



WORKSHOP: RESIDENTIAL ELECTRIC VEHICLES, ELECTRIC VEHICLE RATES AND ELECTRIC VEHICLE PROGRAMS

Presented by: Tracy Sato, Utility Integrations Manager

Customer Relations and Finance Committee
Board of Public Utilities
May 8, 2019

RECOMMENDATIONS

That the Board of the Public Utilities:

1. Receive and file the report on the status of residential electric vehicles in the City of Riverside, residential electric rates offered to customers to support electric vehicle charging, and options for programs to support residential electric vehicles;
2. Conduct a workshop and, at its conclusion, provide a set of comments and recommendations representing consensus of the Board on preferred programs and rebates to support residential electric vehicles; and
3. Direct staff to return to the Board in six months with a proposed residential electric vehicle rebate program.

11/26/18 BOARD DIRECTION SUMMARY

1. Approved the staff recommendation to expand the availability of the previously approved EV-TOU rate to all domestic rate customers as well as additional clarifications.
- 2. Directed staff to refer this issue to the Board of the Public Utilities' Customer Relations/Finance Committee followed by a Board Workshop on a Domestic Electric Vehicle Program.**

BOARD DISCUSSION

1. Concern expressed over not meeting with auto dealer
2. Evaluate alternatives to the current process for a customer to utilize the Electric Vehicle Separately Metered TOU Rate
 - A. **Keep it simple, convenient, low-cost for customer**
 - B. The rate for residential EVs should **include a rate discount** for charging
 - C. **Budget of energy use for charging EVs in a rate**
 - D. **Establish a time period for charging**
 - E. Provide an **online or mobile application** for signing up
 - F. Design and propose a **non-intrusive verification process**

3/22/19 COMMITTEE WORKSHOP DISCUSSION

The following were discussed and recommended:

1. Provide ongoing **EV workshops**
2. **Participate regionally** in EV efforts, including application for federal funding
3. **Focus programs on what is needed** and where there are gaps in addressing need
4. **Rebates should be for equipment purchases and expenses**, not for charging up the EV
5. **Rebates could be for permit fees**
6. Identify how EVs factor into **AMI, the IRP, and RPU fleet**

WORKSHOP AGENDA

1. Overview of Residential EVs in Riverside
2. Currently offered RPU Rates supporting EVs
3. Funding for EV rebates and programs
4. Options for EV rebates and programs

**This is an interactive workshop intended for discussion.
Please ask questions throughout**

WHY EVS AND WHY NOW?

1. Climate Change Goals

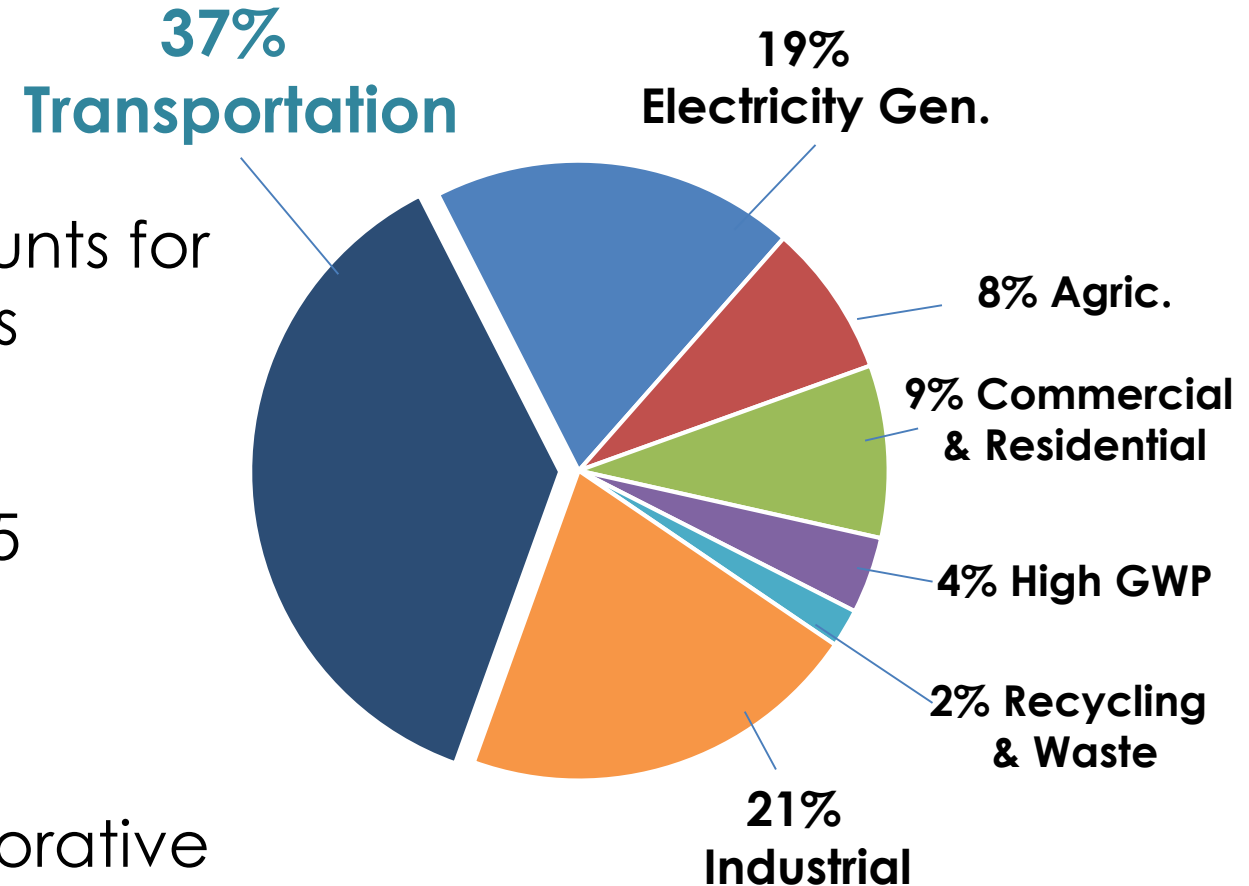
- A. In California, transportation accounts for ~40% of greenhouse gas emissions

2. State of California Goals

- A. 1.5 million EVs on the road by 2025
- B. 5 million EVs on the road by 2030

3. City Commitment

- A. Utility 2.0, Green Action Plan, Restorative Growthprint, and General Plan 2025



EV TECHNOLOGY READY FOR CONSUMERS

More Models to Meet Customer Demand

Lower Cost Options | Price Parity by 2024

Batteries are Cheaper and Better

Legislation/Regulation in CA Driving Change

Medium and Heavy Duty Electric Vehicles



127

Electric Vehicle
Models
by 2025

Includes sedans,
minivans, pickups, and
sport utility vehicles

STATE GRANT AND FUNDING ALLOCATIONS

1. California Air Resources Board ~\$670 million

- A. \$560 million for Low Carbon Transportation investments funded with Cap-and-Trade Auction Proceeds
- B. \$28.64 million for the Air Quality Improvement Program (AQIP)
- C. \$25 million Volkswagen Settlement Funds for ZEV Aspects of Vehicle Replacement Programs
- D. \$50 million for a new Zero- and Near Zero-Emission Warehouse Program

2. California Energy Commission ~\$120 million

- A. \$39 million for Southern California (Possible to increase to \$200 million in the future, \$5 million for Riverside County) for Alternative and Renewable Fuel and Vehicle Technology Program under CalEVIP.
- B. \$78.7 million for School Bus Replacement
- C. More anticipated

3. Southern California Air Quality Management District

CALIFORNIA ELECTRIC VEHICLE REBATES

By Manufacturer and EV Type

Received by Riverside
Residents and Businesses

January 2011 through November 2018

\$2 Million
in CVRP

Not Including Tax Credits or City Rebates

**Almost 60% Generated
Between 2016-2018**

Manufacturer	Battery	Fuel Cell	Plug-In Hybrid	Total # of Vehicles	Total Amount of Rebates
Audi			3	3	\$6,500
BMW	26		3	29	\$71,500
Cadillac			1	1	\$1,500
Chevrolet	57		201	258	\$460,833
Chrysler			4	4	\$6,000
FIAT	62			62	\$166,500
Ford	10		142	152	\$242,056
Honda	8	4	23	35	\$88,500
Hyundai	15		6	21	\$48,500
Kia	4		10	14	\$25,000
Mercedes-Benz	3	1		4	\$10,000
Mitsubishi	1		3	4	\$9,000
Nissan	95			95	\$251,084
Smart	11			11	\$29,500
Tesla	160			160	\$406,000
Toyota	5	11	103	119	\$240,000
Volkswagen	10			10	\$25,000
Total	467	16	499	982	\$2,087,473

Residents – 954 rebates for \$2M | Business 26 rebates for \$56,500 | Non-Profits 2 rebates | \$4,000

SAVING MONEY AND CLEANING THE AIR

Battery EV compared to Conventional Gas Engine Vehicle

Traveling an average of 20,000 miles per year

Vehicle Type	Fuel Economy	Fuel Requirements	Estimated Annual Cost	Greenhouse Gas Emissions
Battery Electric	3.43 miles/kWh	5,831 kWh/year	\$1,069 for electricity	2.3 metric tons
Conventional Gas	22 miles / gallon	909 gallons / year	\$2,591 for gasoline	8.1 metric tons

Benefits of Electric

**\$1,522
Savings**

**5.7 metric
tons reduced**

WHAT WE HEARD FROM THE AUTO DEALERS

1. Automakers are committed to EVs

A. Cadillac's entire line of vehicles will be electric by 2025

2. New technology and charging

A. Porsche's new super-fast charging infrastructure, 350 kw charger with battery storage

3. What we saw in the past is not what will be in the future

4. Data and information for them is helpful

A. Training for sales staff is not requested at this time

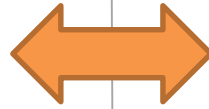
5. Continue the conversation

WHAT SHOULD RPU BE CONSIDERING?

Utility Side

How is RPU planning and preparing for the new EV load?

1. IRP for EV forecasting
2. Power supply & peak load
3. Where is charging occurring
4. Type of charging
5. Infrastructure improvements



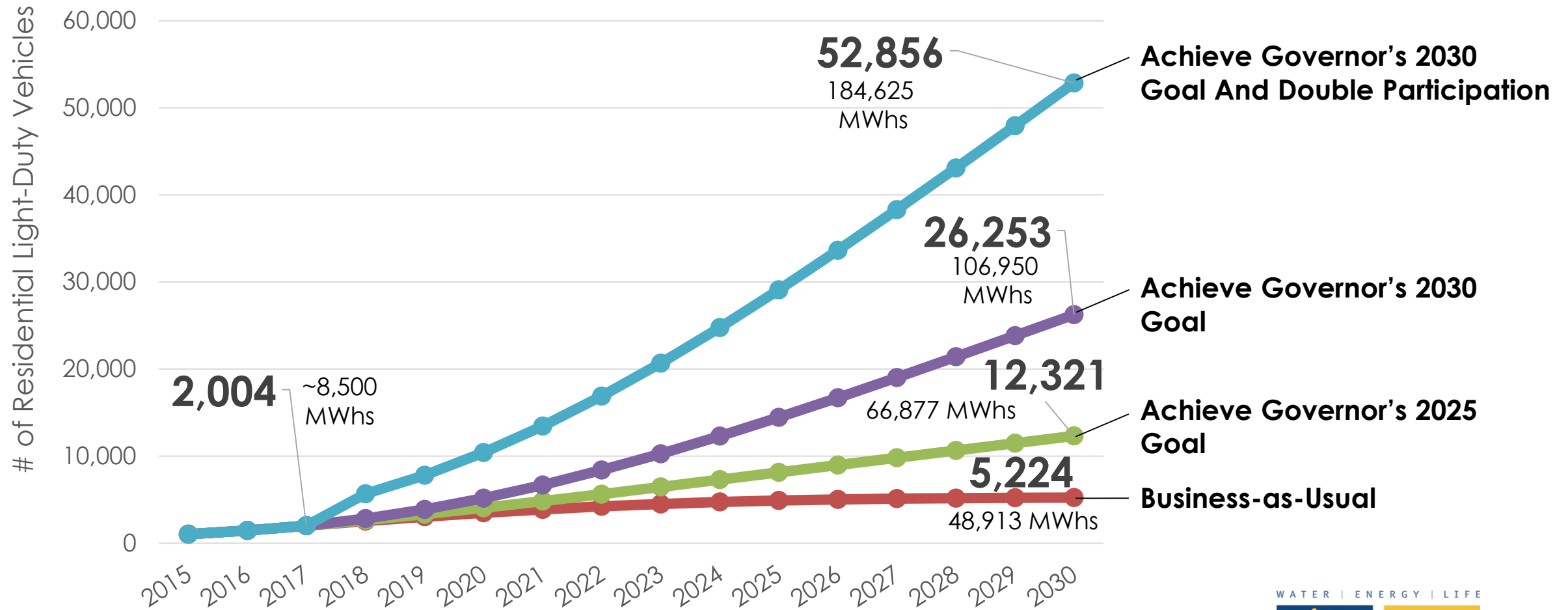
Customer Side

How does RPU support our new EV customers?

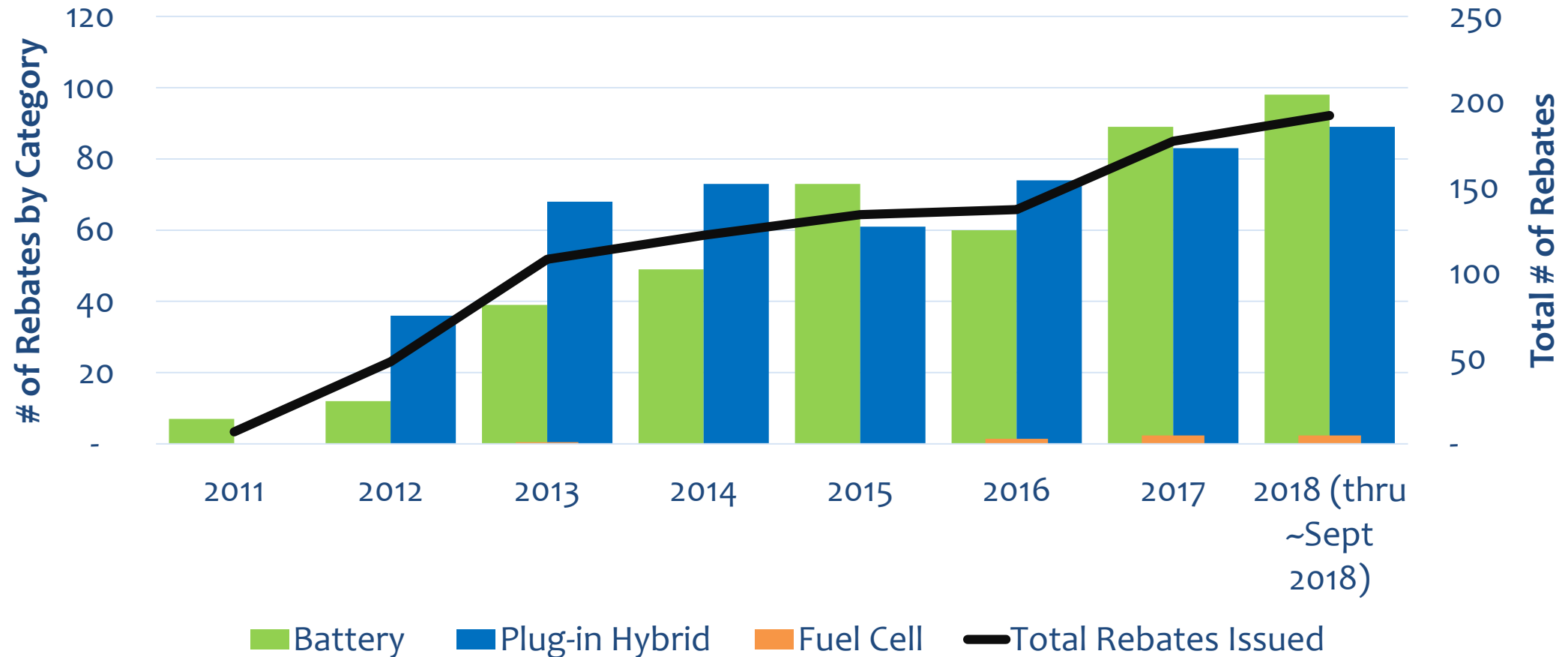
1. Rates to support EVs
2. Rebates
3. Education
4. EV charging locations
5. Ensuring all customers can benefit

RESIDENTIAL EV GROWTH IN RIVERSIDE

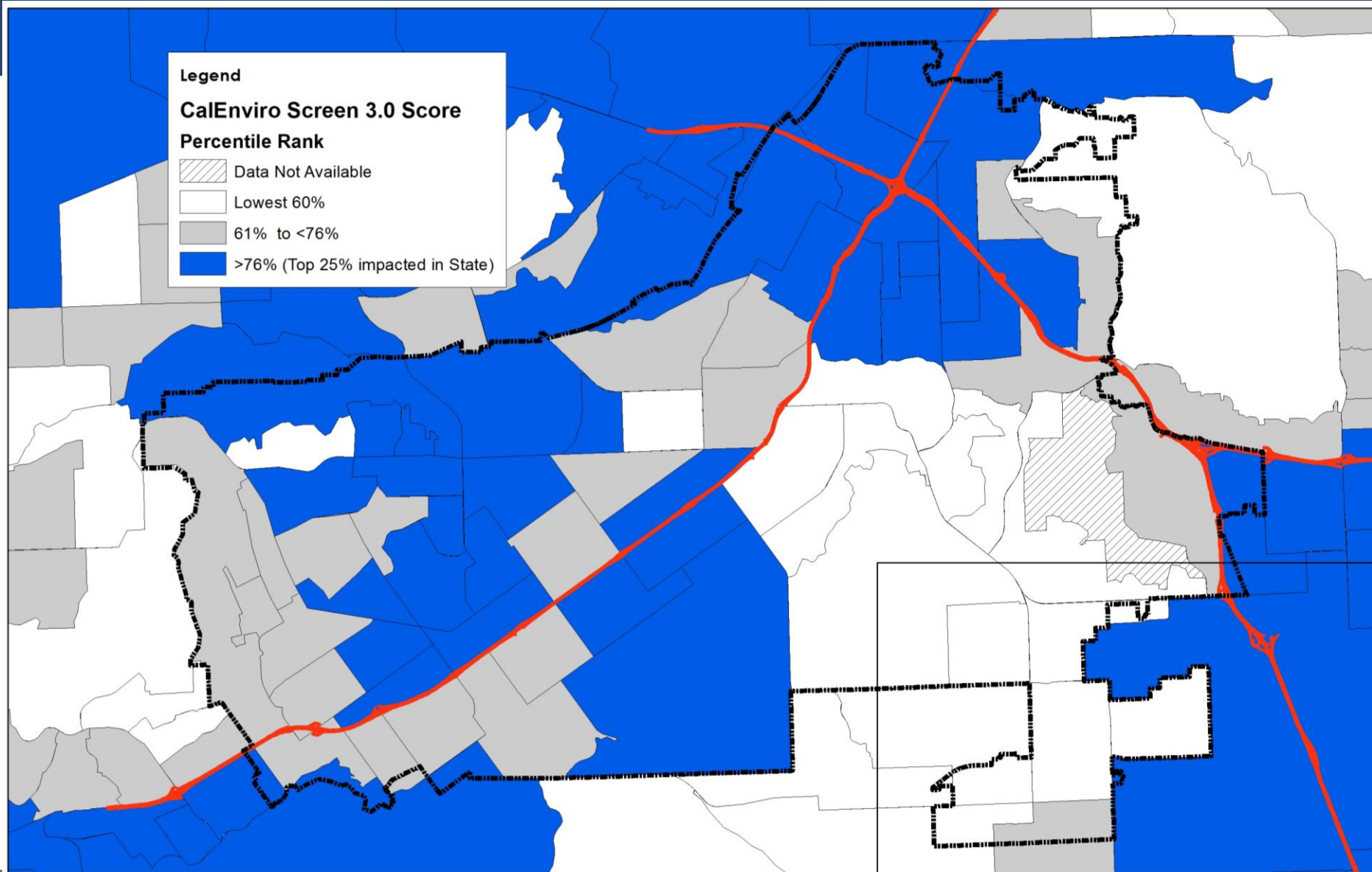
(LIGHT-DUTY VEHICLES ONLY)



CLEAN VEHICLE REBATES BY YEAR IN RIVERSIDE



DISADVANTAGED COMMUNITIES IN RIVERSIDE



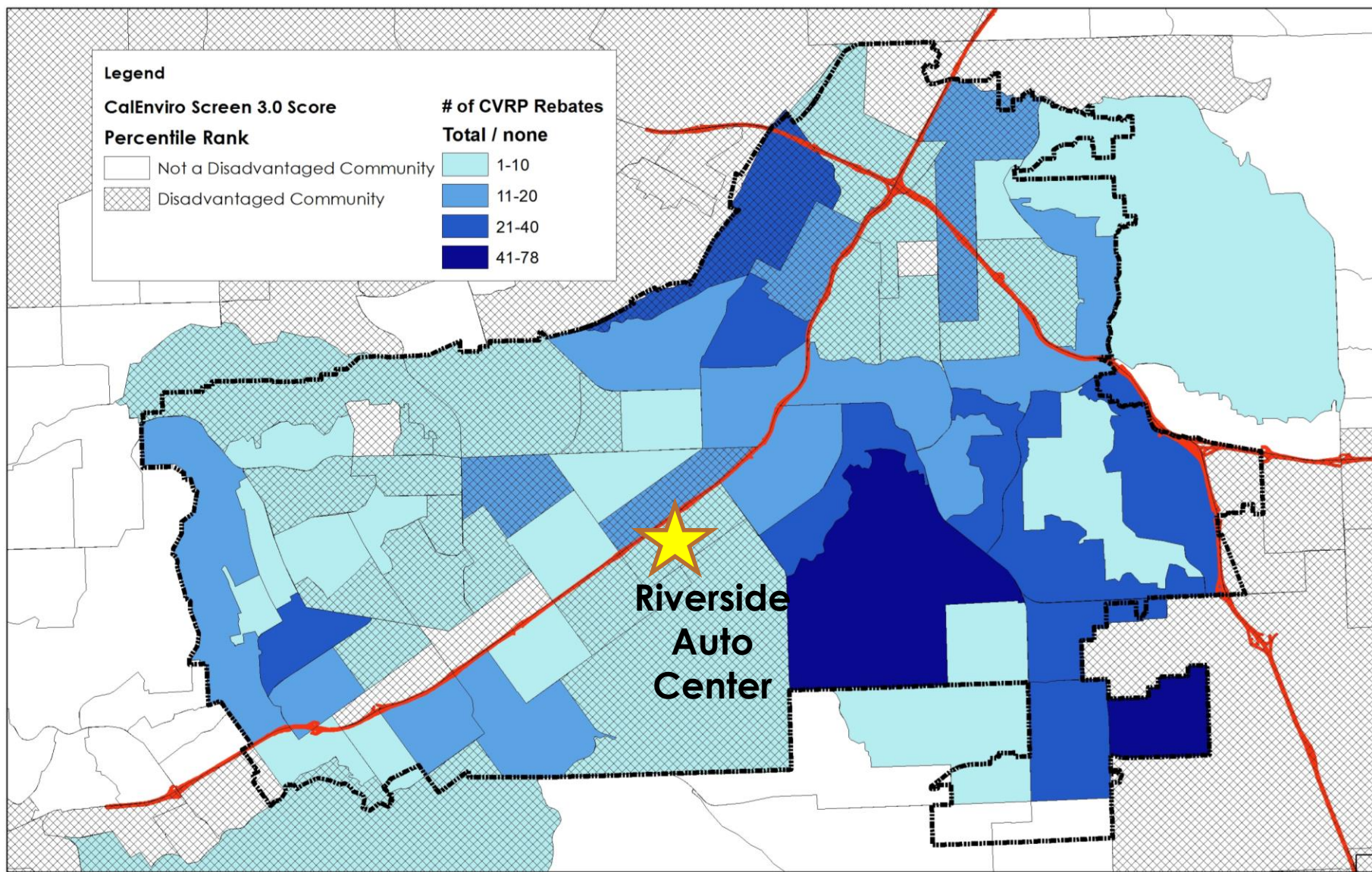
Equity Concerns

~46%

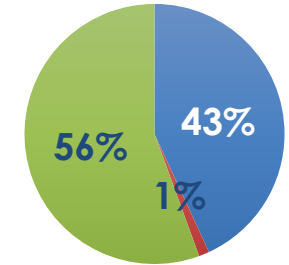
**City Population in a
Disadvantaged
Community**

**Disadvantage
Community is based
on a number of
environmental, socio-
economic, and health
factors**

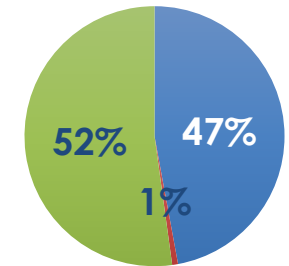
WHO IS GETTING CVRP REBATES IN RIVERSIDE?



Not a Disadvantaged Community
1 EV every 306 persons



Disadvantaged Community
1 EV every 1,007 persons

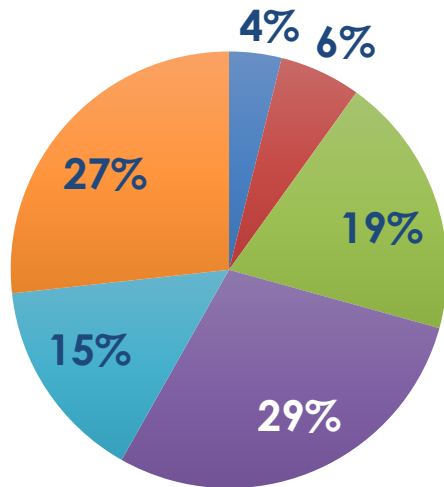


Plug-in Hybrid
Battery Electric
Fuel Cell / Hydrogen

TYPES OF VEHICLE BY AUTOMAKER

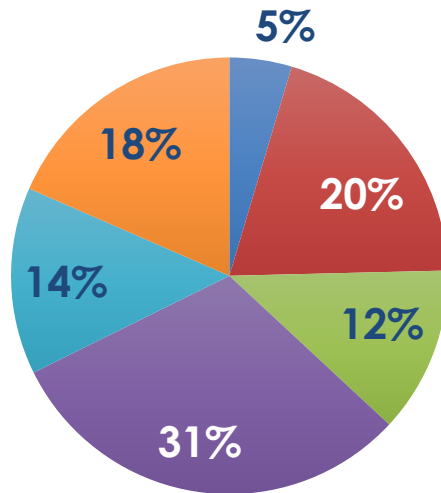
Battery Electric Vehicles

Non-DAC



■ BMW
■ Fiat
■ Other
■ Chevrolet
■ Nissan
■ Tesla

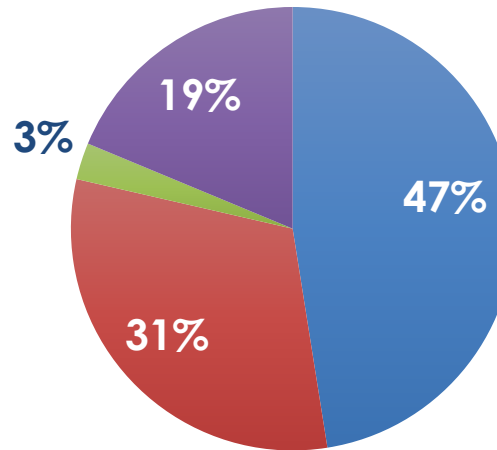
DAC



■ BMW
■ Fiat
■ Other
■ Chevrolet
■ Nissan
■ Tesla

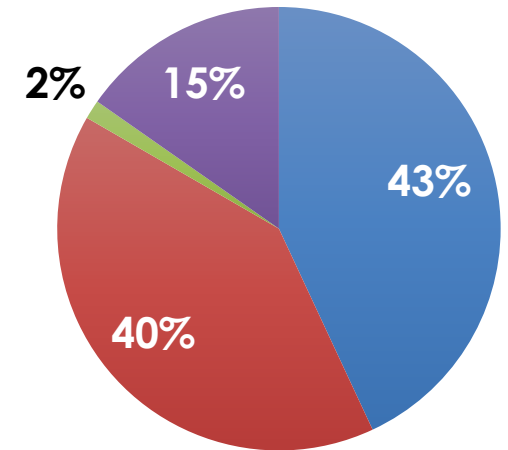
Plug-In Hybrid Electric Vehicles

Non-DAC



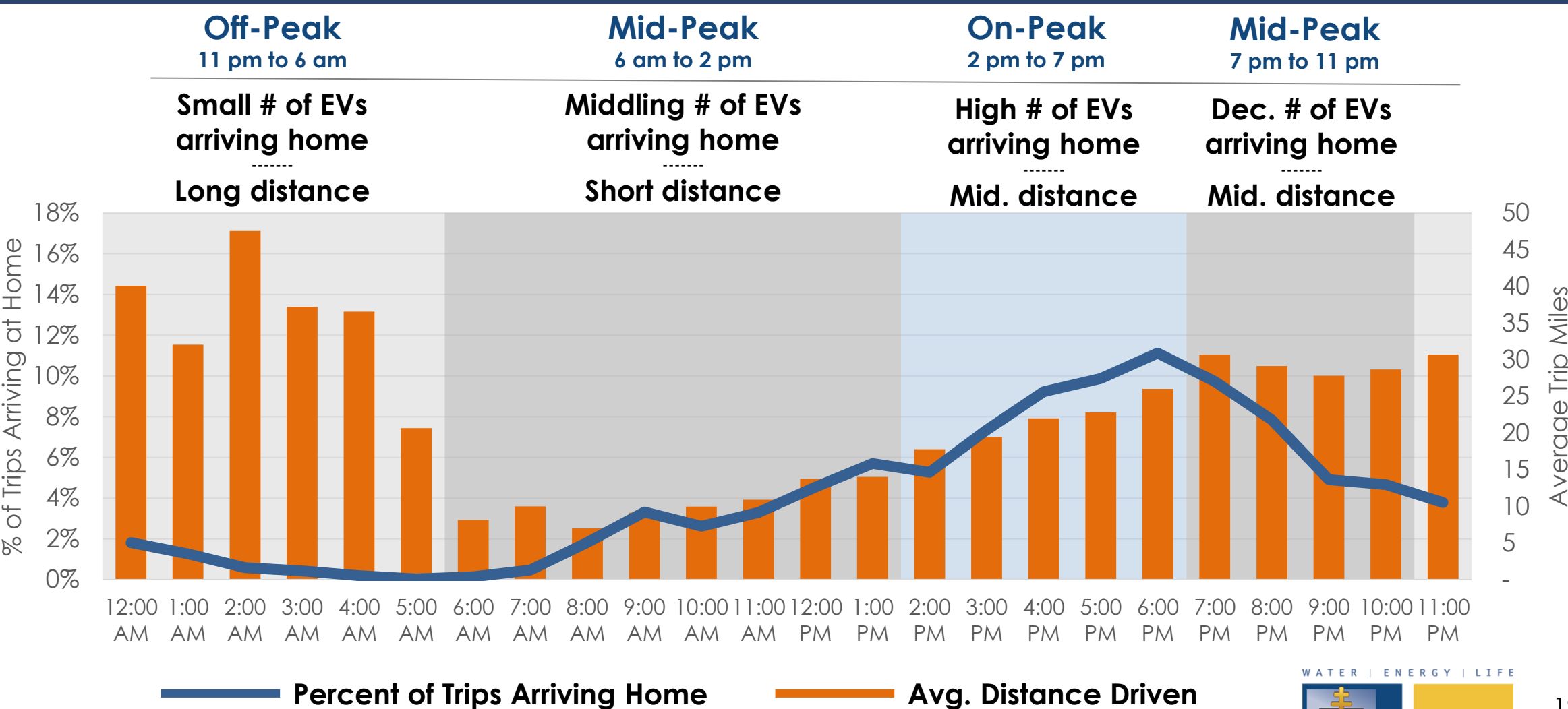
■ Chevrolet
■ Other
■ Ford
■ Toyota

DAC

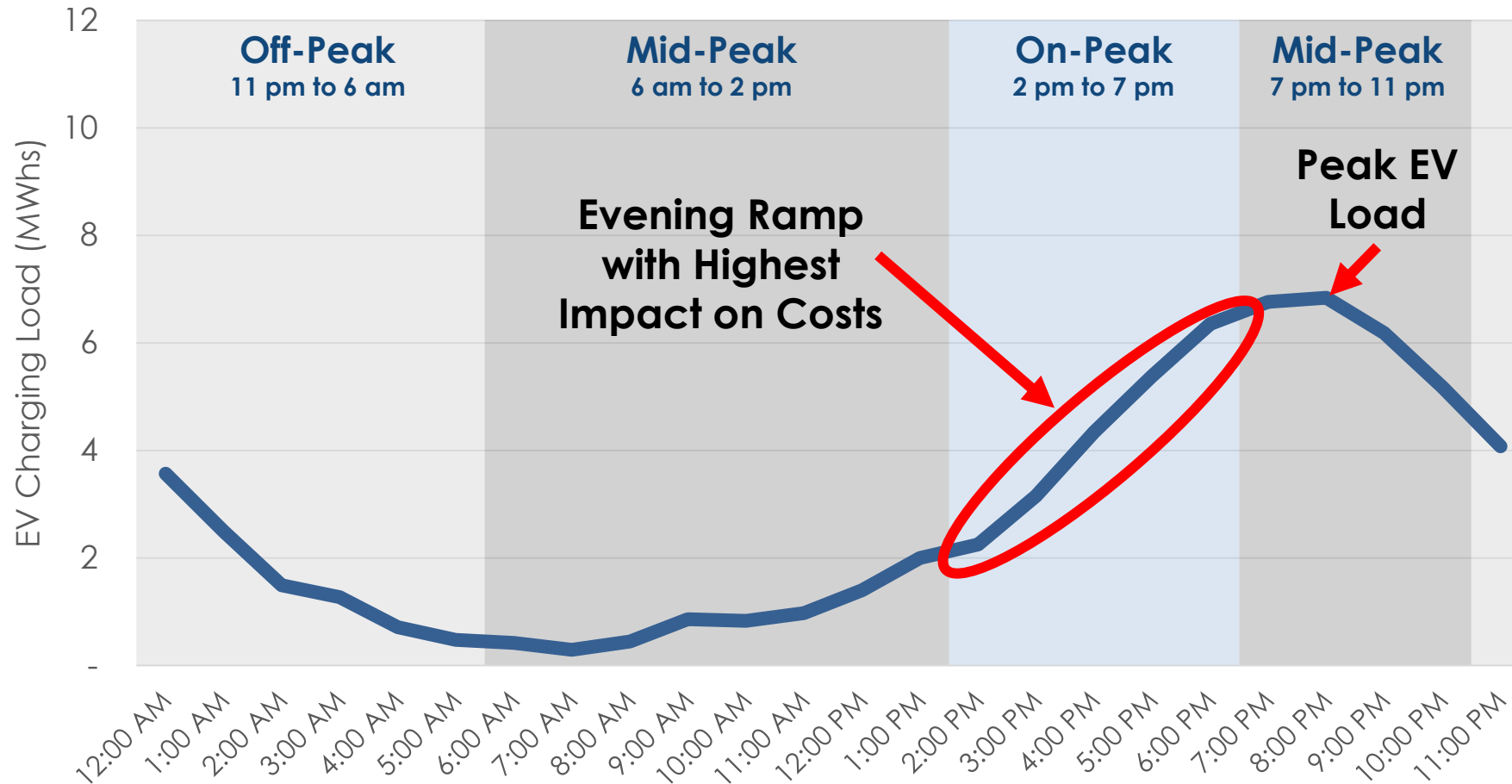


■ Chevrolet
■ Other
■ Ford
■ Toyota

RESIDENTIAL EV CHARGING CHARACTERISTICS



UNCONSTRAINED EV CHARGING LOAD



Evening ramp aligns with RPU's peak daily load demand – when residents arrive home

.....
Peak charging occurs between 7 and 8 pm

RATE SETTING GOALS (FOR EV RATES TOO!)

- 1. Achieve full recovery of costs**
- 2. Equitably allocate costs across and within customer classes**
- 3. Encourage efficient use of water and electricity**
- 4. Provide rate stability**
- 5. Offer flexibility and options**
- 6. Maintain rate competitiveness in region**
- 7. Be simple and easy to understand**

RATES OFFERED TO SUPPORT EVS

EV-Only Time of Use Rate

- Rate only applies to the electricity used by the EV
 - Customer opts into the rate
 - Equipment is installed
-
- Requires a separate meter adapter
 - Requires a 220V outlet (will require an electrical contractor if not available)
-
- Primarily for full Battery EV technology

Whole House Time of Use Rate

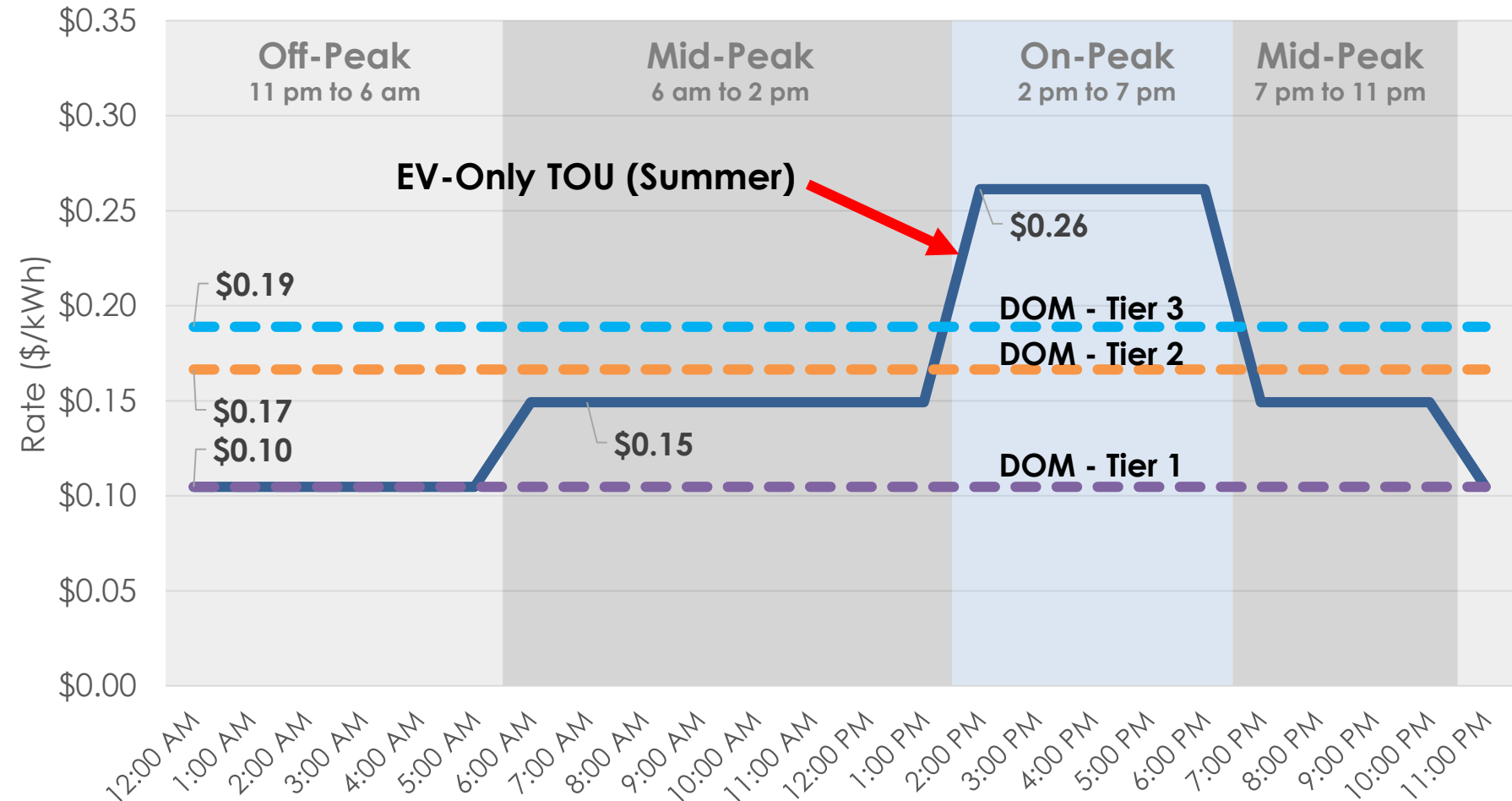
- Rate applies to the electricity used by the whole house
 - Customer opts into the rate
-
- No additional infrastructure or meter needed
-
- For full Battery EV or Plug-in Hybrid EV

2019 DOMESTIC AND EV-ONLY TOU RATE TARIFFS

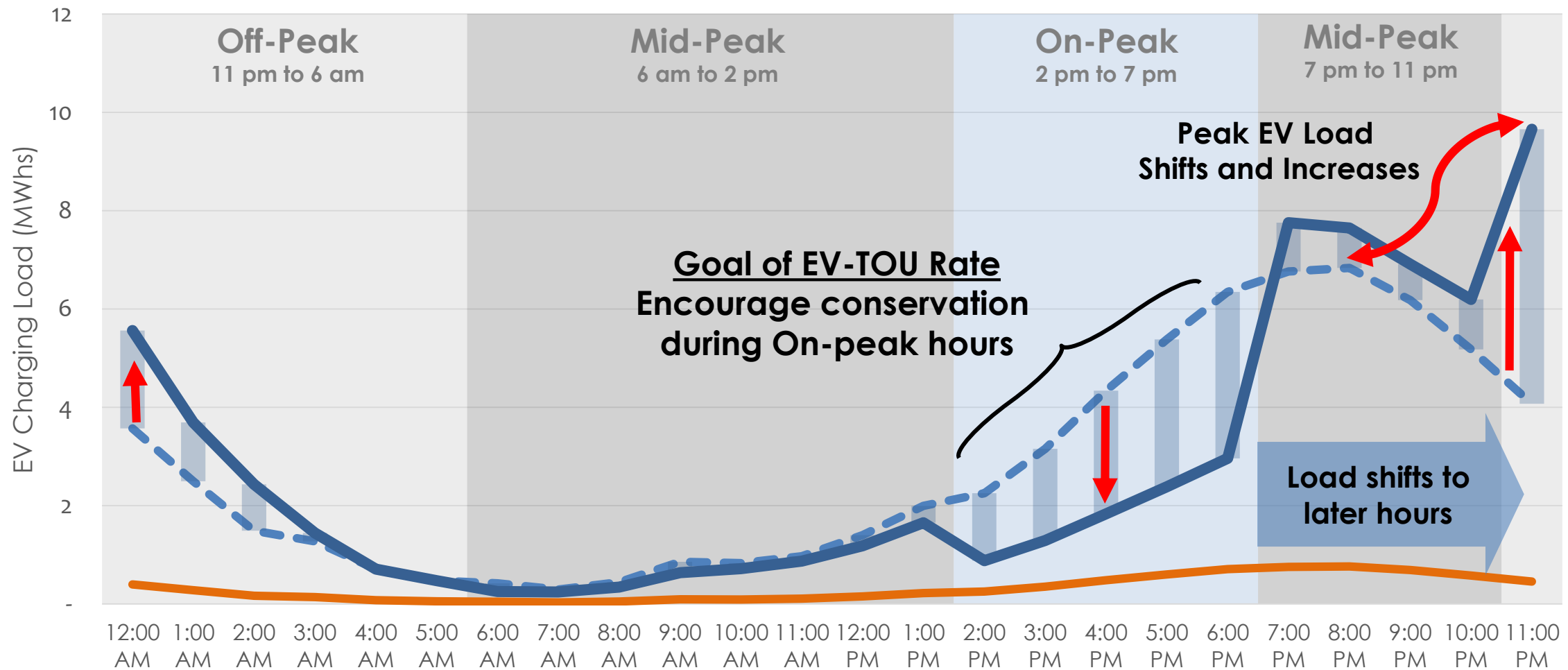
Rate Effective on
January 1, 2019

Customers benefit with
lower rates if they
charge outside of the
on-peak times

Customers pay the
energy cost and a
fixed customer charge
each month



EV-ONLY TOU TARIFF & RESIDENTIAL CHARGING PATTERNS



EV TOU ONE-TIME EQUIPMENT COSTS

Potential Panel and/or Outlet Upgrade

If needed
(Costs vary)

Meter Adapter and Meter Set Cost

\$675

Adapter: \$400
Conduit, Wiring, Fittings & Straps:
\$75
Installation labor: \$200

Building Permit and Inspection

\$120 to \$127

**~\$800 plus any
additional electrical**

WHAT IS THE CUSTOMER BENEFIT?

Low EV Charging

Charging a Plug-in Hybrid

239 kWh/month

(9,500 miles on electric)

Annual Electric Charges (2019)

Schedule D: \$525.70

Schedule EV: \$433.08

Schedule DOM-TOU: \$428.91

Annual Savings

Schedule EV: **\$92.60**

Payback: **8+ years**

Schedule DOM-TOU: **\$96.79**

Medium EV Charging

Drives a Battery Electric Vehicle

292 kWh/month

(12,000 miles on electric)

Annual Electric Charges (2019)

Schedule D: \$642.28

Schedule EV: \$505.54

Schedule DOM-TOU: \$524.02

Annual Savings

Schedule EV: **\$136.74**

Payback: **6.8 years**

Schedule DOM-TOU: **\$118.26**

High EV Charging

Drives a Battery Electric Vehicle

486 kWh/month

(20,000 miles on electric)

Annual Electric Charges (2019)

Schedule D: \$1,069.01

Schedule EV: \$770.78

Schedule DOM-TOU: \$872.18

Annual Savings

Schedule EV: **\$298.23**

Payback: **2.7 years**

Schedule DOM-TOU: **\$196.83**

FUNDING OPTIONS

Highest
Certainty

Availability

Uncertainty
of \$ Amount

Requires
Evaluation

1. Cap and Trade Allowance Sales Proceeds

2. Public Benefit Funds

a. Only for low-income customer programs

3. Local, State, and Federal Grants

4. Low Carbon Fuel Standard Revenue

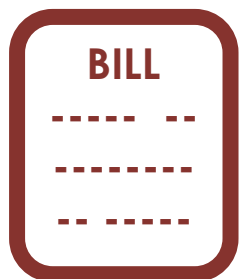
a. High uncertainty of availability of funds

5. Rates / Utility Revenue

PROGRAM OPTIONS



**Rebates for
the Customer**

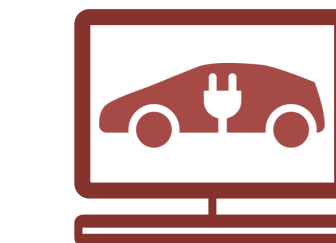


Rebates for
EVs and EV
Chargers

Making It
Easy for the
Customer

Rate Options
and Waived
Costs

Install and
Support
Public,
Shared, and
Workplace EV
Charging



**Actions for
the Utilities**



REBATE OPTIONS FOR ELECTRIC VEHICLES AND CHARGERS

1. Rebate for used electric vehicles (purchase or lease)

- A. Typical rebate amount is \$500 to \$1000
- B. For 200 rebates per year, \$100,000 to \$200,000 per year

AND/OR

2. Rebate for a level 2 EV charger (new purchase)

- A. Typical rebate amount is \$500
- B. For 200 rebates per year, \$100,000 per year

OR

3. Rebate to cover \$500 of EV charging

- A. New EV owners only
- B. \$500 towards charging cost For 200 rebates per year, \$100,000 per year



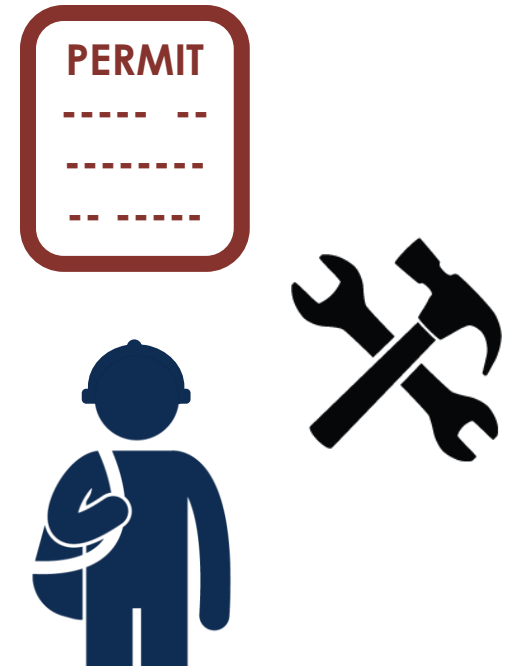
OPTIONS FOR RATES OR ELECTRICITY

1. RPU currently offers two rates that support residential EV charging

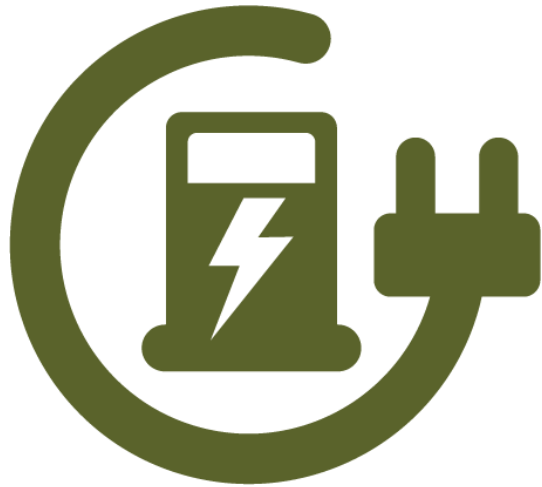
- A. Schedule EV – Domestic separately metered EV rate
- B. Schedule DOM-TOU – Whole house time of use rate

2. Rebate to cover City and Utility-side costs for Schedule EV one-time equipment installations

- A. One-time rebate to cover the City's and Utilities' costs for the one-time permits, equipment, and installation of the meter adapter
- B. Initial year would cover all customers opting into the rate 500 to 1000 customers at \$802/customer for a total cost of \$401,000 to \$802,000
- C. Subsequent years, 150 customers per year at \$802/customer for a total cost of \$120,300



PUBLIC, WORKPLACE, AND MULTI-FAMILY EV CHARGING



1. **Utility installed public access EV charging**

- A. Located on City properties
- B. Costs depend on existing infrastructure

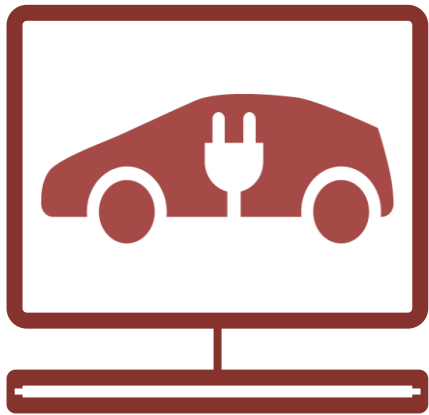
2. **Workplace EV charging**

- A. Provide charging access, public or private, to employees at Riverside businesses
- B. Supports regional efforts to reduce vehicle related emissions
- C. Provides charging access to EV owners who may not be able to charge at home

3. **Multi-family EV charging**

- A. Provide customers in multi-family housing access to EV charging

MAKING IT EASY FOR THE CUSTOMER



1. Online application processes

- A. For the rate and the rebates
- B. Concurrent with the rebate automation program being developed by RPU's
- C. Coordination between RPU and Building Division on permitting to minimize time demands for the customer

2. Non-Intrusive

- A. Must maintain verification requirements associated with the funding source
- B. Electronic submission of photos or scans of required documentation

DISCUSSION

- 1. Questions**
- 2. Feedback about program and rebate options**

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