

Lansing Leads: Multifamily EV Charging Solutions

Supported by the U.S. Department of Energy



Michigan Clean Cities

- Since 1997, U.S. Department of Energy designated Clean Cities coalition connecting the expertise of the U.S. national laboratory network with the knowledge of local stakeholders to reduce pollution and costs with cleaner alternative fuel use.
- Michigan Clean Cities is affiliated with and staffed by NextEnergy, a nonprofit organization accelerating smarter, cleaner, more accessible solutions for communities and cities.



NEXTENERGY™
ACCELERATING INNOVATION



MICHIGAN
CLEAN CITIES

Panelists

- **Anna Guida, Forth**
- **Chase Attanasio, Clean Fuels Michigan**
- **Jennifer Binkley-Power, Lansing Board of Water
& Light**

Charge at Home

Charge at Home provides free electric vehicle charging guidance, tools and support to multifamily housing (MFH) decision makers and residents.





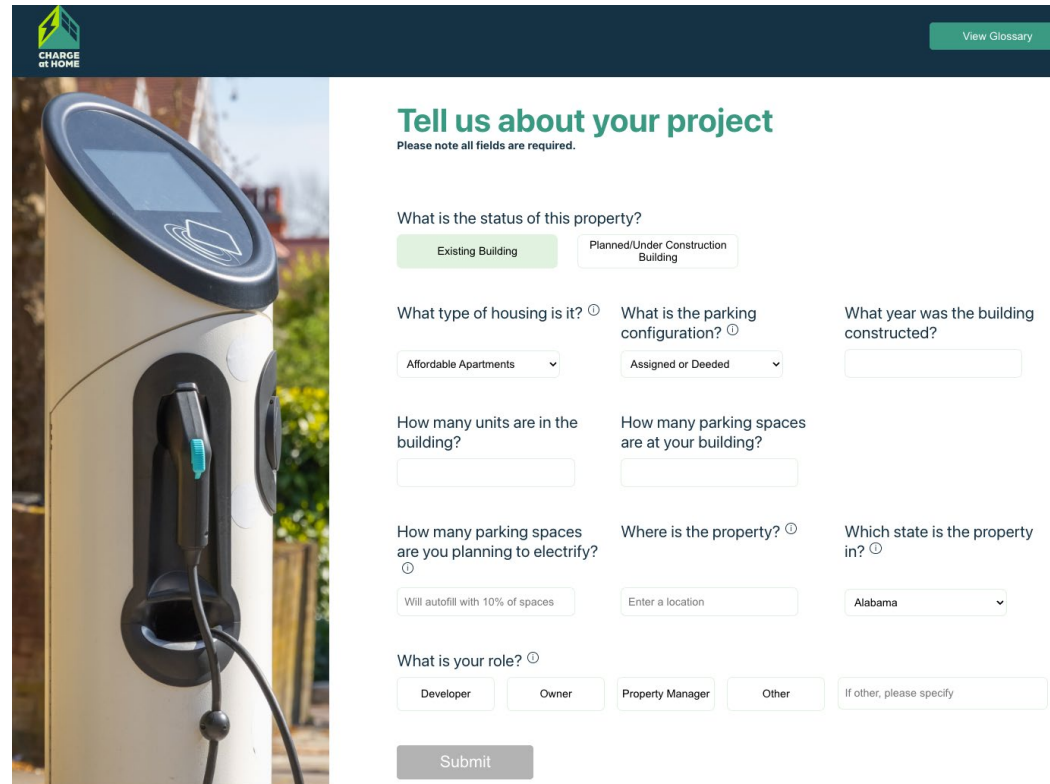
Charge at Home Resources

- Detailed market-segmented EV installation toolkits
- EV charging project builder tool, designed specifically for MFH properties
- Educational one-pagers
- MFH EV charging project case studies
- Free site-specific consultations for multifamily decision makers (coming soon)
- Communication templates for updating residents about EV charging policies
- Resident empowerment resources
- Roundtable Sessions: live technical assistance and education

Charge at Home Resources

Charge at Home Project Builder Tool chargeathome.org/tools

Generates site-specific EV charging infrastructure cost estimates based on unique inputs entered about a multifamily property.



CHARGE at HOME [View Glossary](#)

Tell us about your project

Please note all fields are required.

What is the status of this property?

☒ Existing Building ☐ Planned/Under Construction Building

What type of housing is it? [ⓘ] What is the parking configuration? [ⓘ] What year was the building constructed?

How many units are in the building? How many parking spaces are at your building?

How many parking spaces are you planning to electrify? [ⓘ] Where is the property? [ⓘ] Which state is the property in? [ⓘ]

What is your role? [ⓘ]

☐ Developer ☐ Owner ☐ Property Manager ☐ Other

Recent Case Studies

Direct wire to meter L2 charging with load management

EV Charging Retrofit at Condos Avoids Upgrades by Wiring Chargers to Unit Meters

Cascadian Court Condominiums - Portland, OR



Property Details:

- 87 units | Midrise | 9 stories
- Underground garage under building
- 14 total parking spaces
- Deeded parking
- Located in Portland's Lloyd District
- Building was completed in 2010
- Home Owners Association (HOA)



Cascadian Court Parking Garage

Background:

Several condominium owners with deeded parking spaces wanted to install electric vehicle (EV) chargers. However, parking was limited, and the existing electrical infrastructure could not support multiple communal Level 2 (L2) chargers. While electric meters were conveniently located in an electrical room adjacent to the garage, the electrical panels (70 or 100 amp panels, depending on the unit) for each unit were situated within the condos themselves, as many as nine floors above the garage. The property needed an innovative method for solving its various capacity limitations.

EV Charging Project Details:

This was an independent project scope, without other upgrades to the building. The General Contractor (Conserve Energy, LLC.) created a list of EV charging options with technical details and budgetary costs for the HOA to consider and review with their members. Once they decided on a solution, the HOA polled members with parking spaces to determine who might be interested in adding an EV charger. Bids were provided to all interested members.

Pre-existing EV Charging Set Up:

This was the first EV charging project for the property. Condo owners had not considered purchasing EVs due to the lack of home charging at the property.

Tech Solution: RVE Electric Vehicle Energy Management Systems (EVEMS)

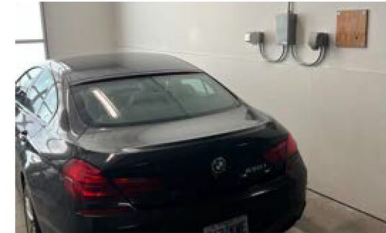
- An EVEMS was installed in the electrical room for unit owners with a parking space willing to pay the install cost. The EVEMS connected into the wiring that runs between a condo unit's electric meter and the in-unit electrical panel, allowing all charging to be billed on the unit owner's utility bill.



The EVEMS system in Cascadian Court's electrical room

Tech Solution Continued: RVE Electric Vehicle Energy Management Systems (EVEMS)

- The EVEMS measures real-time power consumption of the condominium's electrical panel, so when the power demand is high, the EVEMS turns off power to the charging circuit to avoid a circuit breaker tripping.
- Level 2 (L2) non-networked outlets with option to hard-wire. Conserve Energy, LLC. provided infrastructure allowing condo owners to select preferred charger.
- Condo owners preferred 240V plugs with locking covers to prevent EV charging equipment from being unplugged or removed.
- This solution allowed condominium owners to install chargers without ongoing HOA involvement.



240V and 120V outlets ready to support up to L2 chargers



Unit electric meters in Cascadian Court electrical room

Project Financials:

- A new transformer and house panel was considered, but the expense was prohibitive. This would have required added metering, the HOA would have to pay for electricity upfront and bill individual users for power used to charge their vehicles.
- Residents with chargers qualify for Home EV charger incentives from [Pacific Power](#).
- Condo owners paid for their individual portion of the project costs.
- Condo owners can expect ROI through reduced charging cost compared to commercial EV chargers, and increased resale value of their unit.

Installation Process:

Conserve Energy ensured futureproofing, leaving room to add more circuits if and when additional chargers were needed. The total installation took 2 weeks.

Project Permitting and Compliance:

- The City of Portland electrical inspector was unfamiliar with the EVEMS units. The General Contractor provided documentation showing the specifications and UL/CSA listing.
- Charger mounting height was based on ADA guidelines.

Takeaways:

- Electric Vehicle Energy Management Systems (EVEMS) can help with rightsizing a project and lowering costs for residents.
- The EVEMS can allow for a project to avoid costly upgrades on electrical panels.
- Load management with direct wiring to the unit meter simplifies tracking energy usage while allowing MFH residents a close to single family home experience.

www.chargeathome.org

www.chargeathome.org



Recent Case Studies

L1 charging deployed to electrify all parking spaces with minimal cost to property and resident

Stanford University Housing Provides Ubiquitous and Affordable Low-Power EV Charging Without Electrical Upgrades

Palo Alto, California - University Terrace



GOPOWEREV

Property Details:

- 112 units | 2 buildings | Midrise | 4 stories each
- Underground garage beneath each building: 128 total EV parking spaces
- Condominium developed by Stanford University specifically for faculty
- Faculty purchase and own units while residing at property
- Property management group operates day-to-day
- 1 Homeowners Association serves the community, both buildings and garages

EV Charging Project Details:

HOA initiated and led the project to meet resident demand. EV charging was included as an amenity to residents in their purchase agreements. HOA knew the number of EVs on site.

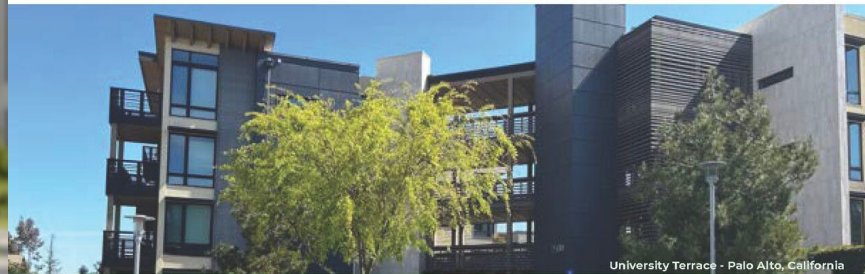
- No service upgrade, meter, or transformer work done
- Assigned parking configuration
- Utility only involved for incentives
- 128 parking spaces electrified for EV charging
- 20 Amp breaker (2-pole) per smart outlet
- 64 breakers installed



GoPowerEV SmartOutlets

Pre-existing EV Charging Set Up:

L2 chargers, many had become non-functional. Pre-existing set up did not meet resident need due to the number of EVs on site.



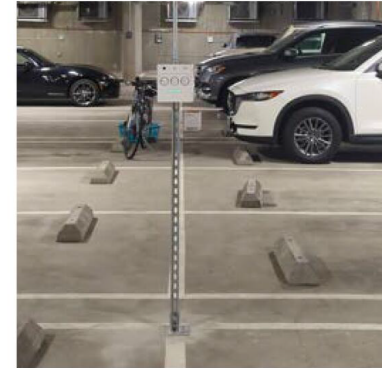
University Terrace - Palo Alto, California

www.chargeathome.org

Technology Solution: GoPowerEV SmartOutlets & PowerShift Platform

3 outlets for each GoPowerEV SmartOutlet. Two L1 outlet ports on either side, one low-power (20A) L2 port in the middle. The GoPowerEV SmartOutlet can charge 2 EV's simultaneously at L1. If requested by the end user, the equipment can direct all energy to a low-power L2 (240/208V) port, turning off both L1 outlets while it does so.

- Electron flow is controlled by GoPowerEV's PowerShift technology to meet all users requested charging sessions.
- Resident requests charging sessions and pays for electricity through the GoPowerEV smartphone app
- Access control via property management portal; residents requesting to charge are approved by the property manager.



GoPowerEV SmartOutlets in the University Terrace Garage



GoPowerEV SmartOutlets

Project Financials:

Project received \$160,000 in incentive funding (\$80,000 per charging project for two properties) through the [City of Palo Alto incentive program](#).

- Total cost before incentives: \$1,776 per EV enabled parking spot
- Property's out-of-pocket cost after incentives: \$526 per EV enabled parking spot

Installation Process:

GoPowerEV was introduced by the property management company HOA officers. GoPowerEV facilitated the RFP to identify the commercial electrical contractor, JG Electric. Installation took less than 4 months after permit application approval. The building had existing 40-amp circuits planned for EV charging. The installer added small load centers with 20A circuit breakers throughout the garage to disperse energy for the EV enabled parking spots. All residential units now have at least one assigned parking space with EV charging capabilities.

Project Permitting and Compliance:

The city requires Emergency Power Off (EPO) buttons for fire personnel safety.

Current Use and Takeaways:

- 35 end user accounts registered & charging at the property
- L1 and low power L2 (LPL2) solutions meet the needs of most multifamily residents
- An electrical service upgrade was avoided by using low-power options
- Incentive programs for low power charging make a significant impact on project cost



www.chargeathome.org



The Case for EV Charging at MFH Properties

- EV ownership is on the rise
- EV drivers want to charge where they park (i.e. at home, at work, where they shop)
- **EV drivers will make decisions about where they live based on access to EV charging**

The Case for EV Charging at MFH Properties

- 40+ million renters live in ~23 million apartment homes
- 75% of apartment households have at least one vehicle
- Most EV drivers prefer charging convenience and affordability (i.e. home charging) over charging speed



MFH EV Charging Considerations for New Properties

Barriers

- MFH decision makers uncertain of EV-readiness ROI
 - Lack of knowledge about projected rate of EV adoption for next 5-10 years
- Load management systems not widely used or understood, *yet*
- Codes vary significantly across different jurisdictions
- Cost



MFH EV Charging Considerations for New Properties

Potential Solutions for Common Barriers

- Education designed for MFH decision makers; access to reliable technical support (internal or external)
- Utilize EV load management systems at the panel or building level
- Utilize load-managed networked chargers if EV load management systems are not used
- Prioritize EV-readiness:
 - Panel capacity
 - Conduit
 - Breakers & wiring



MFH EV Charging Considerations for Existing Properties

Barriers

- Cost
 - Limited electrical capacity requires new panel, service upgrade
 - Electrical capacity suboptimally located
 - Internet connectivity
- Parking is often constrained
- Utility service upgrades can take a long time
- Lack of knowledge about load management systems



MFH EV Charging Considerations for Existing Properties

Potential Solutions for Common Barriers

- Education designed for MFH decision makers; access to reliable technical support (internal or external)
- Utilized load-managed chargers, load management systems, or smart panels
- Utilize lower-cost ports, including power-sharing chargers
- Use level 1 and other low-power options

What influences decision makers to install EV charging infrastructure?

- Mandates
- Incentives
- Understanding of value proposition and ROI expectations
- Familiarity with technology
- Internal company sustainability requirements
- Residents/tenants requesting EV charging
- Staying competitive with comparable properties

Resources for Workplace Charging

CALSTART's Charge@Work project builder tool

www.chargeatwork.org

A step-by-step guide to launching workplace EV charging (WPC) projects. Designed for organizations of all sizes, Charge@Work streamlines planning, budgeting, and implementation to help you create a sustainable, EV-friendly workplace.

Forth's Electric Vehicle Adoption Leadership certification program (EVAL)

Let's Stay in Touch

Anna Guida, Forth

annag@forthmobility.org

Sign up for the Charge at Home newsletter at www.chargeathome.org or follow us on LinkedIn (Charge at Home by Forth).

EV CHARGING FOR MULTIFAMILY PROPERTIES

- Why now is the time to invest in EV chargers for multifamily properties
- How to take advantage of state, federal, and utility incentives to help offset the costs of deploying EV charging infrastructure
- How to get started with an EV charging project

Speaker
Chase Attanasio
POLICY MANAGER





WHY INVEST IN EV CHARGERS?

RESIDENT DEMAND:

EV drivers prioritize properties with charging. *58% of renters are willing to pay more for access.*

MARKET DIFFERENTIATION:

Stand out by offering this in-demand amenity.

BOOST PROPERTY VALUE:

EV chargers can increase rental income and property valuation.

INCENTIVES ARE AVAILABLE NOW



Clean Fuel and Charging Infrastructure Program

State of Michigan

\$5M available for MFH properties with 2+ units

30% match required



Tax Credits

30C Tax Credit

30%, up to \$100,000

Eligibility requirements based on census tract



Utility Programs

DTE

Consumers Energy

Indiana Michigan Power

Lansing BWL

INCENTIVES ARE AVAILABLE NOW

- **Consumers Energy**: Up to \$7,500 for Installing Overnight EV Charging for Resident Use.
- **DTE Energy**: EV Charger rebates for businesses and multi-unit dwellings, 2025 program details to be announced.
- **Indiana Michigan Power**: \$2,500 for the first port and \$500 for each additional port toward installation of PEV charging equipment.

CHARGING OVERVIEW

CHARGER TYPE	SPEED OF CHARGE	IDEAL USE CASE	APPROXIMATE COST	MAINTENANCE REQUIREMENTS
LEVEL 1	2–5 miles/hour	Low daily mileage drivers	Low	Minimal
LEVEL 2	10–25 miles/hour	Daily/overnight for multiple users	Moderate	Periodic servicing
DC FAST	50–350 miles/hour	High-traffic or premium options	High	Regular maintenance

Level 2 chargers are the most common choice for multifamily housing applications, offering a balance of speed and cost-efficiency.

CHARGING OVERVIEW

01



Software

Energy management, billing integration, tenant access, and more.

02



Connectivity

Networked chargers connect to the internet, allowing it to share data with the owner.

03



Future Proofing

Plan for future charging needs to reduce costs.

04



Charger Placement

Consider building layout and customer use patterns.

CHARGER INSTALLATION CHECKLIST

PLANNING



Identify Project Partners:

- **Local Electric Utility:** Assess installation needs, electrical upgrades, and associated costs as well as rebate programs.
- **Certified Electrical Contractor:** May also be a charger vendor; provide input on installation and charger selection.
- **Charging Infrastructure Provider:** Assist with equipment selection, planning, and timeline development.



Assess Resident Demand: Electric vehicles make up almost 10% of new car sales and are expected to continue rising in popularity. A survey can be used to assess current tenant demand for EV charging and inform you about tenant preferences.



Determine Network Requirements: Decide if chargers need to be networked for utilization data collection and payment processing.



Evaluate Ownership Models: Compare options for owning, leasing, or partnering on charger infrastructure.



Review Codes and Permits: Work with your contractors to review applicable building codes, regulations, and permitting requirements before construction begins.



Apply for Incentives: Submit applications for relevant grants, tax credits, and utility programs.

CHARGER INSTALLATION CHECKLIST

INSTALLATION

- ☐ **Coordinate with the Utility:** Confirm power requirements, pricing impacts, and any necessary electrical upgrades. If using a utility incentive program, the utility can likely provide a high level of support for many installation tasks.
- ☐ **Select Charging Site Location :**
 - Consider current and future demand for chargers to select the appropriate number of charging spots.
 - With your utility, assess proximity to electrical infrastructure and metering requirements.
 - Ensure access to wireless internet for networked chargers (if applicable).
- ☐ **Select Vendors:** It's recommended to obtain at least three quotes from vendors.
 - Charging Infrastructure Manufacturer: Provide chargers and related hardware.
 - Network Provider (if applicable): Manage software and payment systems.
- ☐ **Obtain Permits:** Electrical contractors should secure required building and zoning permits.
- ☐ **Plan for Inspections:** Electrical contractors should understand inspection requirements and timelines.
- ☐ **Address Site Needs:** Procure signage, lighting, and security measures for the charging site.

CHARGER INSTALLATION CHECKLIST

OPERATION

- ☐ **Complete Installation:** Oversee engineering, construction, and permitting processes.
- ☐ **Add to Station Locator:** If the station is open to the public, ensure it is listed in the [Alternative Fueling Station Locator](#).
- ☐ **Plan for Maintenance:** Assess ongoing maintenance needs and keep chargers operational.
- ☐ **Communicate with Tenants:** Provide information to tenants about how to use the equipment properly and EV charging etiquette (for example, if the charger is shared, drivers should move their vehicle once charging is complete).
- ☐ **Train Staff:** Provide training on charger operation as needed.

MICHIGAN CLEAN FUEL AND CHARGING INFRASTRUCTURE PROGRAM



\$30 million available for EV Charging across Michigan

- \$5M available for MFH properties with 2+ units administered by the Michigan Department of Environment, Great Lakes, and Energy
- Eligible costs include make-ready upgrade costs, planned maintenance and operation costs.
- 30% match required for properties not located in an environmental justice community
- Stackable with other incentives
- Rolling applications

SPONSORED BY:



Get Started Today! This is your opportunity to attract and retain residents, build a sustainable community, and boost revenue. [Learn more in our full guide](#)

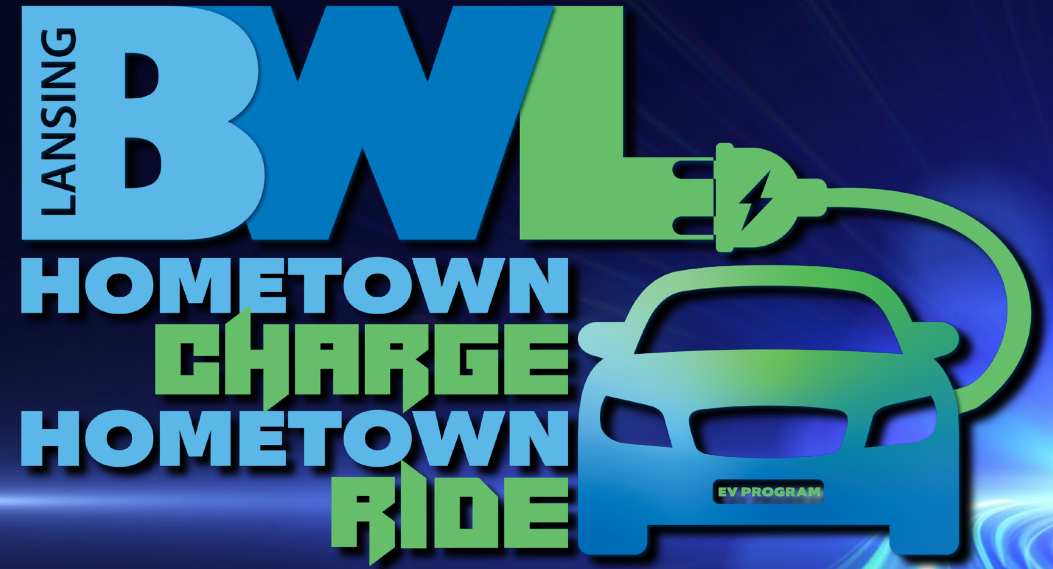


clean-fuels-michigan

@cleanfuelsmichigan

cleanfuelsmi.org

Jennifer Binkley-Power
Supervisor, Carbon Neutrality



LANSGING BOARD OF WATER & LIGHT

- The Lansing Board of Water & Light is a municipally owned public utility that provides safe, reliable, and affordable utility products and services to around 100,000 electric and 58,000 water customers in the greater Lansing, Michigan area.
- The BWL owns 2,000 miles of overhead and underground power lines and more than 800 miles of water mains, providing 2.7 million megawatt hours and 7 billion gallons of water to customers annually.
- The BWL provides steam and chilled water services to buildings in downtown Lansing and operates 34,000 streetlights.



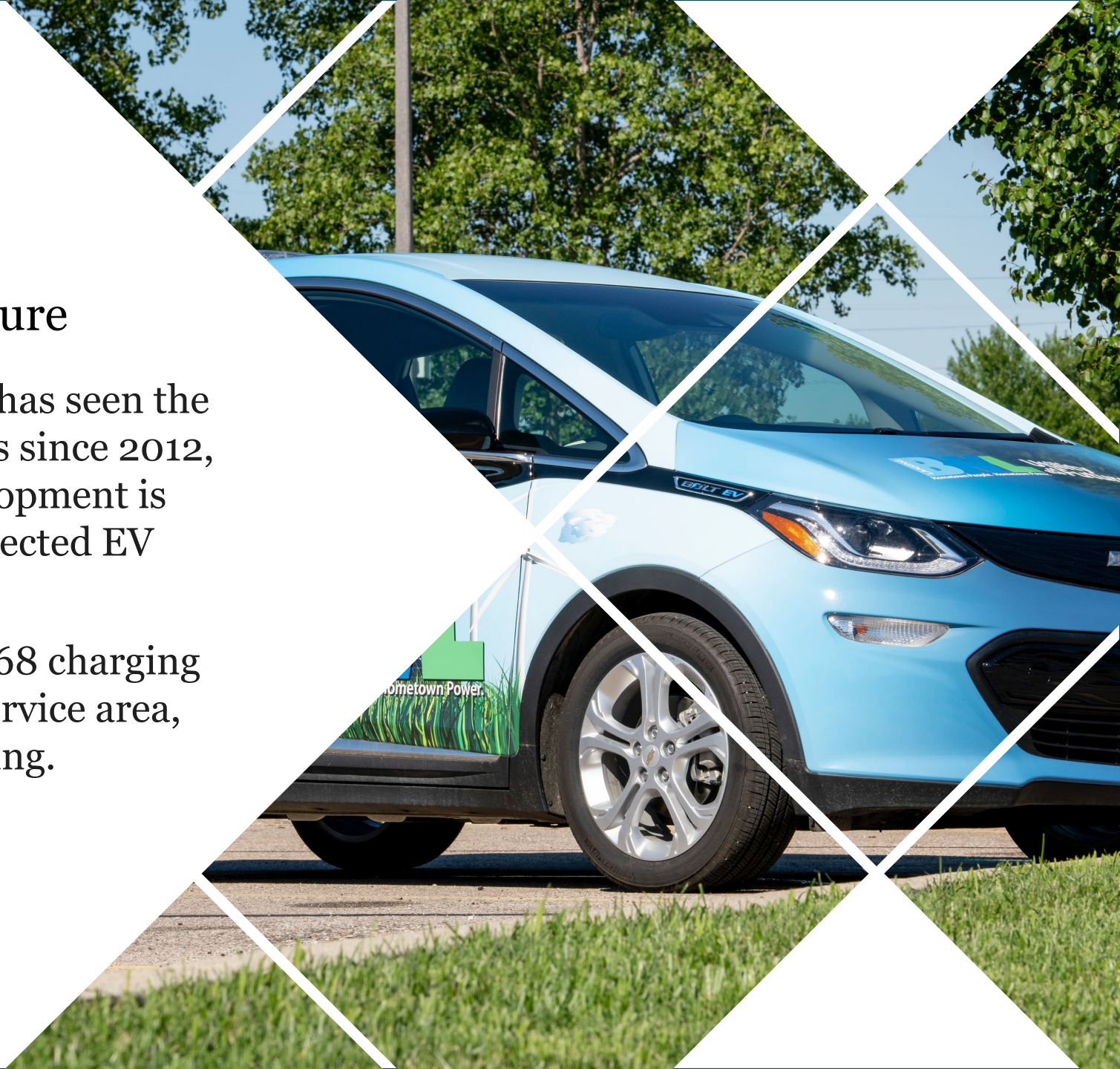
BWL ELECTRIC VEHICLES THEN...

- BWL receives DOE grant in 2010 to research EVs & Electric Vehicle Supply Equipment (EVSE) to install chargers and offer rebates to customers for purchase of EVs.
 - Potential PEV buyers would be more inclined to purchase an electric vehicle if there were public charging locations while on their daily commute or options for at-home charging.
 - Eliminate the public perception that the infrastructure to support electric vehicles does not exist.
 - Worked with the local electrical inspectors in the BWL's distribution territory to determine which models will be acceptable, meet National Electrical Codes, and best serve our customers.
 - Michigan was able to get a new building code passed, which allowed a separate disconnect specifically for the EVSE on residential homes.
 - A total of 9 different vendor charging stations were selected.
 - A total of 54 EVSEs were installed: 16 residential, 9 work, 17 public, and 12 fleet.



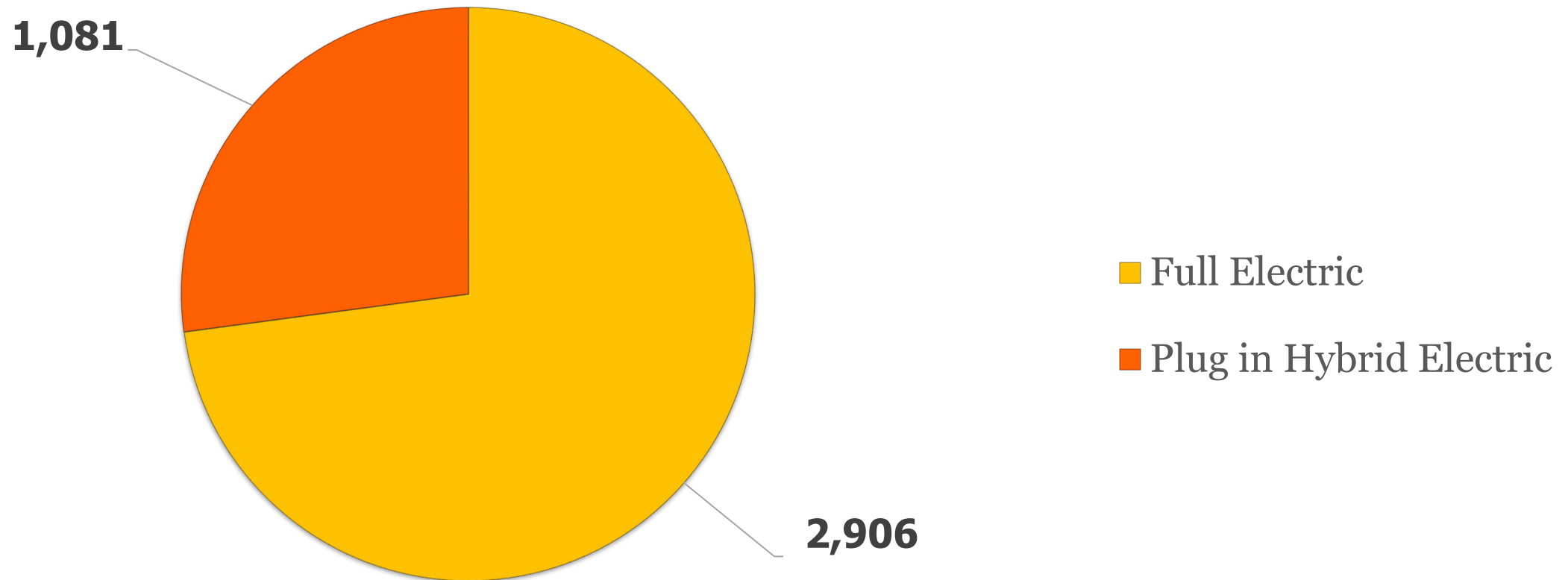
BWL ELECTRIC VEHICLES NOW

- Lansing EV Charging Infrastructure
 - The Michigan Capital Area Region has seen the deployment of EV charging stations since 2012, though significant additional development is needed to support current and projected EV charging needs.
 - Currently there are approximately 68 charging stations offering 147 ports in our service area, within 30 miles of downtown Lansing.
 - 26% are DC Fast Chargers
 - 15% are brand specific (Tesla)



BWL SERVICE TERRITORY

Electric Vehicles by Type*



* Source- Michigan Secretary of State

ENCOURAGING OPTIMAL EV CHARGING WITH TIME OF USE (TOU) RATES

- Time of Use (TOU)
 - Standard Rate for All Residential Customers
 - Gradual Increase On- Peak Off-Peak Differential
- Off-Peak Savers –Optional
 - Higher Pricing On-Peak, Lower Pricing Off-Peak
 - Larger Opportunity for Savings Off-Peak
- Rate 22 – Second Meter Electric Vehicle Charging
 - Slightly Lower On and Off-Peak Pricing than Off-Peak Savers
 - Second Meter Dedicated to EV Charging

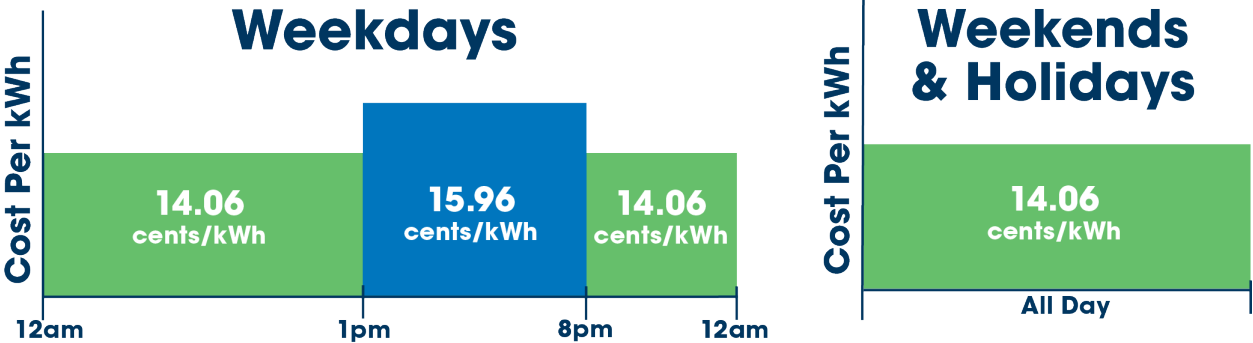


BWL RESIDENTIAL TIME OF USE RATES

Rate - RES1

Valid beginning October 1, 2024

 = Off-Peak RES1  = On-Peak RES1

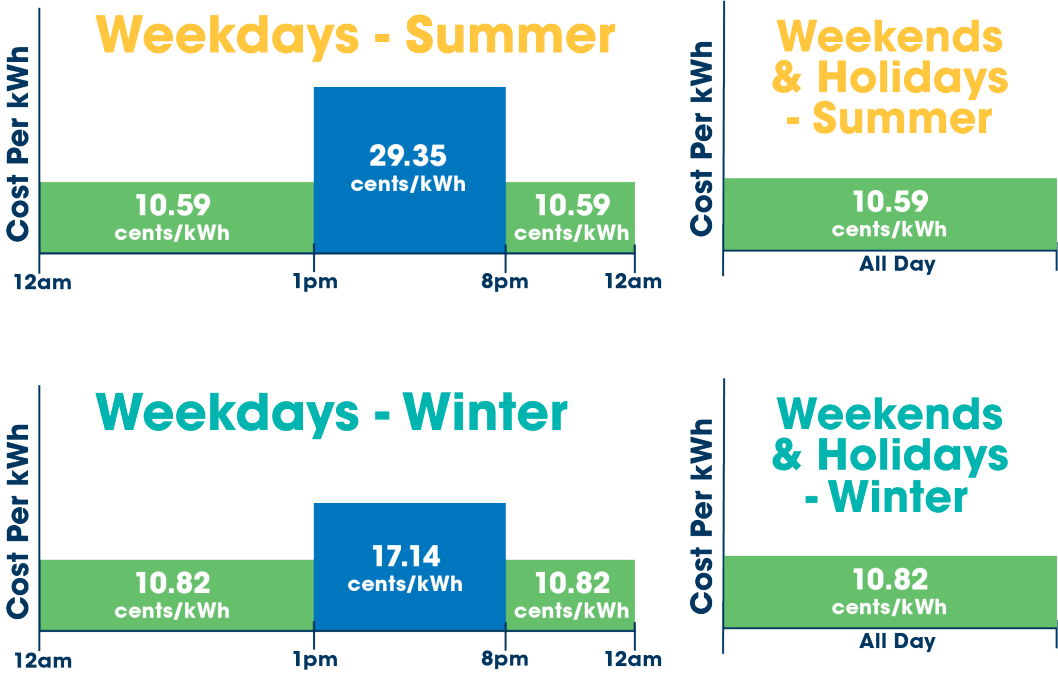


RES1 rates are the same in summer & winter.

Rate - RESTOU

Valid beginning October 1, 2024

 = Off-Peak RESTOU  = On-Peak RESTOU



RESIDENTIAL EV RATE CUSTOMER BENEFITS

- PEV Off-Peak Savers* - **Up to \$500 Rebate**
 - Install a portable EV charger or one that is not hardwired to the home
 - Customers not interested in a second residential meter or the associated installation costs
 - Customers interested in optimizing their home energy usage by enrolling your home in a time of use rate and take advantage of lower energy prices during off-peak hours

*Available to all customers, but **required** for the EV Charging Rebate





RESIDENTIAL EV Rate CUSTOMER BENEFITS

- Rate 22 is a Separately Metered EV Charging TOU Rate – **Up to \$1,000 Rebate**
 - A second meter that is dedicated to the EV charger
 - The electric vehicle charger is hardwired
 - To serve customers who may be limited on the available amperage in their home electrical panel and choose not to upgrade the panel
 - Customers that want to track electrical usage from charging their EV separately and take advantage of charging when energy prices are low

WORKPLACE, PUBLIC, & MULTIFAMILY*

- Business (fleet, workplace, public):
 - \$2,500 rebate, up to three stations per location
- Multifamily:
 - \$4,500 rebate, up to three stations per location

* Rebates are for Level 2 chargers only



Thank You



Q&A

With

Panelists

- Anna Guida, Forth
- Chase Attanasio, Clean Fuels Michigan
- Jennifer Binkley-Power, Lansing Board of Water & Light

Thank you for joining us!

Find more information about Charge
at Home at www.chargeathome.org

Jeffrey Hoang, NextEnergy

jeffreyh@nextenergy.org

