



**ZEV Regulation 2010**  
**Staff Proposal**

Public Workshop  
November 16, 2010

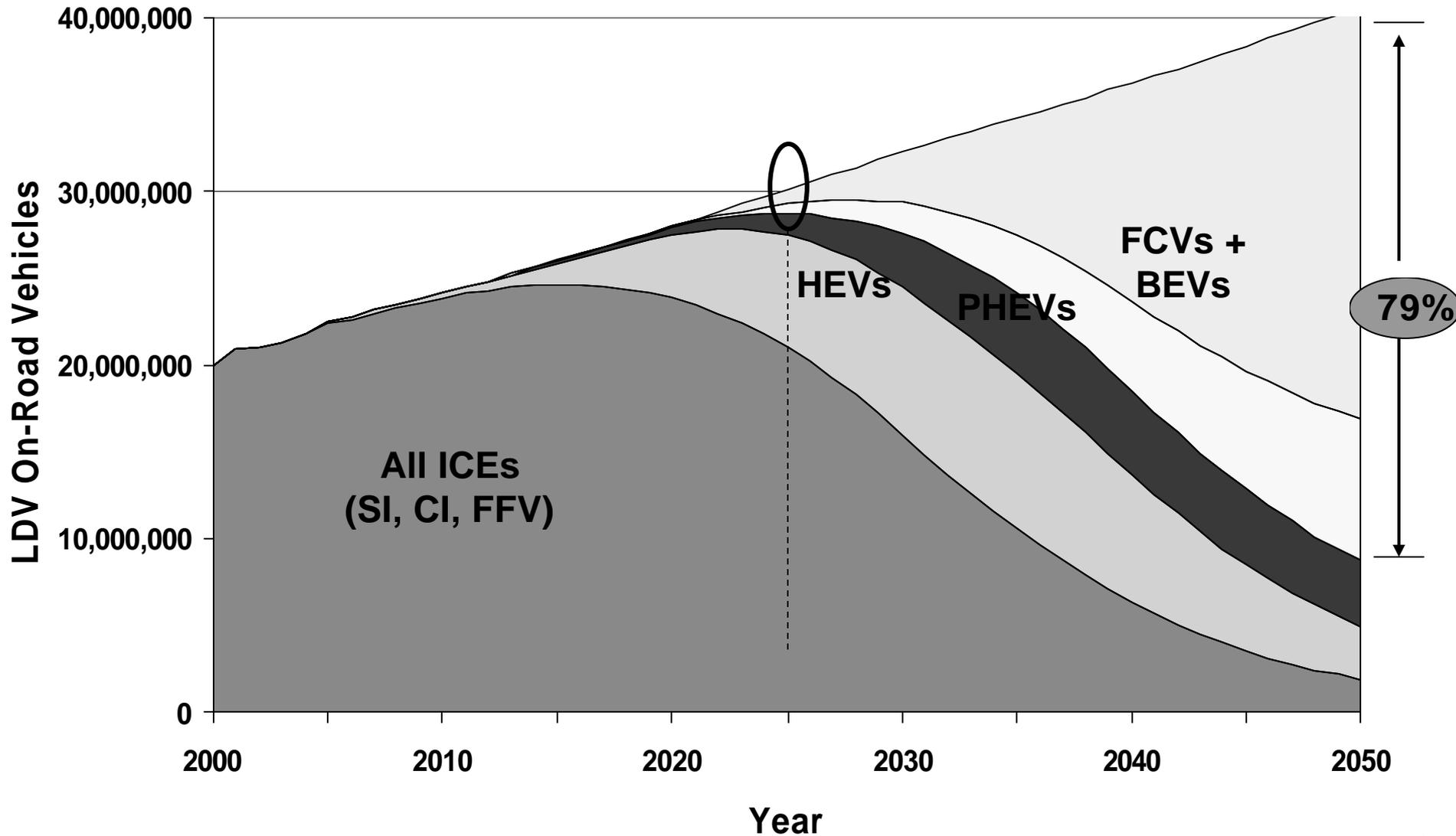
# [ Overview ]

- 2012-2014: Minor clarifying changes
- 2015-2017: Minor changes, some provisions extended
- 2018 and Beyond: Major changes

# [ Guiding Principles ]

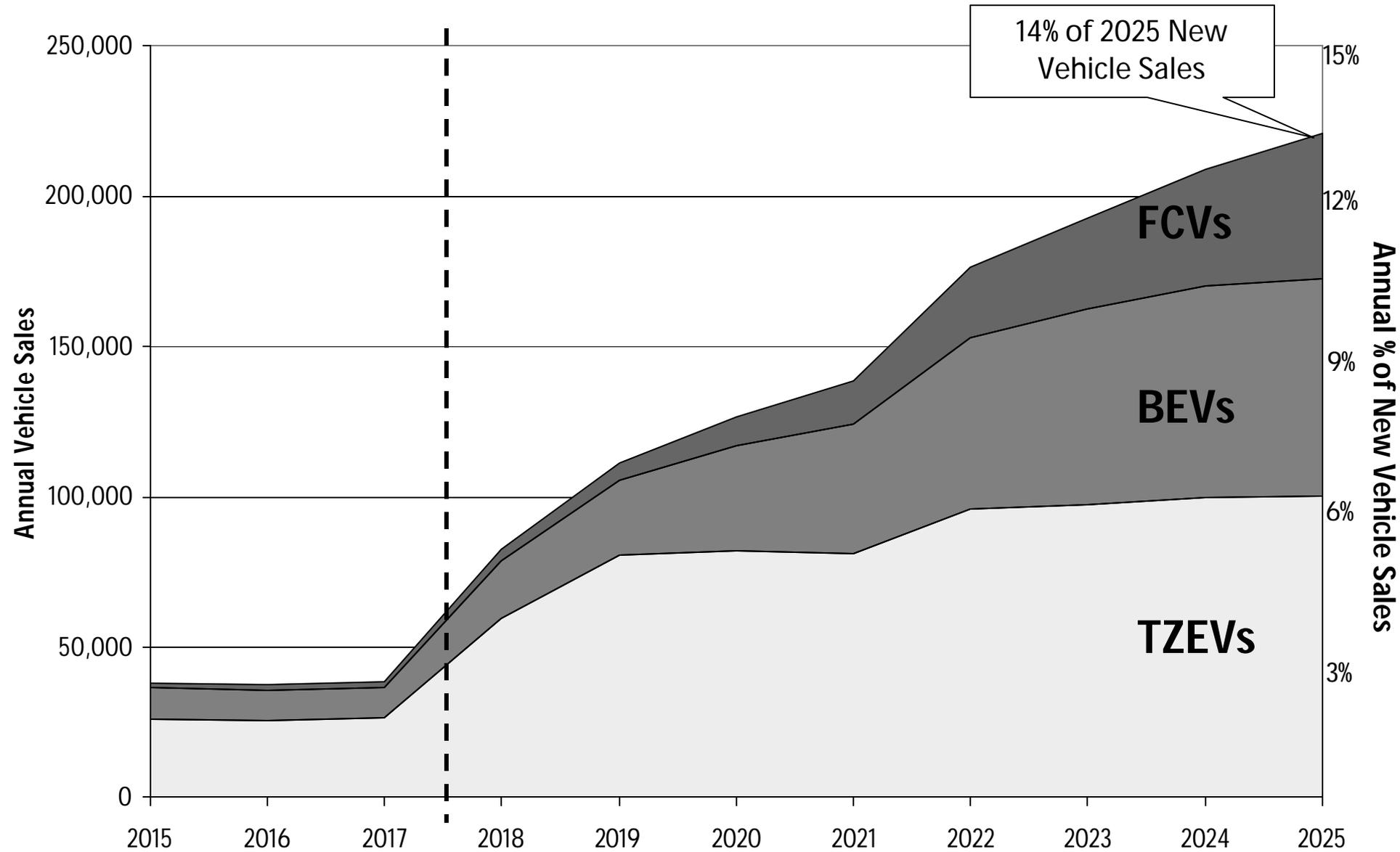
- 2050 Target requires a critical mass of vehicles by 2025
- 2025 Volume = high enough production to reach inflection point on cost curve
- Total ZEV program vehicle % of new sales is consistent with market demand
- Vehicle technologies are common in market place – i.e. multiple ZEV platforms

# LDV On-Road - 2050 Scenario 2



# Likely Compliance Scenario

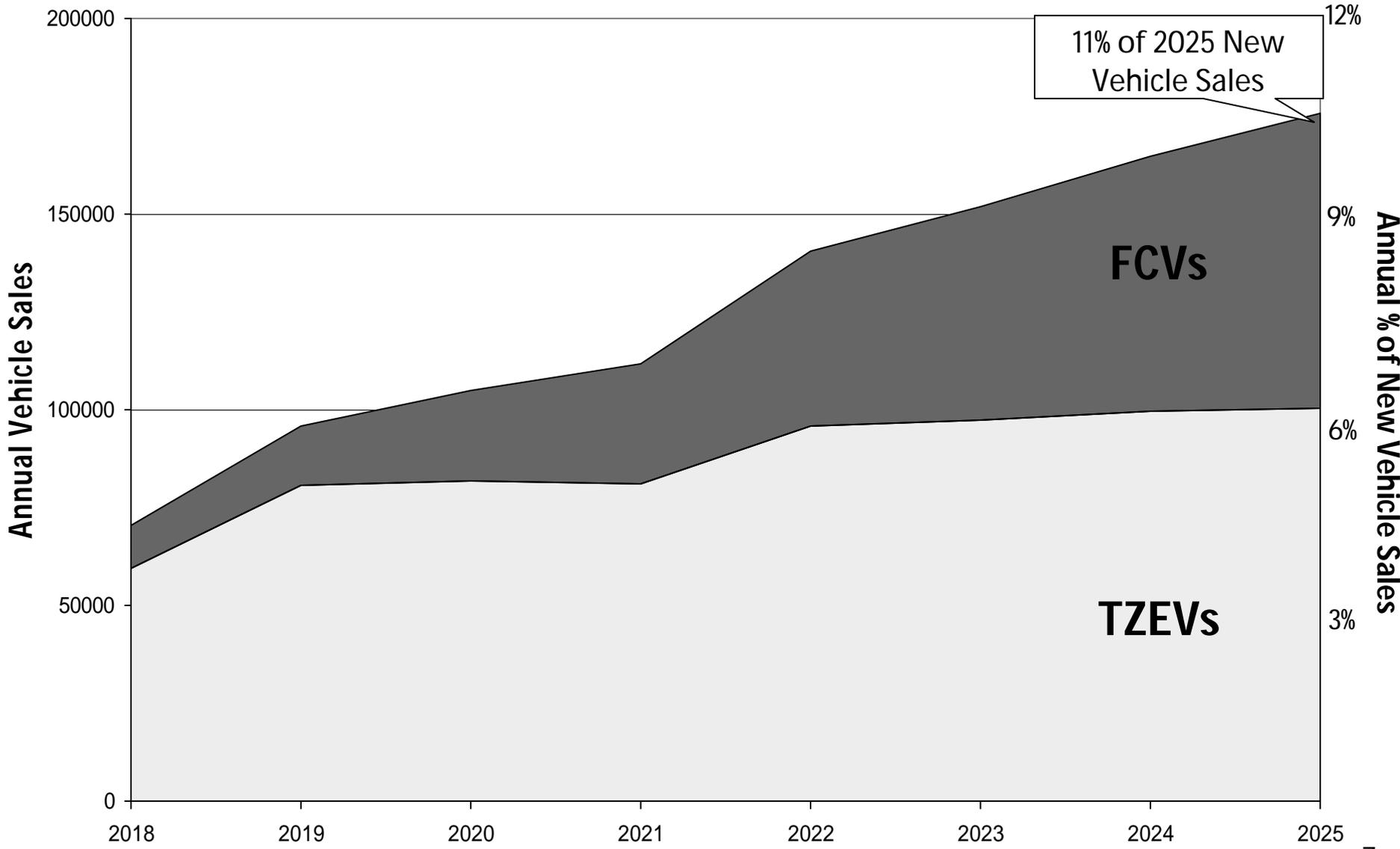
Min ZEV Compliance with expected FCV/BEV split



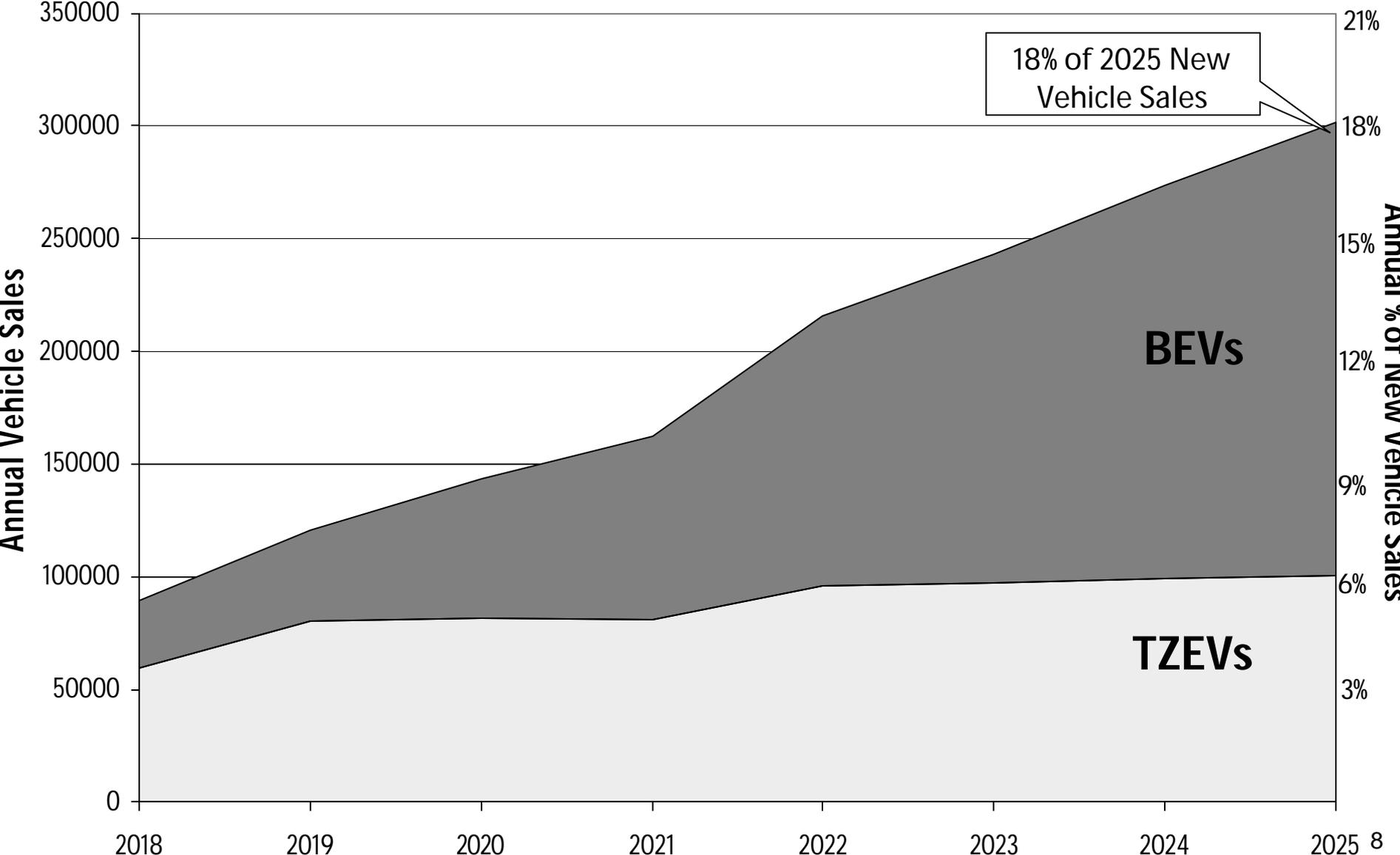
# Likely Compliance Scenario

|                           | 2018             | 2019              | 2020              | 2021              | 2022             | 2023             | 2024             | 2025             |
|---------------------------|------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|
| <b>ZEV Credit %</b>       | 6.12%            | 8.16%             | 10.20%            | 12.24%            | 16.59%           | 18.96%           | 21.33%           | 23.70%           |
| <b>ZEV %</b>              | 3.06%            | 4.08%             | 6.12%             | 8.16%             | 11.85%           | 14.22%           | 16.59%           | 18.96%           |
| <b>TZEV %</b>             | 3.06%            | 4.08%             | 4.08%             | 4.08%             | 4.74%            | 4.74%            | 4.74%            | 4.74%            |
| <b># ZEVs</b>             | 23,021<br>(1.5%) | 30,768<br>(2%)    | 44,894<br>(3%)    | 57,314<br>(4%)    | 80,568<br>(5%)   | 95,333<br>(6%)   | 109,513<br>(7%)  | 120,550<br>(8%)  |
| <b>#TZEVs<br/>(35 mi)</b> | 59,471<br>(4%)   | 80,584<br>(5.5%)  | 81,807<br>(5.5%)  | 81,195<br>(5.5%)  | 95,787<br>(6%)   | 97,258<br>(6%)   | 99,484<br>(6%)   | 100,458<br>(6%)  |
| <b>Total Vehicles</b>     | 82,493<br>(5.5%) | 111,352<br>(7.5%) | 126,702<br>(8.5%) | 138,509<br>(9.5%) | 176,355<br>(11%) | 192,591<br>(12%) | 208,997<br>(13%) | 221,008<br>(14%) |

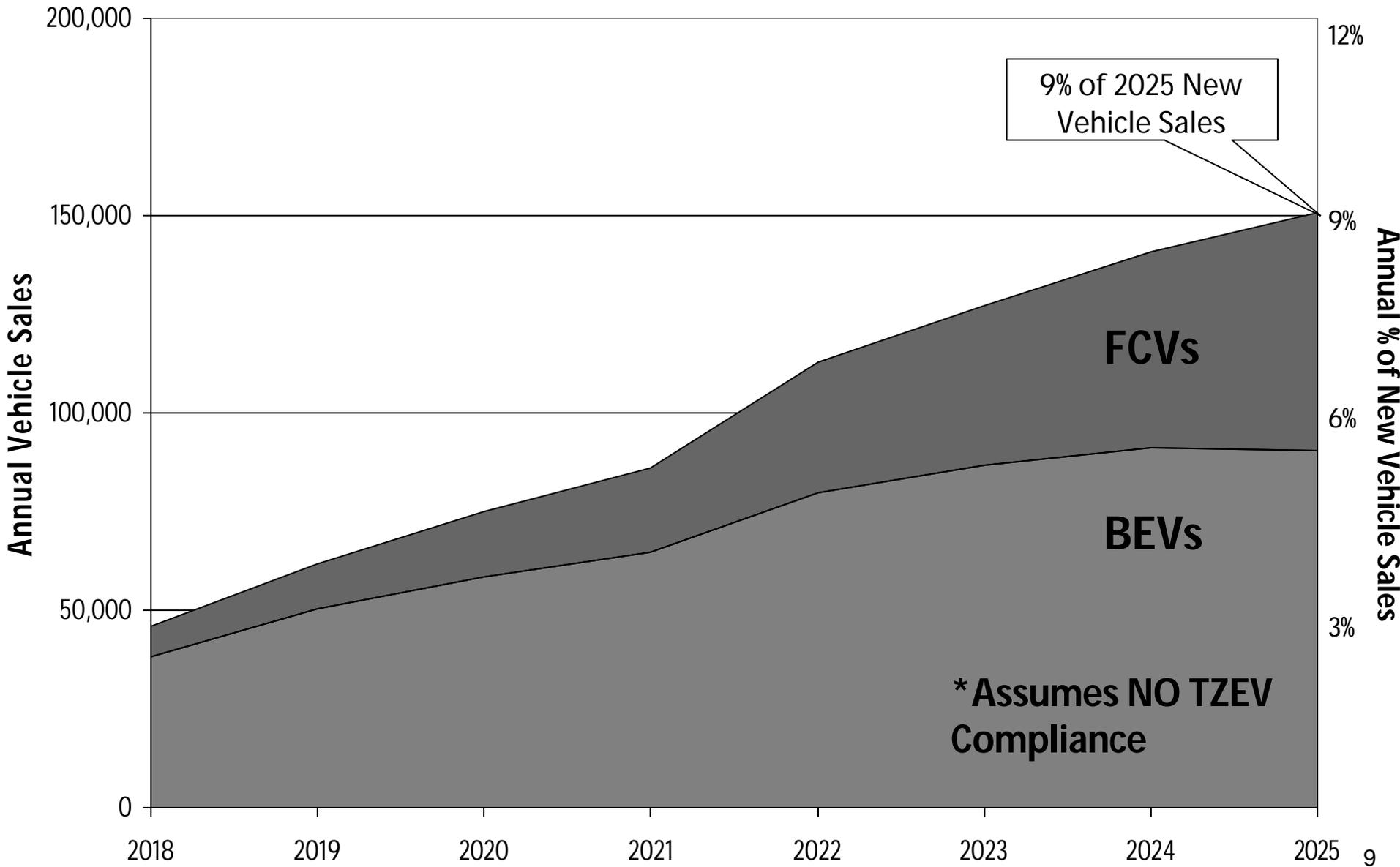
# Min ZEV Compliance (350 Mi FCV) with Max TZEV Compliance



# Min ZEV Compliance (100 Mi BEV) with Max TZEV Compliance



# Max ZEV Compliance (No TZEV) With Expected FCV/BEV Split



9% of 2025 New Vehicle Sales

**FCVs**

**BEVs**

**\* Assumes NO TZEV Compliance**

# [ New IVM/LVM & Ownership Definitions ]

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- IVM definition: less than 20,000 vehicles on annual average
- Ownership: owned 33.4% or more by another, sales aggregated for size determination

# [ LVMs and IVMs (Status) ]

|  |  |  |
|--|--|--|
| <p>LVMs</p> <ul style="list-style-type: none"><li>■ Toyota</li><li>■ Honda</li><li>■ Nissan</li><li>■ GM</li><li>■ Chrysler</li><li>■ Ford</li></ul> | <p>Transitioning LVMs</p> <ul style="list-style-type: none"><li>■ BMW (2012)</li><li>■ Daimler (2016)</li><li>■ VW (2018)</li><li>■ Mazda (2018)</li><li>■ Hyundai (2018)</li><li>■ Kia (2018)</li></ul> | <p>Continuing IVMs</p> <ul style="list-style-type: none"><li>■ Subaru</li><li>■ Volvo</li><li>■ Mitsubishi</li><li>■ JLR</li></ul> <p><b>* Continuing IVMs will be able to fully comply with TZEVs</b></p> |
|--|--|--|

# [ IVM Requirements ]

- 2015 through 2017
  - Currently: 14% credit requirement
  - Proposal: Reduce credit requirement to 12%
    - PZEVs = 60% of IVM new vehicle sales
- 2018 through 2025
  - Intermediate volume manufacturers can meet their entire requirement with TZEV credits

# Possible Ramp-In Options

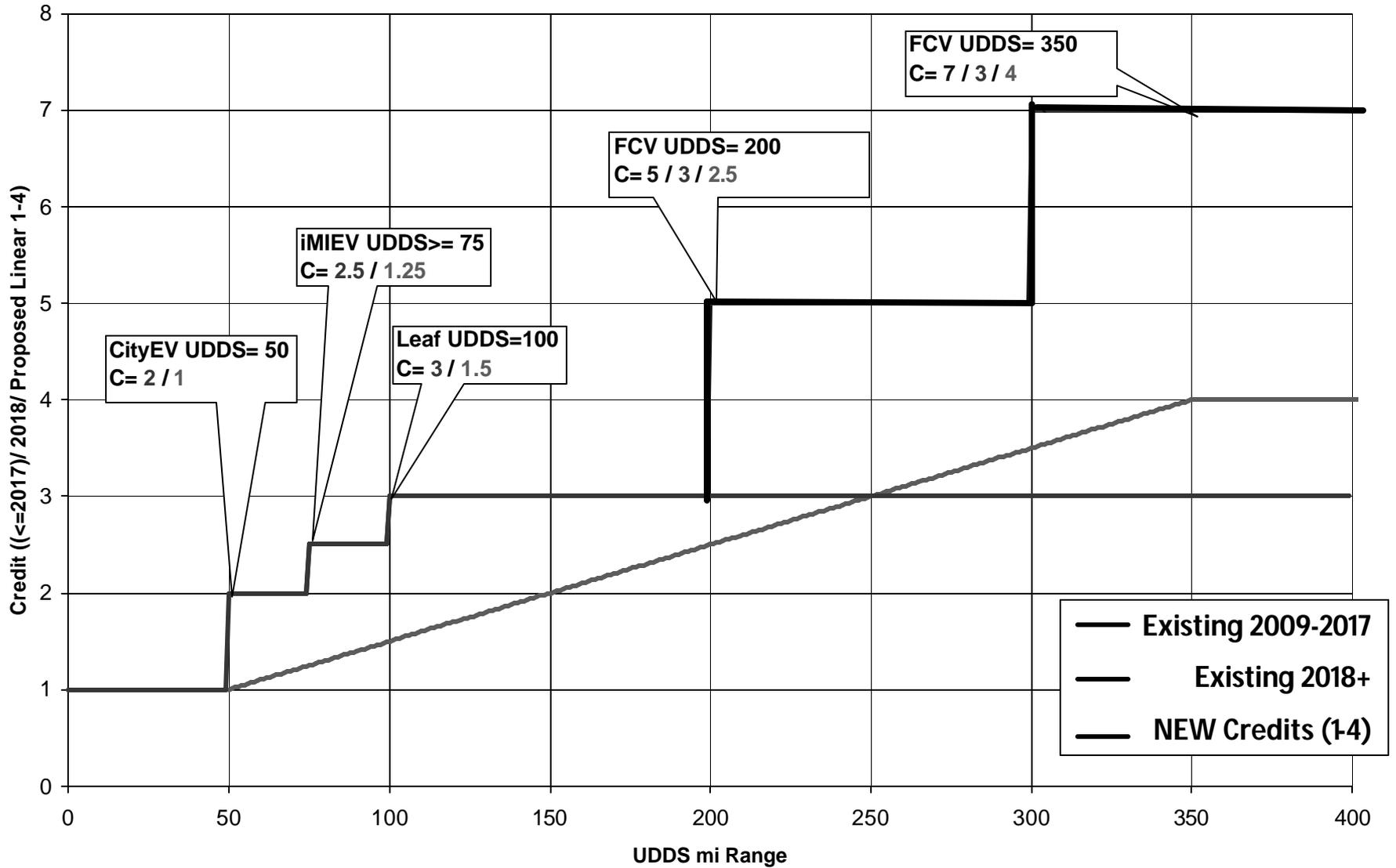
## Continuing IVMs and Transitioning LVMs

1. No cap for converted PZEV credits in 2018 and 2019 for IVMs, so that their entire requirement could be met with converted credits
2. Only 75% reduction to upgrade from PZEV to TZEV

# ZEV Credit Factors

- 2012-2017: No change
- 2018 and beyond: Credit based on range only
- Credit range between 1 and 4 , with 50 mile (UDDS) min, and 350 mile (UDDS) max

# ZEV Credits



# [ Placed in Service (Current) ]

- Review: ZEVs receive 1 credit for being delivered for sale, and receive additional credits after being placed in service
- Review: NEVs must be placed in service

# [ Placed in Service (Proposed) ]

2018 and Beyond:

- NEVs required to be placed in service
- ZEVs no longer required to be placed in service
- Manufacturers are to submit list of VINs for ZEVs delivered for sale

# TZEVs

## The New Enhanced AT PZEVs

### Definition

- TZEV = **T**ransitional **Z**ero **E**missions **V**ehicle
- Requires use of a ZEV fuel
  - Electricity (PHEV)
  - Hydrogen (dedicated)
- Meets SULEV emission level
- 15yrs/150k mi Emissions Warranty
- 10yrs/150k mi Battery Warranty
- Earns at least 0.5 credits

# TZEV Credits

- Simplify credits by eliminating low fuel cycle emissions allowance and advanced componentry allowance
  
- Adjust overall credit range
  - Current: 1-2.5 credit
  - Proposed: 0.5- 1.25 credit (\*considering lower min credit)
  
- HICEs must have 200 mile range and receive 0.75 credits
  - Plug-in HICE Credits = 0.75 credits + zero emission VMT allowance
  - Total credit will not exceed 1.25

# PHEVs

## Qualifications:

- $\geq 50$  kW (electric kilowatts) drive
- Traction Drive System voltage  $\geq 60$
- EAER (equivalent all electric range)  $\geq 10$  miles (unadjusted UDDS range)
- All consumer accessible operating modes must be recharge dependant

## Credits:

### Based on UDDS

$$\text{Credit} = [UF_{R_{cda-d}} * ERF * C1] + C2$$

### Based on US06

$$\text{Credit} = [UF_{R_{cda}} * ERF * C1] + C3$$

UF = Utility Factor, based on range

$R_{cda-d}$  = Discounted Range Charge Depletion Actual

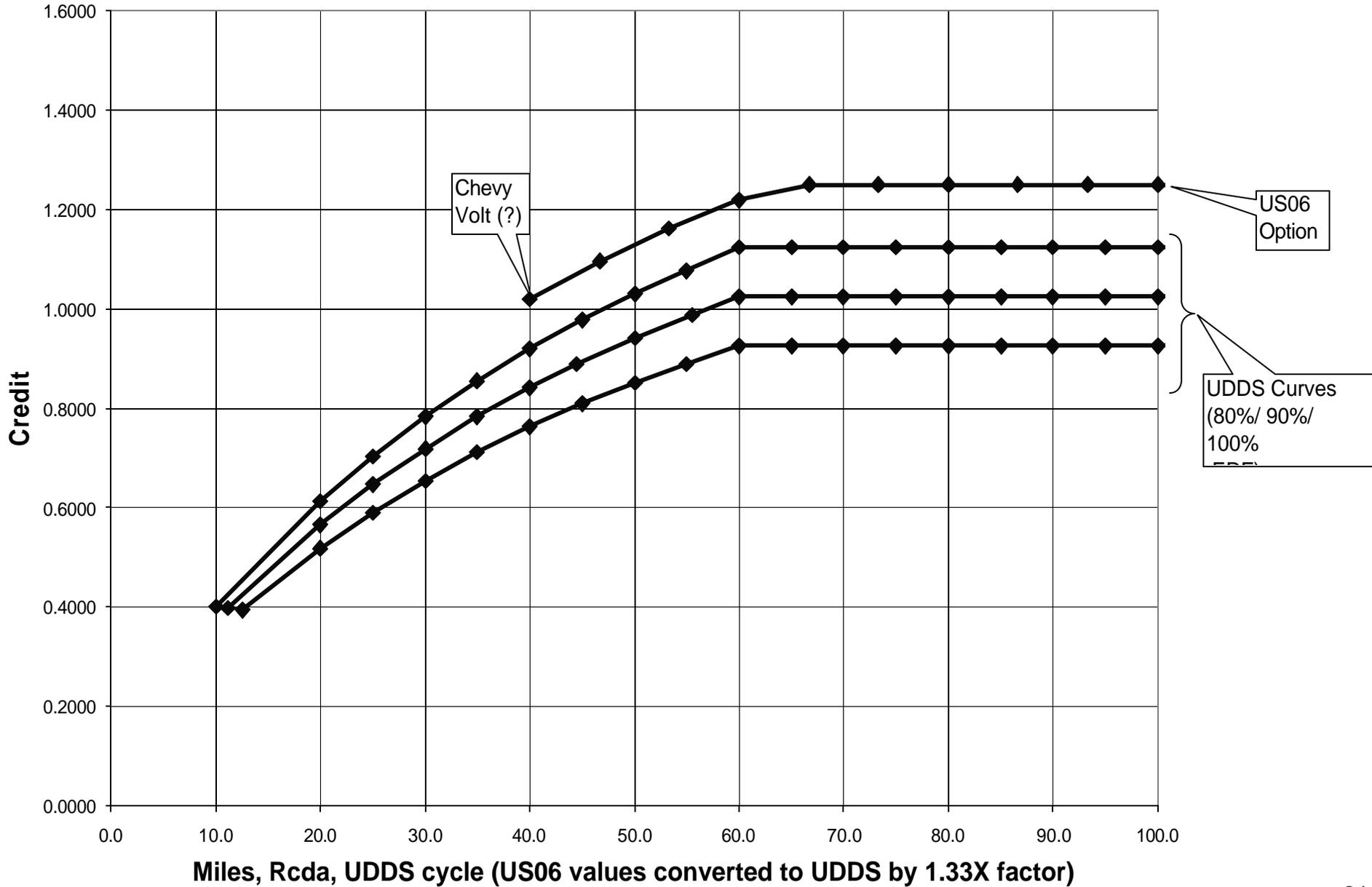
ERF = Electric Range Fraction ( $EAER/R_{cda}$ )

C1 = 1.5

C2 = 0.136

C3 = 0.236

# Proposed TZEV-PHEV Credit VS UDDS Miles (6e)



# [ Advanced Componentry Allowance ]

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- Eliminating Type C advanced componentry allowance after MY 2011

# [ Travel Provision ]

- Type I, I.5, and II: extended through 2017 MY, sunset in 2018 MY
- Type III: no change, sunset in 2018 MY
- Type IV and V (ie. Fuel cell vehicles): travel until sufficient complimentary policies established in S177 states
- No travel for TZEV, AT PZEV, or PZEV

# ZEV Bank

- For simplification, NMOG no longer used in ZEV bank accounting
- Process:
  - After 2013 MY reporting is complete, manufacturers' bank balances will be divided by 0.035
  - In 2014 MY and beyond, transactions with the ZEV bank will be in terms of ZEV credits

# PZEV and AT PZEVs

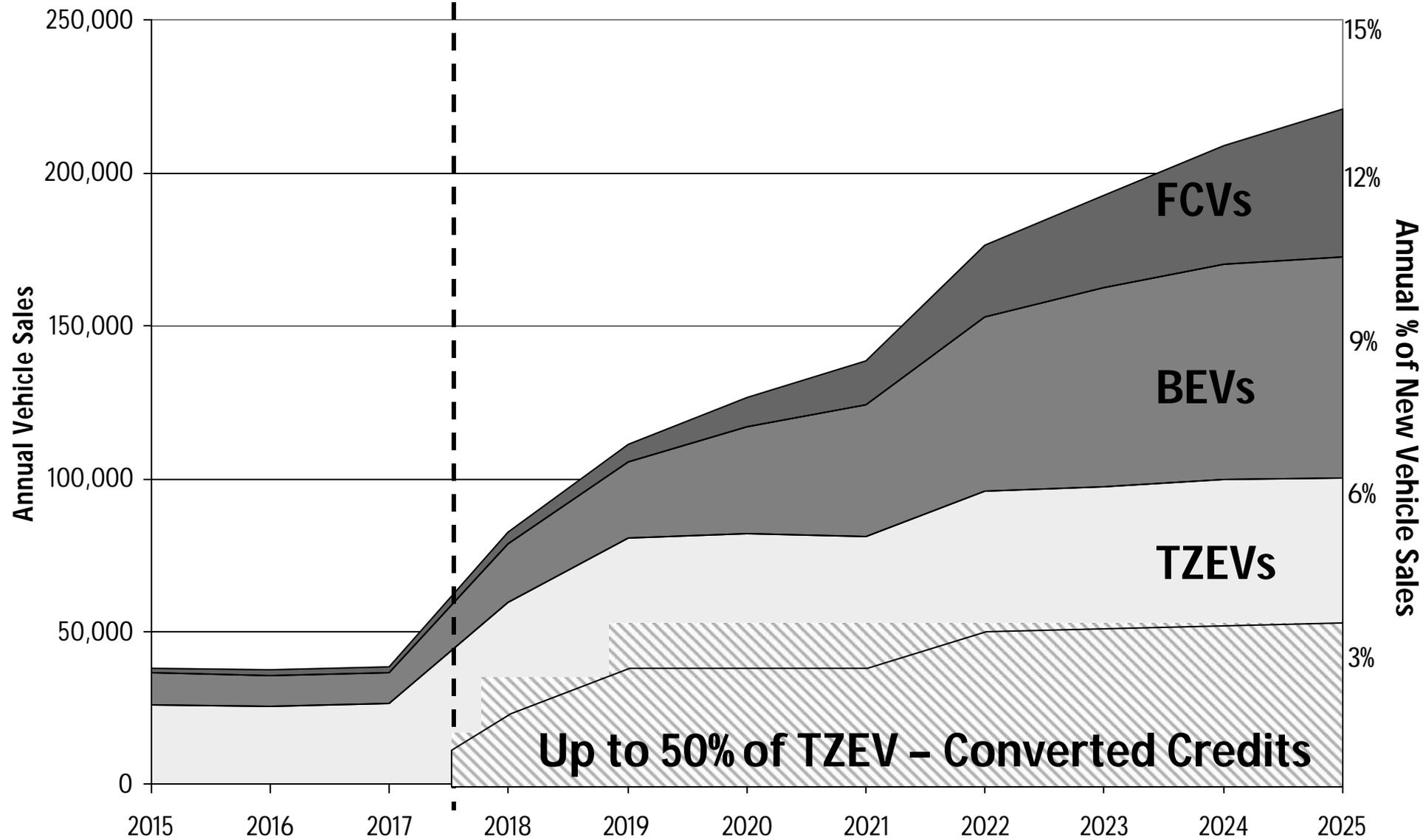
- PZEVs and AT PZEVs will remain as compliance options in regulation through MY 2017
- Only TZEVs and ZEVs will remain in the ZEV program 2018 and beyond

# Historical Credits

- Historical PZEV and AT PZEV credit banks converted after MY 2017 compliance
- **PZEVs: 93.75% Discount**
  - Example: 60 PZEVs = 1 TZEV
- **AT PZEVs: 75% Discount**
  - Example: 5 AT PZEVs = 1 TZEV
- Converted credits: only able to fulfill 50% TZEV category
  - IVMs allowed to fulfill entire requirement with converted credits through MY 2019

# Likely Compliance Scenario

Min ZEV Compliance with expected FCV/BEV split



# [ Advanced Demonstration Credits ]

Current:

- Available for TZEVs and ZEVs (Type I - V)
- Advanced Demo (AD) credits set to expire after MY 2014

Proposed:

- Sunset TZEV AD Credits after MY 2014
- Extend AD Credits for ZEVs (Type I - V) through MY 2017
- Sunset AD Credits for ZEVs at end of MY 2017

# [ Transportation System Credits ]

- Lessen value of TS Credits for MY 2015-2017

| <b>2015-2017</b> | <b>Shared Use, Intelligent Technologies</b> | <b>Linkage to Transit</b> |
|------------------|---|---------------------------|
| TZEVs            | 0.50  | 0.50                      |
| ZEVs             | 0.75  | 0.75                      |

- Sunset TS Credits for ZEVs and TZEVs at end of MY 2017

# [ Charging Requirements ]

- Updating 1962.2 to reflect charging requirements for all ZEVs
  - SAE J1772 - January 15, 2010 Version
- Effective MY 2012
- Required for all MY 2014 and beyond NEVs

# Penalty Equation

- 1 Full ZEV Credit = \$5000 Penalty

DRAFT Regulatory Language:

2012-2013

- $(\text{No. of ZEV credits required to be generated for the model year}) - (\text{Amount of ZEV credits submitted for compliance for the model year}) / (\text{the fleet average requirement for PCs and LDT1s for the model year})$

2014 +

- $(\text{No. of ZEV credits required to be generated for the model year}) - (\text{Amount of ZEV credits submitted for compliance for the model year})$

# Contact Us

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