



The Bioeconomy's Role in COVID-19 Recovery and Climate Solutions

Briefing Series: Rural Communities, Climate, and COVID-19 Recovery

June 17, 2020

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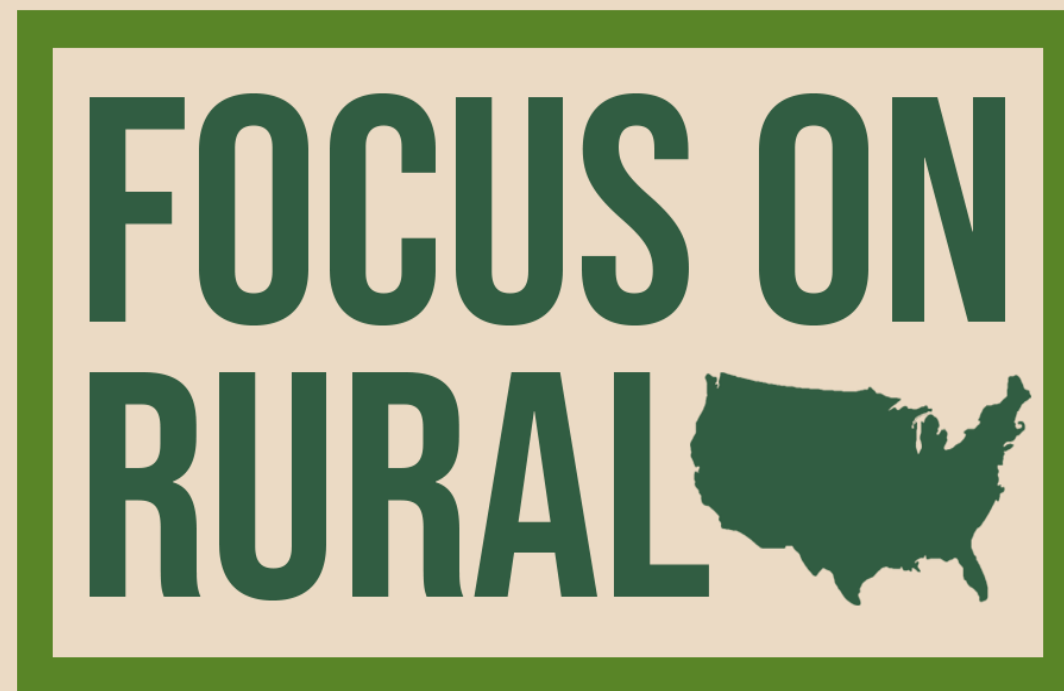
Environmental and
Energy Study Institute

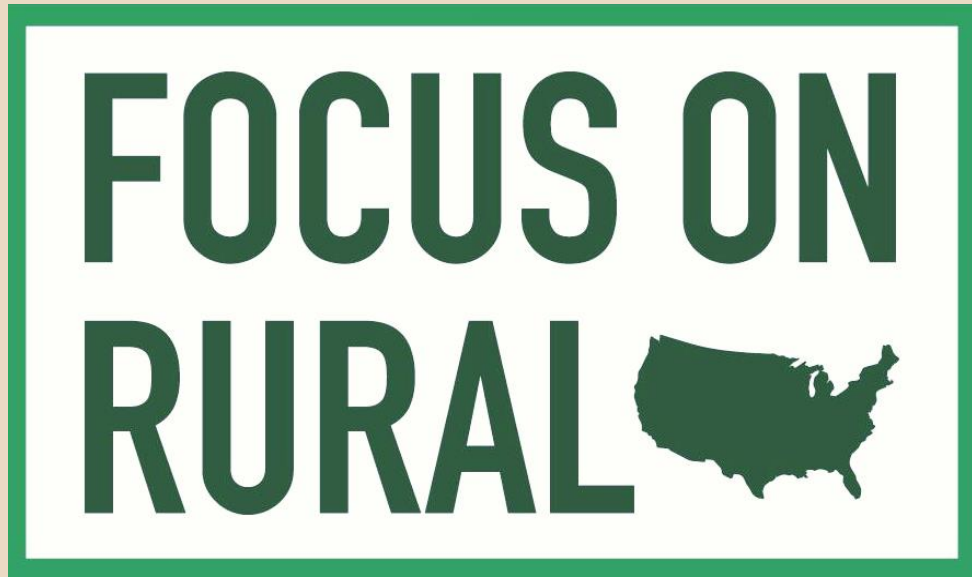
- Founded in **1984** by a **bipartisan** Congressional caucus.
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The Rural Economy & COVID-19





Focus on Rural America is a 501(c)4 organization aimed at boosting progressive causes and developing economic messages that resonate in rural.

We conduct public opinion research, panel presentations, press conferences and policy discussions to engage and educate federal candidates on messages that capture progressive values in a way that rural voters relate to.

Rural communities feed and fuel our world.

Biochemical and bio-manufactured products from farms provide revenue streams that support towns across America and our national GDP.

Maintaining our economic diversity means maintaining strong rural communities.

Farmers and their families can't continue to serve our economy without renewed investments in their schools, hospitals, infrastructure, and Main St.

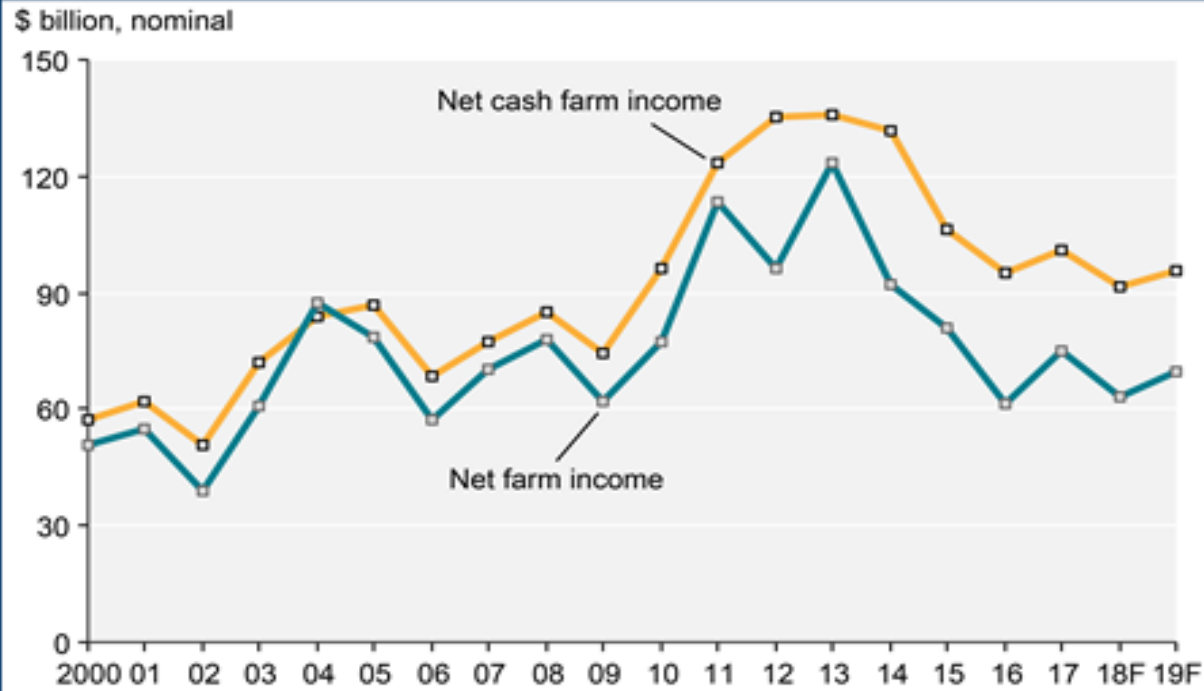
For every American, the buck stops with a good job.

Rural economic pain is not new

Leaders have failed to make critical investments for years

- Farm income in decline
- Lack of infrastructure & investments
- Crumbling housing stock
- School consolidation
- Hospital closures

Net farm income and net cash farm income, 2000-19F



Note: F = forecast.

Source: USDA, Economic Research Service, Farm Income and Wealth Statistics.

Data as of March 6, 2019.

Farm income has been on the decline for years.

Added instability is hurting farmers and the entire agriculture supply chain.

Rural communities are on the ropes.

Trade disputes of 2019

Farm Bureau Estimates Tariff Related Losses Cost Nebraska Farmers Nearly \$1 Billion in 2019

September 3, 2019



Midwestern flooding, Spring 2019

Farm losses drive Iowa's flood damage to \$2 billion, Farm Bureau economists estimate

Donnelle Eller The Des Moines Register

Published 2:49 p.m. CT Apr. 3, 2019



Iowa flooding: Gov. Reynolds on touring western Iowa: 'It was heart-wrenching'

Iowa Gov. Kim Reynolds toured counties hit by recent flooding in western Iowa on Monday, calling the extent of the damage "unbelievable." *Kelsey Kremer, kkremer@dmreg.com*

In the Spring of 2019, biofuel production buffered the impact of trade disputes and epic floods.

In the summer of 2020, COVID-19 has had a dire impact on travel and business. Biofuel plants all over the country are still shut down, the industry continues to go without aid, and corn farmers continue to go without markets for their crops.

The latest pain from COVID-19 is layered on top trade losses and waivers for oil and gas companies.

GALLONS OF GAS EXEMPTED FROM BIOFUEL BLENDING BY ADMINISTRATION



OBAMA

TRUMP

SOURCE: EPA RFS SMALL REFINERY EXEMPTIONS

In recent years, small refinery waivers for oil and gas have skyrocketed.

4 billion gallons of biofuels diverted from the market.

Companies as big as Exxon and Chevron receive waivers.

In January, the 10th Circuit ruled that certain small refinery waivers should not have been provided.

To lock themselves in for future waivers, refineries have now asked for “gap year” waivers from 2013 on to ensure they meet the court’s criteria for future exemptions, regardless of economic hardship criteria EPA is required to follow.

Providing “gap year” waivers would allow refineries to receive future waivers, even though they don’t meet the hardship requirements.



Biofuels Leaders Ask Trump to Reject New Round of Small-Refinery Exemption Requests

6/11/2020 | 3:35 PM CDT

The U.S. Court of Appeals for the 10th Circuit in Denver ruled on Jan. 24, that the EPA improperly granted small-refinery exemptions to the Renewable Fuel Standard in 2017 and 2018.

The court ruled EPA didn't have the authority to issue exemption extensions to three companies that were not originally granted waivers. It also found EPA "abused its discretion" by not explaining its conclusion that a small refinery could suffer disproportionate economic hardship while also maintaining refiners passed RFS compliance costs on to consumers at the pump.

Congress of the United States
Washington, DC 20515

June 8, 2020

President Donald J. Trump
The White House
1600 Pennsylvania Ave, NW
Washington, D.C. 20500

Dear President Trump,

We write to express our concern regarding recent requests to waive blending requirements under the Renewable Fuel Standard (RFS). This pandemic has severely strained the market for biofuels, closing plants and dealing another crippling blow to an industry that is already struggling. We urge you to stand with our farmers and rural economies during this challenging time and deny any request for blanket statewide or nationwide waivers from the 2020 RFS blending requirements under the Clean Air Act.

On June 8, a group of 44 bipartisan House members sent a letter to the Administration, requesting the President and EPA Administrator deny blanket waiver requests.

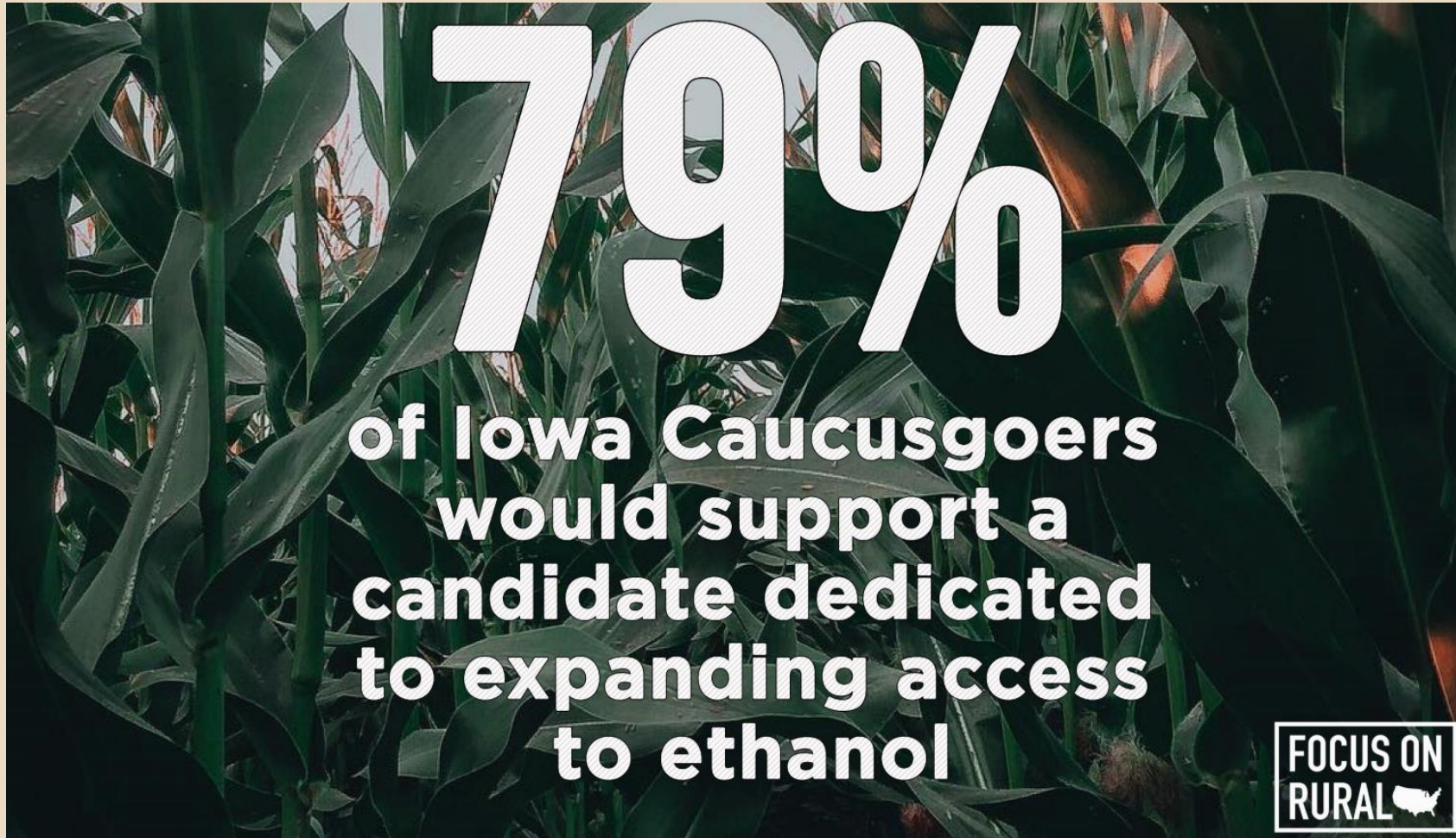
With 150 biofuel facilities down, the rural economy cannot withstand more carveouts for oil and gas. Biofuel facilities and farmers are being left behind.

The effects of COVID-19, on top of the damage caused by abuse of the small refinery exemption waivers, have caused more than 150 biofuel plants to either completely or partially idle production. This means that over 50 percent of US ethanol production capacity has ceased operations, resulting in economic uncertainty for our rural economies and the loss of a critical market for corn farmers. At an already turbulent time for ethanol and biodiesel producers, we must take action to support—not undermine—the industry and our farmers.

In addition to the economic harm waiving the RFS would cause rural America, these requests are unjustified and run contrary to the EPA's well-established precedents. The Clean Air Act (Title 42 United States Code §7454(o)(7)) stipulates that the EPA can only grant RFS waivers if the renewable fuel requirement “would severely harm the economy or environment of a state, a region, or the United States” or “that there is an inadequate domestic supply” of renewable fuel. The requests for RFS waivers fail to meet these crucial legal criteria and the EPA must reject these requests because:

- Recent oil market volatility is a result of COVID-19 impacts on travel and lower demand for fuel combined with high production levels in Russia and Saudi Arabia, not the RFS;
- RFS regulations and requirements account for a drop in the demand for fuel with a proportional change in the volume of renewable fuel required; and

Rural Americans know that biofuels help their economies and communities



Focus on Rural America: David Binder Research Poll, January 2019.

The coronavirus pandemic makes rural communities increasingly vulnerable

AGRICULTURE

'Something isn't right': U.S. probes soaring beef prices

One hundred years ago, U.S. antitrust prosecutors broke down monopolies in meatpacking. But can they do it again?



As meatpacking plants reopen, workers terrified of coronavirus risk
Infection rates are still rising at many plants, prompting lawmakers and unions to call for more enforcement.

[politico.com](https://www.politico.com)

Farmers Groups Fear Coronavirus Aid Won't Reach Hardest Hit Farmers

JUN 08, 2020

Alex Robinson

Farming organizations say farmers of color and small growers will likely fall through the cracks.



As farmers worry about who will get help, ethanol producers wonder if they'll get any.

COVID-19 continued spread will squeeze our hospitals and small towns.

25% of all rural hospitals are in danger of closing.



The Chartis Center for Rural Health

Insight and Solutions to Address Today's Most Complex Challenges



Ethanol facilities add value to farm income and products and put the revenue into good jobs and benefits for workers in rural America.

Policies the Administration can use to help today:

- Implement the Renewable Fuel Standard as written and intended.
- Set the RFS Volume Obligations
- End the use unjust small refinery waivers

Key take-ways:

Ethanol facilities add value to farm income and products and put the revenue into good jobs and benefits for workers in rural America.

However, they have been hit hard over the years, particularly due to small refinery waivers.

Every inch of the value-added agriculture economy puts money into small towns. Ethanol facilities are a shining example. Without them, we will continue to see our small towns contract.



Role of Biofuels in Emission Reduction Strategies

*Environment and Energy Study Institute
Rural Communities, Climate, and COVID-19 Recovery
Briefing*

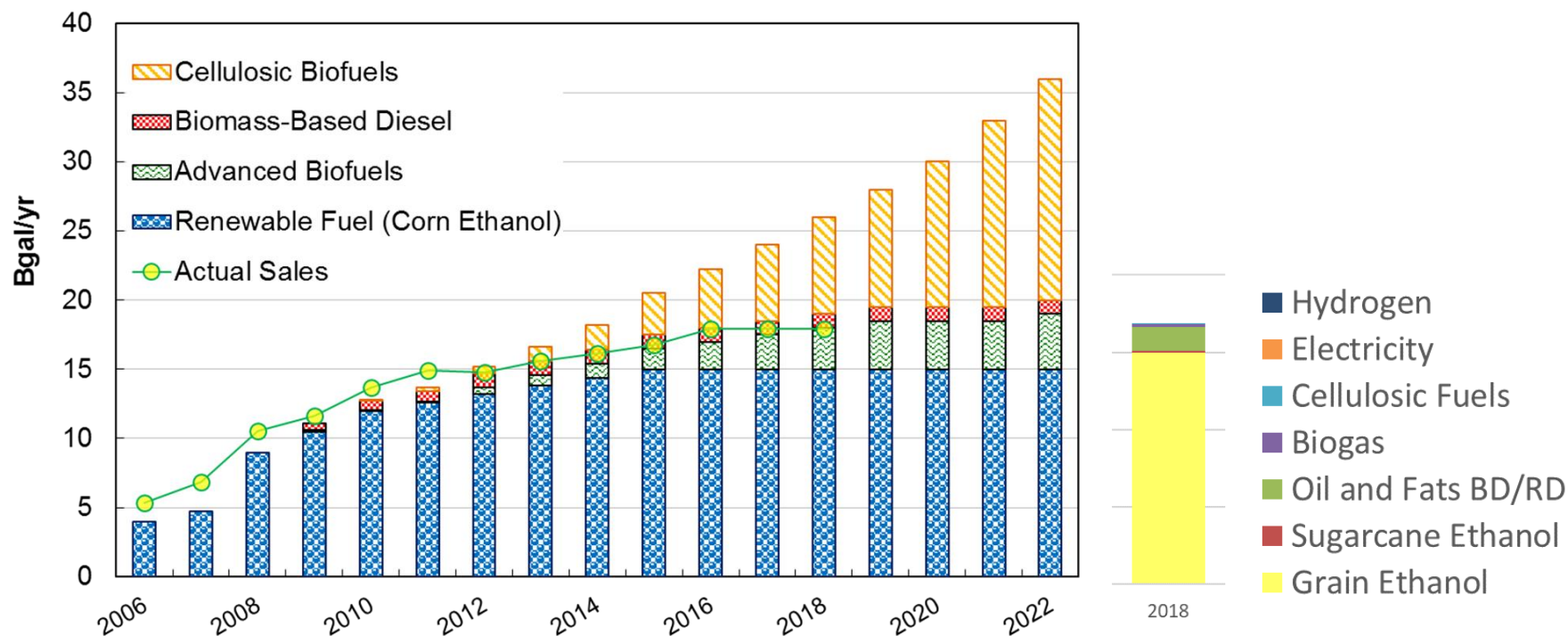
Stefan Unnasch

Outline

- Biofuels and Air Quality Impacts
- GHG Reductions
- Policies for Rural Development

Alternative Fuels and RFS

- Biofuels have not kept pace with RFS expectation but still provide benefits.

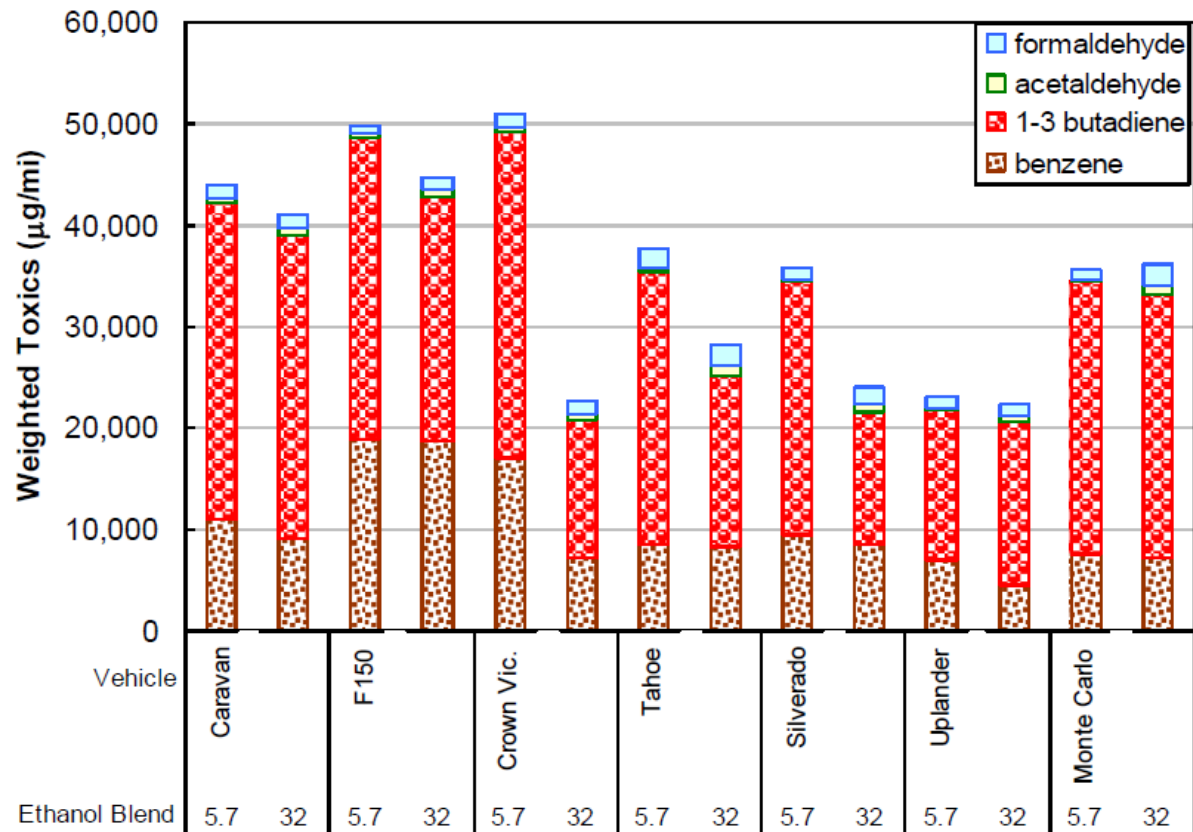


Fuel Properties and Air Quality

- Ethanol
 - High Octane Number: $99 (R+M)/2$
 - Heat of vaporization, low sulfur, distillation properties
- Renewable Diesel
 - High Cetane Number: ~ 80
 - Low sulfur, no aromatics
- Biodiesel
- Biogas
 - Avoids flaring, dairy lagoons
- Electricity & Hydrogen: ZEV

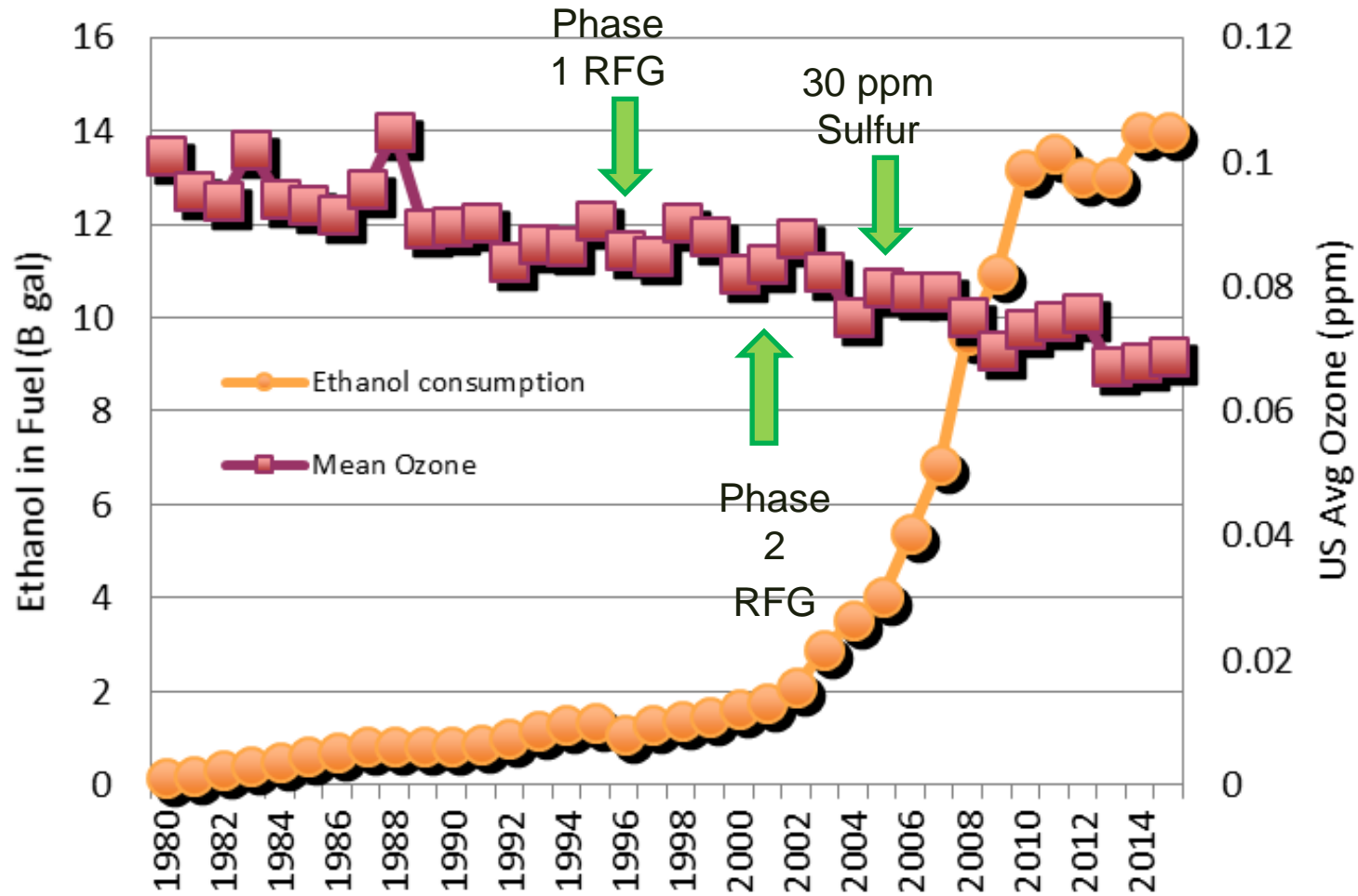
Ethanol Blends and Air Toxics

- Aromatics
- T50
- T90
- Benzene
- Sulfur

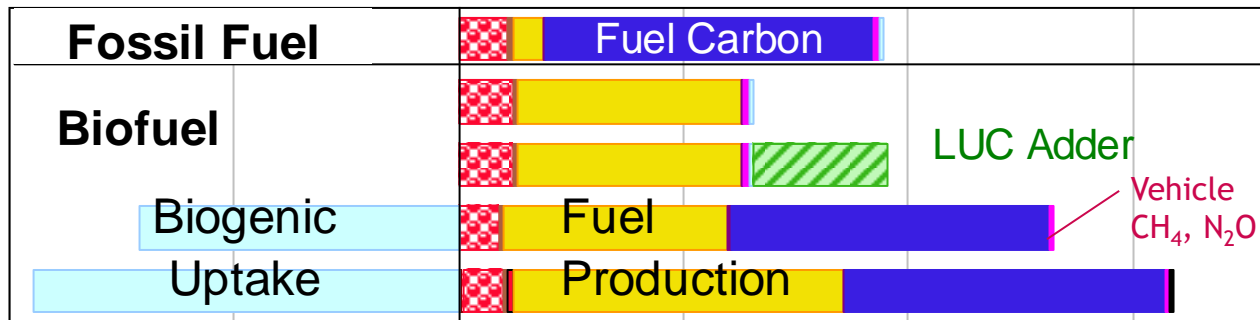
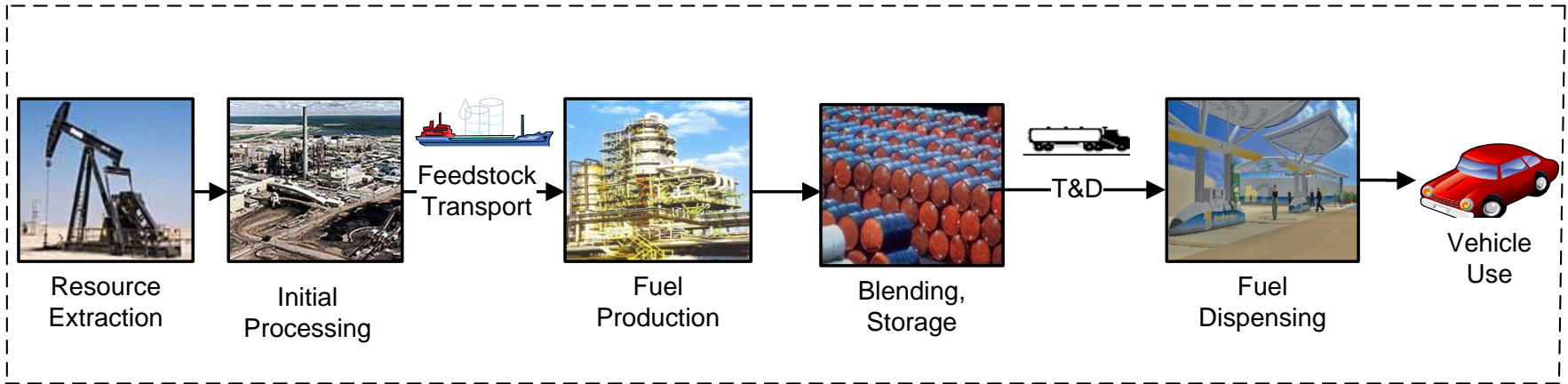


Source: Unnasch, S. and A. Henderson, (2014). Air Quality Impacts Associated with the Use of E15 Blends Instead of E10. Life Cycle Associates Report LCA.6091.94.2014. Prepared for Americans United for Change.

U.S. Ozone Levels



Life Cycle Steps and Carbon Intensity

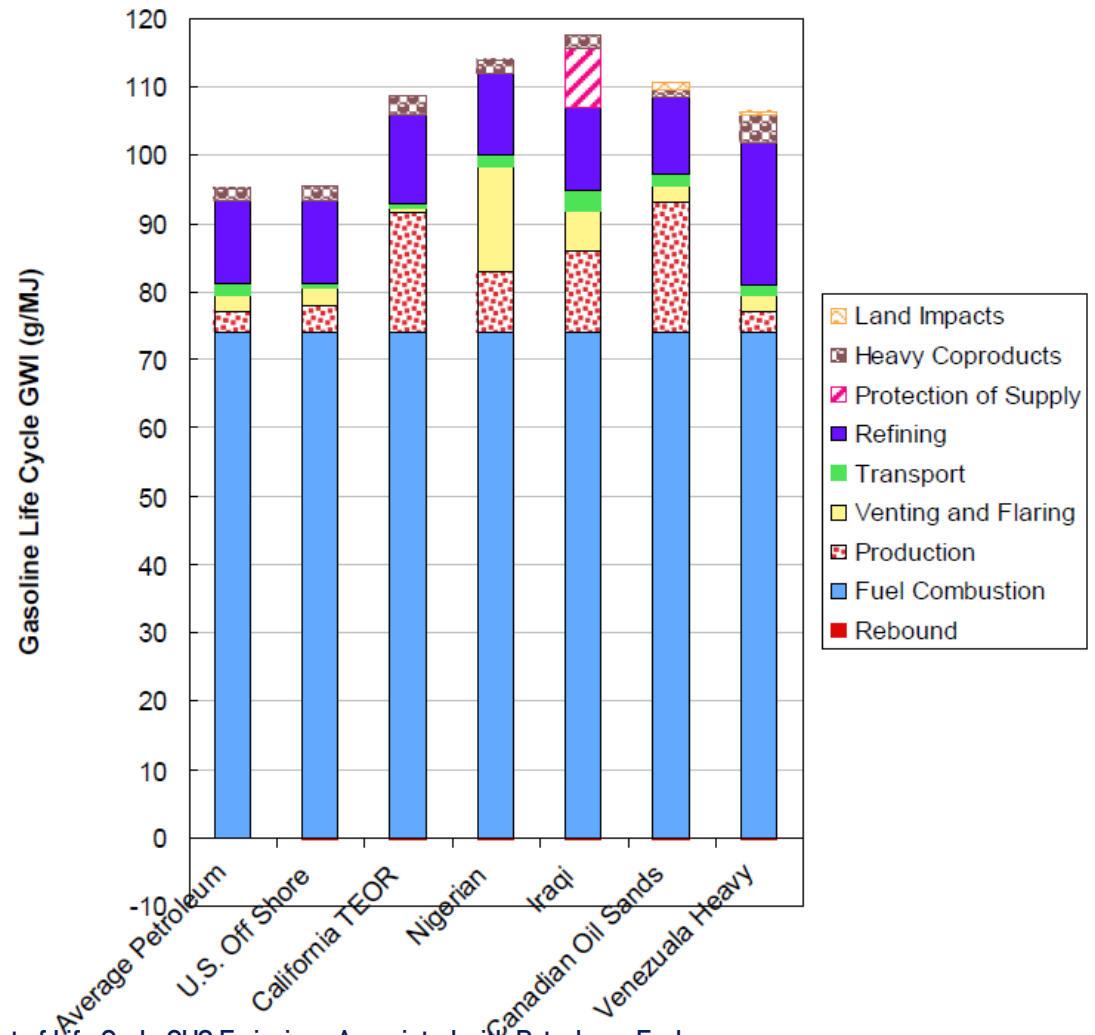


Well to Wheel: $WTW = WTT + TTW$ (g/mi)

Fuel CI: $= WTT + Fuel\ Carbon + Vehicle\ CH_4, N_2O$ (g CO₂e/MJ)

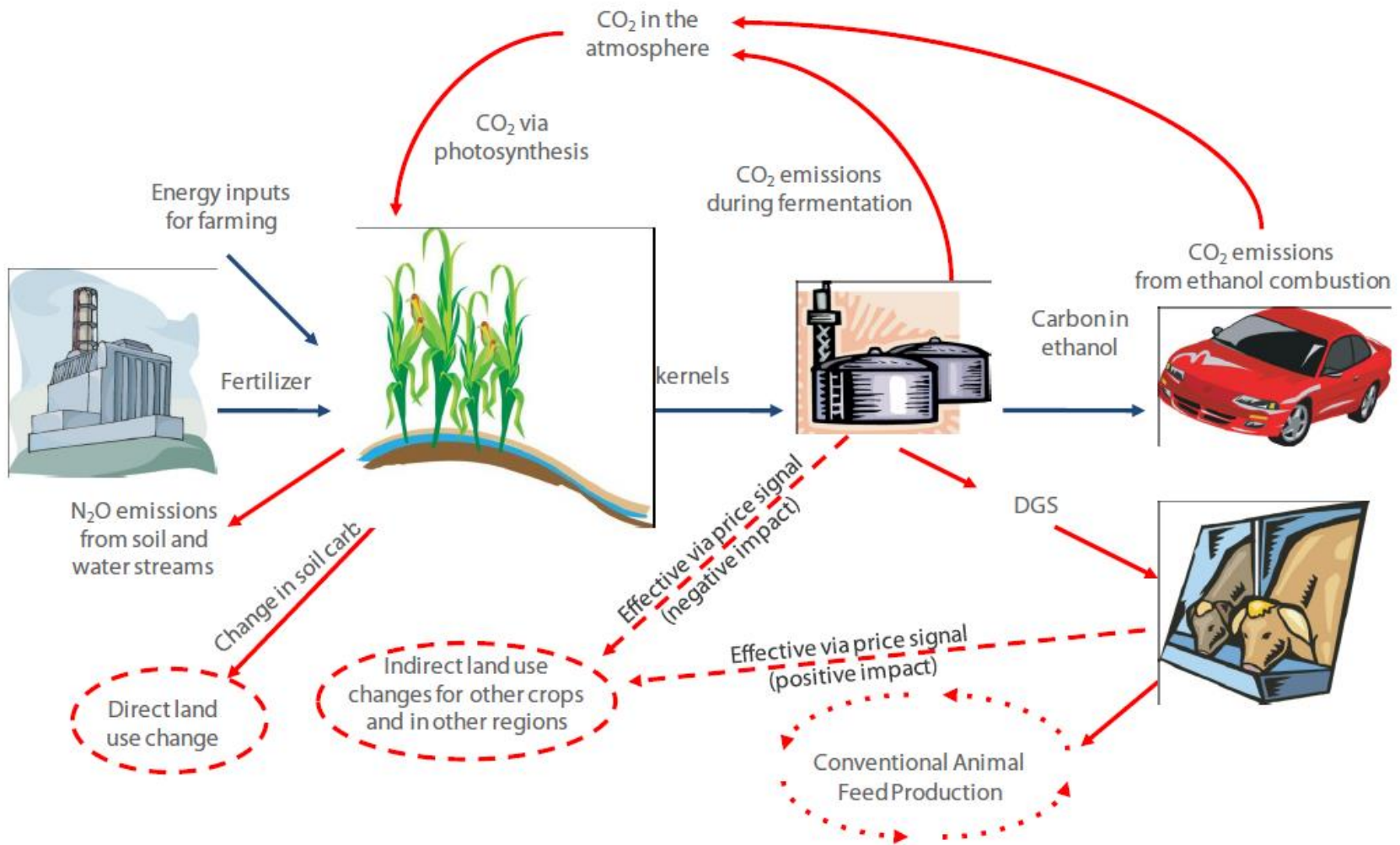
GHG Emissions from Petroleum Fuels

- Growth in unconventional sources
- Supply volatility
- Complex refining

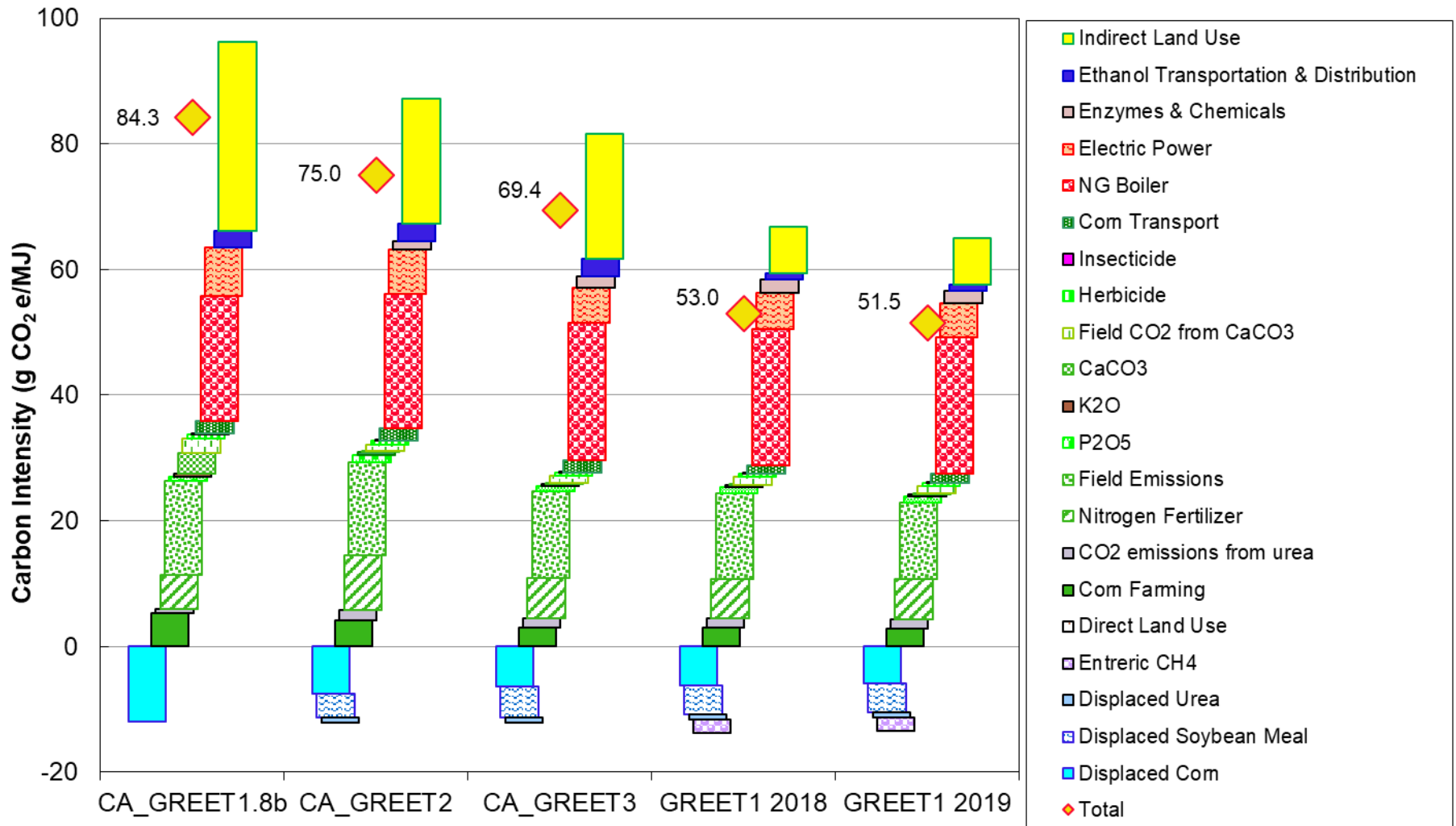


Source: Unnasch, S. et al. (2009) Assessment of Life Cycle GHG Emissions Associated with Petroleum Fuels. Life Cycle Associates Report LCA-6004-3P, prepared for New Fuels Alliance.

System Boundary – Corn Ethanol



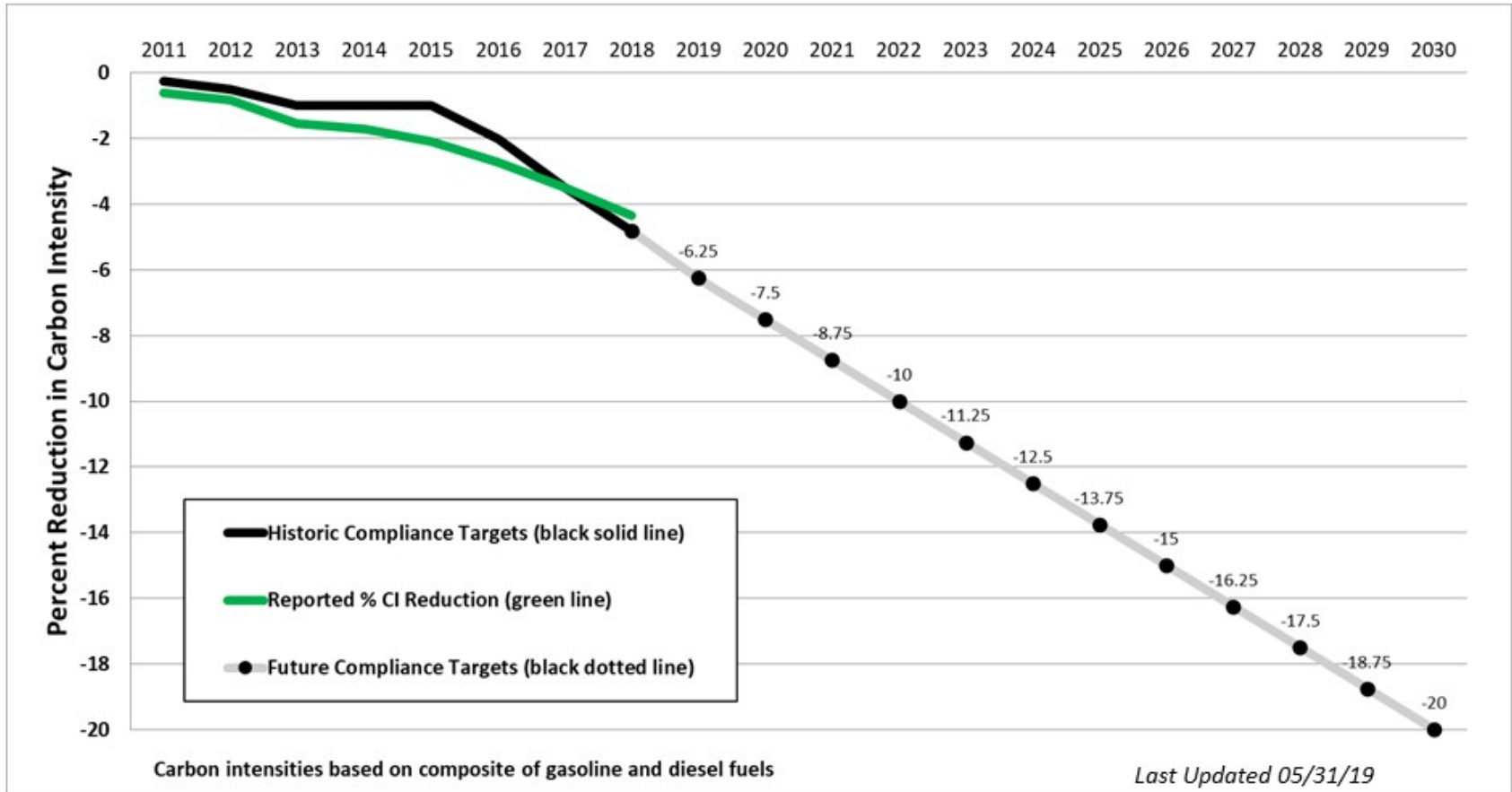
Evolution of Corn GHG Analysis



Why have a low carbon fuel program?

- Transportation is a significant portion of GHG emissions.
- Why not rely on Cap and Trade and Fuel Efficiency?
 - How to count EV GHG emissions?
 - Limited consumer incentive
- Many opportunities exist for innovation in transportation.
 - Low carbon fuels
 - Ethanol, Biodiesel, Renewable Diesel, Biogas, FT diesel, etc.
 - Electric vehicles: Battery, E85 PHEV, Hydrogen

2011-2018 Performance of the Low Carbon Fuel Standard



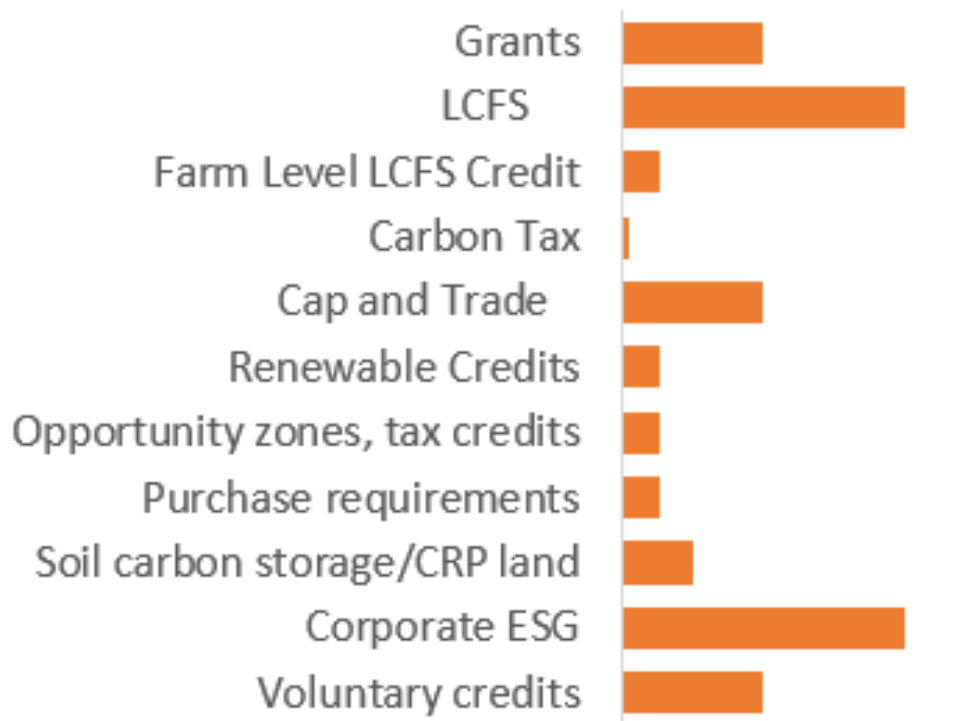
This figure shows the percent reduction in the carbon intensity (CI) of California's transportation fuel pool. The LCFS target is to achieve a 20% reduction by 2030 by setting a declining annual target, or compliance standard. The compliance standard was frozen at 1% reduction from 2013-2015 due to legal challenges, contributing to a build-up of banked credits as regulated parties bringing new alternative fuels to market continued to over-comply with the standard. The program will continue post 2030 at a to be determined stringency.

GHG Reduction for Rural America

Activity	GHG Savings	Utilization Options
No till farming	Reduce soil disturbance and enable build-up of soil carbon.	Corn Ethanol, Switchgrass Biofuel, Oilseed Diesel.
Reduced input farming. N ₂ O inhibitors.	Reduced emissions from fertilizer production and N ₂ O from fields.	
Energy crops	Soil carbon storage from perennial roots. Absorb nutrients from run-off.	Biogas, Ethanol, Jet Fuel, Hydrogen, Electricity, Pellet Fuel, Bio Chemicals, Bio Materials.
Manure and waste utilization	Divert wastes from generating methane and N ₂ O.	
Crop and forest residue utilization	Provide carbon neutral feedstock. Avoid decomposition in fields. Return nutrients as fertilizer.	
Prairie and forest restoration, Buffalo trace, Habitat zone	Provide opportunity for soil carbon storage on land associated with crop production. Absorb nutrients from run-off.	Corn and soy margins. Assign land to biofuel production.

Complexity and Value for GHG programs

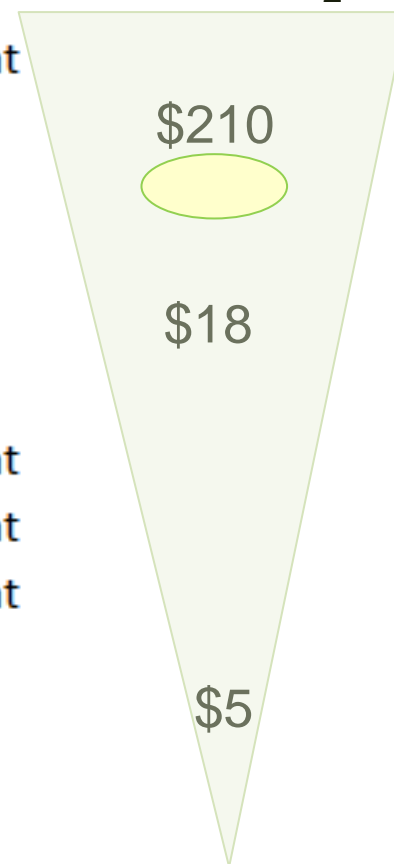
Certification Cost per Facility



Funding Source

- Government
- Fuel
- Fuel
- Fuel
- Fuel
- Corporate
- Government
- Government
- Government
- Corporate
- Corporate

Credit Value \$/tonne CO₂



Lessons Learned from Fuel Programs

- **Equity in GHG Reductions**
 - Credits tied to GHG reductions
 - Flexibility in adopting new technologies
- **Confidence for Investors**
 - Losses in solar energy projects
 - Changes in RFS volume
 - Persistence in LCFS targets and price
- **Technology Adoption**
 - Biogas to RNG
 - Tallow to renewable diesel
 - Investments in cellulosic technology
 - Investments in electrification

Suggestions for the Future

- Support E15.
- Bring back the flexible fuel vehicle.
 - As a high octane plug in hybrid
- Add RIN pathways for hydrogen and electricity.
- Develop biomass based jet fuel from residues.
- Enable innovation.
 - Manure by wire for biorefineries
- Support farm level benefits.
 - Low emission farming
 - Habitat restoration

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EESI

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