



EV Charging: Clean Charge Network

Mark Cosby

Evergy Energy Solutions





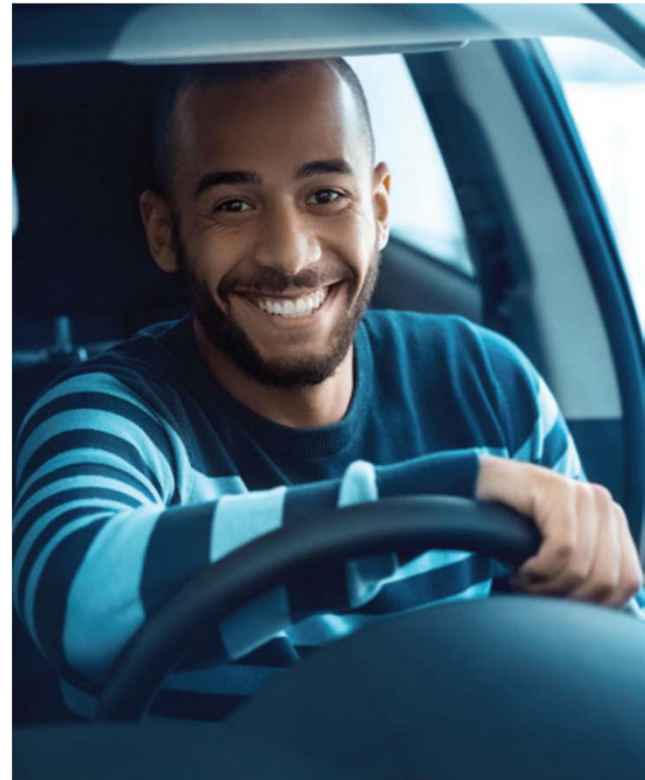
What percentage of new car sales are projected to be electric in 2025?

- 5%
- 10%
- 15%
- 20%



What percentage of new car sales are projected to be electric in 2025?

- 5%
- 10%
- 15%
- 20%





Time Magazine



This City May Soon Be the Best Place to Own an Electric Car

A huge plan is in the works to juice electric vehicle adoption.

TIME.COM

Clean Charge Network (CCN)



- Launched in January of 2015
- Deployment:
 - 2,2000+ Level 2 charger ports
 - 58 DC Fast Chargers
 - 95% of sites complete
- Establish one standard communications and payment platform
- Turnkey utility infrastructure installation
- Currently the largest installed and operating utility-owned EV network in the US



CCN Goals

- **If you build it, they will come: Eliminate range anxiety**
 - Increase EV adoption rate
 - Support drivers without dedicated home charging
 - Supplement home charging
 - Enable long-distance travel
- **Grow EV adoption**
 - Educate customers
 - Drives economic and environmental benefits
 - Provides for stabilized rates for all customers
- **Real data: Understand and influence grid impacts**
 - Integrate with the utility grid
 - Analyze charging models/load shapes
 - Explore managed charging opportunities
- **Develop customer solutions: Strategic/Beneficial Growth**

Site Host Framework

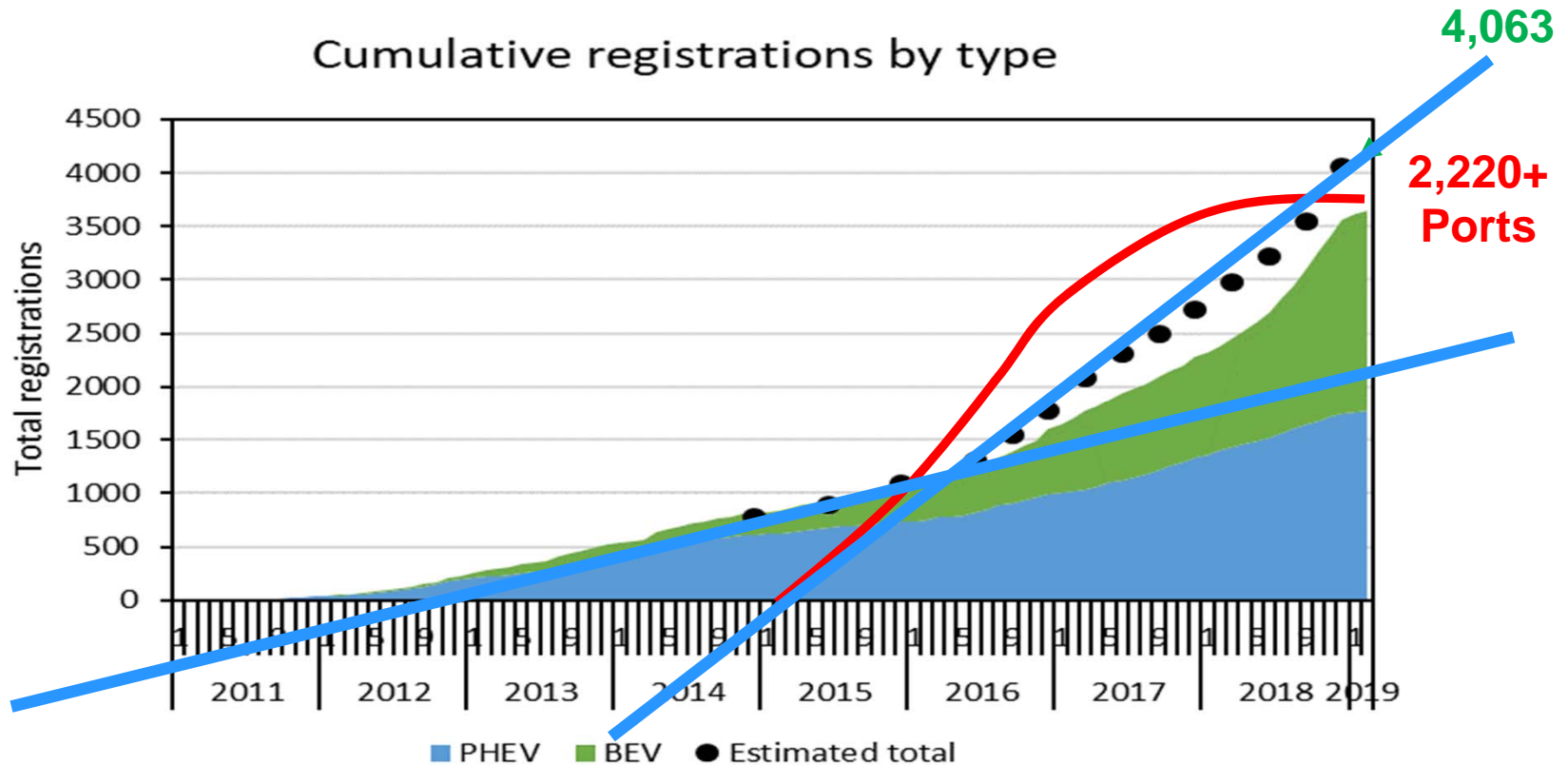
Site Host agrees to provide public access to charging infrastructure and to dedicate an agreed number of parking spaces

10 Year agreement

Site characteristics

- Safe environment
- Convenient access
- Available for general public use
- Sufficient power infrastructure
- L2 sites publicly accessible, high population density / long dwell time areas, workplaces and geographic dispersion
- DCFC sites near highway corridor

KCP&L EV Adoption



- The PHEV and BEV wedges represent cumulative registrations
- The black dots represent the total vehicles estimated to be in operation.
- Vehicle crashes, sales and relocation account for differences between these vehicle counts

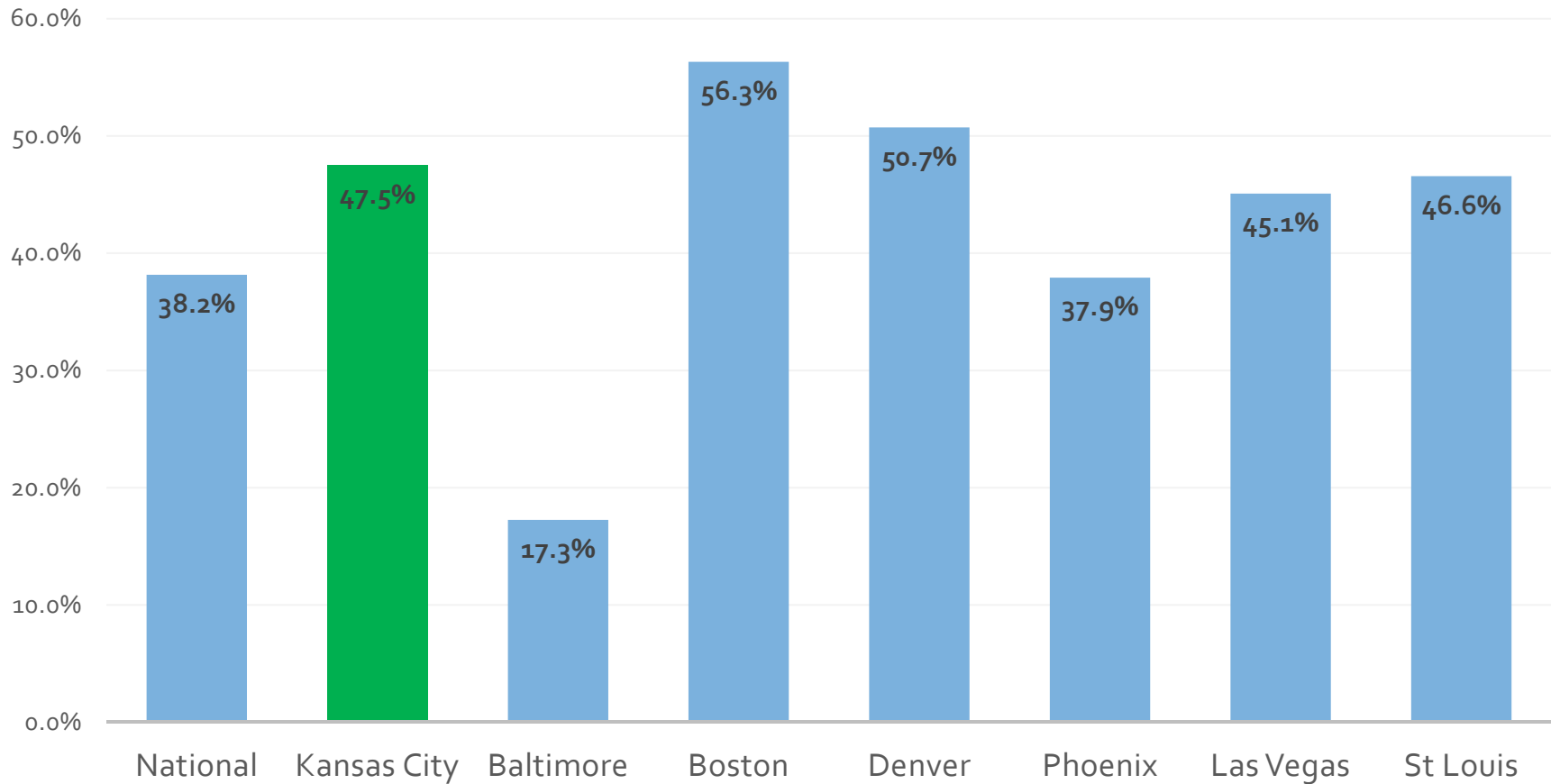
Source: EPRI KCP&L Vehicle Registrations February 2019



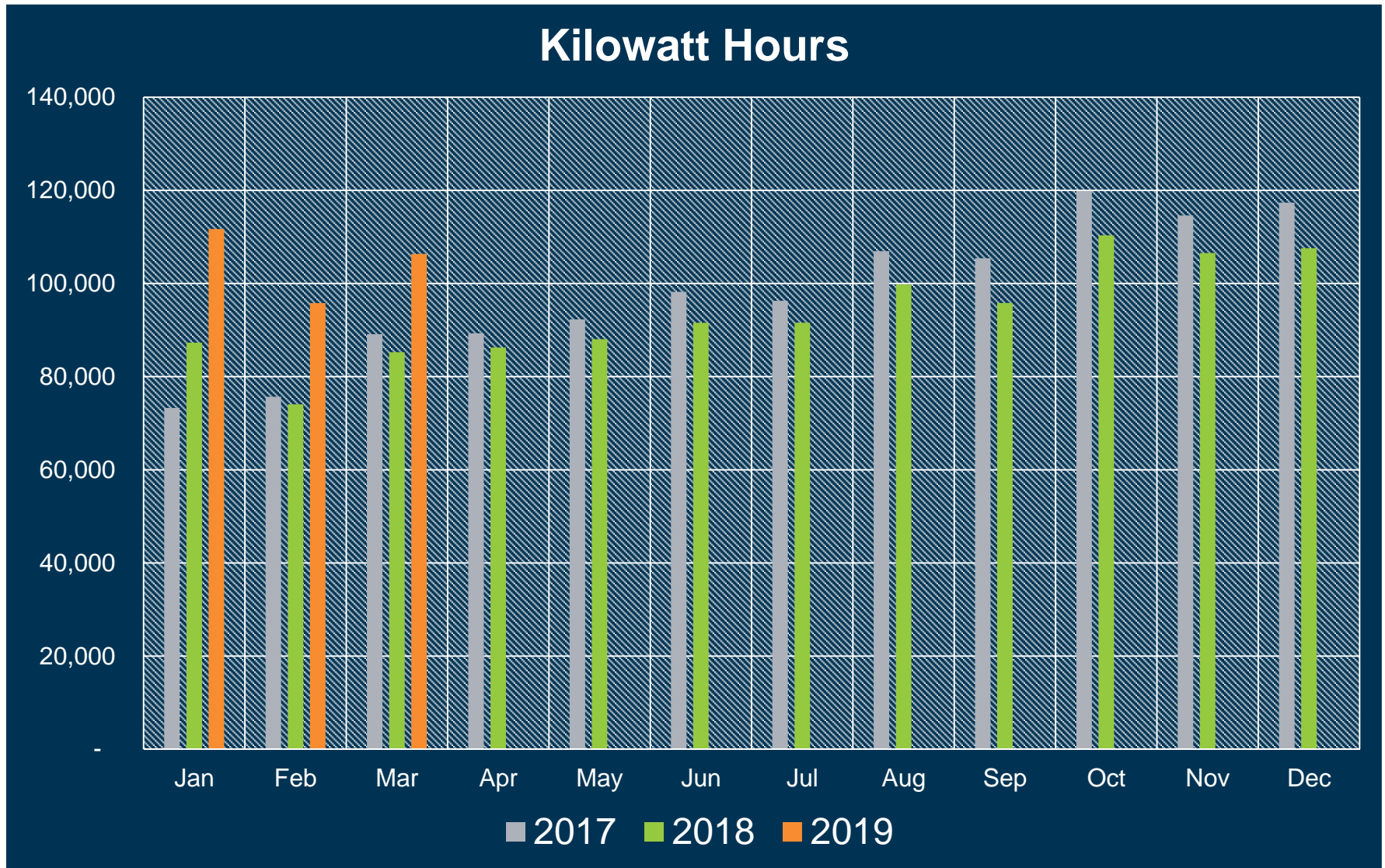
Year Over Year Sales Growth

**CAGR 2015-2019:
70% +**

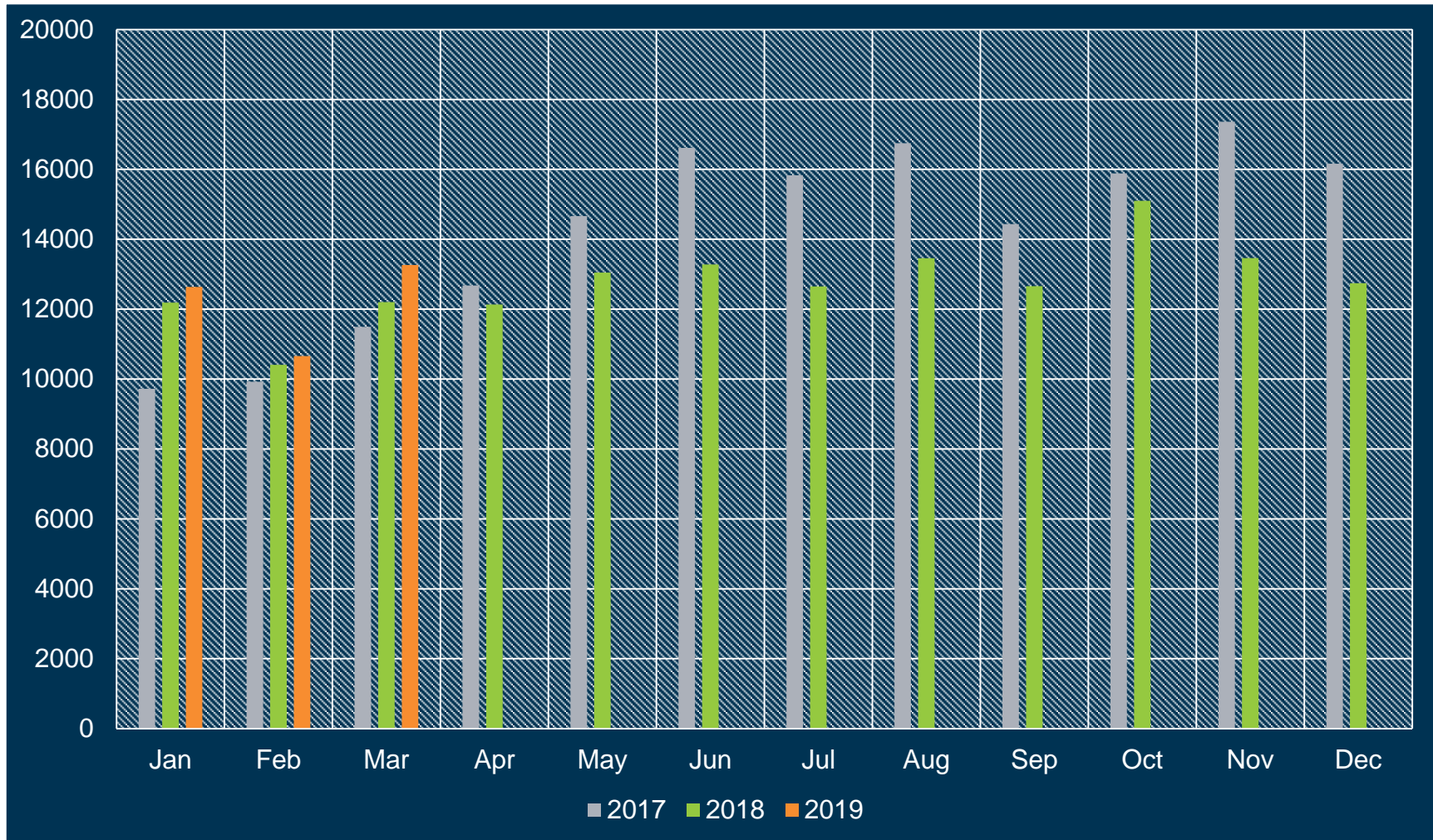
YOY EV Sales Growth – 2017 to 2018



Energy Usage



Charging Sessions Per Month



Impact of CCN Environmental Benefits

Environment

Lifetime

Here's how EV charging has helped:



You've avoided
1,414,722 kg
greenhouse gas
emissions



that's like
planting
36,275
trees
and letting them
grow for 10 years

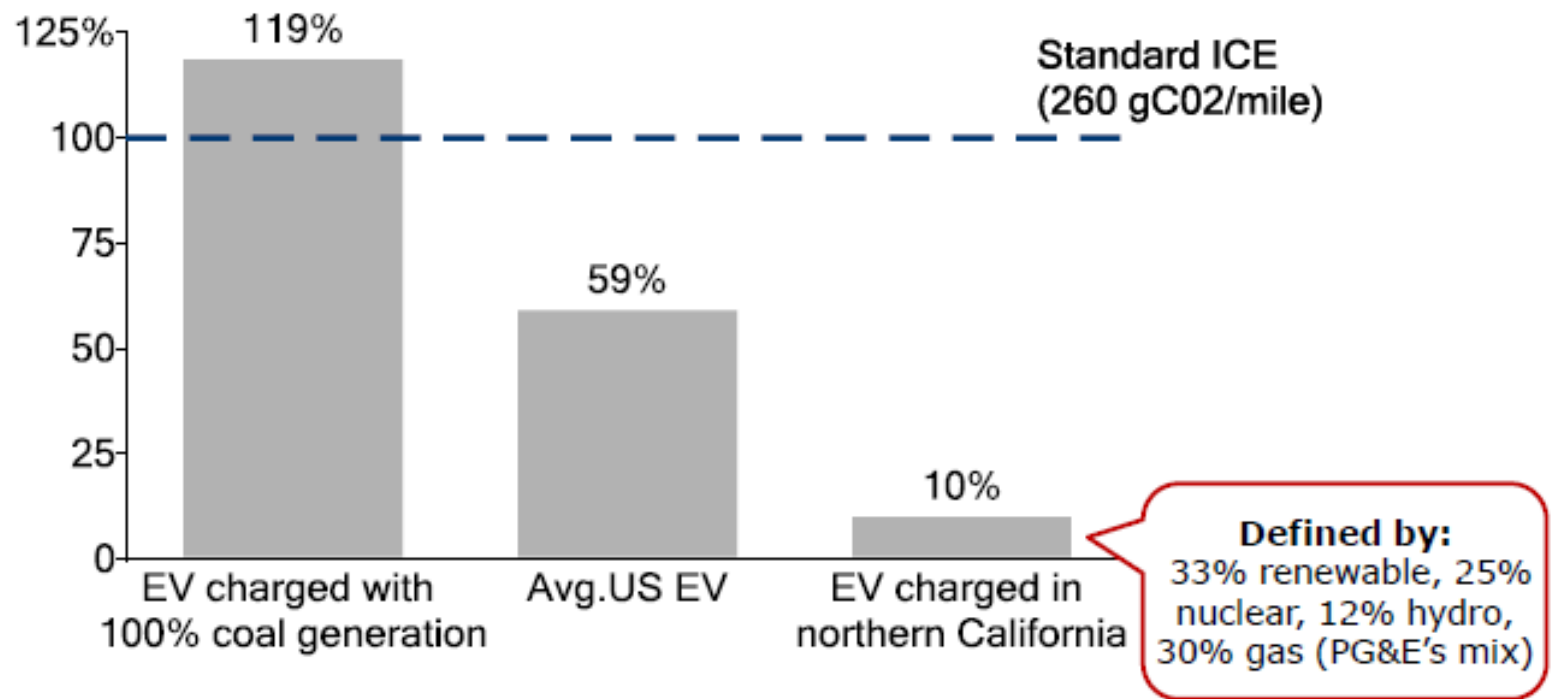
Source: ChargePoint Dashboard

Public

 evergy™

Environmental benefits can be massive

CO2 emissions compared to standard ICE
(2016, g CO2/mile)



Note: (1) Average EV and ICE CO2 emissions calculated on US energy mix, emissions factor of 2.1 lb CO2/kWh for coal
Source: BNEF; AFDC; Bureau of Transportation; Bain analysis

EV's as Strategic Grid Assets

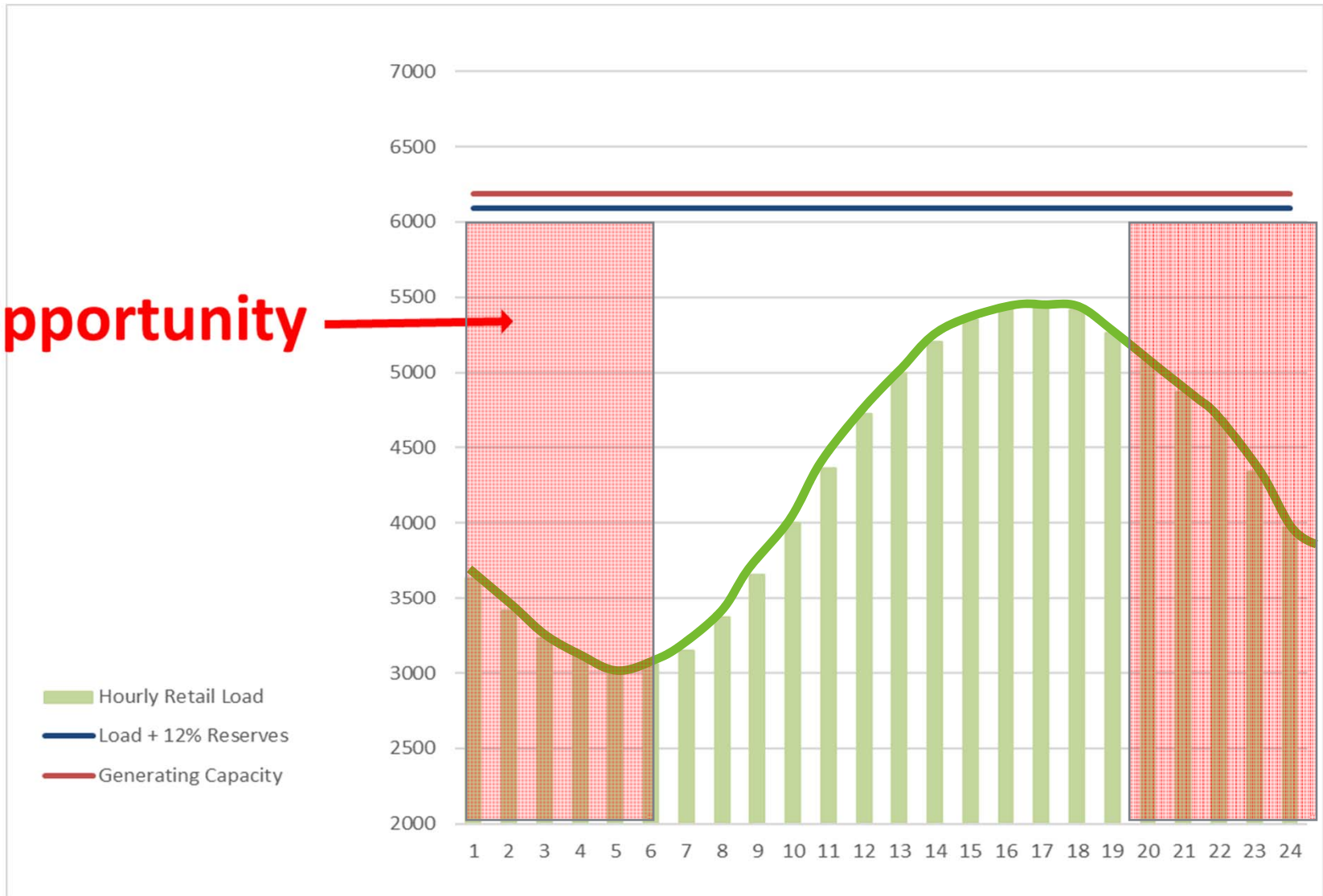


Mandates & Aging Grid:  Costs

kWh's: Solar & EE  Electric Vehicles 

Grid Optimization Opportunity

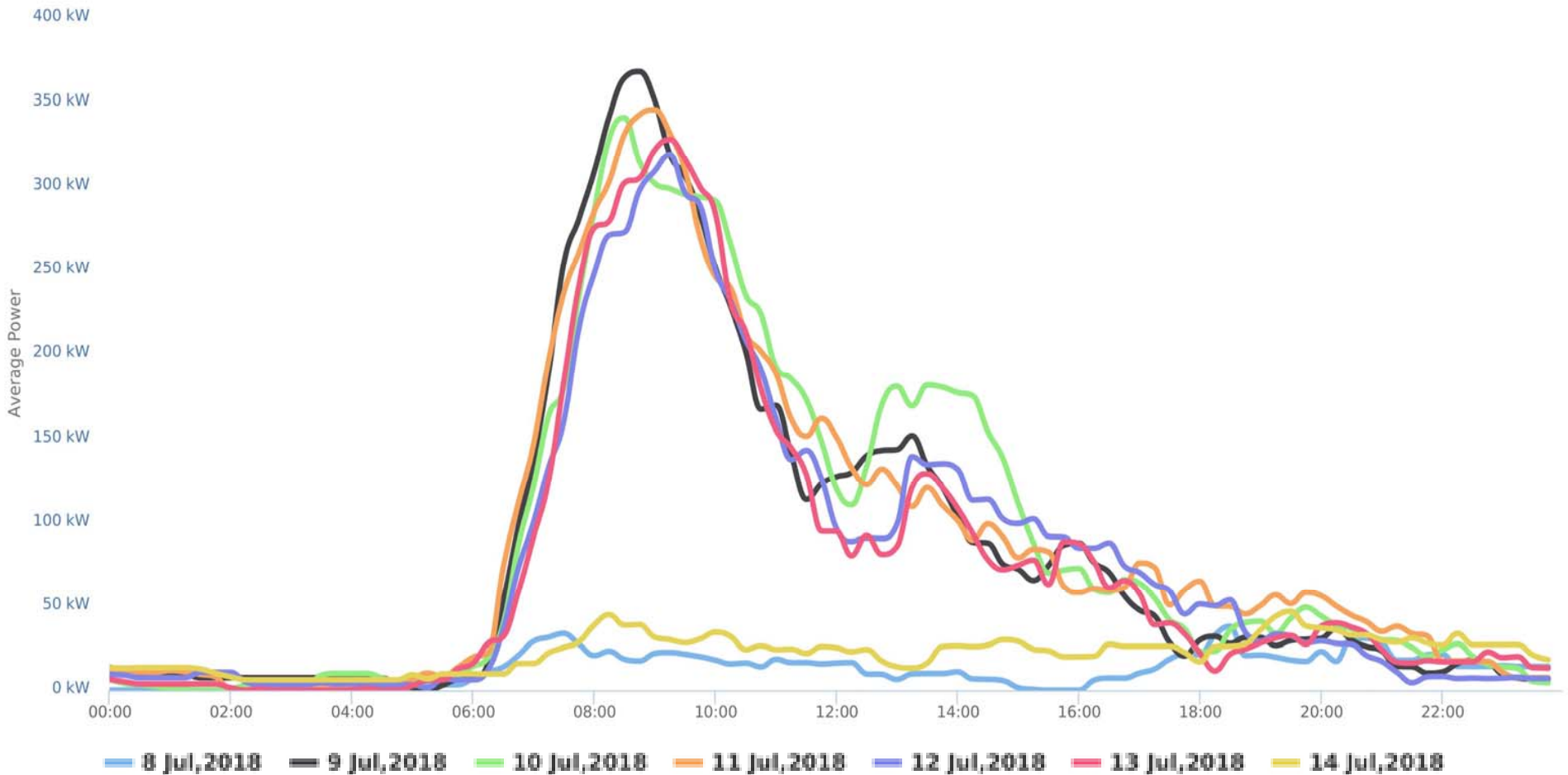
Opportunity →





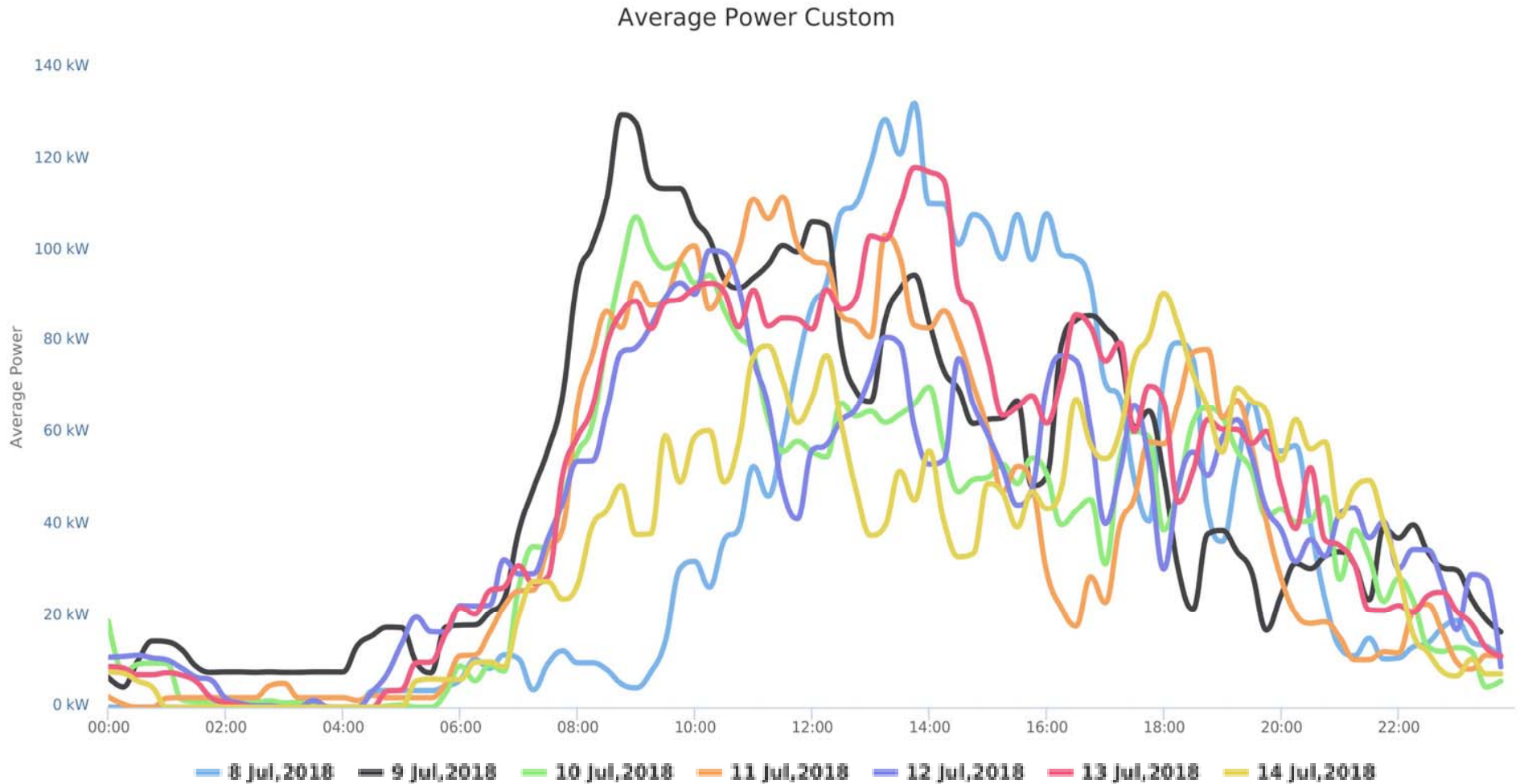
Workplace Charging Load Shape

Average Power Custom

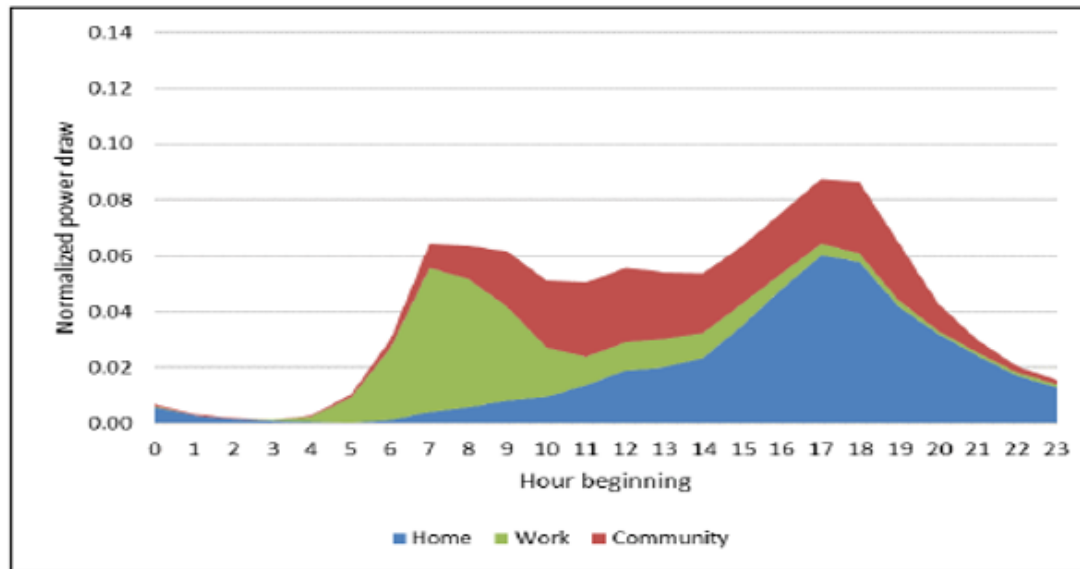




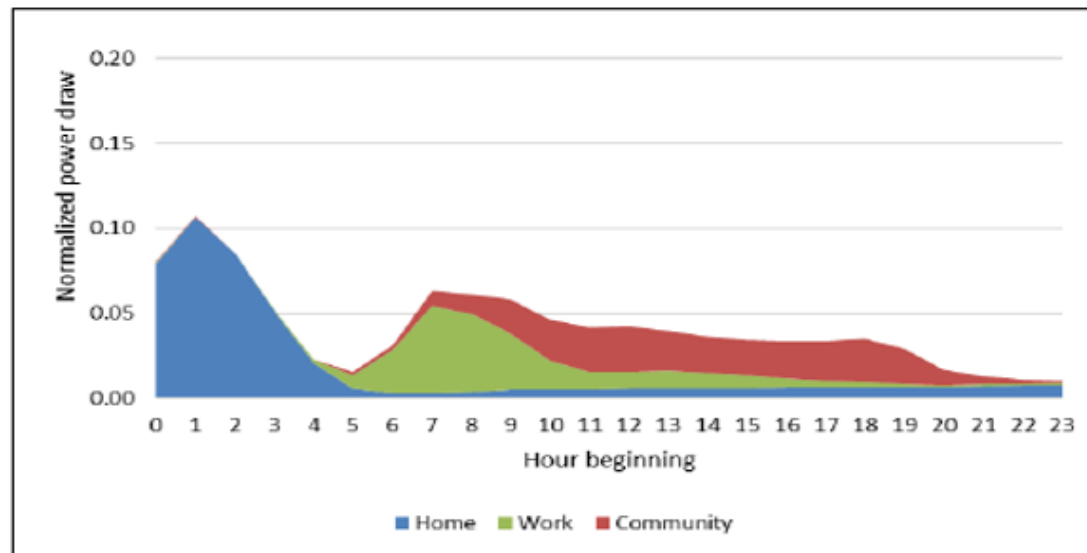
Retail Charging Load Shape



Influencing Charging Pattern



Unmanaged



Managed



Source: EPRI Ph 2 Analysis



Q&A

Mark.Cosby@westarenergy.com