



# Nevada Division of Environmental Protection

## *Clean Cars Nevada*

On the Road to a Cleaner Nevada

May 27, 2021

### **Presented by:**

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# AIR QUALITY IMPACTS ANALYSIS

## MAY 27, 2021 @ 9:00 TO 10:00 AM



### Presentation Outline

- Introduction
- State of the Fleet Review
  - Data Sources
  - Fleet Statistics
  - ZEV Sales
- How We Quantify Air Quality Benefits
- LEV – Criteria Pollutant and GHG Emissions Discussion

# AIR QUALITY IMPACTS ANALYSIS

## MAY 27, 2021 @ 9:00 TO 10:00 AM



### Presentation Outline cont.

- ZEV Program Projections – Credits and Emissions Benefits:
  - Business as Usual
  - Minimum Compliance
  - Anticipated Compliance
- ZEV – Credit Approach
- ZEV – CARB Advanced Clean Cars II Staff Proposal
  - MY 2026 and Beyond

# AIR QUALITY IMPACTS ANALYSIS

## MAY 27, 2021 @ 9:00 TO 10:00 AM



### Presentation Outline cont.

- The Regulatory Process and Opportunities for Public Input and Participation
- Where to Find Out More
- Where to Find Public Comments
- Contact Us



## Clean Cars Nevada is Proposing the Evaluation and Potential Adoption of Two New Regulatory Programs



Low Emission Vehicle (LEV) Program - Meet emission requirements that reduce greenhouse gases, criteria air pollutants, and hazardous air pollutants.



Zero Emission Vehicle (ZEV) Program - Introduction of clean vehicle technology in Nevada.



## **The goal of today's webinar is to ....**

Understand the emissions benefits that will result from the adoption of this regulation under different compliance scenarios.

# STATE OF THE FLEET REVIEW

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## Data Sources:

### Vehicle Sales for calendar years 2015-2020

- From Electronic Dealer Report of Sale Program (provided by DMV).
- QA/QC and processing of data provided a list of all new vehicles, their makes, and model years sold between 2015 and 2020.

### Vehicle Credits for all model years sold in 2015-2020

- Assigned to each vehicle using Executive Orders from the California Air Resources Board
- (<https://ww3.arb.ca.gov/msprog/onroad/cert/cert.php#1>)

[https://ndep.nv.gov/uploads/air-ccn-docs/ccn-air\\_quality\\_impacts\\_session\\_1.pdf](https://ndep.nv.gov/uploads/air-ccn-docs/ccn-air_quality_impacts_session_1.pdf)

# STATE OF THE FLEET REVIEW

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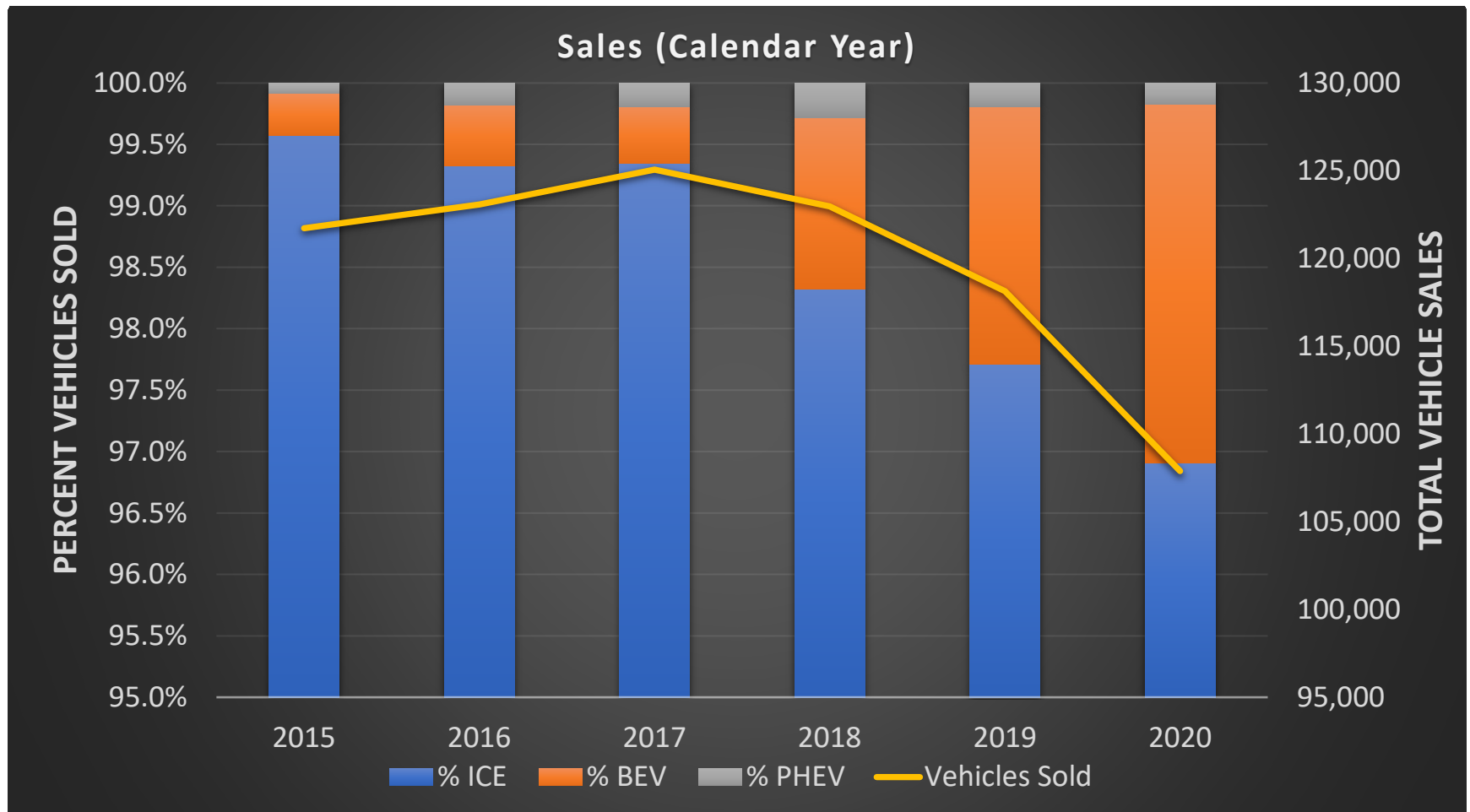
## Fleet Statistics:

- 2,000,000 – Light-Duty Vehicles Registered in Nevada
- 60% registered in Clark, 17% registered in Washoe, and the remainder are registered throughout the rest of the state
- 119,356 – Average Annual New Light-Duty Vehicles Sales from 2015-2020
- Passenger Cars make up 35%, Light-Duty Trucks 65% of New Registrations for Light-Duty Vehicles
- 3% – Fraction of New Light-Duty Vehicles Sales in Nevada in MY 2021 that are ZEV or TZEVs



# FLEET STATISTICS – NEW LDV SALES

Total LDV Sales and Percentage of BEV and PHEV



# LEV CRITERIA POLLUTANTS AND GHG EMISSIONS DISCUSSION

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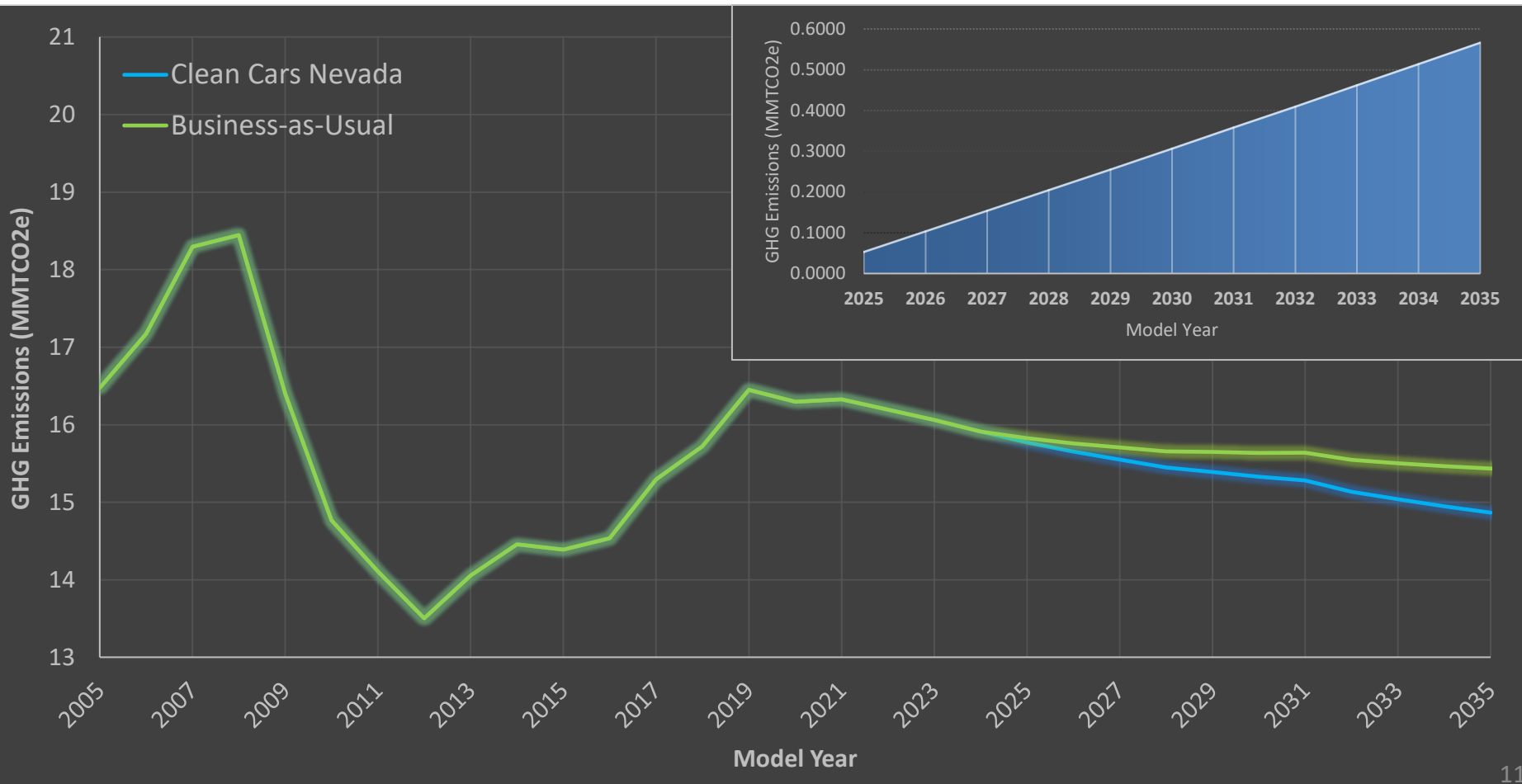
- LEV presents air quality benefits
- LEV provides an incremental decrease in fleetwide internal combustion engine (ICE) vehicle emissions
- LEV maintains regulatory consistency for auto manufacturers that are complying with Section 177 state rules
- Emissions benefits:
  - GHG reductions from the fleetwide emission standard
  - NO<sub>x</sub> and PM<sub>2.5</sub> benefits mainly from decreased fuel combustion

**Adoption of LEV standards helps Nevada make reductions in ICE emissions, and when combined with the ZEV requirement, represents a broader effort to reduce overall transportation sector emissions**

# LEV CRITERIA POLLUTANTS AND GHG EMISSIONS

## DISCUSSION

Estimated Transportation Sector GHG Emissions Under Business-as-Usual and Clean Cars Nevada LEV



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS

## BENEFITS

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### Approach Taken

- NV ZEV Calculator – spreadsheet based on ZEV program rules and populated with projected state sales data by manufacturer
- Utilized to predict emissions benefits and credit compliance for several future scenarios as compared against a business-as-usual scenario
- For CO<sub>2</sub> emissions, it estimates avoided tailpipe emissions and upstream EV emissions
- For NMOG+NO<sub>x</sub>, it estimates avoided tailpipe emissions
- NV ZEV Calculator is a functional tool for testing the impact of future implementation scenarios of Clean Cars Nevada, but does not provide the definitive prediction of credits and emissions

# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS

## BENEFITS

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At its most basic, vehicle emissions — and avoided vehicle emissions— are quantified with this equation:

$$\text{Vehicle Emissions} = \# \text{ of Vehicles} * \frac{\text{Average annual vehicle miles travelled}}{\text{Average vehicle emission rate}}$$

- We quantify avoided emissions using this equation and assume a BEV or PHEV is replacing a pure ICE vehicle

For the adoption of ZEV, we also consider an increase in upstream emissions from our electricity generation sector:

$$\text{Upstream EV Emissions} = \# \text{ of Vehicles} * \frac{\text{Average amount of electricity to charge BEVs and PHEVs}}{\text{Average electricity emission rate}}$$

**The factors informing the variables in these equations can get very complex**

# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS

## BENEFITS

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Main factors considered in the model

- ZEV Program Credit Requirements
- Overall LDV sales projection (EIA–AEO 2021 Reference Case)
- Trends in ZEV and TZEV credits per vehicle
- Compliance strategies (ZEV vs TZEV sales projections) and manufacturer announcements on EV plans
- Large Volume Manufacturers and Intermediate Volume Manufacturers considered separately
- Tesla as separated IVM

# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS

## BENEFITS

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Main factors considered in the model (continued)

- Upstream CO<sub>2</sub> emissions
  - Difference in electricity generation portfolio between Northern and Southern Nevada
  - Average 24-hour emission rates (no consideration for the time of day that EVs are charged)
  - Increase in renewable portfolio standard
- No assumption for how banked credits will be used

# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS

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## Scenarios Considered

- Business-as-Usual – expected ZEV sales without Clean Cars Nevada program; baseline for the other scenarios
- Minimum Compliance – least number of ZEVs delivered for sale necessary to comply with credit requirements
- Anticipated Compliance – likely number of ZEVs delivered for sale based on trends and manufacturer announced ZEV product offerings



New Ford Mustang Mach-E Photo by Bram Van Oost on Unsplash



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – BUSINESS AS USUAL

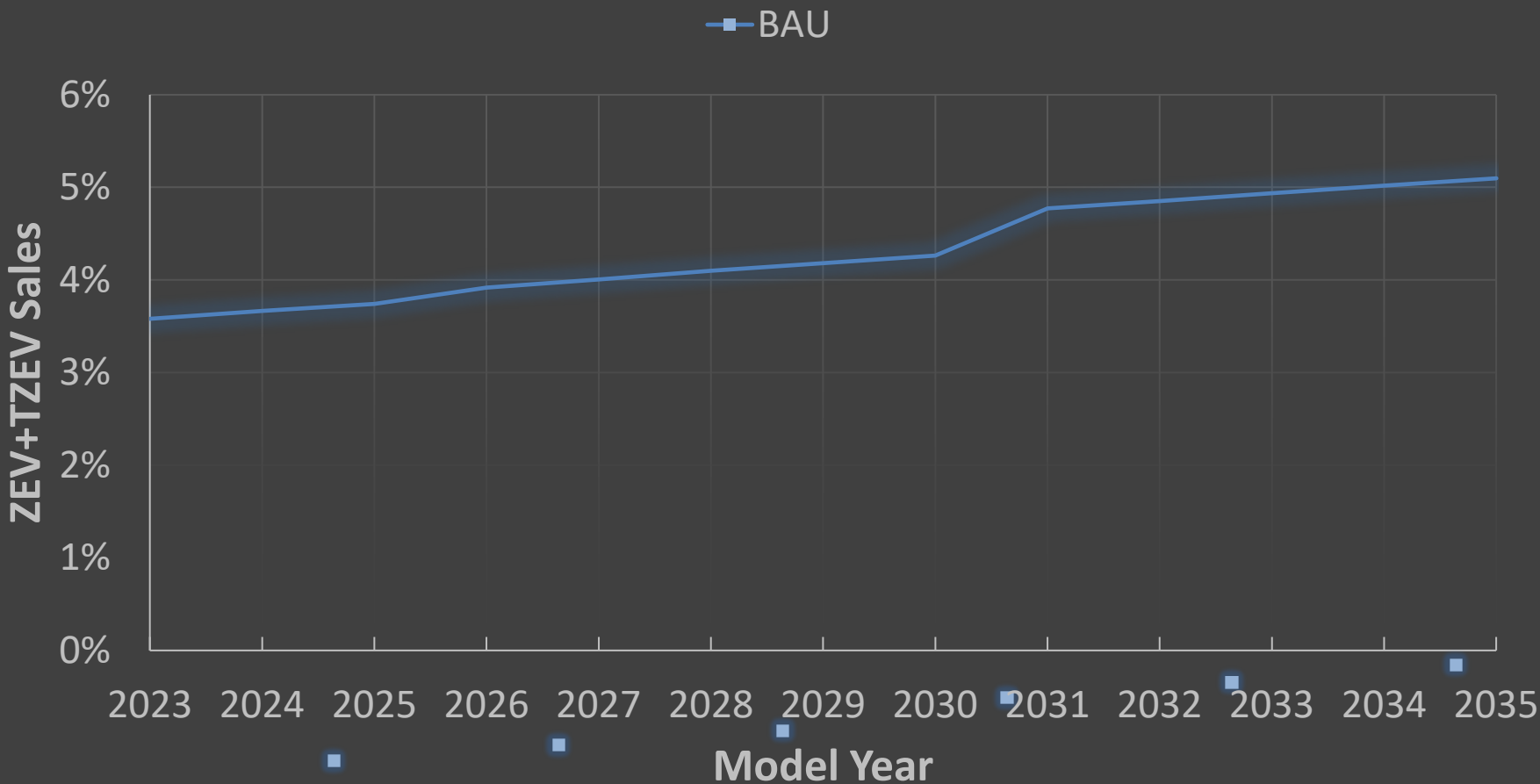
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## Business-as-usual

- Nevada does not adopt a ZEV Program starting with MY 2025
- Car manufacturers do not increase sales of ZEVs and TZEVs beyond what the current sales and trends show
- Recent announcements by car manufacturers about partial fleet/brand electrification are not considered
- However, manufacturer announcements of full electrification of their fleet/brand are considered

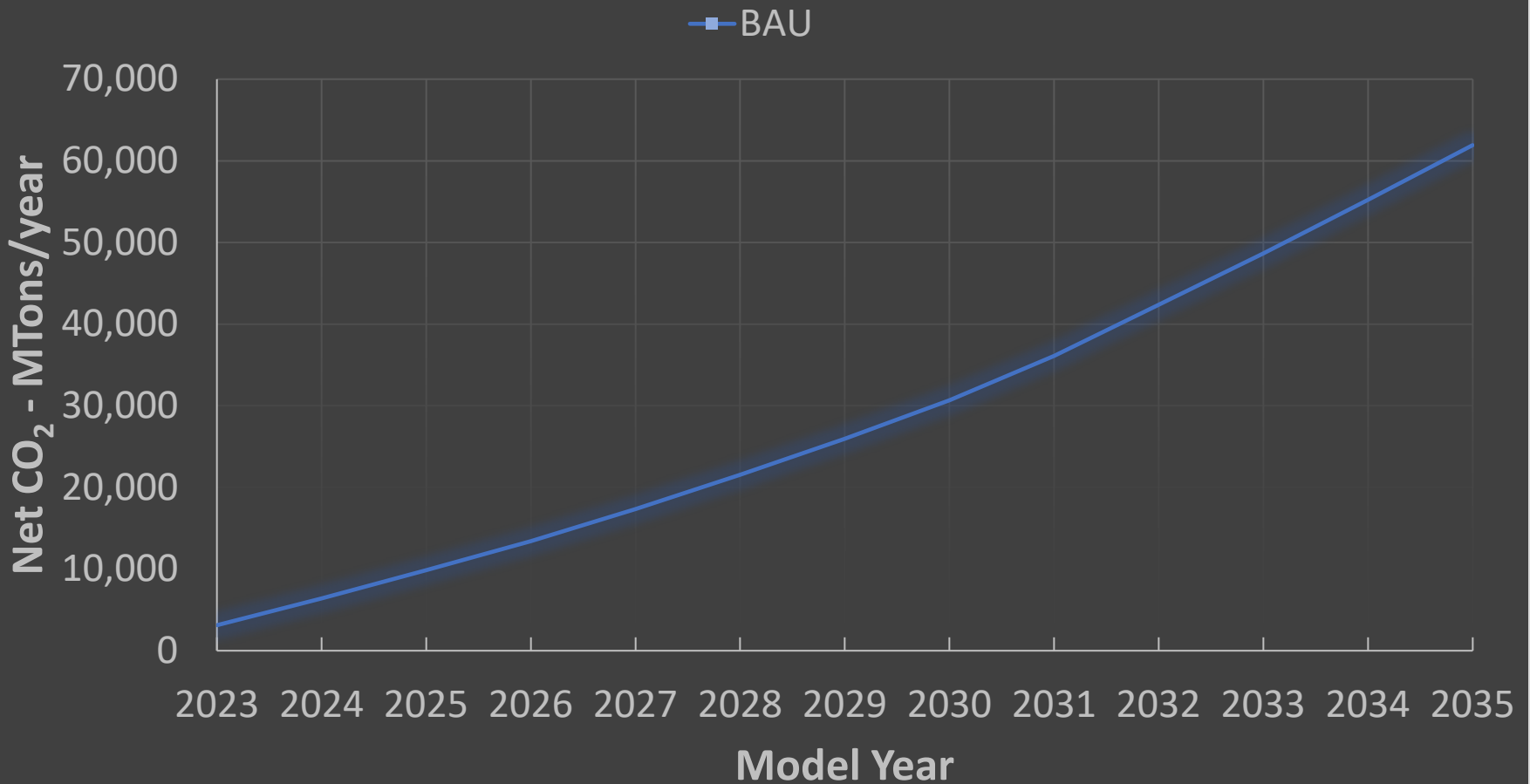
# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – BUSINESS AS USUAL (CONTINUED)

## ZEV and TZEV Sale Rates



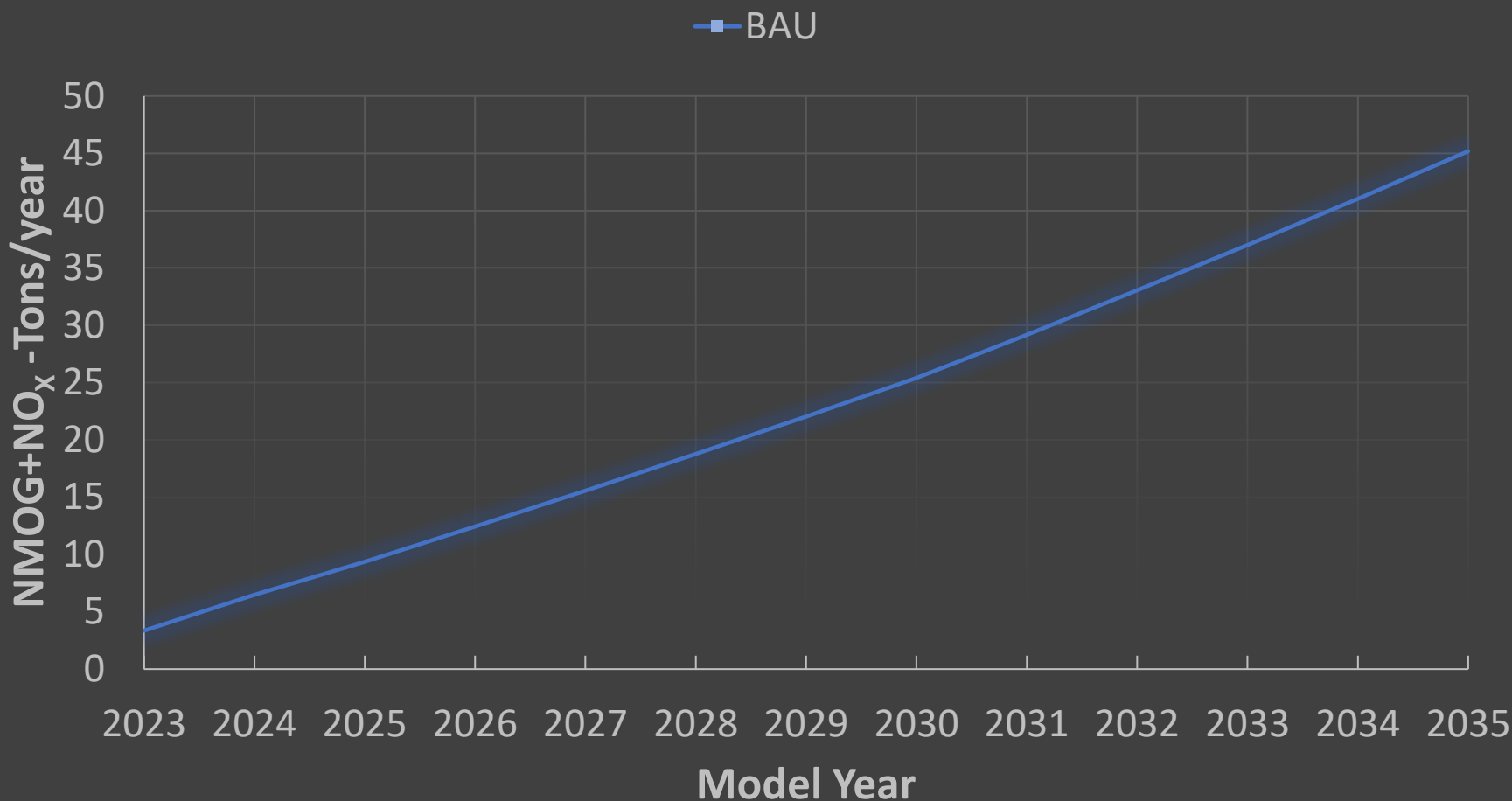
# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – BUSINESS AS USUAL (CONTINUED)

## CO<sub>2</sub> – Annual Emission Avoidance



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – BUSINESS AS USUAL (CONTINUED)

## NMOG+NO<sub>x</sub> – Annual Emission Avoidance



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – MINIMUM COMPLIANCE

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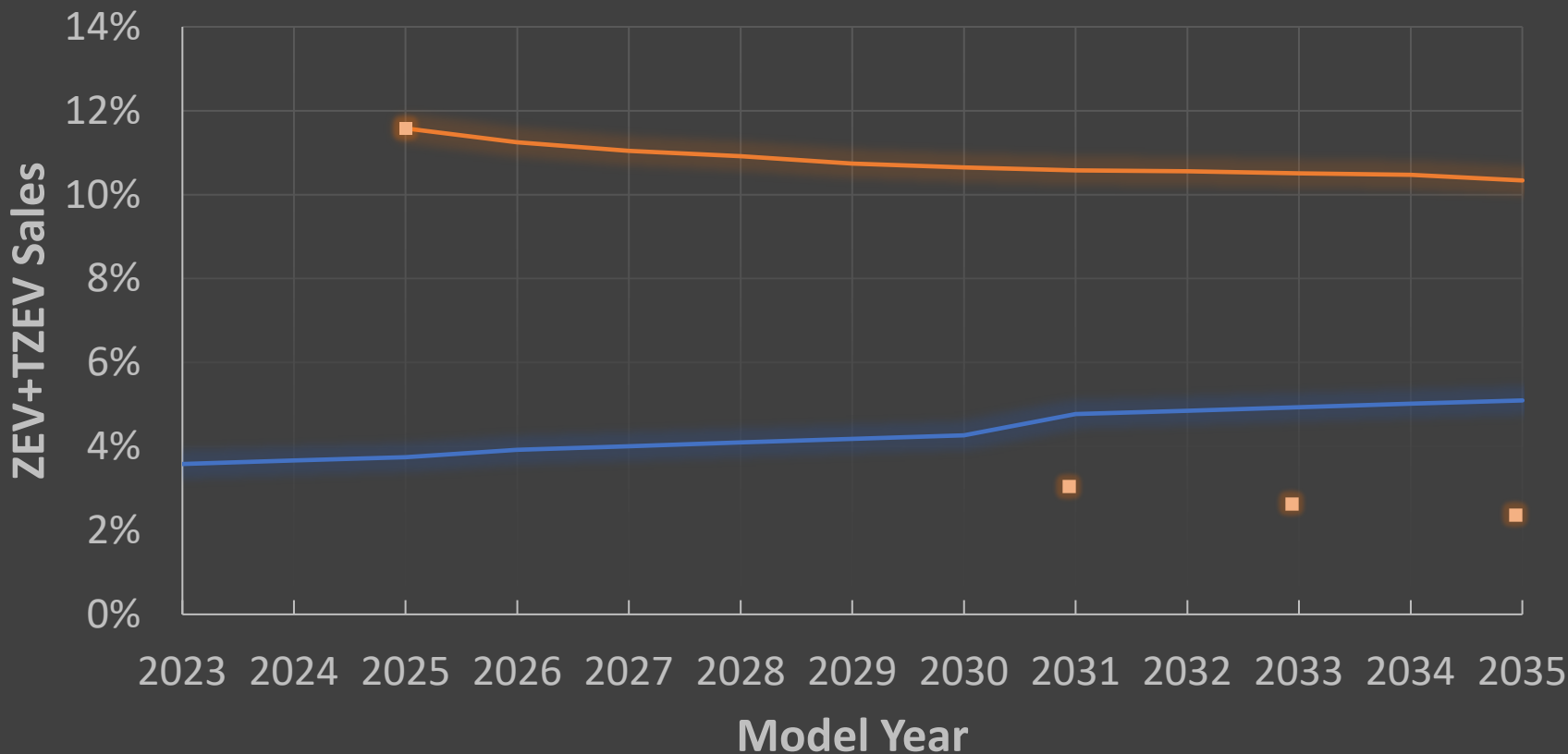
## Minimum Compliance

- Nevada adopts the ZEV Program starting MY 2025
- ZEV Program's requirements are the same through to MY 2035
- Car manufacturers' strategy is minimum compliance with the Program. No car manufacturer is over complying with the Program

# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – MINIMUM COMPLIANCE (CONTINUED)

## ZEV and TZEV Sale Rates

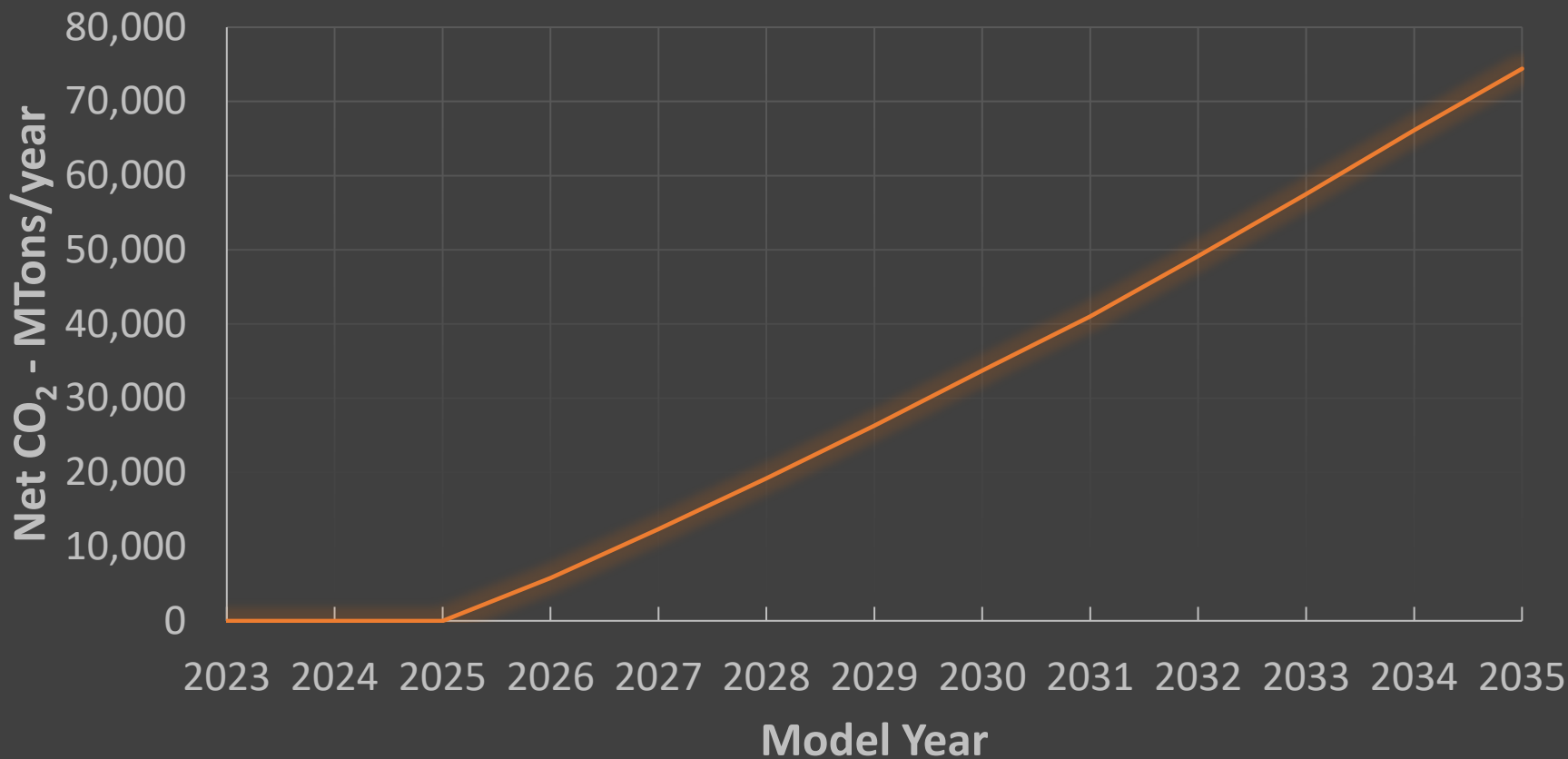
—■— BAU    —■— Minimum Compliance



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – MINIMUM COMPLIANCE (CONTINUED)

## CO<sub>2</sub> – Annual Emission Avoidance

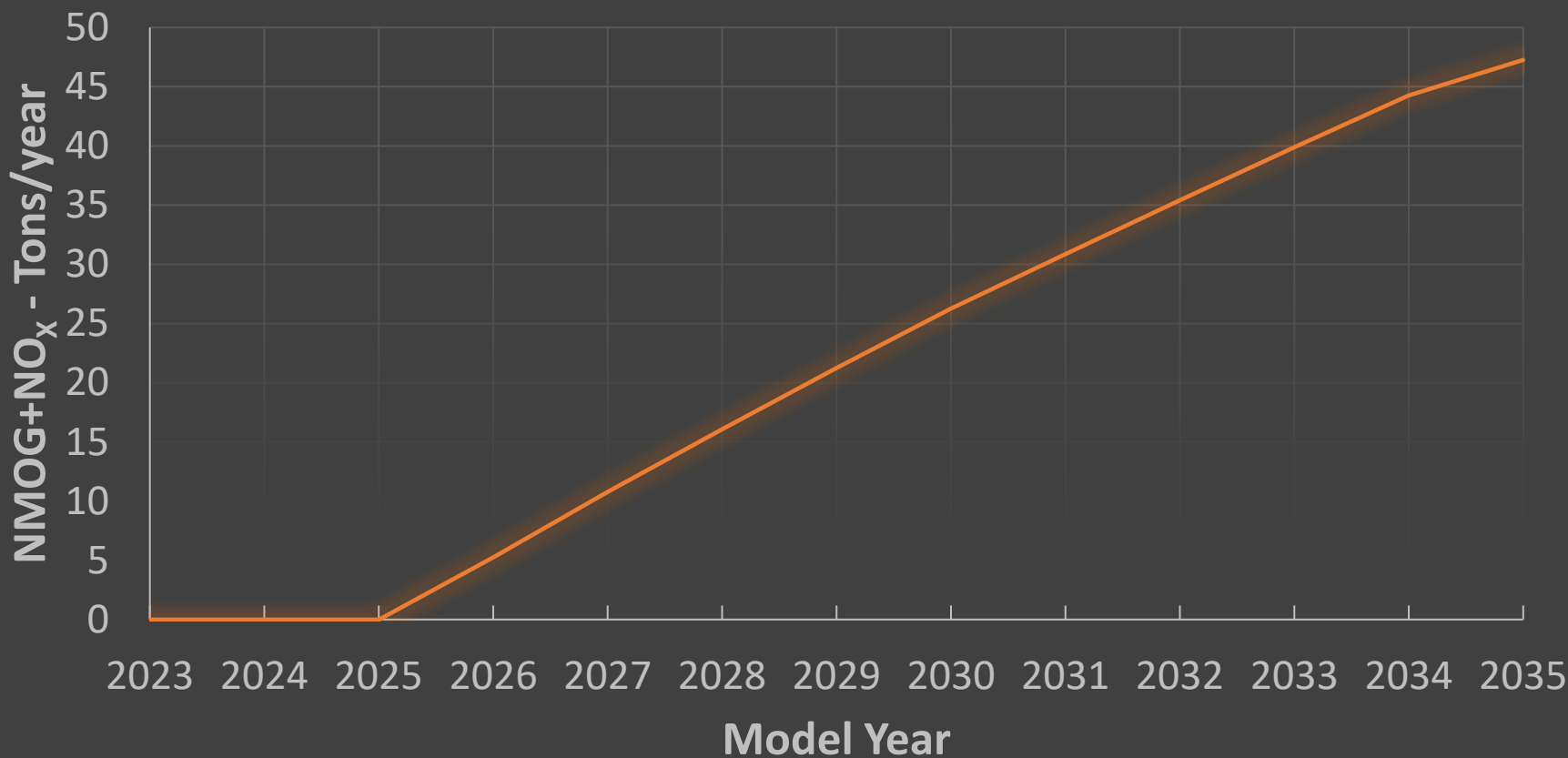
— Minimum Compliance



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – MINIMUM COMPLIANCE (CONTINUED)

## NMOG+NO<sub>x</sub> – Annual Emission Avoidance

— Minimum Compliance





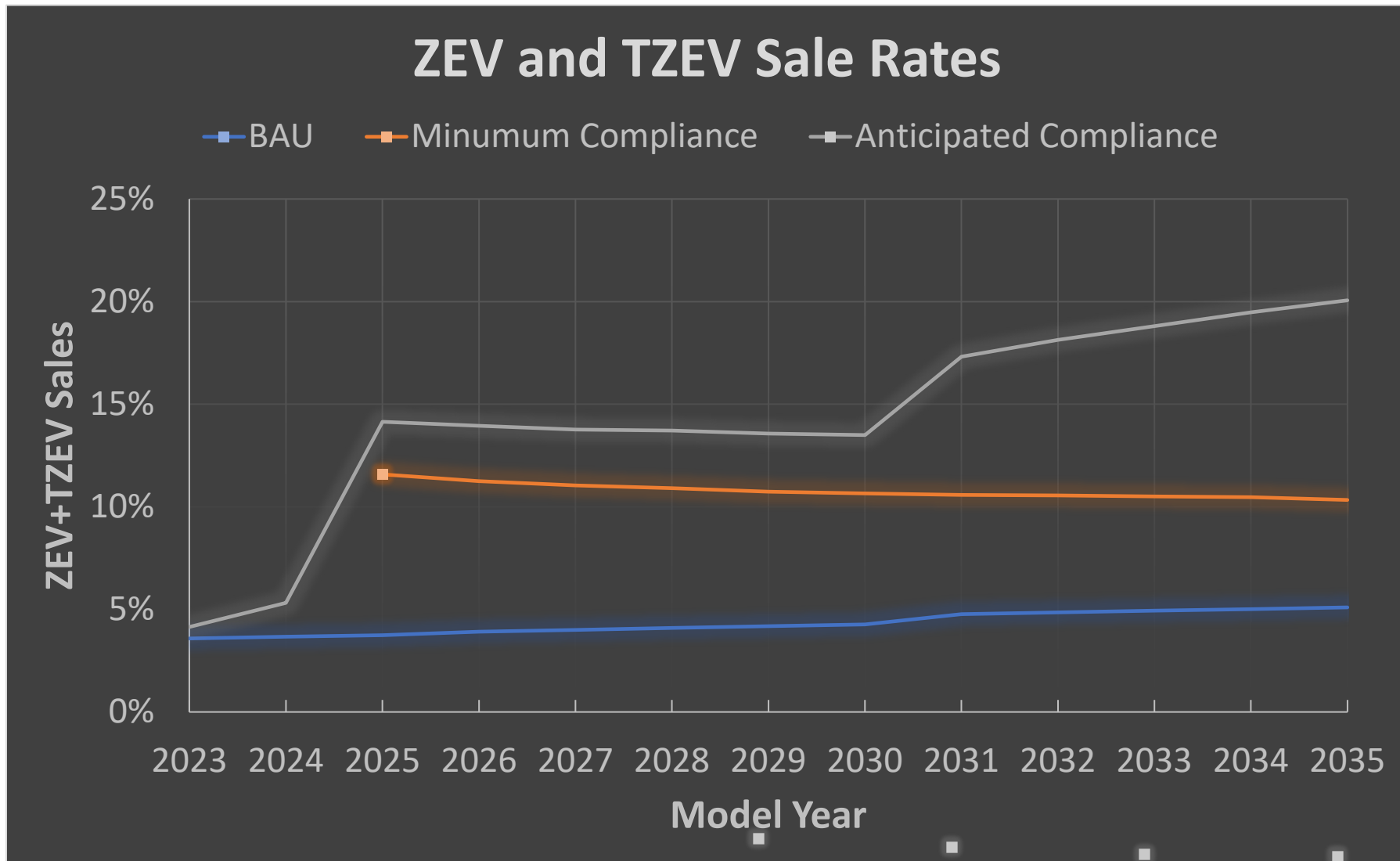
# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – ANTICIPATED COMPLIANCE

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## Anticipated Compliance

- Nevada adopts ZEV Program starting with MY 2025
- ZEV Program's requirements are the same through to MY 2035
- In addition to minimum compliance, sales of ZEV and TZEV follow trends and recent manufacturers' announcements of fleet electrification

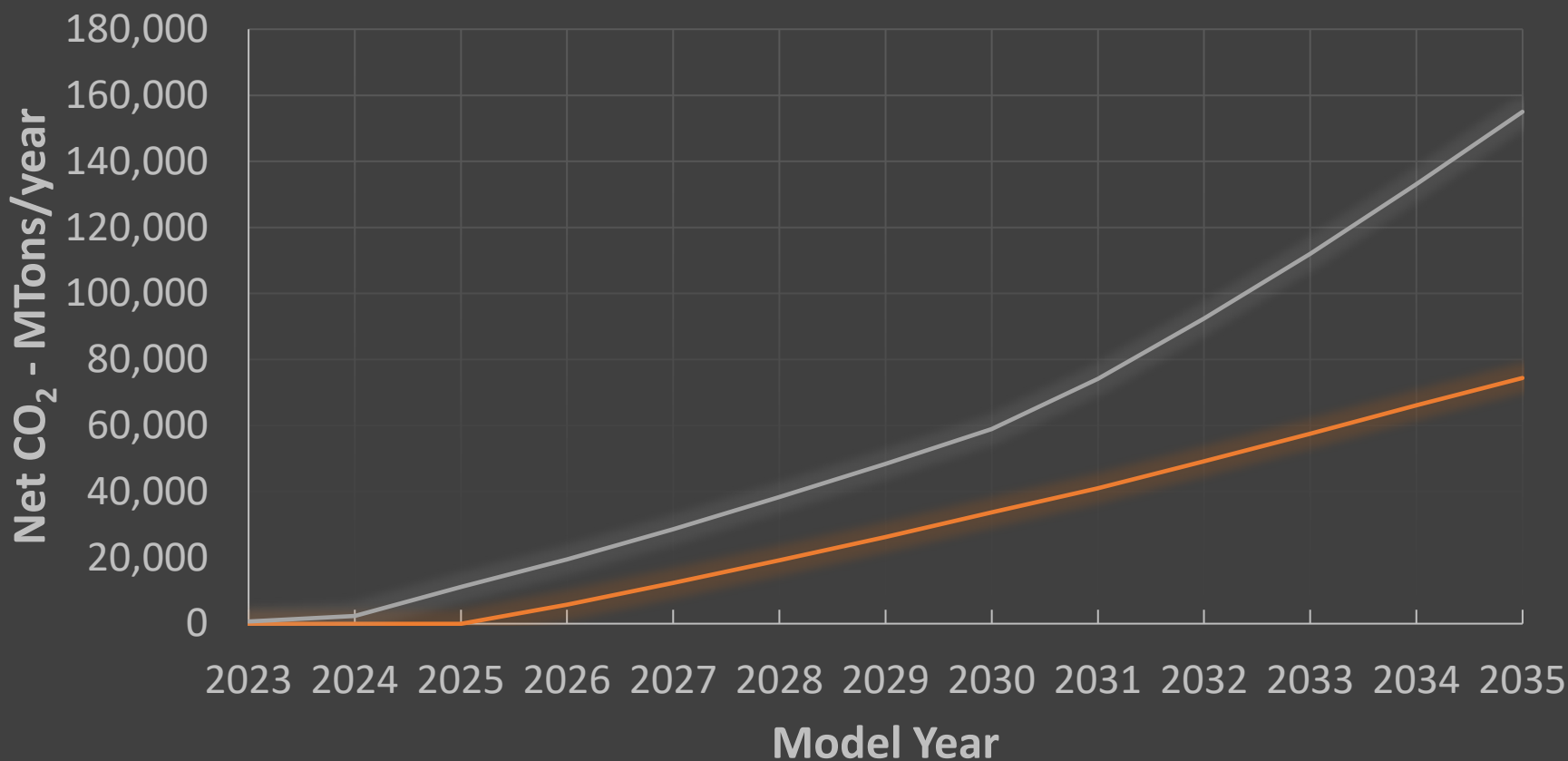
# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – ANTICIPATED COMPLIANCE (CONTINUED)



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – ANTICIPATED COMPLIANCE (CONTINUED)

## CO<sub>2</sub> – Annual Emission Avoidance

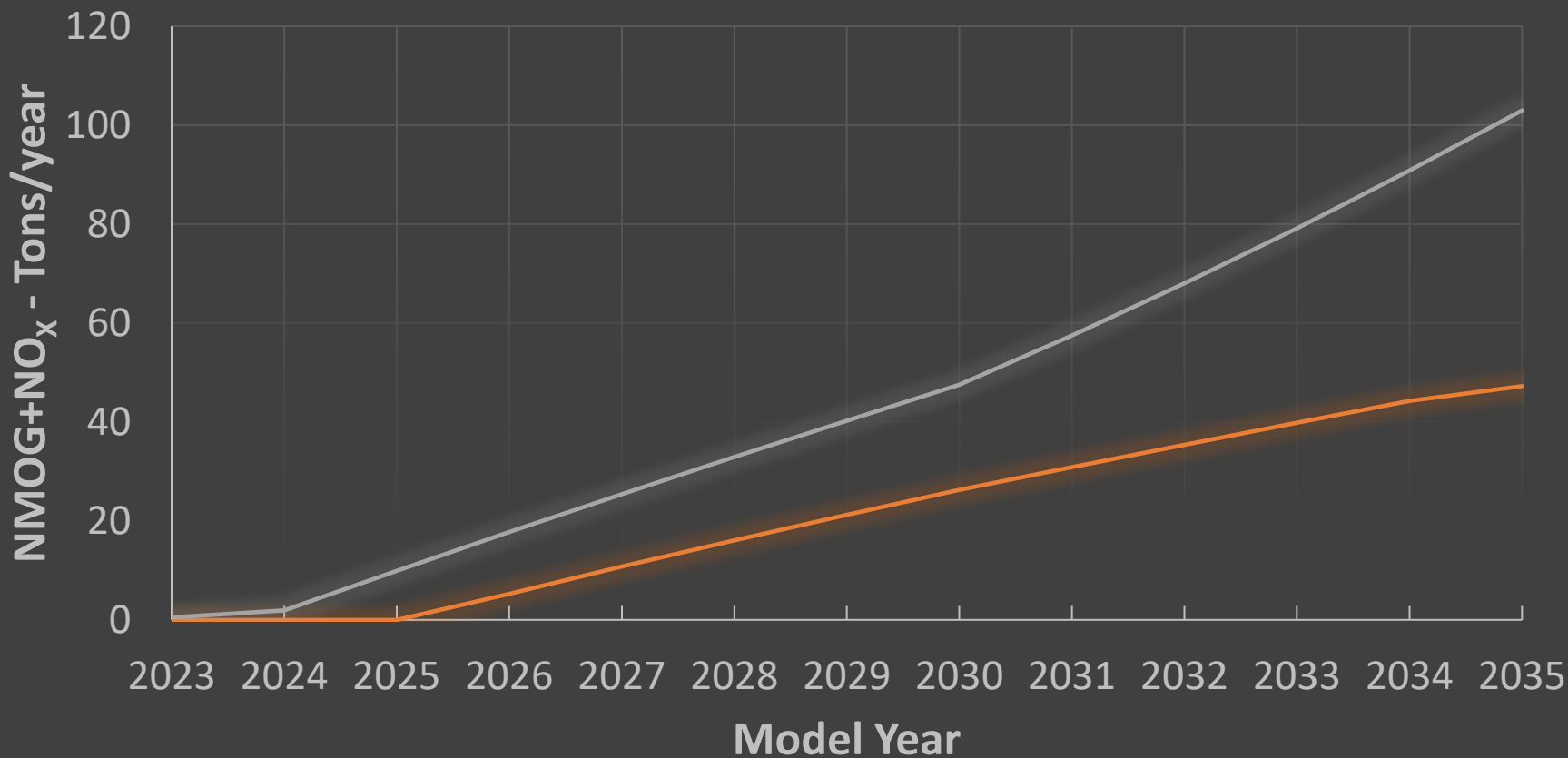
— Minimum Compliance    — Anticipated Compliance



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS BENEFITS – ANTICIPATED COMPLIANCE (CONTINUED)

## NMOG+NO<sub>x</sub> – Annual Avoided Emissions

— Minimum Compliance    — Anticipated Compliance



# ZEV PROGRAM PROJECTIONS – CREDITS AND EMISSIONS

## BENEFITS

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Review benefits of Clean Cars Nevada program vs. business as usual

- 1) Significant GHG reductions (helps achieve state climate goals)
- 2) Significant criteria pollutant reductions (benefits non-attainment areas and public health)
- 3) Helping to foster the more widespread availability of new BEVs and PHEVs in the NV market (helps improve consumer choice)

# ZEV CREDIT APPROACH

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Early Credits	Initial Proportional Credits
Directly related to Nevada ZEV sales	Proportionally based on a more mature and understood ZEV market
Manufacturers engage earlier with the ZEV Program	More effective in reducing the compliance uncertainty for manufacturers in the first few years of the program
Earlier and direct impact on air quality	Provides a credit buffer should CA dramatically increase its ZEV % in 2026

- Early Credits – yes, NV desires to facilitate the early adoption of ZEVs by the marketplace, and manufacturers should be able to capitalize on their early action by earning bankable credits. NV will accept and bank early credits for ZEVs sold in MY 2023 and MY 2024.
- **Proportional Credits – not yet; revisit in 2022 for MY 2026 and beyond.**

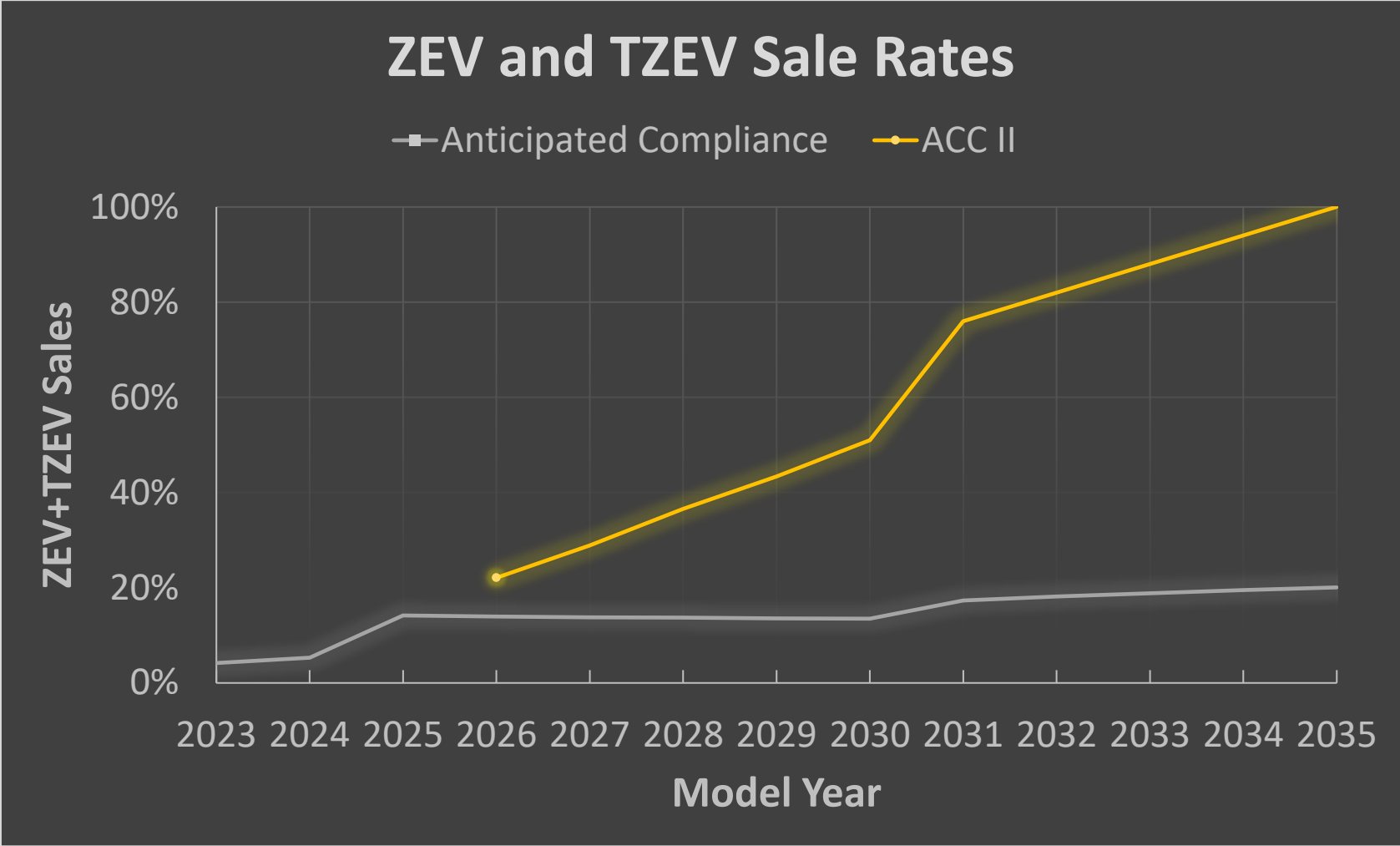
# ZEV – CARB ACC II MY 2026 AND BEYOND

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- On May 6, 2021, California Air Resources Board staff proposed draft regulations that seek to further reduce criteria and GHG pollutants from new light and medium-duty vehicles for 2026 and beyond.
- CARB Advanced Clean Cars II (ACC II) summary:
  - Annual manufacturer credit requirements progressively increase to 2035, when 100% ZEVs are required;
  - BEVs only receive 1 credit per vehicle;
  - PHEVs also receive 1 credit and must meet a minimum 50 miles US06 capable all-electric range to qualify for the credit;
  - Banked credits and historical credits expire after 5 years;
  - Value of banked historical credits will be reduced in value and other limitations imposed on credit usage.

<https://ww2.arb.ca.gov/events/public-workshop-advanced-clean-cars-ii>

# ZEV – CARB ACC II MY 2026 AND BEYOND



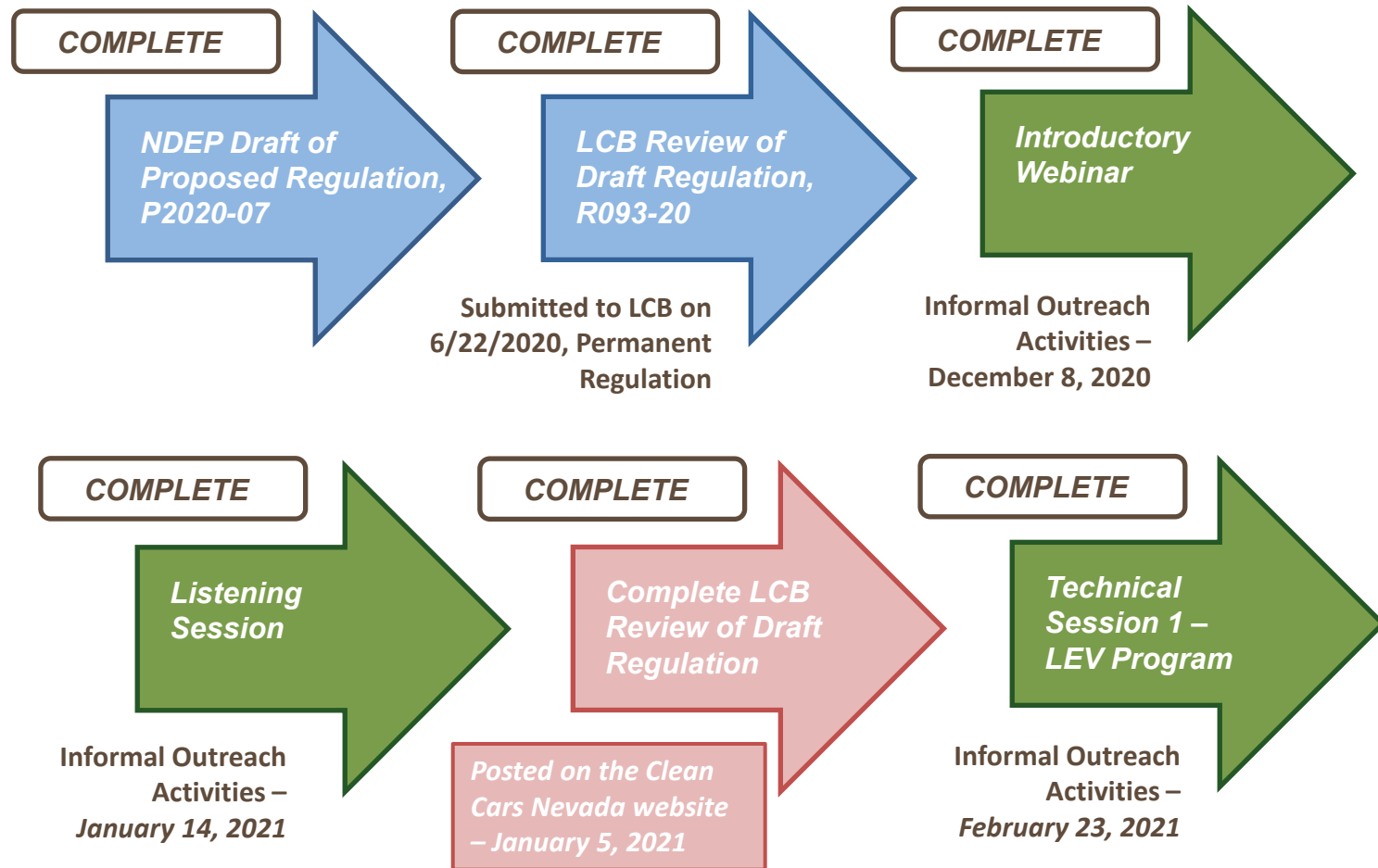


# ZEV – CARB ACC II MY 2026 AND BEYOND

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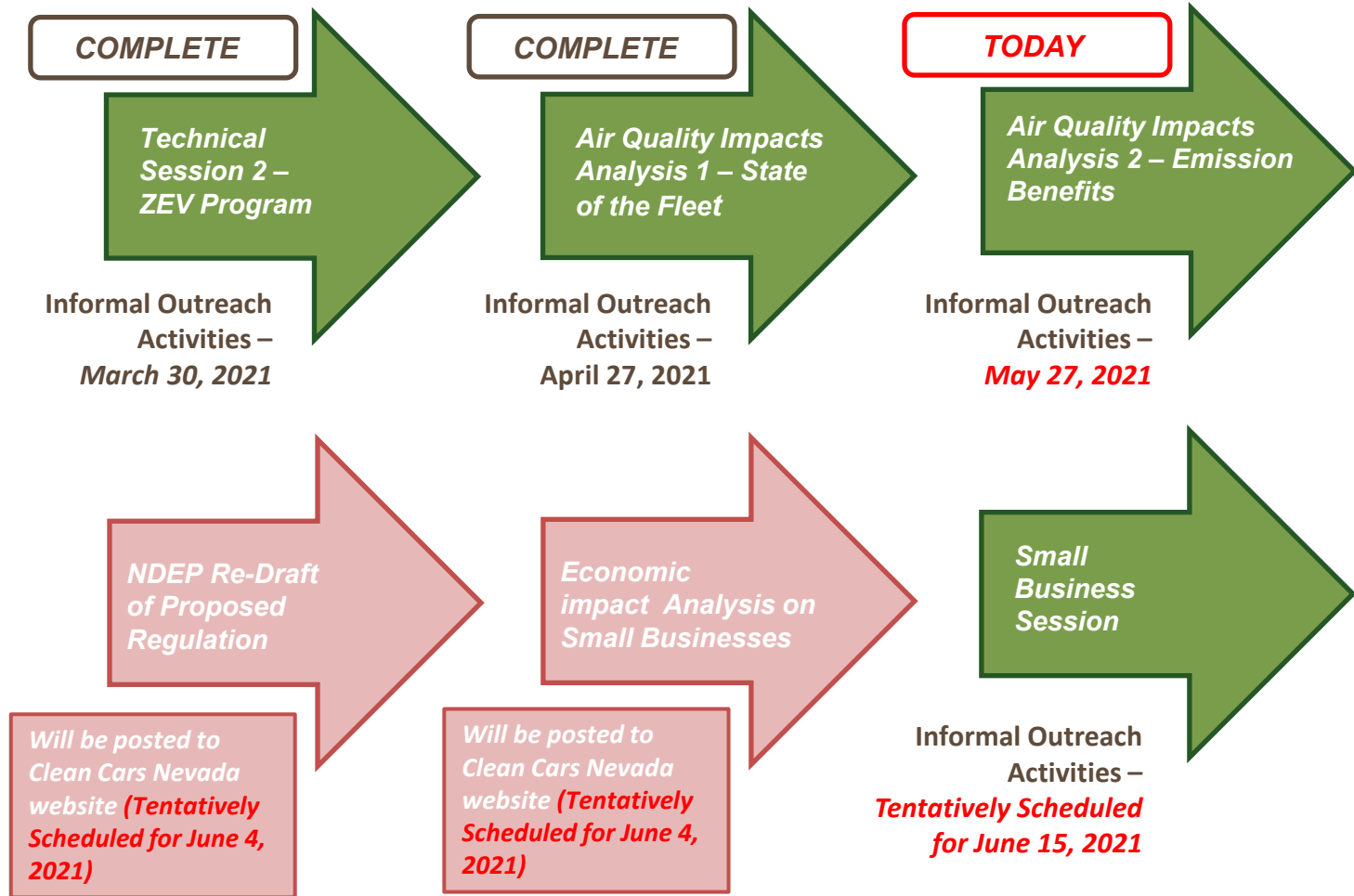
- This current Clean Cars Nevada rulemaking does not seek to adopt the draft CARB ACC II recommendations.
- Annual credit requirements for the manufacturers would dramatically increase beginning in MY 2026.
- NDEP commits to revisit the issue in a future Clean Cars Nevada rulemaking in 2022.

# THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION



Note: **BLUE** = Regulatory Step; **GREEN** = Informal Activity; and **RED** = Data/Analysis Step

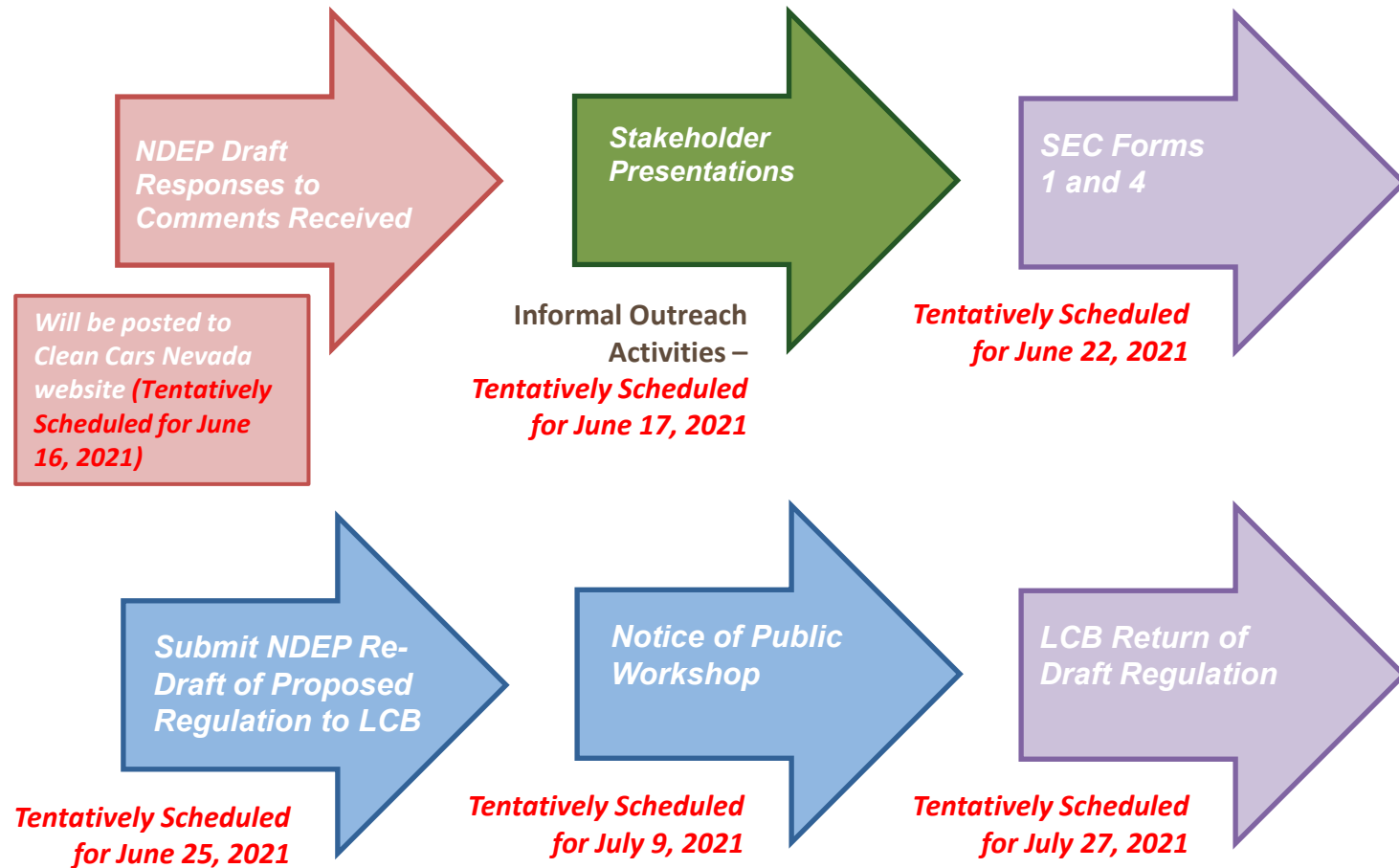
# THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION (CONTINUED)



Note: GREEN = Informal Activity; and RED = Data/Analysis Step

# THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION (CONTINUED)

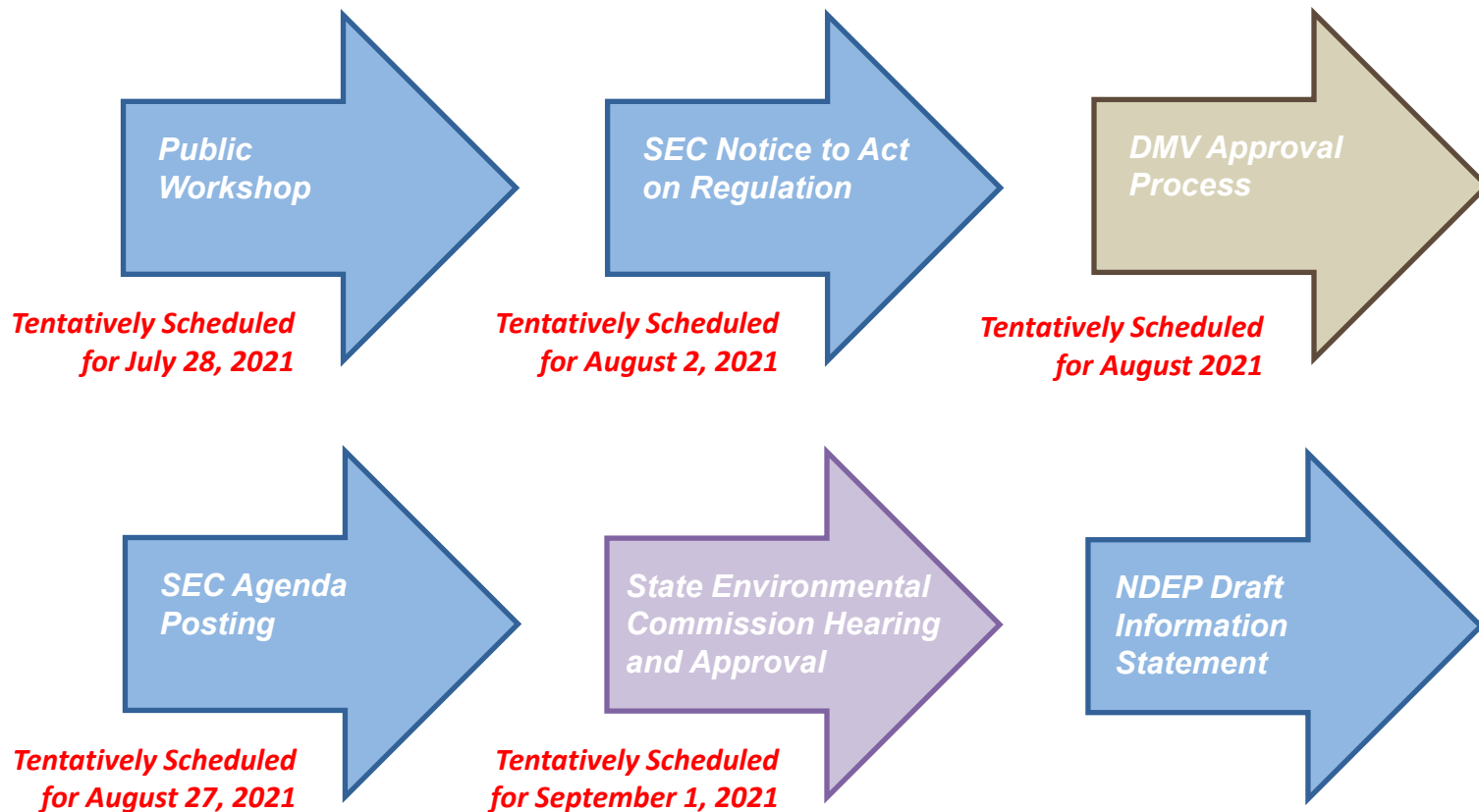
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Note: BLUE = Regulatory Step; GREEN = Informal Activity; RED = Data/Analysis Step; and PURPLE = Approval Process

# THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION (CONTINUED)

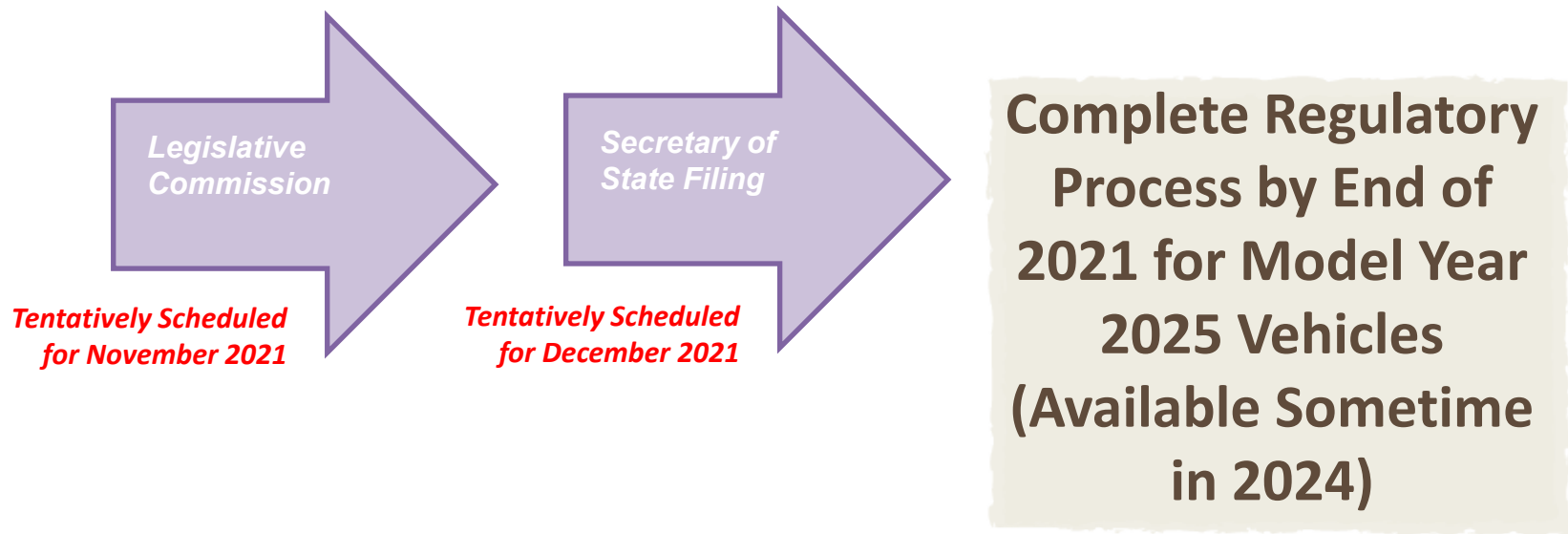
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Note: BLUE = Regulatory Step; PURPLE = Approval Process; and BROWN = DMV Process

# THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION (CONTINUED)

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# WHERE TO FIND OUT MORE



Visit NDEP Clean Cars Website for updates  
<http://ndep.nv.gov/air/clean-cars-nevada>



E-mail at [CleanCarsNevada@ndep.nv.gov](mailto:CleanCarsNevada@ndep.nv.gov)



Sign up for Clean Cars Nevada listserv on NDEP Website

Join a program-specific email list to follow NDEP's regulatory actions and public notices

GET NOTICES >

Select a topic below for program-specific news and updates.

Board for Financing Water Projects

VW Settlement - Nevada Mitigation Fund

Nevada Recycling Program

Nevada Brownfields Program

Air Quality Info and Notices

Nevada Federal DOE Facility Oversight

Environmental Outreach & Education

Clean Cars Nevada

# **NDEP is posting all public comments received by email or letter on-line**

**<https://documentviewerpublic.ndep.nv.gov>**

**An account is required to access the comments, but it can be created right away by signing up.**

**Once signed in, select the category 'Public Comments For Clean Cars Nevada'**

**You can then search for public comments by name, organization and submission date**



# Contact

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Visit NDEP Clean Cars Website for updates  
<http://ndep.nv.gov/air/clean-cars-nevada>



E-mail at  
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