

Opportunities for Biofuels and Renewable Energy Post Election Q&A

ISCC North America Stake Holder Meeting

**THE
UNIVERSITY OF
ILLINOIS
AT
CHICAGO**



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Regardless of Election:
Electric Vehicles vs. Liquid Fuel Vehicles
will be one of the Biggest Topics in US
Energy Plans

Recent UIC & Life Cycle Associates Report: GHG Emissions of Petroleum Fuels, Biofuels and EVs

- EVs have zero direct emissions
- Ethanol and Biodiesel are biogenic fuels using short-cycle carbon
- Emission comparisons need to be made on a life cycle basis
- Wide range of resource mixes and vehicle efficiency parameters affects comparison

- We compared:

Gasoline

EV Electric Vehicle with different utility mixes: electric grid region for Midwest (SRMW) and California grid region

E15 (15% corn ethanol)

E25 HOF (high octane fuel with 25% corn ethanol)

E85 (85% corn ethanol)

E85 PHEV (plug-in hybrid electric vehicles)

Diesel

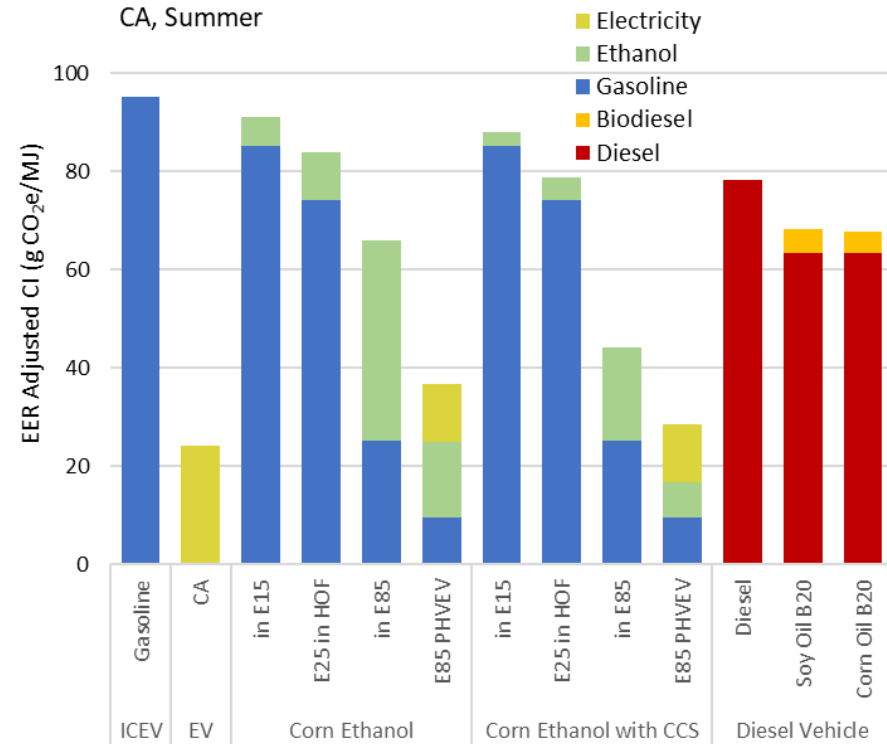
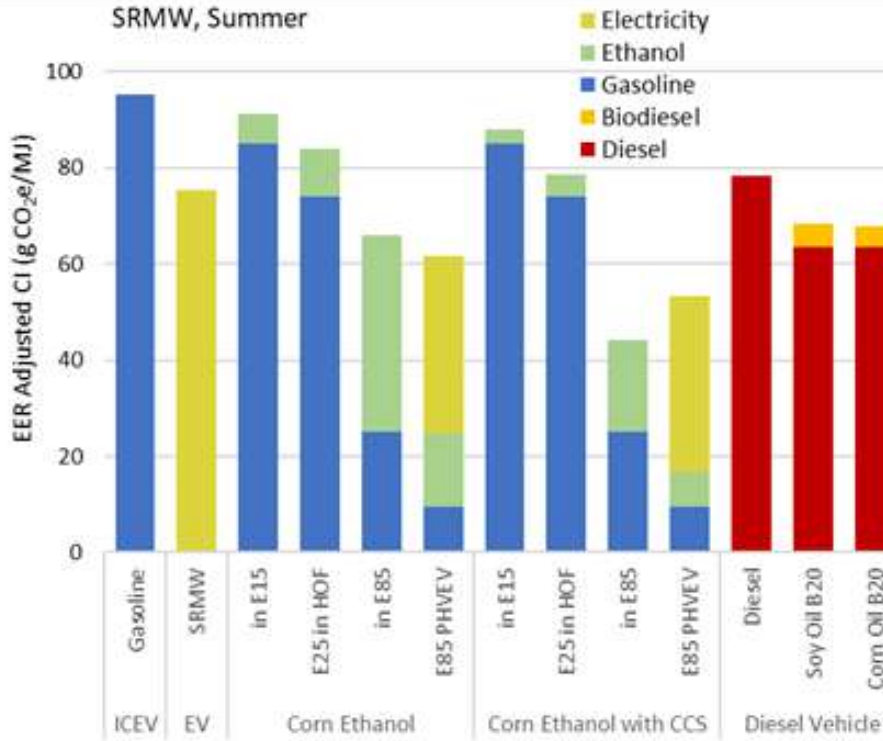
Soy Oil B20 (20% soy based biodiesel)

Corn Oil B20 (20% corn oil based biodiesel)



With and Without
Carbon Capture and
Storage CCS
Technology

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Large Variations in GHG Emissions for EVs Across US Regions

Recent UIC & Life Cycle Associates Report: GHG Emissions of Petroleum Fuels, Biofuels and EVs

- **Electric vehicles, ethanol blends, biodiesel blends all reduce GHGs relative to their petroleum-based counterparts.** High-octane ethanol fuels improve fuel efficiency and reduce GHG emissions in various technology options. Many advanced options exist for low CI biofuels e.g. ethanol produced with carbon capture and storage (CCS), biodiesel produced from soy, corn oil, or used cooking oil.
- The regional electricity grid mix significantly impacts life cycle GHG emissions of different fuel/vehicle technologies. Therefore, the cleanest renewable fuel technology depends on geography.
- Electric vehicles in the Midwest will only be cleaner if the marginal electric generating mix (new power plants added to the grid) consists of all renewable resources (wind, solar).
 - Unlike the Southwest, the Midwest is not necessarily the best location for these generating resources and land demands for renewable resources may conflict with existing land use.
 - Furthermore, low carbon nuclear resources are being phased-out, a trend that is further skewing the current electricity grid mix towards higher carbon-intense resources even before electric vehicles add to the demand profile.
- Only a portfolio of fuel/vehicle technologies will avoid unintended “recarbonization” effects of the transportation sector.



Biofuel groups congratulate Biden and Harris

By Erin Voegele | November 09, 2020

The Renewable Fuels Association and Growth Energy have spoken out to congratulate President-elect Joe Biden and Vice President-elect Kamala Harris on their victory, noting they look forward to working with the upcoming administration to advance the use of biofuels.

Major news organizations on Nov. 7 announced that democratic presidential nominee Joe Biden had surpassed the required 270 electoral votes needed to become the 46th president of the United States.

“We look forward to working with the Biden administration in the years ahead to ensure a strong and growing market for low-carbon renewable fuels like ethanol,” said Geoff Cooper, president and CEO of the RFA. “During the campaign, Joe Biden repeatedly stressed his support for ethanol and the Renewable Fuel Standard, which for 15



President-elect Joe Biden

From Biden Energy Plan Website

THE BIDEN PLAN FOR A CLEAN ENERGY REVOLUTION AND ENVIRONMENTAL JUSTICE

- Using the Federal government procurement system – which spends \$500 billion every year – to drive towards 100% clean energy and **zero-emissions vehicles.**
- Reducing greenhouse gas emissions from transportation – the fastest growing source of U.S. climate pollution – by preserving and implementing the existing Clean Air Act, and developing **rigorous new fuel economy standards aimed at ensuring 100% of new sales for light- and medium-duty vehicles will be electrified and annual improvements for heavy duty vehicles.**
- Doubling down on the liquid fuels of the future, which make **agriculture a key part of the solution to climate change.** Advanced biofuels are now closer than ever as we begin to build the first plants for biofuels, creating jobs and new solutions to reduce emissions in planes, ocean-going vessels, and more.
- Target airline emissions: Aviation accounts for nearly 2% of global greenhouse gas emissions, and that portion is expected to increase. Unfortunately today, few low-carbon technologies or fuels have been developed to tackle this challenge. Biden recognizes that must change and will pursue measures to **incentivize the creation of new, sustainable fuels for aircraft, as well as other changes to aircraft technology and standards, and air traffic management.**

From Biden Energy Plan Website

- Partnering with farmers and ranchers so that better agriculture practices and deployment of **digesters generate new sources of revenues.**
- Biden will review regulatory roadblocks to new innovations and invest in climate-friendly farming such as **conservation programs for cover crops and other practices aimed at restoring the soil and building soil carbon, and in the process,** preventing run-off and helping family farmers deploy the latest technologies to maximize productivity.
- He will create new opportunities to support deployment of **methane digesters to capture potent climate emissions and generate electricity.** With these efforts, family farmers can benefit and help lead the Clean Energy Revolution.
- **Biden will rejoin the Paris Agreement,** but simply rejoining is not enough. Biden will use every tool of American foreign policy to push the rest of the world to raise their ambitions alongside the United States. A Biden Administration will: Re-enter the Paris Agreement on day one of the Biden Administration and lead a major diplomatic push to raise the ambitions of countries' climate targets.

Summary Thoughts

- Incoming administration support of electric vehicles, new fuel economy standards, encourage conservation management practices, specifically mentioning of advanced biofuels, digesters and methane reduction, rejoin Paris Climate Agreement
- Concerns:
 - At this point any more stringent fuel economy standards will be hard to meet by current light duty vehicle fleet.
 - High octane fuel technologies and biodiesel blends could help meet more stringent standards but will the regulatory barriers to their use be removed?
 - Statements like “rigorous new fuel economy standards aimed at ensuring 100% of new sales for light- and medium-duty vehicles will be electrified” do not leave much room for any biofuels.