

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
 - Continue to reduce criteria pollutants and improve air quality
 - Focus on clean renewable fuels



Overview of Current Fuels Regulations

California Fuels Regulations and Programs

- **Conventional Fuels**

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

- **Alternative Fuels**

- Alternative Motor Vehicle Fuels Specifications – 13 CCR 2290-2295
- 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



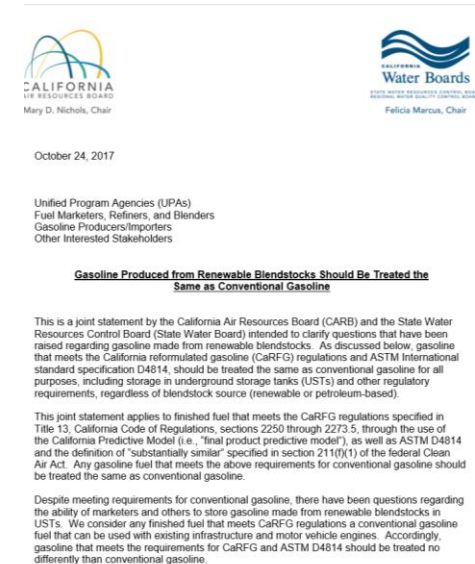
California Diesel Regulations

- 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:
 - Stage 1: Pilot Program – Initial limited sales of an ADF during screening evaluation
 - Stage 2: Determination of Fuel Specifications – Expanded sales governed by enhanced monitoring, testing and multimedia evaluations
 - 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

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 Oxygen Content of Gasoline in the Wintertime	Consider deleting repealed section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



Reformulated Gasoline Regulations

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



Diesel Fuel Regulations

- Delete obsolete provisions
- Primarily minor updates and non-substantive revisions



Diesel Regulations

SECTION	ACTION
§ 2281. Sulfur Content of Diesel	Consider deleting obsolete 1993 and 2006 effective dates and phase-in periods Consider updating the 15 ppm sulfur standard to 10 ppm
§ 2282. Aromatic Hydrocarbon Content of Diesel Fuel	Consider deleting 1993 and 2007 effective dates Reevaluate aromatic hydrocarbon content for small refiners
§ 2284. Lubricity of Diesel Fuel	Consider deleting obsolete phase-in lubricity requirements



Alternative Fuels Regulation

- 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:

SPECIFICATION	REVISION	
	CURRENT	PROPOSED
Vapor Pressure	<u>RVP Range</u> 6.5 - 8.7 psi 7.3 – 9.4 psi 8.7 – 10.2 psi	<u>Volatility Class</u> A, A/B, B/A B/C, C/B, C, C/D, D/C D, D/E, E/D, E
		Rescind <u>minimum</u> 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 <u>maximum</u> RVP to 7.2 psi in summer as defined in CaRFG3, 13 CCR § 2262 (volatility class same as CaRFG3)
Ethanol Content	79 vol% (min)	Revise minimum to 70-75 vol% Revise test method ASTM D3545 to ASTM D5501
Hydrocarbon Content	15 – 21 vol%	Revise maximum to 25-30 vol% for E51 blends
Sulfur	40 ppm (max)	Revise maximum to 20 ppm



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:
 - Achieve emission reductions for LED fuels relative to conventional diesel
 - Diversify diesel fuel pool through increased use of LED fuels
 - 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
 - Framework similar to Federal Renewable Fuel Standard
 - Require specific volumes of different LED fuels
 - Annual volume requirements increase over time
 - 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
 - Reductions in total aromatics and polycyclic aromatic hydrocarbons (PAH) reduce tailpipe NOx and PM
 - Amend diesel regulations to reduce maximum total aromatic content and PAH content
 - LED fuels contain little or no aromatics
 - 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** @
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