California Fuels Update

OCTOBER 18, 2019
Sacramento, CA
Agenda

• Introduction
• Overview of Current Fuels Regulations
• Concepts for Potential Updates
• Discussion
Introduction

• CA has made significant progress to improve air quality and reduce GHG emissions

• On path to meet State’s 2030 climate goal

• Executive Order B-55-18 establishes statewide goal to achieve carbon neutrality by 2045

• Board Resolution 17-46 directs CARB staff to continue to evaluate and explore opportunities to achieve significant reductions in GHG emissions

• Staff plans to update various fuels regulations and programs as CA transitions away from fossil fuels
  o Continue to reduce criteria pollutants and improve air quality
  o Focus on clean renewable fuels
Overview of Current Fuels Regulations
California Fuels Regulations and Programs

• Conventional Fuels
  o Reformulated Gasoline Regulations (CaRFG3) – 13 CCR 2250-2273.5
  o Diesel Fuel Regulations – 13 CCR 2281-2285, 2299-2299-5; 17 CCR 93114, 93117, 93118, 93118.2, 93118.5

• Alternative Fuels
  o Alternative Motor Vehicle Fuels Specifications – 13 CCR 2290-2295
  o Alternative Diesel Fuels (ADF) Regulation – 13 CCR 2293-2293.9

• Low Carbon Fuel Standard (LCFS) – 17 CCR 95480-95503
• Cap and Trade Program – 17 CCR 95801-96022
California Reformulated Gasoline Regulations

• Require CA gasoline to be produced according to specifications determined by the CA Predictive Model
• Correlates emissions with fuel properties to determine emission-equivalent fuel specifications
• Determines specifications for oxygen, sulfur, total aromatic hydrocarbon, benzene, olefin contents, T90, T50 and RVP
California Diesel Regulations

- Sulfur content – 15 ppmw limit
- Aromatic hydrocarbon content
  - 10 vol% limit
  - 10 vol% average
  - Designated equivalent limits
  - Certified emission-equivalent formulation
- Standards also apply to stationary, marine harbor craft, and locomotive diesel-engine fuel uses in CA
Renewable Gasoline and Renewable Diesel

- Renewable gasoline that meets the requirements for conventional gasoline is treated the same as conventional gasoline:
  - California reformulated gasoline regulations
  - ASTM D4814
  - Federal Clean Air Act section 211(f)(1)

- Renewable diesel that meets the requirements for conventional diesel is the same as conventional diesel:
  - California diesel regulations
  - ASTM D975
Alternative Fuels Regulation

Alternative fuels regulations establish fuel specifications for following alternative motor vehicle fuels:

- M100
- M85
- E100
- E85
- Compressed Natural Gas (CNG)
- Liquefied Petroleum Gas (LPG)
- Hydrogen
Alternative Diesel Fuels Regulation

• Comprehensive, multi-stage process governing commercialization of alternative diesel fuels (ADFs) in California:
  o Stage 1: Pilot Program – Initial limited sales of an ADF during screening evaluation
  o Stage 2: Determination of Fuel Specifications – Expanded sales governed by enhanced monitoring, testing and multimedia evaluations
  o Stage 3: Commercial Sale – Full-scale commercial sales, as warranted
• In-use requirements for biodiesel
Concepts for Potential Updates
Reformulated Gasoline Regulations

- Delete obsolete provisions
- Primarily minor updates and non-substantive revisions
# Reformulated Gasoline Regulations

<table>
<thead>
<tr>
<th>SECTION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>§ 2257. Required Additives in Gasoline</td>
<td>Consider adding maximum concentration level</td>
</tr>
<tr>
<td>§ 2258. Oxygen Content of Gasoline in the Wintertime</td>
<td>Consider deleting repealed section</td>
</tr>
<tr>
<td>§ 2261. Applicability of Standards; Additional Standards</td>
<td>Reevaluate subsections referencing CaRFG2 specifications</td>
</tr>
<tr>
<td>§ 2262. The California Reformulated Gasoline Phase 2 and Phase 3 Standards</td>
<td>Reevaluate subsections referencing CaRFG2 specifications</td>
</tr>
<tr>
<td></td>
<td>Consider reducing sulfur averaging limit to 10 ppm to align with U.S. EPA standards</td>
</tr>
<tr>
<td>§ 2262.5(a) Compliance with Minimum Oxygen Cap Limit Standard in Specific Areas in the Wintertime</td>
<td>Consider deleting obsolete minimum oxygen cap limit standards</td>
</tr>
<tr>
<td>§ 2265.5 Alternative Emission Reduction Plan</td>
<td>Consider deleting obsolete section</td>
</tr>
</tbody>
</table>
## Reformulated Gasoline Regulations

<table>
<thead>
<tr>
<th>SECTION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>§ 2266.5 Requirements Pertaining to California Reformulated Gasoline Blendstock for Oxygen Blending (CARBOB) and Downstream Blending</td>
<td>Reevaluate subsections referencing CaRFG2 specifications</td>
</tr>
<tr>
<td>§ 2272. CaRFG Phase 3 Standards for Qualifying Small Refiners</td>
<td>Reevaluate need for small refiner provisions</td>
</tr>
<tr>
<td>§ 2273. Labeling of Equipment Dispensing Gasoline Containing MTBE</td>
<td>Consider deleting MTBE labeling requirements</td>
</tr>
</tbody>
</table>
Diesel Fuel Regulations

- Delete obsolete provisions
- Primarily minor updates and non-substantive revisions
## Diesel Regulations

<table>
<thead>
<tr>
<th>SECTION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>§ 2284. Lubricity of Diesel Fuel</td>
<td>Consider deleting obsolete phase-in lubricity requirements.</td>
</tr>
</tbody>
</table>
Proposed Updates:
- Delete obsolete fuel specifications not in use: E100, M85, M100
- Minor updates and non-substantive revisions

Future Improvements:
- Update E85 specifications
- Rescind CNG specifications
- Update LPG specifications
- Establish E15 specifications
### E85 Fuel Specifications

- **Option 1:** Update or rescind individual specifications:

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>CURRENT</th>
<th>PROPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vapor Pressure</strong></td>
<td><strong>RVP Range</strong></td>
<td><strong>Volatility Class</strong></td>
</tr>
<tr>
<td>6.5 – 8.7 psi</td>
<td>6.5 – 8.7 psi</td>
<td>A, A/B, B/A</td>
</tr>
<tr>
<td>7.3 – 9.4 psi</td>
<td>7.3 – 9.4 psi</td>
<td>B/C, C/B, C, C/D, D/C</td>
</tr>
<tr>
<td>8.7 – 10.2 psi</td>
<td>8.7 – 10.2 psi</td>
<td>D, D/E, E/D, E</td>
</tr>
<tr>
<td><strong>Ethanol Content</strong></td>
<td>79 vol% (min)</td>
<td>Revise minimum to 70-75 vol%</td>
</tr>
<tr>
<td><strong>Hydrocarbon Content</strong></td>
<td>15 – 21 vol%</td>
<td>Revise maximum to 25-30 vol% for E51 blends</td>
</tr>
<tr>
<td><strong>Sulfur</strong></td>
<td>40 ppm (max)</td>
<td>Revise maximum to 20 ppm</td>
</tr>
</tbody>
</table>

- **Rescind minimum vapor pressure (lower RVP values result in less evaporative fuel emissions) and refer to ASTM D5798-18a: 5.5, 7.0, 8.5, 9.5 psi depending on area and time of year**
- **Revise maximum RVP to 7.2 psi in summer as defined in CaRFG3, 13 CCR § 2262 (volatility class same as CaRFG3)**
- **Potential Updates > Alternative Fuels Regulation > E85**
E85 Fuel Specifications

• Option 2: Rescind entire E85 Specification and refer to ASTM D5798
  ◦ CARB must confirm no air quality impacts
  ◦ No performance or compatibility issues reported under CARB test program exemption
CNG Fuel Specifications

- Rescind CNG specifications
- Consider updating engine certification fuel to be more representative of in-use fuel in place of regulating CNG using fuel specifications
- ASTM is developing specifications for CNG
  - Consider adopting ASTM specifications after CDFA adoption
  - Consider additional specifications
LPG Fuel Specifications

- Increase butane limit and decrease propane minimum to reflect properties of in-use renewable propane
  - Butane (maximum): 5 percent → 10 percent
  - Propane (minimum): 85 percent → 80 percent
- Consider higher butane limit based on emissions impact and necessity
E15 Fuel Specifications

- Currently undergoing fuels multimedia evaluation to determine knowledge gaps, multimedia impacts
- Results of the evaluation will determine if development of E15 specifications is appropriate
Alternative Diesel Fuels (ADF) Regulation

- Provisions require program review of the biodiesel in-use requirements
- Proposed amendments in the areas of:
  - NOx mitigation point
  - NOx mitigation control level
  - Cleanup certification provisions
  - General regulation language cleanup
Low Emission Diesel (LED) Standard

• CARB State Strategy for the State Implementation Plan (SIP) requires substantial NOx and PM reductions by 2031 or sooner

• CARB committed to developing a performance-based emission standard for diesel fuels to:
  o Achieve emission reductions for LED fuels relative to conventional diesel
  o Diversify diesel fuel pool through increased use of LED fuels
  o Contribute to California’s long-term transition away from fossil fuels

• Public meeting held on November 28, 2018 – Discussed renewable diesel and biodiesel emissions study
Low Emission Diesel Standard

• Concept 1: Volumetric Standard for LED Fuels
  o Framework similar to Federal Renewable Fuel Standard
  o Require specific volumes of different LED fuels
  o Annual volume requirements increase over time
  o LED fuel types
    • Non-petroleum-based fuels (e.g., renewable diesel (RD), NOx-mitigated biodiesel (BD), RD/BD blends, renewable natural gas
    • Petroleum-based fuels (e.g., cleaner refined diesel, gas-to-liquid (GTL) diesel, CNG
Low Emission Diesel Standard

• Concept 2: Reduce Aromatic Content of Diesel Fuel
  o Reductions in total aromatics and polycyclic aromatic hydrocarbons (PAH) reduce tailpipe NOx and PM
  o Amend diesel regulations to reduce maximum total aromatic content and PAH content
  o LED fuels contain little or no aromatics
  o Compliance achieved through blending LED fuels into diesel or additional refining of diesel

• Other concepts?
General Timeframe

• 2020 – Clean up items and non-substantive revisions
• 2021 – Remaining updates
Discussion

Thank You

Please submit feedback by **November 1st @**

[FuelsProgram@arb.ca.gov](mailto:FuelsProgram@arb.ca.gov)