through a Web interface to report their conservation and renewable resource activities. BPA will conduct a competitive solicitation in 2010 for a third-party contractor to rewrite the PTR system. The vendor will develop, implement and maintain a new system, tentatively called EE Central, which is expected to be launched by October 1, 2011. In the interim, BPA and its customers and trade allies will continue to use the existing PTR system to document and track their energy efficiency activities and opportunities. All data currently in the PTR system will be migrated into EE Central once the new system is operational.

3.3.5. Programs

This department consists of six sector-specific divisions: residential, commercial, industrial, agriculture, federal and distribution system efficiency. Each is managed by a sector lead, who is responsible for developing and executing a strategy capable of delivering the savings potential specified by the Council's plan. The programs staff interacts extensively with utilities and manages third-party program delivery contracts; oversees all internal BPA initiative operations; and collaborates with the marketing, planning, and engineering departments to ensure existing opportunity needs are addressed and future measures are identified and planned for in the pipeline. They also work with NEEA and other stakeholders to guide regional collaborative efforts and ensure stakeholder directives are carried out as needed. Section 4 provides details on specific strategy initiatives planned in each sector to meet the 6th Power Plan targets.

4. SECTOR STRATEGIES AND OPPORTUNITIES

BPA's energy efficiency sector leads are responsible for developing opportunities that capture market potential, meet the needs of utility customers and lead to the achievement of sector-level targets. Five primary delivery mechanisms are available to support program deployment:

Deemed measure reimbursement. The RTF establishes and approves deemed savings values for end-use measures and applications. BPA funds a fixed reimbursement based on a willingness-to-pay calculation for deemed measures installed via its utility customer programs. Utilities may pay any incentive level to end-use

consumers and may mix and match approved measures to create programs that best suit their service area. Deemed savings and participation is tracked by each utility and reported through the PTR system.

Deemed calculated savings. For those measures that lend themselves to deemed values but may have custom applications (e.g., commercial lighting), BPA provides its utility customers with a calculator tool that allows them to analyze measure applications and calculate the correct reimbursement and savings level.

Custom projects. BPA supports installation of cost-effective measures or projects that are not eligible for deemed reimbursement through a custom-project process. To implement custom projects, customer utilities and end-users submit proposals along with M&V plans for review and approval. Individual custom projects must have a benefit-cost ratio of 0.5 or greater, while the portfolio of projects must have a ratio of 1.0 or greater.

Third-party programs. For programs that target specific end-user markets or can benefit from efficiencies on a regional scale, BPA uses a direct acquisition approach. BPA contracts with third-party program delivery partners to administer and manage turn-key programs. The delivery partner typically provides all products and services required by the program, which may include marketing, technical support, direct installation of measures, participant and savings tracking, and rebate processing.

Upstream incentives/market transformation. NEEA is the primary lead for upstream incentive programs and market transformation initiatives. BPA collaborates with NEEA to identify activities and provides funding, along with other regional utilities and stakeholders, to support them. Upstream programs and market transformation activities seek to influence manufacturer, dealer, retailer, or consumer behavior toward specific energy-efficient technologies, and/or may also include research, development, and demonstration of emerging technologies and program concepts to transform the market. NEEA tracks energy savings from its activities and reports them to BPA.

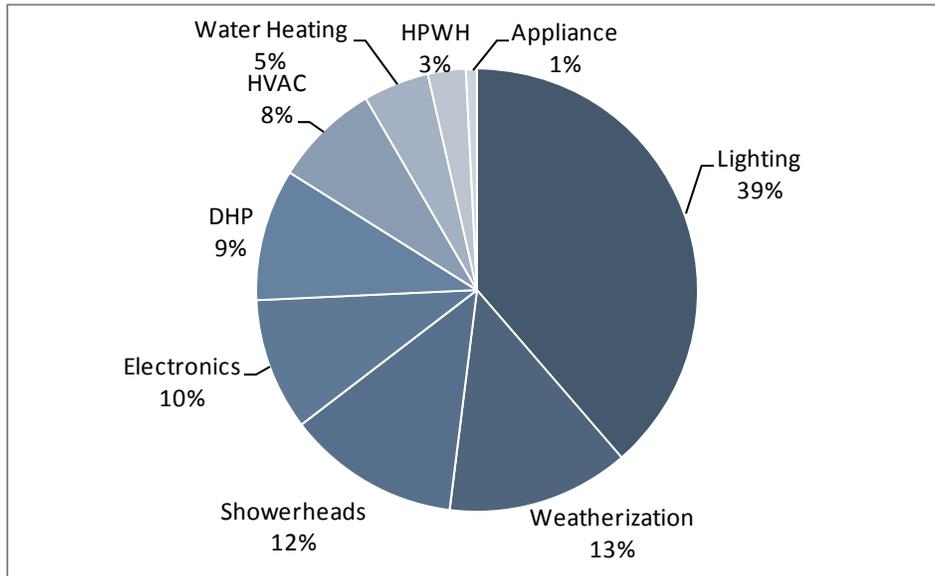
4.1. Residential Sector Strategy

The residential sector aims to balance priorities between offering measures that deliver the highest savings potential and providing a variety of measures to meet the needs of BPA's utility customers. Residential sector opportunities consist primarily of RTF-approved deemed measures and market transformation activities led by NEEA (see below). Third-party programs are employed when sector managers determine more can be achieved by working on a regional scale or when infrastructure support is critical for success. In many cases, a single measure may be distributed through multiple mechanisms. For example, CFLs are promoted through retail markdowns, direct distribution and direct installation programs. Customer utilities select measures most appropriate for their end-use consumers and service territories, and may bundle measures into end-user programs.

4.1.1. 6th Plan Potential and Program Targets

The 6th Power Plan indicates that potential in the residential sector is dominated by lighting, followed by weatherization, showerheads and electronics.

Figure 3. Residential Sector 6th Plan Potential by Measure Category



As Table 7 illustrates, the residential sector has a five-year program savings target of 132 aMW. Even if it continues to generate savings equivalent to its 2009 achievement, the residential sector will have a shortfall of 69 aMW and will require a 110% increase from new activities. The residential sector's program target is the most aggressive of all the sectors, and its required increase is the largest. Meeting its targets will be challenging, particularly considering that a substantial portion of the sector's current energy savings come from CFLs, which after the 2012 phase-out of standard incandescent bulbs will no longer be a viable source of energy savings.

Table 7. Residential Program Target, Projected Savings and Required Increase (aMW)

Program Target	132
Projected Historic Savings ¹¹	63
Increase Required to Meet Target	69 (110%)

The program target above excludes 38 aMW of savings from non-programmatic activities and 35 aMW from market transformation by NEEA. These savings, particularly those generated through market transformation activities, are critical to achieving the Council's targets. During the five-year Action Plan period, BPA will work closely with NEEA to ensure the highest priority market transformation activities are carried out. Based on its 2010-2014 Business Plan, NEEA plans to target market transformation activities in consumer electronics (initially high-definition TVs and other home electronics), ductless heat pumps, residential lighting, and new home construction.

In 2007, NEEA completed its CFL regional promotion; NEEA expects to shift to a research role for developing new applications in solid state lighting. NEEA's existing residential new construction program has achieved some success over the past few

¹¹ Projected savings are based on the residential sector's historic achievement (2009 reported results), net of standard CFLs in 2012-2014 due to change in standard.

years; moving forward, NEEA will continue to provide training and education to participants in the residential new construction market and pursue more aggressive residential building codes and standards, while broadening its scope to take advantage of the multiple green building brands (e.g., LEED, Built Green) that have recently gained recognition in the new homes market.

4.1.2. Overview of Sector Approach and Timing

BPA’s residential sector will focus on continuing to deliver existing opportunities, and will add new measures and offerings to target market sectors and technologies associated with strong savings potential. The table below summarizes current and future residential sector opportunities and the anticipated delivery approach.

Table 8. Residential Opportunity Delivery Approach

Opportunity	Existing	New	Research	Deemed	Third-Party	Direct Install	Retail Promotion	NEEA
Residential Lighting & Shower Heads								
CFLs (standard & specialty) and ENERGY STAR fixtures	○			○	○	○	○	
LEDs		○	○				○	
Showerheads	○	○		○	○	○	○	
Appliances & Water Heaters								
Appliance (deemed)	○			○	○		○	
Electric resistance water heater	○			○				
Heat pump water heater		○	○					○
Fridge/freezer decommissioning	○			○	○			
Consumer Electronics								
TVs 30% above ENERGY STAR	○							○
Computers & other		○	○					○
HVAC								
Air source & geo heat pump	○		○	○				
Ductless heat pump	○		○	○	○			○
PTCS installation	○			○	○			
Weatherization	○	○		○				
ENERGY STAR New Homes	○			○				○
Low-Income Weatherization	○			○	○	○		
Manufactured Homes	○	○		○				
Multifamily Program		○	○	○	○	○		

4.1.3. Achieving the Savings

RESIDENTIAL SECTOR

Improvements to Existing Activities

- Residential Lighting: In the near term, BPA will increase distribution of all types of CFLs in multifamily, low-income and rural markets. Retail promotions will continue to focus on specialty CFLs (e.g., reflectors, globes, candelabra-based) and will add ENERGY STAR qualified fixtures and light emitting diodes (LEDs). Lighting promotion activities will include both upstream and direct installation opportunities.
- Appliances & Electric Water Heaters: BPA is working to improve connections with major store chains, increase the penetration of high-efficiency technologies and develop end-user marketing materials tailored to assist smaller utilities.
- Consumer Electronics: BPA provided early support to NEEA to bring California's upstream Consumer Electronics high-efficiency television initiative to the Northwest. BPA will continue to work with NEEA to add new electronics measures with strong energy savings potential, such as personal home computers, computer monitors, set top boxes, game consoles and DVD players.
- Weatherization: To eliminate barriers and increase penetration of weatherization and air sealing measures, BPA will improve and clarify weatherization specifications and documentation requirements, emphasizing simplified verification procedures and quality contractor networks. BPA also will assist utilities in building stronger links between weatherization and direct installation opportunities (discussed below).
- HVAC: Building on the past year's success with air-source heat pumps and ductless heat pumps, BPA is conducting research to identify new applications for these technologies. Work is already under way to increase outreach and provide better marketing collateral for high-efficiency HVAC equipment and services.
- ENERGY STAR New Homes: NEEA leads the region's efforts in residential new construction through its Northwest ENERGY STAR Homes program. BPA will work with NEEA to broaden the scope of this program to incorporate Built Green and LEED homes that meet the ENERGY STAR specifications. In addition, BPA is working with utilities and the RTF to expand opportunities for an efficient electric home model proposed by Montana utilities known as the MVP Home.
- Low Income: BPA is working with federal, state and community low-income agencies to facilitate integration of Recovery Act-funded efficiency initiatives into broader efforts in this sector and establish protocols for tracking energy savings.

New Activities and Measures

- Residential Energy-Efficient Products: BPA has recently selected a contractor to support an expanded regional promotion of CFLs, light fixtures, low-flow showerheads and other residential retail products, as follows.

- Retail Promotion: BPA will use a third-party contractor to manage an aggressive retail promotion of CFLs, ENERGY STAR qualified light fixtures, low-flow showerheads, LEDs and more. Promotional activities will consist of upstream market transformation models in both retail and builder channels, as well as bulk purchasing opportunities.
- Direct Installation: This delivery model will provide utilities with a variety of resources for executing direct installations of low-cost measures (showerheads, lighting, etc.) in homes. Opportunities will range from full turn-key programs to utility-delivered opportunities tailored to the needs of BPA's customer utilities.
- Manufactured Homes: Manufactured housing offers strong energy savings potential. Historically this market has been supported by Super Good Cents, the Manufactured Home Acquisition Program (MAP), and more recently by Northwest Energy Efficient Manufactured Homes (NEEM). However, the economic downturn has taken a toll on both NEEM and manufactured homes. BPA is working with regional customer utilities to determine how best to support NEEM to maximize savings opportunities in anticipation of a recovery in the manufactured home market.

Longer-Term Research Activities

- Multifamily Housing: In the near term, BPA's lighting and showerhead direct installation initiative will target multifamily housing. Additionally, BPA will research appropriate target measures and best practices for utility multifamily programs
- New Fast-Track Measures: BPA will work to quickly incorporate new measures, including consumer electronics and residential lighting measures, into its deemed reimbursement opportunities.
- Emerging Technologies Research: Several new measures have been identified as having potential in residential sector applications and are being assessed in preparation for seeking RTF approval, with the primary savings expected from heat pump water heaters and ductless heat pumps.

4.1.4. Sector Savings Estimates

Table 9 shows energy savings by measure type expected over the five-year plan period. This includes estimated savings from improvements to existing opportunities, new opportunities and research opportunities.

Table 9. Sector Savings by Opportunity (aMW)

Opportunity	2010	2011	2012	2013	2014	Total
Lighting	15.5	28.0	9.8	5.3	3.3	61.7
Appliances	1.5	1.8	2.1	2.1	2.1	9.6
Water Heating	0.2	0.2				0.3
Showerheads	1.3	2.9	2.9	2.9	2.9	12.9
Ductless Heat Pumps	2.6	3.9	4.5	5.0	5.5	21.5
Heat Pump Water Heaters					0.2	0.2
HVAC	1.7	2.1	2.1	2.1	2.1	10.2
Weatherization	1.1	1.5	1.5	1.8	2.0	7.9
Manufactured Homes		0.3	0.5	1.0	1.0	2.8
Multifamily Program		0.6	0.8	1.2	2.0	4.6
Total	23.9	41.2	24.2	21.4	21.1	131.7

4.2. Commercial Sector Strategy

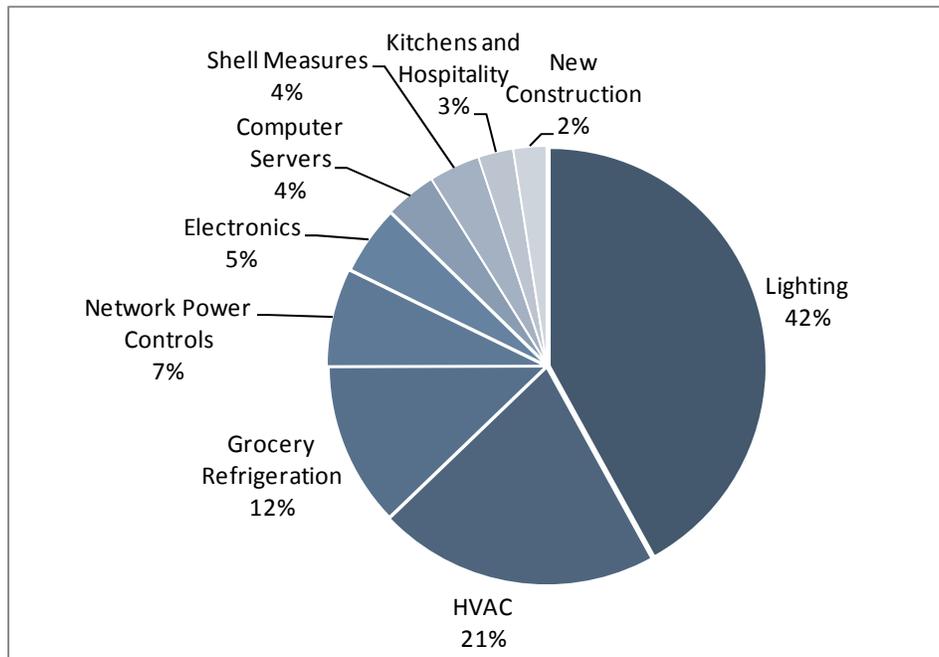
Commercial sector energy efficiency potential is characterized by large, relatively accessible savings opportunities in lighting, coupled with diffuse sources of conservation that are typically complex in terms of technology, delivery or both.

In the near term, the commercial sector will focus on ramping up its existing lighting and refrigeration opportunities to capture their savings potential. The existing lighting offering and grocery refrigeration programs are now reaching market maturity and are well-positioned to continue and accelerate savings acquisition with minimal changes. BPA will supplement these opportunities with new tactics to capitalize on savings potential related to network PC power management, HVAC, and hospitality and commercial kitchen measures. Additional research is also planned to lay the groundwork for savings acquisition in more challenging areas during the 2012-2014 time frame.

4.2.1. 6th Plan Potential and Program Targets

The 6th Power Plan indicates that potential in the commercial sector is dominated by lighting, followed by the grocery refrigeration and network PC power management, as shown in Figure 4. The diverse bundle of HVAC measures also constitutes a significant portion of aggregate potential.

Figure 4. Commercial Sector 6th Plan Potential by Measure Category



The commercial sector has a five-year program savings target of 100 aMW. Even if it continues to generate savings equivalent to its 2009 achievement, the commercial sector will have a shortfall of 21 aMW and will require a 26% increase from new activities. Meeting its targets will be challenging, particularly considering that a substantial portion of the sector's current energy savings come from replacing inefficient T-12 fluorescent lighting, which after the 2012 federal standard change will no longer be a viable source of energy savings for BPA. The program target for the commercial sector is net of savings expected to be achieved by the federal sector.¹²

Table 10. Commercial Program Target, Projected Savings and Required Increase (aMW)

Program Target	100
Projected Historic Savings ¹³	79
Increase Required to Meet Target	21 (26%)

The program target above excludes 22 aMW of savings from non-programmatic activities and 20 aMW from market transformation activities led by NEEA. These savings, particularly those generated through market transformation activities, are critical to achieving the Council's targets. During the five-year Action Plan period, BPA will work closely with NEEA to ensure priority market transformation opportunities are carried out. Based on its 2010-2014 Business Plan, NEEA plans to address market barriers and

¹² In the past, federal and commercial sector targets and savings were aggregated. For the purposes of this Action Plan, and future planning, they have been disaggregated and will be tracked separately.

¹³ Projected savings are based on the commercial sector's historic achievement (2009 reported results). The projection excludes savings from standard efficiency T8s in 2012-2014.

facilitate market transformation, targeting healthcare, offices, and other institutional and real estate segments. NEEA will focus on commercial electronics (computers, monitors, etc.), efficient building operations and energy management, small commercial efficiency opportunities and integrated design for new construction projects. NEEA will offer training and assistance for commercial trade allies and building plant managers.

Under its BetterBricks program, NEEA works with companies on a strategic approach to energy management practices that include building design and construction, building operations, purchasing and capital upgrades. NEEA is taking the lead in the new construction market. It is promoting more aggressive codes and standards and providing project-based design assistance, professional development for trade allies in building design and construction industries, and access to tools and expertise to support efficient building operations. From 2010 through 2014, NEEA’s goal is to influence 30% of the new buildings being built to meet 2030 Challenge standards (50% or better energy performance over current practice). NEEA expects to revamp its BetterBricks program in 2010.

4.2.2. Overview of Sector Approach and Timing

The commercial sector will focus on continuing to deliver its established commercial lighting and grocery refrigeration offerings, and will add new measures and programs. Table 11 summarizes current and future commercial sector opportunities and the anticipated delivery approach.

Table 11. Commercial Opportunity Delivery Approach

Opportunity	Existing	New	Research	Deemed	Deemed Calculated	Custom	Third-Party	NEEA
Commercial Lighting and TAN	○				○			
Grocery Refrigeration	○						○	
Custom Projects	○				○	○		
Small Commercial	○				○			
Network PC Power Management		○					○	
Hospitality and Commercial Kitchens		○		○				
Commercial Electronics		○						○
Commissioning			○				○	
New Construction			○					○
New Fast-Track Measures			○	○				
Emerging Technologies Research			○	○	○			

4.2.3. Achieving the Savings

COMMERCIAL SECTOR

Improvements to Existing Activities

- Commercial Lighting Program and Trade Ally Network: BPA is simplifying and enhancing its commercial lighting calculator tool to increase participation, and is expanding the role of its Lighting Trade Ally Network (TAN) to roll out the new tool when it is ready. The lighting program will also add a limited selection of LEDs as soon as they are market ready.
- Grocery Refrigeration: The Energy Smart Grocer program has recently entered into a new two-year contract with its delivery partner, PECL. The contract includes several new provisions designed to drive rapid program expansion and reduce delivery constraints.

New Activities and Measures

- Custom Projects: BPA will develop “deemed savings calculators” to simplify the custom project path and support commercial applications of custom projects. BPA expects to roll out an internal tool, initially focused on HVAC measures, for use by BPA engineers in 2010, and then pursue RTF approval of the tool in 2011. BPA also will develop standardized evaluation, measurement and verification protocols to help streamline the custom project process.
- Small Commercial: BPA is exploring a simplified custom/deemed calculated approach to implementing opportunities in small commercial applications and researching potential savings available through building shell and HVAC measures.
- Network PC Power Management: BPA plans to launch a direct installation delivery strategy using a third-party contractor for power supply control software, which is fairly inexpensive and already RTF-approved, to deploy this technology rapidly and directly to end users. Consideration will be given to also deploying smart power strips through the same delivery mechanism, thereby expanding the opportunity for acquiring savings at a lower cost.
- Hospitality and Commercial Kitchens: BPA will increase its customer utility support for a new suite of approved commercial cooking measures by providing marketing resources to facilitate comprehensive utility-operated programs that target the hospitality market.
- Commercial Electronics: BPA’s support for NEEA will include new initiatives to promote high-efficiency electronics, such as computers, monitors, servers and other measures targeting data centers, as well as other commercial applications.

Longer-Term Research Activities

- Commissioning: The 6th Power Plan identified significant potential in building commissioning measures; however, commissioning is difficult to implement, requires significant resources and depends on a well-developed trade ally

infrastructure. BPA plans to assess opportunities to incorporate commissioning for commercial buildings into an initiative modeled after BPA's new Energy Smart Industrial Energy Management pilot.

- New Construction: As a result of weak new construction markets and steadily improving codes and standards for new buildings, the potential for savings derived from commercial new construction is low and not expected to increase measurably over the next few years. However, potential may improve as the economy and new construction markets rebound. BPA will monitor potential to determine whether an offering can impact savings in the new construction market later in the plan period and will also continue to promote strong building codes through NEEA.
- New Fast-Track Measures: BPA will work to quickly incorporate new measures, including grocery re-commissioning, small commercial HVAC and new lighting measures into its deemed reimbursement opportunities.
- Emerging Technologies Research: Several new commercial measures are being evaluated in preparation for seeking RTF approval, including controls commissioning, computer servers for data centers, exterior lighting, demand-controlled ventilation, premium ventilation for rooftop packaged units, rooftop unit servicing/upgrades, and smart monitoring and diagnostic systems for rooftop HVAC systems.

4.2.4. Sector Savings Estimates

Table 12 provides estimates of annual energy savings expected from commercial sector opportunities, including anticipated new programs and measures.

Table 12. Sector Savings by Opportunity (aMW)

Opportunity	2010	2011	2012	2013	2014	Total
Lighting	9.9	9.9	9.0	7.0	7.0	42.8
Grocery Refrigeration ¹⁴	5.0	5.0	1.0	1.0	1.0	13.0
HVAC	2.6	3.1	4.0	6.3	6.8	22.6
Hospitality and Com. Kitchens	0.1	0.3	0.5	0.5	0.5	1.9
Network Power Controls	0.2	1.0	1.0	1.0	1.0	4.2
Shell Measures	0.1	0.3	0.5	0.5	1.0	2.4
New Technologies			2.1	4.4	6.7	13.1
Total	17.9	19.5	18.1	20.6	23.9	100.0

4.3. Industrial Sector Strategy

BPA has revamped its industrial sector initiative to streamline program participation, coordination, and delivery and to provide more one-on-one customer utility and industrial end-user support. This effort, known as the Energy Smart Industrial (ESI) Program, was

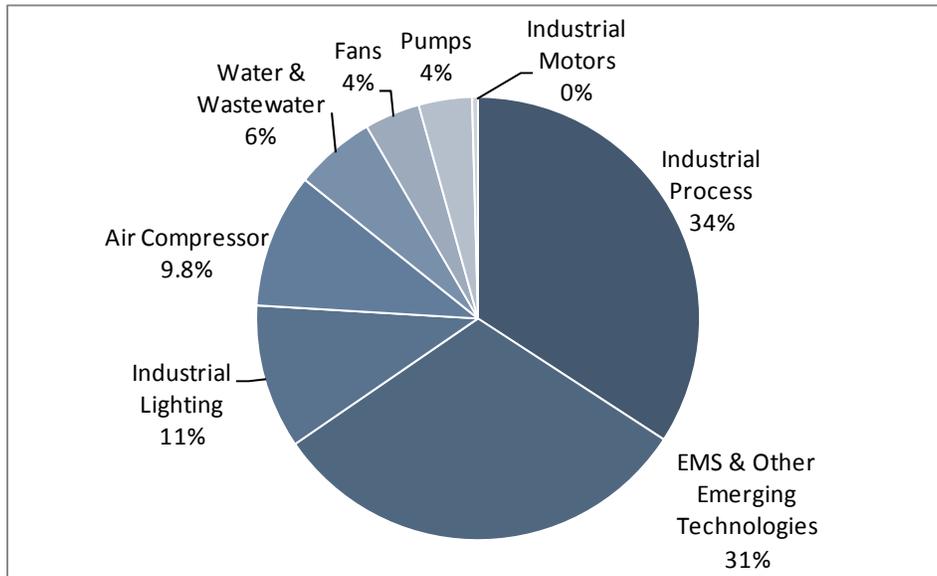
¹⁴ The Grocer Program ends in 2011, so ongoing efforts would be toward achieving additional grocery savings in out years.

launched on October 1, 2009. The ESI program consists of five components. Some are entirely new while others are simply more efficient iterations of older offerings.

4.3.1. 6th Plan Potential and Program Targets

The 6th Power Plan indicates that potential in the industrial sector is dominated by industrial process upgrades and energy management systems, followed by lighting, as shown in Figure 5.

Figure 5. Industrial Sector 6th Plan Potential by Measure Category



BPA's industrial sector has a five-year program savings target of 74 aMW. Even if it continues to generate savings equivalent to its 2009 achievement, the industrial sector will have a shortfall of 25 aMW and will require a 50% increase in savings from new activities.

Table 13. Industrial Program Target, Projected Savings and Required Increase (aMW)

Program Target	74
Projected Historic Savings ¹⁵	49
Increase Required to Meet Target	25 (50%)

The program target above excludes 19 aMW expected to be achieved through market transformation activities by NEEA. These savings are critical to achieving the Council's targets. Therefore, during the five-year Action Plan period, BPA will work closely with NEEA to ensure the focus is on priority market transformation activities.

According to its 2010-2014 Business Plan, most of NEEA's initiatives target the industrial and agriculture sectors in combination. NEEA will implement three integrated initiatives to address barriers in the industrial and agriculture sectors: (1) the Collaborative Energy

¹⁵ Projected savings are based on the industrial sector's historic achievement (2009 reported results).

Strategies initiative mobilizes existing groups, such as trade associations, alliances, and geographic or government led clusters; (2) Strategic Energy Management sets the framework for utilities and market players to support companies; and (3) the Regional Coordination Initiative provides partnerships with regional stakeholders to develop energy-efficient market-ready programs. The ultimate goal is to develop three industrial and agriculture technical solutions for the region that utilities can provide to their customers using programs ready to be implemented.

4.3.2. Overview of Sector Approach and Timing

The industrial sector consists of a single program, ESI, which is delivered almost entirely by a third-party program delivery partner. ESI works in partnership with customer utilities that have opted into the ESI program. It has several components delivered through utilities directly to end users. Utility customers and industrial end users may participate in any components they select, based on their individual needs and efficiency goals. Customer utilities that choose to opt out of ESI can participate in BPA's existing multi-sector opportunities.

4.3.3. Achieving the Savings

INDUSTRIAL SECTOR

Improvements to Existing Activities

- BPA's primary focus will be on implementing projects through its newly launched Energy Smart Industrial (ESI) program (see next bullet). However, BPA will continue to offer reimbursements for multi-sector opportunities, including custom projects and the Green Motors Program.

New Activities and Measures

- Energy Smart Industrial (ESI) Program: BPA has revamped its industrial sector program offering to expand services, streamline participation, enhance coordination and delivery, and provide more one-on-one customer support. Currently in the early roll-out phase, the ESI program has five components:
 - o ESI Partners: ESI partners focus on providing clear, concise explanations of program components and supporting delivery. They serve as a technical resource, develop actionable plans for end users, identify custom project opportunities, review and analyze custom projects, and submit projects for customer approval.
 - o Energy Management Pilot: The pilot is aimed at capturing elusive but valuable operations and maintenance (O&M) savings opportunities through diligent tracking of building and equipment performance. There are three complementary approaches within this pilot: the Energy Project Manager, Track and Tune Projects, and High Performance Energy Management.
 - o Trade Ally Delivered Small Industrial Measures: This component targets projects and opportunities using simpler technologies which may have lower energy savings potential. BPA also will provide analytical tools to support trade allies operating in the industrial area.

- Northwest Trade Ally Network (C&I Lighting): Key Account Managers (KAMs) work one-on-one with trade allies, customers and end users in a joint effort to deliver lighting projects.
- BPA-Funded Technical Service Providers (TSPs): BPA will offer funding for TSP consultants to provide assistance with scoping, project assessments, M&V completion reports, and other tasks related to customer project implementation. Over time, BPA will assess the benefits of shifting the TSP function to its third-party program delivery partner.
- Target Segment Strategies: BPA's ESI program delivery partner is expected to submit a draft strategy for addressing energy savings potential from wastewater facilities, as well as IT and data centers.

Longer-Term Research Activities

- Emerging Technologies Research: BPA has already begun an Energy Management Systems (EMS) pilot. Additional, longer-term research on innovative technologies related to EMS is slated to start in 2010.

4.3.4. Sector Savings Estimates

Table 14 outlines expected annual energy savings accruing from the new ESI program.

Table 14. Sector Savings by Opportunity (aMW)

Opportunity	2010	2011	2012	2013	2014	Total
Lighting	2.0	1.9	1.5	1.2	0.8	7.5
Air Compressor	1.8	1.8	1.4	1.1	0.8	7.0
Fans	0.7	0.7	0.6	0.5	0.3	2.9
Motors	0.1	0.1	0.1	0.05	0.03	0.3
Industrial Process	6.3	6.2	5.0	4.0	2.7	24.2
Pumps	0.7	0.7	0.6	0.5	0.3	2.8
Water and Wastewater	1.1	1.1	0.9	0.7	0.5	4.2
EMS and Other Emerging Technologies	0.3	2.5	5.0	7.5	10.0	25.3
Total	13.0	15.0	15.0	15.5	15.5	74.0

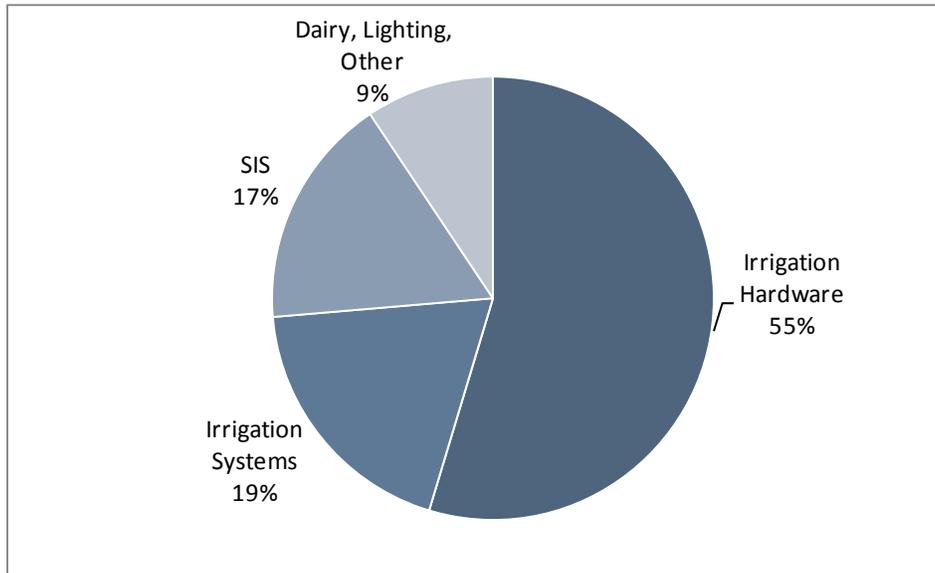
4.4. Agriculture Sector Strategy

The agriculture sector consists of diverse end users, generally located in rural areas throughout BPA's territory. Over the next few years, this sector will focus on two opportunities. First, the agriculture sector will continue its successful existing scientific irrigation scheduling (SIS) offering. Second, it will rapidly ramp up new measures and approaches, such as SIS light, newly approved VFD measures for irrigation hardware, the Green Motors Program, and the development of collaborative agreements with regional Resource Conservation and Development Councils (RC&Ds). BPA's agriculture sector will assist customer utilities in implementing opportunities through enhanced marketing and outreach strategies and regional coordination.

4.4.1. 6th Plan Potential and Program Targets

The 6th Power Plan indicates that potential in the agriculture sector is dominated by irrigation system motors and other irrigation measures, as shown in Figure 6.

Figure 6. Agriculture Sector 6th Plan Potential by Measure Category



The agriculture sector has a five-year program savings target of 20 aMW. Even if it continues to generate savings equivalent to its 2009 achievement, the agriculture sector will have a shortfall of 6 aMW and will require a 39% increase from new activities.

Table 15. Agricultural Program Target, Projected Savings and Required Increase (aMW)

Program Target	20
Projected Historic Savings ¹⁶	14
Increase Required to Meet Target	6 (39%)

During the five-year Action Plan period, BPA will work closely with NEEA to acquire energy savings. Although market transformation activities for the agriculture sector are not tracked separately by NEEA, in its 2010-2014 Business Plan, NEEA does target agriculture sector activities in combination with its industrial sector initiatives (see Section 4.3). NEEA’s Business Plan states that its priority for agriculture savings is irrigation.

4.4.2. Overview of Sector Approach and Timing

Energy-efficiency opportunities in the agriculture sector currently consist of deemed savings measures and custom project proposals. Customer utilities may offer measures that are the most appropriate for their end-user base and service territory, or bundle measures into programs. Customer utilities and end users interested in submitting

¹⁶ Projected savings are based on the agriculture sector’s historic achievement (2009 reported results).

custom project proposals follow the same implementation procedures and project rules used for commercial and industrial sector projects. Table 16 summarizes current and future agriculture sector opportunities and the anticipated delivery approach.

Table 16. Agriculture Opportunity Delivery Approach

Opportunity	Existing	New	Research	Deemed	Custom
Irrigation Hardware	○		○	○	
Irrigation Systems	○			○	
SIS Light (SISL)	○			○	
Federal Irrigation Districts		○		○	○
Custom Projects		○			○
BPA-funded TSP		○			○
Pump Testing		○		○	
Scientific Irrigation Scheduling (SIS)	○				○
Turf Pilot			○	○	

4.4.3. Achieving the Savings

AGRICULTURE SECTOR

Improvements to Existing Activities

- Irrigation Hardware: BPA has recently added irrigation hardware to its deemed savings reimbursements, including pumps, motors and variable frequency drives (VFDs). The agriculture sector will continue to evaluate VFDs for a variety of applications to add as new deemed measures and may also explore opportunities to create a deemed calculator for VFDs.
- Irrigation Systems: BPA will offer irrigation piping, sprinklers, regulators and nozzles as deemed measures.
- Scientific Irrigation Scheduling Light (SISL): In addition to BPA’s modestly successful SIS initiative, SISL will be offered as a deemed savings measure for smaller irrigation systems.
- Federal Irrigation Districts: BPA has begun to implement projects to achieve the energy savings potential available from federal irrigation districts. Initial projects will provide valuable information to help evaluate barriers and opportunities to capture further savings potential from federal irrigation districts.
- Custom Projects: BPA is looking into the benefits and costs of increasing the reimbursement levels and cap for general agriculture measures.

- BPA-Funded Technical Service Providers (TSPs): BPA will provide funding for agriculture TSP consultants to assist utility customers with custom project development.

New Activities and Measures

- Pump Testing: BPA will close its pump testing pilot and transition to a reimbursement for a portion of the cost of testing pumps to determine whether their efficiency may be increased through improvement measures.
- Resource Conservation and Development Council (RC&Ds) Collaboration: BPA is initiating an effort to collaborate with RC&Ds, non-profit entities that work directly with farmers to develop rural natural resources. The RC&Ds will collaborate with local utilities to provide marketing, training and education, project assessment and development, and funding support directly to end users.
- Marketing: The agriculture sector will incorporate new marketing strategies, which include (1) creating a targeted marketing approach for specific end-user segments, (2) exploring opportunities to create an agriculture TAN, (3) hosting vendor and trade association meetings to provide opportunity information and materials, and (4) contracting with RC&Ds to facilitate communication and marketing to agriculture end users.

Longer-Term Research/Activities

- Turf Pilot: The agriculture sector is reviewing opportunities to develop a stand-alone Turf Irrigation program that would address commercial landscaping, golf courses and properties owned by government agencies and municipalities.
- New Fast-Track Measures: BPA will work to quickly incorporate new measures, including impeller optimization and computerized sprinkler heads, into its agriculture sector deemed reimbursement opportunities.
- Emerging Technologies Research: New agriculture measures will be evaluated in preparation for seeking RTF approval, including pump impeller repair and adjustment, and computerized sprinkler heads for landscaping.

4.4.4. Sector Savings Estimates

Table 17 outlines expected annual energy savings from existing and new agriculture opportunities.

Table 17. Sector Savings by Opportunity (aMW)

Opportunity	2010	2011	2012	2013	2014	Total
Irrigation Hardware	1.5	1.5	1.5	1.5	1.5	7.5
Irrigation Systems	0.5	0.5	0.5	0.5	0.5	2.5
SIS	1.5	1.5	1.5	1.5	1.5	7.5
Dairy, Lighting, Other	0.3	0.5	0.5	0.5	0.5	2.4
Total	3.8	4.0	4.0	4.0	4.0	19.9

4.5. Federal Sector Strategy

The federal sector represents approximately 3% of BPA's total power sales. BPA has direct access to many federal sector end users,¹⁷ which offers a marketing and delivery advantage over other end-use consumer segments. Additionally, federal agencies operate under multiple executive orders and laws, requiring that they achieve aggressive energy efficiency goals.

The Federal Agency Program (FAP) encourages and assists regional federal agencies served by BPA power to identify, fund and implement energy efficiency projects. FAP provides full-service energy efficiency project assistance directly to end users. This program model has been successfully delivering a steady flow of energy savings over the past 10 years. Currently, there is a 12-month backlog of projects waiting to receive FAP audit and project development services.

4.5.1. 6th Plan Potential and Program Targets

Federal sector savings potential is not specifically broken out in the 6th Power Plan. Based on an assessment of achievability, BPA expects that the federal sector will generate approximately 25 aMW of savings during the plan period, a 67% increase in savings over its 2009 reported results. Table 18 provides a summary of the five-year delivery targets for the federal sector.

Table 18. Federal Program Target, Projected Savings and Required Increase (aMW)

Program Target	25
Projected Historic Savings ¹⁸	15
Increase Required to Meet Target	10 (67%)

4.5.2. Overview of Sector Approach and Timing

BPA frequently provides comprehensive, turn-key energy efficiency services to its federal customers, including energy audits, project scoping, engineering, project financing, project management, implementation and verification. The FAP team and BPA's engineering department leads FAP project delivery, providing the full scope of project management, oversight, technical and support services required to move a project through identification to verification. This work not only results in valuable energy savings, but also helps keep BPA's engineering staff up to date on engineering and construction best practices, which benefits all sectors.

The FAP core is composed of financed, multi-year relationships at military bases and other large federal facilities. Each agency relationship and project is unique, and may offer savings derived from multiple fuels and/or water, provided there are also significant electric savings. BPA strives to achieve deep energy savings through a comprehensive approach at every facility, in some cases achieving 40% to 80% electric savings. BPA's technical support for energy-saving projects and measures is provided at no cost to the

¹⁷ End-users, that are not direct serve customers, must have express consent from the serving public utility.

¹⁸ Projected savings are based on the federal sector's historic achievement (2009 reported results).

federal agency customer; however, the costs for technical support on water, special metering, and other non-electric fuel-saving measures are fully reimbursed by the agencies to BPA.

Through 2009, federal sector building projects were tracked under the commercial sector; federal irrigation districts were tracked under the agriculture sector. In the future, irrigation savings will continue to be tracked and reported under agriculture, while non-irrigation savings will be credited to the federal rather than the commercial sector.

4.5.3. Achieving the Savings

FEDERAL SECTOR

Improvements to Existing Activities

- FAP's full-service delivery strategy has proven to be effective, but additional opportunities are available. A new implementation approach may be needed to increase delivered savings, and an assessment will be conducted in 2010 FAP will continue to emphasize large, comprehensive facility-specific projects, rather than individual measures or programs designed to be deployed over a large number of end users.

New Activities and Measures

- In response to the 6th Power Plan, the federal sector is exploring opportunities to launch new initiatives with a variety of federal agencies that could double the amount of energy efficiency savings achieved previous years.
- FAP is evaluating additional federal sector opportunities with several agencies and the military.

Longer-Term Research Activities

- No technologies unique to FAP are currently on BPA's E3T agenda. Federal sector facilities can, however, serve as potential pilot testing grounds, and BPA may consider that possibility as part of its Action Plan.

4.5.4. Sector Savings Estimates

Table 19 outlines expected annual energy savings from the federal sector.

Table 19. Sector Savings (aMW)

Sector	2010	2011	2012	2013	2014	Total
Federal	5.0	5.0	5.0	5.0	5.0	25

4.6. Distribution System Efficiency Sector Strategy

Electricity distribution companies are under pressure to improve reliability and system performance while dealing with the ongoing challenges of an aging infrastructure. To support these customers and capture distribution efficiency savings, BPA recently developed the Energy Smart Utility Efficiency (ESUE) program. Through ESUE, BPA

offers several distribution system efficiency measures, including high-efficiency transformer replacement, load balancing, line reconductoring and voltage optimization.

Voltage optimization has proven to be cost-effective at increasing end-use energy efficiency, reducing distribution system losses, providing higher system reliability and improving power quality. Although utilities have been experimenting with conservation voltage reduction (CVR) for more than 30 years, it has not been widely adopted due to perceived high costs, negative customer impacts, and complex design, operations and implementation. In addition, the M&V processes for quantifying benefits are complex and not widely understood. BPA's staff is currently working to reduce the onerous assessment and M&V processes, and spur interest in voltage optimization as a viable conservation measure.

In December 2007, NEEA released its final report on the Distribution Efficiency Initiative (DEI) Study. The DEI Study objective was to support and encourage market transfer of distribution efficiency improvements using simplified, cost-effective measures (including voltage optimization). The DEI Study documented and demonstrated various voltage optimization methods with the participation of 13 Northwest electric utilities on 31 distribution feeders and more than 30,000 customers. The final report provides the technical results from field demonstrations, which conclusively show that operating a utility distribution system in the lower half of the customer's acceptable American National Standards Institute voltage range saves energy and reduces demand, system losses and reactive power requirements, without negatively impacting the customer.

4.6.1. 6th Plan Portfolio and Program Targets

The 6th Power Plan indicates that potential in this sector is dominated by various distribution efficiency measures, as shown in the figure below.

Figure 7. Distribution System Efficiency 6th Plan Potential by Measure Category

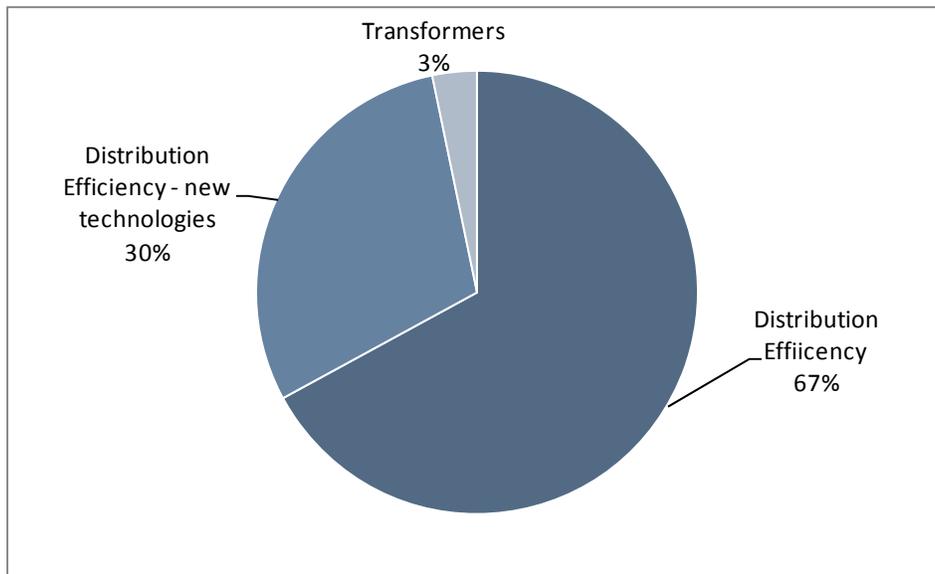


Table 20 summarizes the program target for the distribution system efficiency sector. This sector has a five-year target savings of 20 aMW.

Table 20. Distribution System Efficiency Program Target, Projected Savings and Required Increase (aMW)

Program Target	20
Projected Historic Savings ¹⁹	NA
Increase Required to Meet Target	20

4.6.2. Overview of Sector Approach and Timing

BPA has spent the last year and a half preparing to launch a formal utility customer offering for their distribution system efficiency sector. The offering is called the Energy Smart Utility Efficiency (ESUE) program. The ESUE program targets two areas for critical improvements:

- Voltage Optimization (VO), formerly known as Conservation Voltage Regulation (CVR). Most electrical equipment, including air conditioning, refrigeration, appliances and lighting, is designed to operate most efficiently at 114V based on the normalized scale of 120VAC. If power is delivered at a voltage higher than 114V, energy is wasted. Higher than necessary voltage also shortens the useful life of many types of equipment (because excess energy is dissipated as heat). Delivering voltages at the optimal levels reduces consumption and line losses, improves power quality and extends the life of equipment.
- System improvements to reduce line losses and increase overall distribution efficiency could include the following measures:
 - o Power transformer replacement
 - o Service conductor replacement
 - o Higher distribution primary voltage
 - o Transformer load management
 - o Balancing loads and phases
 - o Adding parallel feeders
 - o Operation improvements
 - o De-energizing seasonally unloaded transformers
 - o Service distribution transformer (which may include):
 - *Replacing an existing or proposed transformer with a higher efficiency transformer*
 - *Multiple transformers vs. single transformer based on system analysis*
 - *Power factor improvement to reduce line losses*
 - *Volt-Amperes-Reactive (Reactive Power) Management*
 - *Voltage management*
 - *Fixed and switched capacitors*

¹⁹ Because distribution efficiency is a new strategy area for BPA, there are no historic achievements.

The updated BPA reimbursement offer and formal participation process of the ESUE program was announced in the October 2009 Implementation Manual (IM). The ESI reimbursement structure of \$0.25/kWh with a 70% cost cap also applies to ESUE, and progress payments may be available for qualifying projects.²⁰ BPA offers technical services through distribution system technical experts currently under contract. These experts also provide all documentation necessary to develop and submit custom project proposals to the PTR system. Technical services are requested via the Technical Services Portal (TSP) and follow the existing industrial TSP contracting process.

4.6.3. Achieving the Savings

DISTRIBUTION SYSTEM EFFICIENCY SECTOR

Improvements to Existing Activities

- Simplified Voltage Optimization (VO) M&V Protocols: BPA developed simplified VO M&V protocols to reduce the onerous process of capturing the energy savings from implementing VO. Once approved, the simplified protocols will allow BPA to calculate energy savings for various methods of implementing VO with minimal metering.
- Stability Thresholds: BPA developed a set of system stability thresholds to mitigate the risk of low voltage problems. Each potential feeder will be required to meet the thresholds prior to implementing VO.
- Calculator Improvements/Enhancements: BPA is leading an effort to analyze and address issues with its distribution efficiency calculator. These enhancements will enable a standardization of both VO and system improvement calculations.
- Business Case Model: BPA developed a business case model that builds Return on Investment functionality into the calculator and allows utility customers to compare project results, tell success stories, and gain approval for capital expenses.
- Phase 1 Education and Training Workshops: Workshops began in the spring of 2009 to clarify voltage optimization design principles, effective approaches and effects on equipment, among others.
- Utility Efficiency Technical Work Group: BPA formed the Technical Work Group of Northwest stakeholders to facilitate peer review of ESUE protocols, tools and templates.

New Activities and Measures

- Phase 2 Education and Training Workshops: Phase 2 Education and Training workshops will focus on the use of the simplified protocols, tools and templates.
- Expanded Technical Services Pool: BPA will work to increase the number of distribution efficiency TSPs.

²⁰ See Section 6, p. 52 of the October 2009 Implementation Manual.

- TrakSmart: BPA will populate the TrakSmart tool with utility research data to facilitate the efforts of the third-party program delivery partner.
- Program Implementation: BPA will hire a third-party program delivery partner to lead marketing, tracking, reporting, and management of distribution efficiency education and training workshops and activities.
- Utility Efficiency Technical Work Group: BPA's program delivery partner will continue to collaborate with stakeholders and engineers in the Work Group community.

Longer-Term Research Activities

BPA will pursue opportunities to generate savings and improve the program throughout the five-year plan period.

4.6.4. Sector Savings Estimates

Estimated annual savings from the distribution system efficiency sector are presented in Table 21.

Table 21. Sector Savings (aMW)

Sector	2010	2011	2012	2013	2014	Total
Distribution Efficiency	2.0	3.0	5.0	5.0	5.0	20