MISSOULA ELECTRIC COOPERATIVE

Rural Electric Cooperative Perspective

Supporting EV Deployment in Rural Montana

MARK HAYDEN, GENERAL MANAGER

1

AGENDA

- OVERVIEW OF MISSOULA ELECTRIC COOPERATIVE
- "FAST CHARGE YOUR RIDE" GRANT – SEELEY LAKE
- MANAGED RESIDENTIAL CHARGING PILOT PROGRAM
- MONTANA RURAL CO-OP PERSPECTIVE

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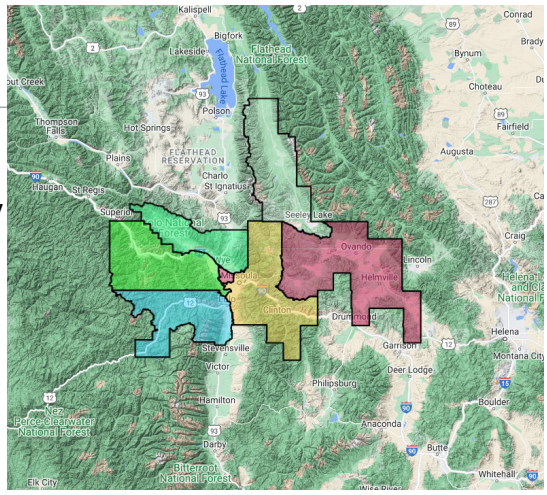
2

Who is MEC?

- Member owned electric cooperative founded in 1938
- Serving 6 counties in Montana and 1 county in Idaho
- Governed by democratically elected 7-member Board of Trustees
- 13,000 members and 16,000 meters
- 39 employees
- 2,000 miles of line
- 16 substations, 2 metering points



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3

Power Supply

- All-requirements customer of BPA
- BPA capacity largely fixed
- Tiered Rate System
  - Tier 1 – Percent allocation of BPA marketable power generation (95%+ carbon free)
  - Tier 2 – BPA makes market purchases to serve load above Tier 1 allocation. Pricing and carbon content less predictable.
- 3 Active Community Solar Programs

Bonneville POWER ADMINISTRATION

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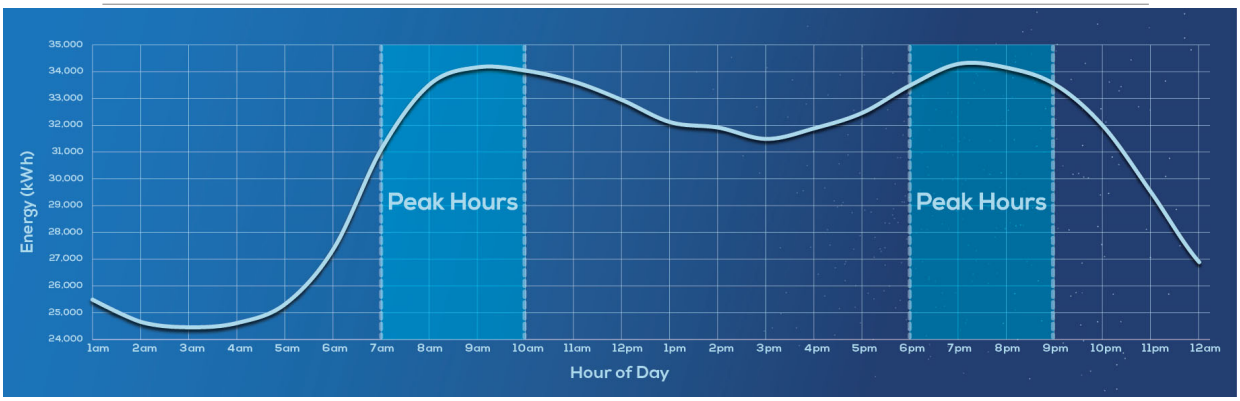
4

MEC System Loading



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5

Current EV Projects at MEC

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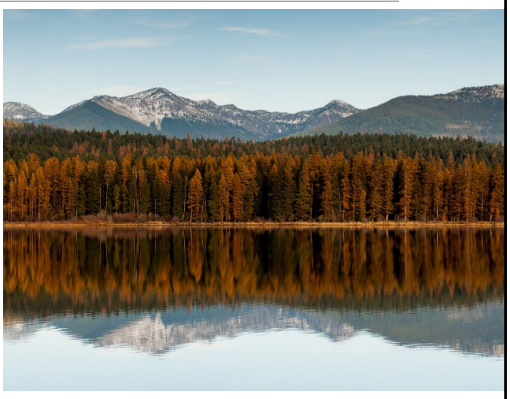
6

Seeley Lake Fast Charger

- All electric cooperatives follow the 7 Cooperative Principles. Co-op principle #7 is Concern for Community.
- Seeley Lake was identified as a destination location on Highway 83 between Glacier and Missoula.
- For MEC, it is an opportunity to provide a service for a new category of travelers passing through Seeley Lake and the greater Seeley and Swan Valleys.



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7

Seeley Lake Fast Charger

- Needed a location near local businesses. MEC owns property in Seeley Lake, although not close to downtown.
- Approached the Seeley Lake Community Foundation (SLCF) about locating the station on their property.
- The SLCF building is centrally located within a short walk to area amenities.
- Like MEC, SLCF is a community-based, community-focused entity with a mission and values consistent with the Cooperative's.
- The SLCF Board was very supportive of hosting the charging station to help serve a need that will benefit the community.

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8

Seeley Lake Fast Charger

Project funded by a Fast Charge Your Ride grant from DEQ. Grant requires:

- 50 KW DC fast charger => 140 to 180 miles of range per hour of charge.
- 15.5 KW level 2 charger for backup => 40 to 55 miles per hour of charge.

FAST CHARGE YOUR RIDE

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9

Seeley Lake Fast Charger

- Chose to work with ZEF Energy because of their history of collaborating with electric cooperatives.
- DCFC: Triton 50 KW Tritium Level 3 charger
- Backup Charger: ZEFNET Pro 15.5 kW level 2 dual-head charger
- Other Equipment: ZEF Mini Sub – capable of supporting up to 150 kW charger for future needs.

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10

Seeley Lake Fast Charger

- Another goal of the project was to obtain as much data as possible to understand the effects of rapid EV charging on our system.
- We want to avoid competing with other entities who wish to make a business of commercial charging stations.
- We must understand the implications of widespread rapid EV charging in order to create rate structures that collect the costs these units will create without cross subsidization.

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11

Managed Residential Charging

executive summary

Electric vehicles (EVs) are expected to continue their proliferation across all markets. With up to a 115% to 130% increase in electricity consumption among households with EVs, this represents a significant opportunity for electricity load demand increases in a market which has stagnated over the past several decades.[1]

To best prepare the region's Consumer-Owned Utilities (COUs) for this sea change, the Bonneville Environmental Foundation commissioned Energy and Environmental Economics, Inc. (E3), to conduct a cost-benefit analysis of EVs for load-following utilities in the Pacific Northwest (PNW). This report serves as a summary of that study's findings.

Managed charging is shown to be a significant benefits multiplier. As such, the companion planning guide to this this report, *PNW Consumer-Owned Electric Utility Strategies for the Rise of Transportation Electrification*, provides recommendations for ways in which COUs can begin developing and implementing their own managed charging program.

Further, the companion planning guide provides additional details on the current state of the electric vehicle ecosystem and its relevancy to COUs of the Pacific Northwest, and the benefits these technologies have for their customers, including those that are economic, social and environmental.

Using four PNW COUs as proxies, the study concluded:

In an **unmanaged charging** scenario, on average through 2030 Electric cars adopted are expected to create

$300 to $800

in net ratepayer benefits per vehicle.

In a **managed charging** scenario, on average through 2030 Electric cars adopted are expected to create

$830 to $1,000

in net ratepayer benefits per vehicle.

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12

Managed Residential Charging

- Residential EV charging will present the largest opportunity and potential challenge for rural electric cooperatives.
- MEC currently has just under 13,000 members-
  - If each member had just one EV charging with a 7.7kW charger, our system peak could increase significantly.
- Accommodating large amounts of charging will require leveraging the 9 hours of off-peak overnight charging.

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13

Managed Residential Charging

- MEC is currently testing a residential charging system for its members- full pilot launch in July .
- The pilot is limited to 100 participants, initially, to allow us to gather data and integrate the chargers into our meter data management system, billing system and member-facing account management site and app.
- Managed charging means the utility can offer rate discounts and incentives to our members to charge off-peak.

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14

Managed Charging Pilot

- Participating members must use the provided charger
- The Cooperative will furnish a ZEFNet 40, 32 Amp, level 2 smart charger.
  - The charger has built in revenue-grade metering.
  - Units allow lockouts to prevent on-peak charging- members can choose to override.
  - Members will likely have a monthly fee for the unit, and the Cooperative retain ownership.

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15

Managed Charging Pilot

What's in it for the member?

- Savings –
  - Participants will receive a reduced kWh charge for all charging taking place during off-peak hours.
  - Participants also avoid any kW charges attributable to charging, provided it takes place off peak.
- Speed – Level 2 chargers provide twice the range in the same amount of time as free 120V chargers.

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16

Managed Charging Pilot

What's in it for the Cooperative?

- Demand Management – The value of the program will be in shifting a demand-intensive load off our peak.
- Data – Cloud-based platform displays data on
  - Charge duration, number of sessions, time of use, instantaneous peak and more.
- Trends– Providing members with the means to charge helps us understand the pace of EV adoption so we can plan for future capacity concerns.

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17

Managed Charging Pilot

How much is 7.7kW?

		
State of charge	20%	80%
kWh in battery	12 – 20 kWh	48 – 80 kWh
kWh needed	36 – 60 kWh	
Time needed	5 – 8 Hours	

36 - 60 kWh corresponds to 140 - 200 miles of driving. For many, this could represent a week or more of driving.

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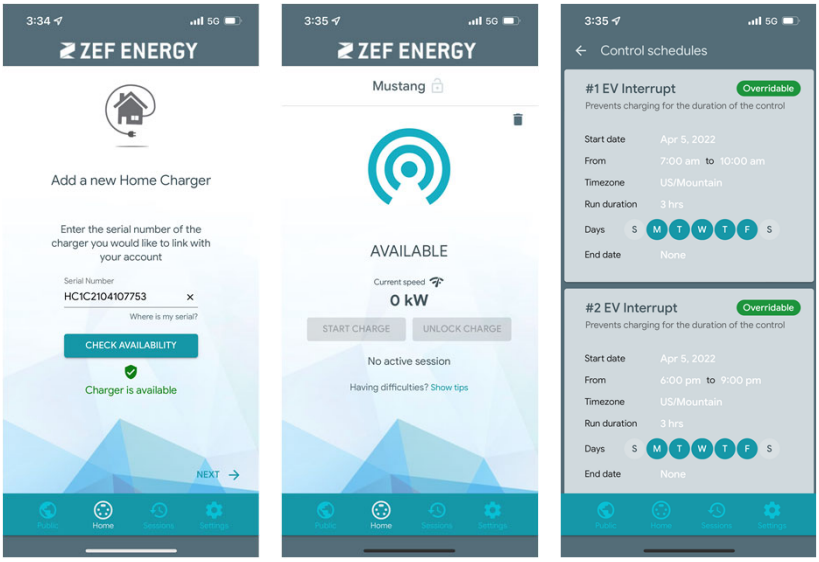
18

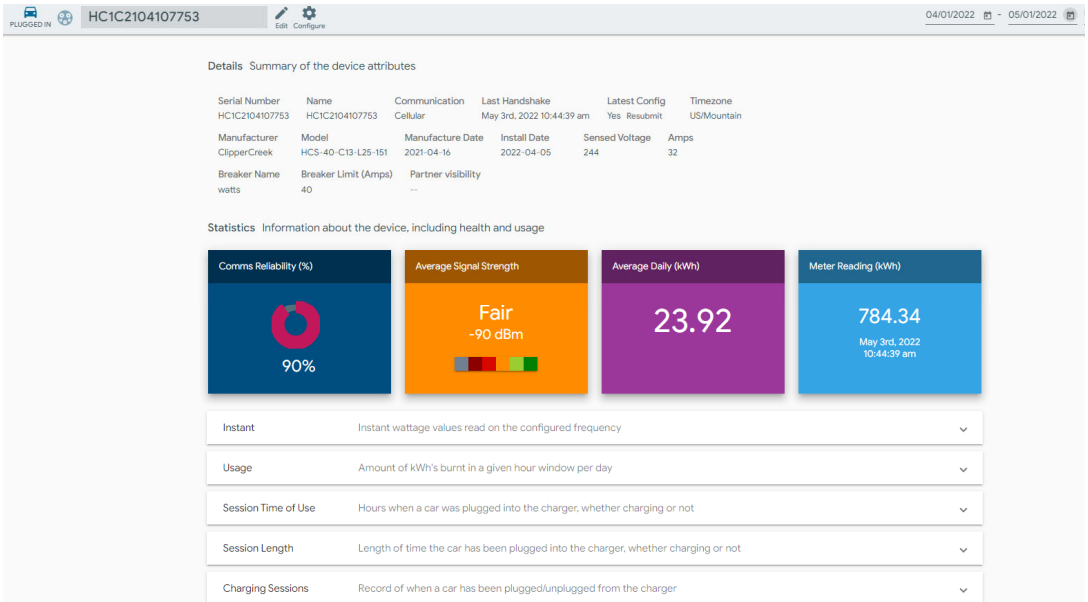
Managed Charging Pilot

- Members interface with their charger(s) through a smartphone app.
- Members are given ability to override charging lockouts in the event of a need to charge.
- Members pay full retail kWh and higher KW charge on peak.



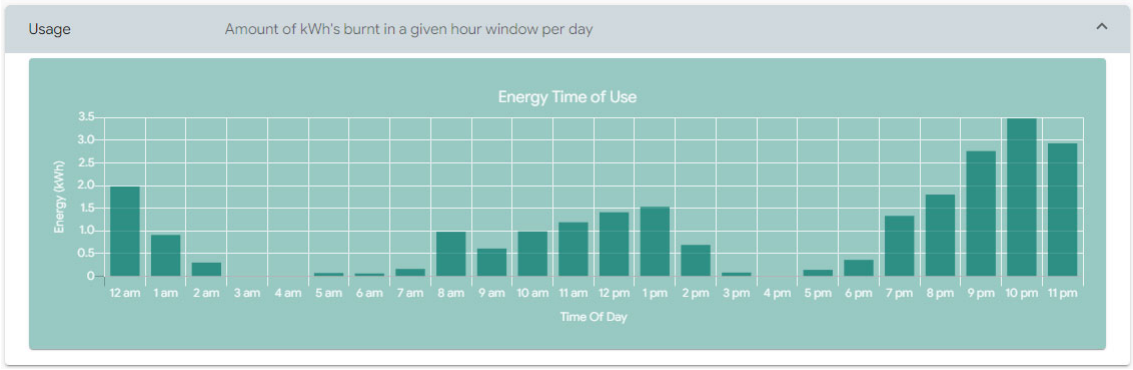
19

Managed Charging Pilot



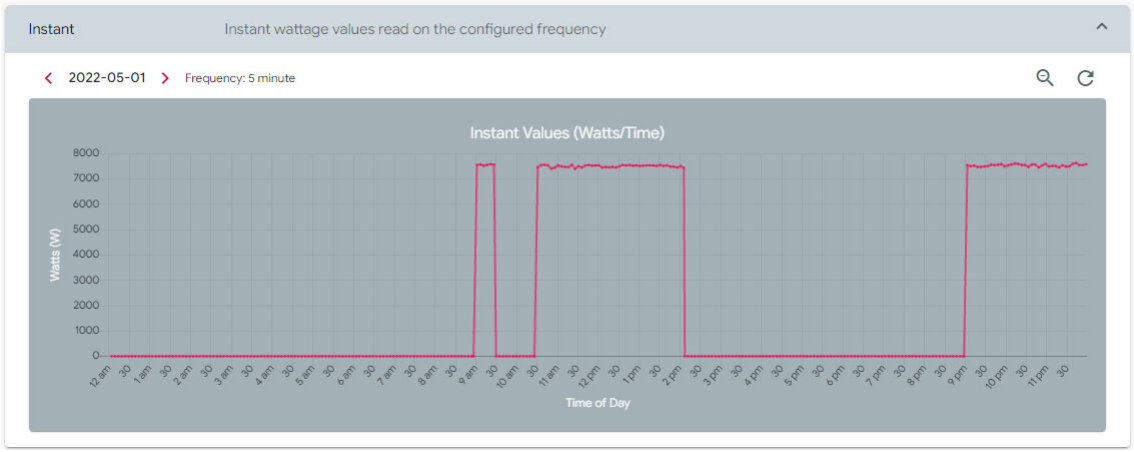
20

Managed Charging Pilot



21

Managed Charging Pilot



22

Managed Charging Pilot

Challenges and Opportunities

- Increased kWh sales during overnight hours when usage typically drops.
- Increase relevance with members as they connect driving with their power provider.
- Not all electrical services will support two 7.7KW chargers – could max out a standard 15KVA residential transformer.
- Not all members will choose to participate

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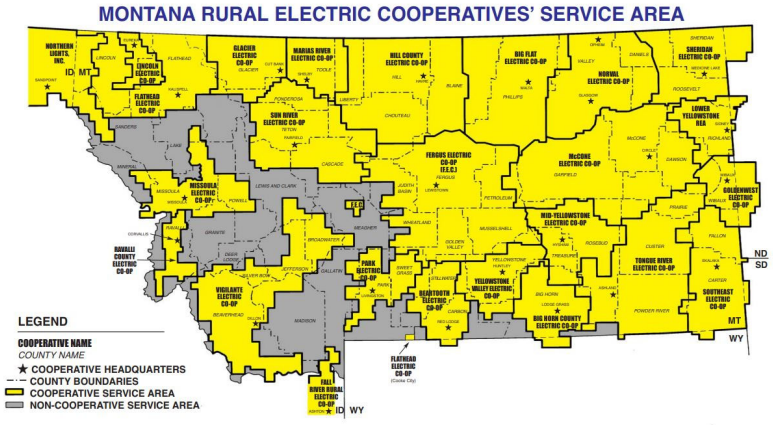
23

EV Infrastructure in Rural Montana



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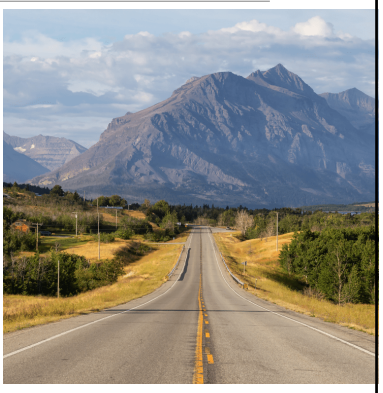
24

The Opportunity

- In 2019 – Motorists drove 3.276 billion miles on Montana's 3 interstate highways.
- The average EV today uses .27 - .36 kWh per mile.
- To replace all interstate miles traveled with electricity as fuel would require 885 million to 1.18 billion kWh.
- Funding opportunities through Infrastructure Bill



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25

Considerations Going Forward

- Corridor Selection – making sure our rural communities are not left behind
- Distribution Infrastructure- Grant requirements of (4 x 150 kW) every 50 miles
- Questions around Road Tax Collection

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26

27

QUESTIONS?

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28