EV Opportunities for Utilities

National Drive Electric Week Webinar Series

- For Audio, dial:

- 1-800-250-3900
- Participant PIN: 55197039#

Wednesday, September 13, 2017

EV Opportunities for Utilities

National Drive Electric Week Webinar Series

- Karl Popham, Austin Energy
- Tom Anthony, Oncor Electric

Dallas-Fort Worth CLEAN CITIES

evnt Electric Vehicles North Texas

#texasEV

Utilities & Electric Vehicles: Case Studies from the Field

NCTCOG

EV Webinar

Karl Popham
Manager, Emerging Tech & EV

September 2017

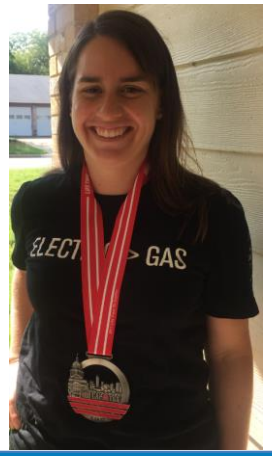
A bit about Austin Energy

The EV Team

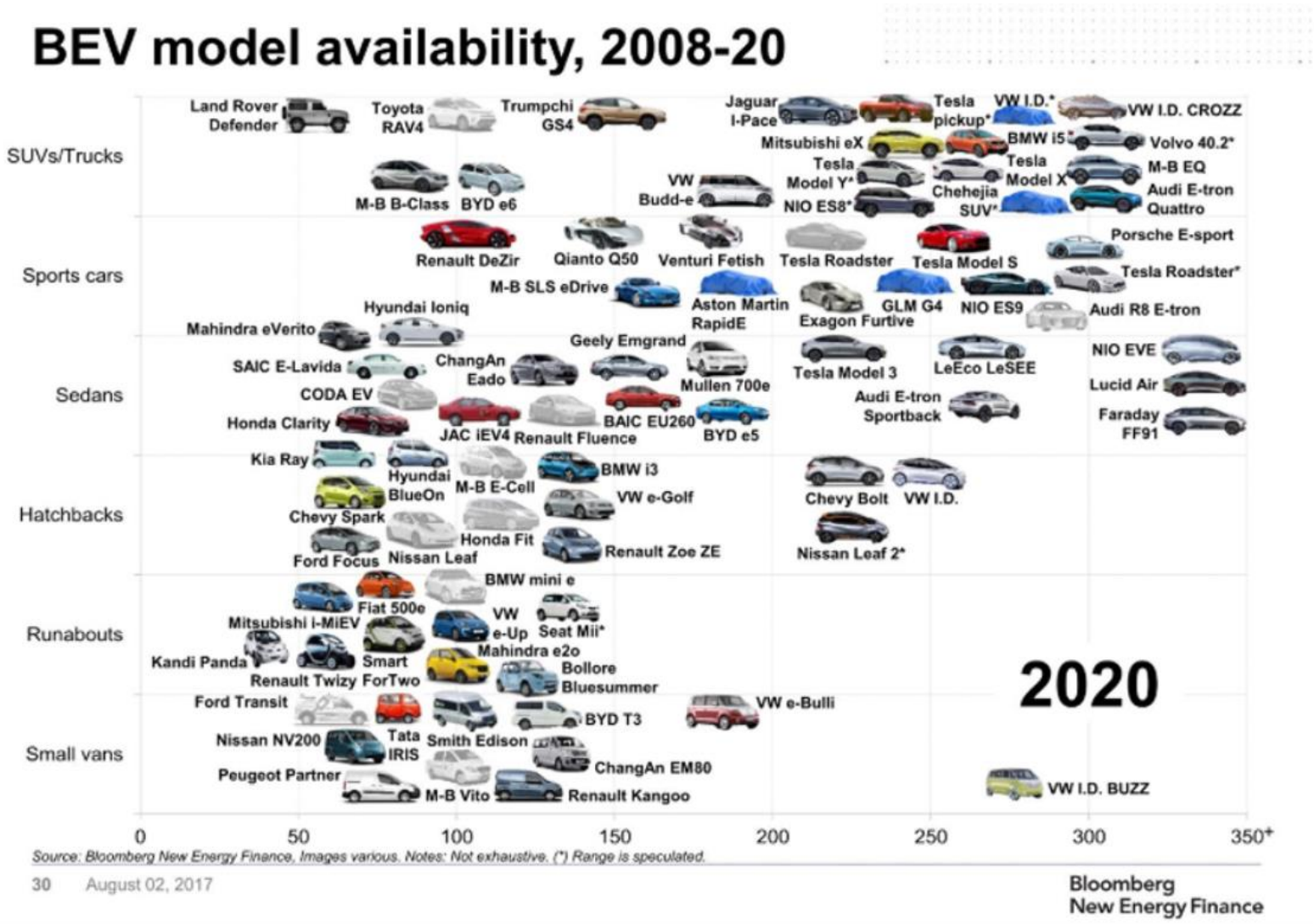

SEAHOLM
ELECTRIC > GAS


CITY OF AUSTIN
POWER PLANT
Electric
Walter Seaholm DR
100
STOP
ALL WAY


ELECTRIC > GAS

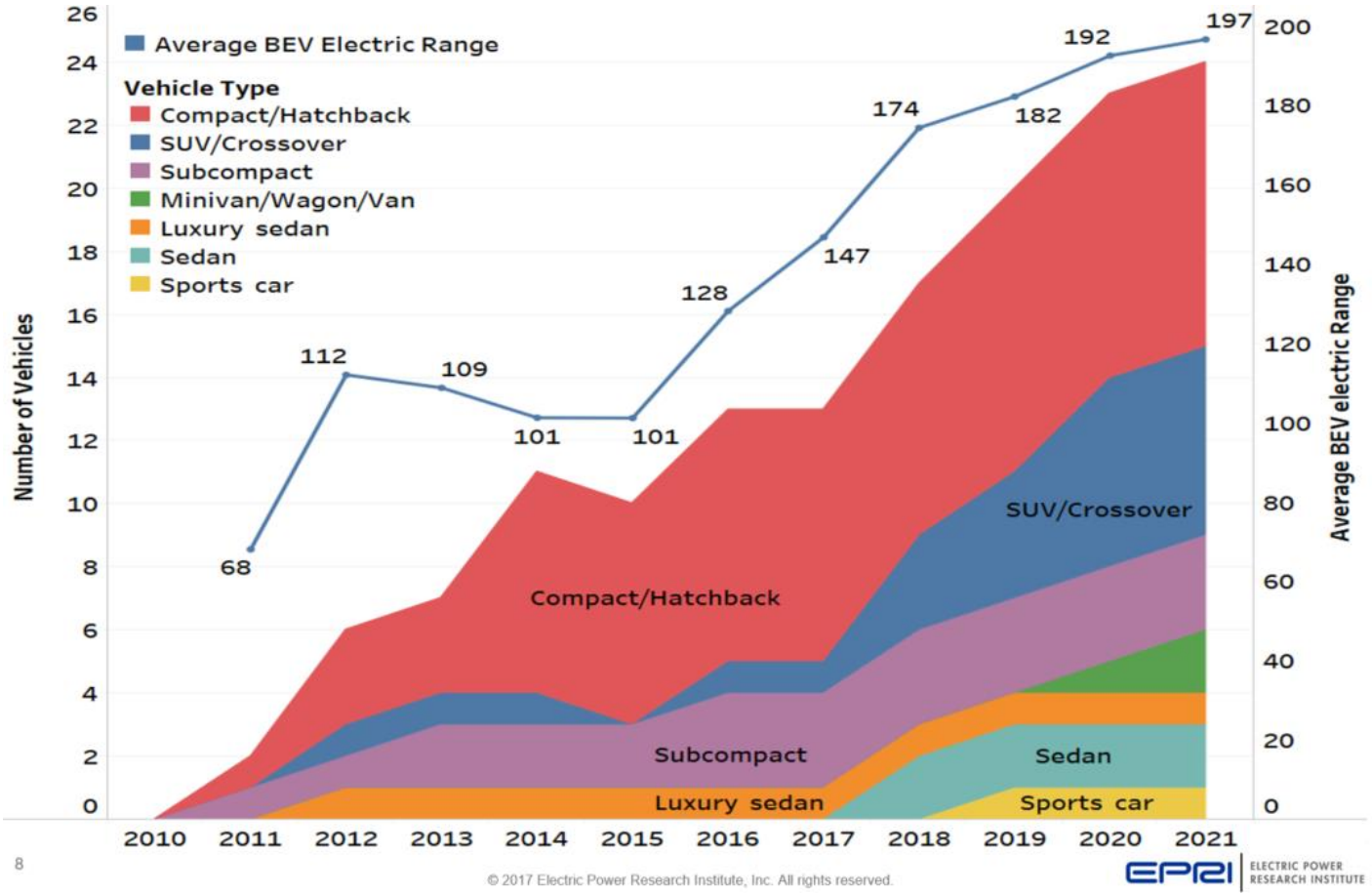


EV Availability



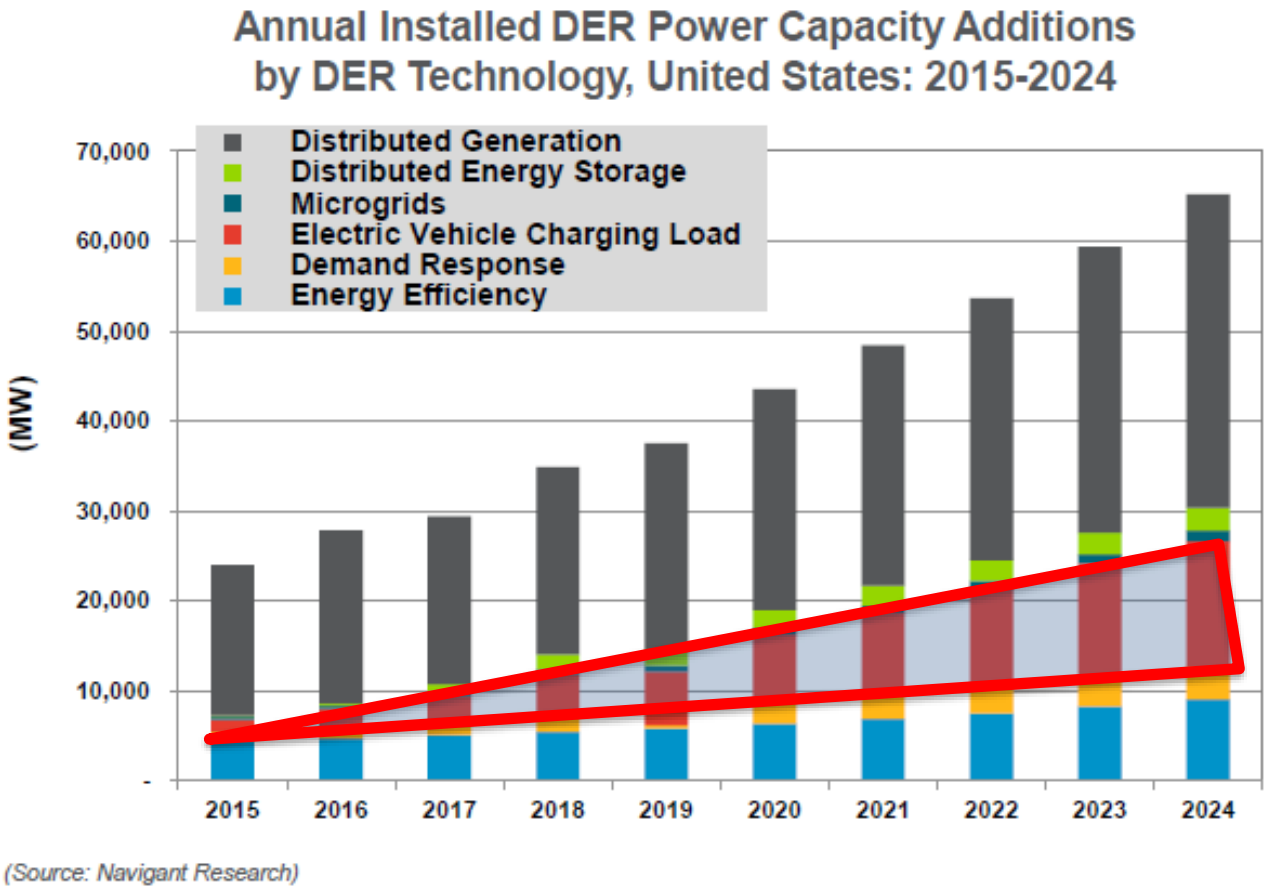
Batteries getting bigger; 60-80kWh

With increased range, one EV is moving to 10x the capacity of a single residential storage system.



EV Charging Load Growth Opportunity

EVs have the largest growth curve for
Distributed Energy Resource power capacity

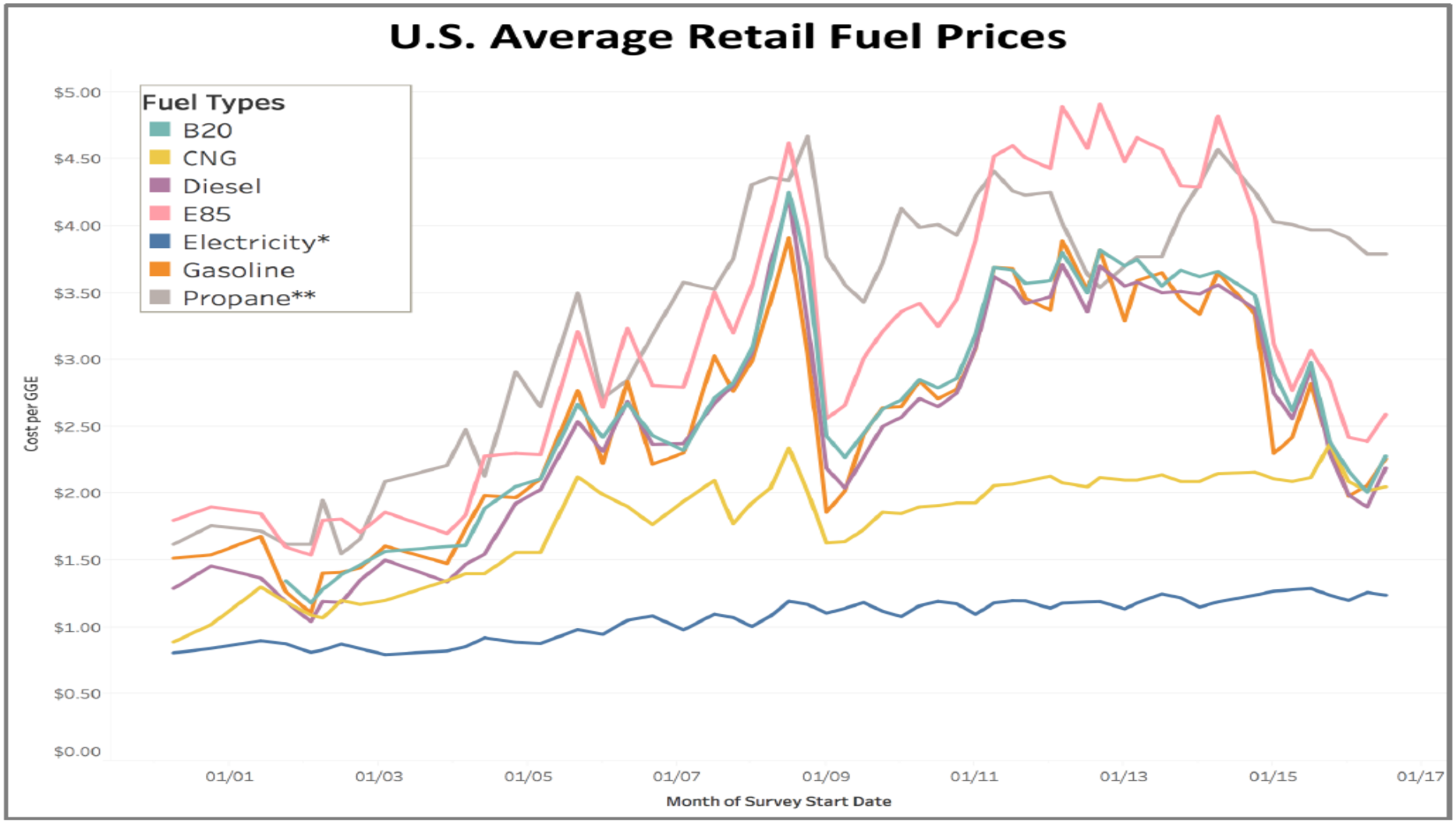


(Source: Navigant Research)

Observations

- DER deployments will reach 30 GW this year in the US, versus new central station generation (19.7GW)
- On a 5-year basis (2015-2019), DER in the US is growing almost 3 times faster than central generation (168 GW vs. 57 GW).

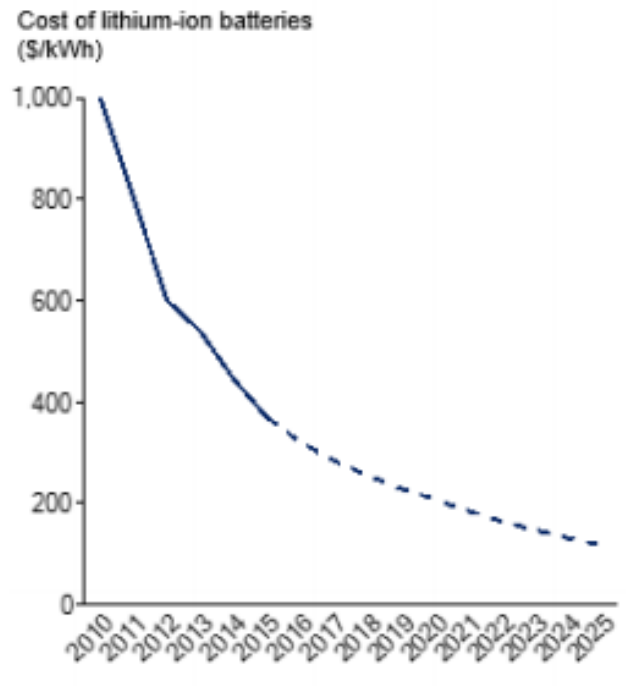
National Fuel Independence/Stability



urce: DOE AFDC

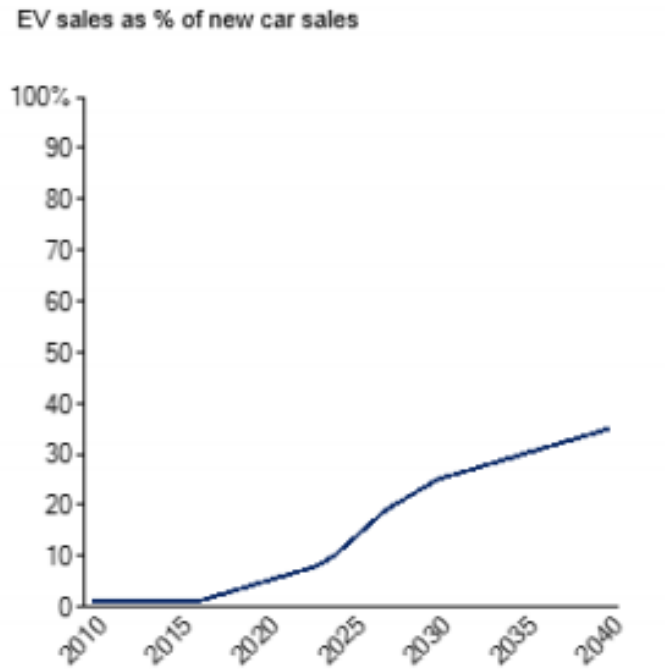
Economies of Scale; Price/Adoption

Figure 5. Declining cost of batteries, from $1,000 per kWh in 2010 to $300 kWh in 2016, has helped encourage adoption of EVs and storage



Source: Bloomberg

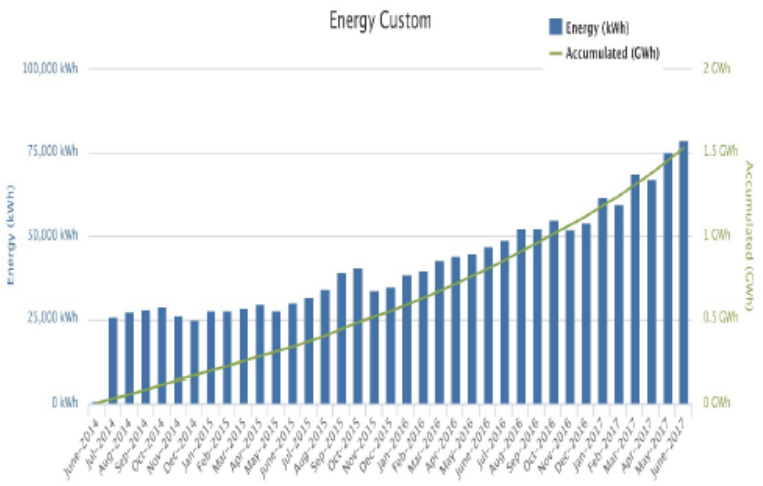
Figure 6. Forecasts of EV adoption show them making up about 25% of new car sales by 2030 and 35% by 2040



Source: Bloomberg

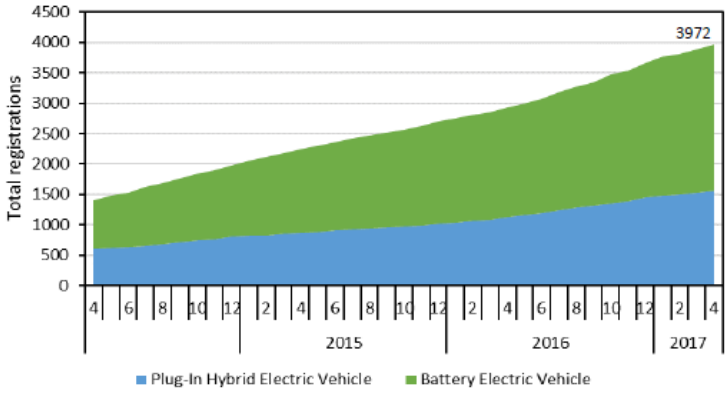
Austin Charging & EV Adoption Growth

Energy Usage – Plug-in EVerywhere Network
(Monthly, 3 year rolling)



Public Charging: 1.848GWh consumed through 251,641 charging sessions since program inception, displacing approximately 7.3M petroleum miles with 100% renewable GreenChoice® energy. Data provided by ChargePoint Station Manager

Cumulative registrations by type

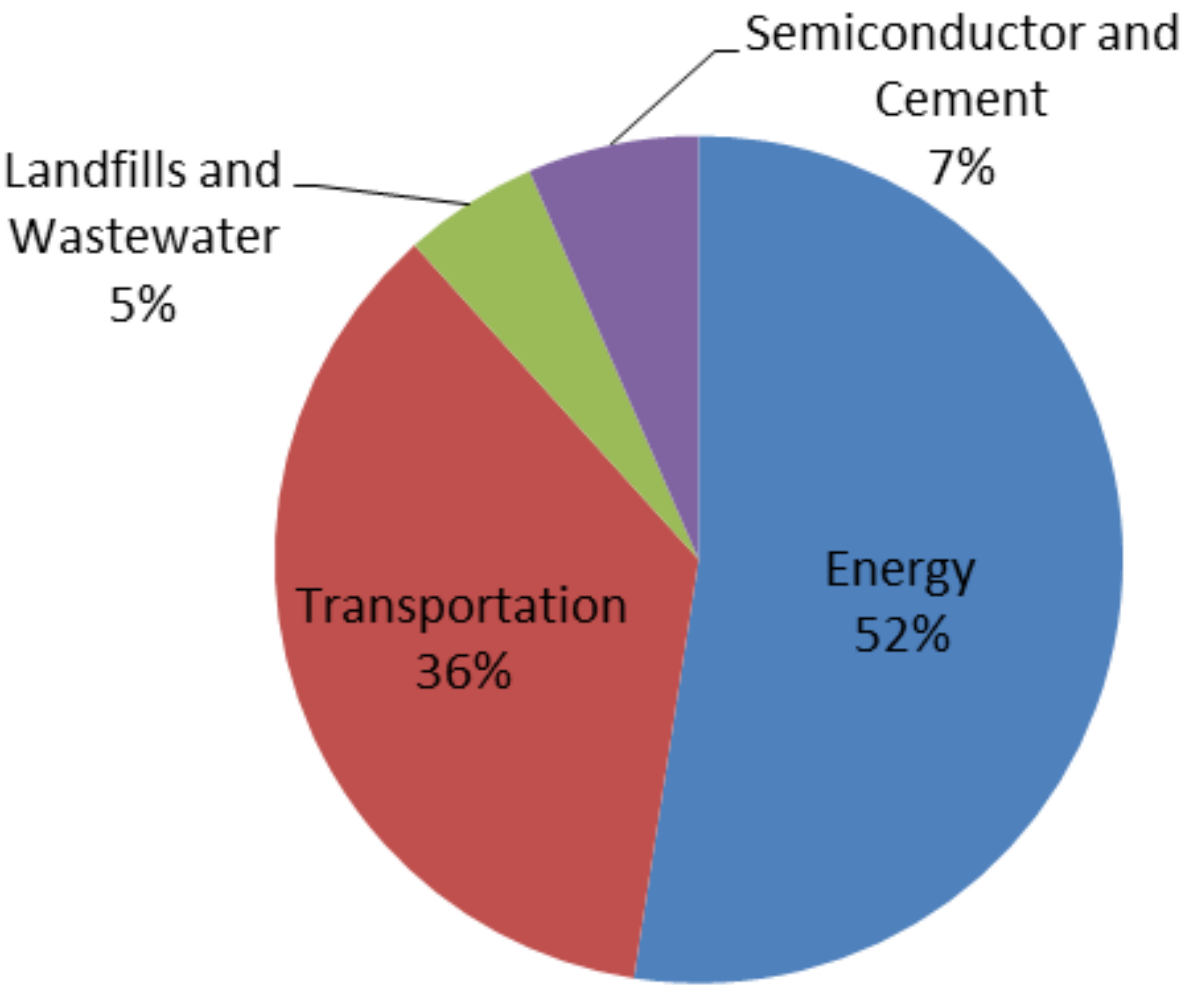


Data provided quarterly from EPRI for Travis and Williamson County.

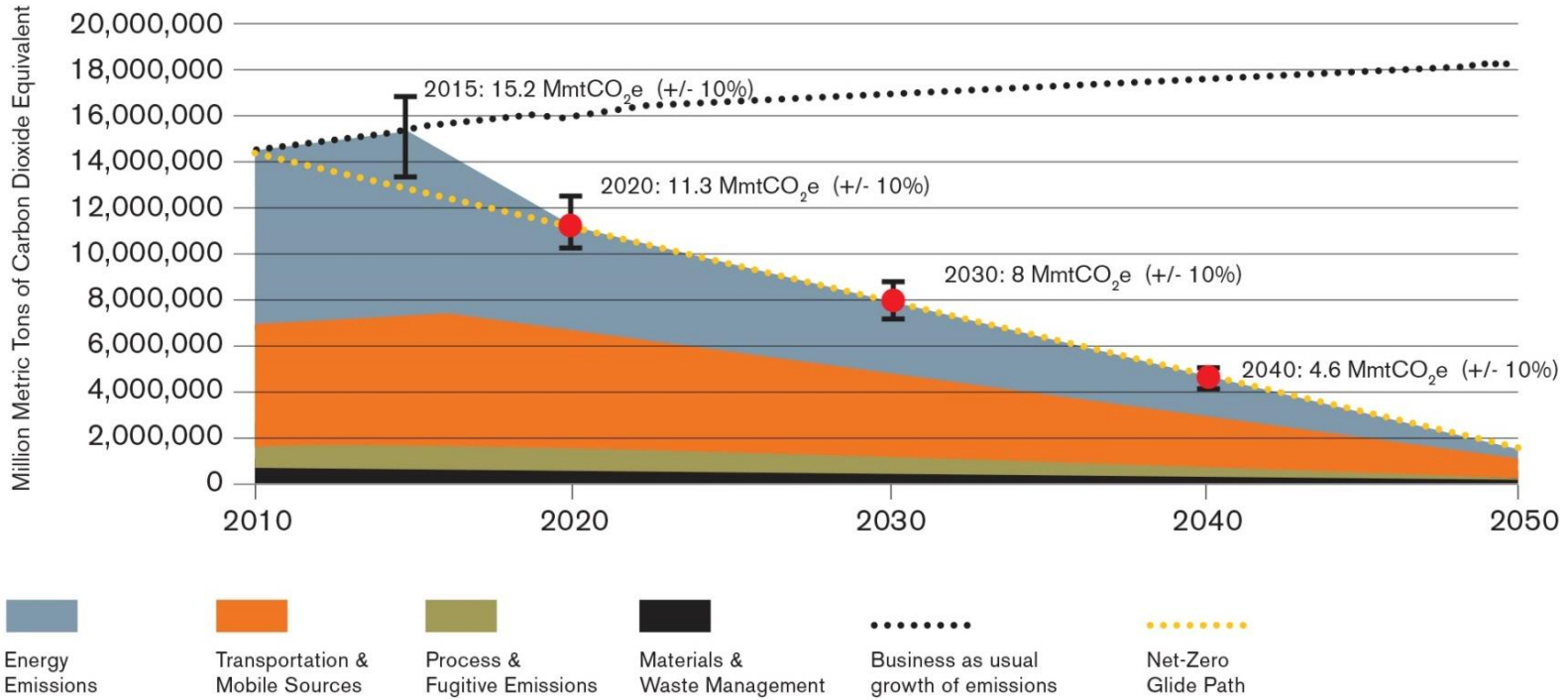
Net-Zero

Austin’s CO2 Emissions by 2050

Travis County GHG Inventory

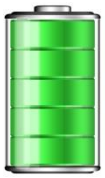


What does Net-zero in 2050 Mean?



City of Austin Sustainability Office

Austin Energy 2027 Goals

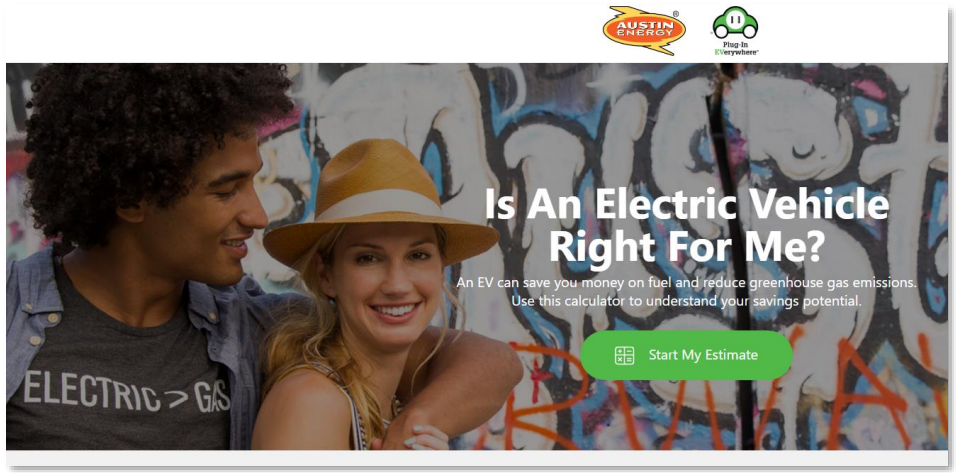


65%	1000 MW	950 MW	30 MW	0 CO_2
Offset 65% of customer load with renewable resources	1000 MW of savings from energy efficiency and demand response	750 MW utility-scale solar + 200 MW local solar, including 100 MW customer-sited PV	10 MW storage and 20 MW thermal energy storage	Net zero community-wide GHG emissions by 2050

*All subject to meeting **Affordability Goals**:
<2% rate increase per year; AE rates in lower half of Texas utilities

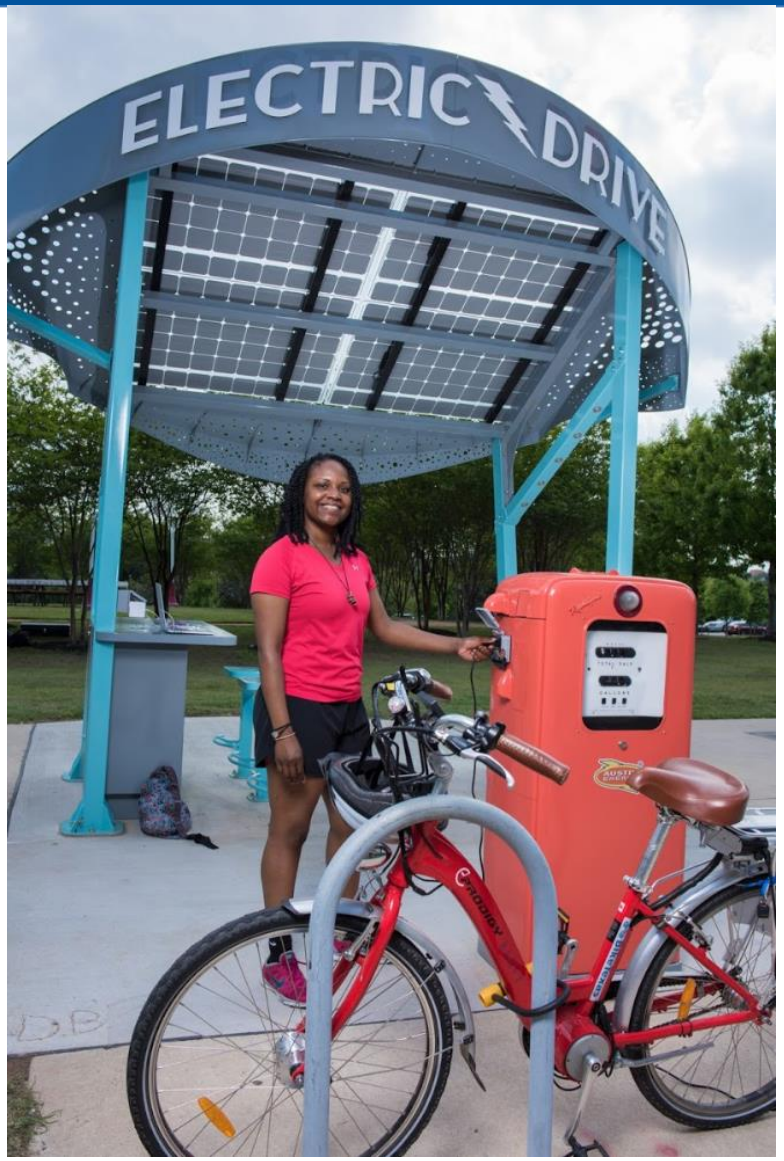
Affordable, Clean & Convenient

Integrated Marketing & Tools



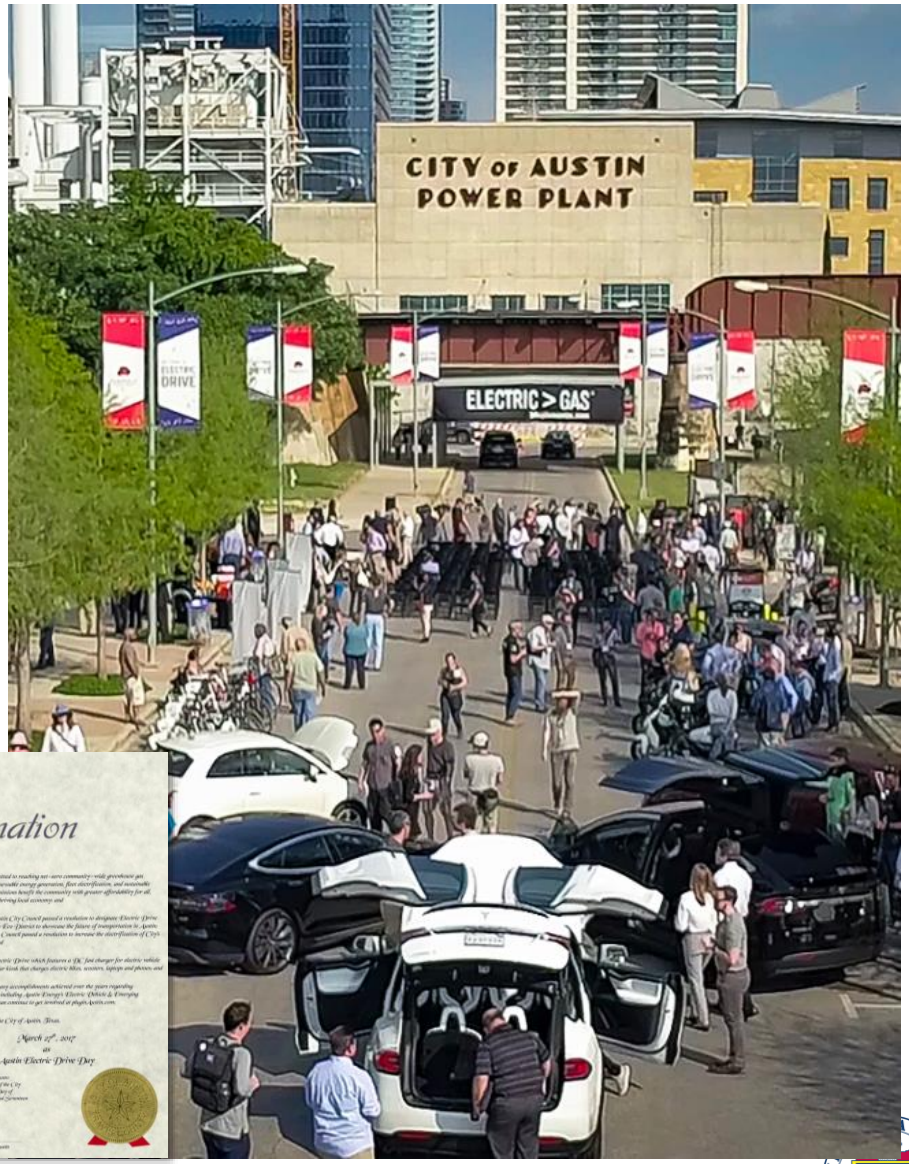
Electric Drive Project

- Downtown showcase for electric mobility
- DCFast, Level 2, & 1 Charging
- Solar powered kiosk and charging center
- Integrated within the Seaholm EcoDistrict



Electric Drive Event

- Event featured on local TV news, print, and radio
- National press coverage
- Over 540,000 traditional and 74,000 social media views



City EV Fleet Rollout

330 Plug In Electric vehicles that are charged from GreenChoice by 2020.

- **35** vehicles 2017
- **134** total vehicles 2018
- **229** total vehicles by 2019
- **330** total vehicles by 2020

Municipal Lease to own spreads initial costs over 3 years & takes advantage of $7,500 federal tax credit per vehicle

These vehicles will avoid over 15,000 mt CO2e & estimated **TCO savings of $3.5M** over their lifetime

Low-income Programs

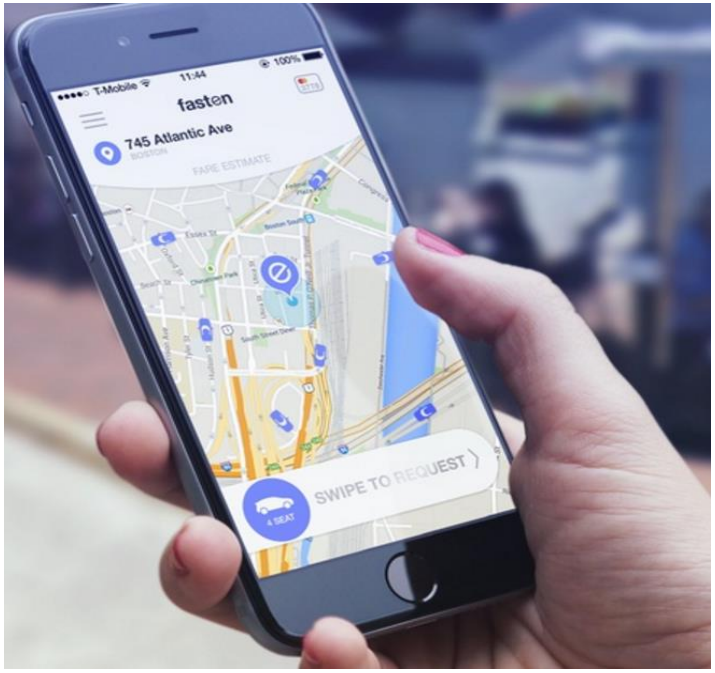
“EVs are for EVeryone” is a new Austin Energy initiative to conduct EV outreach, program development, and deployment for Austinites with a focus on low to moderate income communities.

Funding provided to Austin Energy by: 11TH HOUR PROJECT THE SCHMIDT FAMILY FOUNDATION

Residential EV Time of Use Rate

Shared & Electric Transit

Currently underway is a rollout of utility-owned **DCFast** “dual-standard” charging stations as part of its larger Plug-In EVerywhere™ network to enable ride-share and taxi fleets.



CapMetro is designing a **3MW eBus fueling center** in North Austin as they seek to deploy 30 electric buses by 2020.

Grant-Funded EV-related Initiatives

U.S. DEPARTMENT OF ENERGY

arpa·e
CHANGING WHAT'S POSSIBLE

ChargePoint America

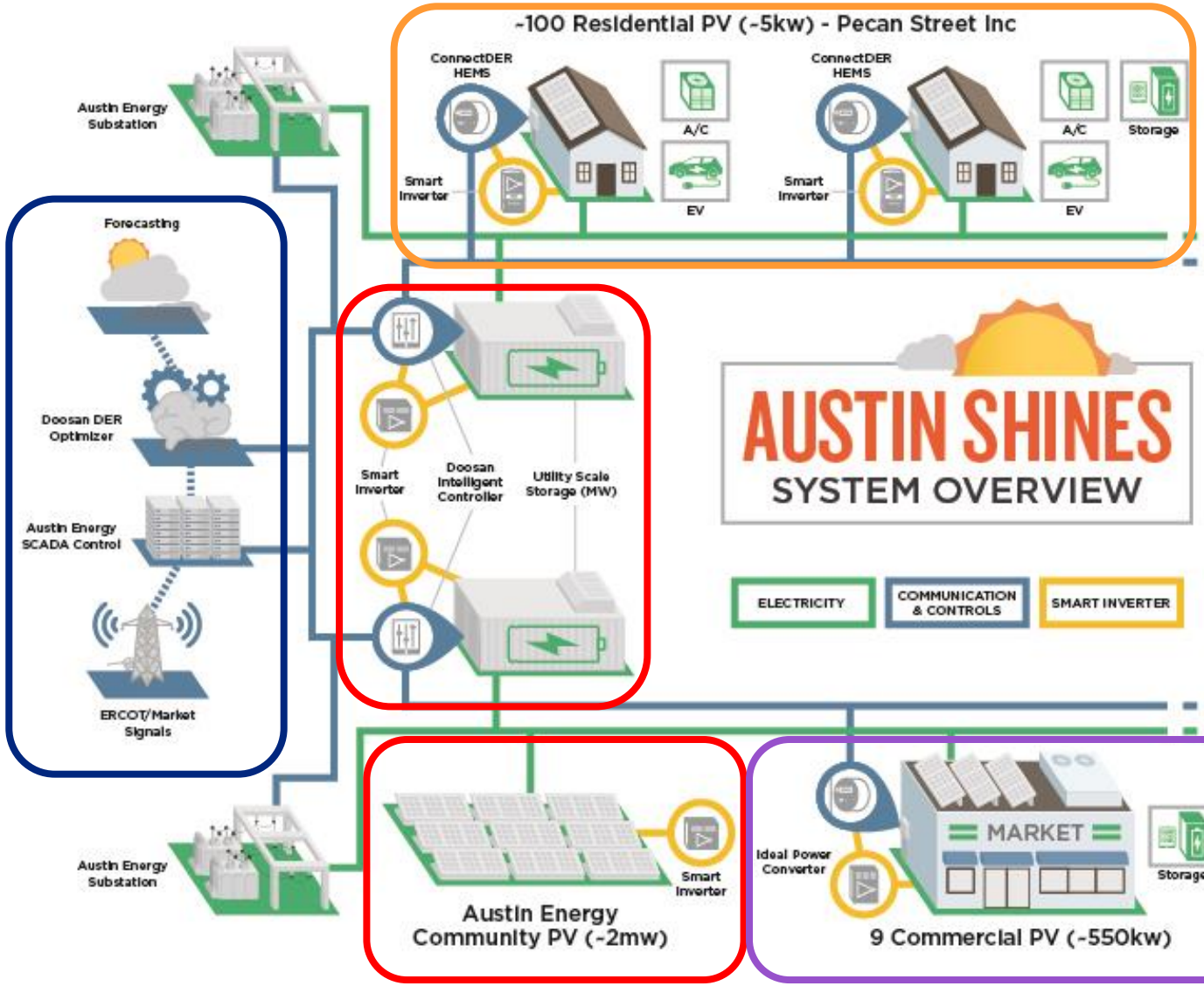
Pecan Street Project

CENTRAL TEXAS fuel INDEPENDENCE PROJECT

TEXAS RIVER CITIES
Plug-In Electric Vehicle Initiative

11TH HOUR PROJECT
THE SCHMIDT FAMILY FOUNDATION

SHINES – Integrated Solar+Storage



Utility Scale Energy Storage + PV

Commercial Energy Storage + PV

Residential Energy Storage + PV

DER Management Platform

Illustrative

Autonomous, Shared & Electric

City Council Resolution: New Mobility Plan for autonomous, shared, and electric

Thank You

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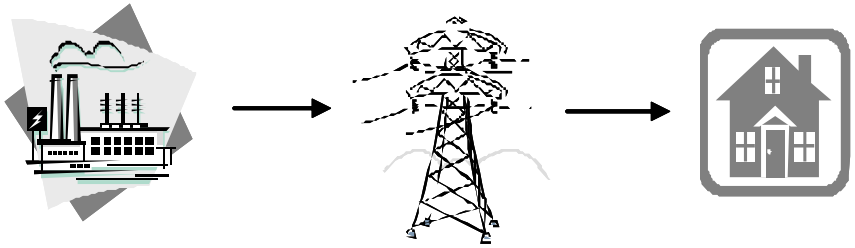
Impact of EVSEs on Oncor Distribution Facilities

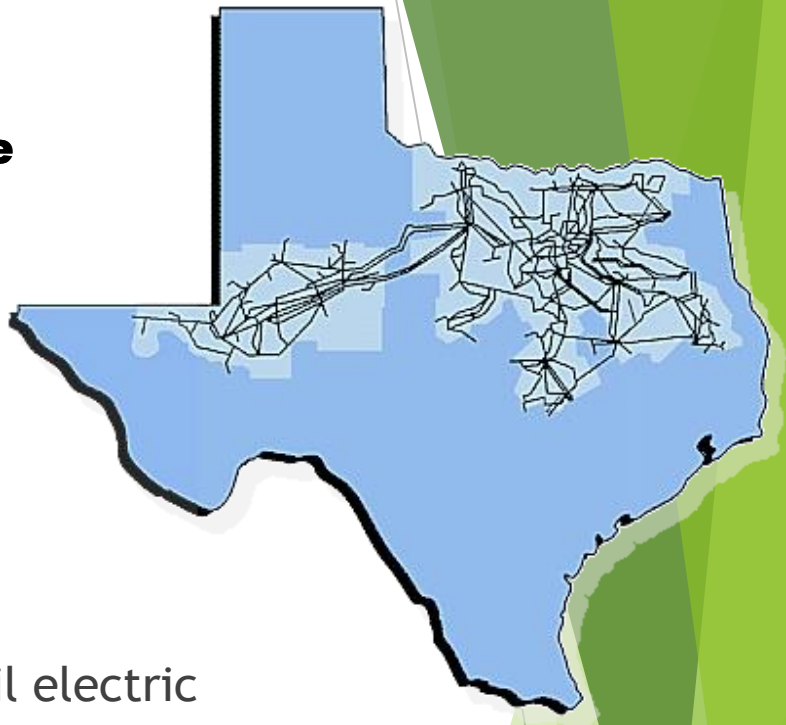
Tom Anthony
September 13, 2017

Oncor

Competitive **Regulated** **Competitive**



Generators *Transmission & Distribution* *Retail Electric Providers (REP)*



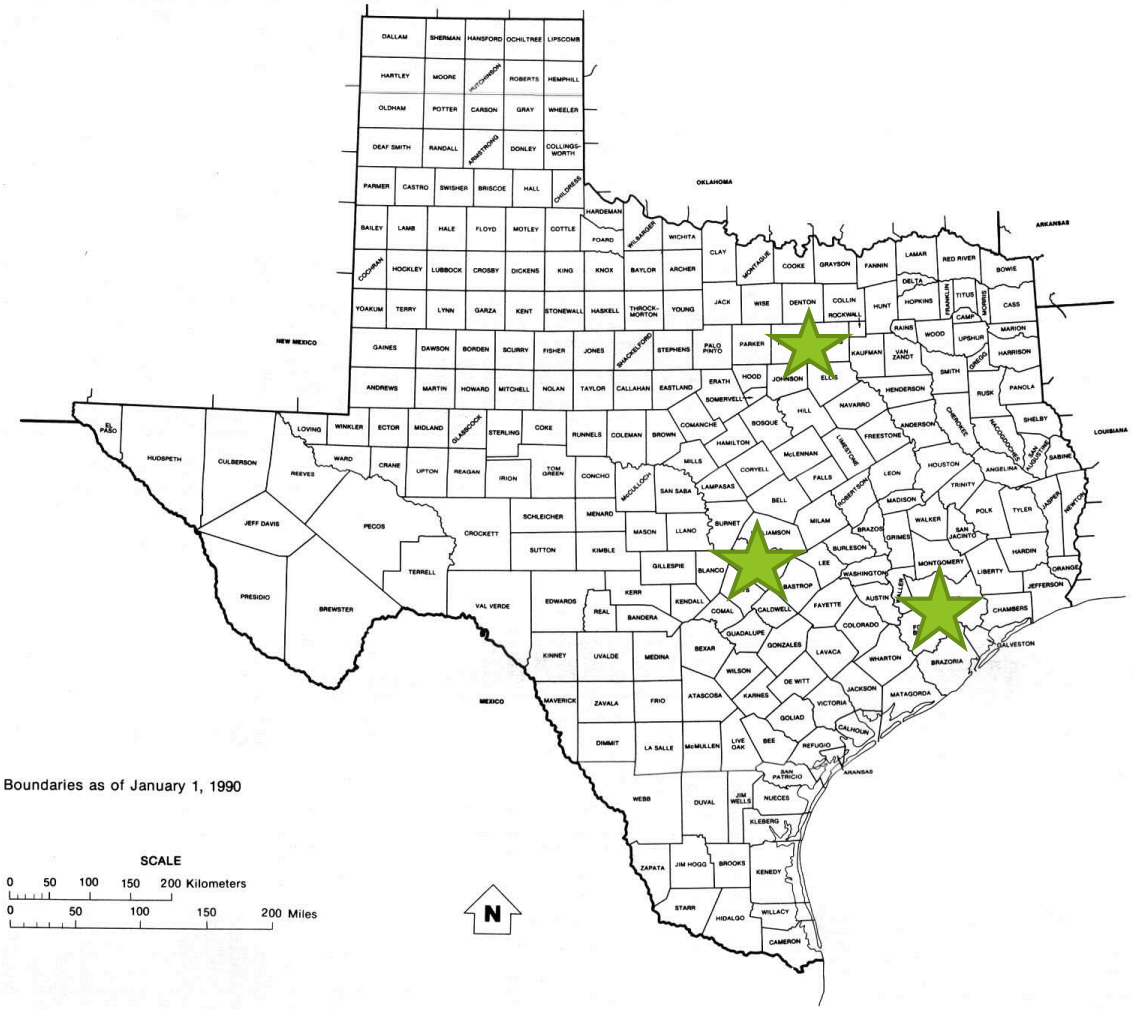
- Competitive in ERCOT wholesale and retail electric investor owned utility market since 2002
- Regulated delivery utilities – do not generate, own, or sell electricity
- 6th largest utility in U.S.
- 3.4 million meters (customers)
- Over 115,000 miles of transmission and distribution lines

Oncor EVs

- Owned six Volts and six Leafs since 2011
- Own 19 private EVSEs located throughout the Oncor system
- Participated in EPRI electric transportation infrastructure program through 2015
  - Purpose was to determine impact of EVs on utility systems
- Studied Oncor distribution grid impact on early EV customers in 2011
- Modeled grid impact of higher penetration of EVs on different types of circuits

EV Counts in Texas (1Q17)

- 20,432 in Texas
- 8166 in DFW (13th highest in U.S.
- 4752 in Houston
- 4316 in Austin



EVSE Equipment Differences

Three types of chargers

- Level 1 – 120V, 15 amp
  1.8 kW (hair dryer) – 6 hour charge*
- Level 2 – 240V, 15 amp
  3.6 kW (water heater) – 3 hour charge*
- Level 2 – 240V, 30 amp – 1.5 hour charge*
  7.2 kW (water heater + clothes dryer)
- DC Fast Charge – 480V,100 amp
  50 kW (7-11 store) – 20-30 minute charge*

*based on 8kWh charge

Impact of EVSEs on Oncor Circuits

- EPRI Program
  - Minimal impact on system at low vehicle penetration
  - Concern about loading system immediately upon arriving home (peak load period, especially in summer
- Oncor Distribution Impact Study
  - 189 residences with home EVSEs were reviewed
  - 3 overloaded transformers (1.6%)
- Oncor Modeled Grid Study
  - Some circuit transformers could start to overload at 20% penetration
  - Transformers overloaded before primary or secondary circuits
  - Depending on age and type of circuit; other circuits saw minimal impact

Summary

- Level 1 and level 2 residential EVSE penetration within Oncor system is not large enough at this time to greatly impact electrical system
- Oncor Distribution Planning group is keeping aware of circuit penetration levels
- EVSE customers can help prevent overload situations by charging off peak (10pm – 6am)
- Please let Oncor know if you want to install a DC fast charger – whole different ballgame!

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Contact Information

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Questions
& Discussion