Florida Utilities – Are you Ready for the Rapid Growth of Electric Transportation?

FMEA Annual Conference

July 19, 2018

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“Electric vehicles represent the largest opportunity for utilities to add load growth without extending or adding to peak”

Rocky Mountain Institute - 2016

What has Changed Since the 2016 FMEA Conference?

EV Market Highlights

- EV sales are increasing
  - 871k on the road; ~30% annual growth
  - 550,000 in 2016
- More EVs with larger batteries are coming to market
  - Longer range, e.g. 200+ mile range
  - Battery sizes of 60 kWh to 100 kWh
  - Nissan Leaf battery grew from 24 kWh to 40 kWh
- Charging power (for DC fast charging) is increasing
  - Moving to 120 - 350 kW per cord
- Utility investment in EV charging infrastructure
  - ~$1.4B in North America

Electric Transit Buses

The total number of fully electric buses delivered for use in public transit in the US grew 83% in 2017, with total buses in service reaching 333.

9% of all transit agencies either have electric buses in service today or have electric buses on order (Source: MassTransitMag – Jan 2018)

Other Electric Vehicles

City Furniture, Ft Lauderdale, FL Pre-Orders 5 Tesla Semis They will operate and charge at Winter Garden facility

Freightliner eCascadia electric semi-truck

Daimler has 2 new electric trucks to counter the Tesla Semi

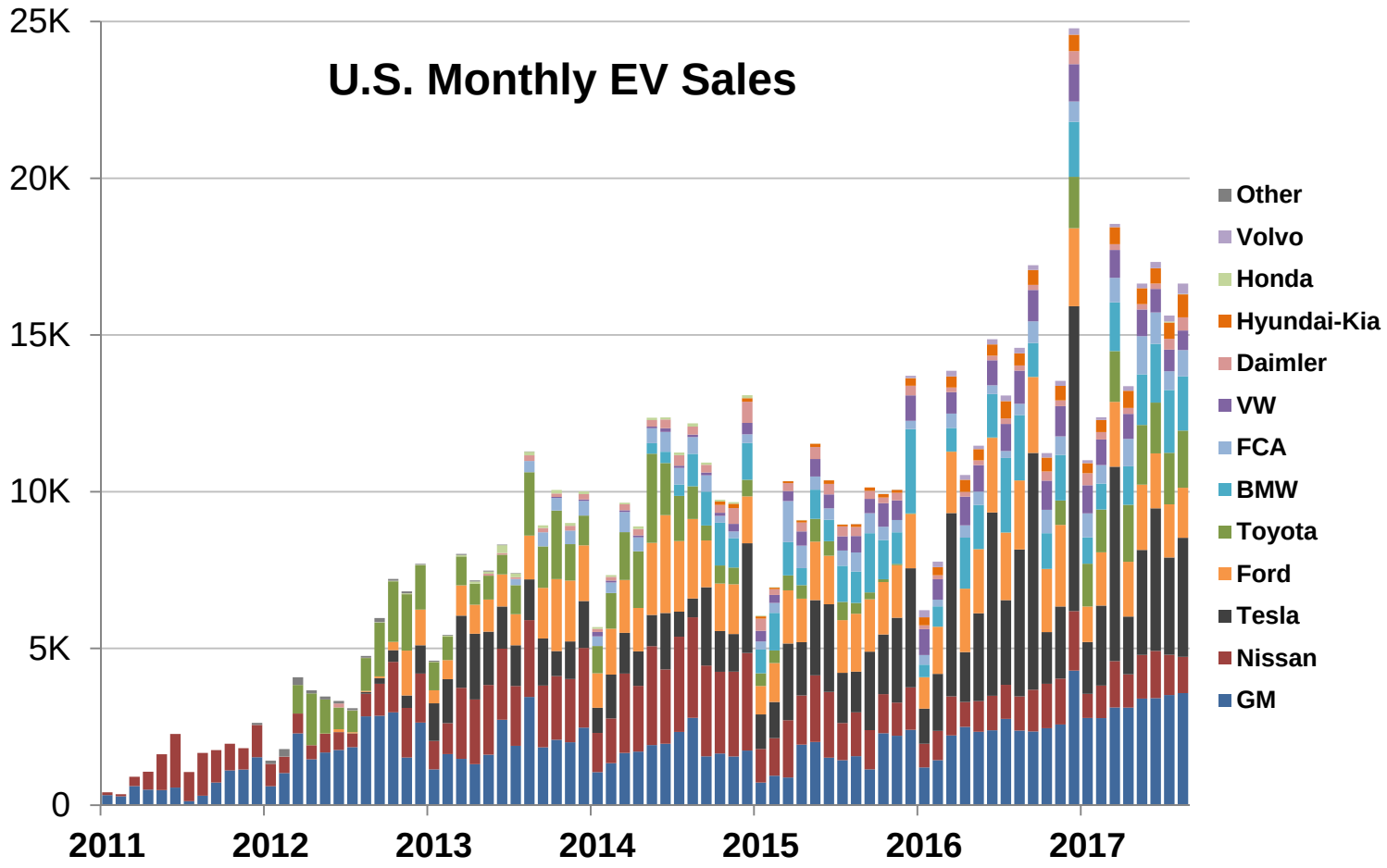
EV Sales Progress

871,000
sales since
Dec. 2010

+32%
2017 sales
YTD vs. ‘16

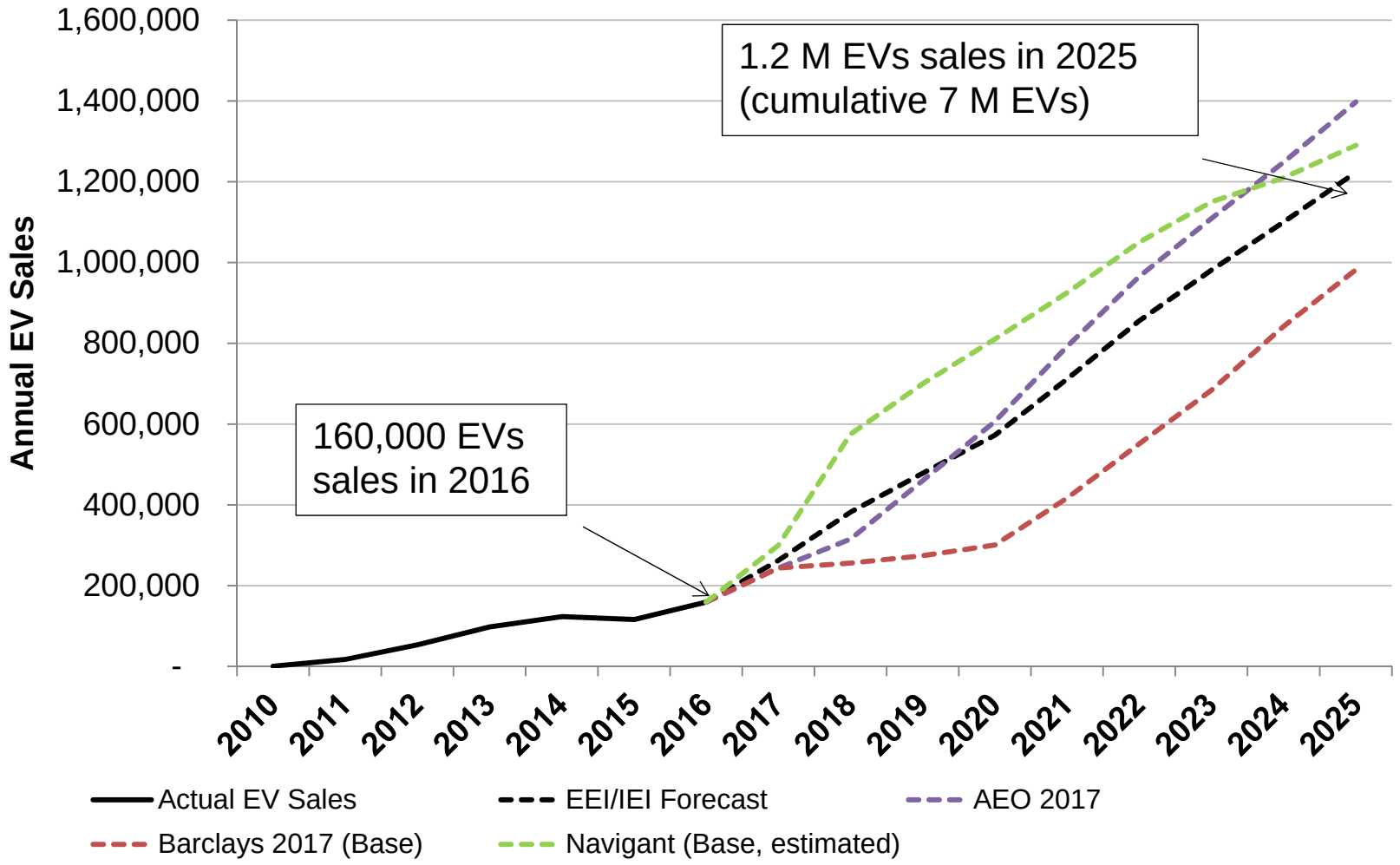
38
PEV models

20
auto brands



SOURCE: Sales data from InsideEVs.com and HybridCars.com

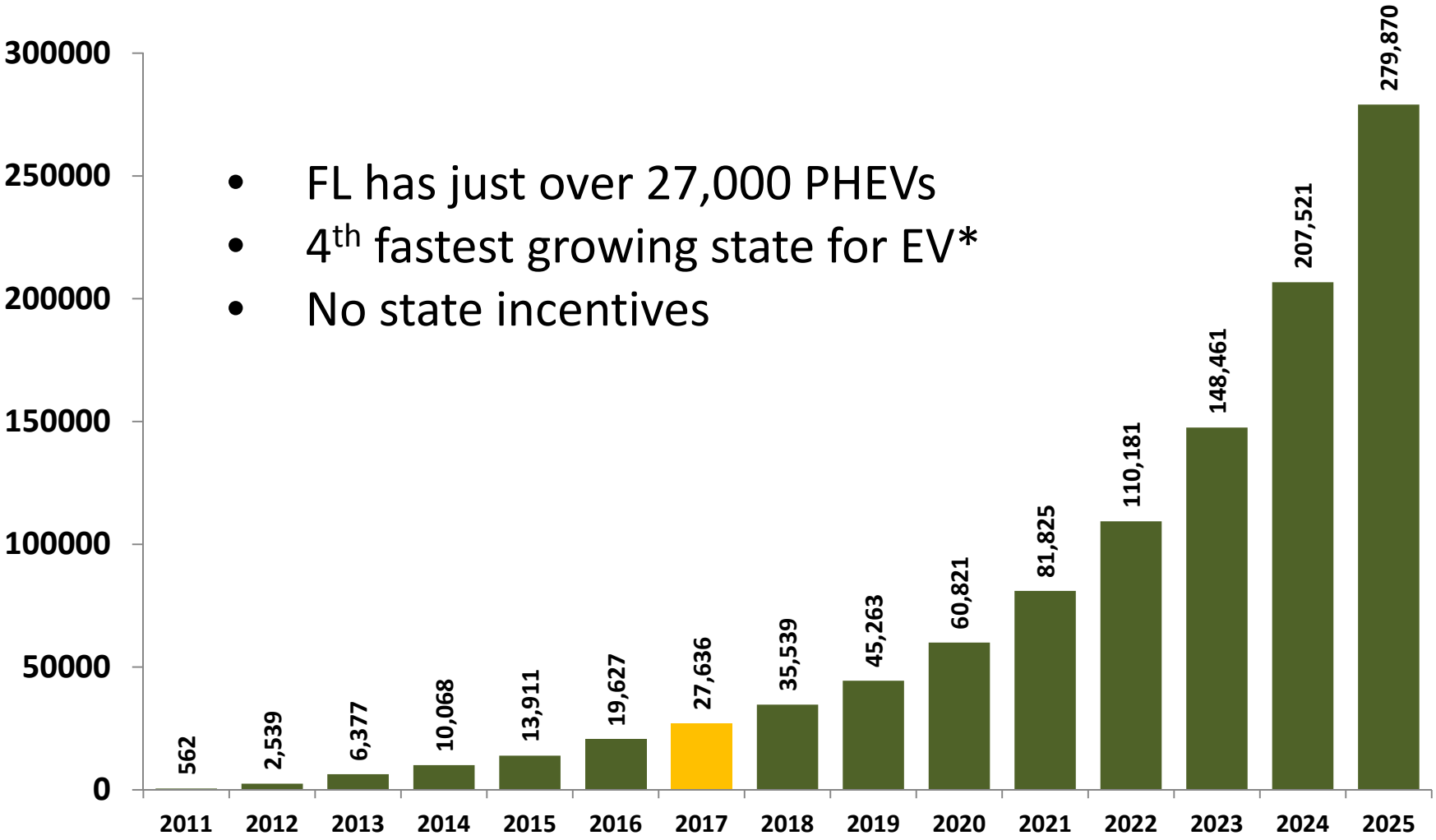
EV Forecast



Source: EEI

EV Adoption Forecast Florida

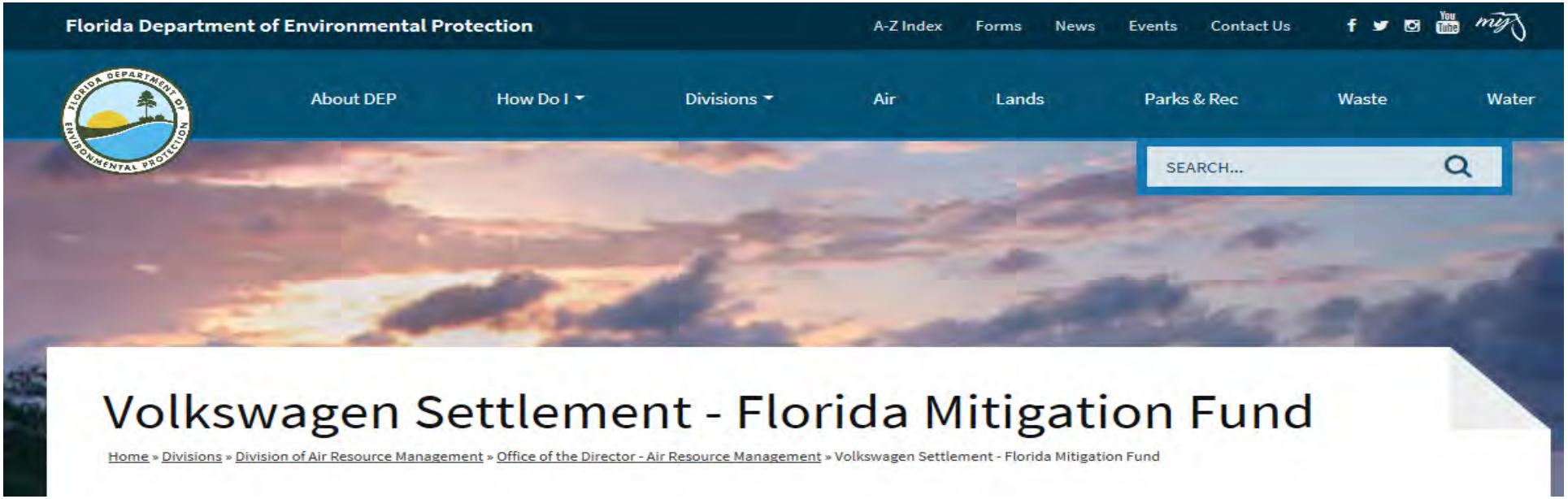
- FL has just over 27,000 PHEVs
- 4th fastest growing state for EV*
- No state incentives



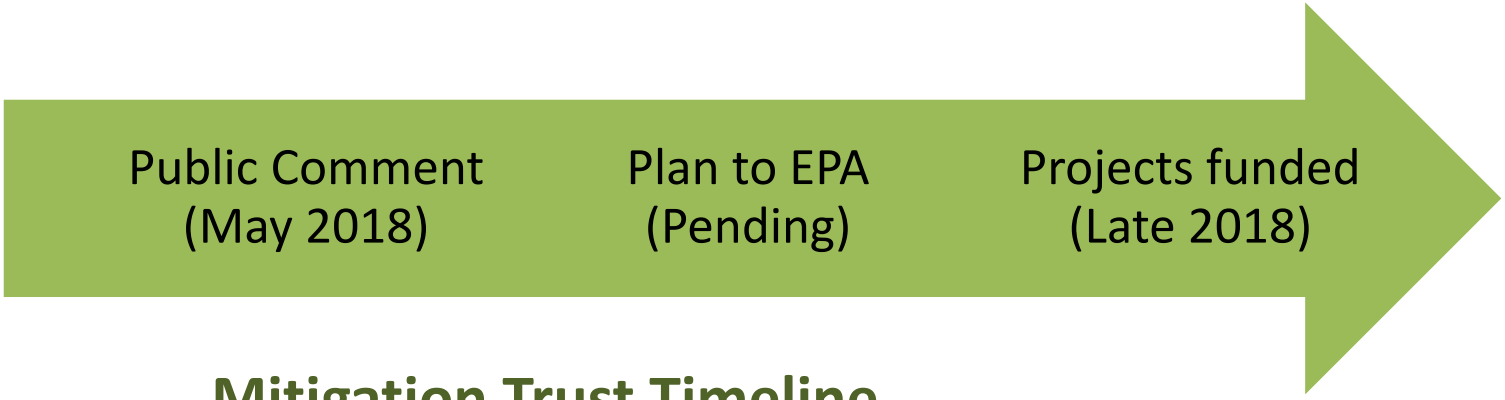
Source: Florida Power & Light

Florida Projects

Duke Energy Park & Plug ($8MIL)
NE Florida “Chargewell” network ($750K, 4 counties)
Electrify America infrastructure metro areas - Miami one of 16 selected nationally DC Fast charging islands – 1MW to 2MW per site
City of Orlando Fleet Services - Will add EV infrastructure & continues to add EV in fleet
Electric transit buses Pinellas, Jacksonville, Broward, Gainesville & Tallahassee
City of Tallahassee charging stations
VW Mitigation Trust & EV Infrastructure Funds?



- 15% EV infrastructure
- Electric transit/school buses



Mitigation Trust Timeline

https://floridadep.gov/air/air-director/content/volkswagen-settlement-florida-mitigation-fund

Utilities and Electric Transportation

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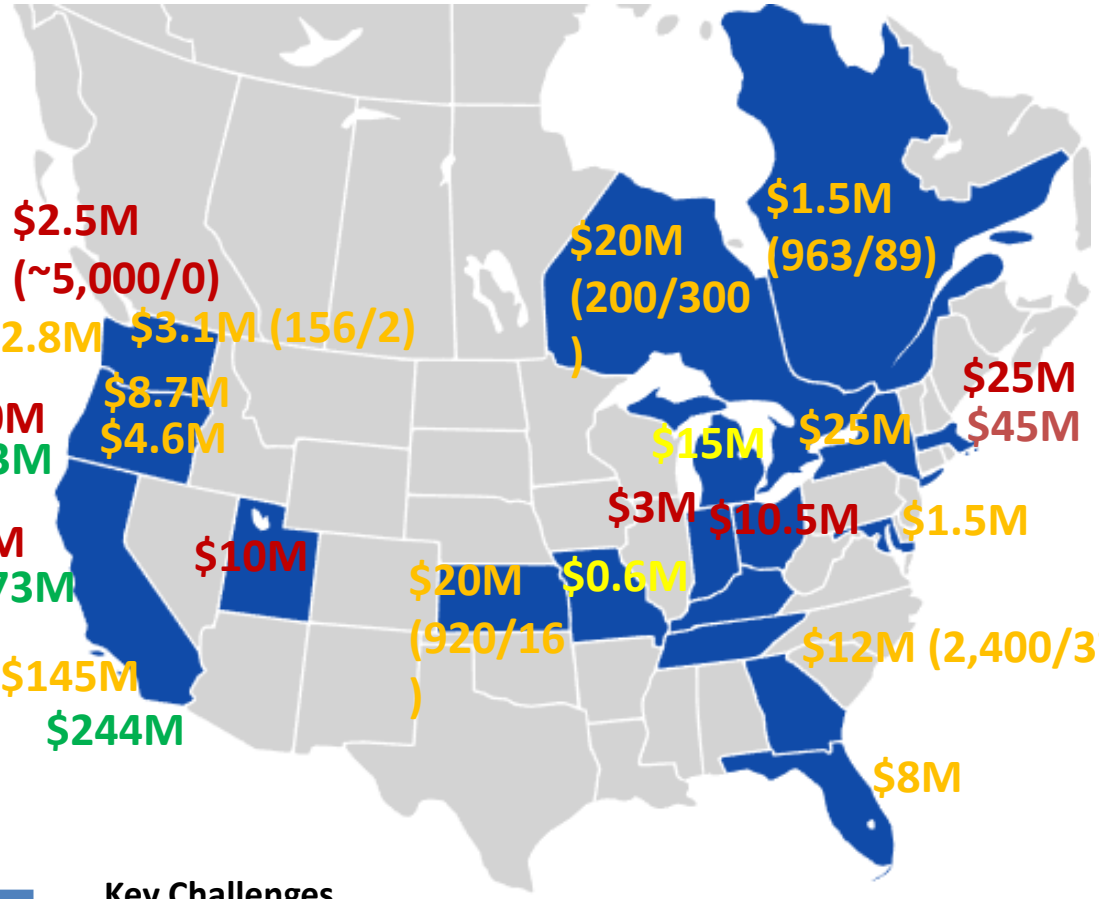
Utilities are proposing ~$1.4B in EV charging, part of the overall charging investment



Legend
Budget (#L2/#DCFC installed)
Make-ready / rebate
Utility-owned
Hybrid

Updated: 11/7/017

Key Challenges

- EV awareness
- Customer education
- Public charging infrastructure (easy to find, easy access, reliability, easy to use, clear pricing)

Slide courtesy of EPRI 2017

Integral Electric Company Role

Grid Integration	• Managed charging / rate design • System-level planning
Market Acceleration	• Remove barriers to adoption • Spur growth and investment
Customer Benefit	• Awareness and education • Access, equity, reliability

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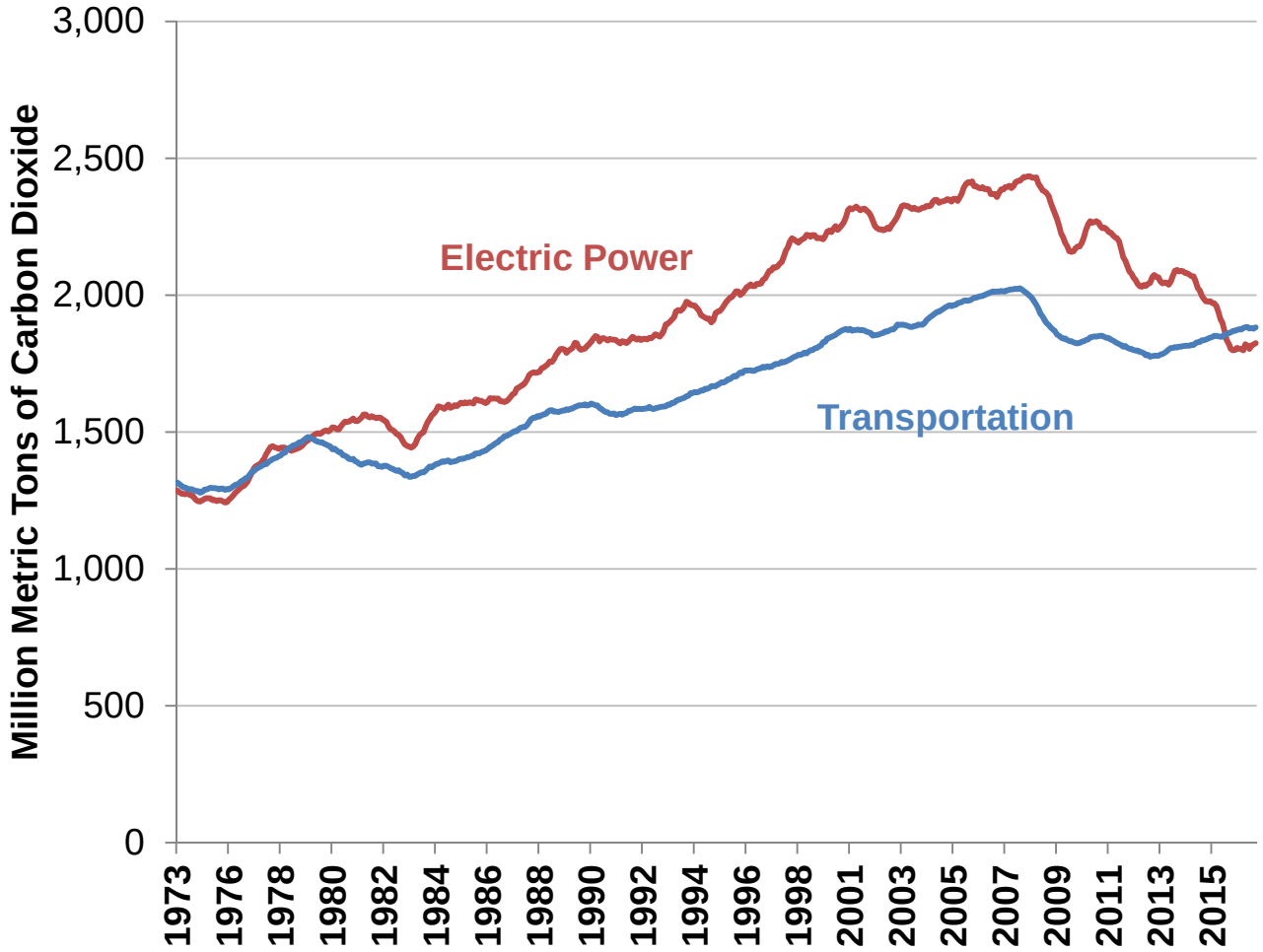
Societal Benefit



Electric Power

nearly **25%** reduction from 2005 levels by end of 2016

Transportation

decreased 10% 2005-2012, but increased 6% through 2016

SOURCE: EIA, *August 2017 Monthly Energy Review*

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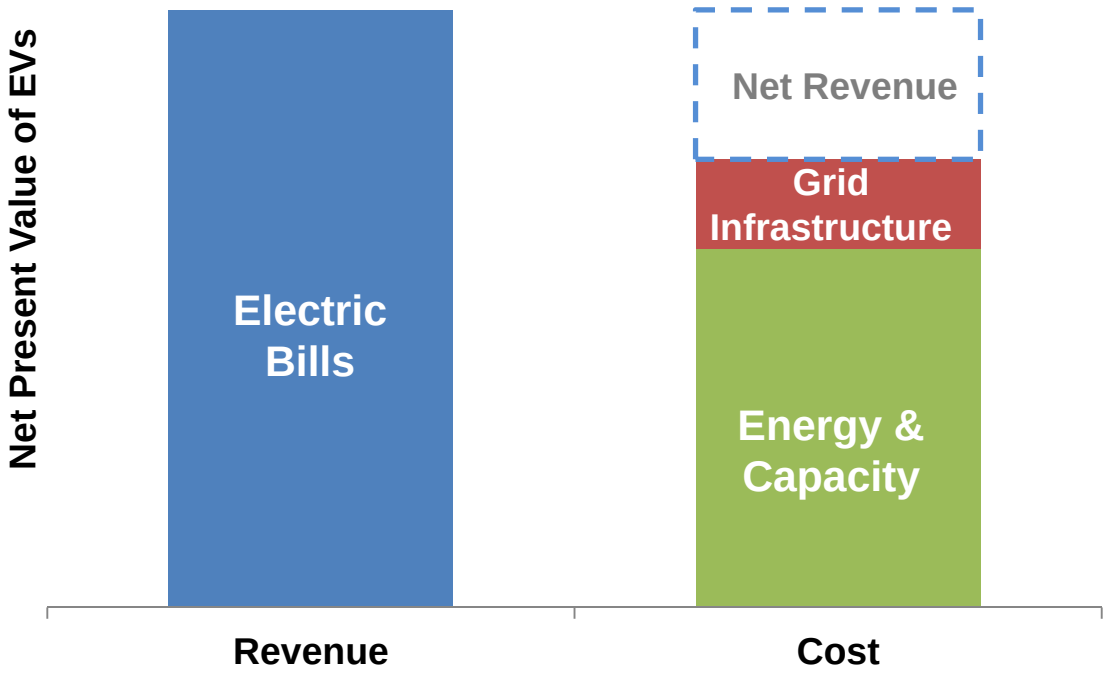
Grid Benefit



Revenue from EV charging exceeds the cost to serve

EV market is trending to BEVs with higher capacity batteries

CalETC, *California Transportation Electrification Assessment, Phase 2: Grid Impacts*
M.J. Bradley & Associates, *Plug-in Electric Vehicle Cost Benefit Analysis*
EPRI, *The Value of Transportation Electrification: Three Preliminary Case Studies of Impacts on Utility Stakeholders*

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Infrastructure

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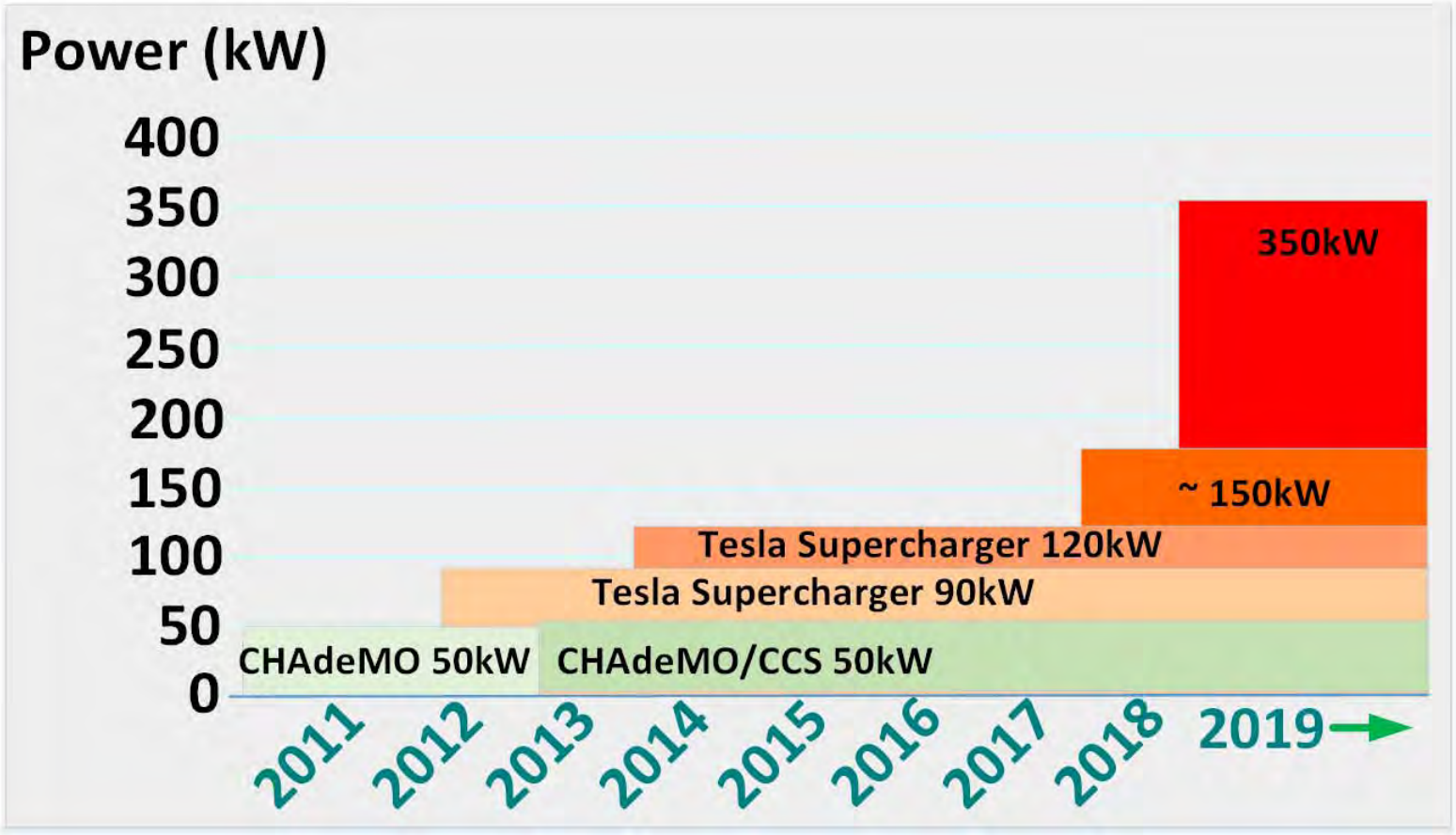
Charging Levels have been Rising



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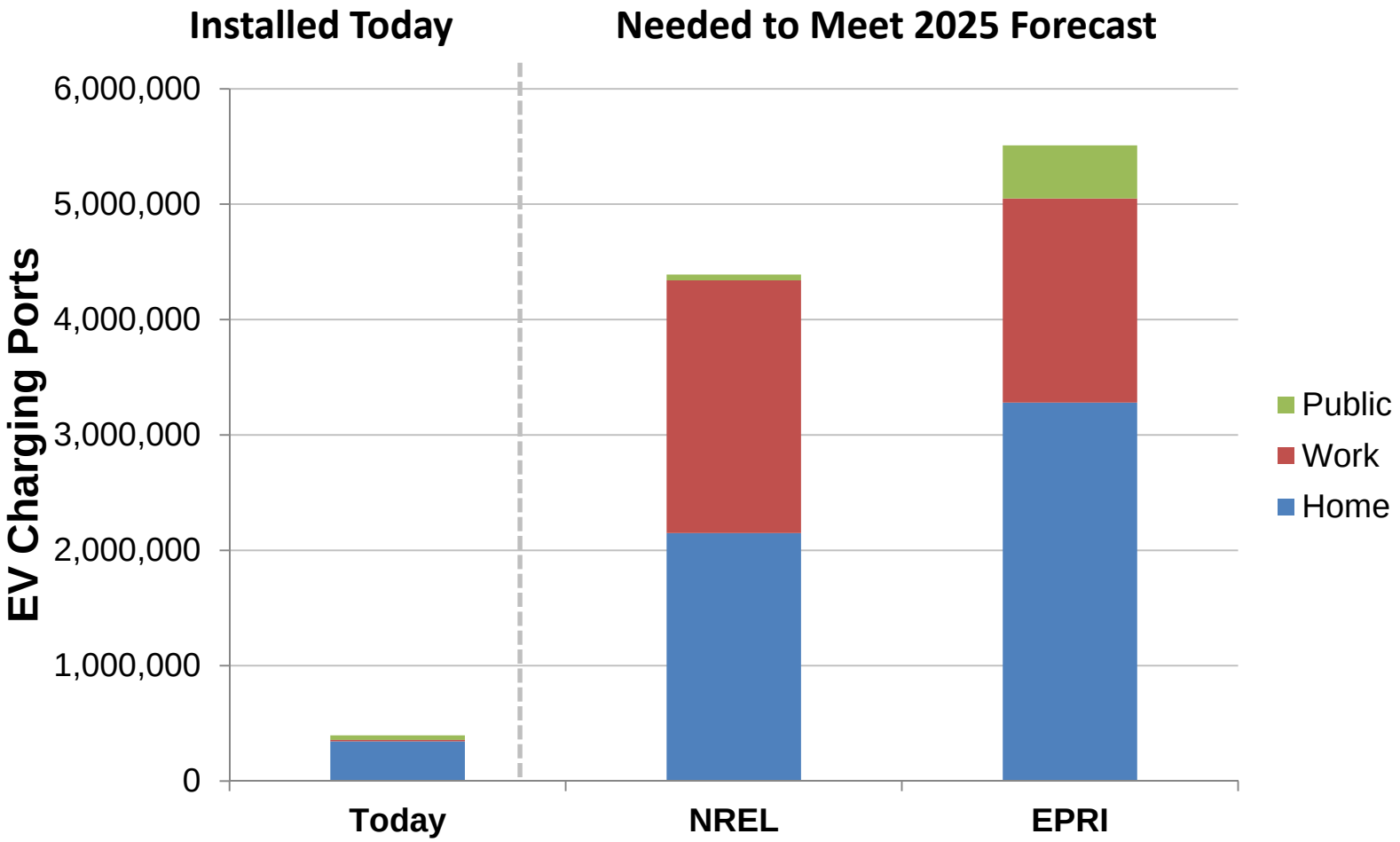
Charging Infrastructure



Takeaways

- Electric transportation is coming – no longer a question of if, but how fast
- Many different actions can help accelerate this transition
  - Technology cost reduction and model availability
  - Market awareness and customer education
  - Infrastructure access and availability
- Electric companies are well positioned to ensure grid benefits, positive outcomes, and accelerate the market

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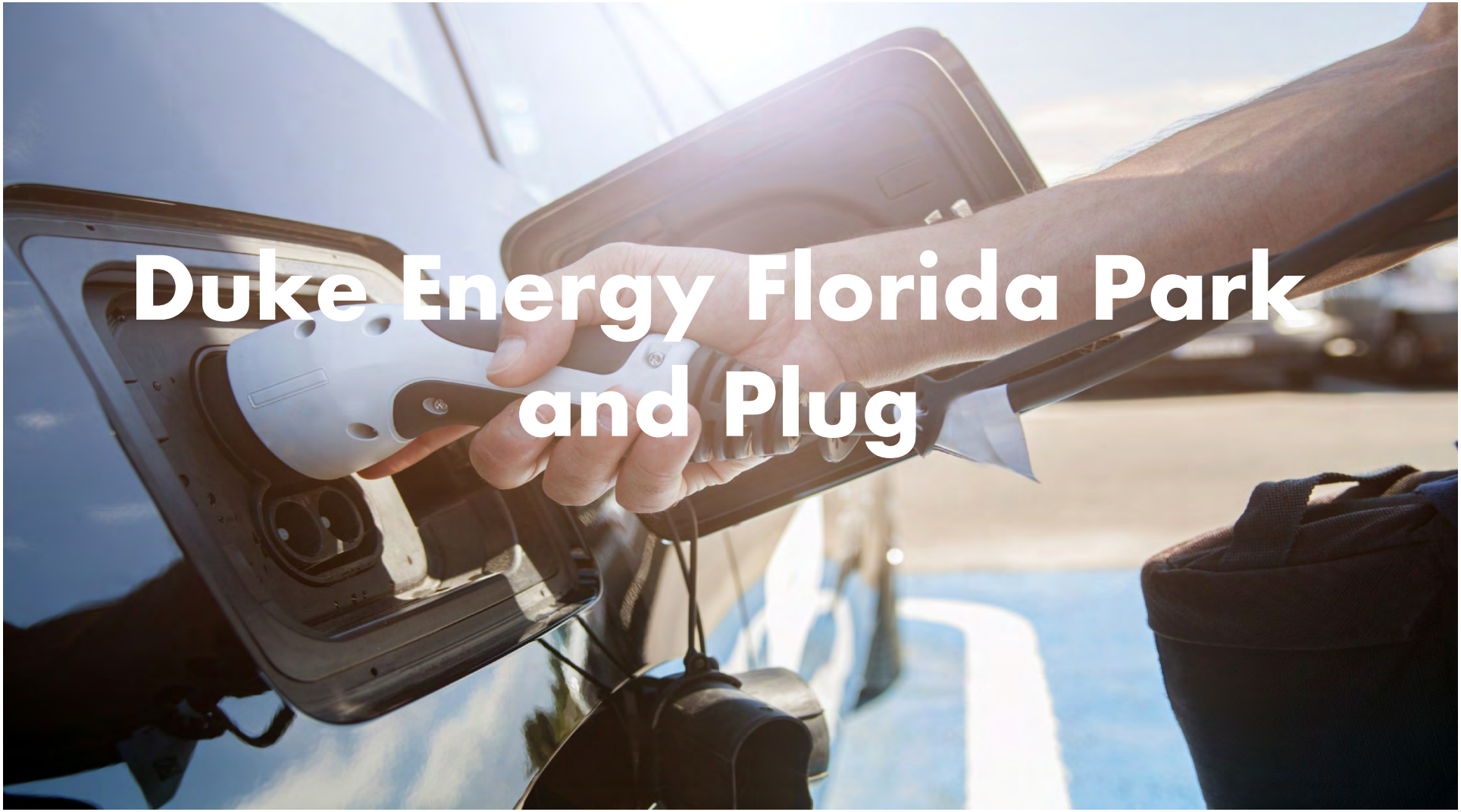

Duke Energy Florida Park and Plug

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- $8MIL agreement with Florida Public Service Commission (FPSC) - *$400,000 for outreach/education*
- Utility owned & operated through at least Dec 2022
- Seeking qualified site hosts in Duke Energy Florida service territory

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Unique Opportunity to install foundational level of charging infrastructure and gather data for evaluation

- Critical load data for system planning
- Utilization across segment types
- Trends in usage, charging times, segments
- Corridor placement – evacuation routes
- Configurations i.e. DCFC with Level 2 or Single phase “Fast charge”
- Rural vs urban placements
- Inform CAIC calculations

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Segment	Multi-unit dwellings (MUD)	Workplaces	"Longer dwell time" public locations	Highway Corridors
EVSE Technology	**Level 2**	**Level 2**	**Level 2**	**DC Fast Charging**
Minimum EVSE to be deployed (number of plugs or ports)	**325 ports**	**100 ports**	**75 ports**	**30 Units** **Chademo/CCS Combo**
Examples	Apartments Condos - Commons Dorms	Offices Employee Parking Small Fleets	Shopping Centers Museums Restaurants Gas stations Public Parking	Near major corridors Adjacent to Tesla Superchargers
Sample driving ranges provided by charge	20 to 30 miles/hour dependent on amperage	20 to 30 miles/hour dependent on amperage	20 to 30 miles/hour dependent on amperage	50 to 80 miles/30 minutes at 50KW
****At least ten (10) percent of the charging stations shall be installed in low income communities, as that term is defined in Section 288.9913(3), F.S.**				