Impacts of CI Scoring on the Food, Feed, and Fuel Industries

Kent Swisher
North American Renderers Association
February 1, 2024

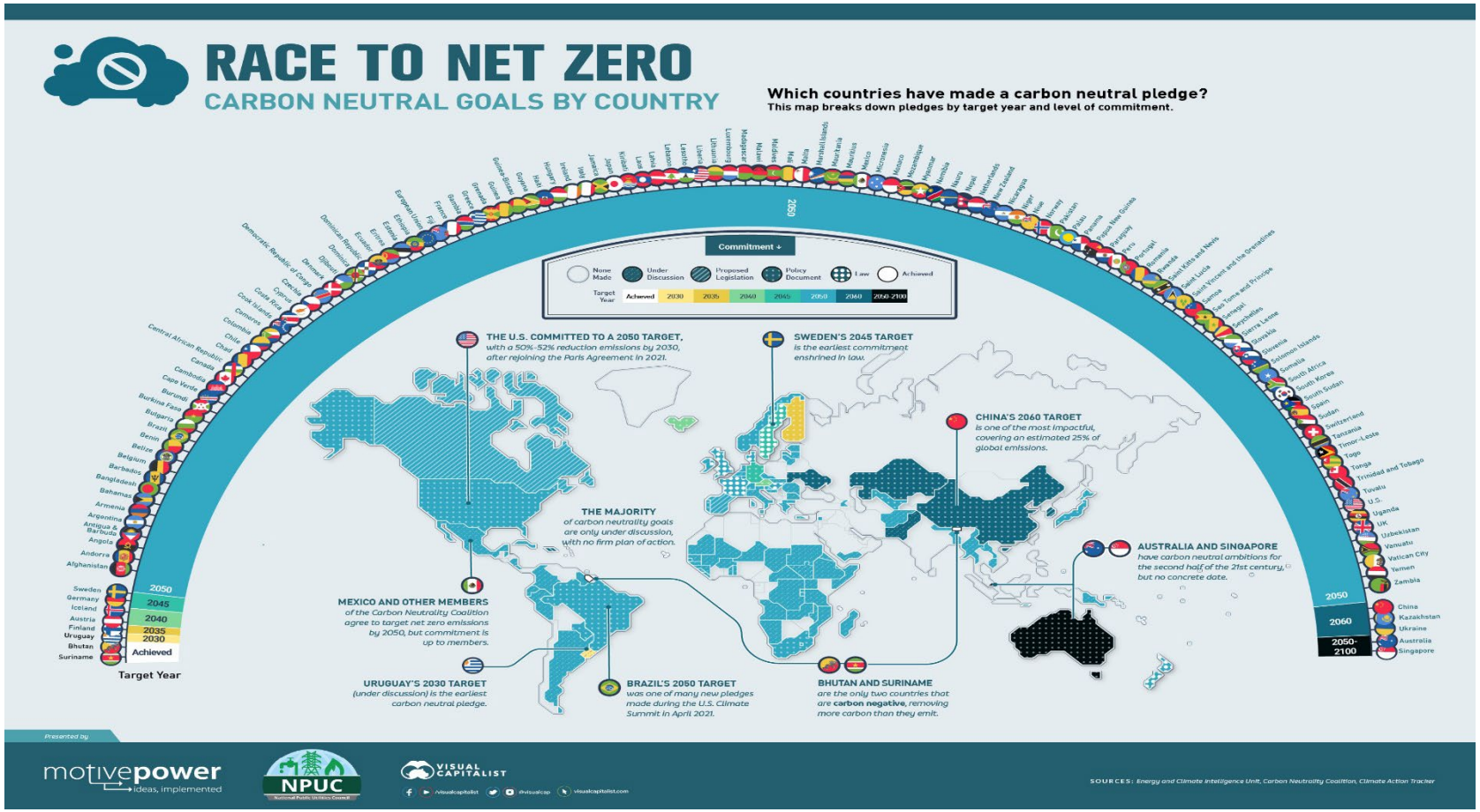
NORTH AMERICAN RENDERERS ASSOCIATION

- Founded in 1933
- Represent over 95% of rendering in U.S. and Canada
  - Packer renderers
  - Independent renderers
- Headquartered in Alexandria, VA
- Offices in Hong Kong and Mexico City
- Market consultants in Brussels, China, Thailand, Vietnam, and Chile

Outline

- **Why?**
- **What is being done?**
- **Impacts?**
- **Outlook**


WAIT BUT WHY


RACE TO NET ZERO
CARBON NEUTRAL GOALS BY COUNTRY
Which countries have made a carbon neutral pledge?
This map breaks down pledges by target year and level of commitment.
2050
Commitment +
None Made
Under Discussion
Proposed Legislation
Policy Document
Law
Achieved
Target Year
Achieved
2030
2035
2040
2045
2050
2060
2050-2100
THE U.S. COMMITTED TO A 2050 TARGET, with a 50%-52% reduction emissions by 2030, after rejoining the Paris Agreement in 2021.
SWEDEN'S 2045 TARGET is the earliest commitment enshrined in law.
CHINA'S 2060 TARGET is one of the most impactful, covering an estimated 25% of global emissions.
THE MAJORITY of carbon neutrality goals are only under discussion, with no firm plan of action.
AUSTRALIA AND SINGAPORE have carbon neutral ambitions for the second half of the 21st century, but no concrete date.
MEXICO AND OTHER MEMBERS of the Carbon Neutrality Coalition agree to target net zero emissions by 2050, but commitment is up to members.
URUGUAY'S 2030 TARGET (under discussion) is the earliest carbon neutral pledge.
BRAZIL'S 2050 TARGET was one of many new pledges made during the U.S. Climate Summit in April 2021.
BHUTAN AND SURINAME are the only two countries that are carbon negative, removing more carbon than they emit.
Sweden
Germany
Iceland
Austria
Finland
Uruguay
Bhutan
Suriname
China
Kazakhstan
Ukraine
Australia
Singapore
Presented by
motivepower
ideas, implemented
NPUC
VISUAL CAPITALIST
SOURCES: Energy and Climate Intelligence Unit, Carbon Neutrality Coalition, Climate Action Tracker

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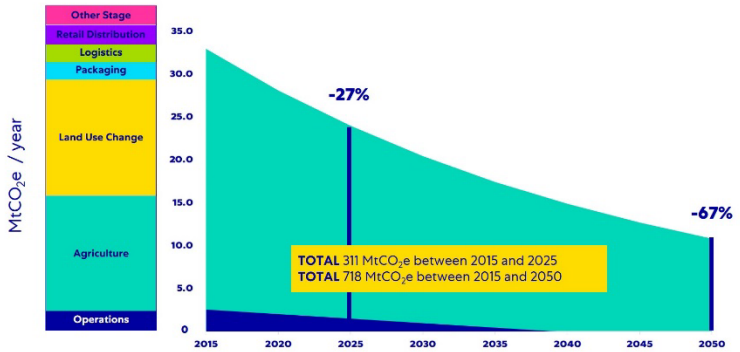
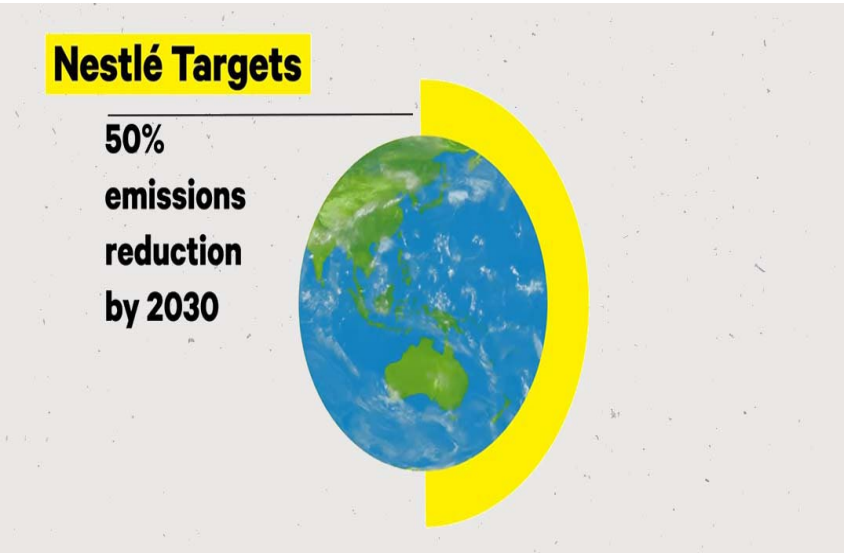
MARS

GLIDEPATH FOR GREENHOUSE GAS (GHG) EMISSION REDUCTION TARGETS





Major U.S. Airline Agreements for Sustainable Aviation Fuel (SAF)

Airline	SAF Commitment	SAF Producer	SAF Pathway
American Airlines	620 million gallons from 2025 to 2030	Gevo	Alcohol to Jet; ethanol feedstock
DELTA	525 million gallons from 2026 to 2032	Gevo	Alcohol to Jet; ethanol feedstock
jetBlue	670 million gallons from 2023 to 2033	SG Preston	HEFA; vegetable and waste oils feedstock
Southwest	219 million gallons from 2026 to 2041	Velocys	Fischer-Tropsch; syngas feedstock
UNITED AIRLINES	1.5 billion gallons by 2041	Alder Fuels	Biomass to crude oil; forest and crop waste feedstock

Source: March 2023 U.S. Government Accountability Office report, airline press releases

DELTA

FLIGHT TO NET ZERO

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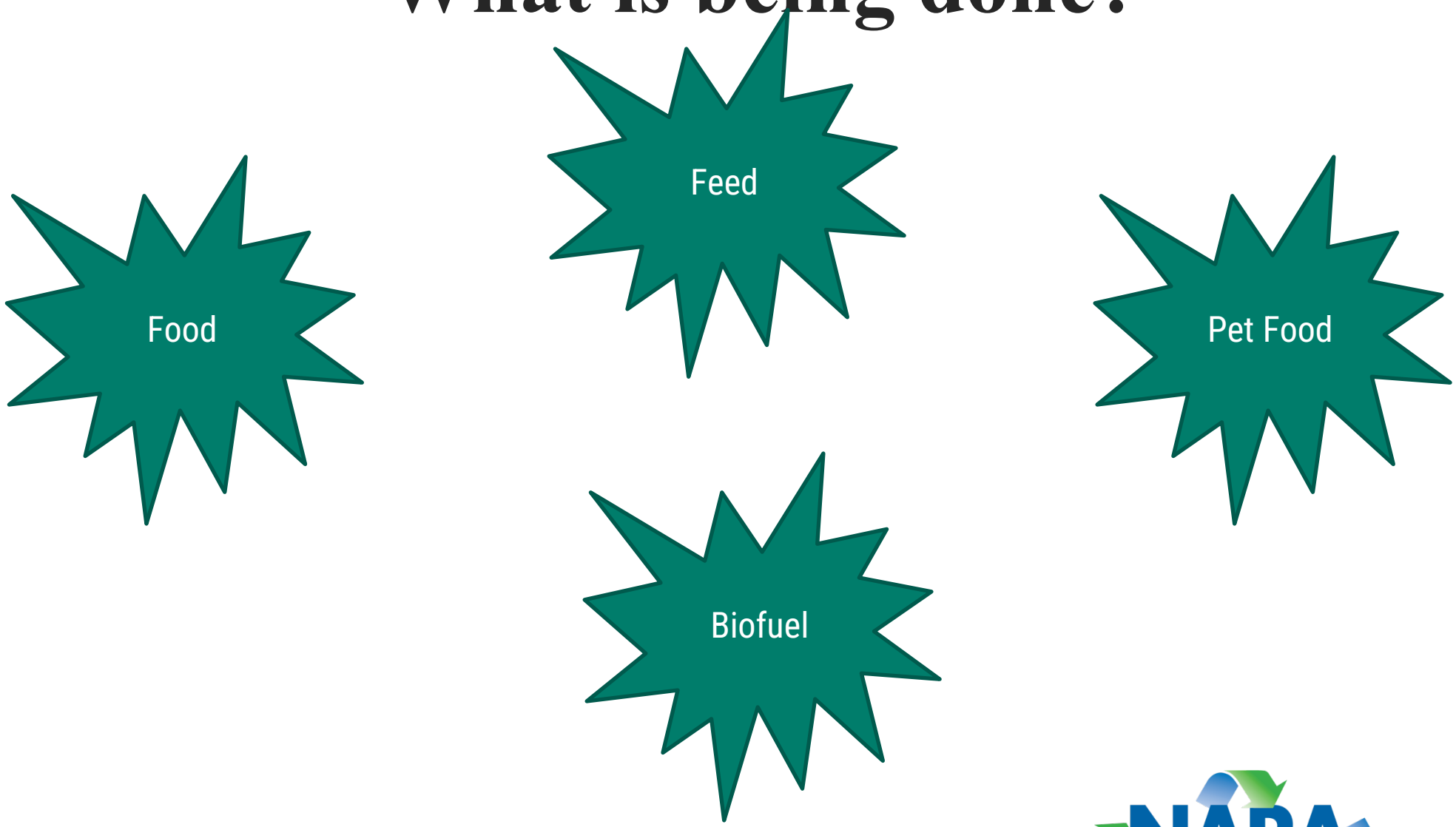
What is being done?



Biomass-Based Diesel Renewable Fuel Programs

Renewable Fuel Standard (RFS) - US

Low Carbon Fuel Standard (LCFS) - California

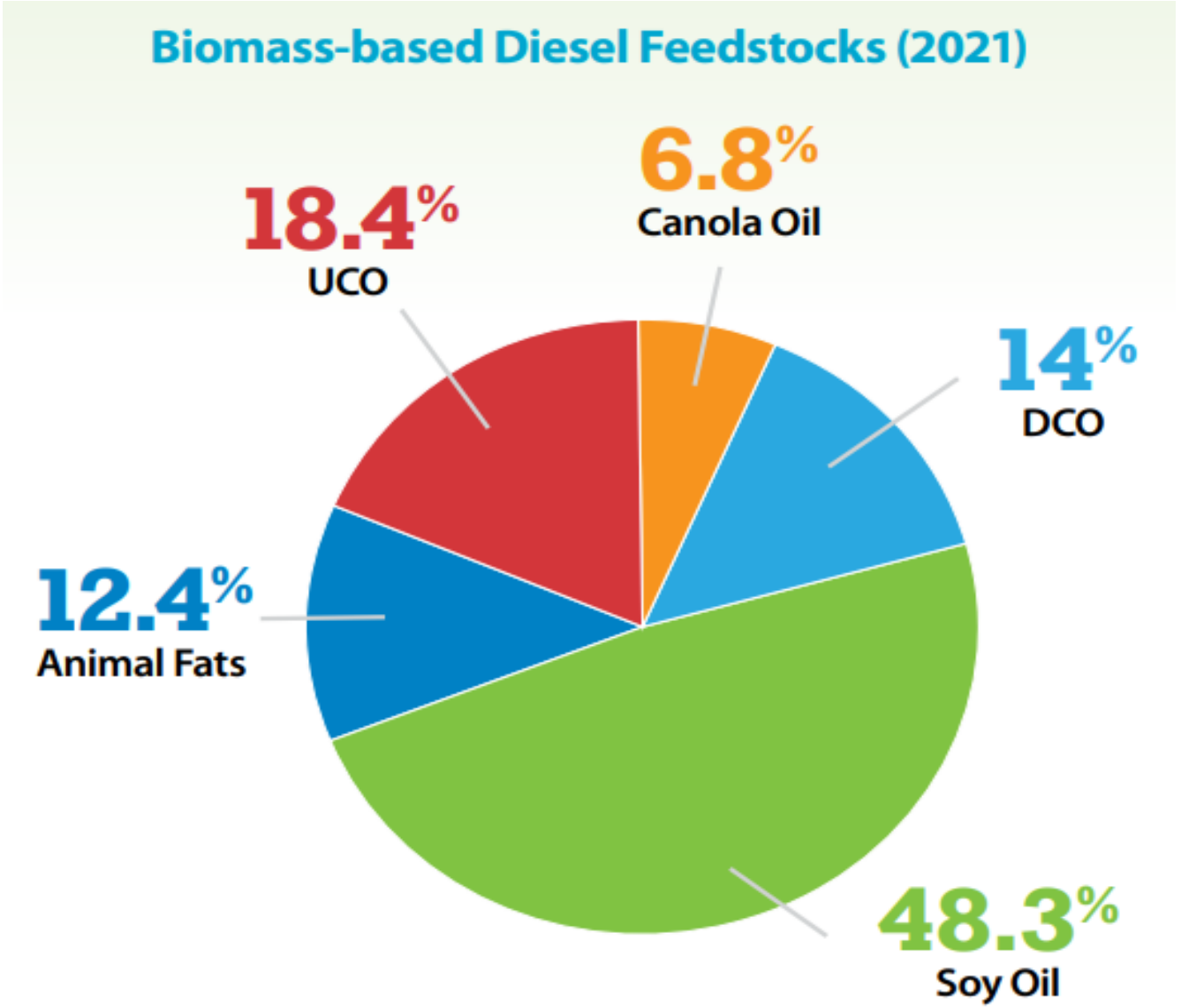
2 Programs Incentivize Biodiesel/Renewable Diesel Production/Use

- Renewable Fuel Standard (RFS) - US
  - RFS sets fuel volumes
  - Biomass Based Diesel must show 50% reduction in GHG as compared to petroleum diesel
- Low Carbon Fuel Standard - California
  - LCFS sets carbon volumes
  - Incentivizes carbon reduction

Inflation Reduction Act

- **2023-2024 Blenders Tax Credit Reauthorized**
  - BD/RD $1.00/gallon
  - SAF
    - Base $1.25/gallon
    - Top $1.75/gallon

- **2025-2027 Producers Tax Credit**
  - BD/RD
    - Base $.20/gallon
    - Top $1.00/gallon
  - SAF
    - Base $.35/gallon
    - Top $1.75/gallon
  -

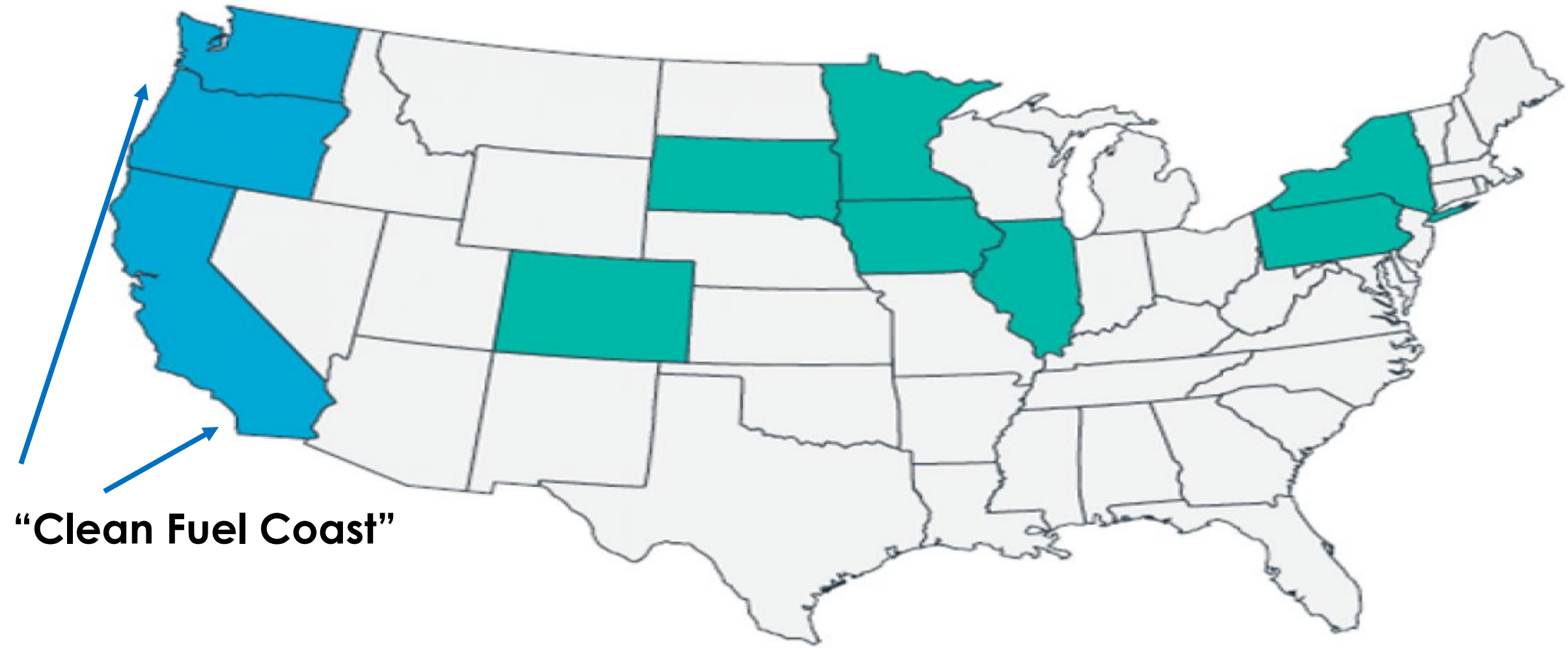


Source: Clean Fuels Alliance America, Annual Report 2022

Source: Biomass Magazine

Exhibit 1: U.S. states with LCFS and those that are considering LCFS

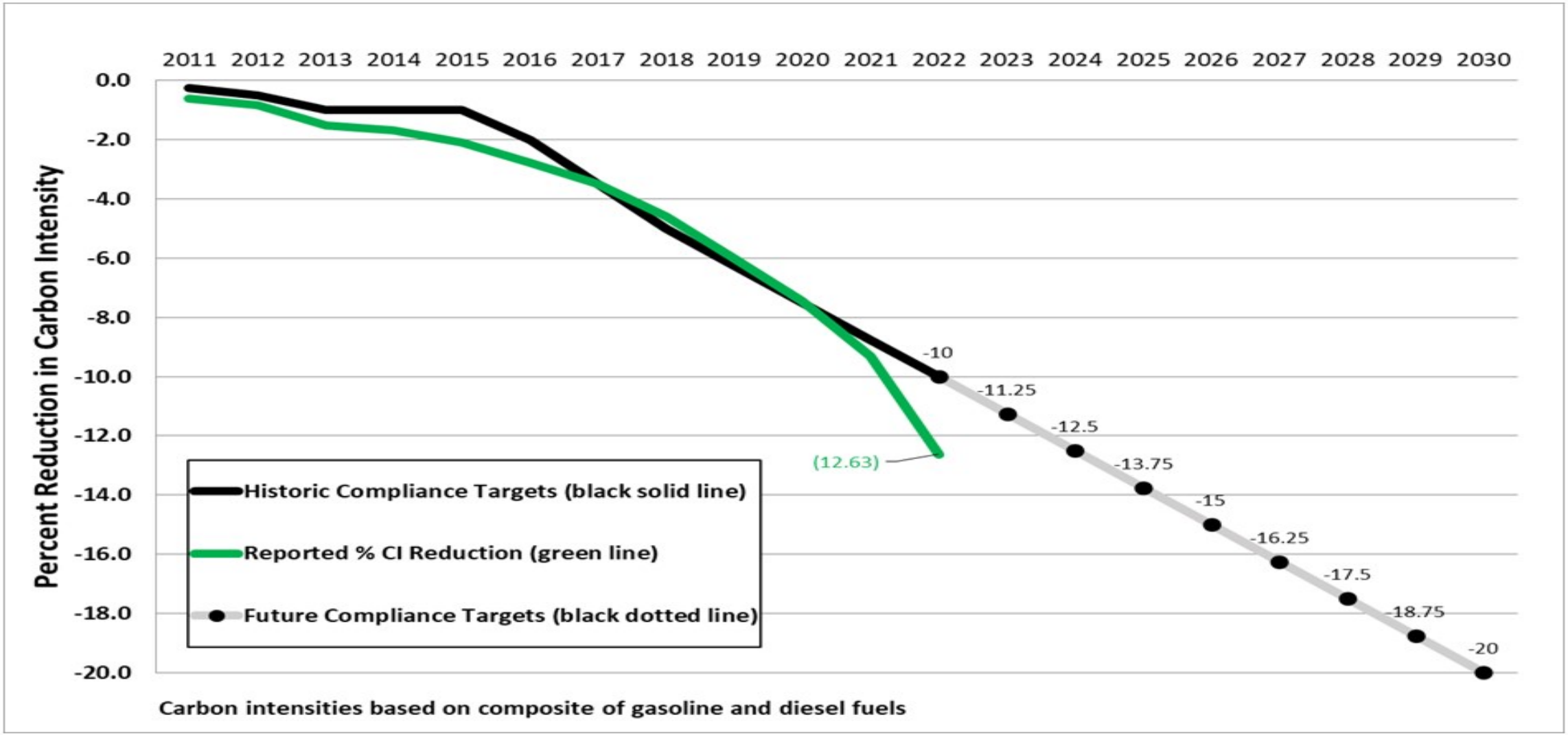
States with LCFS (CA, OR, WA) States considering LCFS (CO, IA, IL, MN, NY, PA, SD)



"Clean Fuel Coast"

Source: Westchester analysis

2011-2022 Performance of the Low Carbon Fuel Standard



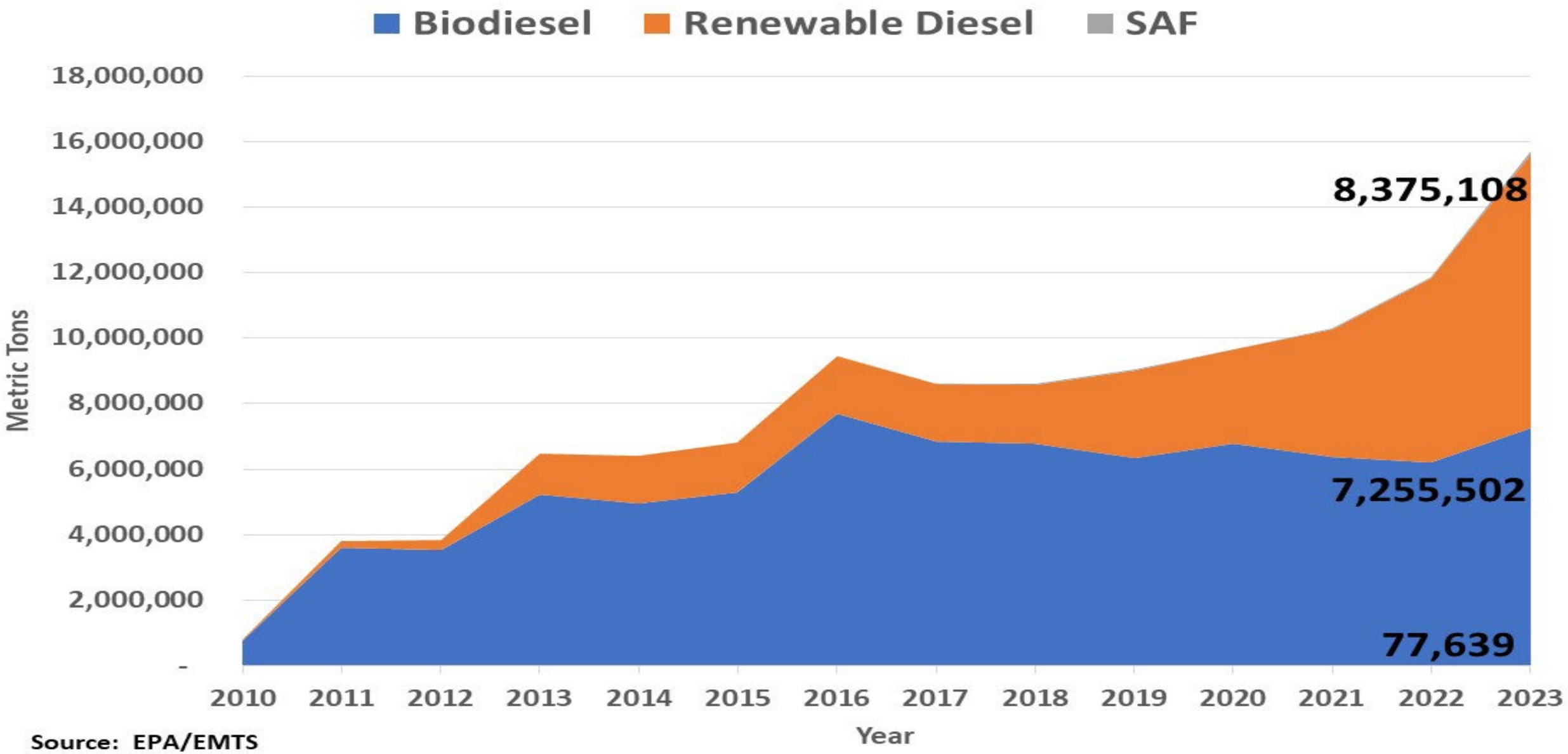
Last Updated 04/28/23

California Low Carbon Fuel Standard (LCFS) Carbon Intensity (CI) Scores (gCO2e/MJ)

California Low Carbon Fuel Stanard (LCFS) Carbon Intensity Scores (gCO2e/MJ)				
Biodiesel Feedstock			**Renewable Diesel Feedstock**	
North America			**North America**	
Tallow	34.46		Tallow	36.29
Used Cooking Oil (UCO)	20.16		Used Cooking Oil (UCO)	20.84
Distillers Corn Oil	29.55		Distillers Corn Oil	32.80
Soy Oil	54.23		Soy Oil	55.22
Canola Oil	53.36		**Singapore**	
			Tallow	36.22
			UCO Global	21.25
			UCO Asian	16.89

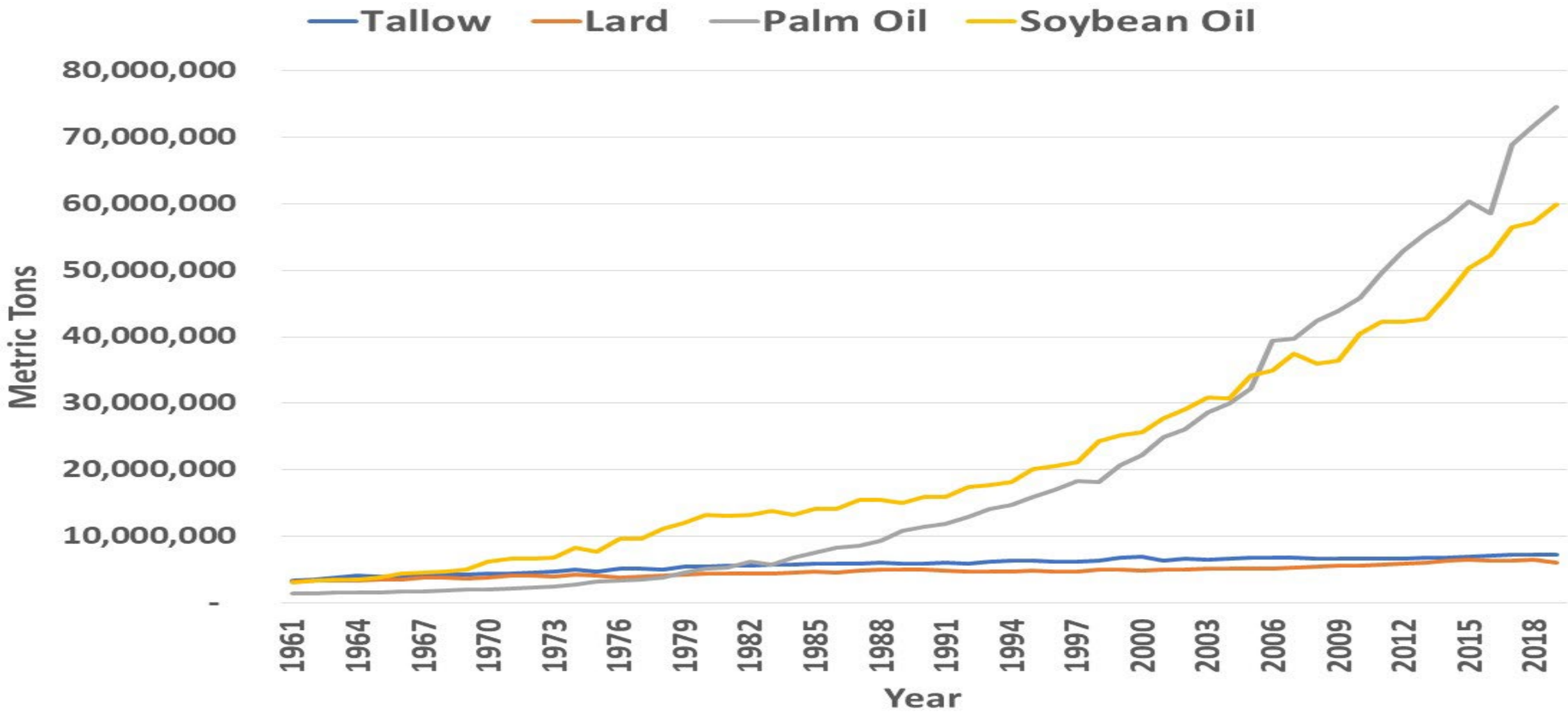
Source: NARA Derived from - California Air Resources Board (CARB); https://ww2.arb.ca.gov/resources/documents/lcfs-pathway- certified-carbon-intensities

US Biodiesel and Renewable Diesel Production 2010-2023 (metric tons)



Source: EPA/EMTS

Global Fat & Oil Production 1961-2019



Source: FAO Stat

What is being done?

Food, Feed, Pet Food

RENDERING COMBATS CLIMATE CHANGE

Rendering protects the environment from high greenhouse gas emissions of other disposal methods. It reduces the environmental impacts of animal agriculture by sequestering 5 times more greenhouse gases than are produced.

This is equal to removing **18.5 million** cars off the road each year.

If all renderable products were sent to landfills, all available space would be gone in **4 years.**

WHAT IF THERE WAS NO RENDERING?

WITH RENDERING		WITHOUT RENDERING
✓ Reduced food waste		✗ Roughly 50% of each meat animal wasted
✓ 62 billion pounds of food waste diverted from landfills		✗ All U.S. landfills full in 4 years
✓ 3.7 billion gallons of clean water reclaimed and returned to rivers and streams		✗ Wasted water: not cleaned or returned to waterways & contaminated water if animal leftovers sent to landfill
✓ Fewer greenhouse gas emissions (5 times more GHGs sequestered than produced)		✗ Lost environmental benefits for animal agriculture (less GHG reduction)
✓ Lower carbon emissions from biodiesel and renewable diesel (80% less than petroleum diesel)		✗ Increased carbon emissions from less environmentally friendly fuels

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Research Published

JOURNAL OF INDUSTRIAL ECOLOGY

International Society for Industrial Ecology

Data for the Carbon Footprinting of Rendering Operations

Charles H. Gooding

First published: 19 March 2012 | https://doi.org/10.1111/j.1530-9290.2011.00430.x | Citations: 15

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REVIEW

REVIEW: Comparison of 3 alternatives for large-scale processing of animal carcasses and meat by-products

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Published online 2021 May 17. doi: 10.1093/af/vfab002
PMCID: PMC8127651
PMID: 34026312

How agricultural rendering supports sustainability and assists livestock's ability to contribute more than just food

Anna D Wilkinson and David L Meeker

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Research


Fats and Proteins Research Foundation


Animal Co-Products
Research & Education Center
CLEMSON UNIVERSITY


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what's next?

Life Cycle Analyses

gfli

Global Metrics for Sustainable Feed

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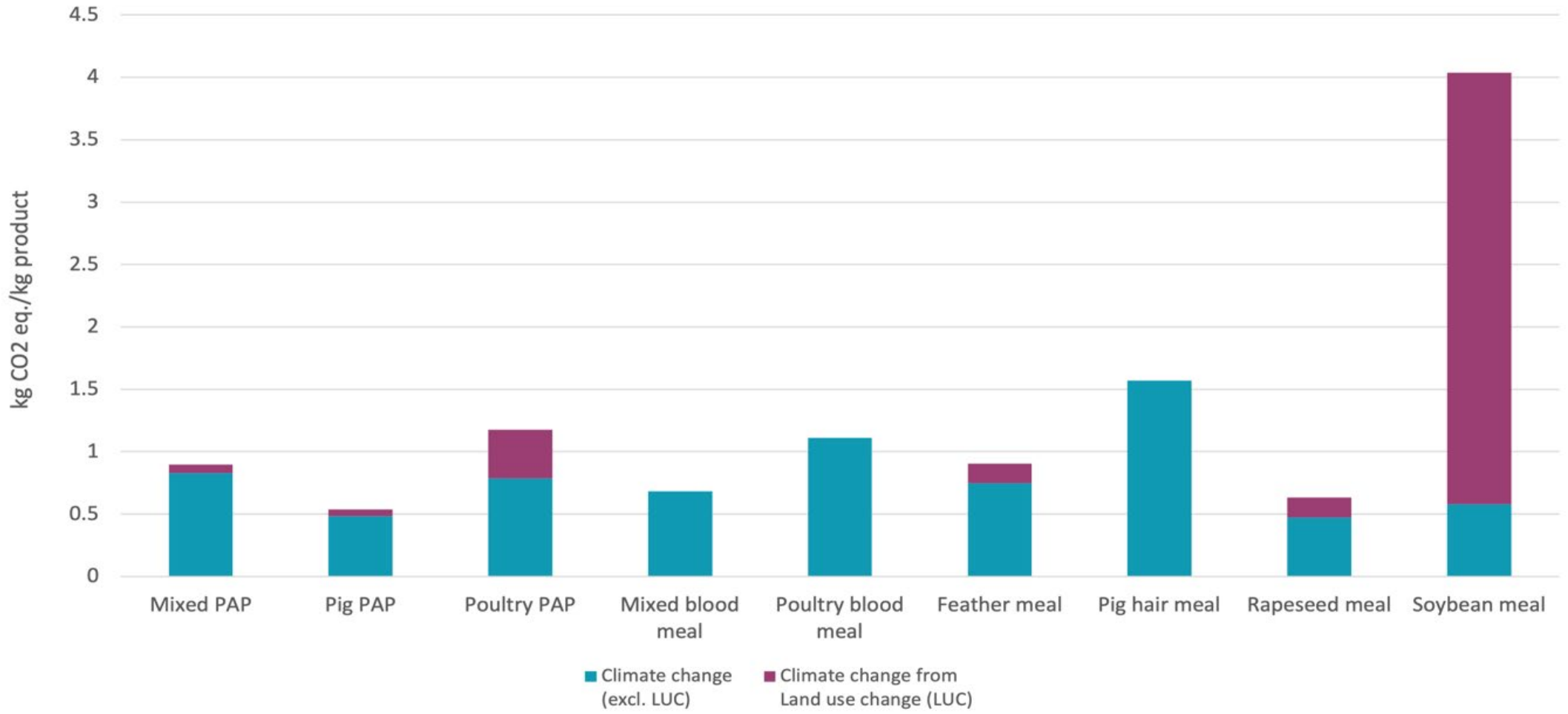
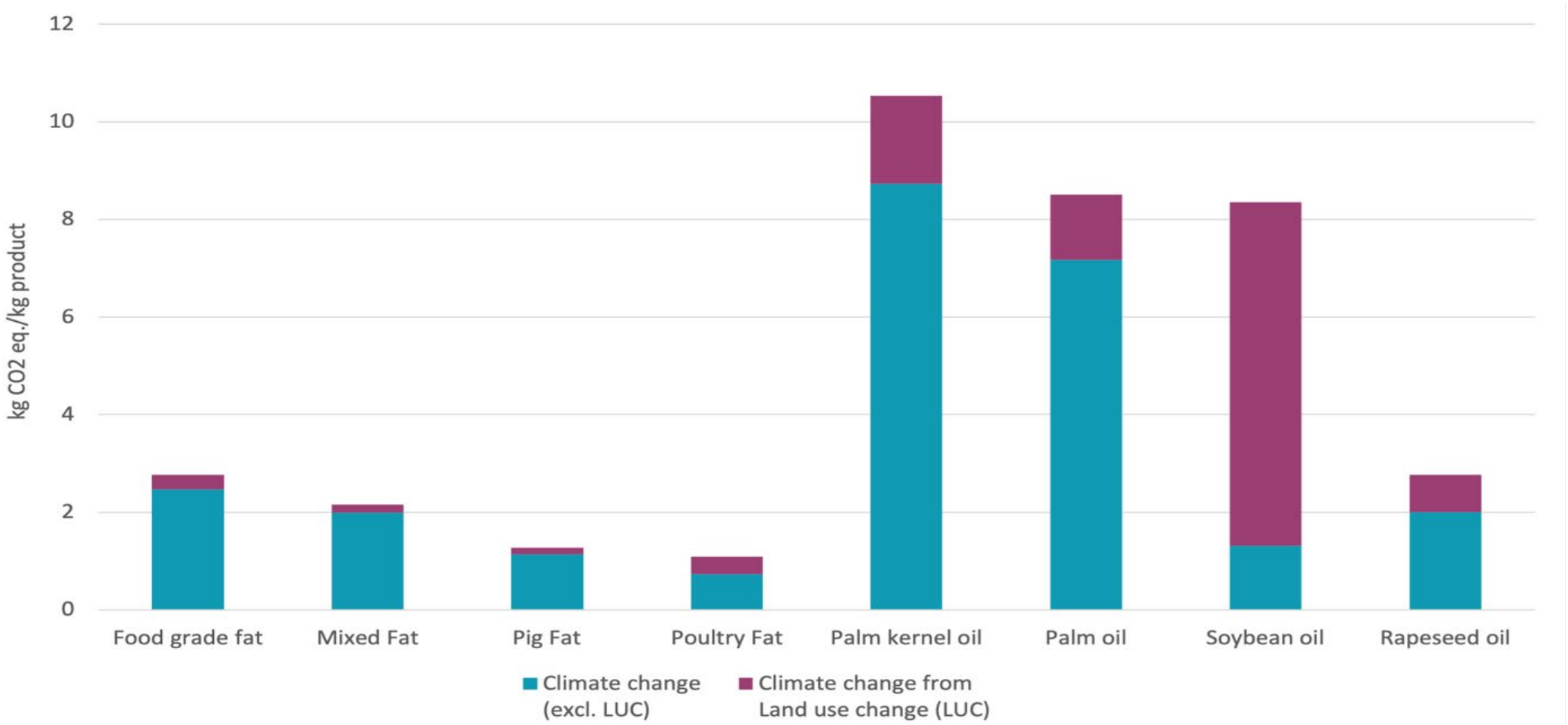
EFPRA – Climate Change Impacts of Meal Products



EFPRA – Climate Change Impacts of Fat Products



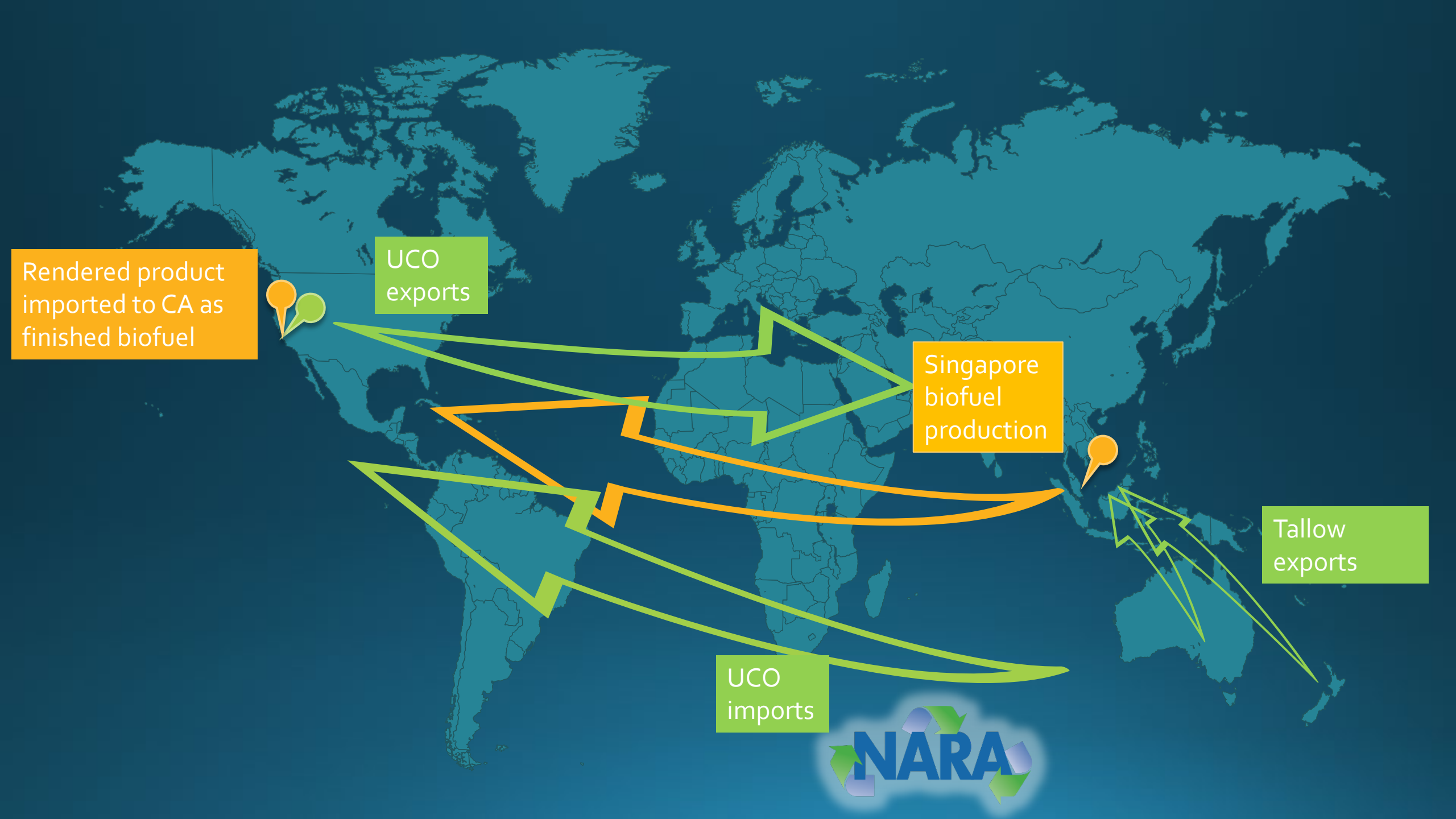

IMPACT

Market Changes

- Soybean crush capacity is estimated to increase by 25% or 600 million bushels

- 1 bushel of soybeans =
  - 48 pounds of meal
  - 11 pounds of oil

- This means a production increase of:
  - 13 million metric tons of soybean meal
  - 3 million metric tons of oil


Rendered product imported to CA as finished biofuel
UCO exports
Singapore biofuel production
Tallow exports
UCO imports
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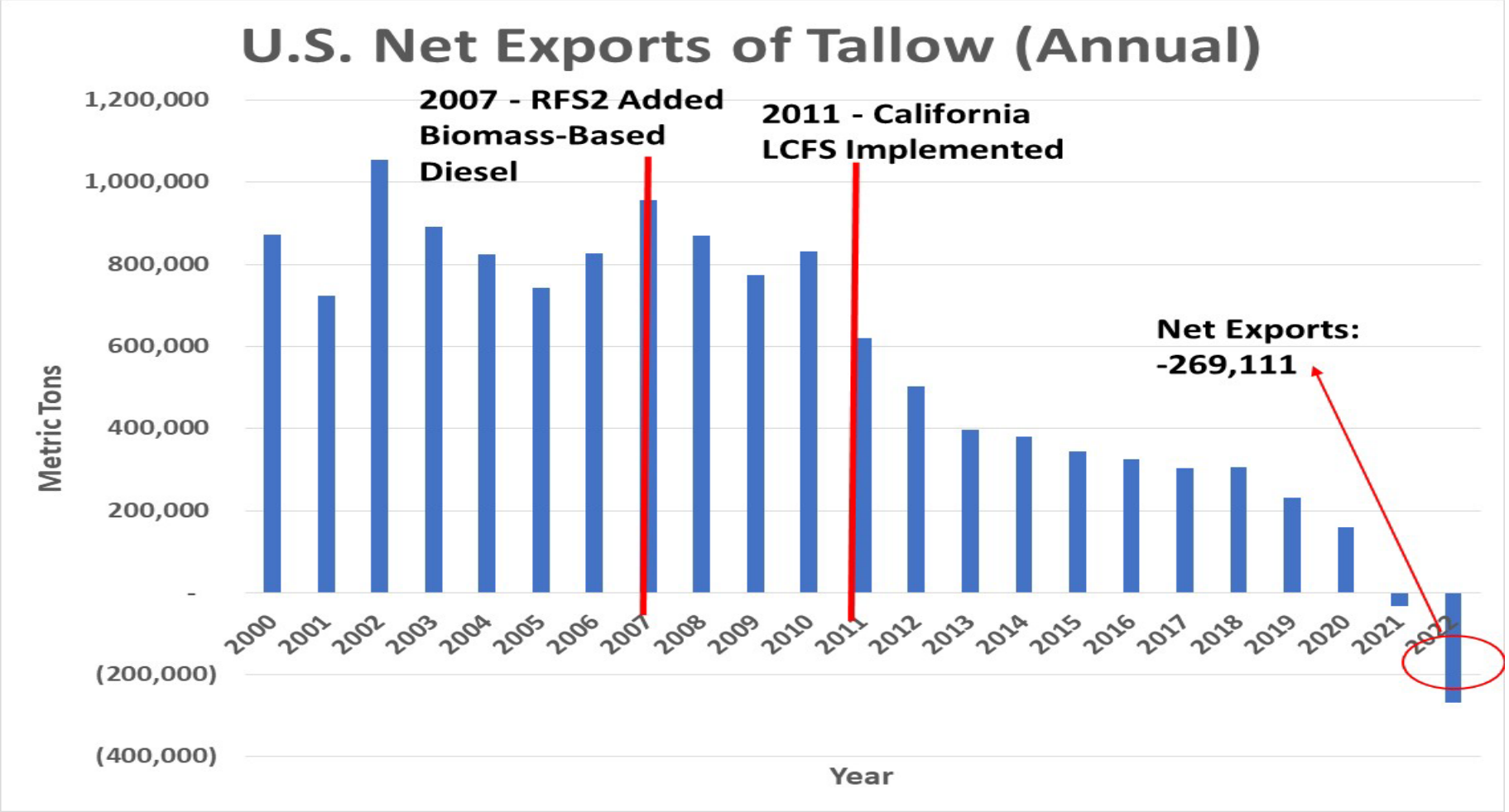
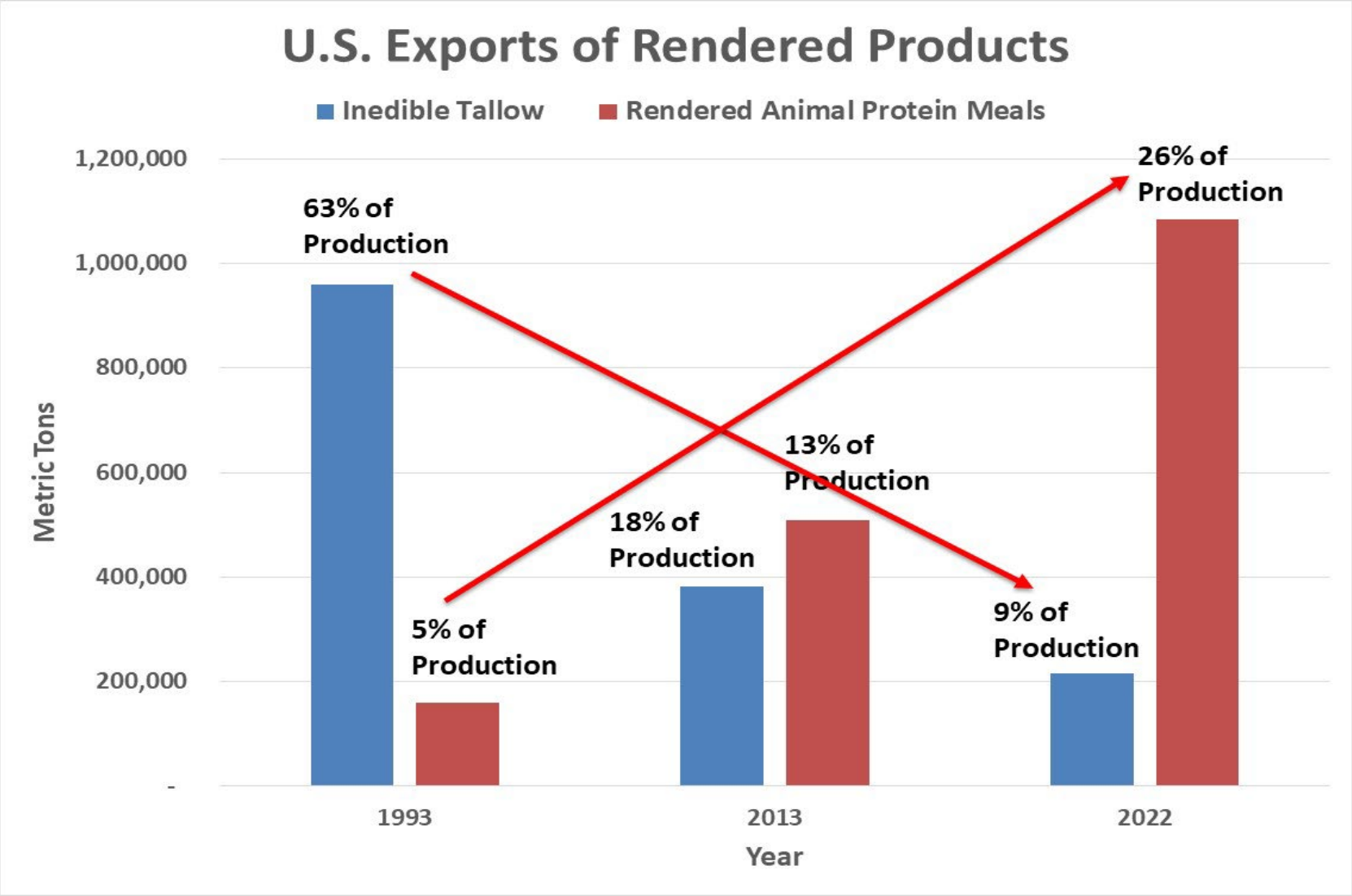
Impact - Markets

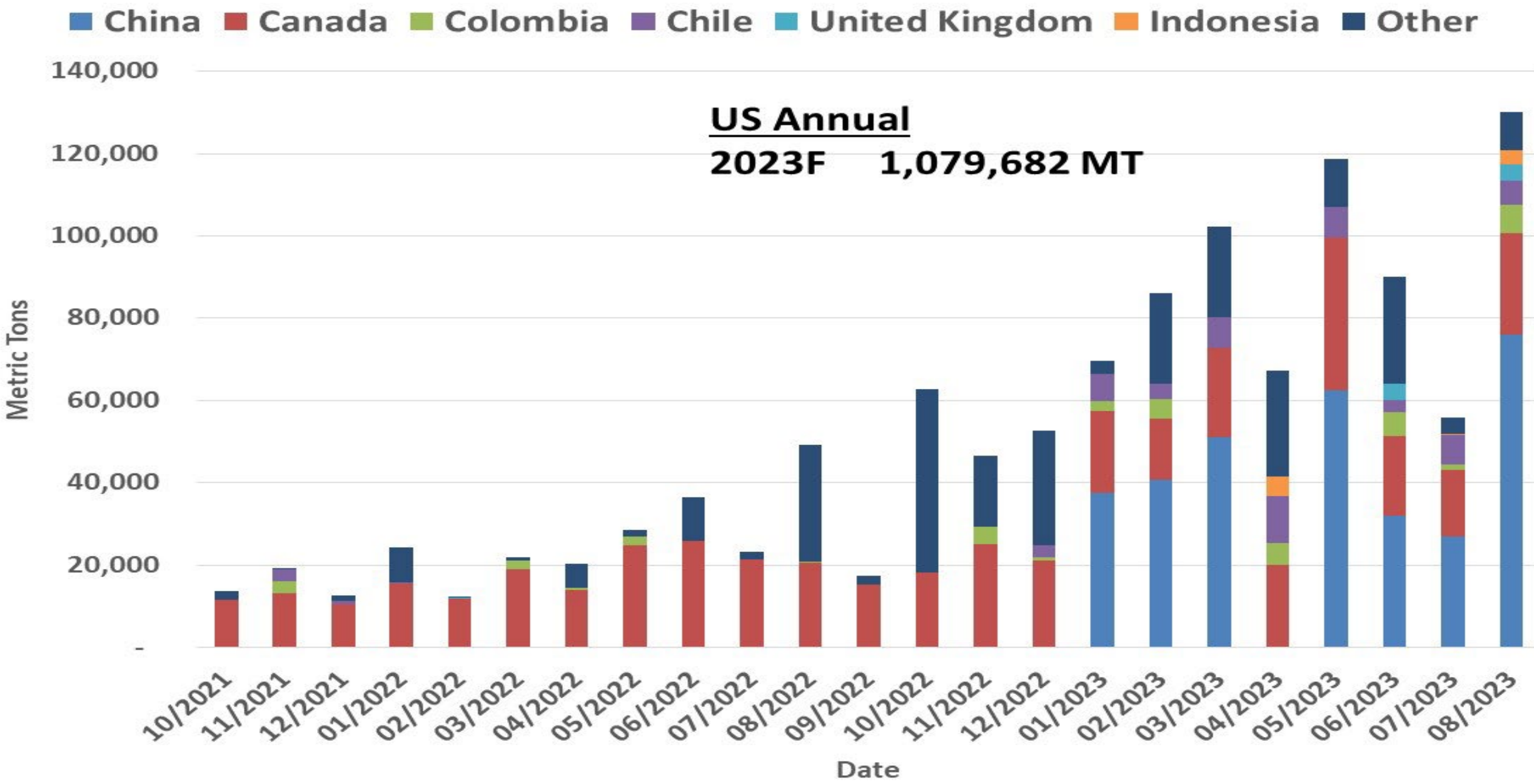


Source: Trade Data Monitor

Impact - Markets



US Monthly Imports of YG/UCO (2021-2023)



U.S. Production & Use (biomass-based diesel) of Rendered Fat in MT; (YTD June 2023)

Product	Production	Imports	Total Supply	Consumption in Biomass-based diesel	Percent of Production	Percent of TOTAL Supply
Poultry Fat	488,903	1,351	490,254	35,226	7%	7%
Tallow	1,463,049	311,577	1,774,626	600,972	41%	34%
White Grease	375,588	30,920	406,508	134,669	36%	33%
TOTAL*	2,327,539	343,848	2,671,387	770,867	33%	29%

Source: USDA/National Agricultural Statistics Service

Energy Information Agency

Why Rendered Fats (Low CI) for Biomass-based Diesel?

- 1960's – Laundry detergents stopped using tallow
- 1990 – Fast food market stopped using tallow in french fry production due to a campaign against saturated fats (listen to podcast "McDonalds Broke My Heart")
- 2000's – Companies villainize "animal by-products" in their marketing
- 2003 – Trade restrictions due to BSE
- 1960 onward – Competing lipids displace rendered fat in global markets

Final Points

- Low CI feedstocks = Opportunity
- Rendered fats and UCO, help meet carbon reduction demands
- The biofuel market shows a precedent that can be applied to feed, pet food.
- Increased crush capacity = lower priced proteins
- Renderers are essential providers of low CI ingredients for food, feed, fuel, and oleochemical producers

Thank You!

NORTH AMERICAN RENDERERS ASSOCIATION
Reclaiming Resources, Sustainably

Kent Swisher
President & CEO
North American Renderers Association