

DRIVE ELECTRIC PA COALITION QUARTERLY MEETING #3

OVERVIEW

- ➔ 10:00-10:05am: Intro and Welcome
- ➔ 10:05-10:15am: PA EV Roadmap Updates
- ➔ 10:15-10:45am: Results of Scenario Modeling
- ➔ 10:45-12:30pm: Presentation on Roadmap Strategies
- ➔ 12:30pm-1:00pm: Lunch
- ➔ 1:00pm-1:50pm: Debrief Strategies for Roadmap
- ➔ 1:50pm-2:00pm: Wrap Up Roadmap Discussion
- ➔ 2:00pm-3:00pm: Updates from PA Drive Electric Coalition Members

MEETING GOALS AND OUTCOMES

- » Review PA EV Roadmap **progress to date and next steps**
- » Present results of **scenario modeling**
- » Present **draft roadmap strategies**
- » Gather insights from stakeholders on **draft roadmap strategies**

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PROJECT SCOPE

Task No.

Description

(1)	Gather and compile federal, state, and local EV and EVSE data
(2)	Professional facilitation of PA EV Coalition meetings
(3)	Develop modeling scenarios
(4)	Create a Pennsylvania EV Roadmap

IMPACT ORIENTED DIALOGUE: STAKEHOLDER ENGAGEMENT & TECHNICAL ANALYSIS

Quarterly Meeting #1

Introduction & priorities for scenarios

November 1, 2017



Quarterly Meeting #2

Market barriers, opportunities, policy options

January 12, 2018



Quarterly Meeting #3

Scenario modeling results and draft recommendations

March 26, 2018

IMPACT ORIENTED DIALOGUE: STAKEHOLDER ENGAGEMENT & TECHNICAL ANALYSIS

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Introduction & priorities for scenarios

November 1, 2017

Quarterly Meeting #2

Market barriers, opportunities, policy options

January 12, 2018

Quarterly Meeting #3

Scenario modeling results and draft recommendations

March 26, 2018

Quarterly Meeting #4

Presentation of final roadmap results

June 4, 2018

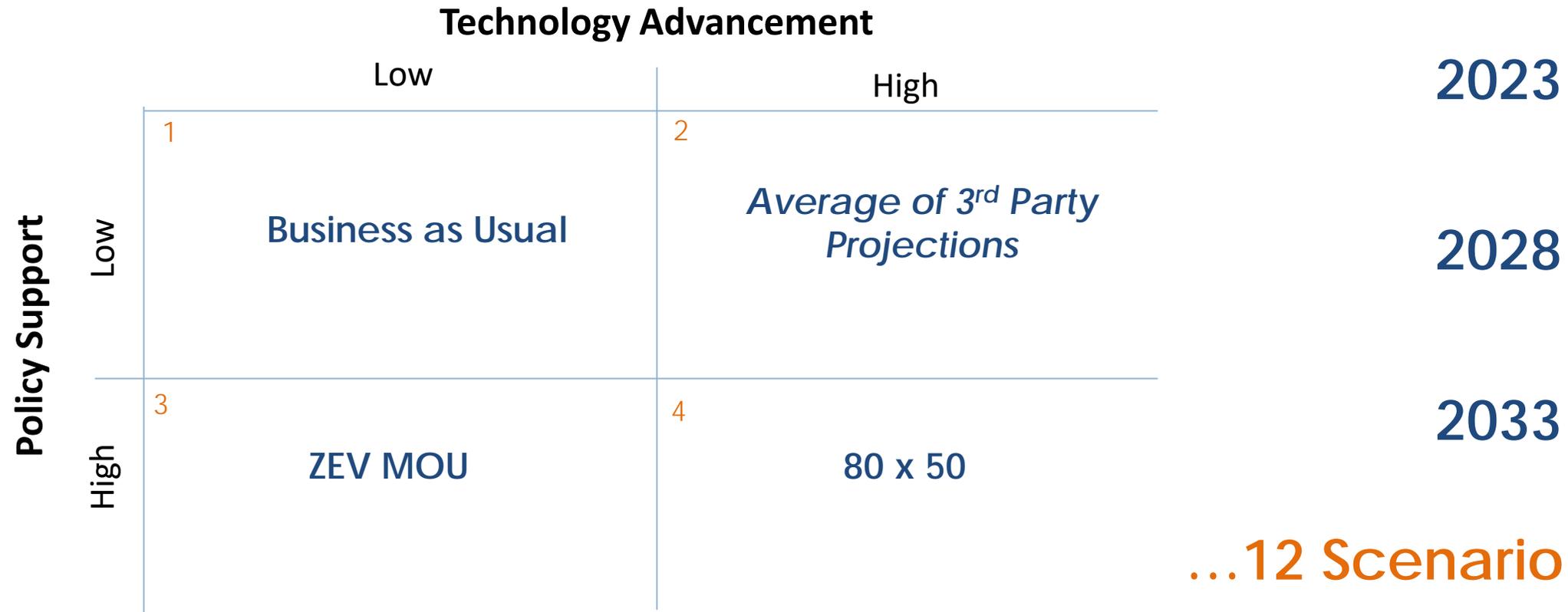
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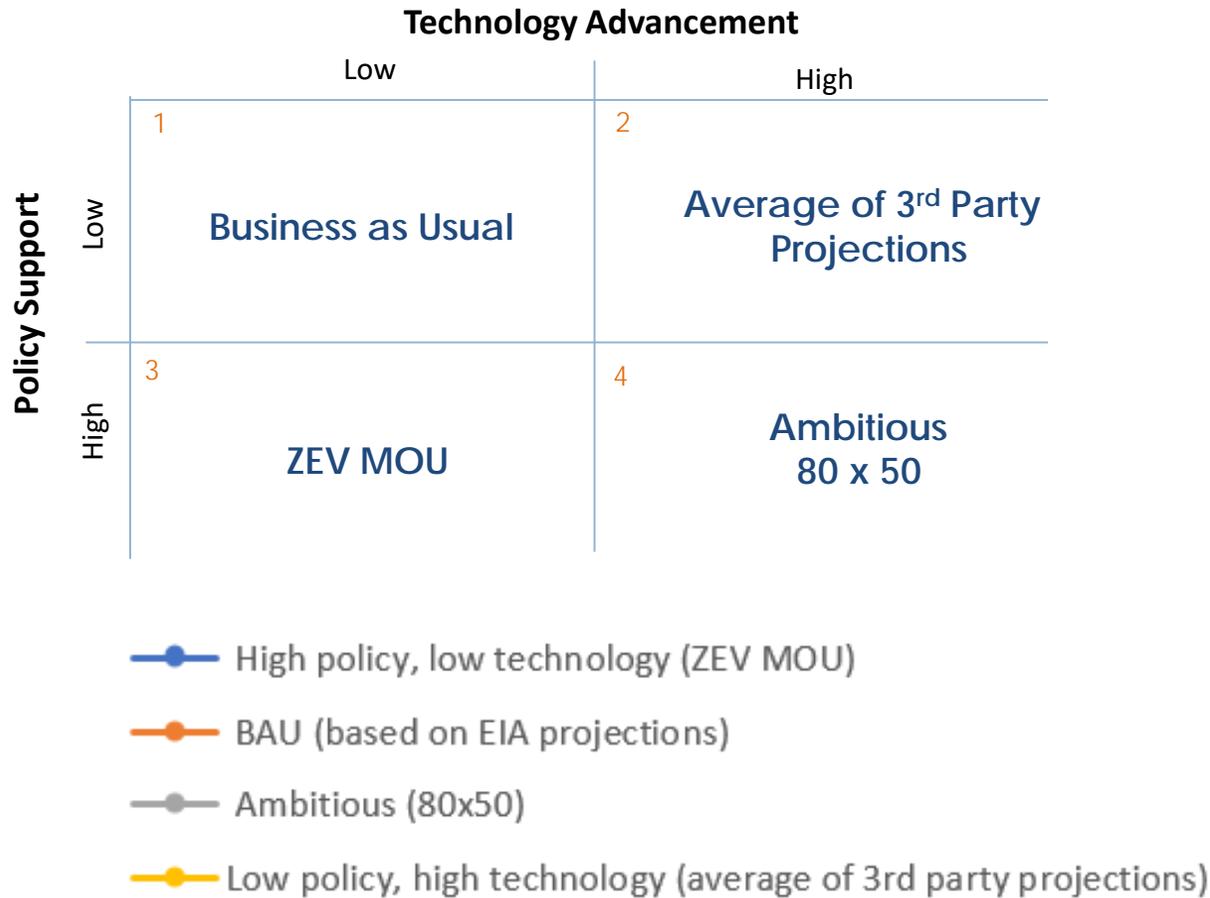
Scenario Modeling Approach

4 EV Adoption Models...

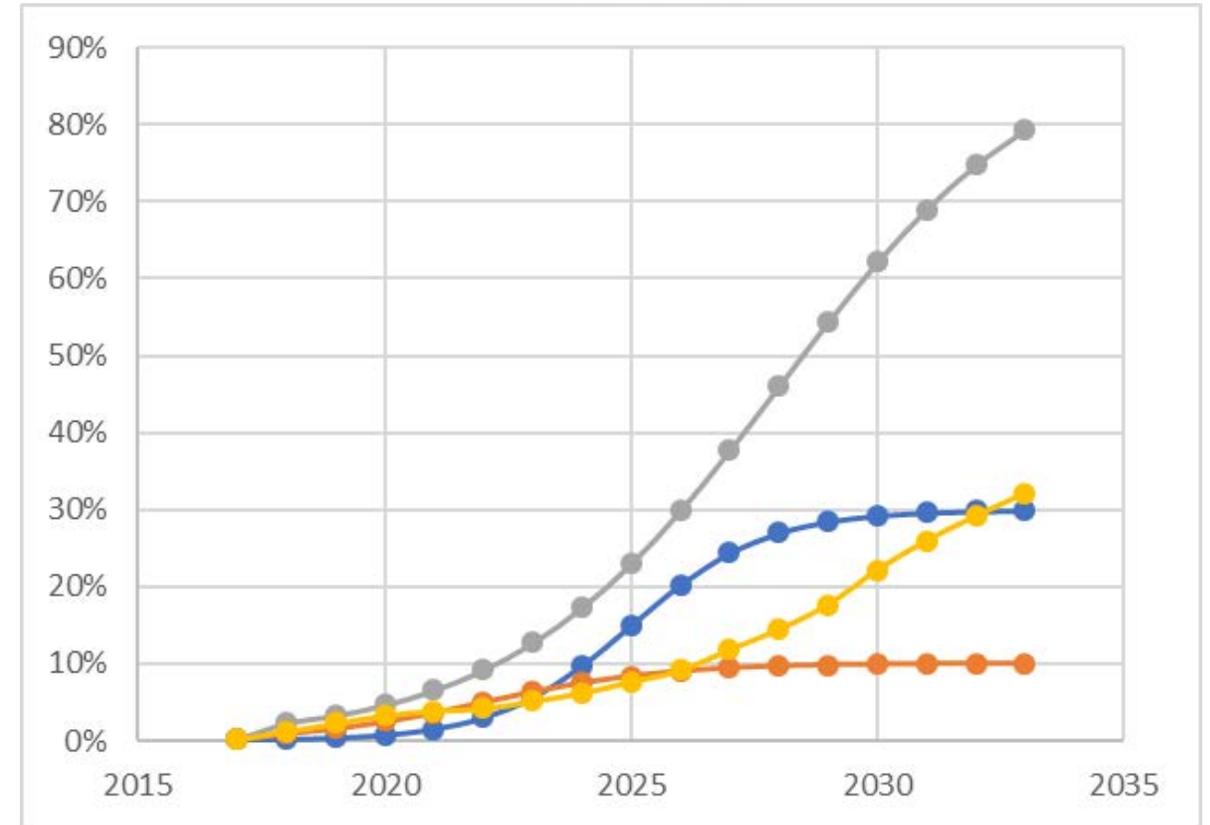
Out to 3 Horizon Years....



Scenario Modeling Results

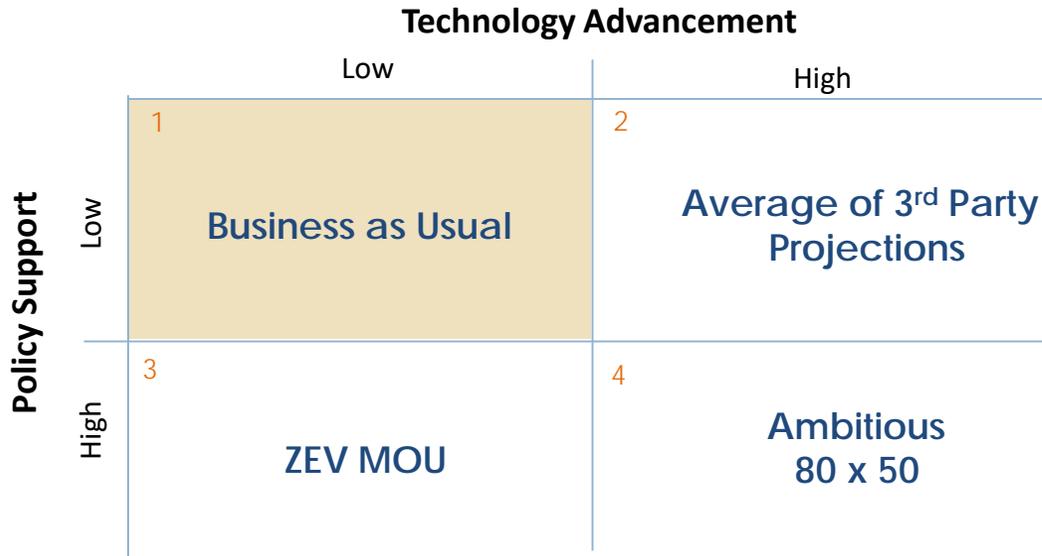


**PEV* sales as a percentage of total vehicle sales:
All Scenarios**



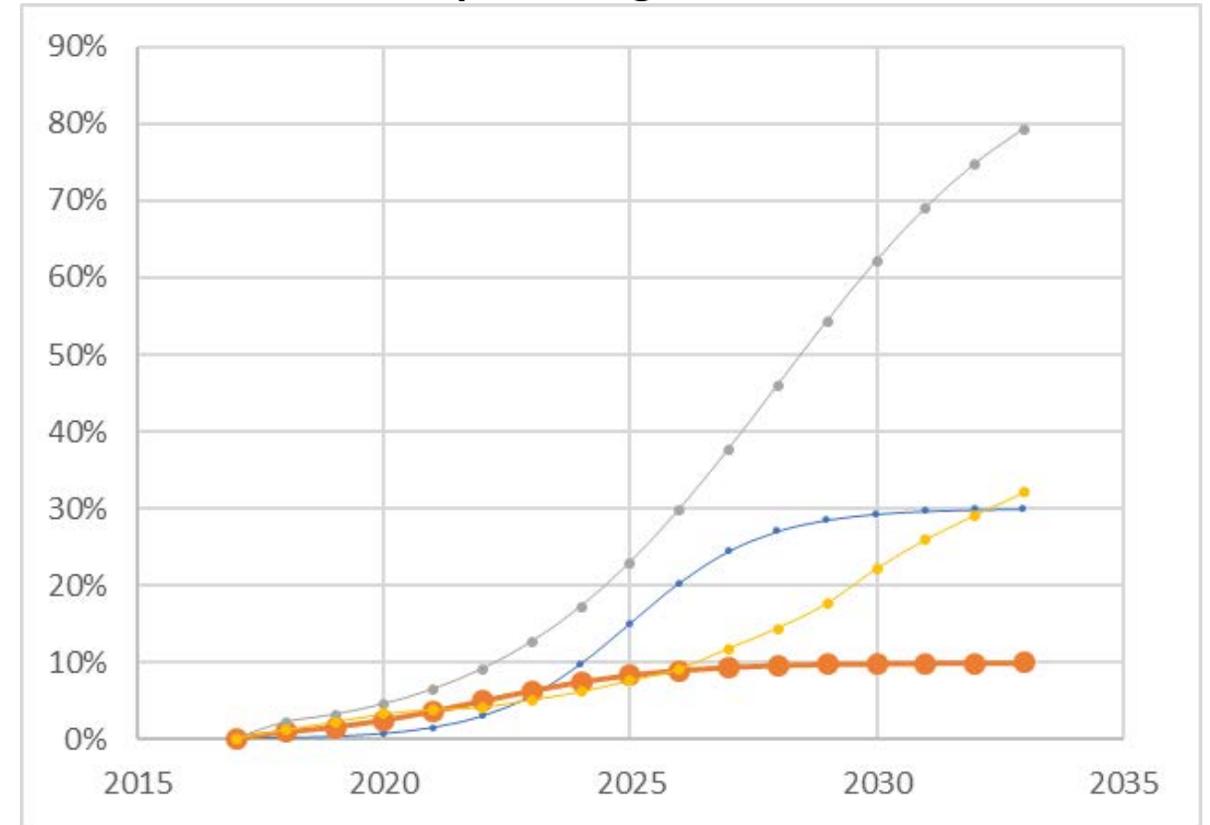
*For the purposes of this model, PEV is defined as battery electric and plug-in hybrids.

Scenario Modeling Results – Business as Usual



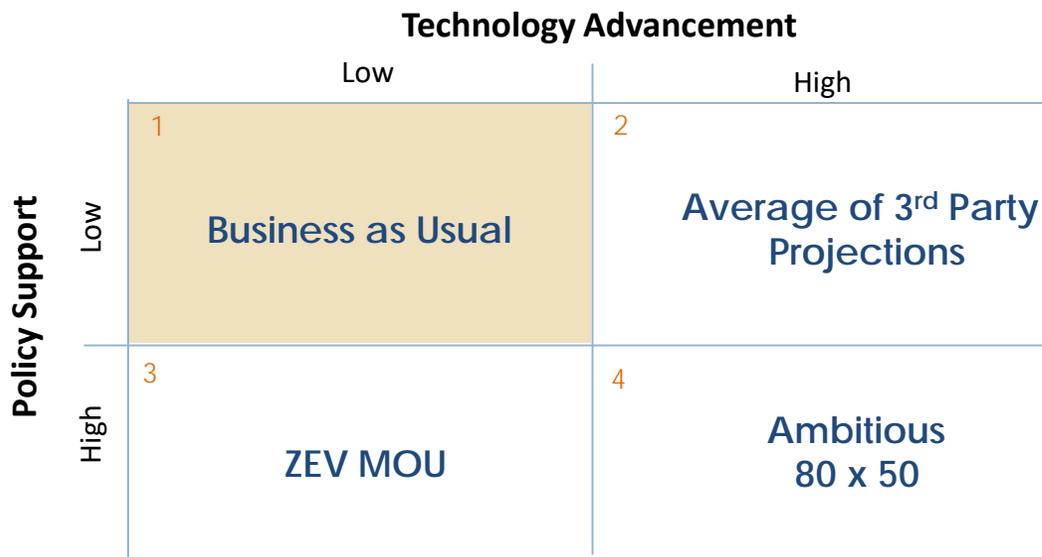
	2023	2028	2033
PEV*: % of light duty sales	6.3%	9.6%	10.0%
PEV: % of light duty fleet	1.2%	4.1%	6.9%
Electric VMT: % of total VMT	1.0%	3.6%	6.1%

PEV* sales as a percentage of total vehicle sales



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Scenario Modeling Results – Business as Usual



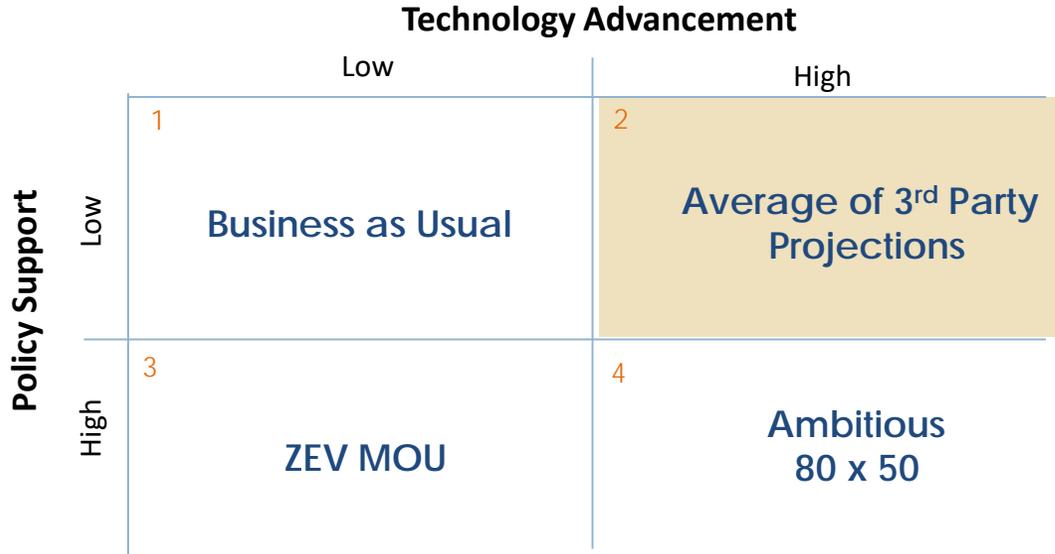
Model Result	2023	2028	2033
PEV*: % of light duty sales	6.3%	9.6%	10.0%
PEV: % of light duty fleet	1.2%	4.1%	6.9%
Electric VMT: % of total VMT	1.0%	3.6%	6.1%

Environmental and Economic Results to 2033

	Result	2033
Environmental	GHGs (metric tons)	38,496,100
	NOx (pounds)	22,549,100
	PM2.5 (pounds)	2,296,700
Economic	Total Resource Cost Ratio	1.03
	Societal Cost Ratio	1.36
	Participant Cost Ratio	1.22
	Non-Participant Cost Ratio	1.50

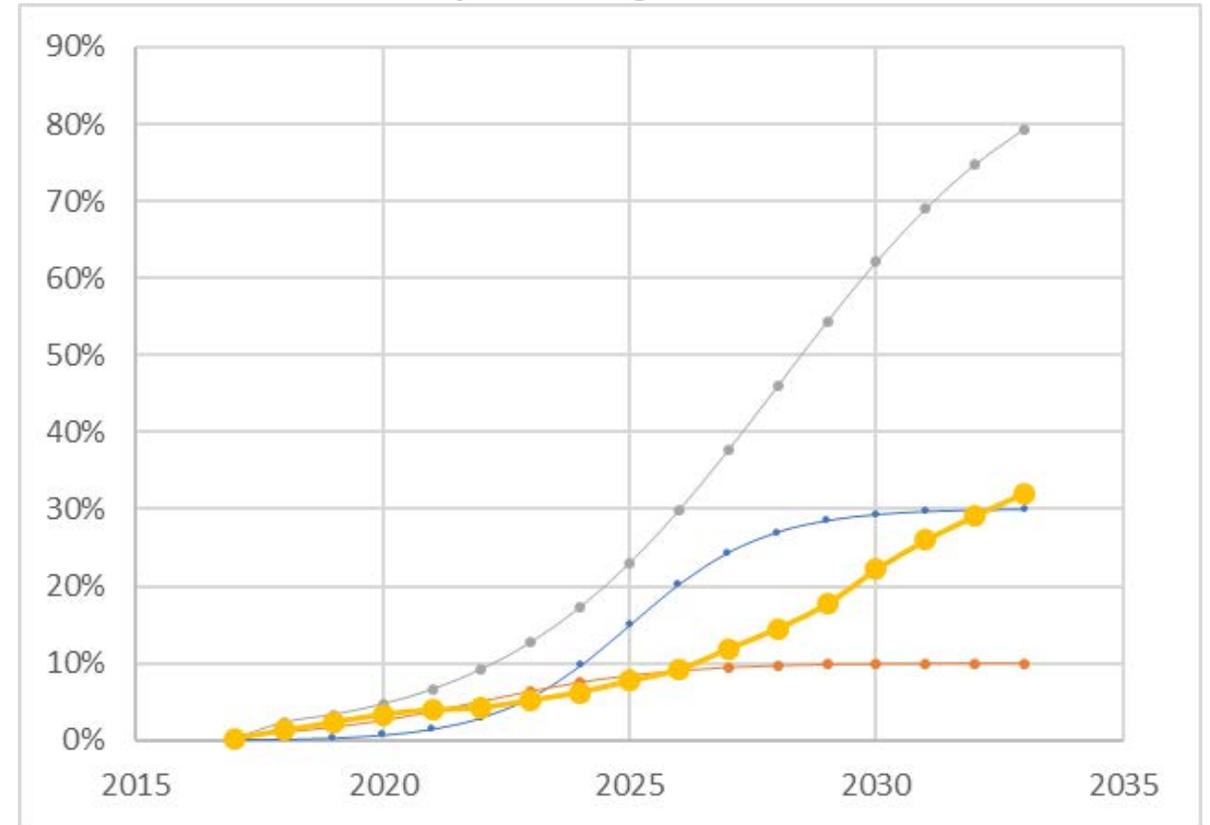
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Scenario Modeling Results – Low Policy, High Tech



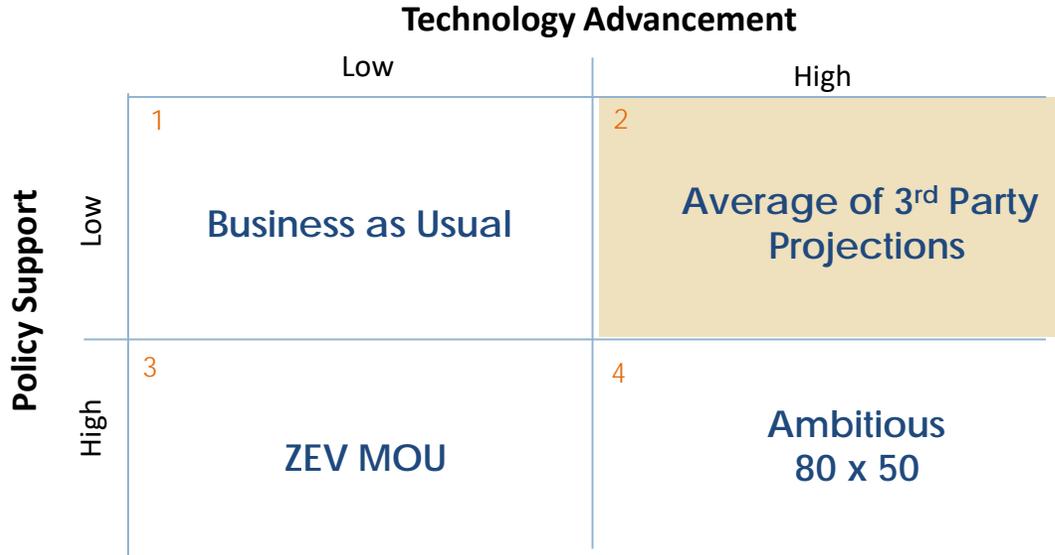
	2023	2028	2033
PEV*: % of light duty sales	5.2%	14.5%	32.1%
PEV: % of light duty fleet	1.3%	4.1%	11.3%
Electric VMT: % of total VMT	1.1%	3.6%	10.5%

PEV* sales as a percentage of total vehicle sales



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Scenario Modeling Results – Low Policy, High Tech



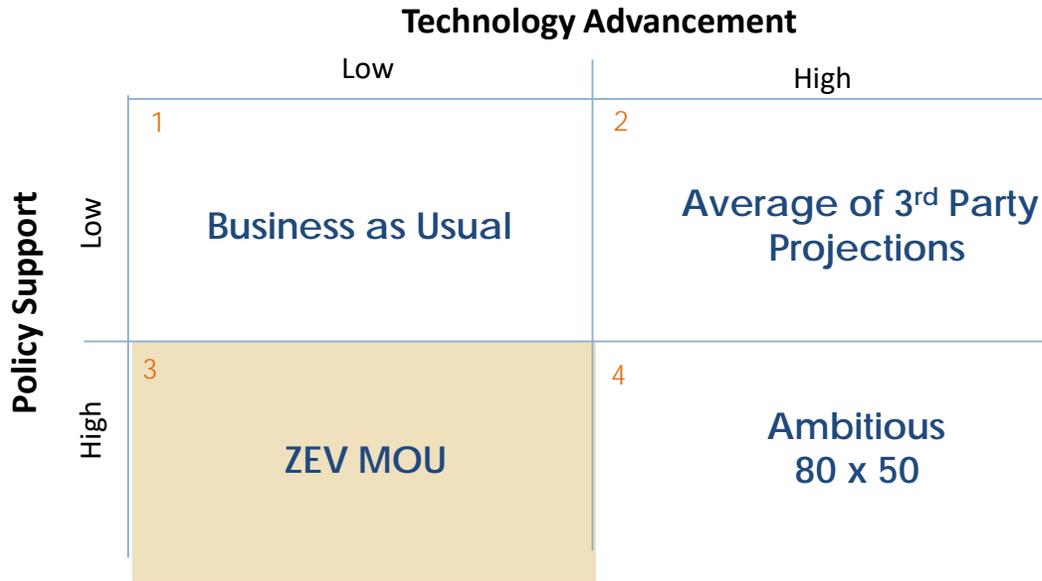
	2023	2028	2033
PEV*: % of light duty sales	5.2%	14.5%	32.1%
PEV: % of light duty fleet	1.3%	4.1%	11.3%
Electric VMT: % of total VMT	1.1%	3.6%	10.5%

Environmental and Economic Results to 2033

	Result	2033
Environmental	GHGs (metric tons)	-2.8%
	NOx (pounds)	-5.0%
	PM2.5 (pounds)	-2.8%
Economic	Total Resource Cost Ratio	1.57
	Societal Cost Ratio	2.01
	Participant Cost Ratio	2.53
	Non-Participant Cost Ratio	1.53

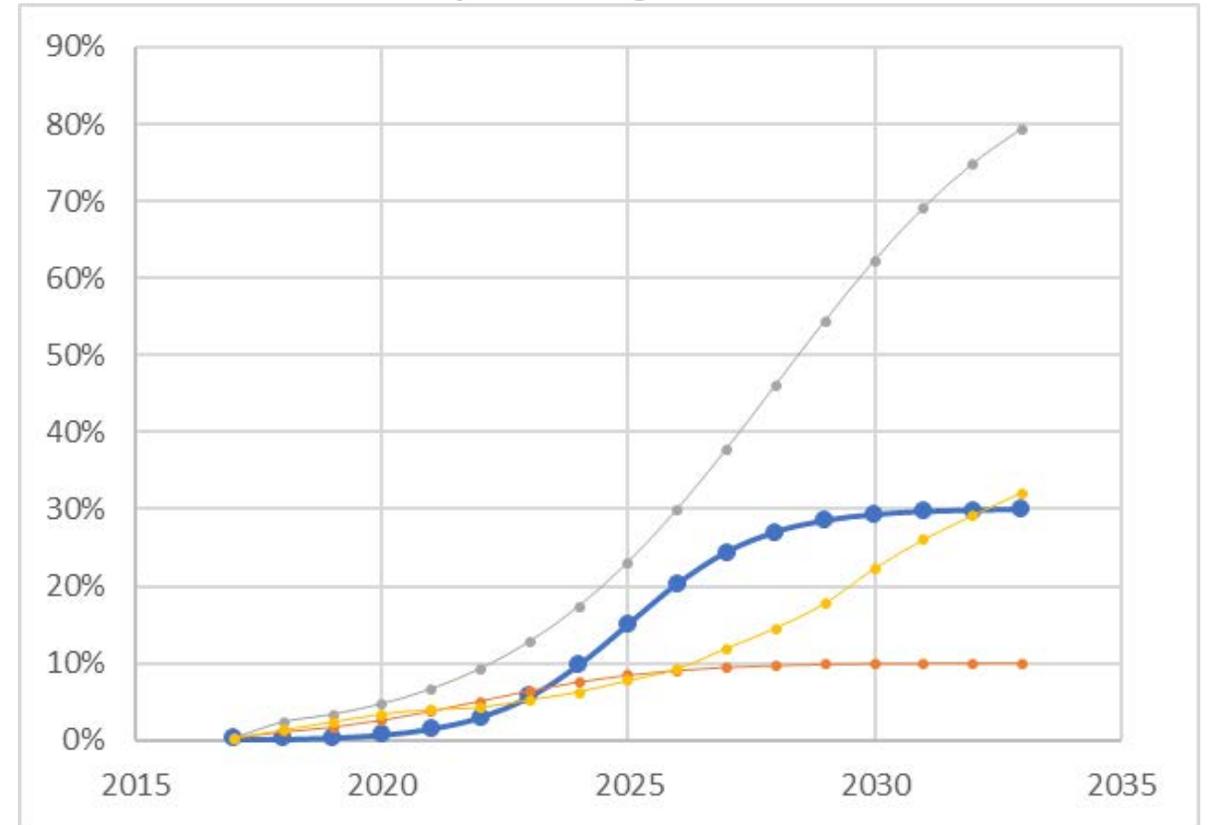
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Scenario Modeling Results – ZEV MOU



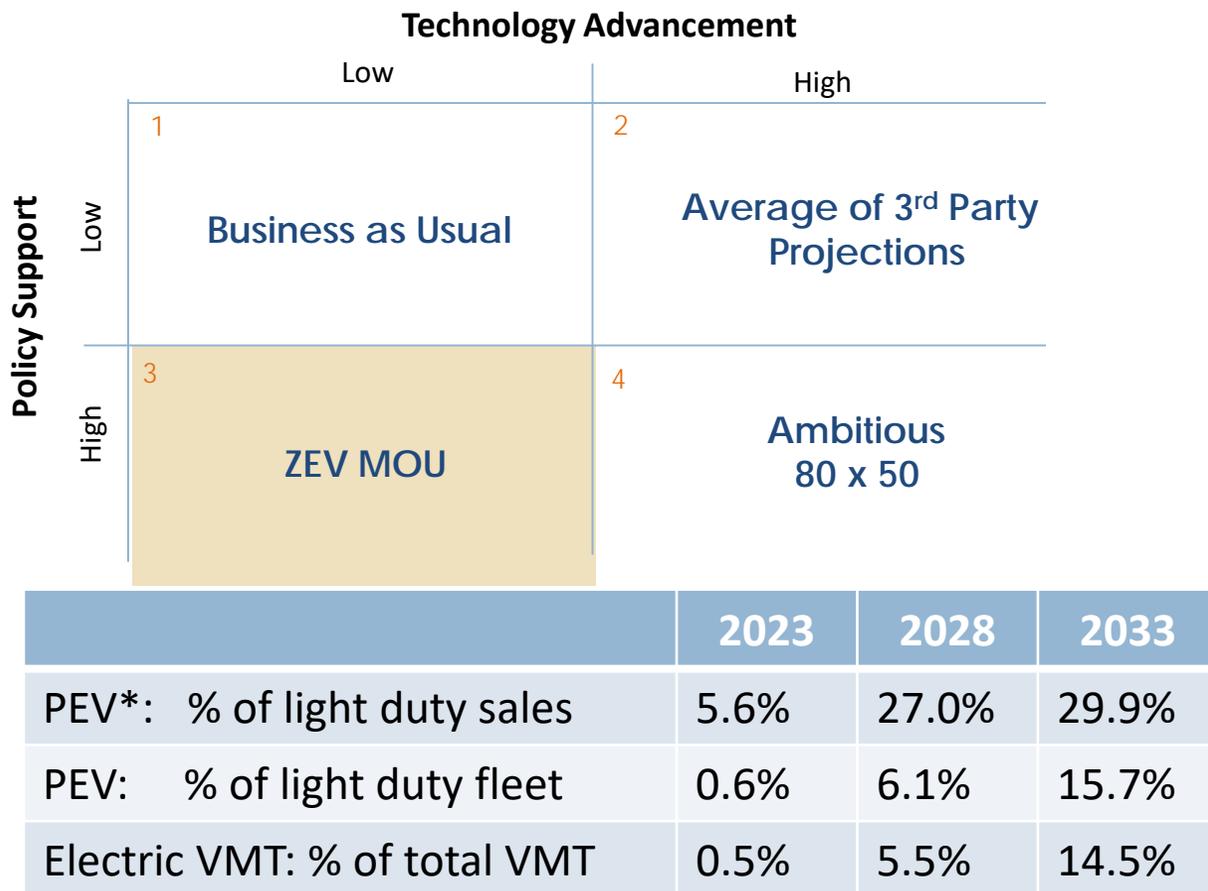
	2023	2028	2033
PEV*: % of light duty sales	5.6%	27.0%	29.9%
PEV: % of light duty fleet	0.6%	6.1%	15.7%
Electric VMT: % of total VMT	0.5%	5.5%	14.5%

PEV* sales as a percentage of total vehicle sales



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Scenario Modeling Results – ZEV MOU

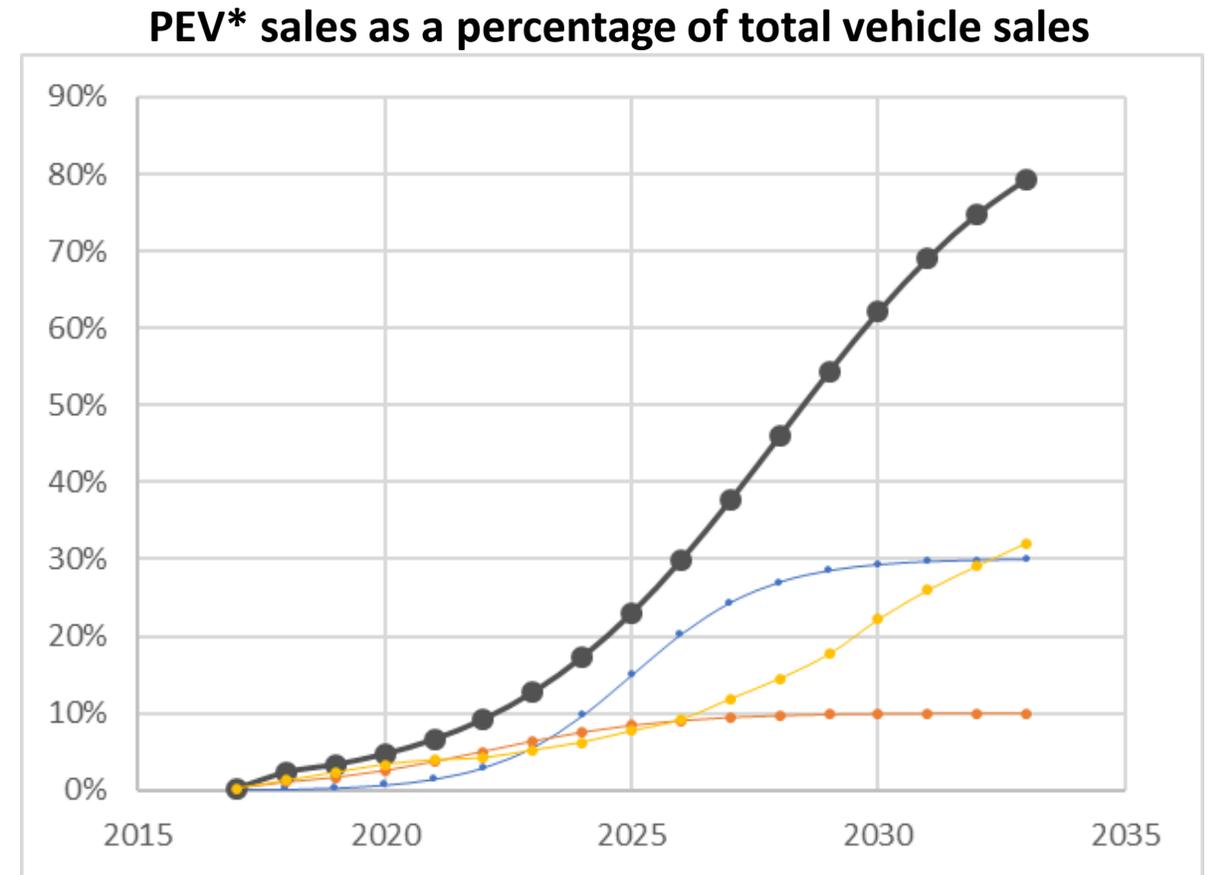
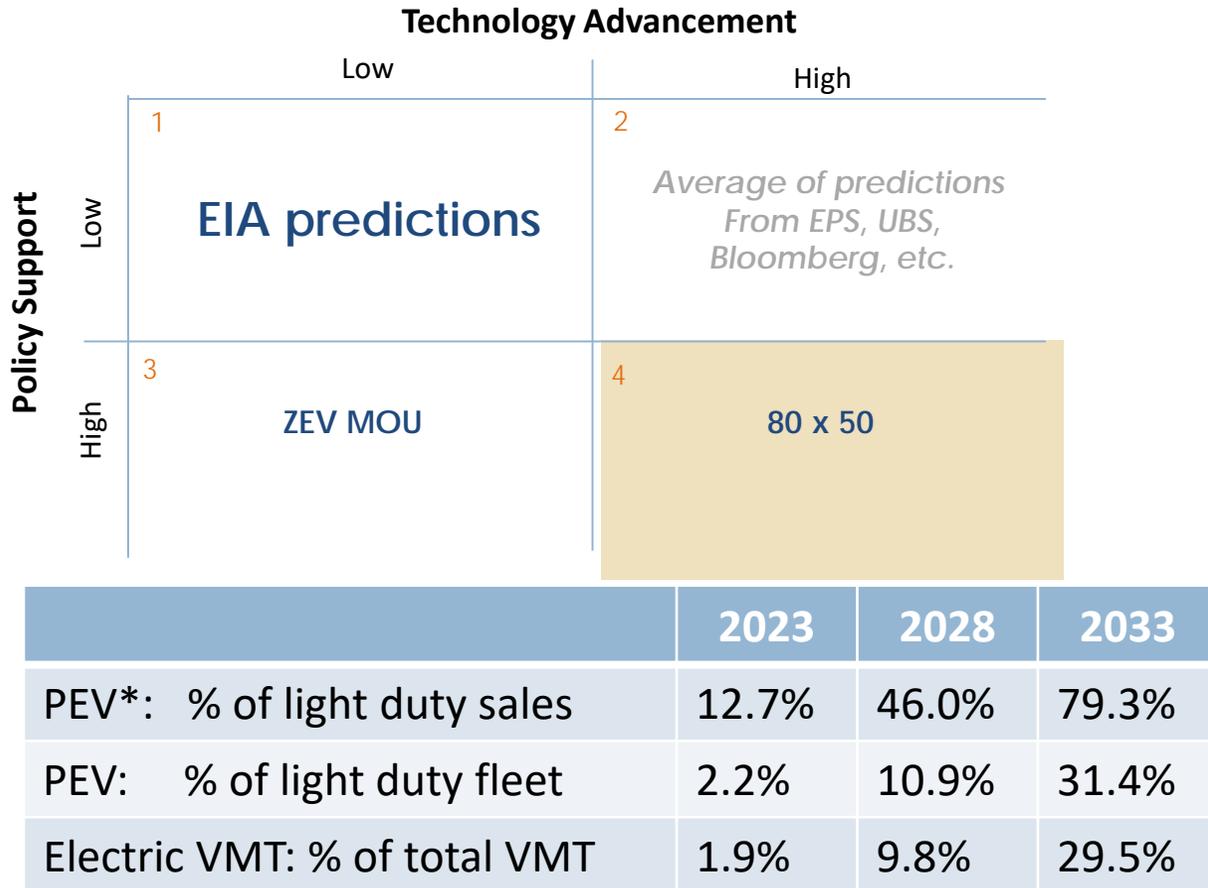


Environmental and Economic Results to 2033

	Result	2033
Environmental	GHGs (metric tons)	-3.2%
	NOx (pounds)	-4.9%
	PM2.5 (pounds)	-2.8%
Economic	Total Resource Cost Ratio	0.78
	Societal Cost Ratio	1.03
	Participant Cost Ratio	1.30
	Non-Participant Cost Ratio	0.70

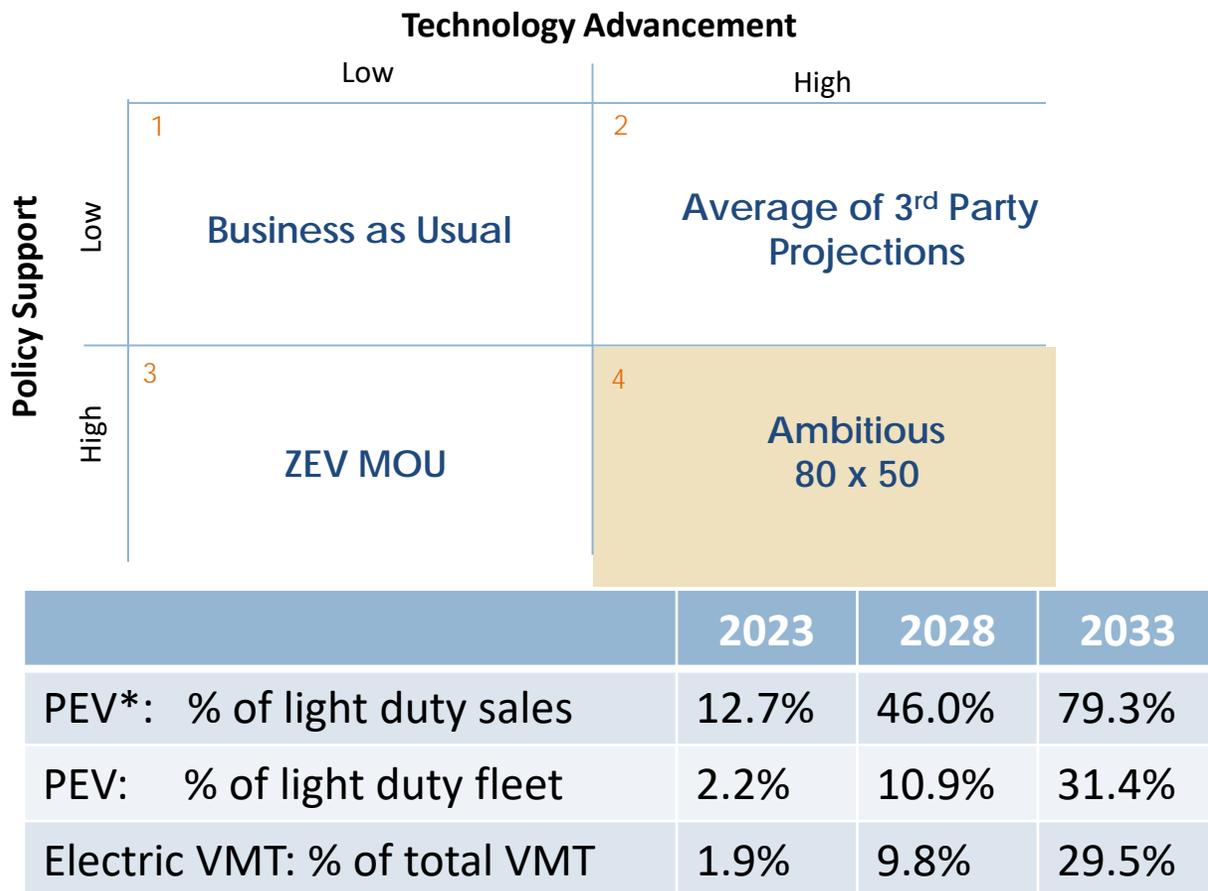
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Scenario Modeling Results – 80 x 50



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Scenario Modeling Results – 80 x 50



Environmental and Economic Results to 2033

	Result	2033
Environmental	GHGs (metric tons)	-10.2%
	NOx (pounds)	-18.6%
	PM2.5 (pounds)	-10.1%
Economic	Total Resource Cost Ratio	1.09
	Societal Cost Ratio	1.40
	Participant Cost Ratio	2.67
	Non-Participant Cost Ratio	0.73

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ROADMAP STRATEGY SELECTION

- » The preliminary list of prioritized strategies is based on:
 - › Quarterly meetings facilitation input
 - › Subcommittee work
 - › Policy research
 - › Expert interviews
 - › Evaluation criteria

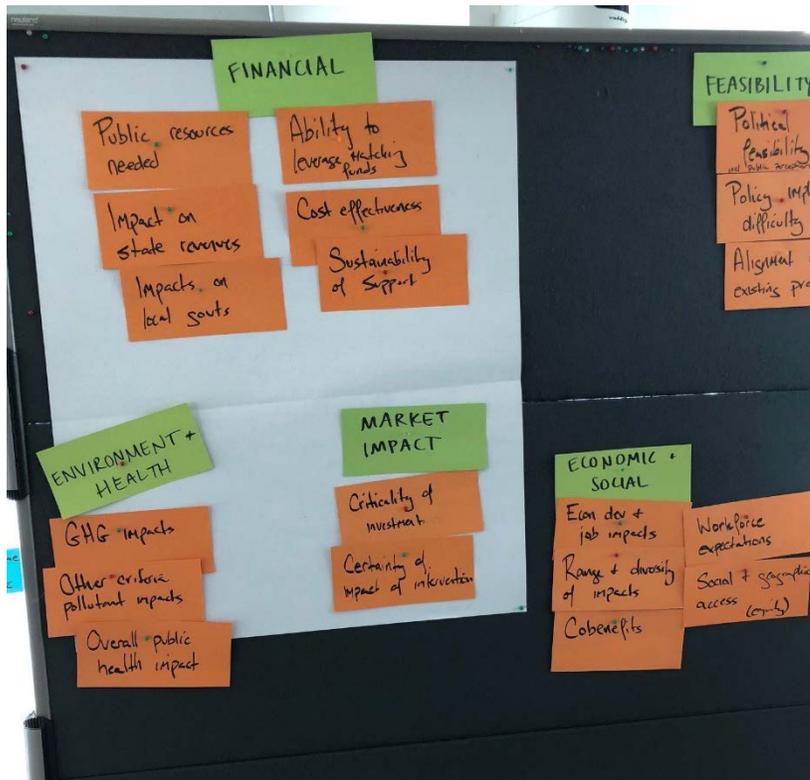
- » The consulting team would like to refine these strategies and rankings with input from the DEPA Coalition today and over the next month

MARKET INTERVENTION CATEGORIES

CATEGORY	DESCRIPTION	Examples
Marketing, outreach & education	Initiatives that improve awareness, confidence, and commitment from consumers to increase EV adoption	<i>Marketing/education campaigns, workplace charging programs, cooperative purchase program, EVSE uniform signage</i>
Targets & mandates	Goals or targets that establish levels of EV deployment, performance, or emissions reductions, or other regulations that support EV deployment	<i>EV sales mandate, public fleet electrification mandate, utility electrification mandate (like HB1446)</i>
Public planning & investment	Government-led efforts to directly plan for and invest in electric vehicle infrastructure and technology	<i>EVSE network planning and investment, technical assistance funding, funding for demonstrations/pilots</i>
Pricing-based policies	Policies that improve the cost-effectiveness of EVs, such as incentives, new electricity rate structures, and pricing of externalities	<i>Vehicle purchase incentives, EVSE incentives, EV electricity rates, driver incentives</i>
Financing & business models	Initiatives that facilitate development of businesses or financing models that increase access to EVs	<i>EV/EVSE financing, partnerships with electric shared mobility companies</i>
Enabling codes & regulations	Regulations that ease deployment of and ensure access to electric vehicles and EVSE	<i>EV readiness building codes, EVSE open access requirements, and removal of barriers for multi-family EVSE</i>

EVALUATION CRITERIA

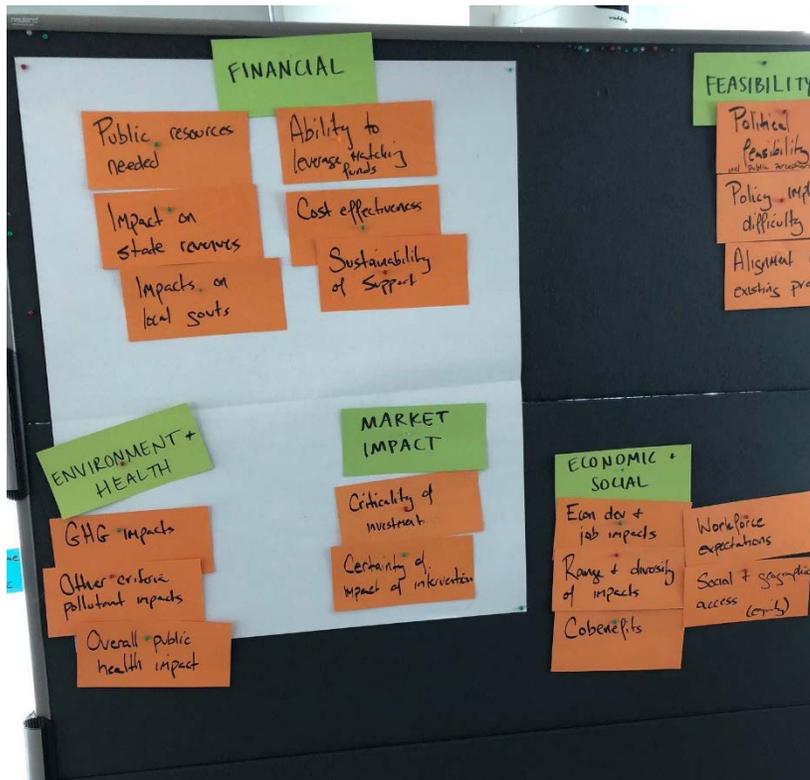
Coalition Input from January 12th Meeting



Criterion	Description
Cost-Effectiveness to Consumer	<i>To what degree does this policy or program increase cost-effectiveness for the EV consumer? (relative to comparable gasoline vehicle)</i>
Market Awareness and Confidence	<i>To what degree does this policy or program increase EV/EVSE market awareness or confidence? Is this a direct or indirect result of the program?</i>
Co-benefits (Environmental, Equity, Economic)	<i>To what degree does this policy or program have associated co-benefits (e.g. reducing GHG or criteria pollutants, increasing equity in the marketplace, creating jobs)</i>
Political Feasibility	<i>To what degree is this policy or program politically feasible in PA? (i.e. Will this be politically easy to implement? Will this be aligned with current policies in PA?)</i>
Financial Feasibility and Durability	<i>To what degree is this policy or program financially feasible and sustainable? (i.e. Is this a large financial burden to PA? Are funds available to leverage?)</i>

EVALUATION CRITERIA

Coalition Input from January 12th Meeting



Criterion	Description	Weight
Cost-Effectiveness to Consumer	<i>To what degree does this policy or program increase cost-effectiveness for the EV consumer? (relative to comparable gasoline vehicle)</i>	30%
Market Awareness and Confidence	<i>To what degree does this policy or program increase EV/EVSE market awareness or confidence? Is this a direct or indirect result of the program?</i>	30%
Co-benefits (Environmental, Equity, Economic)	<i>To what degree does this policy or program have associated co-benefits (e.g. reducing GHG or criteria pollutants, increasing equity in the marketplace, creating jobs)</i>	10%
Political Feasibility	<i>To what degree is this policy or program politically feasible in PA? (i.e. Will this be politically easy to implement? Will this be aligned with current policies in PA?)</i>	10%
Financial Feasibility and Durability	<i>To what degree is this policy or program financially feasible and sustainable? (i.e. Is this a large financial burden to PA? Are funds available to leverage?)</i>	20%

EVALUATION CRITERIA RATING SCHEME

Criterion	Description	Weight	Rating (Scale of 1 to 5)				
			1/5	2/5	3/5	4/5	5/5
Cost-Effectiveness to Consumer	<i>To what degree does this policy or program increase cost-effectiveness for the EV consumer? (relative to comparable gasoline vehicle)</i>	30%	<i>Might increase costs</i>	<i>Neutral</i>	<i>Slightly reduces costs</i>	<i>Moderately reduces costs</i>	<i>Significantly reduces costs</i>
Market Awareness and Confidence	<i>To what degree does this policy or program increase EV/EVSE market awareness or confidence? Is this a direct or indirect result of the program?</i>	30%	<i>Might decrease confidence</i>	<i>Neutral</i>	<i>Slight increase in awareness/confidence</i>	<i>Moderate increase in awareness/confidence</i>	<i>Significant increase in awareness/confidence</i>
Co-benefits (Environmental, Equity, Economic)	<i>To what degree does this policy or program have associated co-benefits (e.g. reducing GHG or criteria pollutants, increasing equity in the marketplace, creating jobs)</i>	10%	<i>Negative impacts</i>	<i>Neutral/No benefits</i>	<i>Slight co-benefits</i>	<i>Moderate co-benefits</i>	<i>Strong co-benefits categories</i>
Political Feasibility	<i>To what degree is this policy or program politically feasible in the PA? (i.e. Will this be politically easy to implement? Will this be aligned with current policies in PA?)</i>	10%	<i>Impossible to implement</i>	<i>Very difficult to implement</i>	<i>Moderately difficult to implement</i>	<i>Slightly difficult to implement</i>	<i>Not difficult at all; easy to implement</i>
Financial Feasibility and Durability	<i>To what degree is this policy or program financially feasible and sustainable? (i.e. Is this a large financial burden to PA? Are funds available to leverage?)</i>	20%	<i>Very difficult to sustain/ fund</i>	<i>Difficult to sustain/fund</i>	<i>Moderately difficult to sustain/fund</i>	<i>Slight difficulty to sustain/fund</i>	<i>Easy to sustain/fund</i>

EXAMPLE RANKING AND SCORE

Background and pathway	Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	WEIGHTED Score
	30%	30%	10%	10%	20%	-
<p>Implement TOU Rates: Many utilities offer time-of-use rates that encourage electric vehicle owners to charge during off-peak times, and enable lower rates during those time periods. Ensuring time-of-use rates designed for EVs are available to residents may be able to help shift charging away from expensive peak periods and help support reduced costs for all ratepayers. Could be encouraged/required through transportation electrification proceedings.</p>	4	4	5	4	5	4.3

TOP STRATEGIES - DRAFT

Strategy category	Strategy name	Weighted Score
Targets/Mandates; Enabling regulations	Utility transportation electrification mandate/directive [HB1446 or similar]	4.50
Pricing-based policies	EV electricity rate designs (time-of-use) (residential)	4.30
Public planning and investment	Utility-supported public EVSE investment	4.20
Pricing-based policies	Expanded and improved AFIG rebate program	4.20
Targets/Mandates	Statewide EV sales goal or mandate	4.10
Enabling regulations	EV-Ready building code amendments	4.10
Marketing, education, and outreach	EV Marketing and education campaign targeted at consumers	4.00
Facilitating emerging financing and business models	Explore development of innovative, affordable financing for EVs/EVSE	4.00
Pricing-based policies	Medium and heavy duty fleet vehicle voucher program	3.90
Public Planning and Investment; Marketing, education, and outreach	State grants to local jurisdictions for EV market development activities, including local EV Accelerator communities	3.90

KEY QUESTIONS FOR STRATEGY FEEDBACK

- » Do the strategies have the appropriate priority level, time frame, and categorization?
- » How can key strategies be further refined? In particular:
 - › Establishing an EV sales target/goal – considerations for policy design, target levels, etc.
 - › Utility transportation electrification mandate – considerations regarding the potential of HB1446
 - › Improving and expanding the AFIG EV rebate program – considerations for funding sources, target funding amounts to meet sales goals, etc.
- » What are the pathways to implementation for the top strategies?
- » Are there missing strategies needed to address major market barriers?

STRATEGY: UTILITY TRANSPORTATION ELECTRIFICATION MANDATE/ DIRECTIVE [HB1446 OR SIMILAR]

- » **Category:** Targets and mandates; Enabling regulations
- » **Barriers addressed:** Lack of sufficient, sustainable funding for EV/EVSE incentives; Inadequate return on investment for EVSE; Lack of available electricity rate options designed for EV charging
- » **Time frame:** 0-1.5 years
- » **Objectives:** Encourage or require utilities to leverage their expertise and relationship to customers to jumpstart the EV market in a way that maximizes benefits to ratepayers and society as a whole.
- » **Description:** A legislative directive to the Pennsylvania PUC to enable or mandate utilities to make investments in transportation electrification. The PUC would open a proceeding asking utilities to submit proposals that advance transportation electrification and provide benefits to consumers, the grid, and society as a whole. The proceeding would seek proposals that encourage competition in the EVSE market and seek to achieve other policy goals to be determined by the legislature and PUC. The legislature/PUC could specify inclusion of key interventions like EV-specific electricity tariffs, EVSE investment, and education and outreach provisions.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
4	5	5	3	5	4.5

STRATEGY: EV ELECTRICITY RATE DESIGNS (TIME-OF-USE) (RESIDENTIAL)

- » **Category:** Pricing-based policies
- » **Barriers addressed:** Available electricity rates inhibit fuel savings; Lack of awareness of co-benefits of technology
- » **Time frame:** 0 - 1.5 years
- » **Objectives:** Maximize grid benefits, reduce costs for ratepayers, and reduce charging costs for EV owners that charge during off-peak times
- » **Description:** Many utilities offer time-of-use rates that encourage electric vehicle owners to charge during off-peak times, and enable lower rates during those time periods. Ensuring time-of-use rates designed for EVs are available to residents may be able to help shift charging away from expensive peak periods and help enable reduced costs for all ratepayers. This strategy could be encouraged/required through transportation electrification proceedings.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
4	4	5	4	5	4.3

STRATEGY: UTILITY-SUPPORTED PUBLIC EVSE INVESTMENT

- » **Category:** Public planning and investment
- » **Barriers addressed:** Insufficient EVSE coverage to enable certain trips; Lack of confidence in EVSE coverage; Inadequate return on investment for EVSE
- » **Time frame:** 1.5 - 3 years
- » **Objective:** Increase access to infrastructure by encouraging utilities to invest in/install public EVSE in locations that are both optimal for drivers and the grid, while ensuring a role for third party charging providers.
- » **Description:** Regulators would enable utilities to invest in EVSE and recover their costs (and achieve a rate of return, where appropriate) if the charging stations or incentives met certain criteria. The PUC could encourage a "portfolio" approach like in WA, where utilities were asked to design multiple programs to reach various market segments. The program could be structured to enable utilities to both directly own and operate charging infrastructure and also provide incentive programs that support ownership by workplaces, fleets, multi-family housing complexes, third-party providers, and other stakeholders. Regulators could create a mechanism to ensure pathways to a private market for EVSE once the EV market matures.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
3	5	5	3	5	4.2

STRATEGY: EXPANDED AND IMPROVED AFIG REBATE PROGRAM

- » **Category:** Pricing-based policies
- » **Barriers addressed:** Competing financial priorities and capital constraints; High EV and EVSE upfront costs; Lack of OEM/dealer EV market confidence
- » **Time frame:** 1.5 - 3 years
- » **Objective:** Support higher levels of EV market share by helping consumers afford the incremental cost of EVs.
- » **Description:** This program would expand the AFIG rebate program to enable a greater number of rebates (\$1,750 per vehicle) per year that would increase as adoption levels rise (e.g. 50% of sales target, up from 24% in 2017, informed by leading states' share of EVs rebated), and offer higher levels for LMI participants (e.g. \$500 additional). Improvements to the existing program could include 1) altering PA's program to be like CT's "dealer assignment" where rebate is directly applied at point of sale and reimbursed to dealer, 2) providing a share of the rebate to dealers, and 3) expanding eligibility to leased EVs. Ensuring durability of the incentives should be considered, including consideration of utility involvement through the transportation electrification proceedings.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
5	5	5	3	2	4.2

STRATEGY: STATEWIDE EV SALES GOAL OR MANDATE

- » **Category:** Targets and mandates
- » **Barriers addressed:** Lack of available EV models and inventory; lack of consumer awareness of EV technology, lack of market confidence from OEMs/dealers/suppliers
- » **Time frame:** 0-1.5 years
- » **Objectives:** Increase market confidence by signaling a clear direction towards investment in EVs in the state, and increase awareness by increasing EV model availability and marketing activity by dealers and other actors.
- » **Description:** This strategy would involve setting a statewide EV sales target by a certain date, like the ZEV mandate. The sales target could be an aspirational goal implemented by Executive Order, or could be binding like the ZEV mandate program that requires automakers to sell a certain share of ZEVs per year (22% by 2025 for the ZEV program) in states that have joined the program. Pennsylvania could join the ZEV MOU states, or set its own sales target. Setting an aspirational target is essential, as a too-low target could stymie adoption levels.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
3	5	5	2	5	4.1

STRATEGY: EV-READY BUILDING CODE AMENDMENTS

- » **Category:** Enabling regulations
- » **Barriers addressed:** Lack of EV-friendly codes increase installation costs; Insufficient electrical capacity for EVSE installation; Providing EVSE for drivers without dedicated parking
- » **Time frame:** 1.5 - 3 years
- » **Objective:** Remove barriers to and promote installation of EVSE.
- » **Description:** This strategy would involve amending the state's building code to ensure that any barriers inhibiting or complicating EVSE investment are addressed, and that EV readiness is promoted through the building code while retaining local flexibility. As an example, the state could adopt EV-readiness provisions as a code appendix that can then be adopted by local jurisdictions.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
4	4	4	3	5	4.1

STRATEGY: EV MARKETING AND EDUCATION CAMPAIGN TARGETED AT CUSTOMERS

- » **Category:** Marketing, education, and outreach
- » **Barriers addressed:** Lack of awareness of technology availability, performance, and costs; Lack of awareness of incentives and other supportive policies
- » **Time frame:** 0 – 1.5 years
- » **Objective:** Increase consumer awareness of EV technology, costs, performance, and available incentives.
- » **Description:** This strategy would include the consumer-oriented educational programs identified by the DEPA Coalition to reach consumers, principally 1) Creating and maintaining a DEPA Coalition centralized website, branded materials, social media presence, and potential media campaign (radio, billboards), informed by consumer survey research and 2) Organizing at least 10 Ride and Drive events statewide per year.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
2	5	4	5	5	4.0

STRATEGY: EXPLORE INNOVATIVE, AFFORDABLE FINANCING FOR EVs/ EVSE

- » **Category:** Facilitating emerging financing and business models
- » **Barriers addressed:** High EV and EVSE upfront costs; Competing financial priorities and capital constraints; restrictions on public procurement methods
- » **Time frame:** 1.5 - 3 years
- » **Objective:** Enable more durable financing solution for consumers and fleets to afford incremental upfront costs of EVs and EVSE than direct incentives.
- » **Description:** Support development (start with study) of innovative financing mechanisms for EV/EVSE deployment that could be a more durable, widely available strategy than direct rebates (e.g. on-bill repayment, inclusion of fleet conversions in Energy Service Performance Contracting, battery leases, PACE for residential EVs/EVSE, etc.). Could be through utilities, or an expanded version of the existing ACE program that provides loans and loan guarantees. Explore opportunities to require "least cost planning" like in energy efficiency, whereby fleets/utilities would invest in electric vehicles if the benefits exceeded the cost of a conventional vehicle 2018.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
4	3	4	5	5	4.0

STRATEGY: MEDIUM AND HEAVY-DUTY FLEET VOUCHER PROGRAM

- » **Category:** Pricing-based policies
- » **Barriers addressed:** Competing financial priorities and capital constraints; □High EV and EVSE upfront cost
- » **Time frame:** 3 - 5 years
- » **Objective:** Increase adoption of EVs in medium/heavy-duty fleets that tend to have greater emissions impact due to worse fuel economy and higher annual mileage.
- » **Description:** Expand AFIG to develop and market a first-come, first-serve voucher program for medium and heavy duty fleet vehicles (trucks and buses) that covers up to 80% of the incremental cost of an electric vehicle compared with a conventional vehicle. Provides additional funds for deployments in disadvantaged communities/non-attainment areas. An estimated total of \$9M available annually (based on NY program levels, normalized by truck/bus population (FHWA)). Funds for NY program come from CMAQ.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
5	4	5	3	2	3.9

STRATEGY: STATE GRANTS TO LOCAL JURISDICTIONS FOR EV MARKET DEVELOPMENT ACTIVITIES

- » **Category:** Public Planning and Investment; Marketing, education, and outreach
- » **Barriers addressed:** Lack of awareness of technology availability, performance, and costs; Depends on what grants used for
- » **Time frame:** 1.5 - 3 years
- » **Objective:** Support EV-readiness planning and implementation activities for strategies best implemented at local or regional scales.
- » **Description:** The state would provide grants to local jurisdictions for EV market development activities, which could include planning or implementation activities, including EVSE network planning, workforce development, and the establishment of EV Accelerator communities. EV Accelerators are primarily forward-thinking municipalities able to lead the Commonwealth on implementing EV adoption policies, codes, zoning, and business incentives to increase adoption of EVs and accessibility of EVSE in their communities. (Drive Electric Northern Colorado Model). A goal would be to offer targeted assistance to 2-4 municipalities in 2018.

Cost-Effectiveness to Consumer	Market Awareness and Confidence	Co-benefits (Environmental, Equity, Economic)	Political Feasibility	Financial Feasibility and Durability	Weighted score
3	5	5	4	3	3.9

TOP STRATEGIES (CONTINUED) - DRAFT

Strategy category	Strategy name	Weighted Score
Pricing-based policies	EV electricity rate designs/strategies (fast charging)	3.90
Pricing-based policies	Single and multi-family residential EVSE incentive programs	3.90
Pricing-based policies; Marketing, education, and outreach	Rebates/vouchers for EV car rental, carshare, and other shared mobility companies	3.80
Public planning and investment	Statewide EVSE network planning and investment (DCFC focus)	3.80
Marketing, education, and outreach	Cooperative purchase program for consumers	3.80
Enabling regulations	EVSE Open access regulations	3.80
Marketing, education, and outreach	Dealer outreach and support program	3.70
Marketing, education, and outreach	Workplace and multi-family EVSE education and outreach program	3.80
Marketing, education, and outreach; Public planning and investment	Fleet education, cooperative purchase, and technical assistance program	3.70
Marketing, education, and outreach	Adopt uniform EVSE sign standards and state route designation program	3.60

OVERVIEW

- ➔ 10:00-10:05am: Intro and Welcome
- ➔ 10:05-10:15am: PA EV Roadmap Updates
- ➔ 10:15-10:45am: Results of Scenario Modeling
- ➔ 10:45-12:30pm: Presentation on Roadmap Strategies
- ➔ 12:30pm-1:00pm: Lunch
- ➔ **1:00pm-1:50pm: Debrief Roadmap Strategies**
- ➔ 1:50pm-2:00pm: Wrap Up Roadmap Discussion
- ➔ 2:00pm-3:00pm: Updates from PA Drive Electric Coalition Members

DEBRIEF QUESTIONS

1. Is the roadmap on track?
2. What specific areas require more polish?

Online survey to provide anonymous feedback: <https://goo.gl/forms/bua4gzD9zMo8xIWD3>

THANK YOU!

Any Questions?

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ADDITIONAL SLIDES



Scenario Modeling Approach – Policy Bundles

Low Policy Scenarios

- AFIG Rebate Program
- Fleet, public, and workplace EVSE Incentive Programs

High Policy Scenarios

- Expanded AFIG Rebate Program
- Fleet, public, and workplace EVSE Incentive Programs
- Residential EVSE Incentive Programs
- EV TOU rates for residential and fast-charging
- Publicly-owned/utility-owned EVSE network

Scenario Modeling Approach – BCA Tests

Total Resource Cost (TRC) Test

- Ratio of resource-related costs and benefits as a result of EV/EVSE adoption

Societal Cost Test (SCT)

- Similar to TRC, except includes the benefits of reduced emissions and pollutants
- Broadest cost test

Participant Cost Test (PCT)

- Ratio of the lifetime benefits to costs of an EV/EVSE adopter

Non-participant Cost Test (NPCT)

- Ratio of lifetime benefits to costs of the people who do not adopt EV/EVSE, but still pay taxes and electric bills