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October 4, 2023

MEMORANDUM

TO: Council Members

FROM: Kevin Smit

SUBJECT: Energy Efficiency for Small and Rural Utilities

BACKGROUND:

Presenters: Kevin Smit, Manager of Power Planning Resources; Dave Moody, Manager of Planning and Evaluation, Bonneville Power Administration; Thomas Elzinga, Energy Services Manager, Central Electric Cooperative

Summary: Over the past several years, the Council has heard from small and rural utilities about the challenges of implementing energy efficiency. At the Council's June 2023 meeting in Victor, MT, after hearing from several Montana utilities, Council members challenged staff to work towards solutions for addressing these barriers. This agenda item at the Power Committee is intended to continue that discussion. Staff will provide a summary of the challenges the Council has heard over the years and review some of the work the Council and its Regional Technical Forum have done to address these barriers. Next, Dave Moody from Bonneville will provide context from an implementation perspective on the challenges customers face and the drivers behind them, as well as highlight some success stories. Finally, Thomas Elzinga from Central Electric Cooperative will provide their perspective of implementing energy efficiency in a rural environment, highlighting what has worked well despite the challenges and what resources might further support implementation for these utilities. The goal of this session is intended to be a step towards finding solutions, whether directly by the Council or

through policy guidance, to address this long-standing challenge in the region.

Relevance: The Northwest Power Act identifies cost-effective energy efficiency as the priority resource for the region, and as such, this has been the cornerstone of the Council's power planning since the beginning. Acquiring all cost-effective energy efficiency requires implementing efficiency measures in all areas of the region where cost-effective potential exists. While the region has been extremely successful in its development of energy efficiency as a resource, the region has and continues to face implementation challenges in rural utilities. The Council's 2021 Power Plan recognizes these challenges and called on the region, including Bonneville, to support rural utilities in acquiring the cost-effective efficiency identified in the plan.

Workplan: A.1.1 Tracking and reporting on energy efficiency accomplishments relative to the 2021 Power Plan Conservation Program.

More Info:

- [Energy Efficiency: Values and Challenges](#)
- [RTF Small and Rural Utilities Subcommittee Web Page](#)
- [7th Power Plan MCS-1 – “Ensure All Cost-Effective Measures are Acquired”](#) (see page 4-10)
 - [Northwest Under-served Energy Efficiency Markets Assessment](#) – Final Report

Energy Efficiency for Small and Rural Utilities

October 2023 Power Committee Meeting

Kevin Smit



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Objective and Speakers/Presenters

- Objective for Today
 - Review what we know about the difficulties that small and rural (SR) utilities have in acquiring energy efficiency, and what actions have been taken to address these concerns (so far) and begin discussing new ideas going forward.
- Presenters
 - Kevin Smit, Manager of Power Planning Resources
 - David Moody, Manager of Planning and Evaluation, Bonneville Power Administration
 - Eric Mullendore, EE C&I Sector Lead, Bonneville Power Administration
 - Thomas Elzinga, Energy Services Manager, Central Electric Cooperative



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Challenges Faced by Small and Rural Utilities in Acquiring Energy Efficiency

- Insufficient contractor pool to support quality installations
- Insufficient staff to support EE implementation
- Significant drive times for staff, contractors, inspectors, etc.
- Other locational challenges
- Relatively homogenous customer base which limits potential
- Technical knowledge
- Limited availability of energy efficient products
- Increased costs in rural areas for equipment (both labor and equipment)
- Regional average baselines may not adequately reflect a small and rural service territory – i.e., local area EE savings could be higher than the regional average
- Difficult programs may be even more difficult for small and rural utilities (e.g., rental housing – split incentive)
- Lower cost-effectiveness threshold in the 2021 Plan
- ...and more

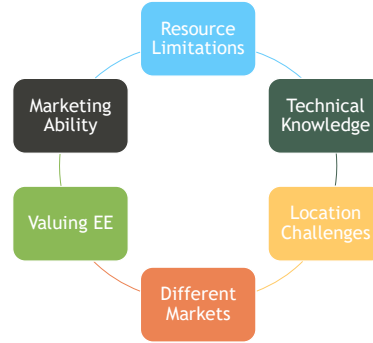


Table 9: Conservation Staff Resources Based on 2012 Survey⁸⁴

Utility Size	FTE Conservation Staff (average)	Utility Interviews
< 15 aMW	0.32	7
15-30 aMW	0.82	5
30-60 aMW	1.18	4
> 60 aMW	2.05	3
All	0.90	19

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Council and RTF Small and Rural Utility EE Efforts

Regional Collaboration and Research



EE Values and Challenges Paper	Under-Served EE Markets Assessment	Regional Technical Forum
<ul style="list-style-type: none"> • Describes the distribution of EE benefits among regional entities • Includes a section on challenges for small and rural utilities 	<ul style="list-style-type: none"> • Focus on participation rates of various demographics for identifying under-served EE markets • Includes some SR utility and rural customer data 	<ul style="list-style-type: none"> • Small and Rural Subcommittee • Small and Rural Technical Needs Study (2012)

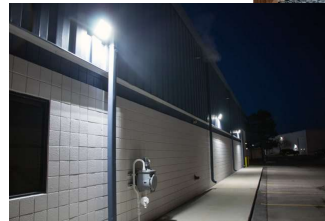
Council/Staff Roles - Assess EE potential, set targets, other actions in the Plan. Research and collaboration during implementation.

RTF Roles: Measure definition, tracking achievements

4

Selected RTF Measures Considered for the Small and Rural Utilities*

- Thermostatically Controlled Outlet for Pump House Heaters
- Energy-Free Stock Watering Tanks
- Stock Tank De-icers (inactive)
- Generator Engine Block Heaters
- Non-Res LED Wallpacks
- Res High Efficiency Central AC
- ENERGY STAR® Air Purifier/ Dehumidifier
- Small Commercial DHPs
- Res/Com Duct Insulation
- Res Efficient Portable Spas
- Res Portable Spa Heat Pumps
- Residential Window Films
- Res ASHP w/Alternative Fuel Backup
- Res Well Pump VFDs



SR Subcommittee meets quarterly. Solicits input for new measures for SR utilities



*These measures have a wide range of "status"; they may not all be currently available. E.g., A few have been deactivated, some are yet to be developed, others were considered but decided not to pursue

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Next up...Dave...then Thomas



There are a couple additional slides containing reference material...

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Reference Links

- Energy Efficiency Values and Challenges Paper
 - [Energy Efficiency: Values and Challenges](#)
- Seventh Power Plan MCS-1 – “Ensure All Cost-Effective Measures are Acquired”
 - [7th Power Plan MCS-1 – “Ensure All Cost-Effective Measures are Acquired”](#) (see page 4-10)
 - [Northwest Under-served Energy Efficiency Markets Assessment](#) – Final Report
- Regional Technical Forum: Small and Rural Subcommittee
 - [RTF Small and Rural Utilities Subcommittee Web Page](#)
 - [Small and Rural Technical Needs Study 2012](#)
 - [Small and Rural Barriers Technical Presentation](#)

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RTF Small and Rural Measure Tracking Sheet

Measure Name	In RTF Scope?	Sufficient Data Available?	Energy Savings Potential	Cost-Effective?	Applicable to Small/Rural Utilities	2019 Small Rural Recommendation	Action To Date	Completed
Generator Engine Block Heaters	Yes	Probably	Unknown	Probably	Yes	Consider further scoping or developing as a measure	Approved June 2020; Planning UES	Yes
Non-Res LED Wallpacks	Yes	Yes	High	Probably	Yes	Consider further scoping or developing as a measure	Incorporated into Non-Residential Lighting Mid-Stream: November 2020	Yes
Res High Efficiency Central AC	Yes	Maybe	Unknown	Unknown	Yes	November 2019: Decision to allocate resources as a higher priority	Approved April 2020; Planning UES	Yes
ENERGY STAR Air Purifier/Dehumidifier	Yes	Unknown	Unknown	Probably	Yes	November 2019: Decision to allocate resources to Air Purifiers but not Dehumidifiers	Approved October 2021; Planning UES	Yes
Small Commercial DHPs	Yes	Maybe	High?	Unknown	Yes	Consider further scoping or developing as a measure	Approved August 2021; Planning UES	Yes
Res/Com Duct Insulation	Yes	Maybe	Unknown	Unknown	Yes	Consider further scoping	Part of the Wx Suite of Measures	Yes
Res Efficient Portable Spas	Yes	Maybe	High	Probably	Yes	Consider further scoping	SRR Presentation 3/2/2022	Yes
Res Portable Spa Covers	Yes	Probably	Low	Probably	Yes	Not interested in pursuing	SRR Presentation 3/2/2022	
Res Portable Spa Heat Pumps	Yes	Maybe	High	Probably Not	Yes	Consider Further Scoping	SRR Presentation 3/2/2022	
Residential Window Films	Yes	Probably	Low	Probably Not	Yes	No	SRR Presentation 3/2/2022	
Res ASHP w/Alternative Fuel Backup	Yes	Unknown	Unknown	Probably Not	Yes	NA	RTF staff considering how this measure, and related measures, fit within EE as a resource.	
Res Well Pump VFDs	Yes	Maybe	Low	Probably Not	Yes	Do not pursue at this time	NA	
Com Waterless Urinals	Unclear	Unknown	Unknown	Unknown	Yes	Do not pursue at this time; not conservation under the Act	NA	

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CEC EE Challenges and Solutions



1

A Little About CEC

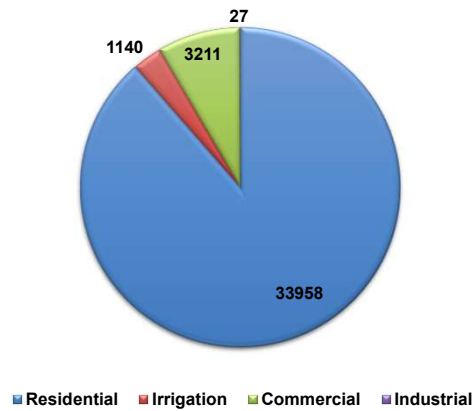
- Electric only cooperative with over 38k meters serving over 5,300 square miles.



2

A Little About CEC

Service Class Breakdown



- Our typical annual energy savings is around 2.5 to 3 million kWh, or .29-.34 aMW.



3

Challenge

- We, like many rural utilities, are a growing utility adding about 1,000 new services annually. We want to capture those new construction savings.



4

Potential Solution

- Ramping up our commercial new construction measures.
- Offering multi-family housing offerings with increased opportunities.
- Reviewing residential custom projects to reach those members.



5

Challenge

- Increasing need to reduce demand from G&T and on our distribution system.



6

Potential Solution

- Heat pump water heaters match our load profile.
- Looking into zero backup heat for heat pumps and incentives for backup heat lockout.



7

Challenge

- Market and baseline energy savings has increased dramatically to cause many measures to be determined as not cost effective. Now we have big EE budgets, very few measures to utilize and smaller rebate amounts.



8

Potential Solution

- We are reviewing BHERs.
- EV chargers – additional side benefit of local engineering review.
- Low-income programs – how they have expanded, but we need more help.



9

Challenge

- BPA continues to cut various support services that have aided utilities with small staff and little expertise.



10

Potential Solution

- This is currently a challenge that we don't have a solution to, and it will hurt small, rural utilities.
- Trying to find other potential offerings that BPA can support utilities with.



Energy Efficiency in Rural Communities: Challenges and Opportunities



Rate Period at a Glance

80 aMW
acquired in
FY 22 and FY
23



\$127 million in
incentives
provided

Nearly **2,600** aMW of
energy efficiency
acquired as a
resource since **1982**



Savings Break Down

Geography		Rural vs Urban		Sector	
Washington	52	Small Rural	14.2	Industrial	30.5
Oregon	13	Non Small Rural	57.1	Commercial	19.1
Idaho	3.1	Non utility	9	Residential	17.5
Montana	2.4			Agricultural	3.4
Other	9.2			Federal	3.2
<small>(NEEA, CA, WY, NV)</small>				Utility	1.9
				NEEA	5.7

BPA's Energy Efficiency Program



BPA allocates an incentive budget proportional to load share.



Customers choose from a menu of measures or customer projects and receive EEI incentive payments



BPA provides implementation support and performance payment funding

Opportunities

Customer choice and local control

Significant flexibility, no targets or penalties

Dedicated funding creates incentive for engagement

Challenges

Requires staffing and engagement

Cost effectiveness and program constraints

Local conditions can mismatch regional assumptions

Available Workforce



Economic Challenges



Implementation Challenges



Utility Resources



Local Opportunity

How BPA Supports Implementation



Funding and Implementation Support

Small rural utilities receive augmented performance payment and field staff provide technical assistance to support project implementation.



Economies of Scale

Regional infrastructure creates economies of scale regional consistency that could not be created individually



Training and Workforce Development

BPA provides training and engagement with the contractor community



Marketing support

BPA offers support for utilities promoting their programs and engaging program participants



Program Opportunities

Residential Efficiency



- › Home Energy Reports
 - › Digital and paper delivery
 - › Increased customer outreach
- › HVAC
 - › Move to more efficient VSHPs
 - › Explore cold climate HPs and other new technologies
 - › Leverage other funding
- › Water Heating
 - › HPWH
- › Weatherization

Low Income and Tribal



- › Increased incentives keeping pace with the market.
- › Incentives aim to cover full installation and repair costs.
- › New attestation-based income verification option eases qualification burden.
- › Incentives can be paired with other work supported by CAP agencies or others.

Agricultural Efficiency



- › New agriculture audit measure to ease producer burden
- › Traditional sprinkler and pumping measures
- › Zonal variable rate irrigation

Utility Owned



- › Offices and Warehouses
 - › Lighting
 - › HVAC
 - › Weatherization
 - › Custom Projects

- › Distribution System
 - › Transformers
 - › Reconductoring
 - › Transformer De-energization
 - › Voltage reduction

Commercial and Municipal



- › City Hall, Schools, Libraries, Fire Stations, Public Works Facilities
- › Small commercial, grocery and local business
- › Field support specialists can help connect utilities and contractors to offer support for program implementation

Industrial Efficiency



- › Energy Smart Industrial provides specialized technical support and project facilitation for all
- › Wastewater opportunities are available even in very rural territories
- › Small industrial opportunities

The image features a scenic landscape with a river, mountains, and tall grasses in the foreground. A white text box is overlaid on the right side of the image, containing the text "Success Stories".

Success Stories

Low Income

- › Worked with several tribes to install high efficiency heat pumps as part of an engineering pilot program
- › Oregon Trail Electric installed a CO2 HPWH installed that will deliver domestic hot water to a group of low-income housing units
- › Central Electric Coop worked with BPA to install high-performance, high-capacity heat pumps in low-income members homes



Irrigation and Agricultural

- › Okanogan Irrigation District to replaced three of their four pumps at its Shellrock pumping station
- › Umatilla Electric Cooperative supported the installation of a dozen large pumps to irrigate 26,500 acres
- › Benton Rural Electric Association installed variable speed circulating fans for the JK Family Dairy Farm



Rural Industrial

- › The city of Whitefish installed upgrades to its wastewater treatment facility and saved 570,000 kWh.
- › Ten Lumber Mills from Montana, Oregon, and Washington are engaged and a strategic energy management cohort with a collective goal of 6 million kWh in low or no cost savings.



Distribution System

- › Okanogan PUD and Oregon Trail Electric each saved more than 800,000 kWh in distribution system projects last year alone.
- › Smaller projects were completed in many rural areas including Fall River, Ravalli, Idaho County, and Yakima Power.



Custom Installations

- › Jefferson County PUD worked with Pacific Seafood, located in the rural town of Quilcene, to upgrade lighting in their cultivation facilities.
- › Clallam PUD EE helped Forks Community Hospital upgrade their chiller system, HVAC controls, and pump and fan system.



Summary

Success is possible and happening but requires engagement which can be challenging for some smaller utilities.

Local conditions are often the most significant challenge in program implementation.

Cost effectiveness constraints significantly limit the measures available to rural customers.

BPA will continue to support rural customers and seek creative solutions to address implementation challenges.