A Riff from RaFF

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Rural and Farm Finance Policy Analysis Center

The Electric Vehicles Trend and Implications for Ethanol

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This Rural and Farm Finance Analysis Center brief is the first in a series focused on green energy and transportation. It describes the nexus of biofuels and electric vehicles (EVs) — both industries that government policies have shaped significantly. Are these industries — and the policies supporting them — at odds? Could EVs affect the ethanol industry?

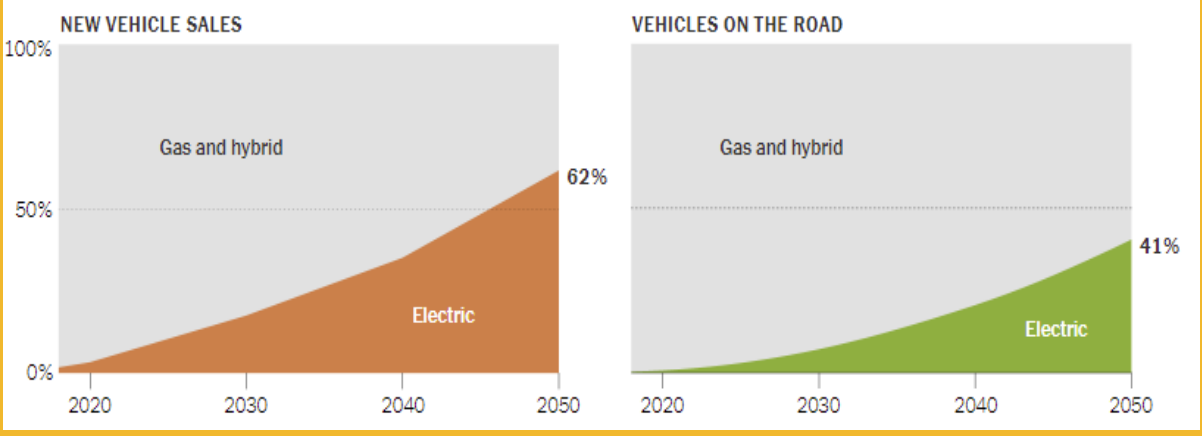
Slow Turnover in the Light-Duty Vehicle Fleet Will Moderate EV Impact

The extent to which EV adoption affects the U.S. motor vehicle fleet's demand for motor fuels and ethanol depends on the inventory of EVs relative to internal combustion engine (ICE) vehicles. Modern ICE vehicles remain in the fleet for a long time. In the U.S., a car's average lifespan is more than 12 years and a car's usable life has increased in recent years, according to IHS Markit. Thus, most of the 16 to 18 million cars sold each year will be around for more than a decade.

Key Takeaways

- The U.S. light-duty vehicle fleet has slow turnover. Therefore, the shift to electric vehicles (EVs) will likely be gradual.
- EVs will have a modest effect on ethanol demand in the next decade.
- U.S. motor fuel use is projected to decline, but ethanol exports are expected to offset much of the difference.
- Emerging demand shifters for biofuels may positively affect the ethanol market.

New Car Sales and Light-Duty Vehicle Fleet Composition Projections, 2020-50



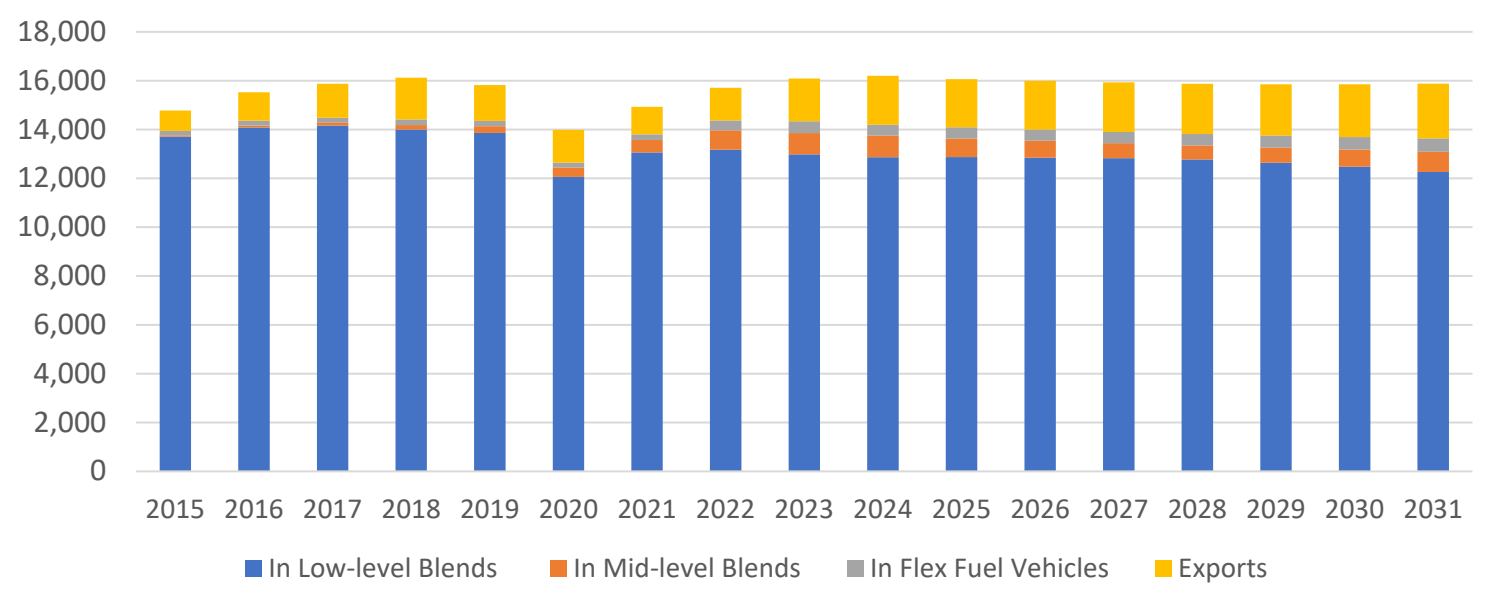
Source: Fleet turnover model via Alarfaj, Griffin and Samaras in Environmental Research Letters; Electric vehicle sales projection from IHS Markit via New York Times.

Policy questions abound on ethanol and EVs

- **Would higher fuel prices affect EV adoption rate?**
- **What are the "unknowns" related to low carbon fuels trends?**
- **How might EV adoption affect rural economies and infrastructure?**

The U.S light-duty fleet turns over slowly, therefore analysts expect that EV sales could represent 35% of new car sales by 2035. If that happens, then EVs will still comprise only 13% of the fleet with the remaining vehicles consuming ethanol-blended motor fuels. If EV sales increase to 60% of annual sales in the next 30 years, then only 41% of the fleet will be EVs by 2050.

U.S. Ethanol Disappearance



Source: Food & Agricultural Policy Research Institute, University of Missouri

Projections Point to Slight Declines in Ethanol Utilization

The Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri estimated that ethanol utilization in motor fuels will decrease slightly during the next decade. Fuel economy improvements will lead to a decline in motor gasoline use despite drivers traveling more vehicle passenger miles. FAPRI expects a small expansion in mid-level blend production (e.g., E15 or a 15% ethanol blend) and a slight increase in flex-fuel vehicle use. These changes help to offset some of the overall domestic decline in motor fuels disappearance – or use. Increases in exports offset the rest of the decline and lead to relatively stable total demand for U.S. ethanol.

FAPRI's projections do not account for substantial policy changes related to blending levels or other potential ethanol demand shifters, however. For example, the low-carbon aviation fuel initiatives create new demand not only for ethanol but also for isobutanol, which can also be derived from corn and converted into sustainable aviation fuel. Finally, depending on carbon intensity ratings, other states and countries are pursuing policies similar to California's Low Carbon Fuel Standard. Such policies could increase biofuel demand.

All Riffs from RaFF in this series are available at raff.missouri.edu/publications

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The Rural and Farm Finance Policy Analysis Center (RaFF) at the University of Missouri aims to help policymakers and stakeholders understand rural economic and financial conditions and trends and explore how existing and proposed policies affect rural and farm finances.