

Context for 10-Year Fuel Specification Outlook - Federal Fuel Controls

Renewable Fuel Standard

- High probability of EPA Reset of Renewable Fuel Standard (RFS) tables in next two years
- Medium probability of legislative RFS reform in next two years

1 psi Waiver for E15

Congress could include as part of RFS reform legislation – 2018-2019

EPA could decide it has authority to extend the 1 psi waiver to E15 via regulation – 2018-2019

EPA Modernization Rule Phase 2 – legislation to end both RFG and the 1 psi waiver for E10 – 2023+

EPA could achieve the same thing by issuing a tighter RVP standard for E10 – 2023+

EPA Modernization Rules Phase 1 and 2 will change federal Reid Vapor Pressure (RVP)

- Phase 1 - High probability of new RVP standard for Reformulated Gasoline (RFG) areas effective 1H2020
- Phase 2 - Medium probability of replacing Conventional Gasoline (CG) and RFG RVP standards with one 49-state RVP standard (less stringent than RFG; more stringent than CG) effective 2023+

EPA Modernization Rule

Phase 1

- Consolidate Northern and Southern RFG VOC Control Areas to the Southern VOC Performance Standard (required by Energy Policy Act of 2005)
- Replace the Consolidated VOC Performance Standard with an RVP standard that is equivalent in stringency. The current EPA strawman proposal is a 7.4 psi RVP downstream cap (with ethanol) for all RFG Areas. This is similar to how EPA replaced the RFG NOx Performance Standard with the CG sulfur standard; and replaced the RFG Toxics Performance Standard with the CG benzene standard.
- Remove Chicago/Milwaukee RFG VOC Allowance
- Expected implementation 1H 2020

Phase 2

- Eliminate federal RFG program; replace with 9.0 psi RVP with ethanol/*no* 1psi waiver. This would apply to all federal gasoline areas, excluding California; and 49-state areas that have adopted low RVP standards into their State Implementation Plans.
- Need legislation to rescind RFG and withdraw 1 psi waiver– adds uncertainty
- Potential implementation 2023
- Wildcard: The legal provision allowing states to set more stringent RVP controls will remain. Thus any 49-state area, in particular RFG areas, may choose to replace the new RVP standard with a lower level RVP fuel, depending on their 2015 ozone NAAQS status.
- This RVP standard is what both the ethanol industry and the automakers have proposed to EPA; the autos argue that a 10.0 psi RVP gasoline is too high because it requires a large canister and impedes vehicle design to meet CAFE/vehicle GHG standards.
- Withdrawing 1 psi waiver for E10 effectively gives E15 the 1 psi waiver

State RVP and Reformulated Gasoline (RFG) Changes - short term

1. Rescind state 7.8 psi RVP requirement in Pittsburgh – revert to federal 9.0 psi standard. Expect completion beginning of or during 2018 ozone season.
2. Relax federal 7.8 psi to 9.0 psi RVP in Memphis, TN. Expect completion by May 2018.
3. Relax remaining federal 7.8 psi areas in Louisiana to 9.0 psi. Expect completion by May 2018.
4. Northern Kentucky (Cincy area) plans to opt out of federal RFG and revert to federal 9.0 psi – estimate effective date May 2018.

5. Potential relaxation of federal 7.8 to 9.0 psi RVP in Atlanta, GA. GA has not decided if it will formally request this from EPA. If so, potential completion by May 2019.

Redacted - First Amendment

Long-term (10+ years) - monitoring for potential new federal regulation

- **Octane** – D3 automakers are seeking a higher octane pool (95 RON minimum) to enable advanced gasoline engine technology and help them achieve CAFE and vehicle GHG emission standards.
 - **Potential EPA regulation of octane is 10+ years out** - EPA is authorized to regulate fuel emissions which endanger public health; and to regulate emission control devices. ASTM sets fuel specs for vehicle performance, and octane is in this category. To regulate octane, EPA would need to show that low octane fuel emissions impair emission control technology (e.g., higher compression ratios) that is needed to meet CAFE and GHG vehicle standards; in other words, high octane fuel is needed to enable auto technology.
 - **Legislation - Grand Bargain?** D3Autosand AFPM talking about potential legislative agreement for a higher octane pool (95 RON).

More Aromatics controls for gasoline engines -- Auto/oil research is showing that direct injection gasoline engine technology increases particulate matter (PM) emissions. Industry is working to figure out what in gasoline increases PM -- heavy aromatics are suspected but not confirmed. EPA is studying the issue - has *not* mentioned regulation. But be aware of the potential for future EPA regulation to address these higher PM emissions with: (1) controls on the aromatics limit or distillation end point limit for gasoline; or (2) PM controls via engine design; however, that costs OEMs more and could also result in higher octane requirements.

Context for 10-Year Fuel Specification Outlook – US Northwest

California Fuel Controls

- Do not expect changes in CARB RFG fuel specifications in next five years.
- There is a potential for LCFS changes in the next five years.
- CARB continues to move in the direction of seeking to phase out fossil fuels; discourage certain types of crude (e.g., oil-sand derived); and incentivize and promote electric vehicles.

Oregon Fuel Controls

- Continues to try to harmonize state Clean Fuels Program with California LCFS.

Washington Fuel Controls

- In next 10 years, expect WA to have a B5 requirement.