BONNEVILLE POWER ADMINISTRATION

Energy Conservation
Utility Distribution
Quickstart Guide

2026

Introduction

Bonneville Power Administration's (BPA) energy conservation group works with its customer utilities to meet energy-saving targets established in the Northwest Power and Conservation Council's Power Plan. To support this objective, BPA's utility distribution energy conservation program develops measures, programs, and opportunities identified in the Implementation Manual (IM) that utilities can implement within their service territories.

This guide is a resource for utilities to identify measures, programs, and opportunities that reduce energy losses within their service area and thus helps to keep power rates low. For specifics on the complete suite of Utility Distribution sector program components, guidelines, and requirements, please consult section 11 of the BPA Implementation Manual.

Implementation Manual

The Implementation Manual provides the guidelines and requirements for implementing energy conservation projects in the region. The IM describes the requirements that BPA's utility customers must meet to receive incentive payments and savings for conservation accomplishments.

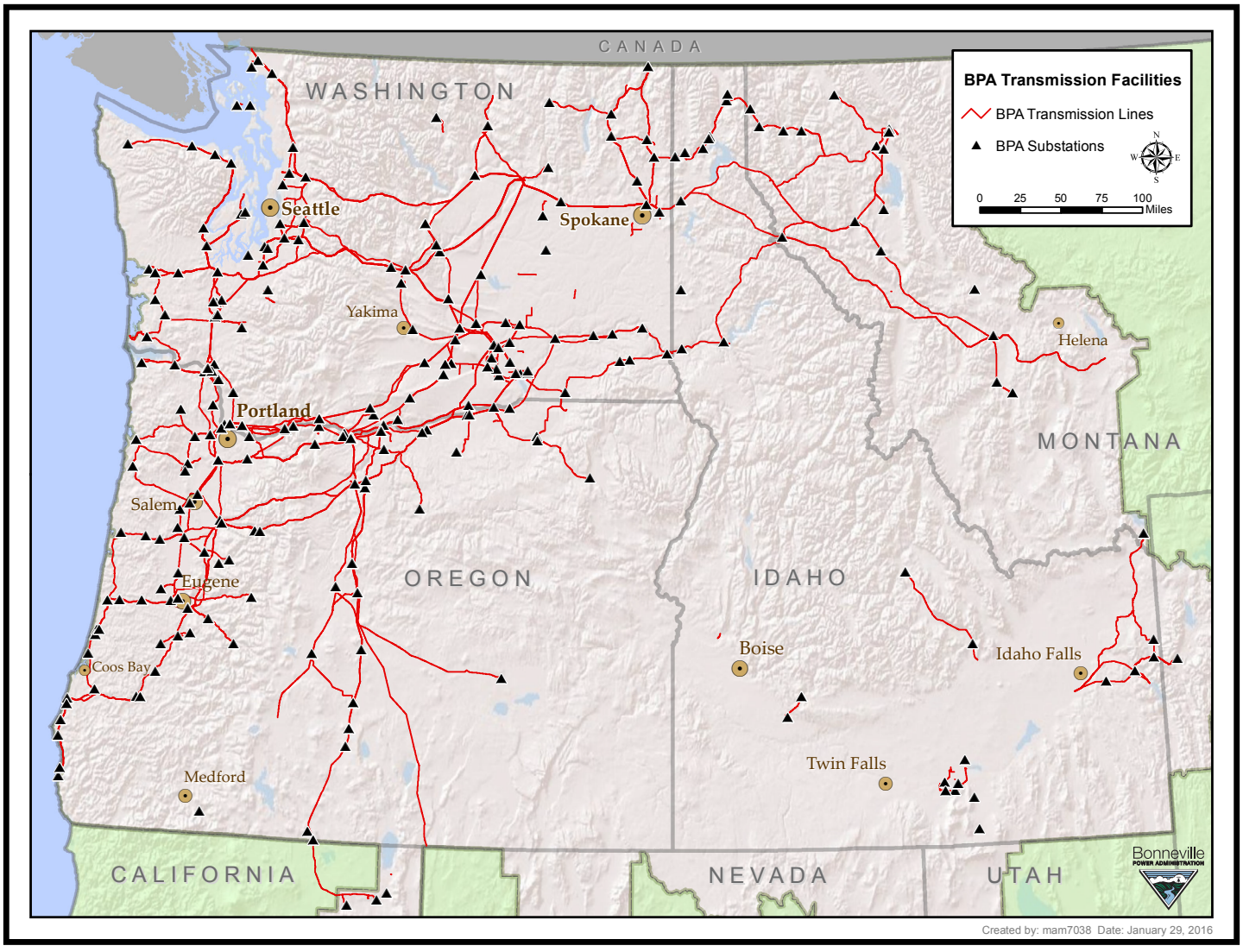
BPA publishes the IM once a rate period (every three years) and updates it every six months (in April and October). These six-month, or mid-cycle updates are revisions or amendments that address critical changes, such as new policy directives, urgent regulatory requirements, or significant adjustments that cannot wait for the next annual publication. The IM is available on the BPA energy conservation webpage.

Customer Service

Energy Conservation Account Executives (ECAE) foster and maintain customer relationships and serve as the primary support for BPA's Energy Conservation program with utilities. They lead the customer service team, which also includes field engineers and Program Compliance Specialist (PCS) for each utility. ECAEs collaborate with all BPA staff, third-party personnel, and contract support to oversee, coordinate, and execute all communications with utilities.

Utility Distribution Overview

Many utilities in the Pacific Northwest and throughout the United States operate aging transmission and distribution infrastructure. As the distribution-system landscape changes and demand for power increases, BPA offers opportunities for utilities to increase system performance while claiming energy savings with financial incentives for improvements to their distribution systems. Typically, these savings stem from service conductor replacements or substation power-transformer replacements. Other energy-savings measures include, but are not limited to, lower-loss distribution transformers, particularly those with amorphous cores, voltage-class increases, power-factor correction, and conservation voltage reduction (CVR), also known as voltage optimization (VO). System improvements enhance the efficiency of the electrical distribution system.



Conservation Voltage Reduction/ Voltage Optimization

Utilities should consider CVR or VO as a key measure. This technique improves the efficiency of the electrical grid by reducing voltage on the feeder lines running from substations to utility retail loads. The measure can be very cost-effective and allows utilities to pursue aggressive or mild savings. For example, a 2.5% average annual reduction in voltage typically results in a minimum of 1% energy reduction. These typically range in 200,000-700,000+ kWh/year savings per substation, from small to large substations, respectively. BPA customer utilities have successfully deployed voltage reductions in the 1-4% range on the primary lines and have maintained the ANSI service voltage standard for all retail customers.

Two qualifying approaches exist for CVR/VO. BPA created the first approach, Simplified Voltage Optimization Measurement and Verification Protocol, to assist utilities with implementing voltage optimization projects. The protocol provides a basic approach to determine end-use energy savings when operating the electric distribution system more efficiently and within the lower band of the ANSI Standard voltage level. The protocol covers utility electric distribution systems serving mostly residential and light commercial loads It focuses on substations serving residential and small commercial end-use loads and requires meeting specific system stability thresholds before lowering service voltage.

The second approach, a custom Measurement and Verification (M&V) plan, is more rigorous and labor intensive but allows for increased feeder understanding and the possibility for higher system optimization. It also creates opportunities for utilities to explore demand voltage reduction, a demand response opportunity that targets peak hours to employ voltage reduction to decrease demand impacts.

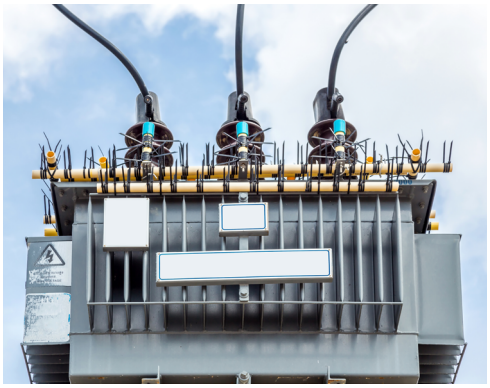
With either approach, utility distribution engineers, conservation staff, and system operators will collaborate with BPA engineers to plan, launch, measure, and validate CVR/VO on their distribution system.

System Improvements

BPA offers several distribution-level efficiency improvement measures, which may include the following:

- Power transformer replacement.
- Service conductor replacement.
- Higher distribution primary voltage, including insulator additions and replacement.
- Transformer load management (replacement of improperly sized transformers or loss improvements).
- Balancing loads and phases.
- Adding parallel feeders.
- Operation improvement (recognition and phase balancing).
- Power factor improvement to reduce line losses.
- Volt-amperes-reactive (reactive power) management.
- Fixed and switched capacitors.
- Service distribution transformer:
  - o Replacing an existing or proposed transformer with a higher-efficiency transformer.
  - o Multiple transformers versus a single transformer, based on system analysis.
  - o Voltage management.

Utilities must submit CVR and system improvements as custom projects. They may combine system improvements and CVR into one custom project when it increases the amount of voltage that can be reduced or improves the monitoring of reduced voltage. Option 1 utilities may submit reconductor and transformer replacements measure via a focused calculator method called the RT Program. BPA customer service engineers can offer a turnkey service to process the technical and administrative aspects thus lessening the burden on customers. We encourage you to engage with our customer service staff.



Getting Started

To initiate a utility distribution project, utilities should contact their ECAE. Multiple paths exist for submitting project completion reports and booking savings, so working with an ECAE or engineer will help guide the project successfully.

Different funding options are available for utility distribution projects. An EEI budget is issued based on a specific formula that calculates a utility's share of the BPA system. EEI budgets are part of the utility's Energy Conservation Agreement (ECA) and are issued for the rate period. These funds can be used for utility distribution projects.

Self-funding offers another option to help maintain low rates long-term. Self-funding refers to qualifying energy savings for which a utility chooses not to seek a payment from BPA. Some utilities use their performance payment to fund additional energy efficiency, and other utilities have board or council approval to self-fund additional energy efficiency in addition to utilizing their EEI budget. Utilities should collaborate with their ECAE to review projects, timelines, and funding options to determine the best path forward.

Additional Resources

- Implementation Manual (IM) provides guidelines and requirements for implementing EE projects in the region.
- IM Document Library contains all documents referenced in the Implementation Manual.
- Custom Projects Documentation Requirements outlines required documentation for option 1 and option 2 custom projects.
- Custom Projects Payment Rate Table provides incentive payment rates for custom projects based on project type and measure life.