

New York State Grid-Interactive Vehicle Roadmap

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EVS 29

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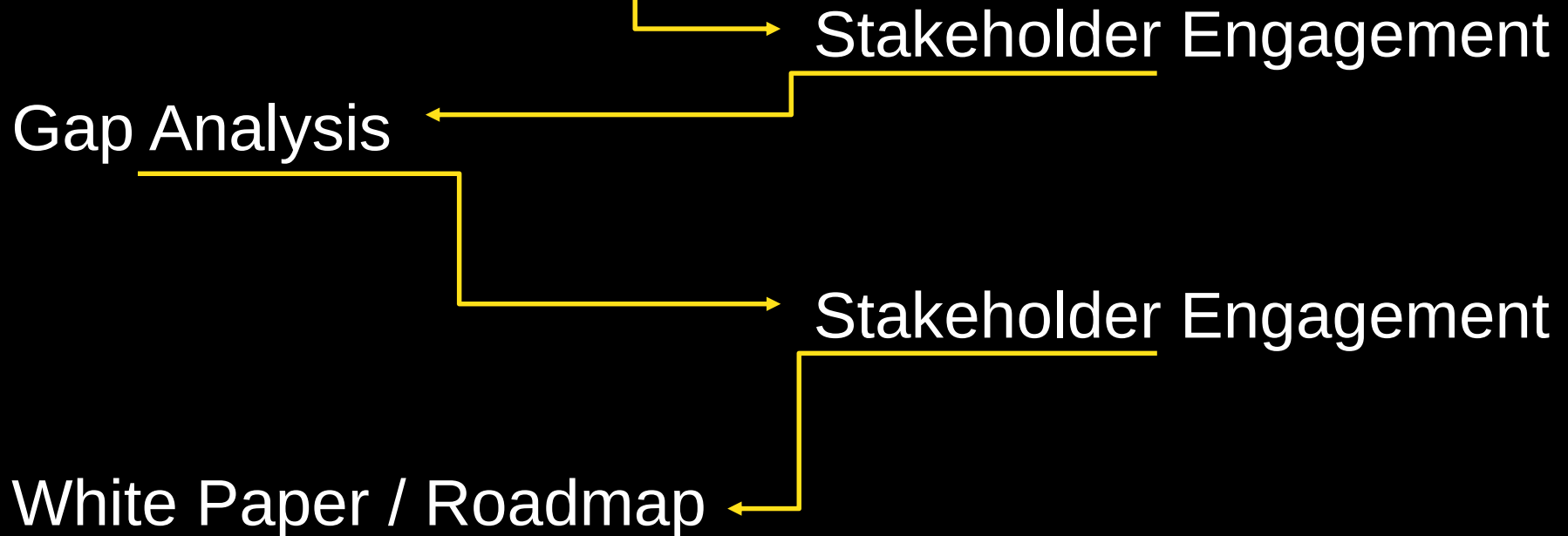
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Project Overview



Preliminary Research

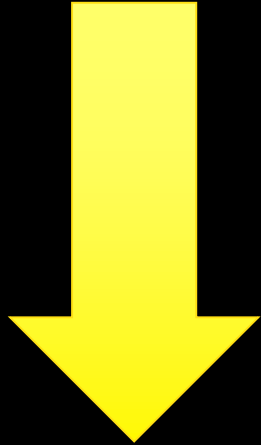


Stakeholder Engagement

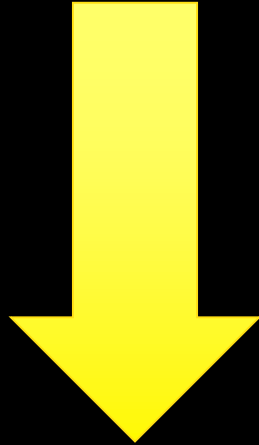


Project Tracks

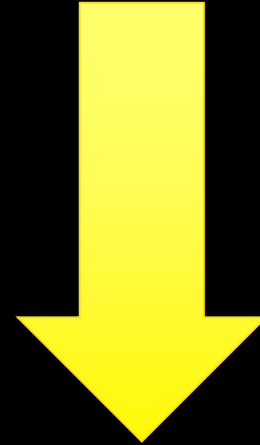
**Technology
and
Standards**



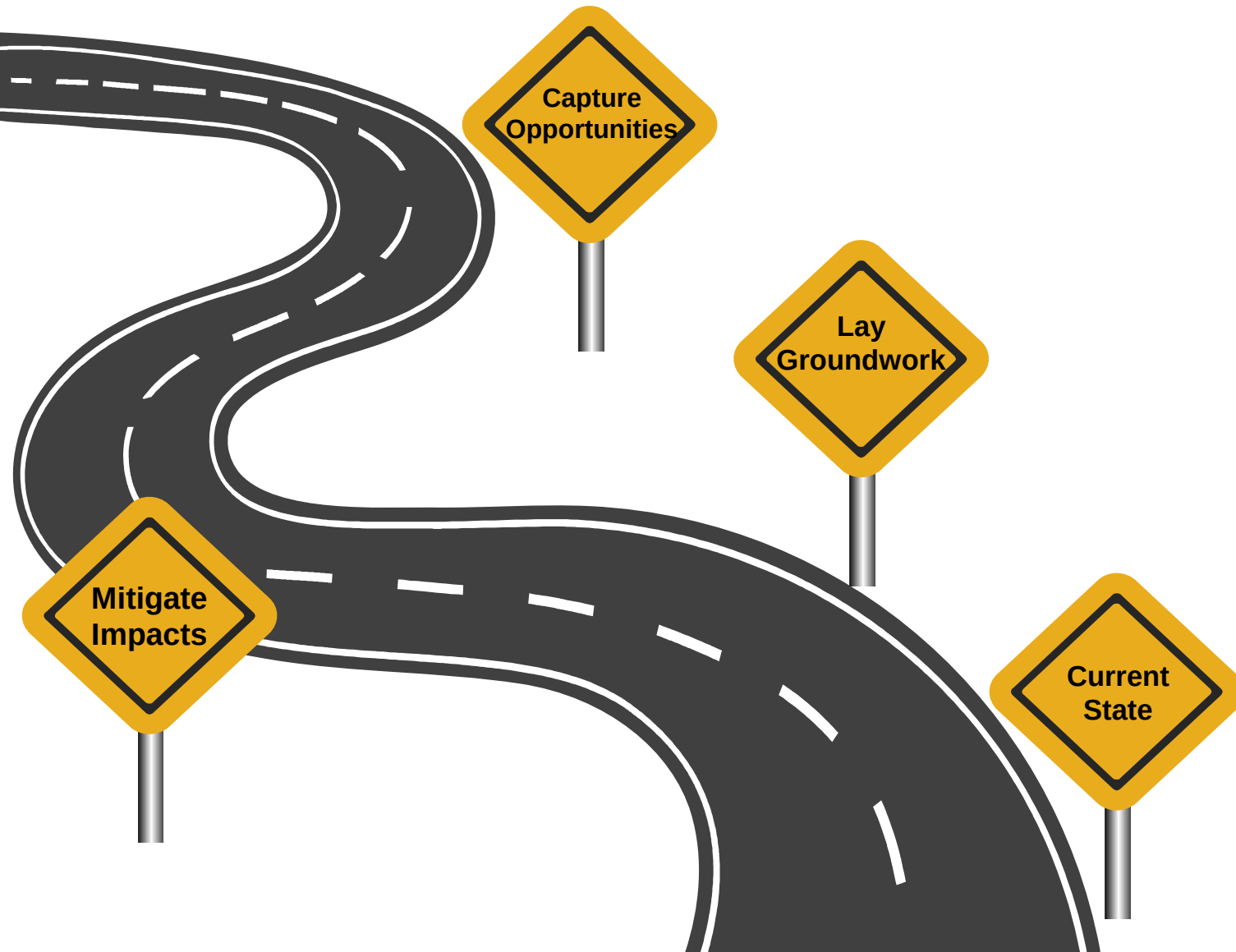
**Retail and
Wholesale Energy
Markets**



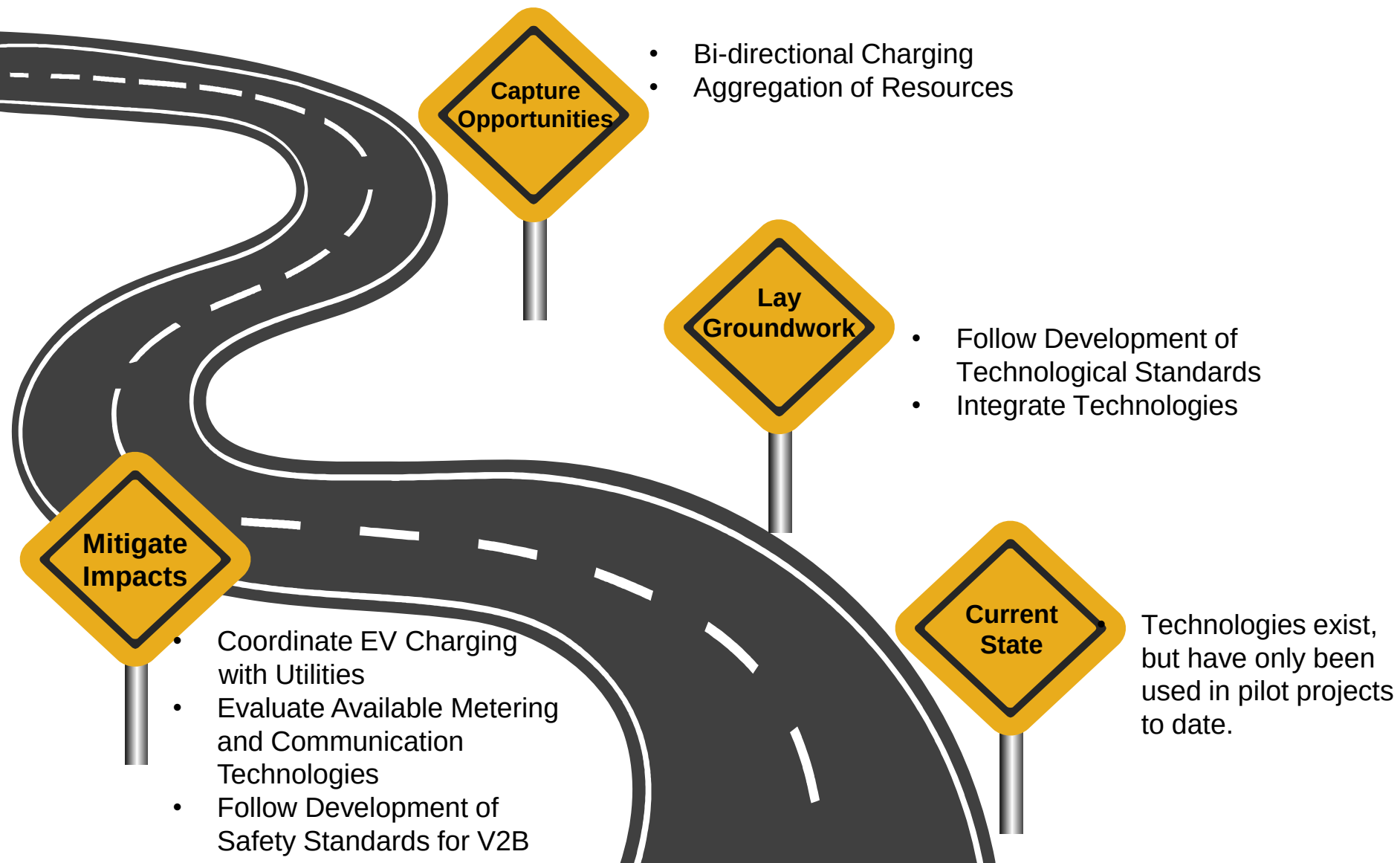
**Regulation
and
Policy**



Grid Interactive Vehicle Roadmap

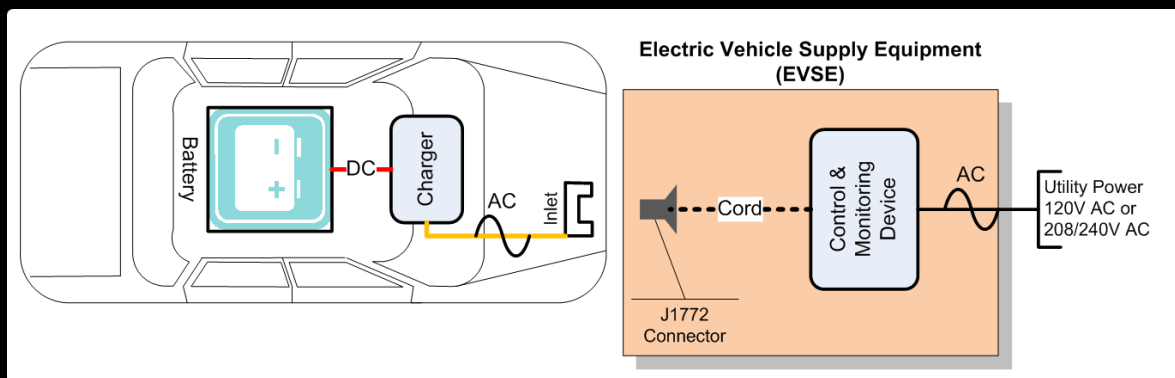
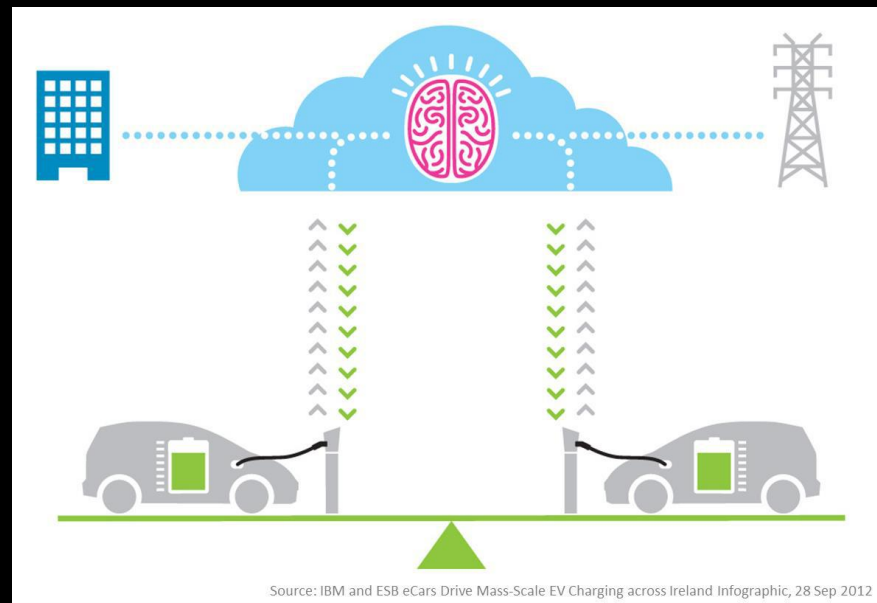


Technologies and Standards Roadmap



Current State: Technology & Standards

- Metering
- Control equipment for smart charging
- Bi-directional power transfer capability for distributed storage applications and V2G

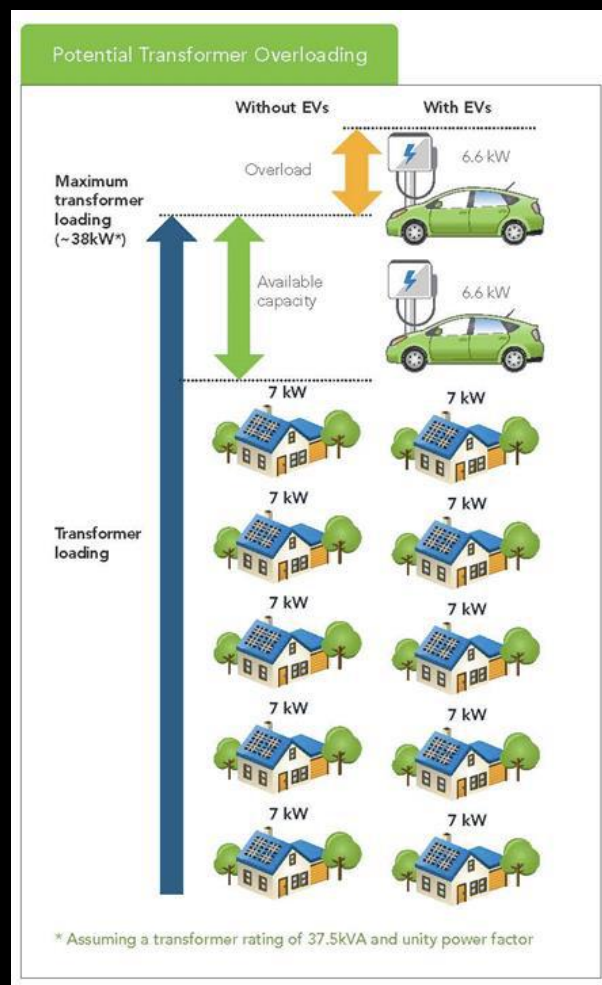


Lay Groundwork: Technology & Standards Consistency



Mitigate Impacts: Technology & Standards

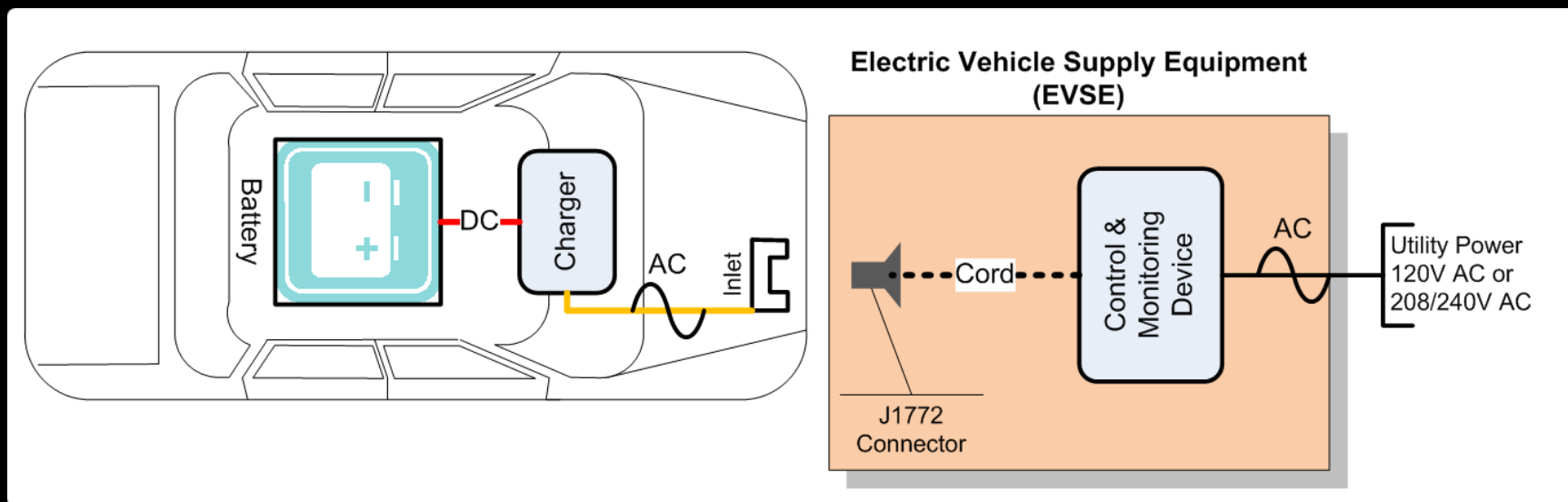
Distribution Level Infrastructure



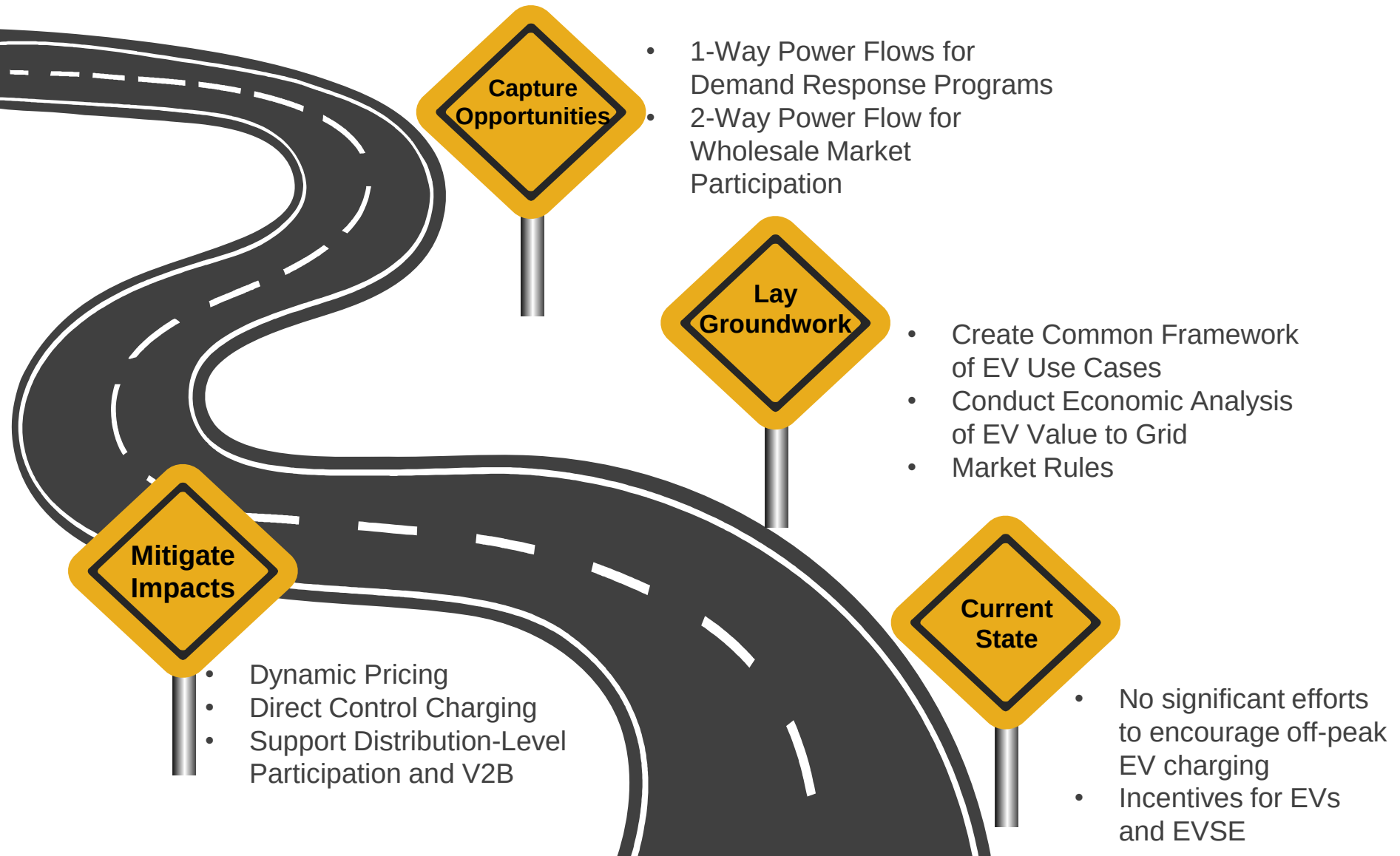
Source: Silver Spring Networks: How the Smart Grid Enables Utilities to Integrate Electric Vehicles

Capture Resource Opportunities: Technology & Standards

Bi-Directional Charging

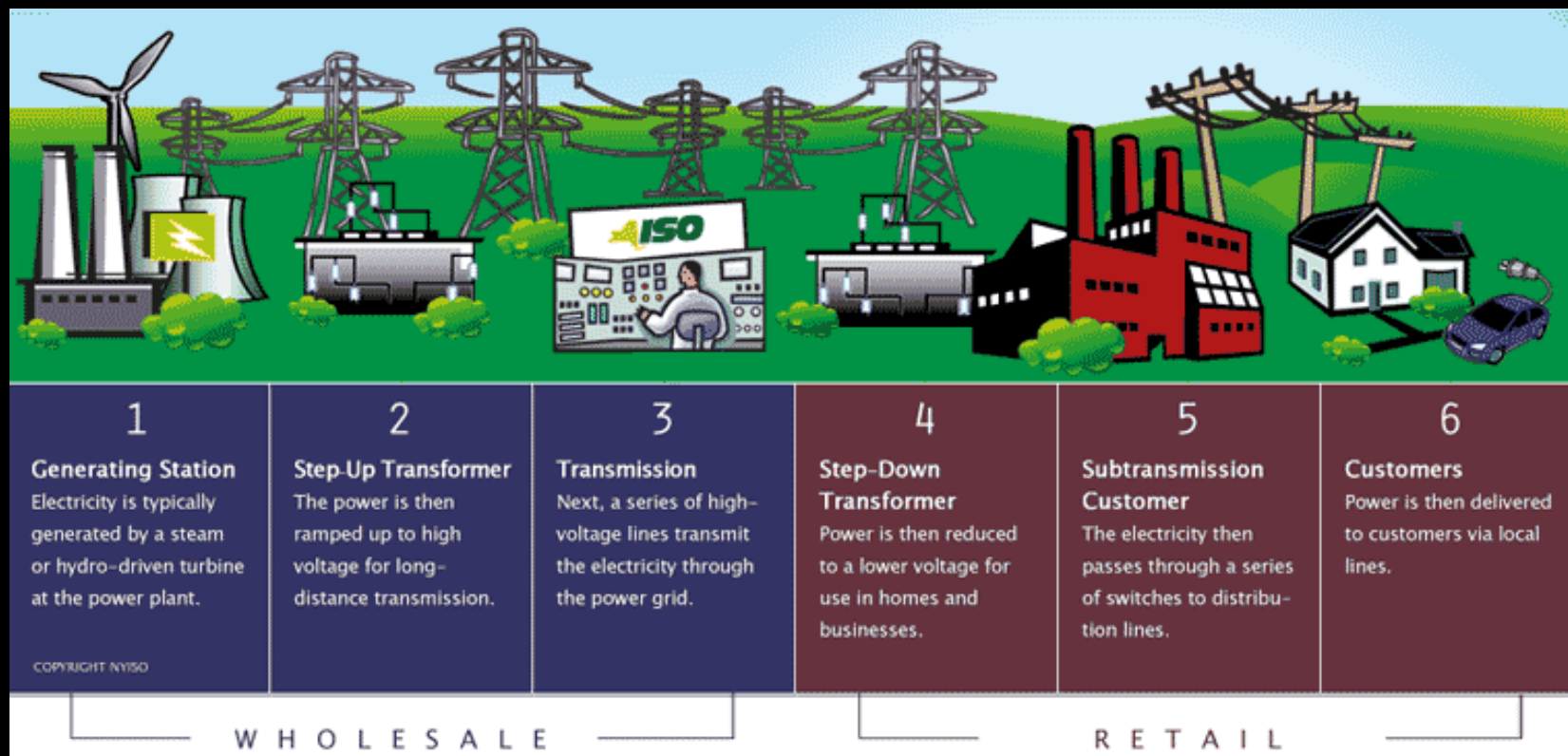


Retail and Wholesale Markets Roadmap



Current State: Electricity Markets

Source: NYSIO



- Demand response programs (DADRP, DSASP, EDRP, TDRP, ICAP SCR)
- Limited Energy Storage Resource Program.
- TOU or dynamic pricing programs.
- Direct load control.
- Vehicle to building (V2B) peak shaving for demand charge management.

Lay Groundwork: Retail and Wholesale Markets

Common Framework

Economic Analyses

Market Rules



Mitigate Impacts: Retail and Wholesale Markets

Rate Design

Direct Control Charging



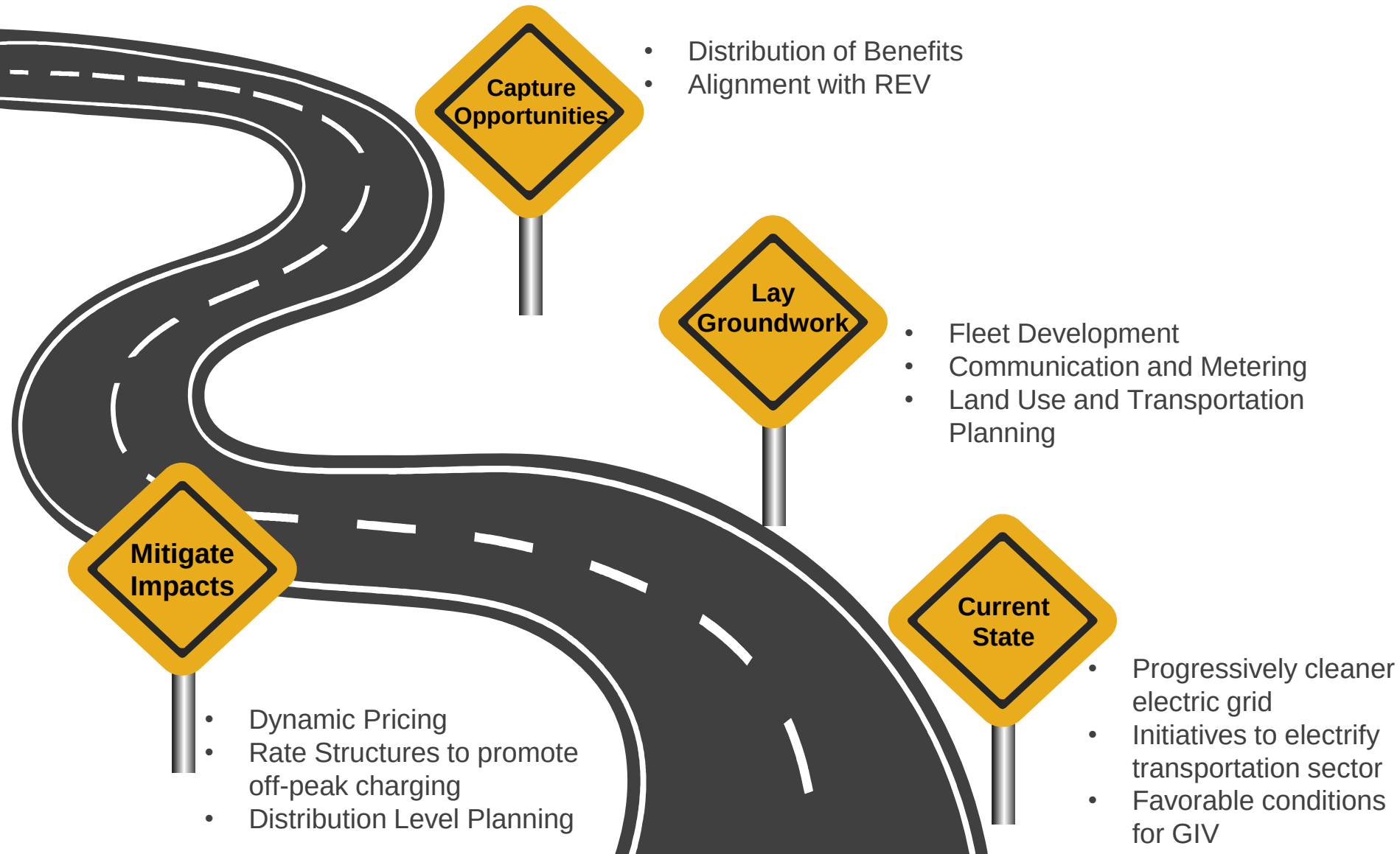
Capture Resource Opportunities: Electricity Markets

Demand Response

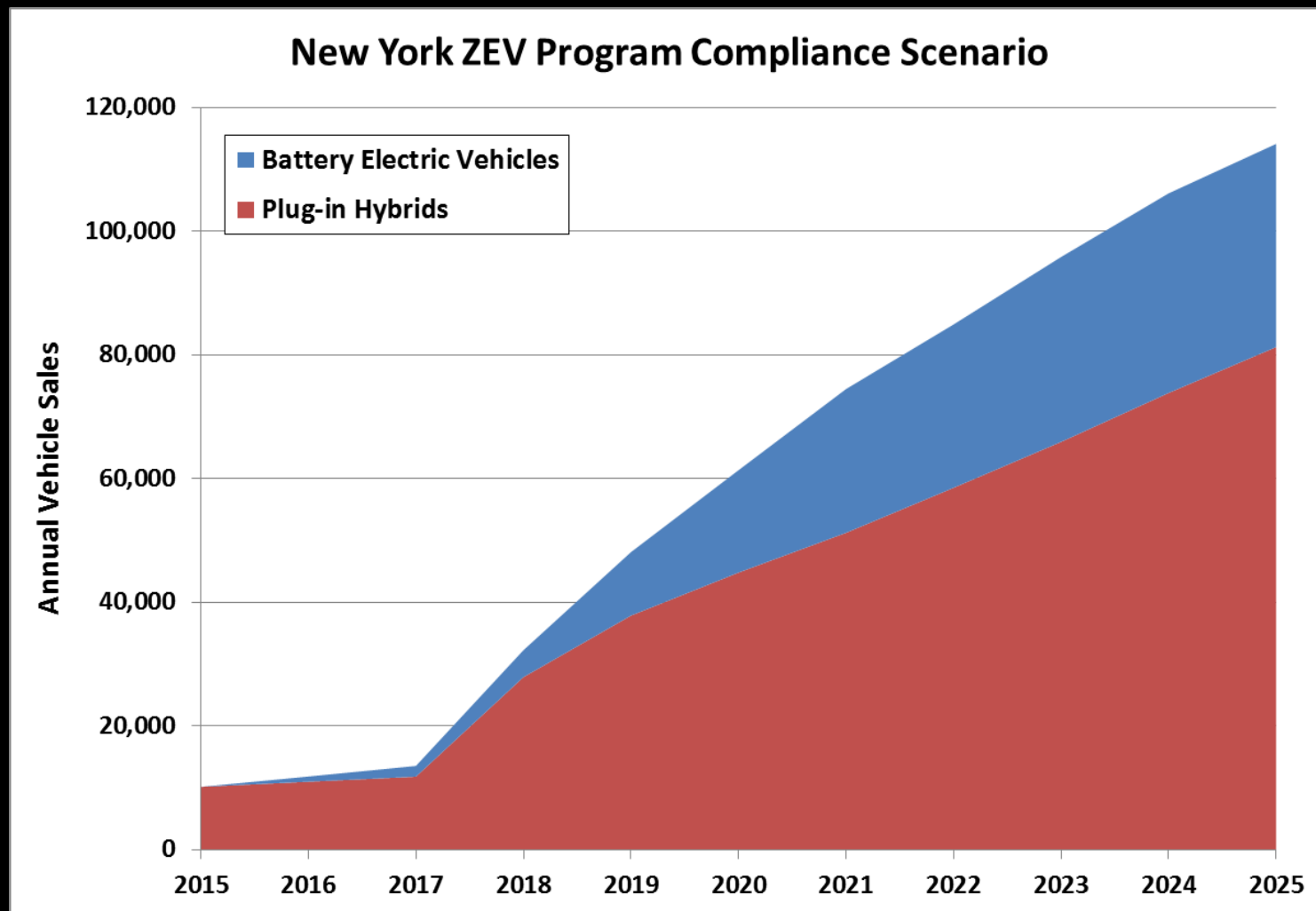
Wholesale Market Participation



Regulation & Policy Roadmap



Current State: Regulation & Policy



Source: NESCAUM 2015

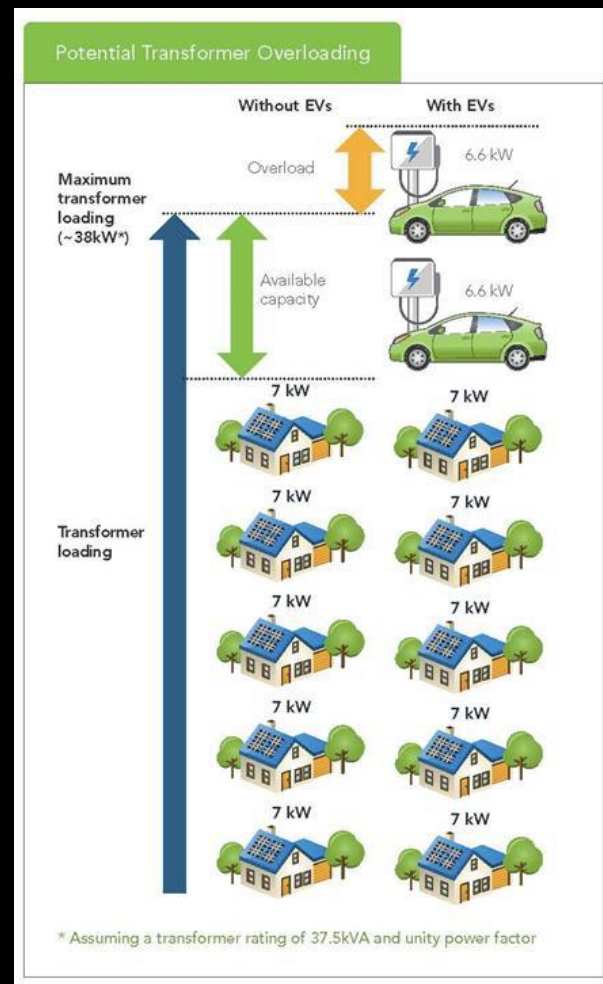
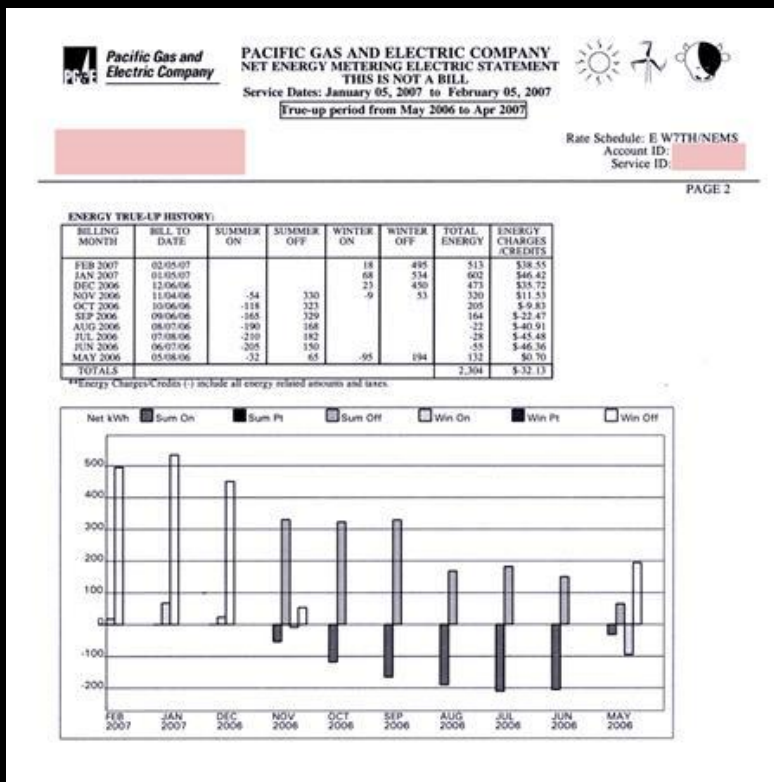
Current State: Regulation & Policy



Lay Groundwork: Regulation & Policy



Mitigate Impacts: Regulation & Policy



Capture Resource Opportunities: Regulation & Policy

Develop Business Model

- Charge and Compensation Mechanisms
- Aggregation Models
- Policy Guidance

Incorporate EV Planning into Regulatory Proceedings

Roadmap

Current State

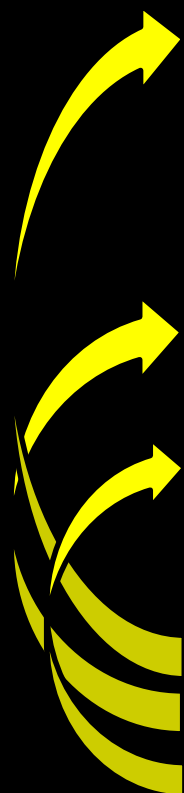
1. Lay Groundwork

2. Mitigate Impacts

3. Capture Resource Opportunities

Ongoing Research, Data Collection, and Valuation

Conclusions



Step	Track 1- Technology and Standards	Track 2- Retail and Wholesale Markets	Track 3- Policy and Regulatory
Current State	Technologies exist, but have only used in pilot projects to date	Value of EVs to utilities and the NY grid is not well understood	Policies in place to promote EV sales, but not necessarily their interaction with the grid
Step 1: Lay Groundwork	- Follow development of technology standards - Integrate technologies	- Develop common framework of use cases - Conduct economic analysis to determine value to utilities and New York stakeholders - Build this value into fleet development as incentives	- Develop land use plans to accommodate EVSE and multi-mode transportation including EVs - Conduct metering and communications study and incorporate guidance from PSC - Develop Master EVSE plan
Step 2: Mitigate Impacts	- Coordinate EV charging with utilities - Evaluate available metering and communication technologies - Follow development of safety standards for V2B	- Evaluate TOU rate design options - Implement distribution level direct-controlled charging - Develop vehicle-to-building programs	- Conduct hosting capacity analyses for EVSE - Develop EV TOU rate requirements - Develop metering and communication requirements - Develop V2B regulations
Step 3: Capture Resource Opportunities	- Assess value of bi-directional charging technologies - Assess technological options for aggregation models	- Incorporate EVs into wholesale level demand response programs - Incorporate EVs into wholesale level markets with 2-way power flows	- Adopt storage mandates or goals - Adjust regulations to allow multiple wholesale market participation - Explore value of mobile storage resources
Ongoing Research, Data Collection, and Valuation	- Integrate national and international standards - Evaluate cost-effectiveness of integrating new technologies	- Continue research on driving and charging behaviors in New York - Develop business model for EV integration with the grid - Assess economic value of grid-interaction	Evaluate and revise policies and regulations based on updates in research and technology

Thank you

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