



Accelerating EVs and a Clean Grid: Impacts and Policy Considerations

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2035 2.0 Report

Research Question:

Given recent rapid declines in battery costs, what are the impacts of rapid transportation sector electrification on:

- Consumers
- Emissions
- Public Health
- Employment
- Electric Grid

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Two Comparative Scenarios

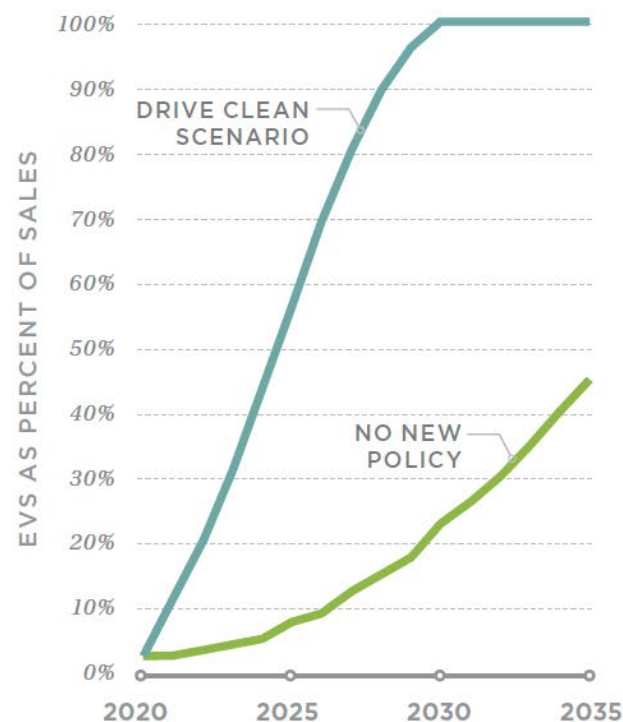
❖ *DRIVE CLEAN Scenario:*

- 100% electric sales of new passenger cars and trucks by 2030
- 100% electric sales of new medium- and heavy-duty vehicles by 2035
- 90% clean electricity grid by 2035

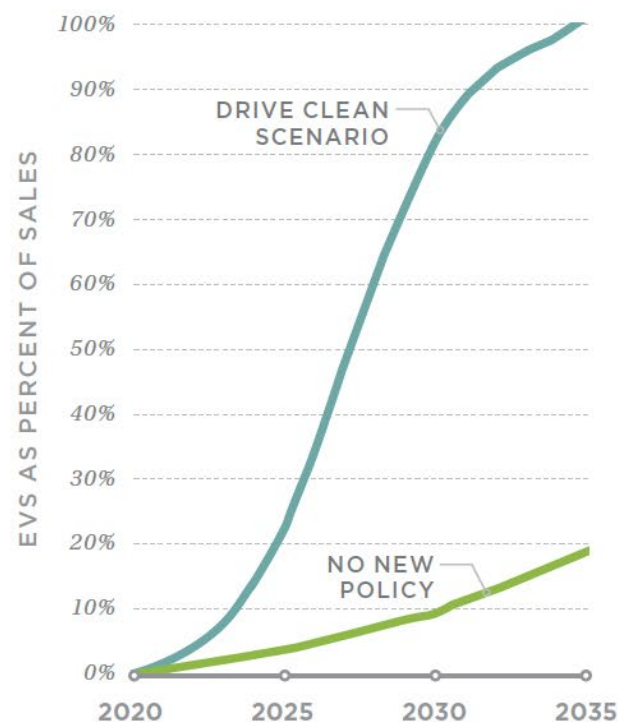
❖ *NO NEW POLICY Scenario (BAU)*

EVs as a Percentage of Sales: DRIVE CLEAN vs. No NEW POLICY Scenarios

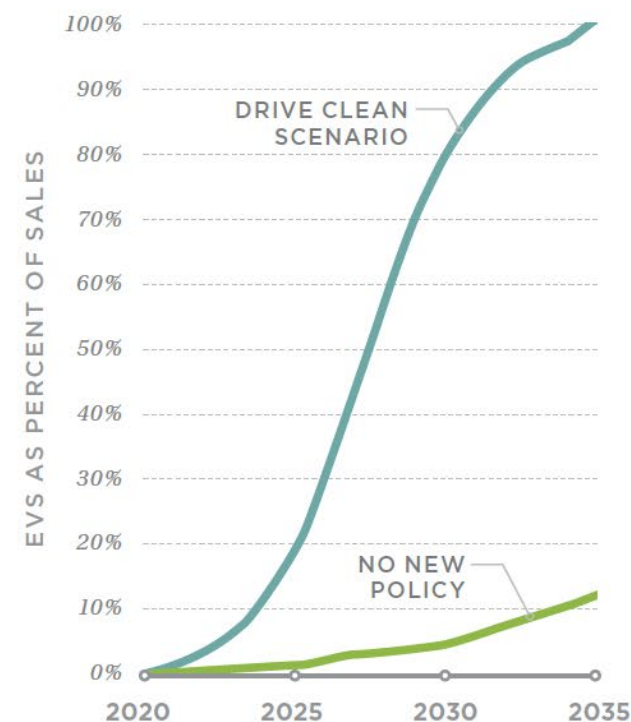
LDV



MDV



HDT



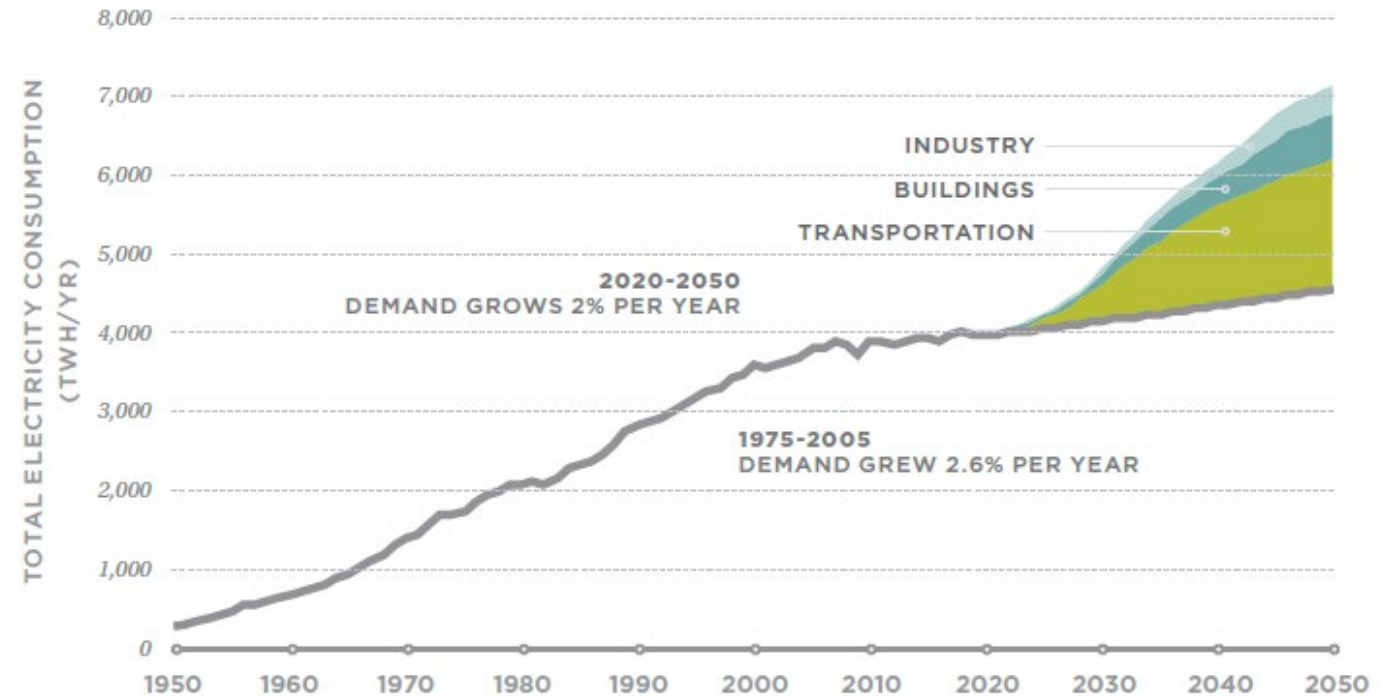
Accelerating EVs and a Clean Grid Benefits Consumers, the Economy, and the Environment

- **Consumers save ~\$2.7 trillion** between 2020 and 2050
 - Avg. household saves \$1,000/yr. for 30 years
- **2 Million** net jobs in 2035
- GHG emissions* decline
 - **60% by 2035**
 - **93% by 2050**
- Pollution-related* premature deaths decline
 - **56% by 2035**
 - **96% by 2050**

* Associated with ground transportation

Grid Impacts & Ratepayer Impacts

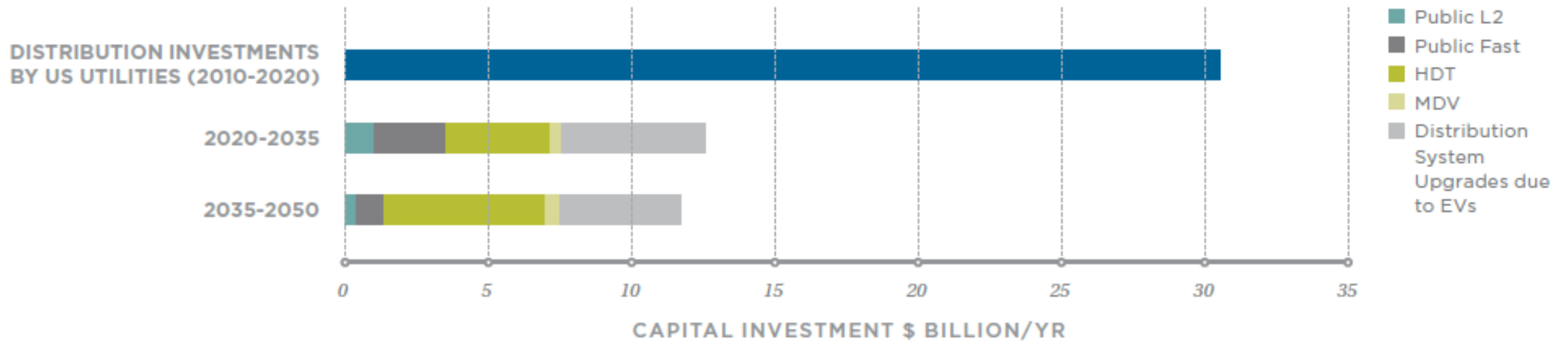
- A 90% clean grid can handle the additional demand in the DRIVEClean scenario.
- ~120 GW/year of new renewables/storage capacity additions needed.
- Wholesale electricity costs and distribution costs on a per kWh basis do not increase from today's levels.
- Since total electricity sales increase, average \$/kWh may decline for the average ratepayer ([E3 Analysis](#)).



* Note: Industry and building electrification projections are lower than technical potential and are derived from [NREL Electrification Futures Study \(May 2021\)](#).

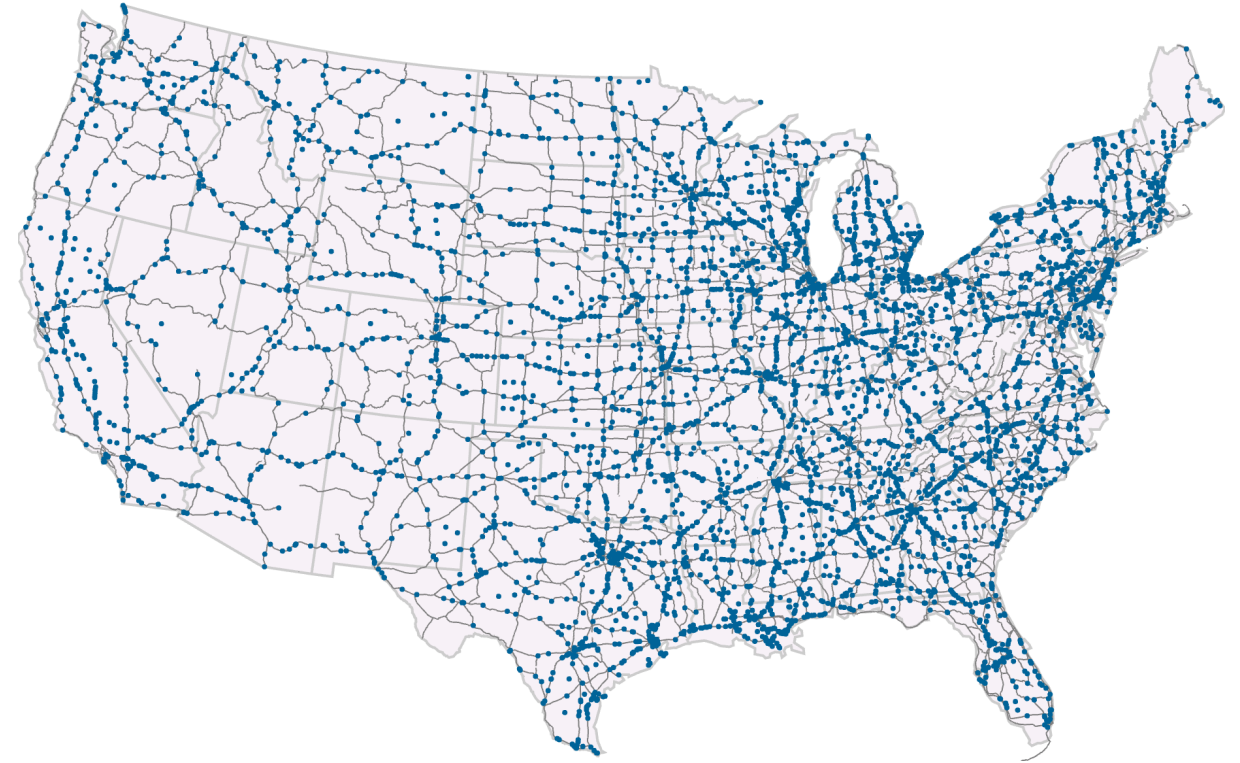
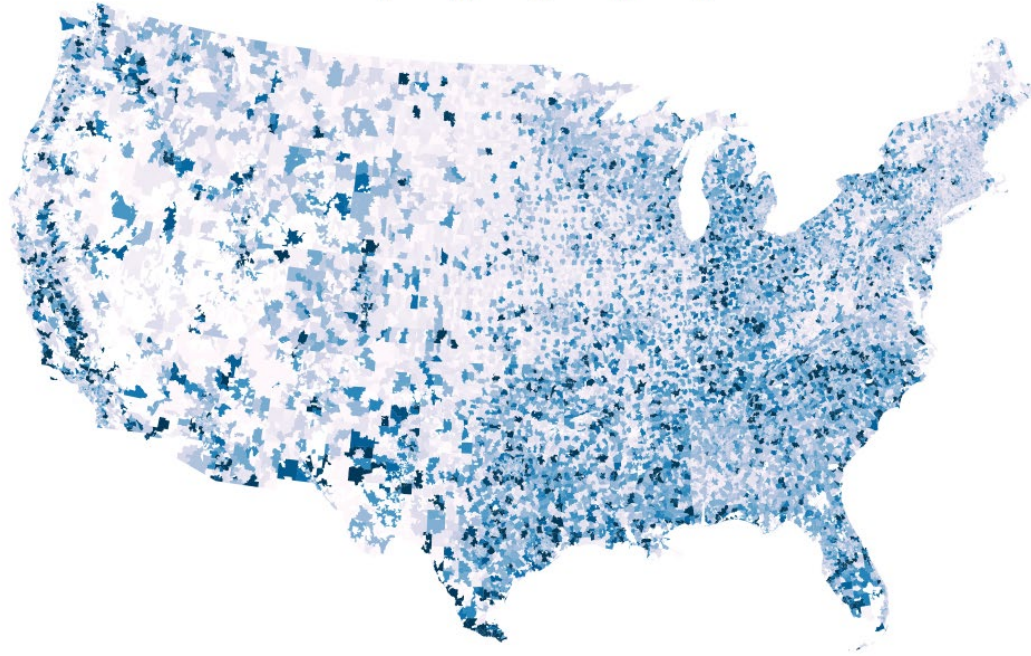
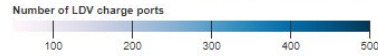
Charging Infrastructure & Grid Investments Are Needed

- Rapid investments in public charging infrastructure (+ grid upgrades) required
 - ~\$11 billion/year through 2050
 - New public charging plugs: ~300,000/year (China already achieved that number in 2020)
 - New MDV/HDV charging plugs: ~30,000/year
- Historical distribution grid investments are ~\$30 billion/year



Charging Ports in 2050 – DRIVE Clean Scenario

LDV CHARGE PORTS IN 2050



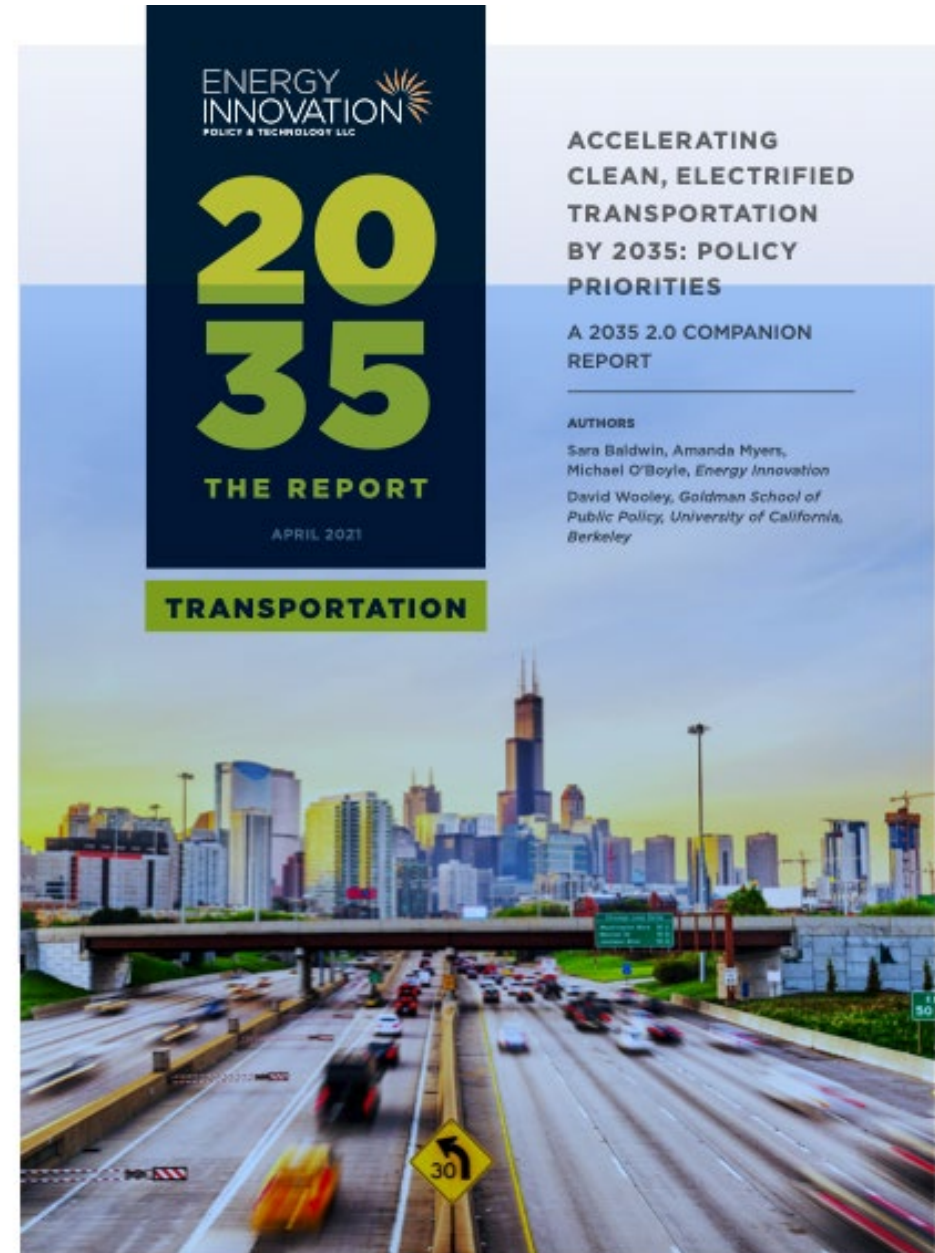
New LDV charging points/year	2020-2035	2035-2050
Home	4.8 million	2.3 million
Work	170,000	51,000
Public L2	350,000	110,000
Public Fast	60,000	19,000

Map (right) shows optimal siting of the MDV/HDV charging infrastructure by 2050 so that every long-haul freight mile along major highways is electrified

What Policies Are Needed to Achieve the 2035 2.0 DRIVE CLEAN Scenario?

Companion Policy Report available at:

www.2035report.com/transportation/



50+ Policy Actions, Across 7 Core Categories

- National & State Vehicle Standards
- Targeted Incentives
- Strategic Charging Infrastructure
- Domestic Manufacturing
- Smart Rate Design
- EV-Friendly Codes & Procedures
- Equity & Environmental Justice

POLICY ACTIONS & TIMELINE FOR ENACTMENT			FEDERAL ACTION	STATE ACTION	LOCAL ACTION	UTILITY ACTION
	NEAR-TERM (2021 - 2023)	MID-TERM (2024-2026)	LONG-TERM (2027-2035)			
NATIONAL/STATE 100% EV SALES STANDARD	Adopt federal GHG Emissions Standards reaching 0g/mile by 2030/2035					
	Adopt increasingly rigorous Federal Fuel Economy (CAFE) Standards					
	Adopt state 100% ZEV Sales Standards					
INCENTIVES AND FUNDING TO SUPPORT EV ADOPTION	Reform and expand Federal Plug-In EV Consumer Tax Credit					
	Provide incentives for public and private fleet conversion					
	Provide used EV incentive					
	Offer competitive grants and funding programs for public and non-profit entities					
	Require EV procurement for public fleets, transit, buses					
	Offer federal/state tax exemption or reduction					
	Adopt special lane access for EVs, parking incentives, road toll fee waivers, and licensing incentives					
	Support new financing models and innovative funding programs that significantly expand consumer and business access					
						

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Policy & Regulatory Pathways to Manage Grid Impacts

- **Coordinated Plans & Publicly Available Maps:**

- *Direct electric utilities to develop transportation electrification plans/forecasts*
- *Adopt and implement hosting capacity analyses and maps that integrate EVs and EVSE*
- *Adopt Integrated Distribution Planning (IDP) with a framework for EVs and EVSE*

- **Interconnection Best Practices:**

- *Adopt interconnection best practices that proactively streamline EV charging*

- **Rate Design:**

- *Enable time-varying rates*
- *Mitigate demand charge impacts for HDV charging*
- *Enable managed charging*
- *Explore V2G and bi-directional charging, and adaptive load management*

- **Incentives:**

- *Target co-located distributed generation and/or energy storage at strategic EVSE charging locations*

Thank you!

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