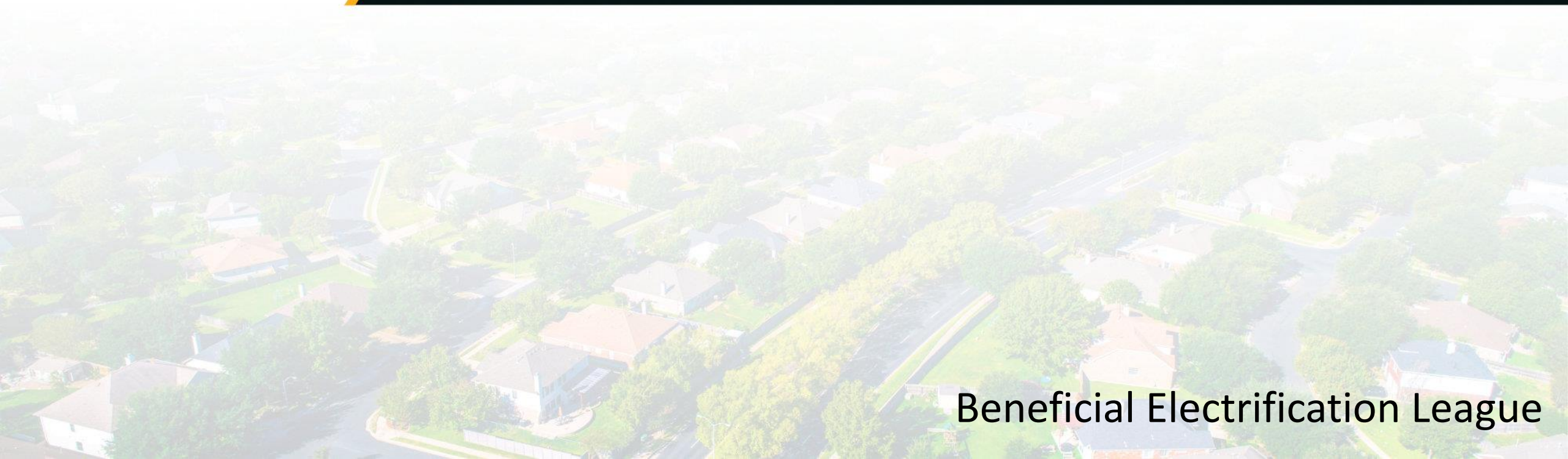




Strategic Load Growth Through Environmentally Beneficial Electrification



Beneficial Electrification League

Vision

Our vision of the future is for beneficial electrification to be universally accepted as a necessary strategy to meet economic, consumer and environmental goals.

Mission

To increase understanding on the benefits of electrification by promoting the market acceptance of beneficial electrification, educate policy makers on the value, benefits and tools of Beneficial Electrification and serve as a conduit and facilitator of BE resources.

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

BE Strategies and Technologies



Strategies

- Create load flexibility
- Add beneficial load
- Build for community scale

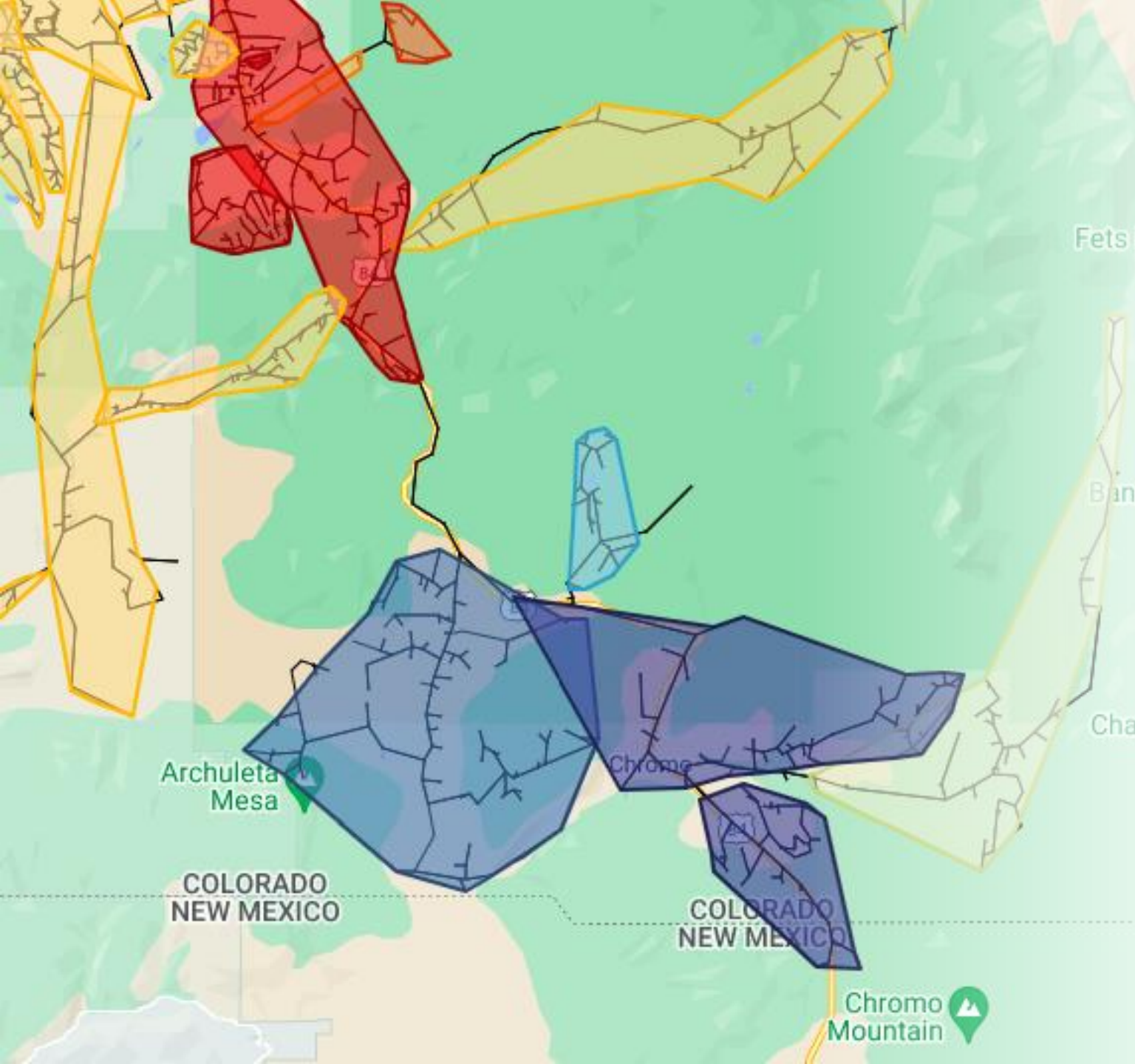
Technologies

- Ground/Air source heat pumps
- Buses and water heaters
- DERM systems



Electrification Program Design Can Benefit the Grid and The Customer

- Many projects involve end use in constrained areas or places that have only one line into a service territory
- Often involve low-income and disadvantaged communities
- Sometimes these are 'end of the world' grid edge where the voltage goes from high and then drops lower and lower down the line.
- New transmission is sometimes a secondary option, and sometimes not
- Resiliency need - When high energy burden exists, power outages can wipe out refrigerated food, for example.





Three Cases of Strategic Load Growth Through Environmentally Beneficial Electrification

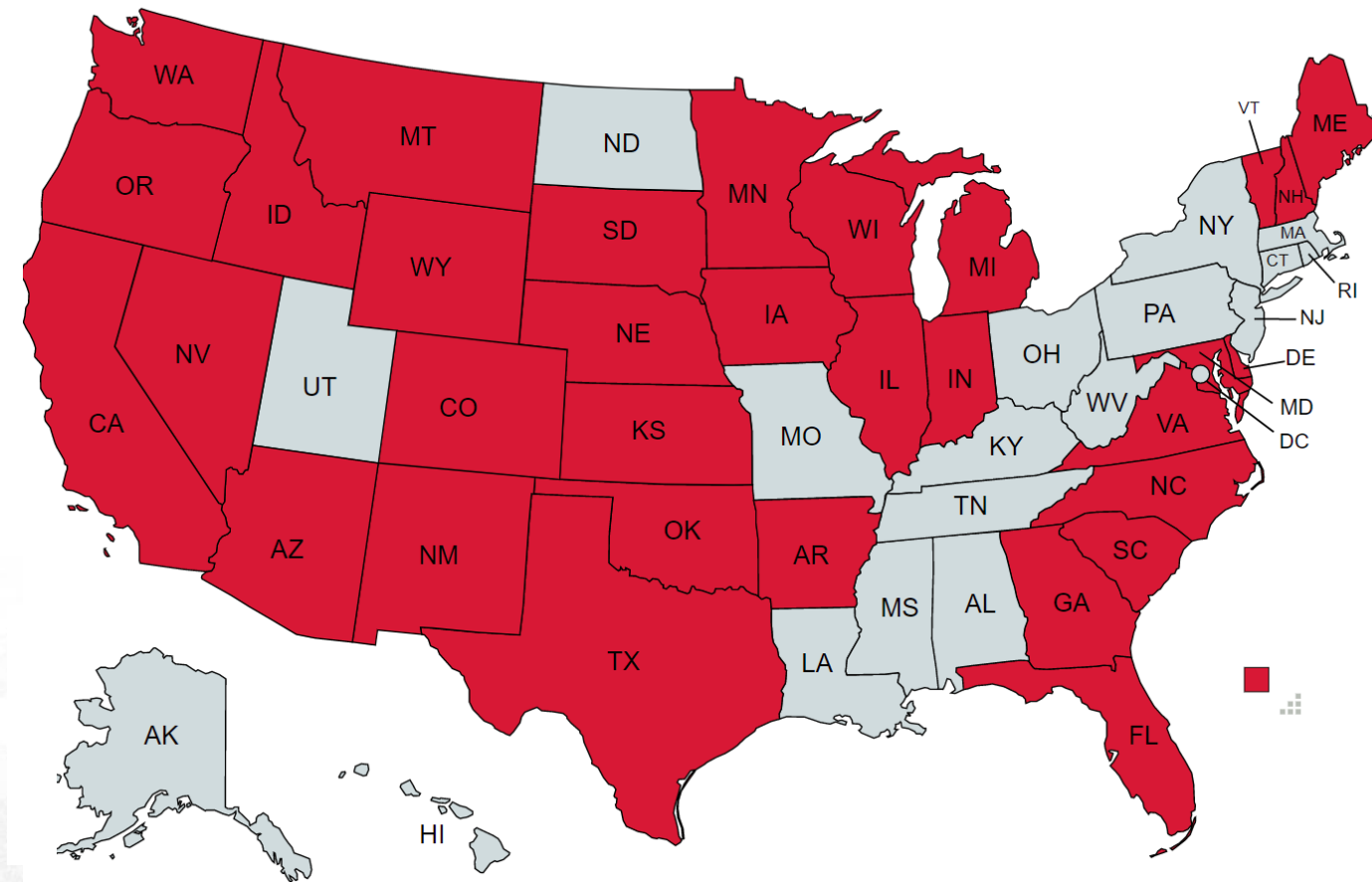
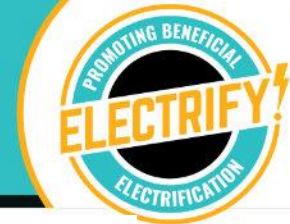
- Buses
- Community geothermal
- Weatherization and electrification together



Electric School Buses Represent Opportunity

- Get kids to school!
- Lower maintenance cost and create environmental benefits (\$461,000 in fuel costs per year 1,700 tons of CO₂ per year according to EPA – 370 passenger cars)
- Create grid flexibility (level 3 charger with backfeed capability)

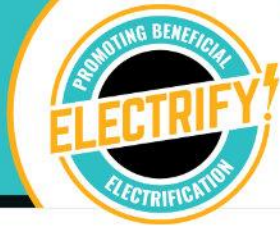
BEL Electric School Bus Initiative – over 350+ Cooperatives and Munis in ~2/3 of States



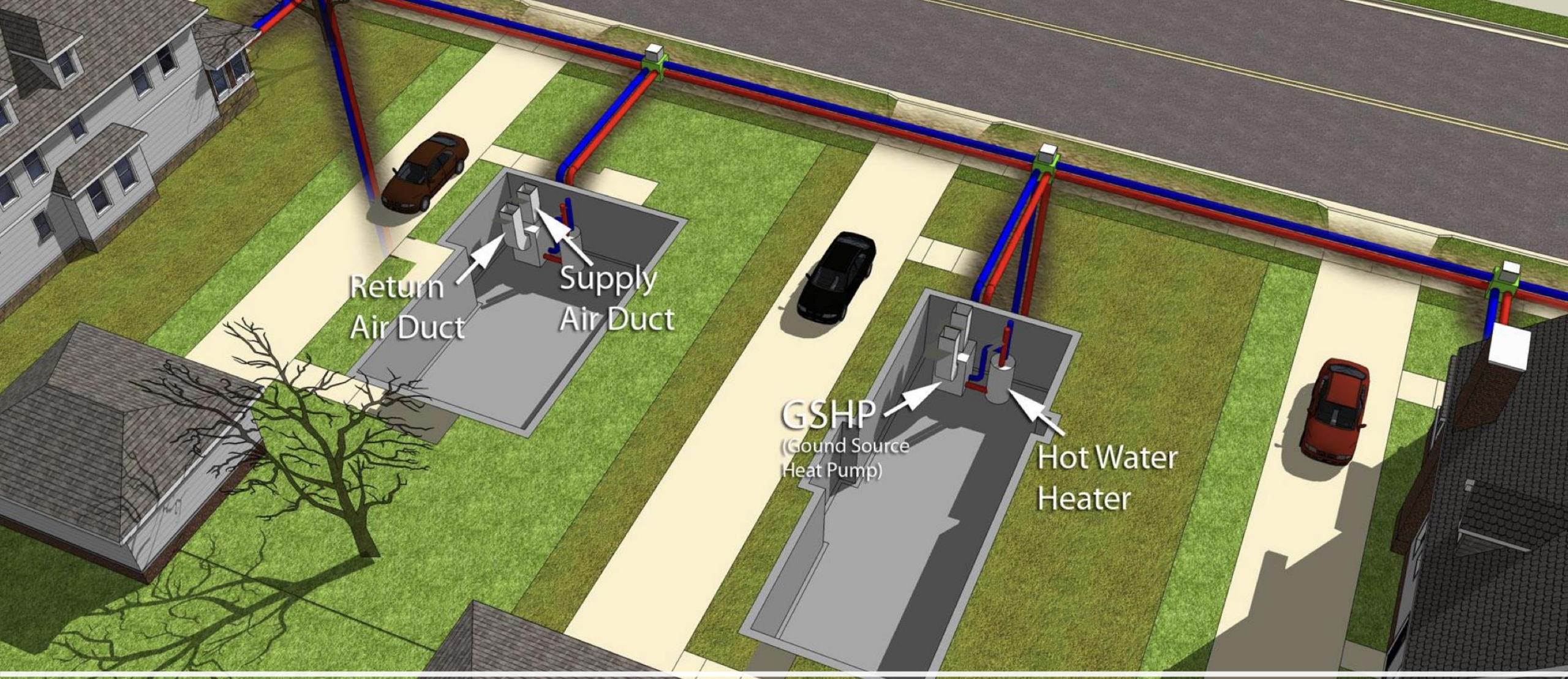
Of the **13,185** unified school districts in the US, **5,881** districts are covered by an electric cooperative. Of those, **3,177** districts have 15% or more of the student population below the poverty line.

<https://be-league.org/buses/>

Consider a Bus Electrification Program



- Help your local school district apply for the next round of EPA funds: <https://www.epa.gov/cleanschoolbus>
- Consider how you might utilize (and share) the extra benefits of having a mobile battery -- On average, school buses are parked for up to 18 hours a day during the school year and nearly three months over the summer.
- Join the BEL peer to peer electric bus program



sement Equipment

A BE Case Study – Wyandotte Community Geothermal

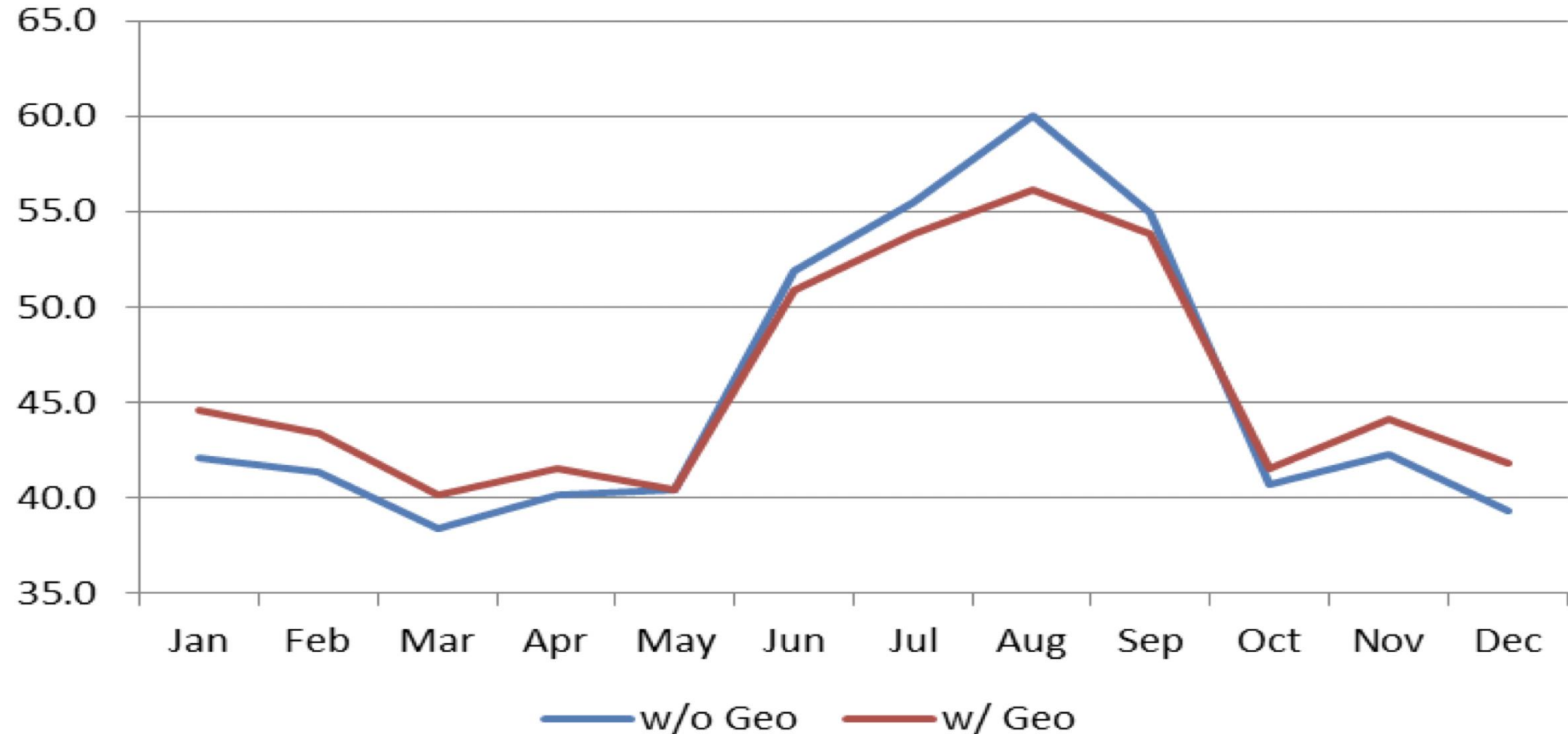


In 2013 Wyandotte, MI created a community geothermal heating and cooling option for customers

- “The geothermal systems in Wyandotte, Michigan, save the average customer a total of \$580 USD per year! Not only do the geothermal systems save the customer money, it also saves our utility \$580 dollars per year as well! This means it is a win- win situation for both the customer and the utility. “
- Some examples of utilities that could benefit are utilities that:
 - Are experiencing a poor load factor
 - Have a high peak value
- “Efficiency of heating/cooling units was considered in our tests which were found to be an average of 80%. Different areas may have a higher or lower average based on age of neighborhoods.”

Current Program for WMS participation is under a moratorium while new Rules and Regulations are updated based on gained experience and lessons learned. **WMS is looking into an incentive program instead of a city/municipally owned system.**

Geothermal and Peak Load



Geothermal Opportunity in MA



- Using geothermal energy for heating and cooling can reduce the average residential customer's carbon emissions by up to 60%
- Consider the community approach, but new residential incentives make customer focused programs appealing
- Consider the risks and work to mitigate them
 - Power outages
 - Equipment failures



Weatherization and Electrification Together Represent Opportunity



- Get customers comfortable/ improve quality of life
- Lower cost and create environmental benefits
- Utilize incentives:
 - \$3.5B DOE WAP (IIJA)
 - \$4.5B IRA HOMES (IRA)
 - \$4.5B IRA HEEHRA (IRA)
 - Tax credits (IRA)

Weatherize and Electrify Together Programmatically

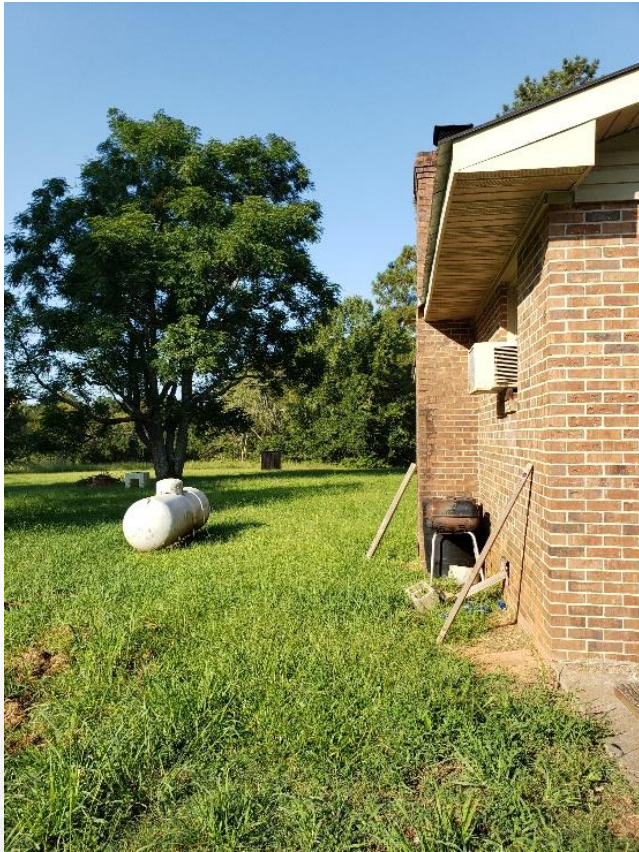
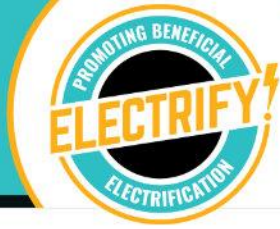
Electrification without Weatherization
= potential comfort issues and
oversizing

Weatherization without electrification
= missed opportunity for assessment
and BE/EE opportunities

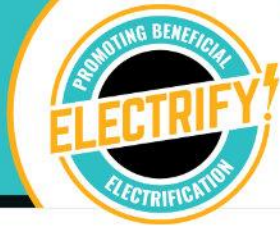
W/E Together = Reduced peak load
(counterintuitive), increased comfort
and multiple benefits



On the Ground in GA



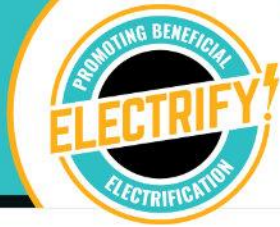
W/E Together Research Questions



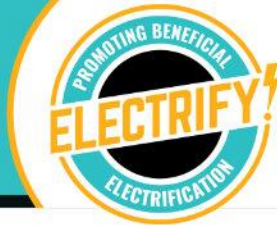
- What is business model when changing fuel sources from gasoline, diesel, fuel oil, gas to electricity (including panel and wiring and new appliances)
- Money from the federal government will change this equation
- Consider how you might create a program that braids together incentive programs and community energy goals



HOMES and HEEHR



- Both programs are newly created and have over \$4B each set aside to flow to states for implementation
- Home Owner Managing Energy Savings (HOMES) Rebate Program allows for HP upgrades with a rebate of \$4,000 (\$8,000 for LMI homeowners)
- High-Efficiency Electric Homes Rebate Program is an income-qualified program with a cap of \$14,000 per home and \$8,000 for HP systems



High Efficiency Electric Homes Rebates (HEEHR): \$4.5 billion over 10 years. Provides funding through State Energy Offices and Tribes for rebates for electric appliances.

- \$8,000 for heat pump HVAC ,
- \$1,750 for a heat pump water heater and
- \$4,000 for electric load center upgrade
- \$840 for an electric stove, range, oven or cooktop or electric heat pump clothes dryer
- \$2,500 for wiring

Total home cap of \$14,000 cap.

- This program is **income tested** at 150% AMI.
- 50% of costs up to rebate caps for households at 80%-150% AMI
- 100% costs up to caps for households at <80% AMI
- No double dipping with Hope for Homes or other federal rebates.

New Energy Efficient Homes and DPA



- Home builders are eligible for credits for building Energy Star qualified homes (\$2,500) or certified zero-energy ready homes (\$5,000)
- Invocation of the Defense Production Act has now been allocated \$500 million
- DPA funds will be used to spur manufacturing and market development in the heat pump sector

Next Steps and Opportunities



Is there an opportunity in your community to:

- Build a program so that the average community action partner is ready to implement beneficial electrification?
- Implement weatherization and electrification together?
- Better target when electrification is beneficial and increase electrification?

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