Missouri River Energy Services Members

North Dakota
Cavalier
Hillsboro
Lakota
Northwood
Riverdale
Valley City

South Dakota
Beresford
Big Stone City
Brookings
Burke
Faith
Flandreau
Fort Pierre
Pickstown
Pierre
Vermillion
Watertown
Winner

Minnesota
Adrian
Alexandria
Barnesville
Benson
Breckenridge
Detroit Lakes
Elbow Lake
Henning
Hutchinson
Jackson
Lake Park
Lakefield

Iowa
Alton
Atlantic
Denison
Hartley
Hawarden
Kimballton
Lake Park
Manilla
Orange City

Paullina
Pella
Primghar
Remsen
Rock Rapids
Sanborn
Shelby
Sioux Center
Woodbine
Vision/Goals of EV Program

- Increase electric sales that are economically beneficial to our members and MRES;
- Enhance the utilization of the electric system while maintaining its integrity;
- Educate customers and supporting their needs and preferences; and,
- Impact the environment in a positive manner.
EV Program Development

- Economics & Incentives
- Technology
- Implementation & Education
Economics & Incentives
BEV & PHEV sales projections in MRES service territory
Cumulative BEV & PHEV sales range in MRES service territory
Home charging load characteristics

• Annual energy usage: 3,500 - 4,500 kWh (water heater)
• Demand: 1.5 - 11 kW
• Load factor: 4 – 33 percent
• Low load factors could also result in lower coincidence with system peaks.
• $1,200 NPV lifetime benefit to MRES for each residential customer who switches to an EV
• $285 million lifetime NPV benefit to MRES if all residential customers convert to EVs
• EV adoption within MRES territory is projected to be slow; substantial benefits may take time
Electrification impact on members

• Member rates based on average power costs
• Additional utility revenues often less than incremental power costs
• Key factor: **coincidence with system peak demands**
  • Load growth may or may not increase utility income. **Off-peak growth is best.**
  • Load reductions may or may not reduce utility income. **On-peak reductions are best.**
# Managing residential charger demand

<table>
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<th><strong>Customer Education</strong></th>
<th>Educate customers about utility impacts. Leverage relationships.</th>
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<td><strong>Time-of-use Rates</strong></td>
<td>Charging-only or whole-house (AMI)</td>
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<td><strong>Control through Charger</strong></td>
<td>Customer inconvenience</td>
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<td><strong>Traditional Load Management</strong></td>
<td>Additional wiring/metering cost</td>
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<td></td>
<td>Customer inconvenience</td>
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Member impact variables

- Retail energy rates
  (7.5 to 11.5 cents)
- System peak times
- Transmission rates
  ($5 - $12 / kW)
- Mix of charger demands and load diversity
Annual member impact per EV

- **Worst Case**: Regular rates; 50% on-peak
  - Up to $500 loss
  - $20 - $70 gain

- **Mid Case**: Off-peak rates; 100% off-peak
  - Up to $250 gain

- **Best Case**: Regular rates; 100% off-peak
  - $175 - $350 gain

- **Most Likely Outcome for most members**: Up to $250 gain
  - Up to $250 loss
Technology
What do we want in a charger?

- Easy to use customer phone app and web portal
- Reliable
- Good company reputation and likelihood of survival
- Acceptable pricing
- Service / maintenance availability
- Utility web portal
  - 15-minute sub-metering data
  - Variable load-control capability
  - Reasonable monthly fees
The winner: ChargePoint
The winner: ChargePoint

• Residential Wi-Fi connected charger:
  • Alexa compatibility
  • Customer portal
  • Utility portal with sub-metering
  • ENERGY STAR-certified
  • Variable load control capabilities
• Approximately $599/residential unit
ChargePoint utility portal

SMART CHARGING

1. Provides 360° view of charger utilization
2. Interval Level Data
3. Manage load via demand response or power sharing
4. Automate load management and data retrieval via standards based interfaces

- 15 minute clock aligned data via secure encrypted tunnel
- Load management capabilities

API for utilities

openADR ALLIANCE
ChargePoint utility customers

- Alliant Energy
- **Austin Energy**
- ComEd
- **CPS Energy**
- Consumer's Energy
- Duke Energy
- Enmax
- Florida Power & Light
- Georgia Power
- Kansas City Power & Light
- Madison Gas & Electric
- National Grid
- **Orlando Utilities Commission**
- Ontario Power Generation
- Portland General Electric (PGE)
- Tampa Electric (TECO)
- **Nebraska Public Power District (NPPD)**
- **Omaha Public Power District (OPPD)**
- And many more...
ChargePoint customer portal

https://www.youtube.com/watch?v=unysGieBEjM

Driver Mobile App- Class Leading Functionality

**Access to Stations**
- Find Available Stations
  - Real-time info and universal map
- See Station Pictures
  - User photos make finding stations easier
- Navigation
  - Seamless integration into iOS and Android maps

**Tools for Drivers**
- Get Driver Tips
  - Arrive equipped with best practice advice from other drivers
- Tap to Charge
  - Access station with phone (no physical card needed)
- Payment Sources
  - Compatible with Apple Pay, PayPal, and credit cards
Public Level 2 AC Charging

- ChargePoint CT4000 Series Dual Station
- 25 miles of Range Per Hour
- Pricing:
  - $2,750 per year, 3-year “As A Service” contract
  - $2,400 per year, 5-year “As A Service” contract
- Hedge against technology changes
ChargePoint DC fast-chargers (DCFC)

- Express 250 – 62.5 kW
  - 250 Miles of Range Per Hour
  - Priced at $38,760
    - + Cloud Plan $470 / year
    - + Assure Plan $3,700 / year
    - Can pair 2 for 125 kW output for 800v, 80 kW for 400v.
Implementation & Education
Home charger program overview

• $500 incentive for ChargePoint HOME (Level 2)
  • Customer must own or lease EV (BEV or PHEV)
  • One rebate per EV per charger
  • Must connect charger to ChargePoint via Wi-Fi and allow ChargePoint to provide data to utility and MRES
  • Commercial customers eligible under same criteria
  • Member may adopt TOU rate or load-control incentive

• $50 incentive for Level 1 or other chargers with survey
Residential/commercial customer process

1. Purchase EV Charger
2. Install Charger & Connect to ChargePoint via Wi-Fi
3. Complete Incentive Application
4. Receive Rebate
Member public charger overview

**Option 1: ChargePoint-as-a-service**
- $3,000 incentive for CT4000
- Min. 3-year subscription
- One rebate per utility

**Option 2: DC Fast (DCFC) Chargers**
- Incentive: 50 percent of cost up to $15,000*
- Min. 50 kW
- Share data with MRES via web portal if available
- One rebate per utility

*Total cost does not include distribution upgrades.*
Member public charger process (ChargePoint only)

1. Contact MRES to discuss options
2. MRES will make initial contact with ChargePoint
3. Install charger and connect to ChargePoint
4. Receive Rebate
Member marketing support

- ChooseEV Website
- Traditional marketing
- Social Media
- ChargePoint materials
- MRES PHEV
- Dealer one-on-one visits
- Ride & Drives
- Home shows, presentations, school events
Electric Vehicle Facts

There are various electric vehicle (EV) types available; these are the three most common types:

**Battery Electric Vehicles (BEV or AEV)**

Battery Electric Vehicles have a battery and an electric motor instead of a gas tank and an internal combustion engine. Sometimes EVs are also referred to as "All Electric Vehicles" or "Plug-in Vehicles" (not to be confused with Plug-in Hybrid Electric Vehicles). They run entirely on electricity and do not produce any exhaust from the burning of fuel.

**Plug-in Hybrid Electric Vehicles (PHEV)**

Plug-in Hybrid Electric Vehicles have an electric motor AND a gas-powered internal combustion engine. Some PHEVs operate exclusively, or almost exclusively, on electricity until the battery is nearly depleted, then the gasoline-powered engine turns on to provide power. Like Battery Electric Vehicles, PHEVs can be plugged in to charge the battery when the vehicle is not in use.
Future considerations

- Time-of-use rates
- Dealer engagement
- Workplace charging
- Electrifying fleet vehicles
- Electrifying buses
- Grid impacts
Questions?