# Electric Vehicles as Part of Beneficial Electrification

Keith Dennis

Vice President, Consumer Member Engagement, BTS

NRECA
America's Electric Cooperatives

# Overview – What is Beneficial Electrification


Video available at: www.beneficialelectrification.com

NRECA
America's Electric Cooperatives

# What is “Beneficial Electrification?”

Beneficial Electrification includes the application of electricity to end-uses where doing so satisfies at least one of the following conditions, without adversely affecting the others:

- Saves consumers money over time;
- Benefits the environment and reduces greenhouse gas emissions;
- Improves product quality or consumer quality of life;
- Fosters a more robust and resilient grid

Beneficial Electrification programs are a valuable opportunity to engage both electric utilities and environmental groups in the effort to identify solutions that work well for the end-use consumer, local communities and the environment.

NRECA America’s Electric Cooperatives

***NOT an “Electrify Everything” Concept***

# Interests are Beyond Just EVs


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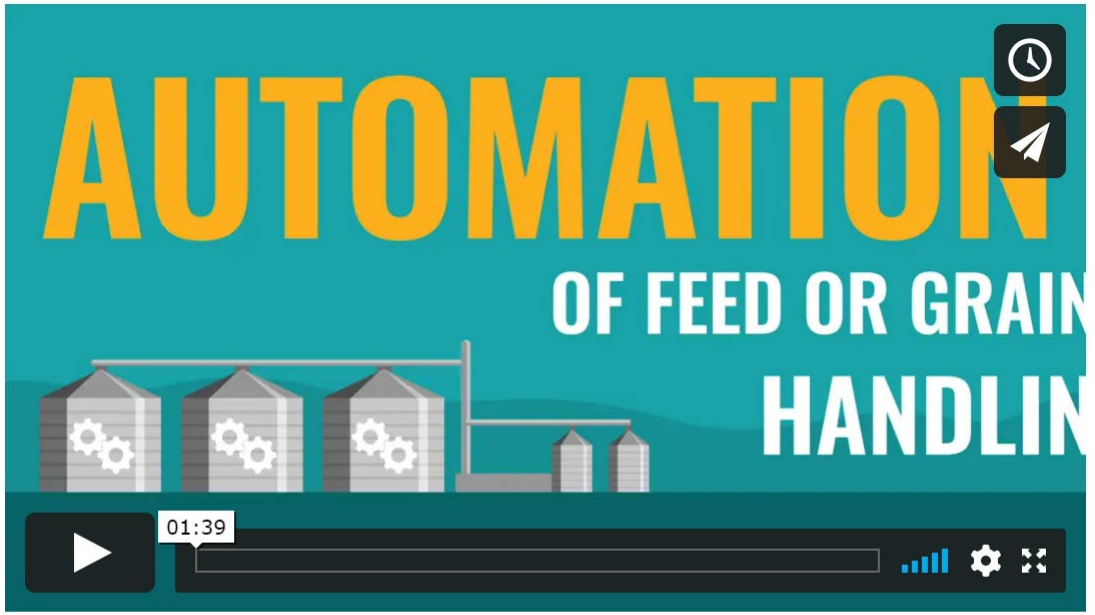
# Consumer Videos / Messages


**Electrify Your World!**

An animated video that discusses the benefits of choosing electricity to power your everyday life, from your home, to your car and even your lawn equipment.

August 2020




**For Businesses – Choose Electricity!**

An animated video that discusses the benefits of electrifying businesses, from cost savings to performance improvements and meeting environmental and sustainability goals.

August 2020

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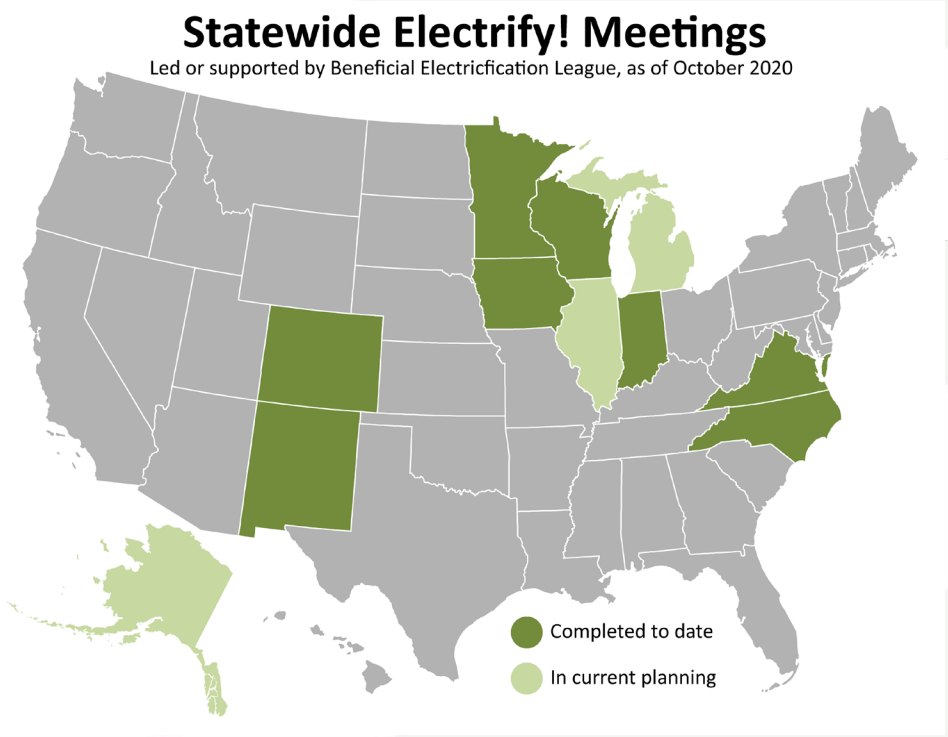
# Electrify! Events

- We have partnered with BEL and NRECA statewide members to hold events in six states (Electrify MN, NC, CO, WI, IA, IN, VA, NM). AK, Planned.




ELECTRIFY! VIRGINIA

ELECTRIFY! ALASKA

Electrify MN Event – Nov 28, 2018

# Recent NRECA EV Reports (cooperative.com)

- Consumer Expectations of the Electric Vehicle Owners
- Electric Transit Buses 10 Things to Consider When Preparing to Plug In Your Municipal Transit Bus Fleet
- Electric Cooperative Load Growth to Accommodate a Migration to Electric Vehicles
- Electric Vehicle Service Equipment Load Control Case Studies
- Viable Fuel Alternatives to Class 7/8 Diesel Trucks

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# Recent EV NRECA Reports (cooperative.com)

- Rate Options That Support Electric Vehicle Adoption
- Preparing To Plug In Your Fleet 10 Things to Consider
- Electric Trucks Where They Make Sense
- Medium-Duty Electric Trucks Cost Of Ownership
- Charging Infrastructure for Electric Trucks
- Gearing Up for Electric Vehicles: Residential EVSE Program Design for Co-ops

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# NRECA EV Services


NRECA
America's Electric Cooperatives

# Further Contact Information

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Co-Chair of the Beneficial Electrification League

NRECA
America's Electric Cooperatives

# Clean Cities Overview

October 20, 2020

Linda Bluestein, Clean Cities Co-Director And Vehicle Technology Manager

U.S Department of Energy

**CLEAN CITIES COALITION NETWORK**

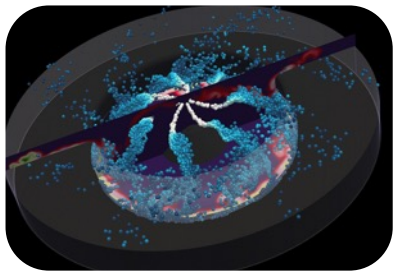
# How Do Clean Cities Coalitions Fit Within DOE?

## Vehicle Technologies Office

Batteries and Electrification

Materials Technologies

Energy Efficient Mobility Systems



Advanced Engine and Fuel

**Technology Integration**

**VTO develops advanced transportation technologies to:**

- ✓ Improve energy ***efficiency***
- ✓ Increase domestic energy ***security***
- ✓ Reduce operating ***cost*** for consumers and business
- ✓ Improve global ***competitiveness*** of U.S. economy

# Technology Integration Program

Provide objective/unbiased data and real-world lessons learned that inform future research needs and support local decision-making

# Clean Cities Coalition Network

Building partnerships to advance affordable, domestic transportation fuels and technologies

**Clean Cities Coalitions:**

- Serve as forums for local stakeholders to connect and collaborate on saving energy and using affordable alternative fuels
- Provide grassroots support and resources on new transportation technologies and infrastructure development
- Support networks to help their stakeholders identify cost-effective solutions that work locally

# Clean Cities Portfolio

**Light-, Medium-, and Heavy-Duty Vehicles**


**Alternative and Renewable Fuels and Infrastructure**

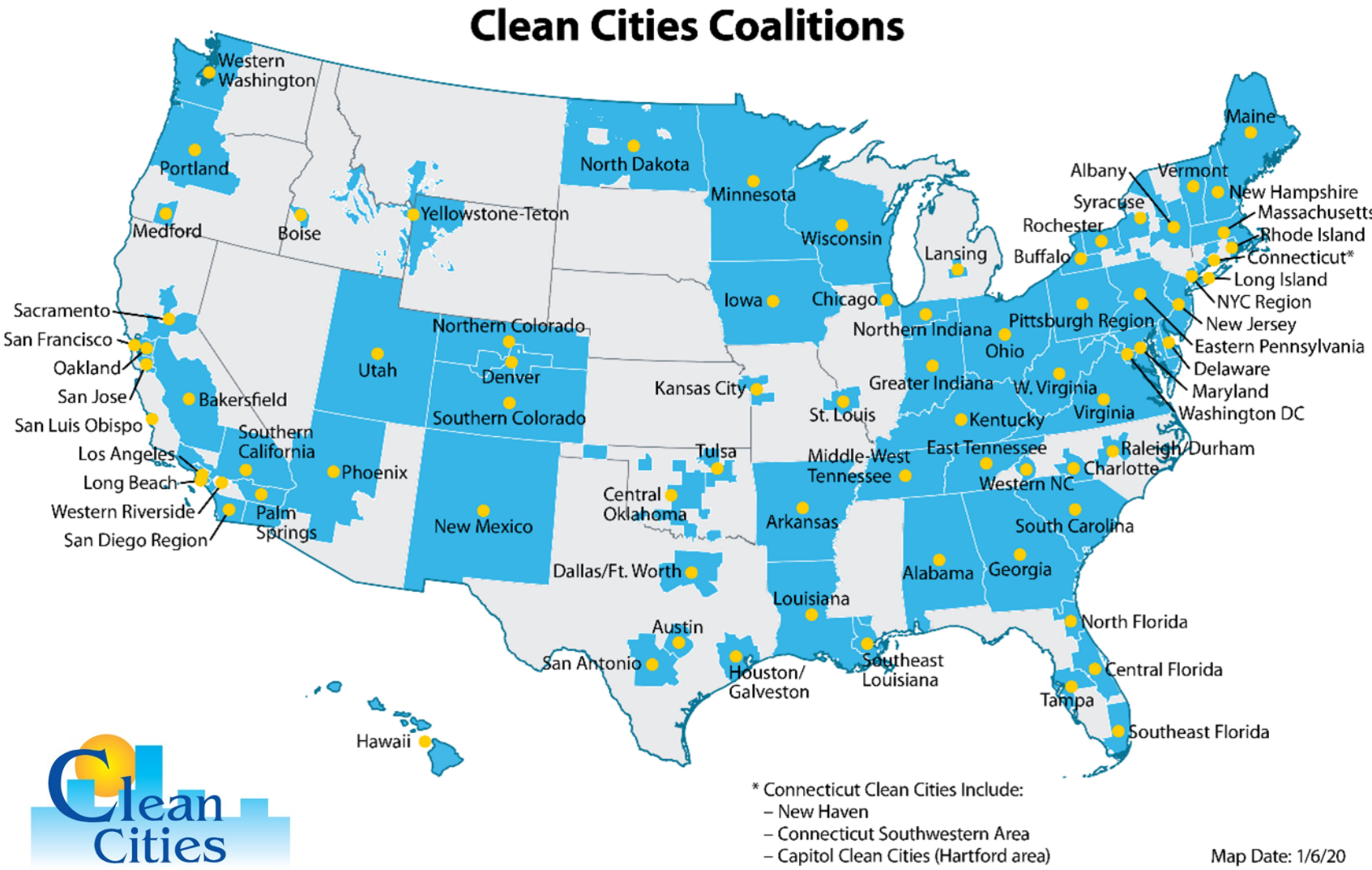

**Idle Reduction Measures and Fuel Economy Improvements**

**New Mobility Choices and Emerging Transportation Technologies**

# National Network of Clean Cities Coalitions

Nearly 100 Clean Cities coalitions with thousands of stakeholders, representing ~80% of U.S. population

**cleancities.energy.gov**



# Locally Based Public-Private Partnerships

- 16,000 stakeholders nationwide
- 43% private sector
- 57% public sector



# Diverse Stakeholders

**Fleets:**

- Private companies
- Federal, state, and municipal
- School districts, universities
- Airports, transit agencies
- Taxi companies, ride share services.

**Product and Service Providers:**

- Vehicle and engine manufacturing
- Conversion companies
- Vehicle dealerships
- Fueling equipment suppliers, installers, and providers.

**Others:**

- Environmental and energy agencies
- Alternative fuel and clean air advocacy organizations
- General public.

# Measuring Clean Cities Coalition Impact

Coalition projects have resulted in a cumulative impact in energy use equal to nearly **10 billion** gasoline gallon equivalents resulting from reduced fuel use and increased fuel diversity.[1]

Enough to drive the distance to the sun and back **1,175** times

Enough fuel to fill nearly **1.2 million** tanker trucks

**cleancities.energy.gov/coalitions**

Coalition projects have helped to put nearly **1 million alternative fuel vehicles** on the road.[2]

**96 million gasoline gallon equivalents** of energy were saved through fuel economy improvement projects like telematics, driver training, and outfitting fleets with idle reduction equipment.[2]

# National Partnerships: Clean Cities National Parks Initiative

Transportation projects educate park visitors on the benefits of shifting to affordable, domestic alternative fuels, advanced vehicles, and fuel-saving technologies.


**cleancities.energy.gov/national-parks**

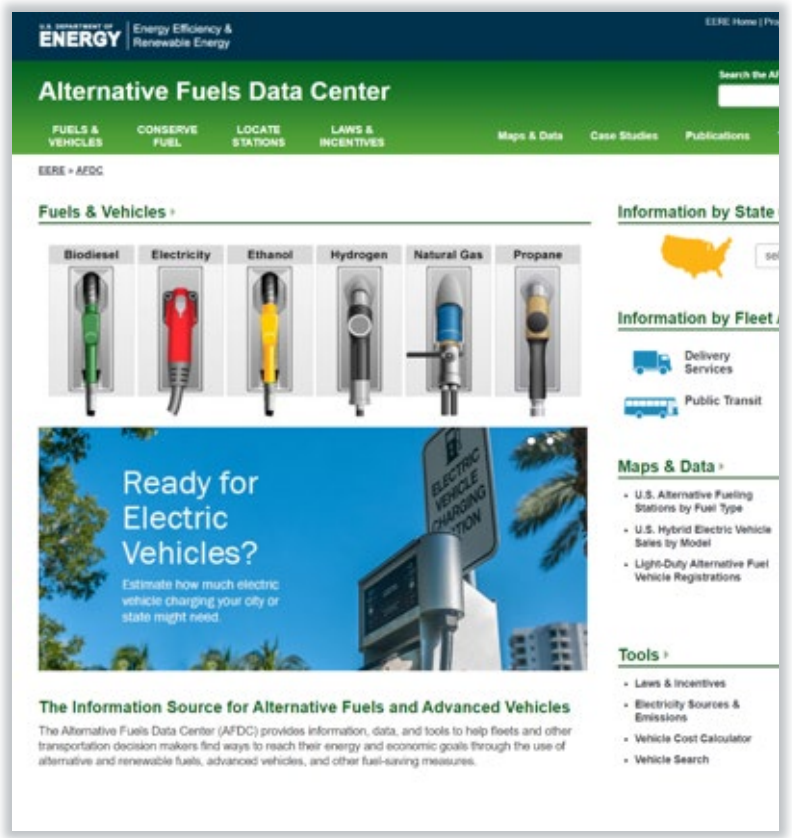

## Accomplishments

- ✓ 32 National Park Service units
- ✓ 20 Clean Cities Coalitions
- ✓ Over 84 million visitors reached annually
- ✓ Thousands of gallons of fuel saved
- ✓ Cleaner air across National Park System

# Building Relationships and Strengthening Markets

- Connecting fleets with fuel providers and industry partners
- Offering training and information
- Supplying access to technical assistance
- Identifying funding
- Providing public recognition
- Collecting data and tracking progress

# Information & Education: Websites




afdc.energy.gov


fueleconomy.gov

# VTO Tech Integration Competitive Project Funding

VTO has funded over **600 Technology Integration projects** and distributed over **$450 million** since 1993.

**Living Labs for Energy Efficient Transportation**

**AFV Adoption Through Partnerships**

**AFV Safety Training**

**Rural New Mobility Solutions**

**PEV & Gaseous Fuel Vehicle Demonstrations**

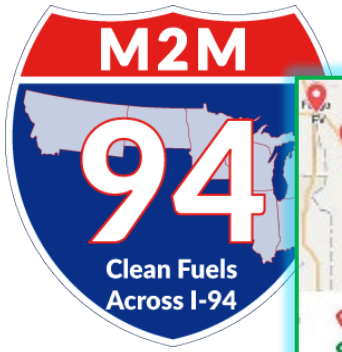
**AFV Data Collection and Analysis**

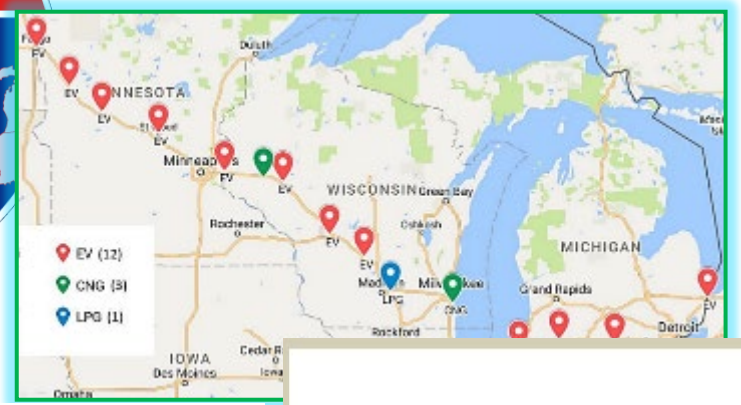
**cleancities.energy.gov/partnerships/projects**

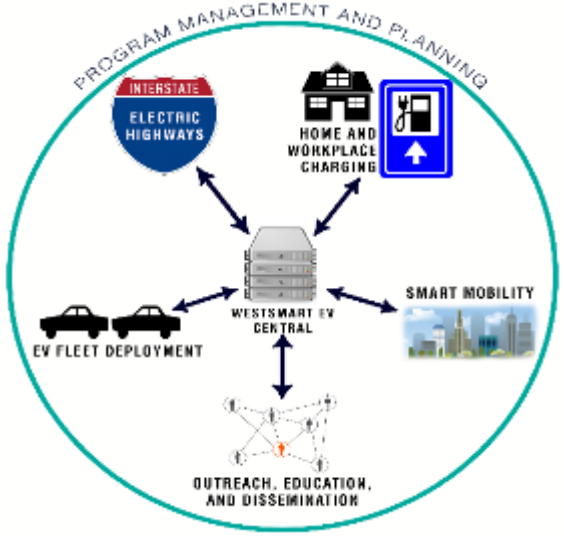
# Technology Integration Funding Opportunities

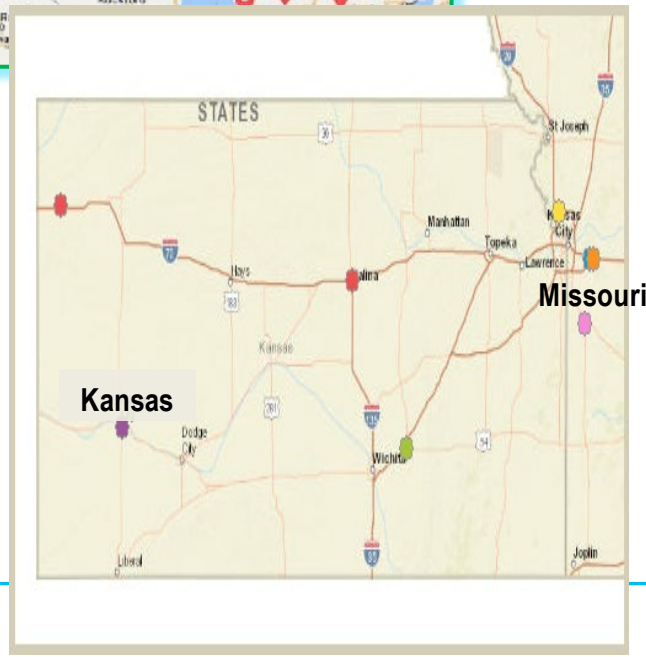
**Training – Experience/Education -- Safety -- Resiliency -- Infrastructure -- Living Labs**





# Summary of Projects Awarded for PEV Showcases FOA

## Midwest EVOLVE

**36 month project**
$1 million (DOE)
$1 million (cost share)

- American Lung Association of the Midwest (prime)
- 7 states, 8 Clean Cities coalitions, 5 utilities
- 200+ events

## Northwest Electric Showcase

**36 month project**
$1 million (DOE)
$1.2 million (cost share)

- Drive Oregon (prime)
- 2 states, 3 Clean Cities coalitions, 4 utilities
- Permanent showcase in Portland + mobile showcases

## Advancing PEV Adoption in New England

**36 month project**
$500k (DOE)
$500k (cost share)

- Plug In America LLC (prime)
- 4 states, 4 Clean Cities coalitions, 2 utilities
- 40+ ride and drive events

# Showcase Surveys

Online surveys were designed to be quick and consistent across events.

## Pre-drive Survey

**Incoming PEV sentiments:**

- **Comparison to traditional vehicles**
- **Willingness to consider purchasing**

Reasons (not) considering?

Prior PEV exposure?

Current vehicle habits:

- Purchase vs. lease
- Miles driven

Test-drive

## Post-drive Survey

**Sentiment changes?:**

- Comparison to traditional vehicles
- Willingness to consider purchasing

Reasons (not) considering?

~3 months later

## Follow-up Survey

**Sentiment changes?:**

- Comparison to traditional vehicles
- Willingness to consider purchasing

Reasons (not) considering?

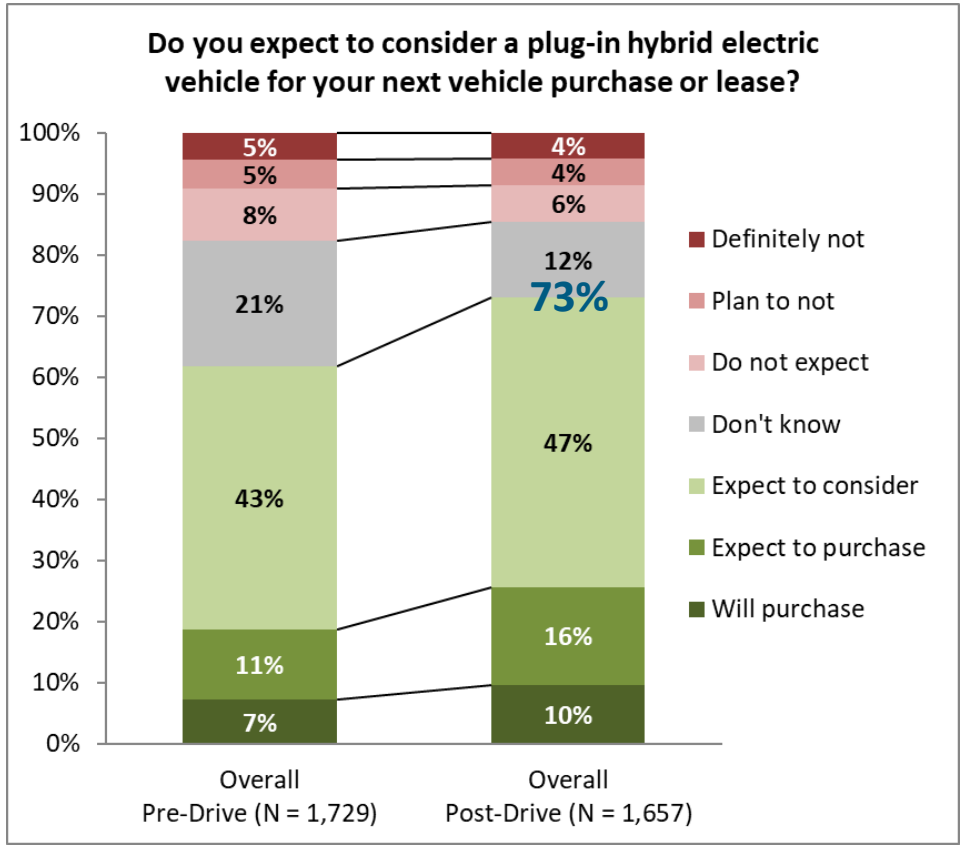
**Actions taken?**

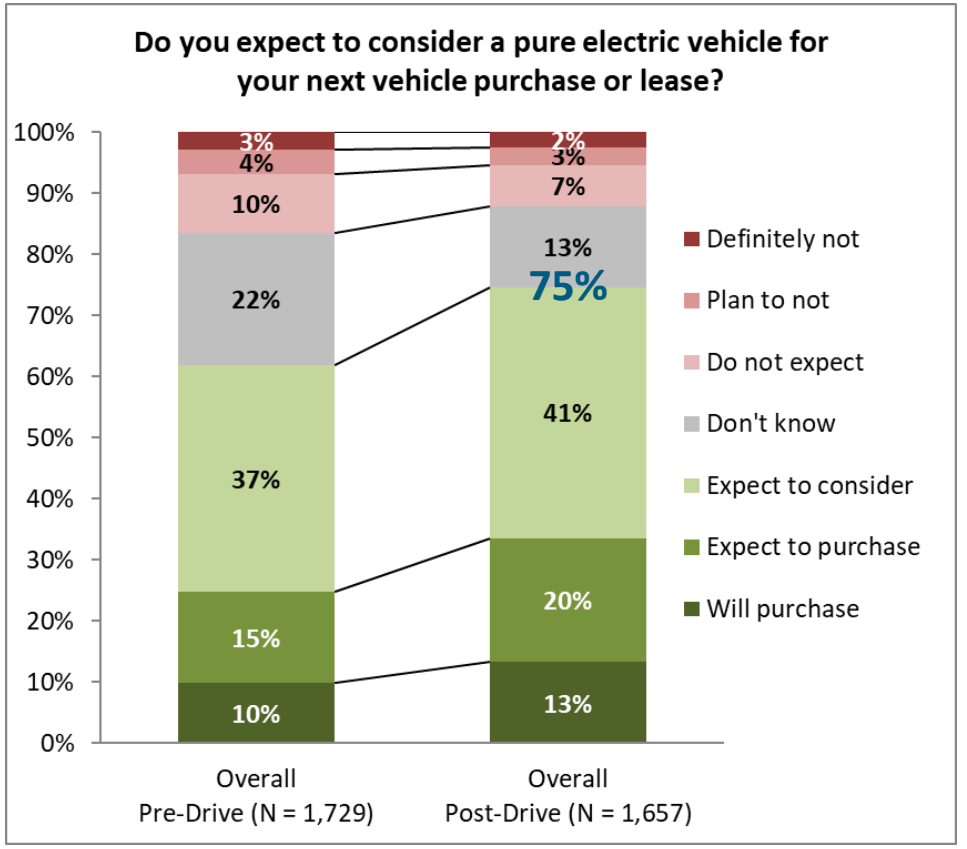
**If purchased, PEV habits?**

Note: Surveys approved by OMB

# Post-Drive Willingness to Consider

Respondents were more likely to consider a PEV after the event experiences.



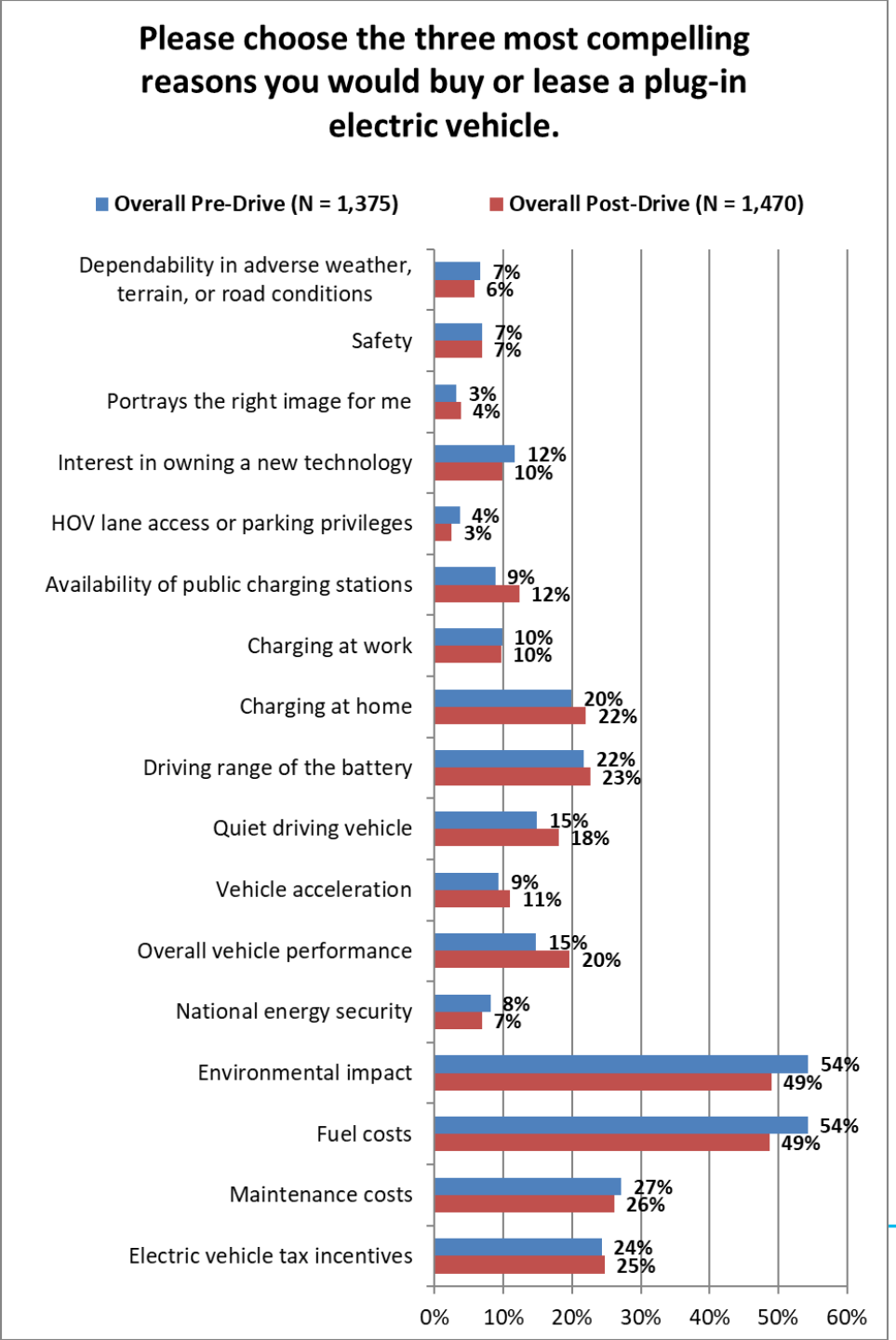




73% expect to consider a PHEV (up from 62%)

75%* expect to consider an AEV (up from 62%)

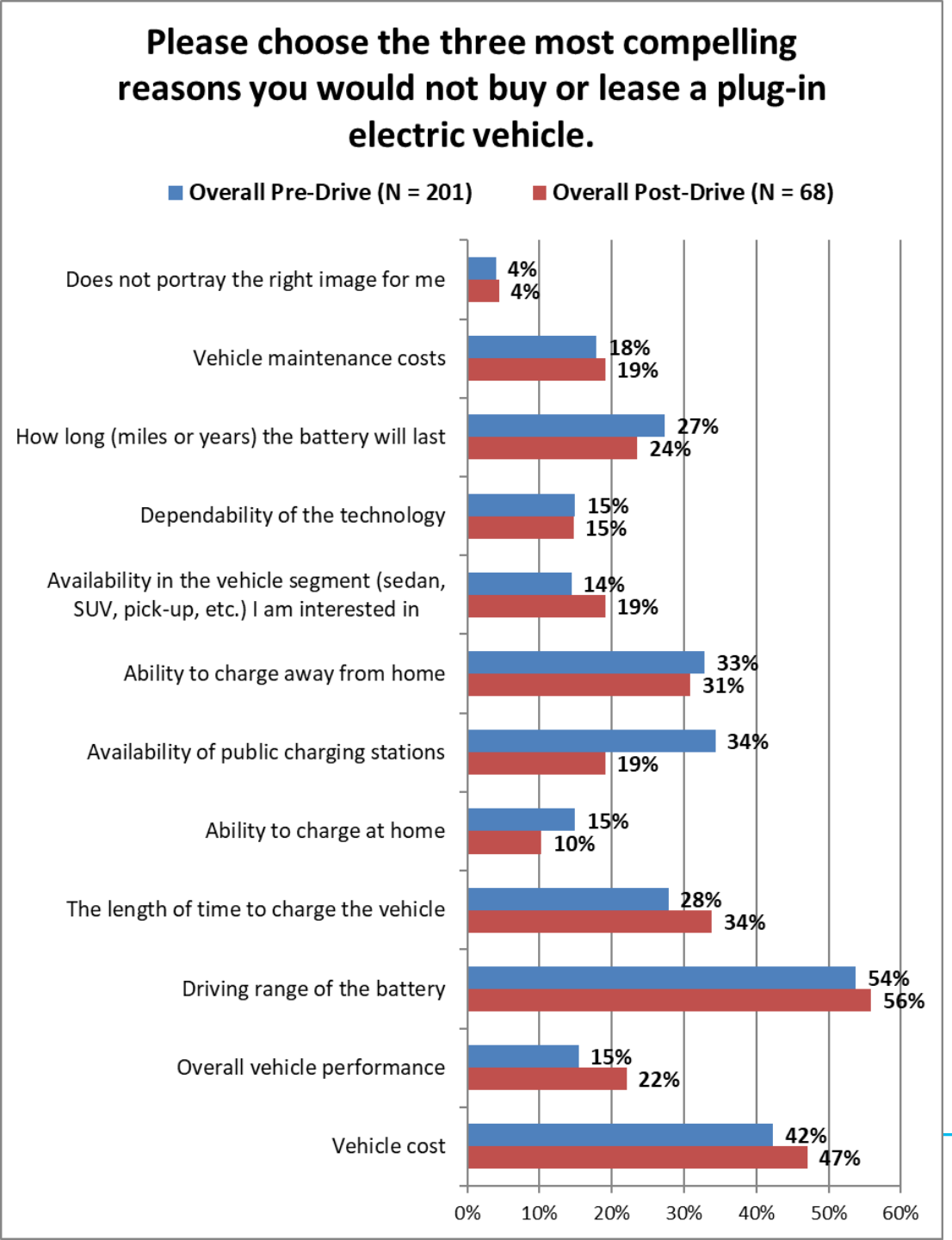
*note: rounding

# Reasons for Considering



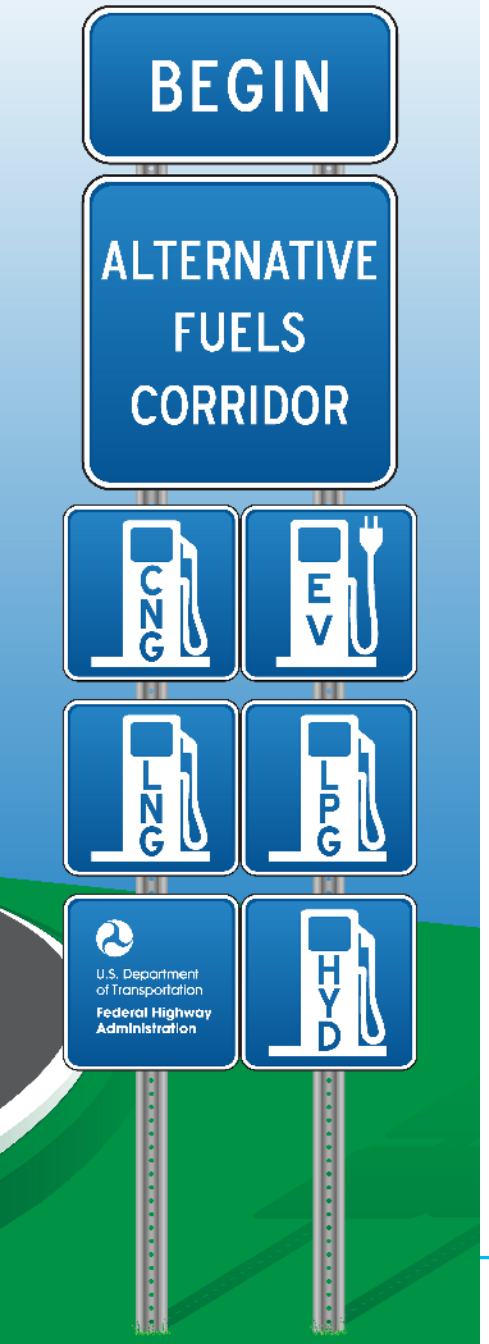

- The top reasons to consider PEVs did not change a lot between the pre- and post-drive surveys.
- Environmental impact and fuel costs were most often selected in both pre- and post-drive surveys.
- Vehicle performance categories increased importance.
  - Overall vehicle performance (5% increase)
  - Quiet driving vehicle (3% increase)
  - Vehicle acceleration (2% increase)
- Charging categories increased importance.
  - Availability of public charging stations (4% increase*)
  - Charging at home (2% increase)

*note: rounding




# Reasons for Not Considering

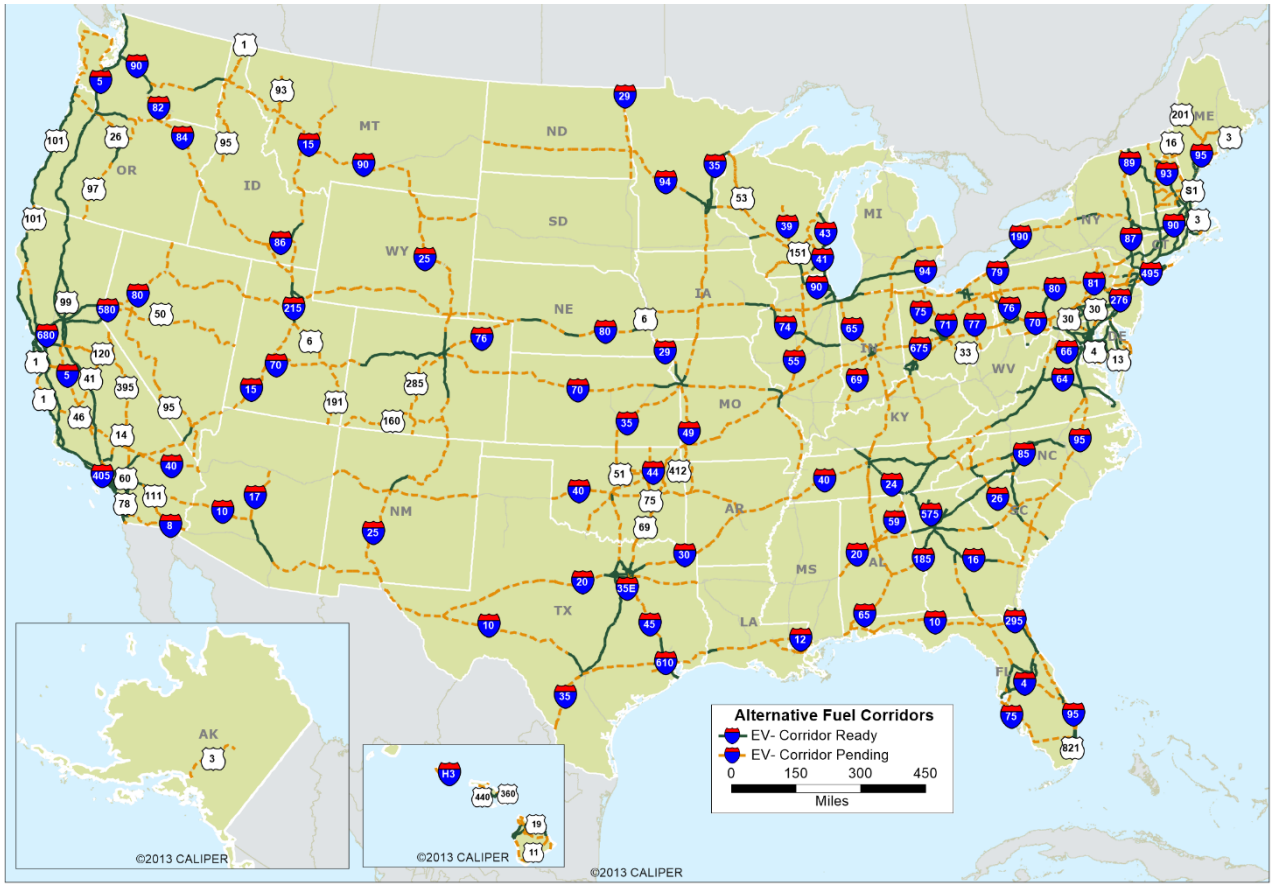
- Small numbers of respondents provided reasons to not consider a PEV.
- The top concerns were the driving range of the battery and vehicle cost.
- Charging options were important.
  - Ability to charge away from home.
  - Availability of public charging stations.
  - The length of time to charge the vehicle.
- Largest increasing concerns included:
  - Overall vehicle performance (7% increase)
  - Length of time to charge (6% increase)
  - Vehicle cost (5% increase)
  - Vehicle segment availability (5% increase)




# FHWA National Alternative Fuel Corridors

To improve the mobility of alternative fuel vehicles, the U.S. Department of Transportation has designated national corridors in strategic locations along major highways for:

- Plug-in electric vehicle charging
- Hydrogen fueling
- Propane (LPG) fueling
- Natural gas (CNG, LNG) fueling




EV Corridors: Rounds 1-4

# Workplace Charging Resources

**AFDC Workplace Charging for Electric Vehicles**
**(afdc.energy.gov/fuels/electricity_charging_workplace.html):**
Resources on planning, installing, and managing workplace charging

## Workplace Charging Toolkit
**(cleancities.energy.gov/technical-assistance/workplace-charging/):**

- Resources on organizing and executing successful and educational workplace charging events
- Best practices, lessons learned, tools, and templates
- Guidelines on administration, registration and liability, sharing, and pricing



# Contact Information

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# Electric Cooperatives and Clean Cities

Jeff Springer - Manager, Innovation and Efficient Electrification
Dairyland Power Cooperative

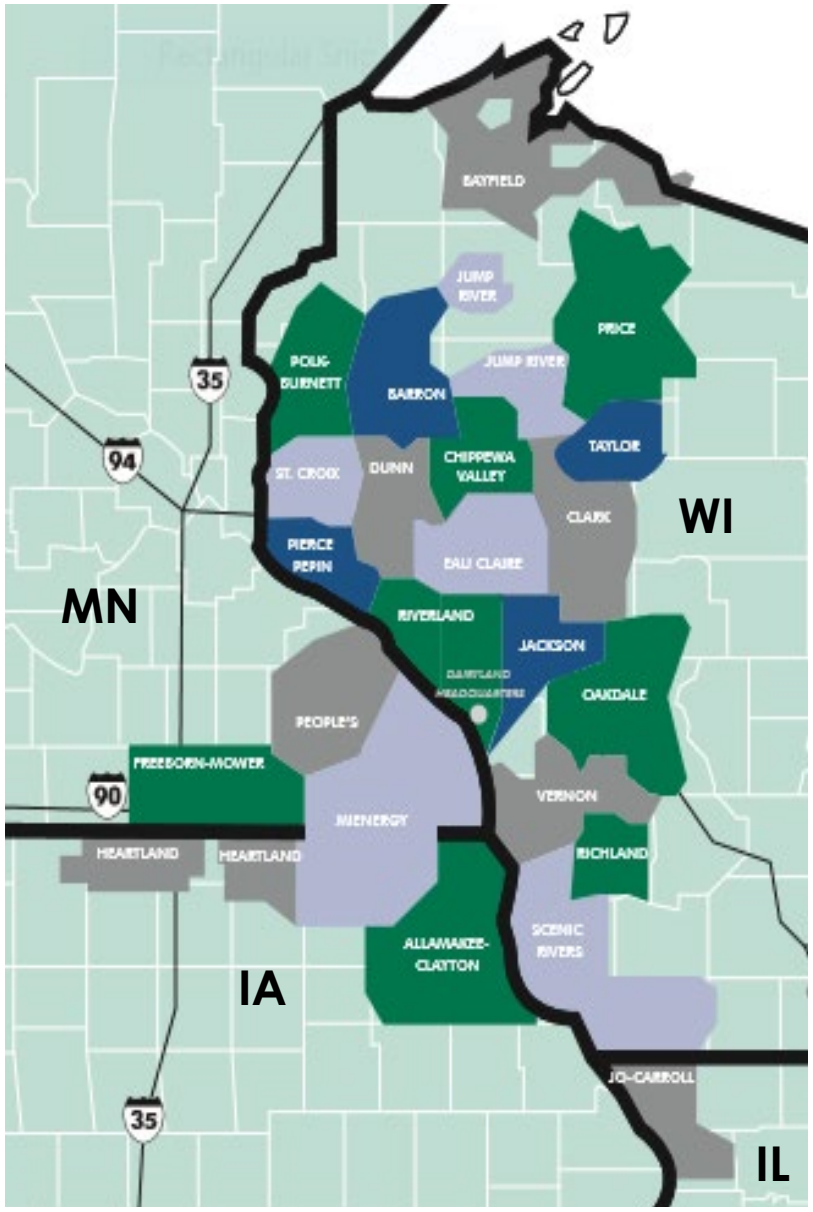
Lorrie Lisek – Executive Director
Wisconsin Clean Cities

DAIRYLAND POWER COOPERATIVE

A Touchstone Energy® Cooperative

October 20, 2020

# Dairyland Power Cooperative




- A Cooperative of Cooperatives
  - Providing generation and transmission to 24 distribution cooperatives located in four states
- These distribution cooperatives serve their retail members in the rural areas
- Most of the cities in our "footprint" are served by large Investor Owned Utilities
- Our cooperatives are located in, and around, the scenic vacation spots that people want to visit – with their electric vehicles



DAIRYLAND POWER COOPERATIVE

# How Clean Cities Helps Us

- Organizing Ride and Drive Events
- Providing brochures and information specific to our region
- Public education and advocacy
- Unbiased third party credibility
- Assistance with infrastructure projects




DAIRYLAND POWER COOPERATIVE


Getting Fast Charging
in rural areas…
…is like pulling hens teeth

# WI Clean Cities: Local Partnerships – Global Impact

- Statewide organization
- Public/Private Partnerships
- Over 38M GGE Petroleum Displaced in 2019
- 2019 Reduction in GHG Emissions 174,000 tons



***Since 2011, WCC has assisted in securing over $23M in funding for transportation projects.***







Multi Unit Dwelling EV Data Grant Program

NGV UP TIME – Natural Gas Project

**New Grant Funding in 2020:**
**DRIVE ELECTRIC WISCONSIN &**
**Helping America's Rural Counties Transition to Cleaner Fuels & Vehicles**

DAIRYLAND POWER COOPERATIVE

# It Takes a Coalition











DAIRYLAND POWER
COOPERATIVE

# The Results are Worth the Effort




DAIRYLAND POWER COOPERATIVE

# Enabling Clean Vehicles is the Icing on the

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www.wicleancities.org



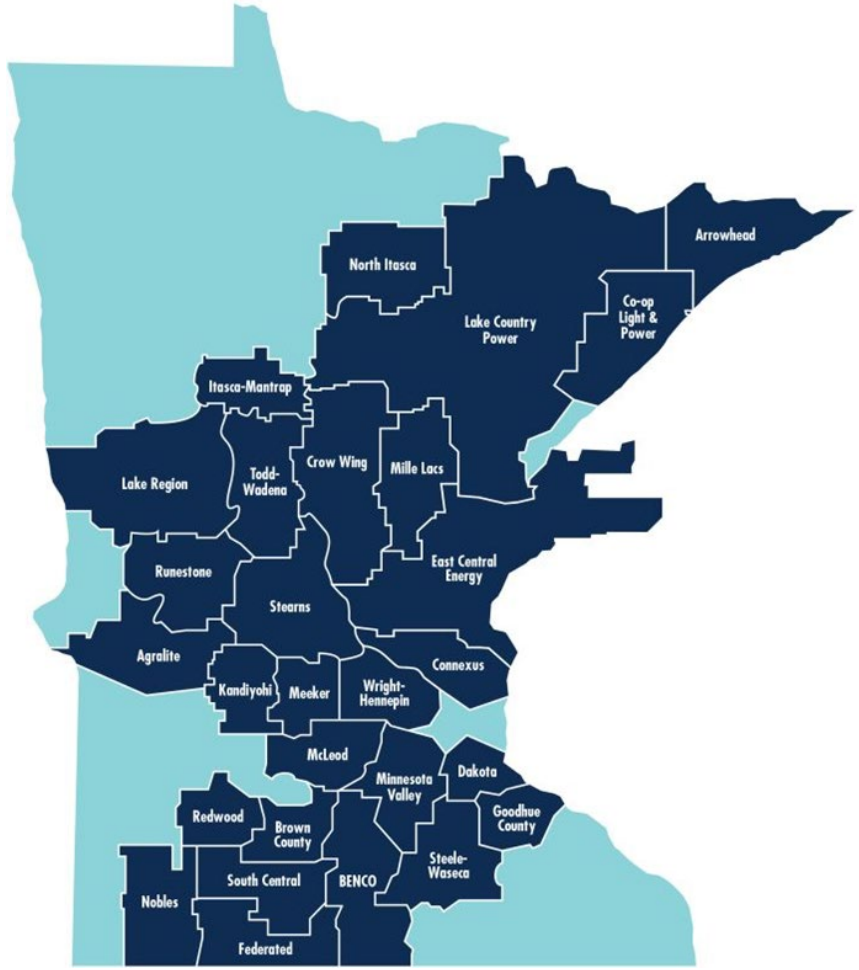
Confidential – Dairyland System

# Transportation Electrification

**David Ranallo**

dranallo@grenergy.com

# Great River Energy - member owners

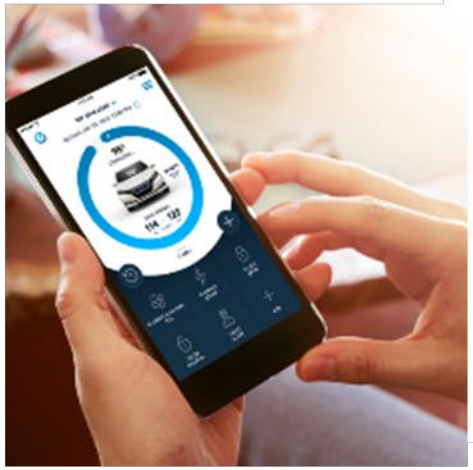


# EV Strategy


- Focus areas
  - Awareness
  - Infrastructure and smart charging
  - Retail solutions
  - Commercial applications

# Barriers for growth

GROW THE BUSINESS



Consumer awareness

Convenience of the technology (range and time)

Lack of infrastructure – perception?

Source: International Council on Clean Transportation

# Events

GROW THE BUSINESS

- Ride and Drives
- EV ‘Show and Tells’
- MN State Fair


# Revolt

GROW THE BUSINESS

GROW THE BUSINESS

# MPCA/VW battery electric school bus pilot

GROW THE BUSINESS

## ELECTRIC SCHOOL BUS GRANT OPPORTUNITY

Minnesota bus companies and the school districts they serve will soon have an opportunity to add an electric school bus to their fleets as the Minnesota Pollution Control Agency (MPCA) enters Phase 2 of its investments in programs to improve air quality, reduce pollution and move the state toward a cleaner transportation future.

The MPCA plans to invest a portion of the state's Volkswagen settlement funding into replacing traditional diesel-fueled school buses with battery electric school buses (BESBs) from 2020-23. Projects will be funded through a competitive grant application process.

**100 MILES**
ELECTRIC SCHOOL BUS RANGE

**66 MILES**
AVERAGE SCHOOL BUS ROUTE

### Why BESBs?

Currently, 95% of school buses on the road today run on diesel fuel. With concerns about air quality, local sources of pollution, carbon dioxide levels, and the high expenses associated with maintaining diesel engines, alternate solutions are being evaluated to make school busing cleaner and less expensive.

The purchase price of a BESB is considerably higher than a diesel bus; however, compared to diesel units, BESBs can achieve operational savings in both maintenance and fuel costs over the life of the vehicle. They also generate fewer greenhouse gas emissions and other pollutants, making them a good choice for the environment and children's health.

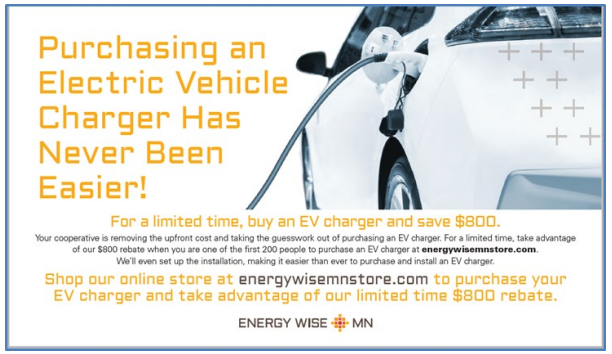
Other benefits include: stable "fuel" costs (electric rate), reduced sound pollution and a reduced lifetime carbon dioxide footprint. The vehicle can also be powered 100% by renewable wind energy and serve as an educational opportunity for the public, bus company, school district and participating electric cooperative.

*Great River Energy worked with its member-owner cooperative Dakota Electric Association and bus company Schmitty & Sons to bring Minnesota's first battery electric school bus into service in 2017. This three-year pilot program is designed to study the economic and emission benefits the bus provides, demonstrate battery electric technology in a cold-weather climate, and exhibit its performance on suburban and rural routes.*


# EVSE One-Stop-Shop promotion

GROW THE BUSINESS

- Offer details:
  - $700- $800 off of an EVSE at time of purchase
  - Connects participants with installation partners when requested




American Lung Association.

Clean Air Choice.

Twin Cities Clean Cities Coalition — The Alternatives Are Clear

# Building Partnerships to Meet Plug-In Electric Vehicle Goals!

October 22, 2020

Lisa Thurstin | Senior Manager

651.223.9568 | lisa.Thurstin@lung.org

# Projects, Programs and History Working Together

E85 Project | Clean Air Choice Program | TC4

Accelerating Alternatives for Minnesota Drivers (AAMD)

Michigan to Montana Clean Fuels Corridor Project (M2M)

Midwest Electric Vehicle Opportunities: Learning, eVents, Experience (Midwest EVOLVE)

Clean Air Choice.


Midwest EVOLVE™

MINNESOTA FARMFEST®

FLEXFUEL Up to 85% Ethanol

BIODIESEL® America's Advanced Biofuel


# Event Highlights

Chicago Auto Show-kickoff 2017


Mall of America Ride & Drive 2016

McLeod Coop 2019

Northtown Mall 2018

North Dakota EV Ride & Drive 2018


Albertville Mall first DCFC 2017

# Event Highlights



Alexandria, MN
Ribbon Cutting 2020

M2M 94 Clean Fuels Across I-94

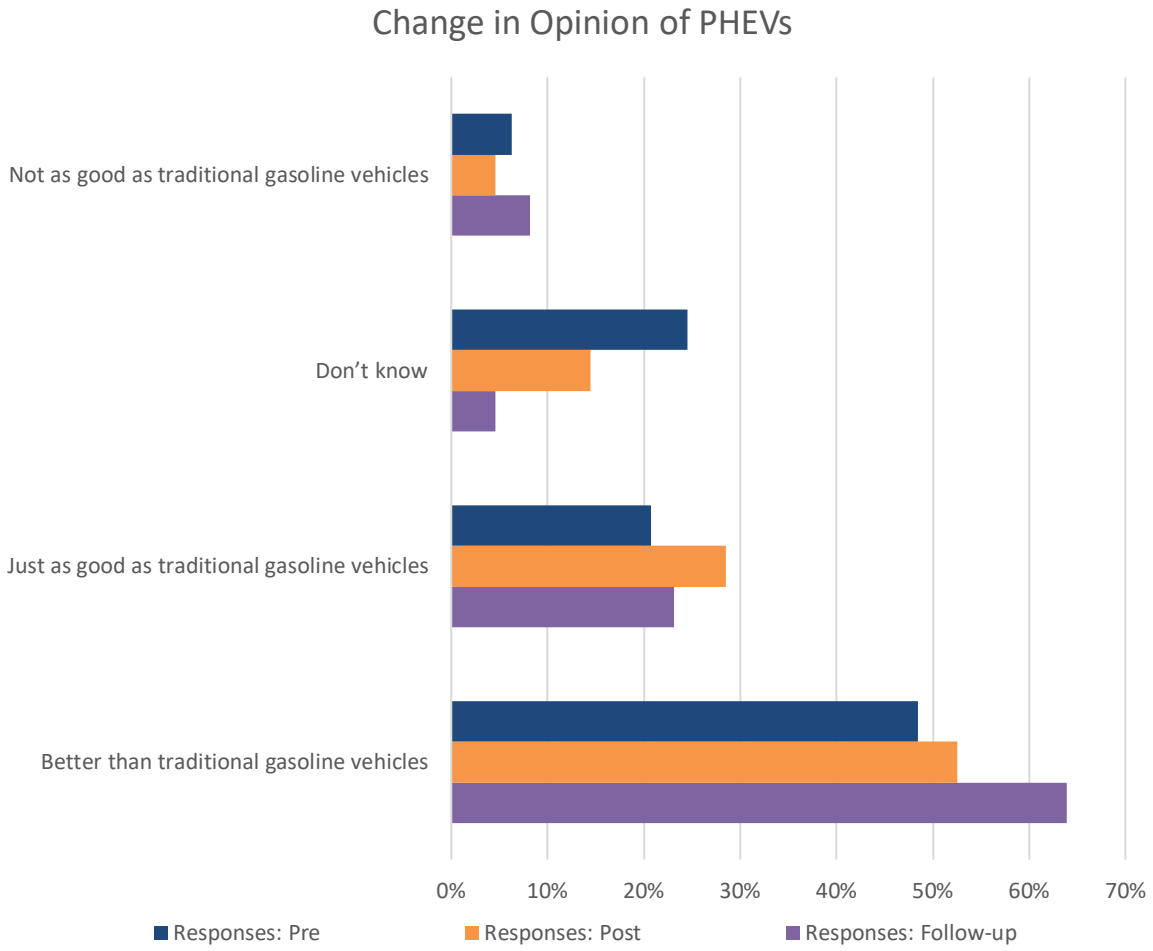
# Project Progress Collected and shared with partners

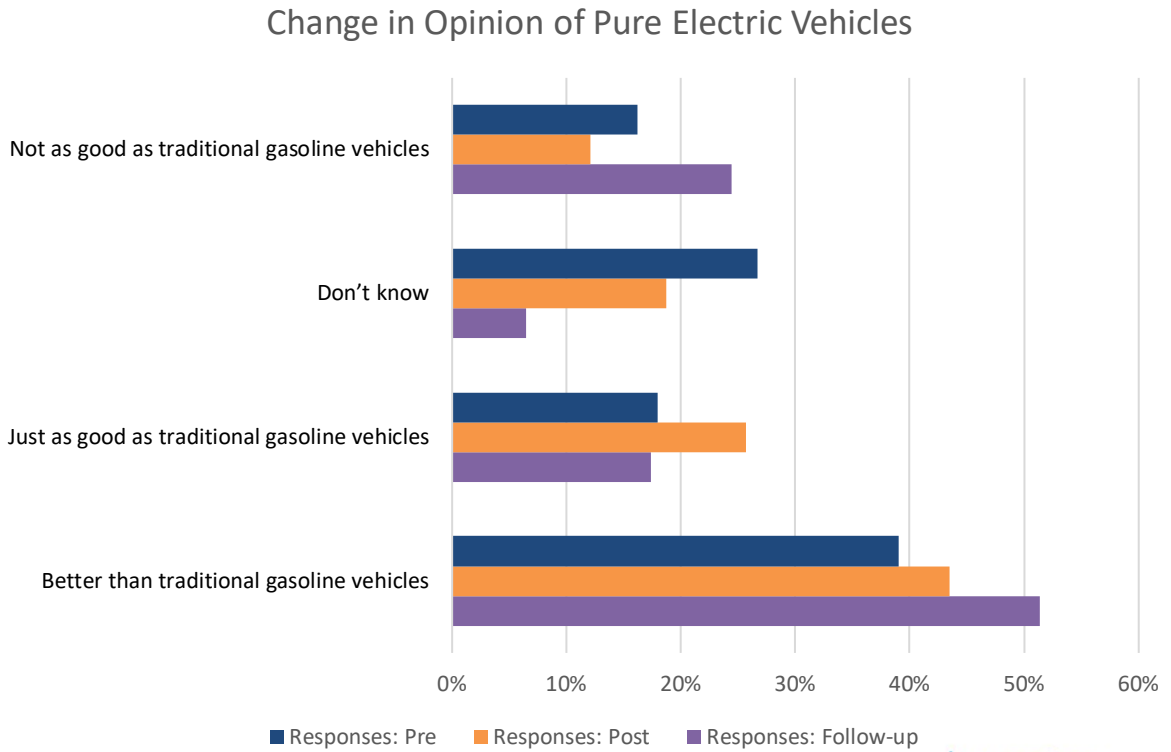
## Test Drives & Surveys

15% of attendees have never experienced an electric vehicle before Midwest EVOLVE test drive events

*Over 70% of attendees take a further step to learn more*

*21% of attendees have purchased or leased an EV*




American Lung Association.

# Tools and Resources

Midwest EV Info List (October 2020) Page 1 of 3

Midwest EVOLVE

| Manufacturer | | | | | | | | | | Range | | | Charging speed (miles/hr) | | | Performance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Make | Model | Photo | Seating | EV Type | FWD/ RWD/ AWD | Base MSRP | Federal tax credit | Price after federal tax credit | Battery size (kWh) | Electric Range (miles) | Total Range (miles) | Charging rates (kW) L2/DCFC | Level 1 120V | Level 2 240V | DCFC 400+V | MPGe/ MPG | Top Spd (mph) | 0-60 mph (sec) | Towing capacity (lbs) | Crash Ratings: IIHS/NHTSA |
| Audi | e-tron |  | 5 | BEV | AWD | $65,900 | $7,500 | **$58,400** | 95 | 222 | 222 | 9.6/150 | 3 | 24 | 264 | 74 | 124 | 5.5 | 4000 | Top Safety Pick +/ Not rated |
| Audi | e-tron Sportback |  | 5 | BEV | AWD | $69,100 | $7,500 | **$61,600** | 95 | 218 | 218 | 9.6/150 | 3 | 25 | 238 | 77 | 124 | 5.5 | 4000 | Top Safety Pick +/ 5 star |
| Audi | Q5 e |  | 5 | PHEV | AWD | $52,900 | $6,712 | **$46,188** | 14.1 | 20 | 390 | 7.4 | 2 | 14 | N/A | 65/27 | 130 | 5.9 | 4400 | Good/ Not rated |
| Audi | | | | | | | | | | | | | | | | | | | 0 | Not Rated |
| BMW | | | | | | | | | | | | | | | | | | | 0 | Good-Acceptable/ Not rated |
| BMW | | | | | | | | | | | | | | | | | | | 0 | Top Safety Pick + / Not rated |
| BMW | | | | | | | | | | | | | | | | | | | 0 | Top Safety Pick + / Not rated |
| BMW | | | | | | | | | | | | | | | | | | | 0 | Top Safety Pick / Not rated |
| BMW | 530e |  | 5 | PHEV | RWD/ AWD | $57,200 | $5,836 | **$51,364** | 12 | 21 | 350 | 3.7 | 3 | 8 | N/A | 69/27 | 146 | 6 | 0 | Top Safety Pick + / Not rated |
| BMW | 745e |  | 5 | PHEV | AWD | $95,900 | $5,836 | **$90,064** | 12 | 16 | 290 | 3.7 | 2 | 6 | N/A | 56/22 | 155 | 4.9 | 0 | Not rated / Not rated |
| Chevrolet | Bolt EV |  | 5 | BEV | FWD | $36,620 | $0 | **$36,620** | 66 | 259 | 259 | 7.2/50 | 4 | 25 | 140 | 118 | 98 | 6.5 | 0 | Top Safety Pick / 5 star |
| Chrysler | Pacifica Hybrid (PHEV) |  | 7 | PHEV | FWD | $38,100 | $7,500 | **$30,600** | 16 | 33 | 570 | 6.6 | 3 | 16 | N/A | 84/32 | 107 | 7.8 | 0 | Top Safety Pick / 5 star |

**www.EVInfoList.com**

Midwest EV Info List (Updated 10/2020)

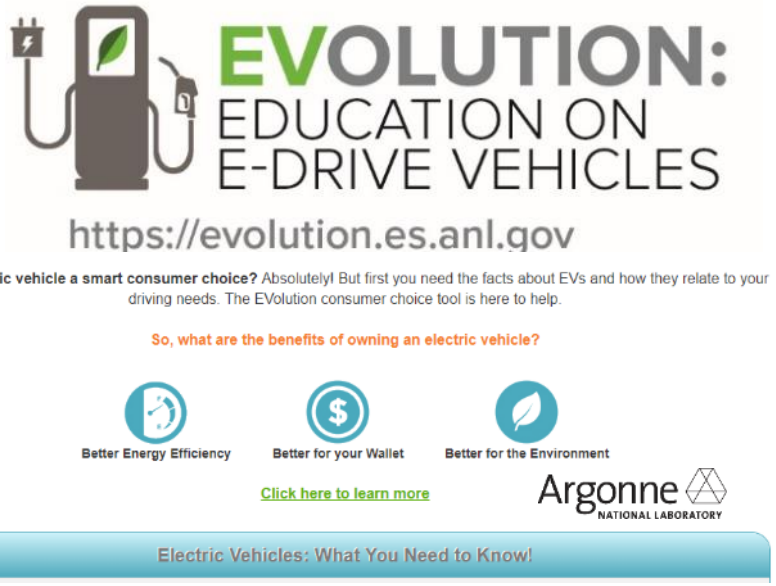
US EV Info List (Updated 10/2020)

How to provide EV charging for condominium and apartment buildings Guide/Worksheets

www.mudcharging.com

## Consumer Vehicle Purchase Guidance Tool:

*EVolution-informing your choice for a smart purchase*

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# Questions?

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