EV Opportunities for Utilities
National Drive Electric Week Webinar Series

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EV Opportunities for Utilities
National Drive Electric Week Webinar Series

- Karl Popham, Austin Energy
- Tom Anthony, Oncor Electric
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
Batteries getting bigger; 60-80kWh

With increased range, one EV is moving to 10x the capacity of a single residential storage system.
EVs have the largest growth curve for Distributed Energy Resource power capacity.
National Fuel Independence/Stability

U.S. Average Retail Fuel Prices

Fuel Types:
- B20
- CNG
- Diesel
- E85
- Electricity*
- Gasoline
- Propane**

Source: 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.

Cost of lithium-ion batteries ($/kWh)

Source: Bloomberg

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

EV sales as % of new car sales

Source: Bloomberg
Austin Charging & EV Adoption Growth

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

Cumulative registrations by type

Public Charging: 1,848,851 kWh 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.

Data provided quarterly from EPRI for Travis and Williamson County.
Net-Zero

Austin’s CO2 Emissions by 2050
What does Net-zero in 2050 Mean?

2015: 15.2 MmtCO$_2$e (+/- 10%)
2020: 11.3 MmtCO$_2$e (+/- 10%)
2030: 8 MmtCO$_2$e (+/- 10%)
2040: 4.6 MmtCO$_2$e (+/- 10%)

City of Austin Sustainability Office
# Austin Energy 2027 Goals

<table>
<thead>
<tr>
<th>Goal</th>
<th>Description</th>
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<tbody>
<tr>
<td>65%</td>
<td>Offset 65% of customer load with renewable resources</td>
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<tr>
<td>1000 MW</td>
<td>1000 MW of savings from energy efficiency and demand response</td>
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<td>950 MW</td>
<td>750 MW utility-scale solar + 200 MW local solar, including 100 MW customer-sited PV</td>
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<td>30 MW</td>
<td>10 MW storage and 20 MW thermal energy storage</td>
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<td>0 CO₂</td>
<td>Net zero community-wide GHG emissions by 2050</td>
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*All subject to meeting Affordability Goals: <2% rate increase per year; AE rates in lower half of Texas utilities*
Affordable, Clean & Convenient

Charging Stations

$4.17/month
Unlimited access to over 400 charging ports

$2.00/hr

600+ Ports

100% Texas Wind

$4.17/mo or $2.00/hr

Plug-in Everywhere

pluginaustin.com
Pump gas? I literally can’t even.

ELECTRIC > GAS
pluginaustin.com

Is An Electric Vehicle Right For Me?
An EV can save you money on fuel and reduce greenhouse gas emissions. Use this calculator to understand your savings potential.

Start the conversation.
Visit pluginaustin.com
A City of Austin Progress

CITY of AUSTIN POWER PLANT
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
“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
Introducing EV360℠

“The EV360 program cuts my EV energy cost in half.”

– Logan Boyd

pluginaustin.com
A City of Austin Program
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
- ChargePoint
- Pecan Street Project
- Central Texas
- Independence Project
- Texas River Cities
  Plug-In Electric Vehicle Initiative
- 11th Hour Project
SHINES – Integrated Solar+Storage

Utility Scale Energy Storage + PV
Commercial Energy Storage + PV
Residential Energy Storage + PV
DER Management Platform

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

Karl Popham
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Impact of EVSEs on Oncor Distribution Facilities

Tom Anthony
September 13, 2017
- 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!
Contact Information

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www.DFWCleanCities.org/EVNT  #texasEV
Questions & Discussion