

Trending in a new direction

Electrified Transportation

Agenda



- Purpose in Electrified Transport
- What We Are Learning
- Accelerating Our Success

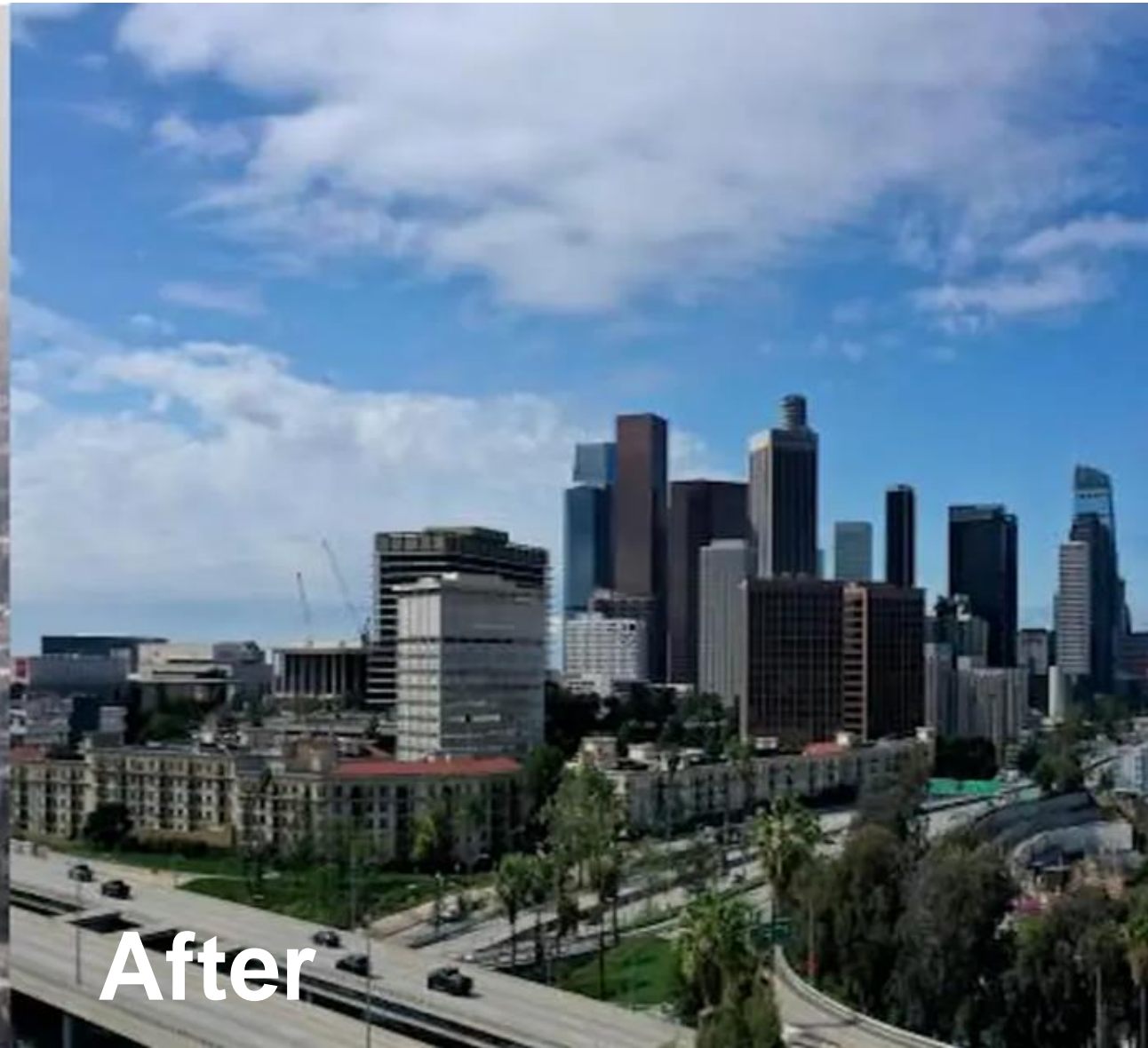
Purpose

Cleaner air – A clear purpose

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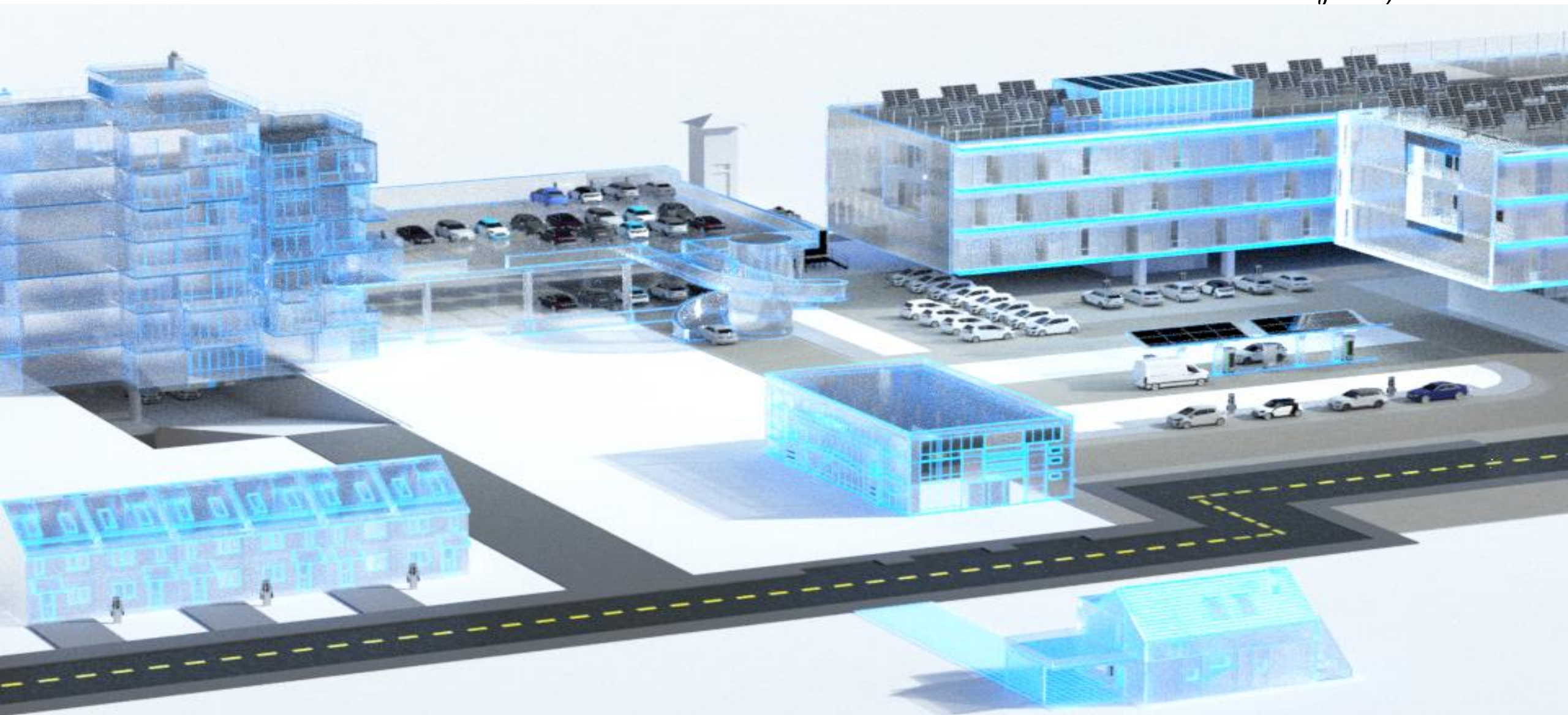
Before



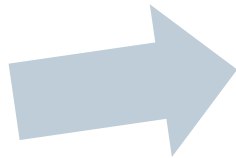
After

Our future: Clean, smart, efficient

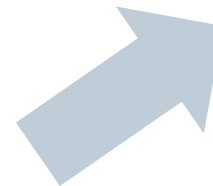
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The decarbonization process: Three powerful levers



**Trending with Impact
For > 20 years**



**Trending with Impact
For > 10 years**

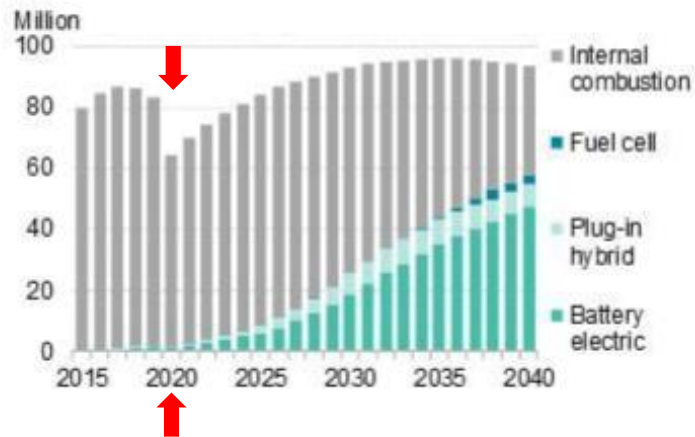


Trending in a New Direction

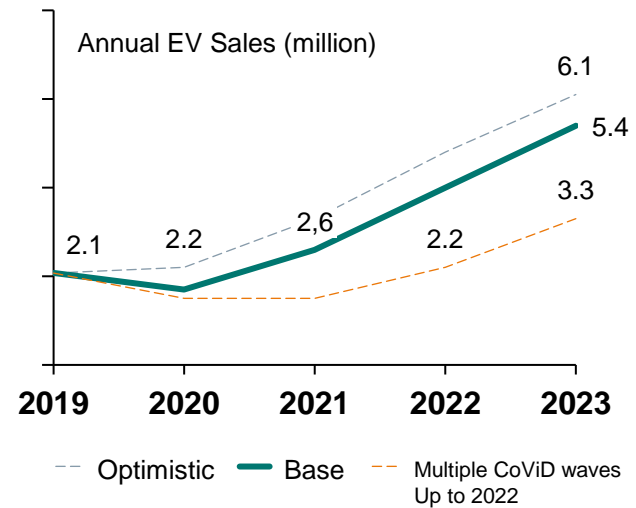
EV market trend - At the beginning of a multi decade conversion cycle

A multi-decade transition

Figure 5: Global annual passenger vehicle sales by drivetrain



Rather resilient to COVID, so far

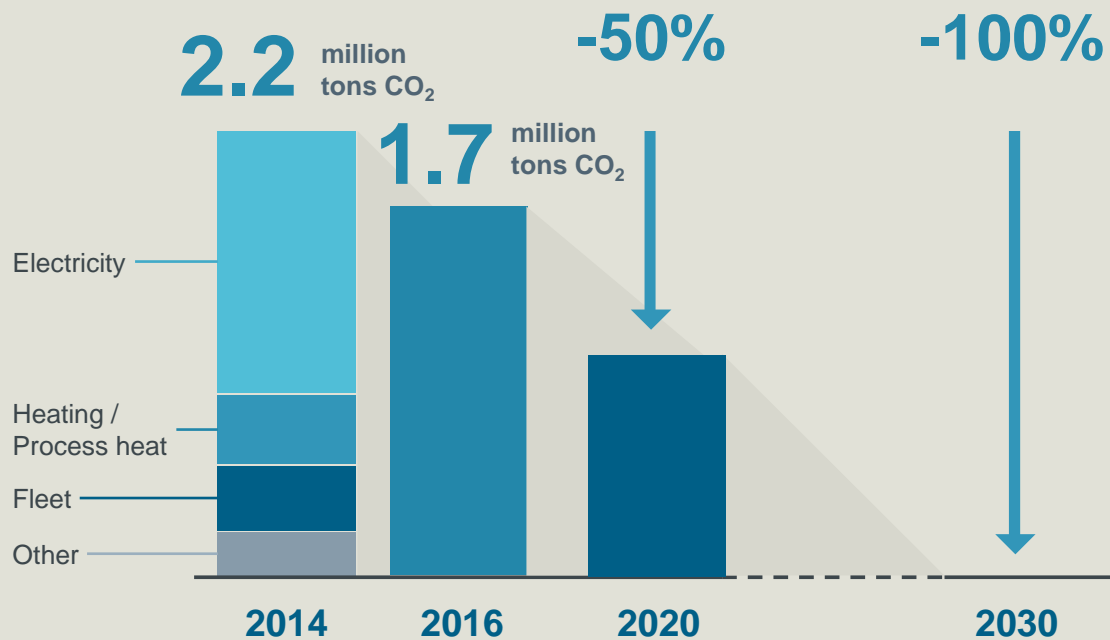


But the USA Lag is Concerning



Bringing these trends together - Our Journey at Siemens

We are investing over \$110 million in measures to reduce our carbon footprint



Do More of What Got Us to 50%



Drive energy-efficiency program

Increase energy efficiency in factories, employ sustainable technologies in new buildings



Expansive green energy purchase

Move toward a significantly cleaner power mix with a strong focus on renewable energy and highly efficient gas

And Change Our Business Further



Leverage distributed energy systems

Reduce energy costs and CO₂ emissions



Reduce fleet emissions

Utilize potential of low-emission cars in fleet, focus on electromobility across vehicle classes

HARD

VERY HARD

What We are Learning

Six lessons to electrify clean transport now

- 1 Vehicle use – Watch the full spectrum
- 2 Electricity has different economics than gasoline
- 3 The land of 10,000 pilots
- 4 Charging infrastructure – Can't plug-it-in
- 5 Service – A new mix of skills
- 6 Watch out for new digital traps that strand assets

Understanding the vehicle use – A key first step



eTruck

(Freightliner, 2020)



Transit eBus

(New Flyer, 2019)



Corporate fleets

(transportationtodaynews/Shutterstock, 2019)



Electric vans

(FIAT, 2020)



School eBus

(Blue Bird, 2020)



Consumer

(Mark Ralston / AFP - Getty Images, 2019)

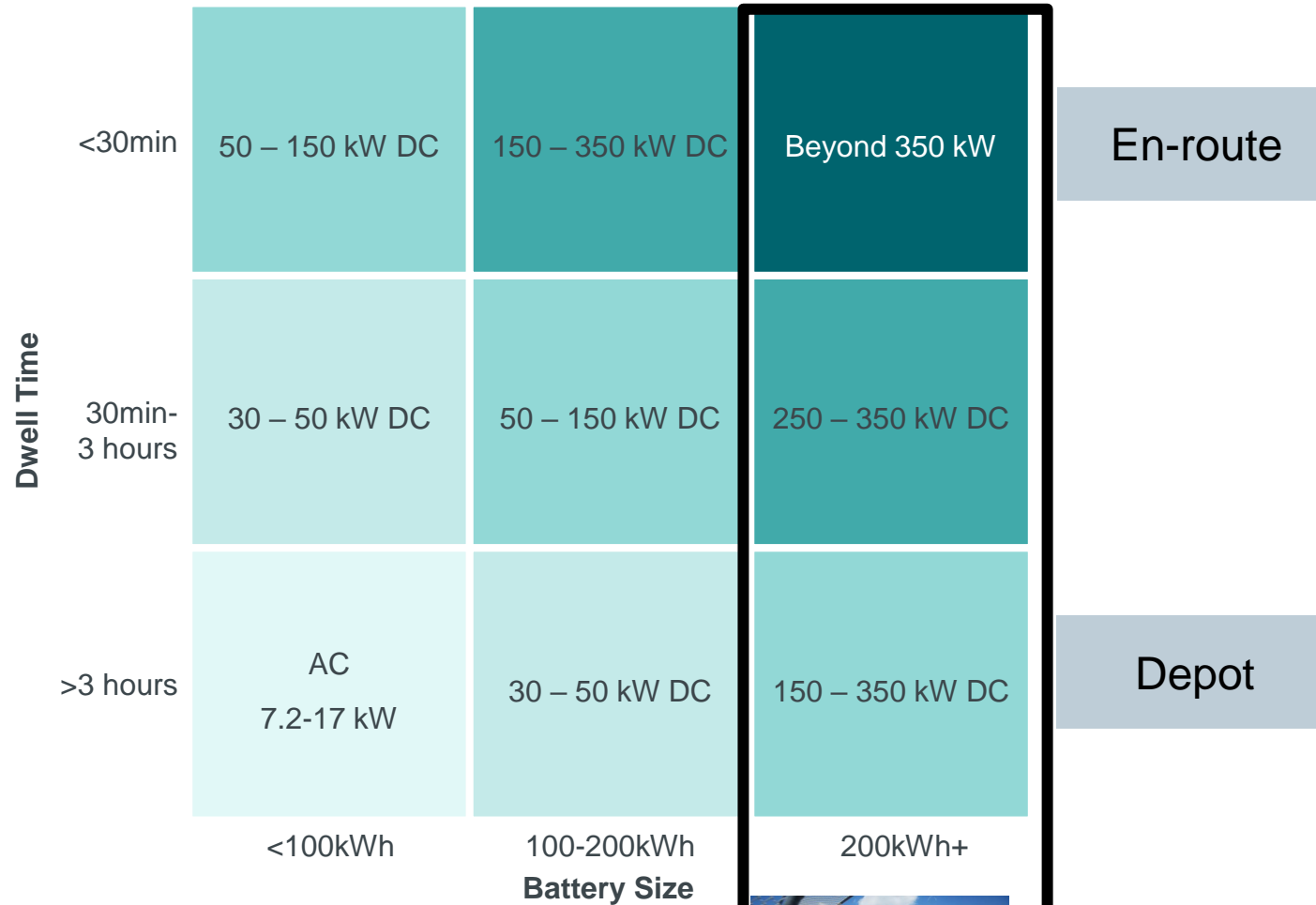
Vehicle use translates into a charging plan

Station	50 – 150 kW DC	150 – 350 kW DC	Beyond 350 kW
Work	30 – 50 kW DC	50 – 150 kW DC	250 – 350 kW DC
Home	AC 7.2-17 kW	30 – 50 kW DC	150 – 350 kW DC
	<100kWh	100-200kWh	200kWh+
	Battery Size		



(Mark Ralston / AFP - Getty Images, 2019)

Vehicle use translates into a charging plan



(Freightliner, 2020)

EV charging infrastructure: More than a gas station



Public
Transport



Public Recharge
Stations



Work



Factory
Depots



Highway Plazas



Parking Lots



Logistics Centers



Parking Garage



Home

Electricity is not equal to gasoline - Different opportunities & risks

Gasoline



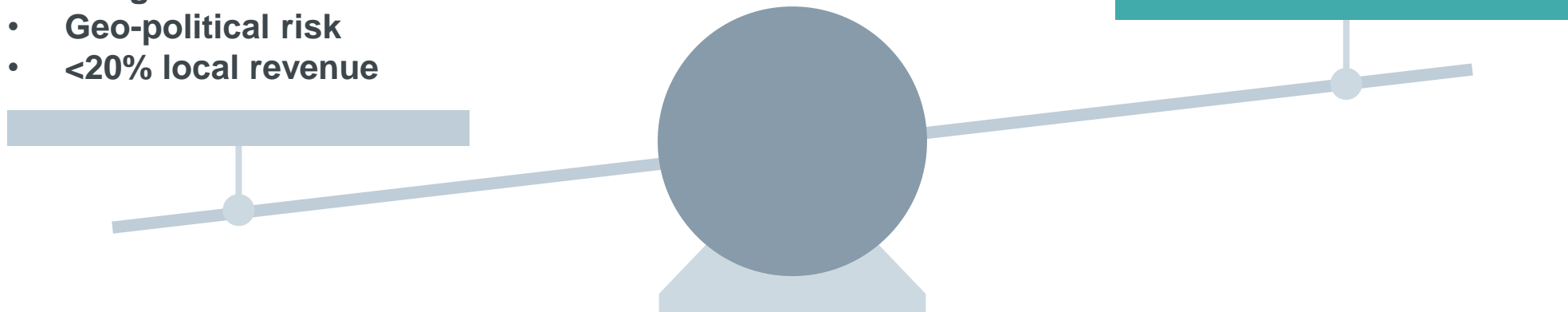
regular	439 ⁹
silver	451 ⁹
ultimate	464 ⁹

- Priced Per Gallon
- Hedge risk
- Geo-political risk
- <20% local revenue

Electricity



- kWh – similar \$/gallon
- kW – Max power used
- Fixed fee
- > 50% local revenue



The land of 10,000 pilots ...Critical as the US Attempts to "Resume a Leadership Role"

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A Holistic View is a Common Theme to the Succeeding Programs

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With a Profound Implication for the Future Service Industry

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**Building
Infrastructure**



**Electrical
Construction**



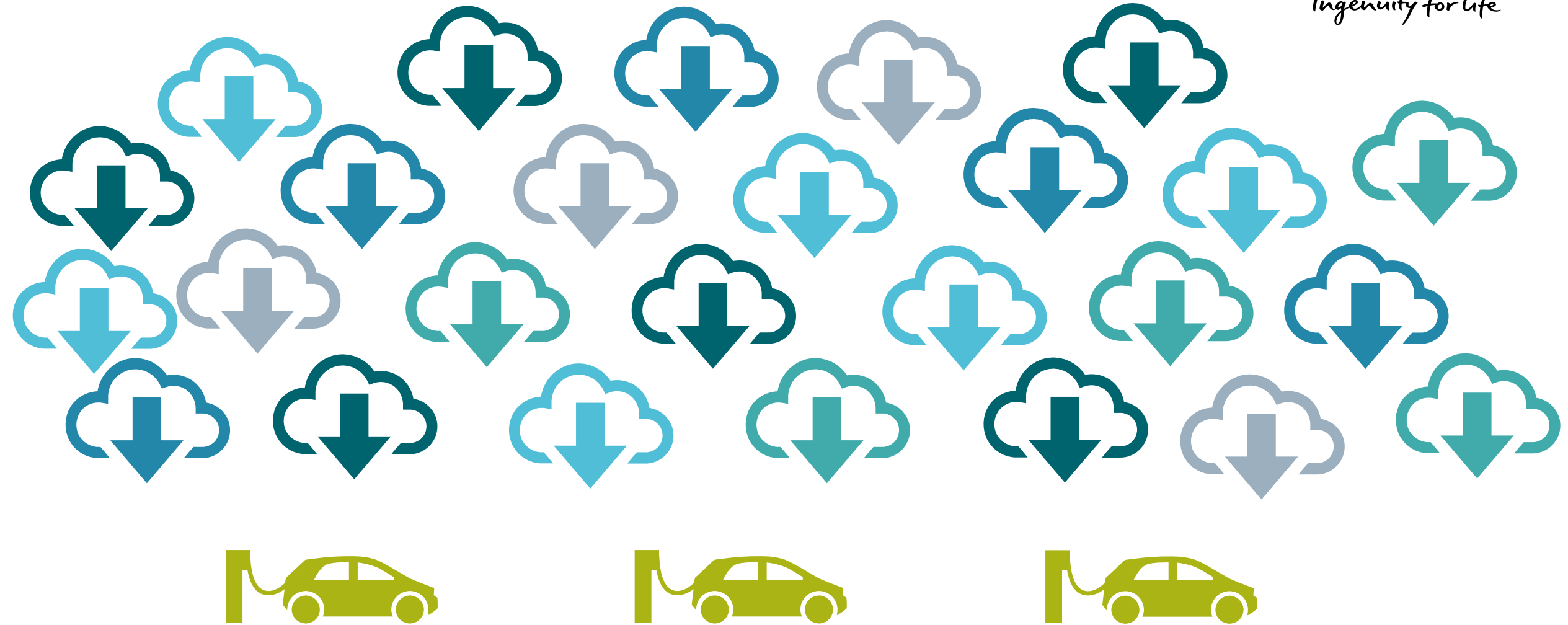
**Mobility
& Transit**



**Automation &
Networking**

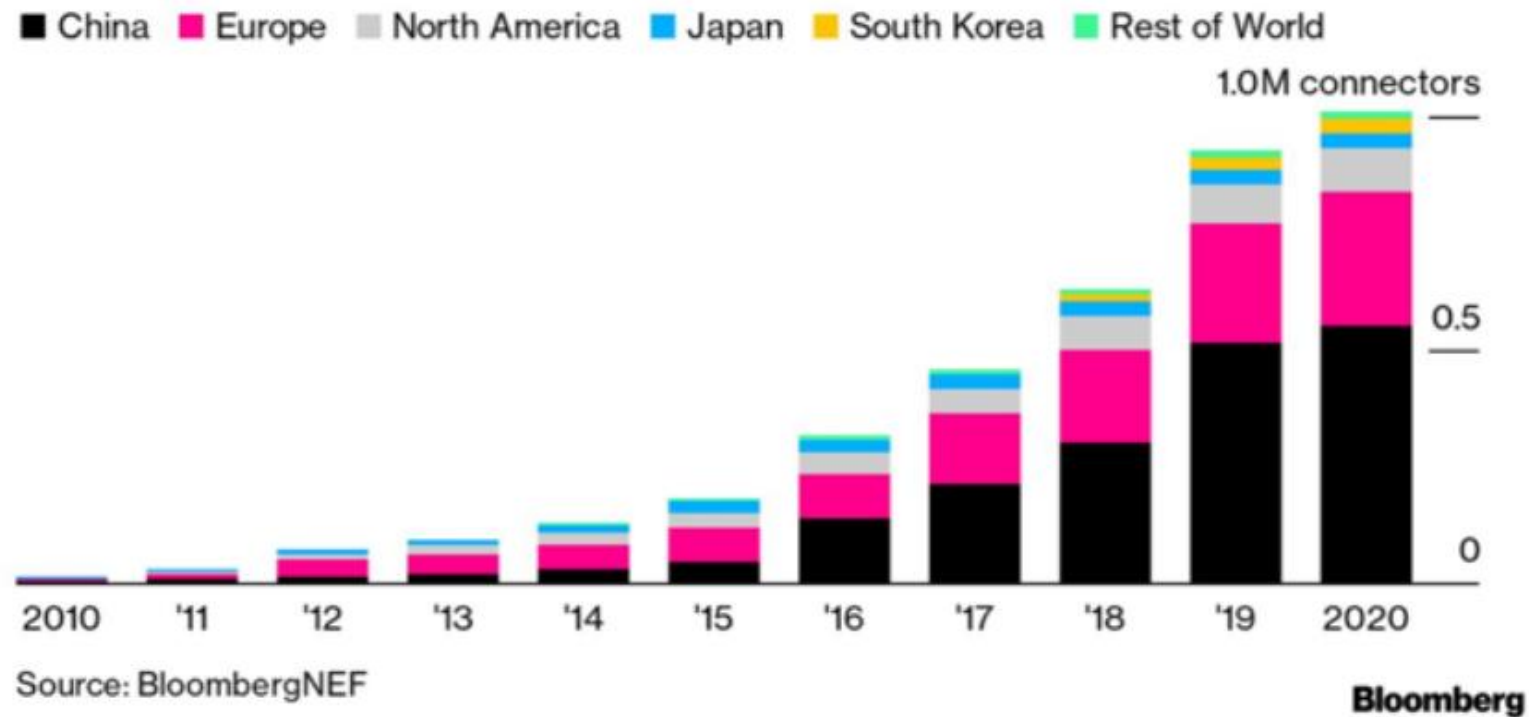
While Striving to End Proprietary IoT islands

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Accelerating our success

The United States EV infrastructure continues to “significantly lag” other regions



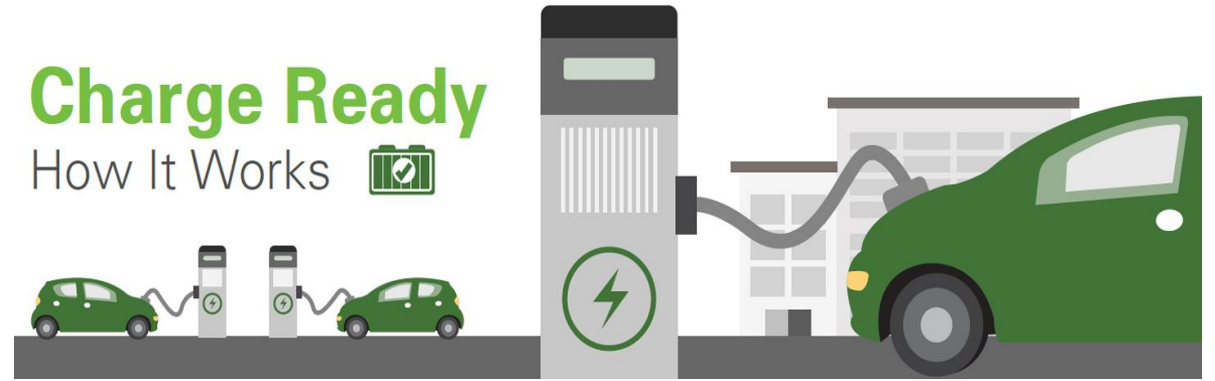
Exciting trends accelerating our market

Last Mile Trucking Depots



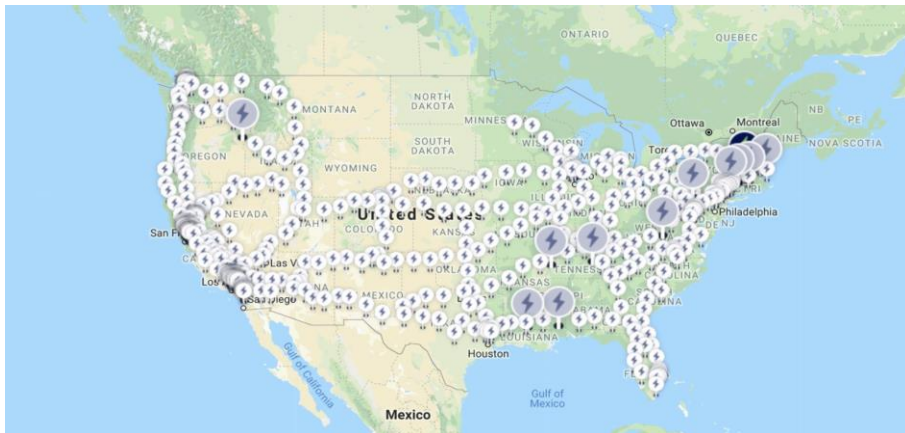
Direct Utility Ownership Programs

Charge Ready
How It Works 



(SCE, 2020)

Nationwide Charging Networks

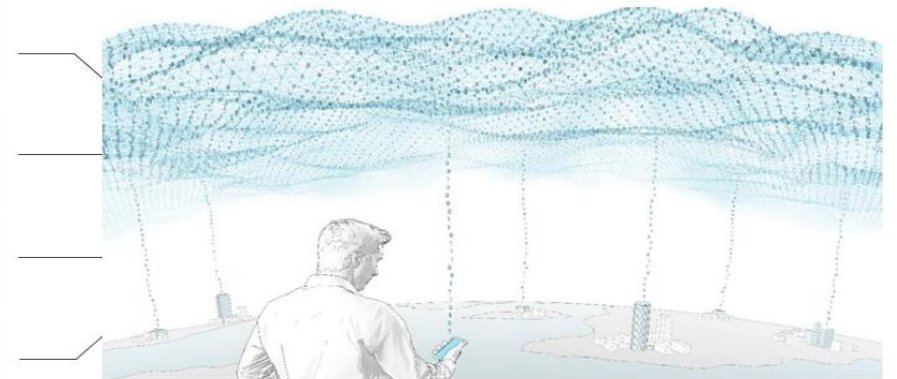


Restricted © Siemens 2020

(Electrify America, 2018)

Open Standard Ecosystems

- OCPP Based
- Multi-vendor
- Access to data
- Secure



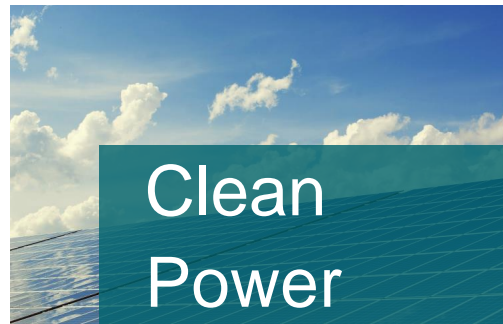
Recommendations to support local success



- 1 Policies to support last mile electrification of goods
- 2 Collaboration with local utilities to find “right balance” of energy rates
- 3 Mandates around open standards for charging infrastructure
- 4 Programs that support “Plug-to-Grid” buildout & not just the charging station
- 5 Policies that support EV infrastructure in traditional building performance contracts

Clean up transportation...now

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Creating
environments
that care



Questions?