Nevada Division of Environmental Protection

Clean Cars Nevada

On the Road to a Cleaner Nevada

June 15, 2021

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Presentation Outline

• Introduction
• Economic Impacts of ZEV Ownership vs. Conventional ICE Vehicles
• Small Business Impacts
• Q&A Session
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.

The goal of today’s webinar is to ....

Share NDEP’s literature review of the economic impacts of ZEV ownership, including initial purchase cost, depreciation fueling costs, maintenance and repair costs.

Understand the small business impacts that may result from the adoption this regulation.
Economic Impacts of Ownership – Sources of Information

• Environmental Advocacy Groups
• Automobile Enthusiast Magazines and Organizations
• Consumer Advocacy Groups
• Government and Academic Research Organizations

Economic Impacts of Ownership – Topics of Focus

• Initial Purchase Cost
• Depreciation
• Fueling Costs
• Maintenance and Repair Costs
• Key Findings of ZEV Ownership Costs
**Initial Purchase Cost**

- Initial purchase price of BEVs and PHEVs is greater than comparable ICE vehicles.

- As battery pack costs drop to approximately $104/kWh in 2025 and $72/kWh in 2030, electric vehicle cost parity with conventional vehicles is likely to occur between 2024–2025 for shorter-range and 2026–2028 for longer-range electric vehicles (International Council on Clean Transportation).


- Applies to cars, crossovers, and SUVs – pickups will take longer.

- Federal Tax Credits are currently in place – but for how long? (Credits have expired for Tesla and GM due to reaching 200,000 sales).
Depreciation

- Initial EVs had higher depreciation
- Residual values have increased as vehicle range has increased
- Federal and state purchase incentives play an important role
- Depreciation rates for ZEVs are expected to be on par with ICE vehicles
Depreciation (continued)  Scatter Plot of Predicted 5-Year Residual Values for EVs by Type and Range Adjusted for Federal Tax Credit

From “Electric Vehicle Ownership Costs: Today’s Electric Vehicles Offer Big Savings for Consumers” Consumer Reports, October 2020
Fueling Costs

• Factors Effecting Fueling Costs:
  ✓ Annual vehicle mileages traveled
  ✓ Driving conditions (city, highway, mountainous, cold/hot weather)

• Electric Charging Costs
  ✓ Costs depend on How, Where, and When you charge your ZEV
  ✓ Costs increase for Level 1 vs. Level 2 vs. DC Fast Charging (highest)
  ✓ Following slides taken from “Levelized Cost of Charging Electric Vehicles in the United States” by Brennan Borlaug, et al., Published in Joule, ARTICLE| VOLUME 4, ISSUE 7, P1470-1485, JULY 15, 2020
The study estimated the Levelized Cost of Charging (LCOC) national averages for electric charging of $0.15/kWh for BEVs and $0.14/kWh for PHEVs, but ranges from $0.08/kWh to $0.27/kWh (assumes a charging mix of 81% residential, 14% workplace and/or public L2, and 5% DCFC).

**ECONOMIC IMPACTS OF OWNERSHIP - COSTS AND SAVINGS**

**Fueling Costs** (continued)

**Combined LCOC ($/kWh)**

<table>
<thead>
<tr>
<th>Charging Mix:</th>
<th>% residential</th>
<th>% work/public L2</th>
<th>% DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCOC&lt;sub&gt;res&lt;/sub&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCOC&lt;sub&gt;work&lt;/sub&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCOC&lt;sub&gt;DCFC&lt;/sub&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Workplace & Public L2**
- Commercial L2 EVSE costs<sup>a</sup> – equipment and installation
- Commercial electricity prices<sup>b</sup>

**Residential**
- Residential L1 and L2 EVSE costs<sup>a</sup> – equipment and installation
- Residential electricity prices<sup>b</sup> adjusted for off-peak TOU rates<sup>c</sup>

**DCFC Station**
- Commercial DCFC EVSE costs<sup>a</sup> – equipment and installation
- Commercial electricity prices under 4 station scenarios<sup>c</sup>
- Station operating and maintenance costs<sup>d</sup>

<sup>a</sup> Real-world EVSE data  
<sup>b</sup> EIA<sup>28</sup>  
<sup>c</sup> Utility Rate Database<sup>29</sup>  
<sup>d</sup> EV station Financial Analysis Scenario Tool
Nevada’s levelized cost of charging is relatively inexpensive at $0.11/kWh.
Nevada’s lifetime fuel cost savings for ZEVs are considerable, because relatively high petroleum fueling costs would be replaced by the relatively low levelized cost of electric charging.
Fueling Costs (continued)

• Approximate NV Energy Residential Single-Family Rates —
  Northern NV: $0.09/kWh, Southern NV: $0.11/kWh

• NV Energy offers special Electric Vehicle Time-of-Use rates that
  allows customers to pay a discounted rate if they charge the
  vehicle during the utility’s electric vehicle charging period

• This topic receives more extensive treatment in
  other forums; costs are shown for comparison purposes
NV Energy Optional Residential Single-Family Electric Vehicle Time-of-Use Rate for Southern Nevada

Hourly Rates during Weekdays of Summer Months

- ORS-TOU REVRR
- compare to your current base rate (RS)

Applies to Weekdays: Mon, Tue, Wed, Thu, Fri
During Summer Months: Jun, Jul, Aug, Sep
Fueling Costs (continued)

- Lifetime Fuel Cost Savings for Nevada ranges from $10,000 to $12,000 with 15 year lifespan (Borlaug et al. study)

- Savings from an Average BEV vs. an Average ICE per 15,000 Miles of Driving in Nevada is $961 for a car and $1582 for a pickup (20% better than national average) reported in “Electric Vehicle Ownership Costs: Today’s Electric Vehicles Offer Big Savings for Consumers” Consumer Reports, October, 2020
Fueling Costs (continued)

- At present, ZEVs do not pay fuel taxes that support highway construction and roadway maintenance.
**ECONOMIC IMPACTS OF OWNERSHIP - COSTS AND SAVINGS**

**Maintenance and Repair Costs**

- BEVs require less maintenance and repair. Their electric motors and other drivetrain components have fewer moving parts than internal combustion engines, and they don’t require fluid and filter changes.
- Data on long-term reliability of BEVs and PHEVs is limited; *Consumer Reports* reviewed their 2019 and 2020 car reliability surveys and compiled the repair data.
### Maintenance and Repair Costs (continued)

<table>
<thead>
<tr>
<th>Powertrain Type</th>
<th>0-50K Miles</th>
<th>50K-100K Miles</th>
<th>100K-200K Miles</th>
<th>Lifetime Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEV</td>
<td>$0.012</td>
<td>$0.028</td>
<td>$0.043*</td>
<td>$0.031</td>
</tr>
<tr>
<td>PHEV</td>
<td>$0.021</td>
<td>$0.031</td>
<td>$0.033</td>
<td>$0.030</td>
</tr>
<tr>
<td>ICE</td>
<td>$0.028</td>
<td>$0.060</td>
<td>$0.079</td>
<td>$0.061</td>
</tr>
</tbody>
</table>

* low sample size

### Lifetime Maintenance Costs by Powertrain

<table>
<thead>
<tr>
<th>Powertrain Type</th>
<th>Lifetime Maintenance and Repair Cost</th>
<th>Lifetime Savings vs. ICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICE</td>
<td>$9200</td>
<td></td>
</tr>
<tr>
<td>PHEV</td>
<td>$4600</td>
<td>$4600</td>
</tr>
<tr>
<td>BEV</td>
<td>$4600</td>
<td>$4600</td>
</tr>
</tbody>
</table>

Key Findings

• BEVs and PHEVs are projected to reach initial purchase price parity with ICE vehicles within the next 5-7 years

• BEVs and PHEVs depreciate at similar rates as ICE vehicles

• Maintenance and repair costs for BEVs and PHEVs are lower compared to ICE vehicles

• Given Nevada’s higher average gasoline prices, fuel cost savings for BEVs and PHEVs are significant compared to ICE vehicles
Nevada Revised Statutes requires that a notice to adopt a regulation must determine whether the proposed regulation is likely to:

- Impose a direct and significant economic burden upon a small business; or
- Directly restrict the formation, operation or expansion of a small business.

Clean Cars Nevada would result in a direct economic impact to auto manufacturers by requiring them to deliver for sale in Nevada Low Emission Vehicles and increased numbers of Zero Emission Vehicles, and to prepare and submit associated compliance reporting.
The proposed regulation would not impose a direct and significant economic burden upon small businesses, and would not directly restrict the formation, operation or expansion of a small business.

The impacts on small businesses are indirect.

NDEP has prepared a qualitative assessment of small business impacts presented below.
**Small Business Impacts**

**Impacts to Automotive Dealerships**
- Revenue from new vehicle sales will depend more on sales of ZEVs and profit margins per vehicle for ZEVs may be less certain
- Gradual decline of repair and maintenance revenue
- Costs of installing EV charging infrastructure
- Marketing, advertising, and purchase incentive costs

**Impacts to Used Car Retailers**
- Installation of charging infrastructure
- Remaining battery life on ZEVs difficult to assess at the present time, creating greater uncertainty in assigning value to used ZEVs for customers and in the used car wholesale market
**Impacts to Automotive Repair and Maintenance Shops**

- Less mechanical components in ZEVs = fewer repairs
- Greater electronic complexity = need for better diagnostics and technician training
- No required fluid and filter changes = decline in maintenance revenue

**Impacts to Automotive Parts Shops and Suppliers**

- Fewer mechanical replacement parts will be needed for ZEVs
Impacts to Collision Repair Industry

- Better diagnostics and training needed to service new lighter-weight automotive materials and innovative ZEV designs
- Collision damage to batteries and associated electronic hardware presents new challenges requiring new repair methods

Impacts to Retail Fuel Providers, Fuel Suppliers, and the Smog Check Industry

- Decreased fuel sales
- Business model for convenience stores may change
- Smog checks performed at smog check stations will decline
Summary of Small Business Impacts

- Dealer uncertainty over consumer acceptance of ZEVs, and how to market and sell ZEVs
- Decline in revenue for maintenance of ZEVs
- Capital costs for charging infrastructure, new diagnostic equipment and updated training
- Decline in fossil fuel sales and associated businesses
THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION

- NDEP Draft of Proposed Regulation, P2020-07
- LCB Review of Draft Regulation, R093-20
- Introductory Webinar
- Listening Session
- Complete LCB Review of Draft Regulation
- Technical Session 1 – LEV Program

Note: BLUE = Regulatory Step; GREEN = Informal Activity; and RED = Data/Analysis Step
THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION (CONTINUED)

Technical Session 2 – ZEV Program
Informal Outreach Activities – March 30, 2021

Air Quality Impacts Analysis 1 – State of the Fleet
Informal Outreach Activities – April 27, 2021

Air Quality Impacts Analysis 2 – Emission Benefits
Informal Outreach Activities – May 27, 2021

NDEP Re-Draft of Proposed Regulation
Will be posted to Clean Cars Nevada website (Tentatively Scheduled for June 15, 2021)

Economic Impact Analysis on Small Businesses
Will be posted to Clean Cars Nevada website (Tentatively Scheduled for June 15, 2021)

Small Business Session
Informal Outreach Activities – June 15, 2021

Note: GREEN = Informal Activity; and RED = Data/Analysis Step
THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION (CONTINUED)

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

- NDEP Draft Responses to Comments Received
  - Will be posted to Clean Cars Nevada website (Tentatively Scheduled for June 16, 2021)

- Stakeholder Presentations Workshop
  - Informal Outreach Activities – Scheduled for June 17, 2021

- SEC Forms 1 and 4
  - Tentatively Scheduled for June 22, 2021

- Submit NDEP Re-Draft of Proposed Regulation to LCB
  - Tentatively Scheduled for June 25, 2021

- Notice of Public Workshop
  - Tentatively Scheduled for July 9, 2021

- LCB Return of Draft Regulation
  - Tentatively Scheduled for July 27, 2021
THE REGULATORY PROCESS AND OPPORTUNITIES FOR PUBLIC INPUT AND PARTICIPATION (CONTINUED)

Note: PURPLE = Approval Process

Legislative Commission

Tentatively Scheduled for November 2021

Secretary of State Filing

Tentatively Scheduled for December 2021

Complete Regulatory Process by End of 2021 for Model Year 2025 Vehicles (Available Sometime in 2024)
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

Sign up for Clean Cars Nevada listserv on NDEP Website
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
NDEP will be hosting Stakeholder Presentations Workshop

Scheduled for June 17, 2021

More details to follow.
Questions?

Contact

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

E-mail at
CleanCarsNevada@ndep.nv.gov

Sign up for Clean Cars Nevada listserv on NDEP Website