Powering Electrification Through Federal Grant Funding

Alex Hofmann - Beneficial Electrification League

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ELECTRICITIES of NORTH CAROLINA, INC. | *The energy behind public power*

Today You Will Learn:

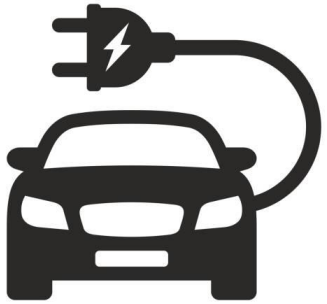
- What is electrification and why is it important?
- How can your utility prepare for one of the biggest electrification opportunities (electric vehicles)?
- What funding opportunities are available and how can you apply for them?

What is Electrification?

- Electrification means replacing technologies or processes that use fossil fuels, like internal combustion engines and gas boilers, with electrically-powered equivalents, such as electric vehicles or heat pumps. These replacements are typically more efficient and have a growing impact on emissions as electricity generation is decarbonized.
- Electrification is one of the most important strategies for reducing CO_2 emissions from energy in the journey to net zero emissions.

Electrification Examples

ICE Vehicle



Electric Vehicle

Coal Plant

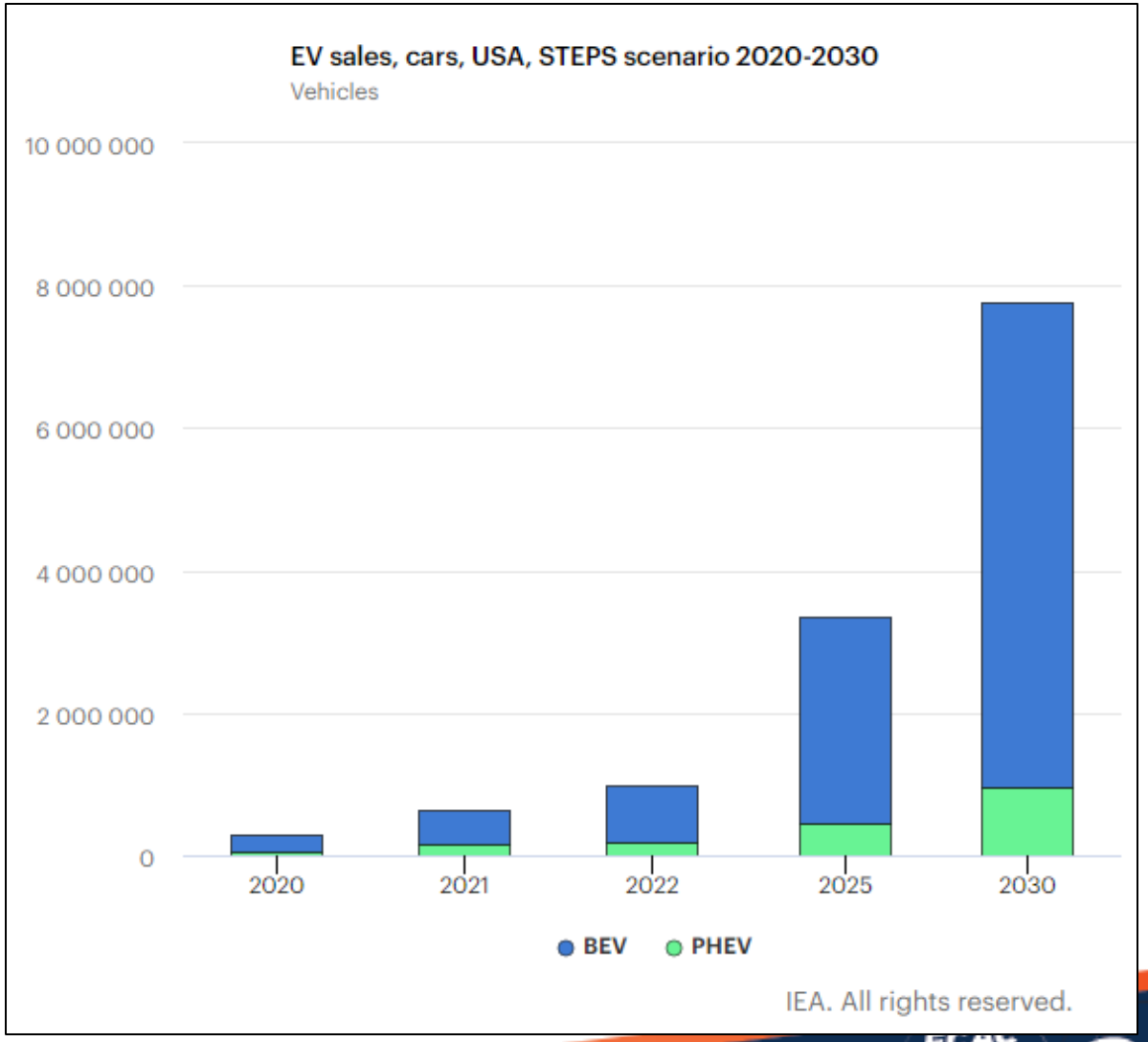
Renewables

Gas Furnace

Heat Pump

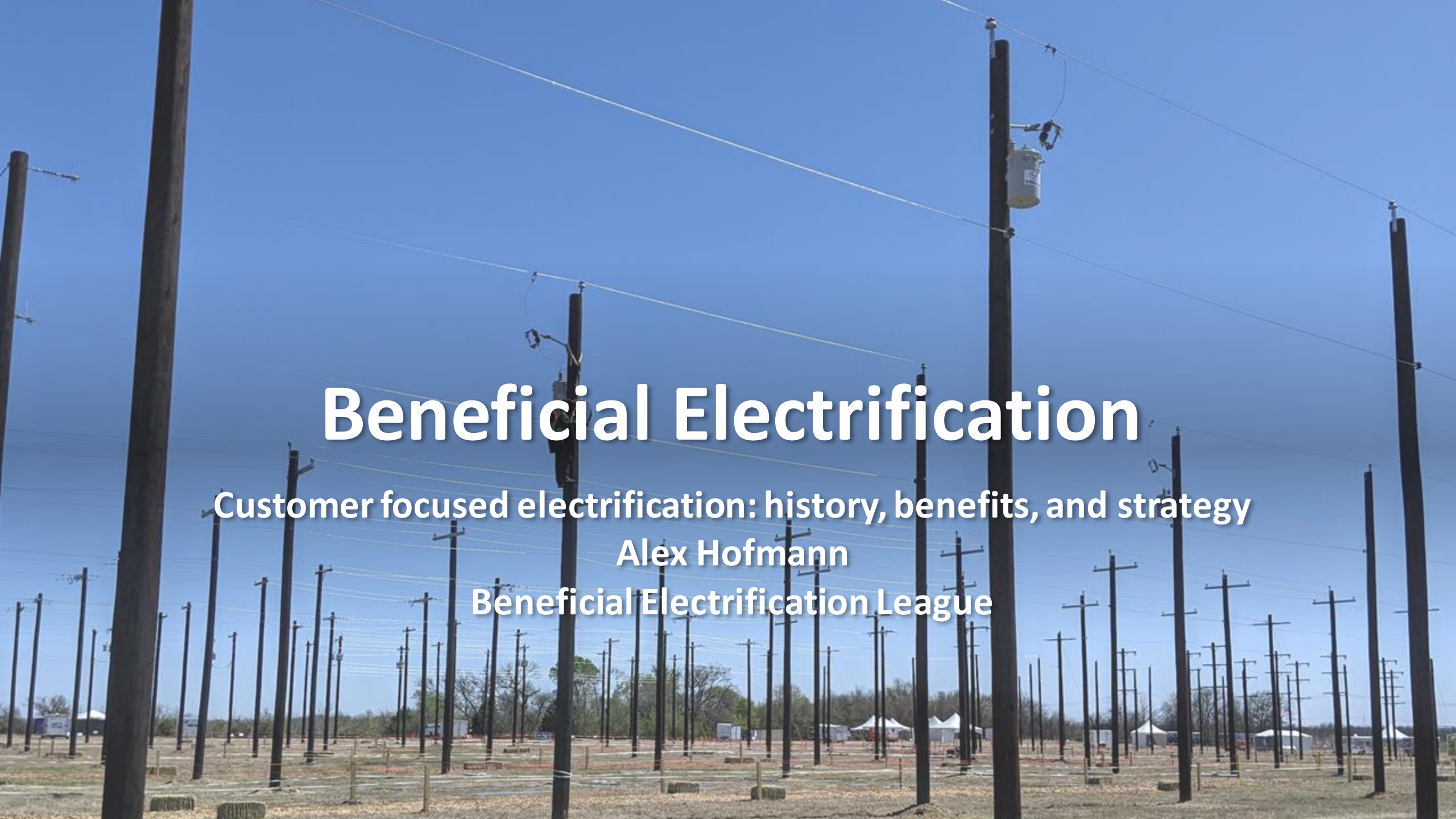
Electric car sales break new records with momentum expected to continue through 2023

Electric car markets are seeing exponential growth as sales exceeded 10 million in 2022. A total of 14% of all new cars sold were electric in 2022, up from around 9% in 2021 and less than 5% in 2020. Three markets dominated global sales. China was the frontrunner once again, accounting for around 60% of global electric car sales. More than half of the electric cars on roads worldwide are now in China and the country has already exceeded its 2025 target for new energy vehicle sales. In Europe, the second largest market, electric car sales increased by over 15% in 2022, meaning that more than one in every five cars sold was electric. Electric car sales in the United States – the third largest market – increased 55% in 2022, reaching a sales share of 8%.



Global heat pump sales continue double-digit growth

Global sales of heat pumps grew by 11% in 2022, according to the latest IEA analysis, marking a second year of double-digit growth for the central technology in the world's transition to secure and sustainable heating. Increased policy support and incentives for heat pumps in light of high natural gas prices and efforts to reduce greenhouse gas emissions were key drivers behind the strong uptake.



Beneficial Electrification

Customer focused electrification: history, benefits, and strategy

Alex Hofmann
Beneficial Electrification League

Reminder – Electricity Improves Quality of Life

Electrification is often an upgrade in:

- Efficiency
- Fuel cost savings
- Air quality
- CO2 emission reductions
- Grid resilience
- Precision agriculture

Achieving benefits of electrification is critical to adoption

What is "Beneficial Electrification?"

Beneficial Electrification (BE) 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.

NOT an "Electrify Everything" Concept

The Beneficial Electrification League

Wabash Valley Power Alliance

TRI-STATE Generation and Transmission Association, Inc.

CoBANK

OglethorpePower

Kansas Municipal Utilities

GDS Associates, Inc. Engineers & Consultants

A Public Agency NCPA Northern California Power Agency

Blue Bird

Pierce Pepin Cooperative Services Live Better.

GeorgiaTransmission

SOLSYSTEMS

KPP Energy

KMEA Kansas Municipal Energy Agency

CONNEXUS ENERGY

your New Hampshire Electric Co-op

DAIRYLAND POWER COOPERATIVE

TrackerSled Solar-Assisted Drawdown

wfec western farmers electric cooperative

STEFFES

nrtc

MISSOURI RIVER ENERGY SERVICES

SIOUX VALLEY ENERGY A Touchstone Energy® Cooperative

ECE East Central Energy Your Touchstone Energy® Cooperative

DEMEC Delaware Municipal Electric Corporation

JEA

GREAT RIVER ENERGY

1951 2021 70th Anniversary ANZA ELECTRIC COOPERATIVE, Inc. A Touchstone Energy® Cooperative

CLIMATE CONTROL GROUP A NIBE GROUP MEMBER

ENERTECH ENERGY + TECHNOLOGY

Rheem The new degree of comfort®

WaterFurnace Smarter from the Ground Up™

Today's Power Your Energy Partner

HOOSIER ENERGY

Golden Spread Electric Cooperative, Inc. A Touchstone Energy® Cooperative

Rappahannock Electric Cooperative A Touchstone Energy® Cooperative

Electric School Bus INITIATIVE

NRDC

NC Electric Cooperatives Your Touchstone Energy® Cooperatives

EGIA

WECA

Seminole Electric Cooperative, Inc.

Heartland Energy Power with Purpose

Old Dominion Electric Cooperative ODEC

aquanta

MREA

CAMUS

AO Smith

STOWE ELECTRIC DEPARTMENT

MITSUBISHI ELECTRIC

MVEC Minnesota Valley Electric Cooperative A Touchstone Energy® Cooperative

DAKOTA ELECTRIC ASSOCIATION Your Touchstone Energy® Partner

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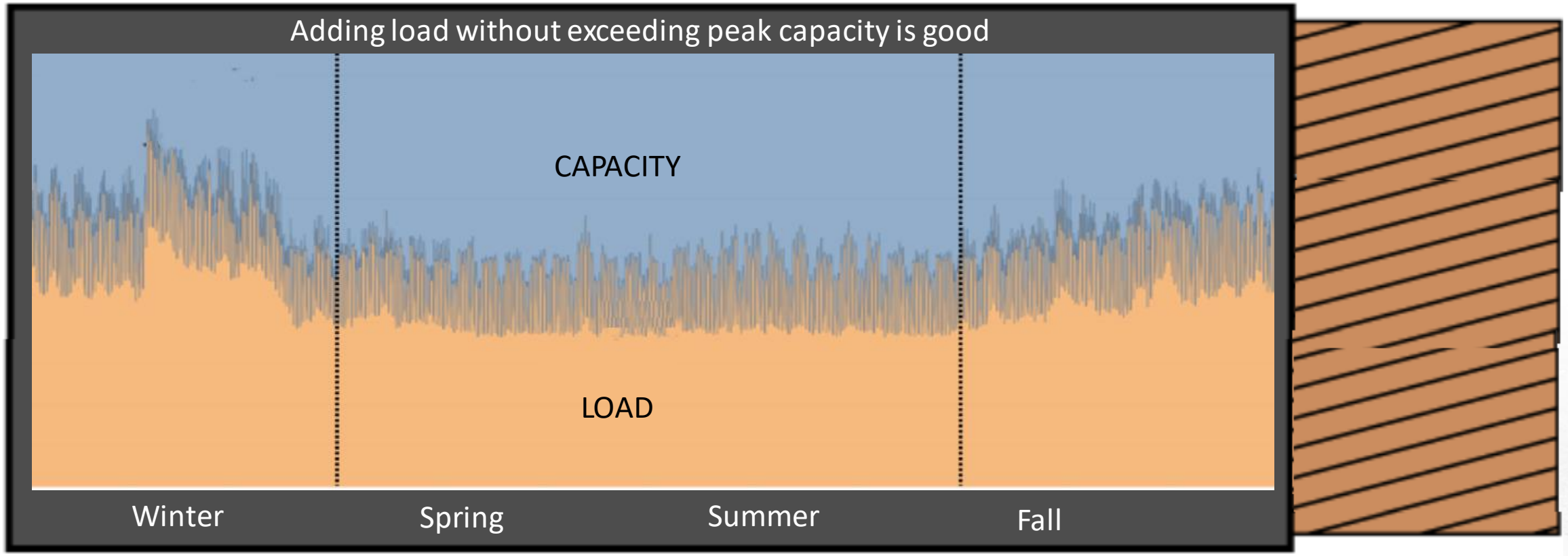
GEO

Technology Advancing Beyond EVs

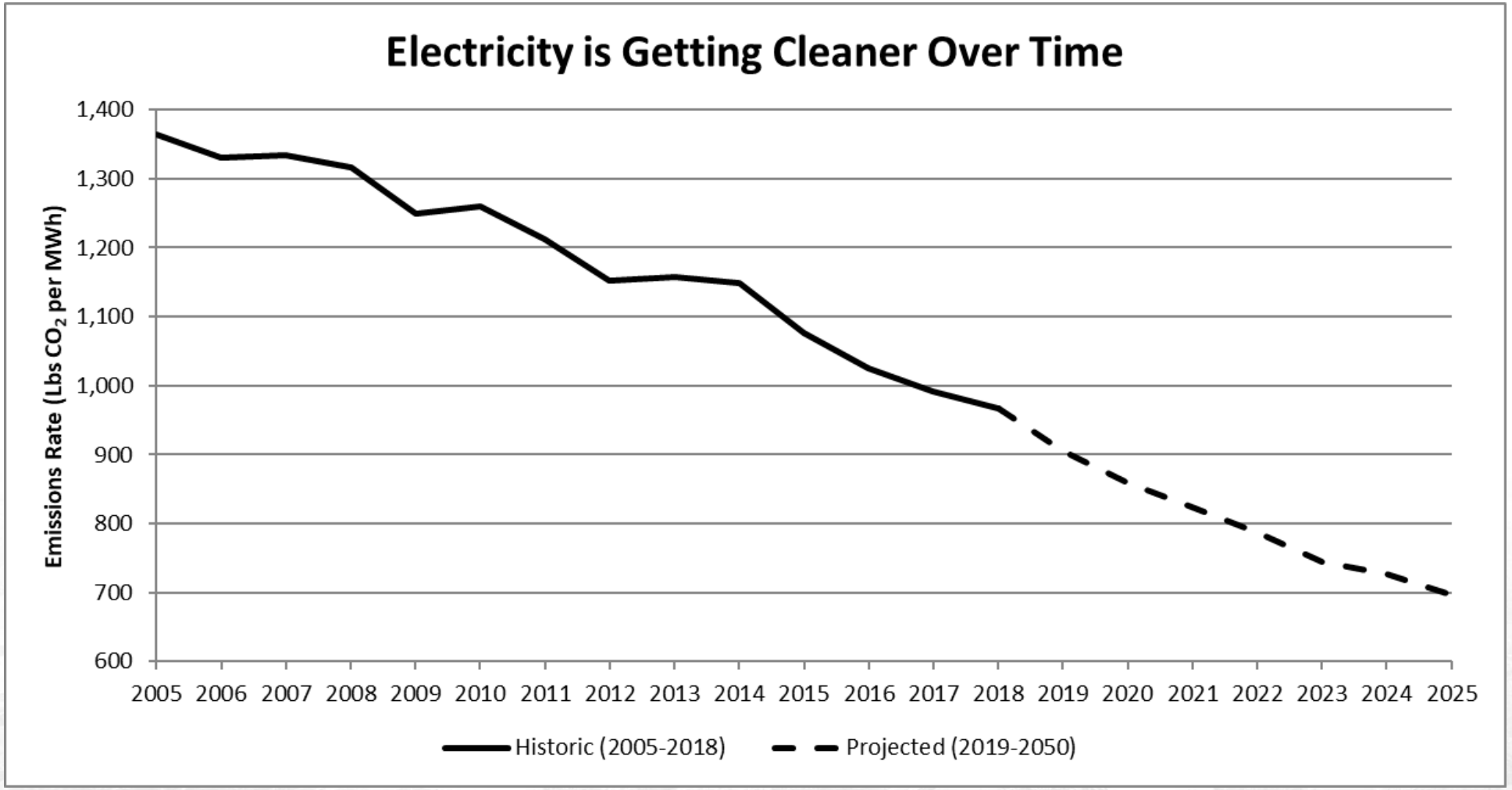
Ever-increasing electric technology for Ag

Unused Capacity Is Unearned Revenue



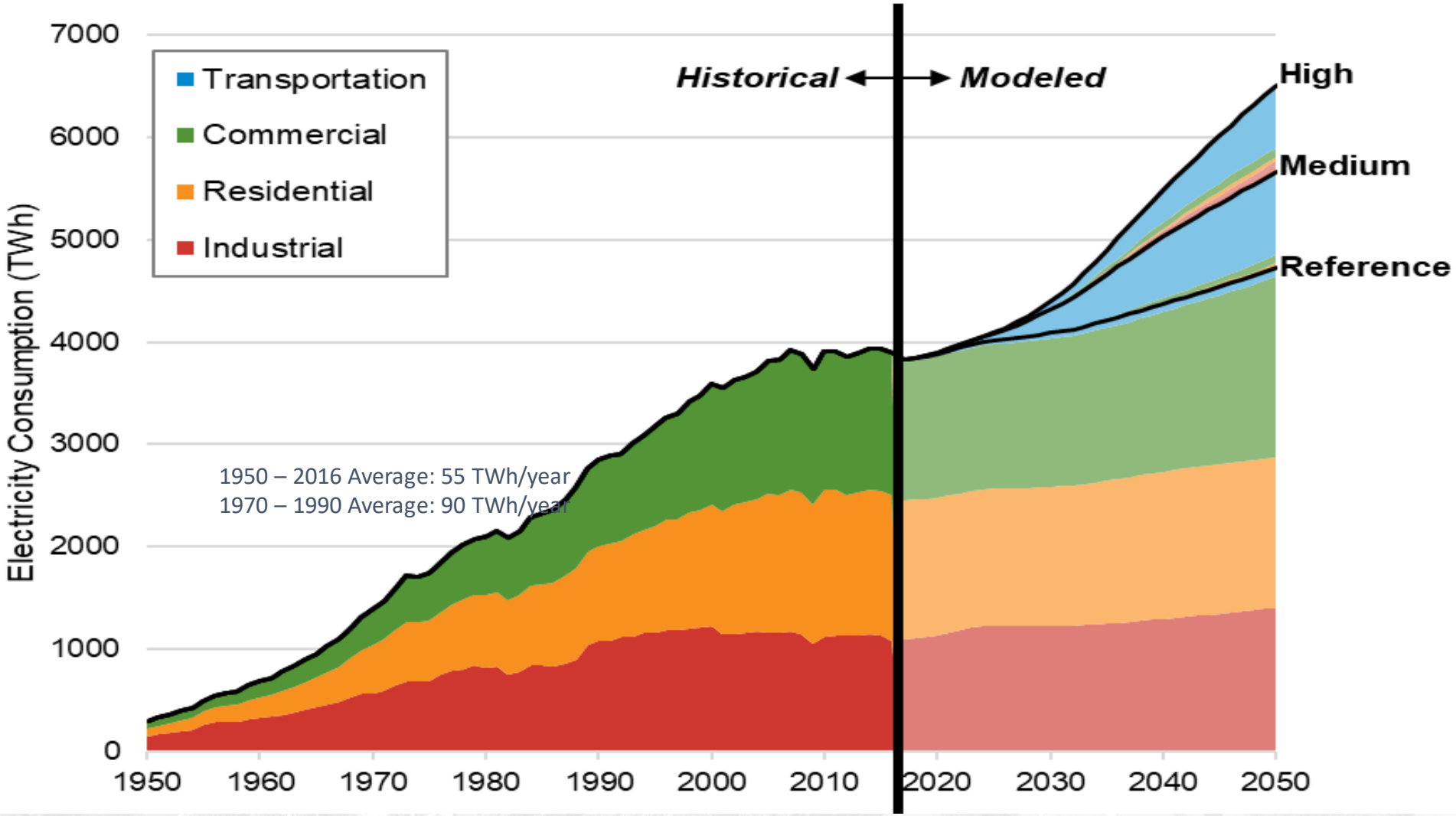
https://powerlines.seattle.gov/wp-content/uploads/sites/17/2022/01/Seattle-City-Light-Electrification-Assessment.pdf

Opportunity to Improve "Emissions Efficiency"



By virtue of being plugged into the grid, the environmental performance of electric devices improves over time. (Source EIA)

Electric Load Growth Significant, but Not Unheard of



80 TWh/year

55 TWh/year

25 TWh/year

Source: NREL

BEL Strategy – Ease Access and Leverage Funds

- $5 Billion EPA (IIJA)

- Assist electric cooperatives, munis and school districts in awareness of the program and technology.

- $3.5B DOE WAP (IIJA)
- $4.5B IRA HOMES (IRA)
- $4.5B IRA HEEHRA (IRA)
- Tax credits (IRA)

- Create a network of stakeholders that can leverage funding to achieve W/E together.
- Explore a national program to make it easier to implement opportunities

DOE / EPA / USDA Funds

- EECGB
- GRIP
- 40101D resiliency grants
- EPA planning grants
- USDA REAP, Loans

- Seek to provide streamlined information and facilitate reduced application and reporting burden

Home Rebate Program (Coming soon)

Point-of-sale rebates up to $14,000 for LMI households

- $8,000 for heat pumps
- $1,750 for heat pump water heaters
- $840 for heat pump clothes dryers
- $840 for electric or induction stoves
- $4,000 for electrical panel upgrades
- $2,500 for rewiring
- $1,600 for basic weatherization

Many barriers to achieving uptake

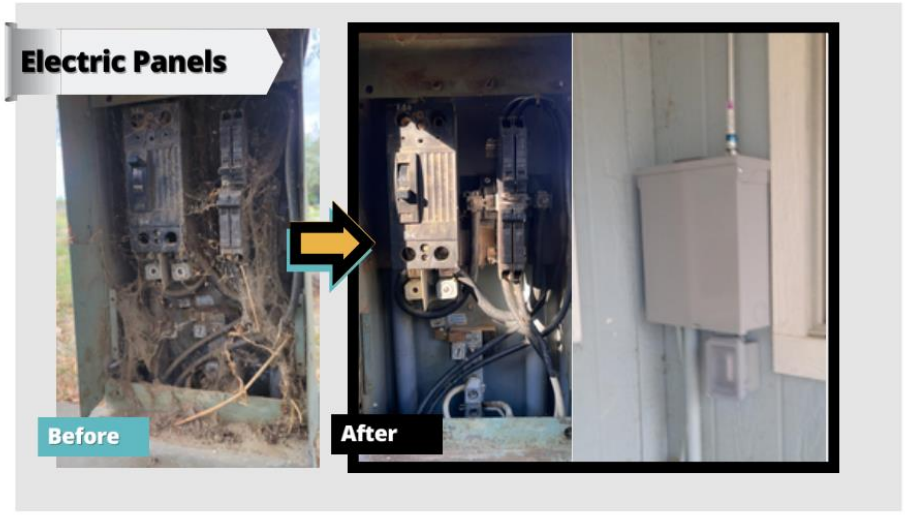
IRA Tax Credits (out now)

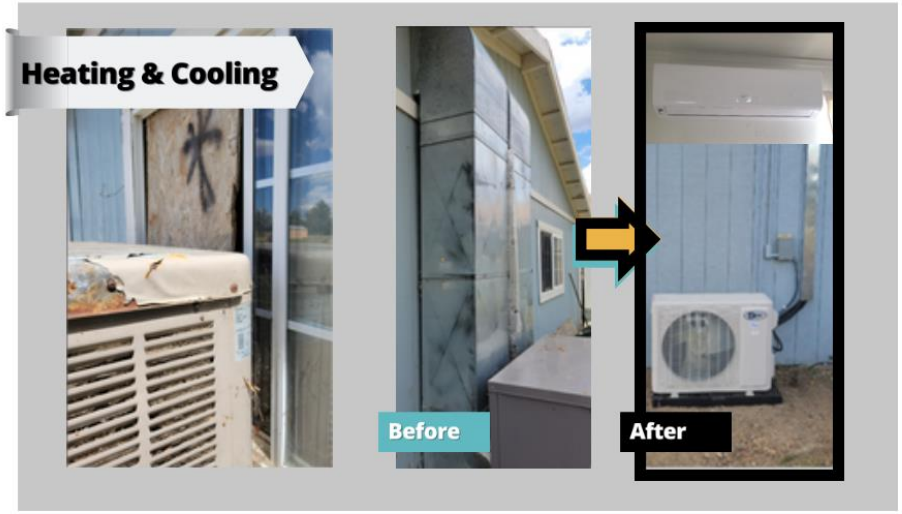
Battery Storage Installation	30%
Geothermal Heating Installation	30%
Electric Panel	$600
Electric Vehicle Charger	$1,000
New Electric Vehicle	$7,500
Used Electric Vehicle	$4,000
Heat Pump Air Conditioner/Heater	$2,000
Heat Pump Water Heater	$2,000
Rooftop Solar Installation	30%
Weatherization	$1,200

W/E Together A Program Approach:

The Phase I Cohort

BEL chose challenging houses in two rural communities, one in the Southwest and one in the Southeast.





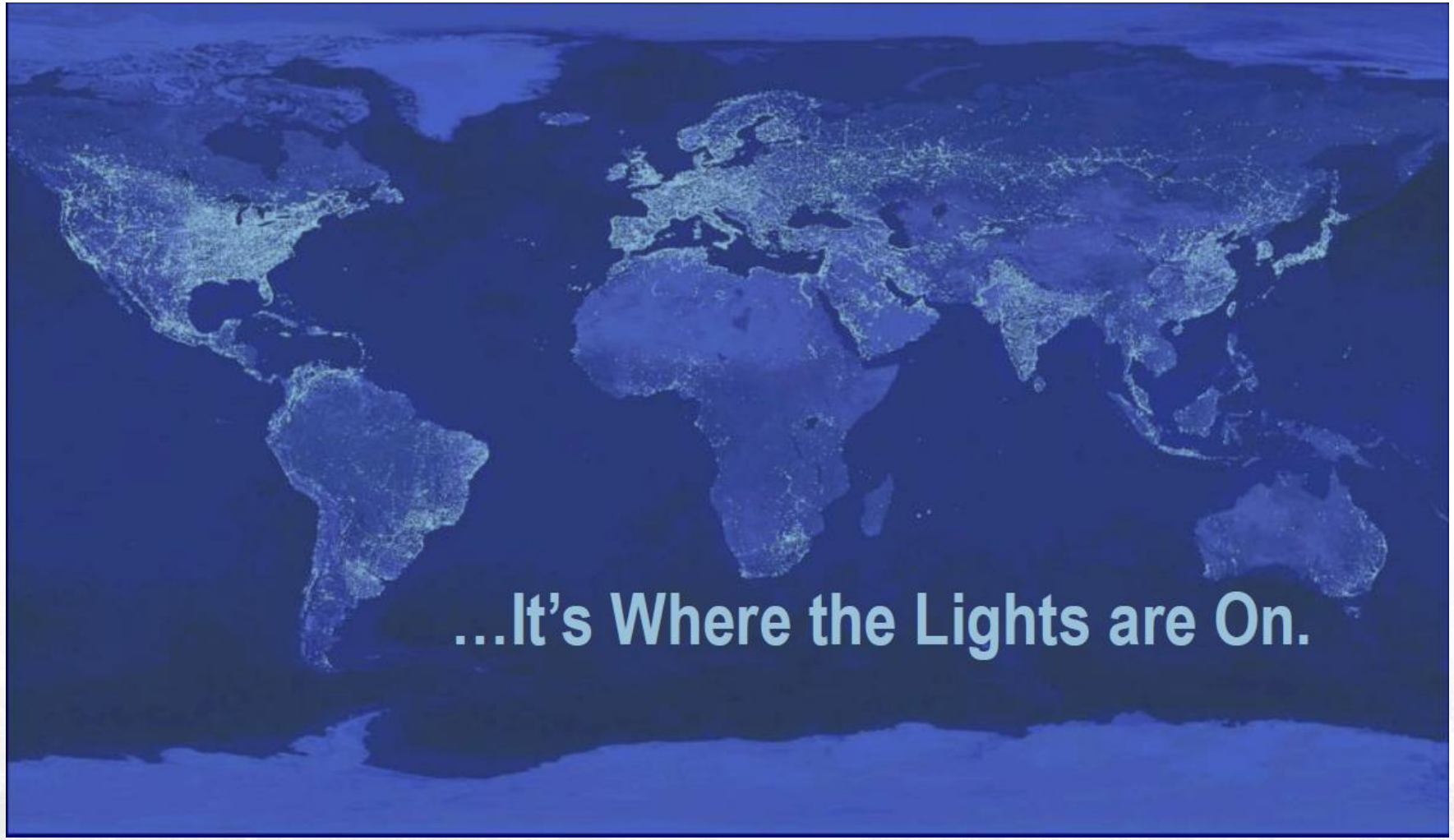
W/E Together Utility Pilot Results

The Emerging Business Case - Including Inflation Reduction Act (IRA) Implementation

House #1 W/E Upgrades	Charges	Utility Rebates*	Totals
3 Mini-Split Systems	11,400	(2,000)	9,400
Upgrade electric panel, breakers	4,275		4,275
Weatherization, air sealing, LEDs	2,390	(500)	1,890
Induction stove	1,227	(250)	997
Electric Water Heater (donated by Utility)	1,455	(1,455)	-
Install electric water heater	1,080		1,080
House #1 Total	**$21,826**	**$ (4,205)**	**$17,622**
Potential IRA Rebates			(14,000)
Total Costs Needed to Complete Post-IRA			**$3,622**

*Some utilities offer their own rebates for certain appliances, such as heat pumps, electric water heaters, electric stoves, and energy efficiency upgrades.

You Can See Prosperity…



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Sign Up for Our Newsletters: https://be-league.org/contact/

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Preparing for and Pursuing Transportation Electrification: A Municipal Blueprint

ElectriCities of North Carolina | 8/15/2023

CONSUMERS

MANUFACTURERS

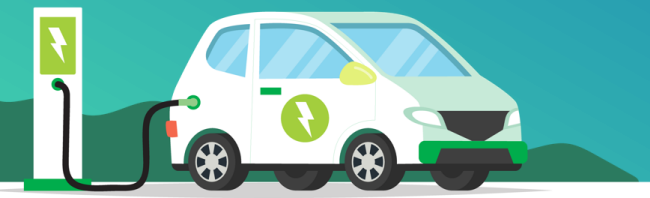
GOVERNMENTS

ENERGY SUPPLIERS & INFRASTRUCTURE PROVIDERS

RESEARCH INSTITUTIONS

The global shift towards sustainable energy has placed electric transportation at the forefront of modern innovations.

The success of this transition lies in the hands of key stakeholders who play vital roles in shaping its landscape.



Stakeholder Roles In Electric Transportation

MANUFACTURERS	GOVERNMENTS	CONSUMERS	ENERGY SUPPLIERS & INFRASTRUCTURE PARTNERS	RESEARCH INSTITUTIONS
RESPONSIBLE FOR • Design • Development • Production of electric vehicles (EVs)	RESPONSIBLE FOR • Sector regulation • Policy guidance • EV incentives • Infrastructure development	RESPONSIBLE FOR • Acceptance and adoption of EVs	RESPONSIBLE FOR • Clean, reliable, and affordable power • Charging Infrastructure access and availability	RESPONSIBLE FOR • Driving Innovation • Technological advancement through cutting-edge research

KEY TASKS INCLUDE
• Reducing production costs
• Increasing EV efficiency
• Improving battery technology
• Jobs
	KEY TASKS INCLUDE
	• Implementing emission standards
	• Provide subsidies or tax credits
	• Encourage EV adoption through education campaigns
	• Electric Vehicle Supply Equipment (EVSE) Ordinances & Codes
		KEY TASKS INCLUDE
		• Seek education
		  • Range Capability
		  • Charging Rates
		  • Vehicle Maintenance
		  • Insurance and Registration
		  • Driver Experience
		• Communicate preferences influencing EV design and functionality
			KEY TASKS INCLUDE
			• Generation of electricity ensures supply meets new demand with EVs
			• Transmission of electricity across large geographic landscapes
			• Distribution of electricity to our business and homes through efficient and affordable interconnections
			• EV Rate Designs
				KEY TASKS INCLUDE
				• White papers
				• Case studies
				• Standards & Specifications
				• Webinars
				• Proof of concept experiments
				• Material sciences
				• Battery chemistries driving sustainability

STAKEHOLDER CONTRIBUTIONS TABLE

The Electrification Ecosystem

Six Essential Steps to Kickstart a Successful Transformation

Business Strategy

System Impact Studies

Rate Design

Feasibility Studies

Enterprise Software Solutions

Business Intelligence & Analytics

The power of collaboration creates an ecosystem to achieve scale pursuing decarbonization

NATIONAL EV CHARGING NETWORKS

This collaboration ensures electric vehicle owners have convenient access to charging infrastructure, which is crucial for the widespread adoption of e-mobility.

AUTO OEM

Ford, TESLA, gm, STELLANTIS

EV CHARGING MANUFACTURES

TESLA, chargepoint+, EVgo, ABB

POLICY & PROGRAMS

This collaboration includes financial incentives for EV purchases, charging, and renewable energy sources supporting electric vehicle adoption.

GOVERNMENTS

U.S. DEPARTMENT OF ENERGY, North Carolina Utilities Commission, FERC

UTILITIES

Dominion Energy, DUKE ENERGY, ELECTRICITIES of NORTH CAROLINA, INC.

BATTERY TECHNOLOGY ADVANCEMENTS

These partnerships improve battery range, durability, and charging speed, addressing key challenges in the e-mobility industry.

AUTO OEM

TESLA, Ford, STELLANTIS

BATTERY TECHNOLOGY COMPANIES

TESLA, Panasonic, LG Chem, SK innovation

Supercharger Deployment

Tesla Southwest USA

Innovation

RESPONSIBLE FOR

- Project Quality
- Speed to Market
- Utility Evaluation & Upgrades

KEY TASKS INCLUDE

- Advisory
- Planning
- Engineering
- Procurement
- Construction
- Testing and Commissioning

Municipal Fleet Electrification Strategy

Alliant Energy & The City of Dubuque, IA

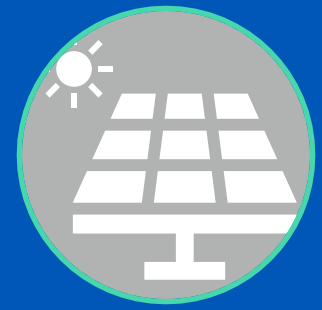
Business Challenge:
The City of Dubuque, IA desires to reduce emissions from their municipal fleet through electrification and charge the fleet with renewable energy.

Approach
In collaboration with the City of Dubuque, IA and Alliant Energy, we are identifying conversion candidates based on use case, vehicle age, duty cycle, and TCO to create a vehicle transition strategy. Additionally, we are evaluating grid interconnection and integrated solar + EVSE energy systems to align forecasted energy consumption with energy production from PV.

Outcome
Fleet transition strategy including a transition costs (vehicle and infrastructure) and timeline adopted by the City of Dubuque.

General Fleet Assessment

Identify Target Facilities



Evaluate Facilities

Identify Target Vehicles

Build Progression Scenarios

Document Strategy / Roadmap

Every stakeholder in the electric transportation ecosystem has a significant part to play in the shift toward a more sustainable future.

Together, we can drive change.

THANK YOU

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Powering Electrification Through Federal Grant Funding

PJ Rehm – Vice President, Grid Innovation & Safety – ElectriCities of NC

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Recap of Panelists

- Electricity use and electrification will only keep ***increasing***
- Generation will continue to rapidly shift to ***non-carbon emitting resources***
- Important to balance increasing load, reliability, affordability, safety, and ***sustainable energy***
- Electric vehicles may be the biggest opportunity for electrification, but it's important for your utility to ***be prepared***
- Federal funding can help!

Federal Funding Trends

- Relevant project areas eligible for funding include:
  - Renewable Generation (solar, wind, geothermal, including battery storage)
  - Energy Efficiency (rebates, energy audits, weatherization)
  - Grid Technologies & Demand Response
  - Electric Vehicle Programs & Charging
  - Infrastructure (undergrounding, new delivery points, resiliency)
- Funding opportunities may require low-income areas/programs
- Funding may require cost share

Upcoming Opportunities

- Investment Tax Credit – Public Power eligible for direct payments
- 40101(d) Grid Formula Grant – Administered through SEO
- Solar for All – Working with SEO on possible joint application
- National Electric Vehicle Infrastructure (NEVI) – State/NCDOT
- ERA Round 2 – Q1/Q2 2024
  - Energy efficiency, renewable generation, upgrading distribution infrastructure – **rural communities**
- GRIP Round 2 – Q4 2023
  - Grid resilience technologies and infrastructure

Upcoming Opportunities – Solar For All

- Considering partnership with SEO, Clean Energy Fund on application through State – seeking up to $400 million in funding
  - Must focus on solar for low-income communities or customers
- Two of the potential scenarios
  - Residential rooftop solar funding
  - Community solar funding (optional storage)
- Application Due Date – September 26th
  - Need to provide our info by September 6th
- Reach out to ElectriCities if interested!

ElectriCities Assistance

- Communicating information on grant opportunities and education
  - Planning 2 webinars for end of year
- Identifying joint grant opportunities
  - ElectriCities Applying (AMI GRIP)
  - Other Coalitions (Beneficial Electrification League, State Energy Office)
- Forming relationships with the SEO, BEL, USDA, APPA, and other organizations
- Providing options for grant strategy, grant writing, etc.
  - Strategics Consulting

Federal Funding Takeaways

- Member joint applications will be important to increase our chances of receiving funding
- ElectriCities will continue to partner with groups to help increase funding chances
- If ElectriCities is an eligible recipient for a funding opportunity on behalf of a group of members, will investigate applying (i.e. GRIP AMI)
- If you have an interest in funding for a particular project, **let us know**
- Don’t wait, plan now!

QUESTIONS

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