LEV III Program

Criteria Emissions
Greenhouse Gas Emissions
LEV III Program - Criteria Emissions
Light-Duty Vehicles

- Declining fleet average 2015-2025
  - Fleet SULEV emissions in 2025 (30mg/mi NMOG+Nox)
- Phase-in to 150K FTP and SFTP
  - 10% in 2015, 20% in 2016, 40% in 2017, 70% in 2018, 100% in 2019
  - Alternative phase-in provided
- Additional emission categories provided for flexibility
- Combined NMOG and NOx standards full useful life standards only
- Increase durability requirement from 120,000 miles to 150,000 miles
- E10 certification fuel
  - Regular 87 octane and Premium 91 octane
  - 100% 2019
  - Phase-in to TBD
Fleet Average Requirement
Light-Duty Vehicle

![Graph showing fleet average requirement for light-duty vehicles from 2014 to 2025. The graph includes two lines, one for PC/LDT1 and another for LDT2, indicating a downward trend in requirement over time.]
LEV III Program – Criteria Emissions
Light-Duty Vehicles

- Zero-fuel evaporative emission standards
- More stringent SFTP emission standards
- More stringent particulate matter standards
  - 3 mg/mi full useful life standard
    - Four year phase-in beginning in 2017
    - 6 mg/mi interim in-use standard
  - 1 mg/mi full useful life standard
    - Four year phase-in beginning in 2025
    - Mid-term review
- Goal is to harmonize with federal Tier 3 program
LEV III – Criteria Emissions
Medium-Duty Vehicles

- Phase-in 2016-2022
- More stringent emission standards
- Additional emission categories provided
- Combined full useful life NMOG and NOx standards only
- More stringent PM standards
- Increase durability requirement from 120,000 miles to 150,000 miles
- MDVs 8,501-10,000 lbs GVW must chassis certify
- More stringent evaporative emission standards
- Supplemental Federal Test Procedure (SFTP) emission standards
LEV III – Greenhouse Gas Emissions
Light-Duty Vehicles

• ARB and federal agencies still developing program
• Phase-in 2017-2025
• Footprint based
• Standards will rely on a number of ongoing studies addressing:
  – Advanced powertrains and transmissions
  – Lightweight vehicle materials and design
  – Safety analysis
  – Computer simulation of GHG emission benefits
  – Component costs
• Goal is one national GHG standard
• Program details to be announced in September
Contact

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ZEV Regulation
ZEV Regulation Overview

- **2012-2014**: Minor clarifying changes

- **2015-2017**: Minor changes, some provisions extended

- **2018 and Beyond**: Major changes – significant increases in vehicle volumes
ZEV Regulation Revisions: 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
ZEV Regulation:
Major Revisions

- PZEVs and AT PZEVs will remain as compliance options in regulation through MY 2017
  - PZEVs helping set LEV III Criteria Standard
  - AT PZEVs helping set LEV III GHG Standard
- Transitional Zero Emission Vehicles (TZEVs) = Plug-in Hybrids
- Only TZEVs and ZEVs will remain in the ZEV program 2018 and beyond
- Travel expires for BEVs after 2017, continues for Fuel Cells
Likely Compliance Scenario
Min ZEV Compliance with expected FCV/BEV split

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Vehicle Sales</th>
<th>Annual % of New Vehicle Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2016</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2017</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2018</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2019</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2020</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2021</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2022</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2023</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2024</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2025</td>
<td>250,000</td>
<td>15%</td>
</tr>
</tbody>
</table>

- **FCVs**
- **BEVs**
- **TZEVs**

14% of 2025 New Vehicle Sales

- 3%
- 6%
- 9%
- 12%
- 15%
ZEV Regulation: 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 25% TZEV category
# ZEV Regulation: Manufacturer Status

<table>
<thead>
<tr>
<th>LVMs</th>
<th>Transitioning LVMs</th>
<th>Continuing IVMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toyota</td>
<td>Daimler (2016)</td>
<td>Subaru</td>
</tr>
<tr>
<td>Honda</td>
<td>BMW (2018)</td>
<td>Volvo</td>
</tr>
<tr>
<td>Nissan</td>
<td>Hyundai (2018)</td>
<td>JLR</td>
</tr>
<tr>
<td>GM</td>
<td>Kia (2018)</td>
<td>Mitsubishi (?)</td>
</tr>
<tr>
<td>Chrysler</td>
<td>Mazda (2018)</td>
<td></td>
</tr>
<tr>
<td>Ford</td>
<td>VW (2018)</td>
<td></td>
</tr>
</tbody>
</table>

* Continuing IVMs will be able to fully comply with TZEVs
Contacts

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916-323-2410

Elise Keddie, manager
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Clean Fuels Outlet
Clean Fuels Outlet Regulatory Proposal

Objectives

• Ensure that enough fuel is available to support ZEVs when and where it is needed
• Encourage best possible chance for success for both fuel providers and automakers
• Achieve 2050 GHG goals in the light-duty vehicle subsector including fuel cycle emissions
Why Clean Fuels Outlet?

Resolution 09-66 adopted at Dec. 2009 board hearing – three tiered approach:

– Financial incentives
– Regulatory incentives
– Regulatory mandate: “Mandate hydrogen through modifications to existing regulations or through a new regulation.”

The CFO is our backstop if other approaches fail to result in sufficient infrastructure.
CFO: Proposed Amendments

Applicability

• ZEVs and fuels only
  – Focus on criteria and GHG reductions
  – Hydrogen fuel cell vehicles and hydrogen stations initially

• Conversions excluded

• Placeholder for BEVs, PHEVs and public charging
  – Set metrics and timeline for evaluating public charging need
  – Avoid interfering with private market charging infrastructure
  – Address environmental and economic concerns
  – Return to Board with report and recommendation

Regulated Party

• Major oil companies will be required to build hydrogen stations when vehicle trigger is reached
CFO Proposed Amendments (cont’d)

Vehicle Trigger
- Automakers provide ZEV production projections 3 years out
- 10,000 regional trigger (FCVs)
- 20,000 statewide trigger (FCVs)

Regulation Activation
- Regulation activated when trigger is projected to be met
- ARB determines number of new stations and areas where they are needed
- Requirement to build stations is allocated among major oil companies based on their share of the gasoline market
- Oil companies have 2.5 years to build new stations
Example Outcome of Regulation

If automakers’ 2012 projections indicate 10,000 FCVs in Los Angeles region by 2015, ARB will:
1. Calculate required fuel supply, new fuel demand, number of new stations needed and where they are needed
2. Notify oil companies of their requirement - how many stations each must build based on their share of the gasoline market – by Oct. 2012
3. Station locations finalized by July 2013
Example - Obligation by Market Share in SCAQMD Region

<table>
<thead>
<tr>
<th>No. FCVs in Region</th>
<th>10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yearly H2 demand</td>
<td>2,700,000</td>
</tr>
<tr>
<td>Existing supply anticipated in 2014</td>
<td>1,600,000</td>
</tr>
<tr>
<td>Supply deficit</td>
<td>1,100,000</td>
</tr>
<tr>
<td>Kg/day demand &amp; No. new stations</td>
<td>3,014</td>
</tr>
<tr>
<td>BP</td>
<td>22%</td>
</tr>
<tr>
<td>Chevron</td>
<td>20%</td>
</tr>
<tr>
<td>Tesoro</td>
<td>15%</td>
</tr>
<tr>
<td>ConocoPhillips</td>
<td>15%</td>
</tr>
<tr>
<td>Valero</td>
<td>13%</td>
</tr>
<tr>
<td>Equilon (Shell)</td>
<td>8%</td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>7%</td>
</tr>
</tbody>
</table>
What will stations look like?

Performance Criteria

- Meet current fueling specifications (J2601)
- Open to public in a retail setting
- Dispense fuel at two pressures – 35 and 70 MPa
- Dispense fuel during peak demand periods with minimal wait time
- Meets environmental standards for hydrogen (SB1505)
- Located in targeted geographic areas – where vehicle owners live and work
Contacts

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916-323-2961

Gerhard Achtelik, manager
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916-323-8973
Environmental Performance Label

Protect the environment, choose vehicles with higher scores:

Global Warming Score: 10
Smog Score: 9

This vehicle includes a 15 year/150,000 mile warranty on the emissions system.

Vehicle emissions are a primary contributor to global warming and smog. Scores are determined by the California Air Resources Board based on this vehicle's measured emissions. Please visit www.DriveClean.ca.gov for more information.

July 19, 2011
Public Workshop
Update

• ARB staff worked closely with U.S. EPA and NHTSA to ensure the new label met California’s labeling requirements.
• ARB staff propose to deem the new Federal Label meets California labeling requirements.
Fuel Economy and Environment

Fuel Economy

26 MPG

Combined city/hwy: 22 city, 32 highway

3.8 gallons per 100 miles

You save $1,850 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost: $2,150

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

- Rating: 7

Smog Rating (tailpipe only)

- Rating: 1

This vehicle emits 347 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 22 MPG and costs $12,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.70 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov

Calculate personalized estimates and compare vehicles
New Label Meets California Requirements

- Compares all cars and trucks to each other
- Uses a 1 to 10 score for both greenhouse gas and smog emissions
- Includes language about upstream emissions and points to a web site for more information
- Includes language that vehicles are a significant cause of smog and climate change
- Uses at least one color
- 5-year fuel save/spend value is useful as more advanced technology vehicles are introduced
Timing of Transition

Before Board consideration:
  – California label will be required on all cars sold in California

If Board approves:
  – ARB staff would issue conditional certifications allowing OEM’s to use the federal label to comply with California labeling requirements
  – ARB staff would issue mail-out following November Board Hearing outlining details

After OAL approval:
  – Once law, Federal Label would serve as compliance with CA labeling provisions
DriveClean.ca.gov

- Provides Global Warming and Smog Scores for all cars certified in CA
- Needs to compare “apples to apples”
- Will continue to use CA scores until our regulation becomes law (est. summer of 2012)
  - Will add clear information about the transition to the new label and the new scores
- Moving forward we will explore what types of vehicle related data should be provided on Drive Clean to best serve the needs of CA drivers
Questions/Comments

• Contact Lisa Chiladakis at:
  lchilada@arb.ca.gov
  916-327-2932

• Web sites
  – www.driveclean.ca.gov
  – www.arb.ca.gov/msprog/labeling/labeling.htm
  – www.fueleconomy.gov
Introduction

- CEQA applies to most public agency decisions to carry out or approve projects that could have adverse effects on the environment
- ARB has a Certified Regulatory Program
- Environmental analysis requirements
  - Describe potential adverse and beneficial impacts associated with proposed action
  - Identify potential adverse impacts
  - Identify feasible mitigation or alternatives that reduce impacts
- 45-day public review period
California Environmental Quality Act
Scoping Meeting

• Your input at the community level is essential to a successful partnership and regulation
• We welcome your input as we develop the environmental analysis to meet the requirements of CEQA
• CEQA analysis will be part of the staff report
• Website to be established
Framework for Environmental Analysis

- Proposed Project – amending passenger vehicle fleet regulations
- Present integrated analysis of simultaneously amending these regulations
  - Low Emission Vehicle (LEV III)
  - Greenhouse Gas (GHG)
  - Zero Emission Vehicles (ZEV)
  - Clean Fuels Outlet (CFO)
  - Environmental Performance Label (EPL)
• CEQA checklist used to identify environmental resource areas potentially impacted
  – Air Quality
  – Aesthetics
  – Biological Resources
  – Cultural Resources
  – Hazards
  – Land Uses, etc.

• Environmental analysis to include
  – Direct, indirect, cumulative impacts, mitigation
  – Alternatives
California Environmental Quality Act
Scoping Meeting

• Impact analysis to focus on likely compliance responses

• Greenhouse gas emissions reductions
  – Engine and transmission improvements
    • Improve drivetrain
  – Mass reduction
  – Air conditioning improvements
  – Low rolling resistance tires
  – Increase plug-ins, hybrids and fuel cells vehicles
Impact analysis to focus on reasonably likely compliance responses (cont.)

• Criteria Air Pollutant emissions reductions
  – Catalyst improvements
  – Air injection improvements

• Impact analysis may also consider consumer responses (e.g. fleet turnover, VMT rebound) and upstream effects (e.g. less fuel processed in and moved through state)
California Environmental Quality Act Scoping Meeting

• Collaborative Partners
  – U.S. Environmental Protection Agency
  – National Highway Traffic Safety Administration
California Environmental Quality Act
Scoping Meeting

Next Steps

• September, 2011
  – Release of Draft Environmental Analysis with Proposed Regulations and Staff Report for public review

• November, 2011
  – Board consideration
Questions?

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