

An Outlook for the 4th Quarter and Early 2024

October 25, 2023

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NATSO Fast Forward Focus 2023

- Crude oil prices collapsed to start October, then rallied. Geopolitics back on the front burner. Iran, Venezuela others.
- Refining...
More capacity has and is coming globally what is the impact on margins?
- Downstream trends...
What can we learn from current margin and demand trends?

But first a disclaimer...

“Most people use statistics like a drunk man uses a lamppost; more for support than illumination.”

--Andrew Lang



- Oil markets moving higher “just in case”
- Israel is not a producer of oil. They do have two small refineries (mostly for domestic fuel needs)
- If Iran is pulled into the conflict...if Israel fires missiles at military or oil infrastructure.
- Current Iranian production is around 3.2 million b/d, exporting 2 million b/d.
- Keep an eye on the Strait of Hormuz...About 17-18 million b/d of crude oil and refined products travel through the strait
- Can the Saudi's step in? Will they?

CITI

- Economic headwinds prevail into 2024 with global GDP at just 1.7%.
- Current prices are at least \$10/bbl too high and Brent may exit 2023 with a price of \$82/bbl.
- Yes, demand currently exceeds supply. But it peaked in August. 3Q saw demand outpace supply by 1.5 million b/d but it will flip to a 200,000 b/d surplus by year's end. Some 3.8 million b/d of refinery maintenance curbs the draws.
- Non-OPEC supply growth rises by 1.2 million b/d in 2024. Meanwhile, the fragile 5 – Iraq, Iran, Libya, Nigeria, & Venezuela—may add another 1.3 million b/d to global markets.
- 2024 sees supply outpace demand. Quarterly prices are \$80/bbl; \$73/bbl; \$74/bbl and \$68/bbl.
- Deferred Anchor Price for Crude \$65-\$70/bbl
- Demand has already peaked for US, EU, and possibly China.

JP Morgan

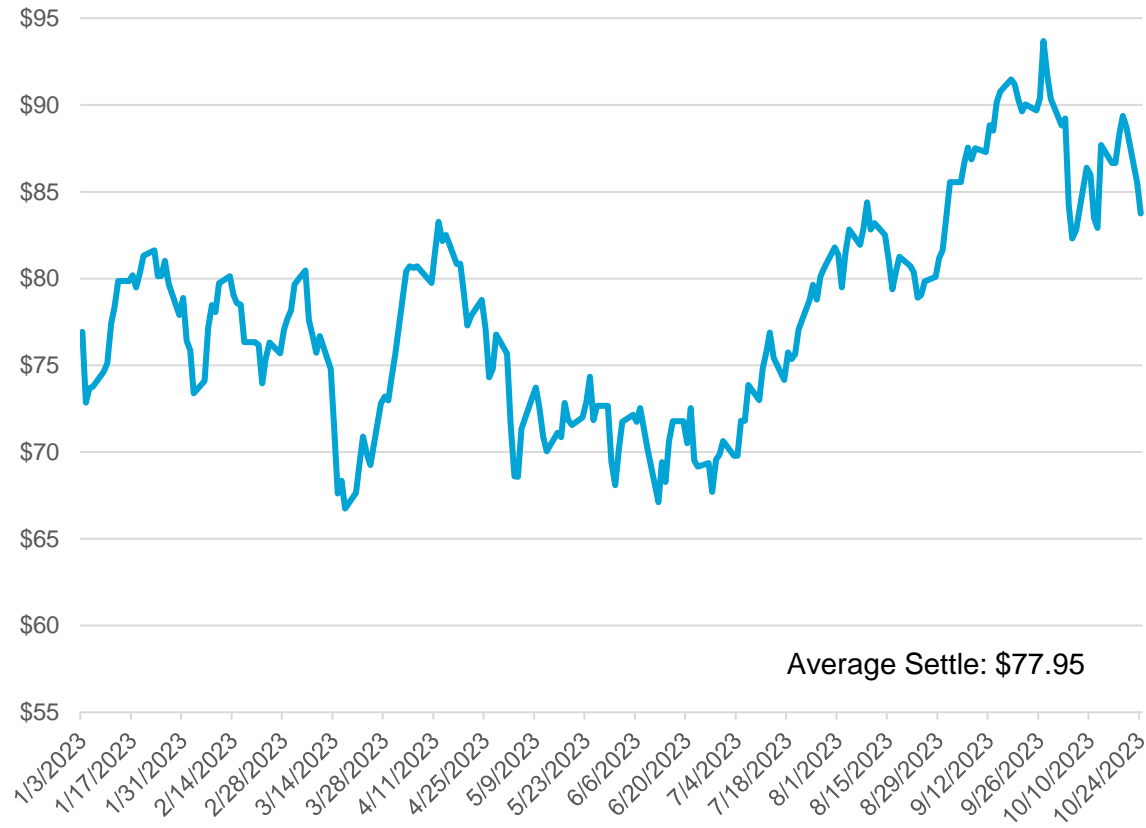
- The “Supercycle” thesis is back and oil prices will remain higher for longer. Prices ultimately flirt with \$150/bbl.
- Demand outstrips supply by 1.1 million b/d in 2025 and by 7.1-million b/d in 2030.
- Spare capacity among OPEC countries will be depleted and a \$20/bbl risk premium is anointed for global benchmarks.
- Higher interest rates mean that there is less capital employed to find crude and production suffers.
- The global economy can withstand triple-digit crude. Pain thresholds in 2008 and 2011 amounted to about 4% of global GDP.
- Peak demand does not occur until decade's end. Multiple energy-led crisis will surface.
- Demand ultimately reaches 106.9-million b/d



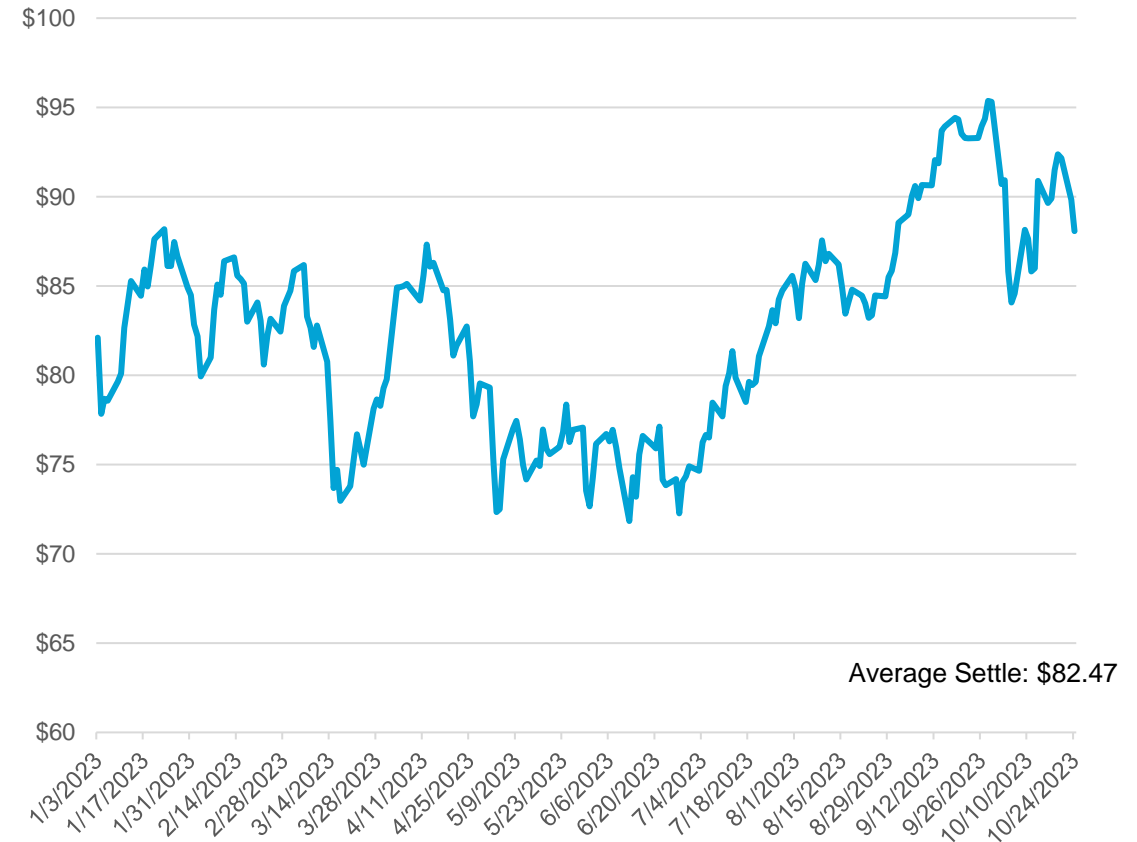
- The previous slide laid out predictions and they are all over the place
- There are short-term data points that can give us hints on market direction
- History can always be a good guide

WTI and Brent year to date settlements

Daily WTI Settle

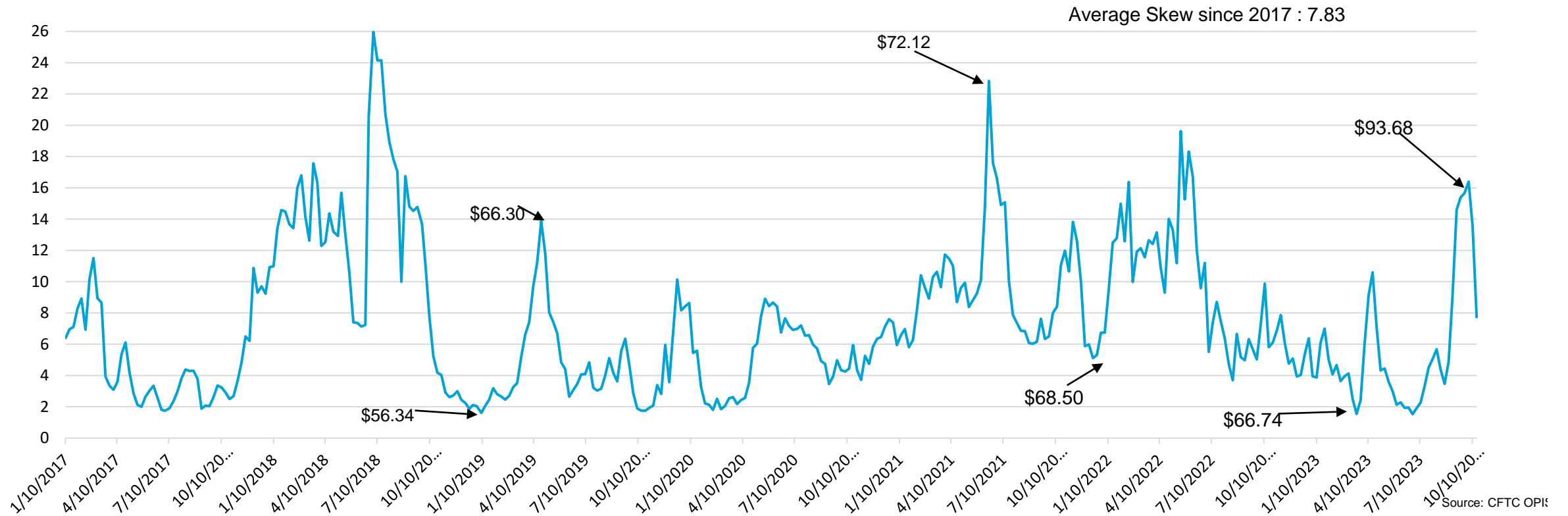


Daily Brent Settle



Positioning and money flow amongst large speculators is a good place to get a sense of a market that is topping or bottoming

Long to Short Ratio of Large Speculators



Refined products

Refinery profitability remains strong

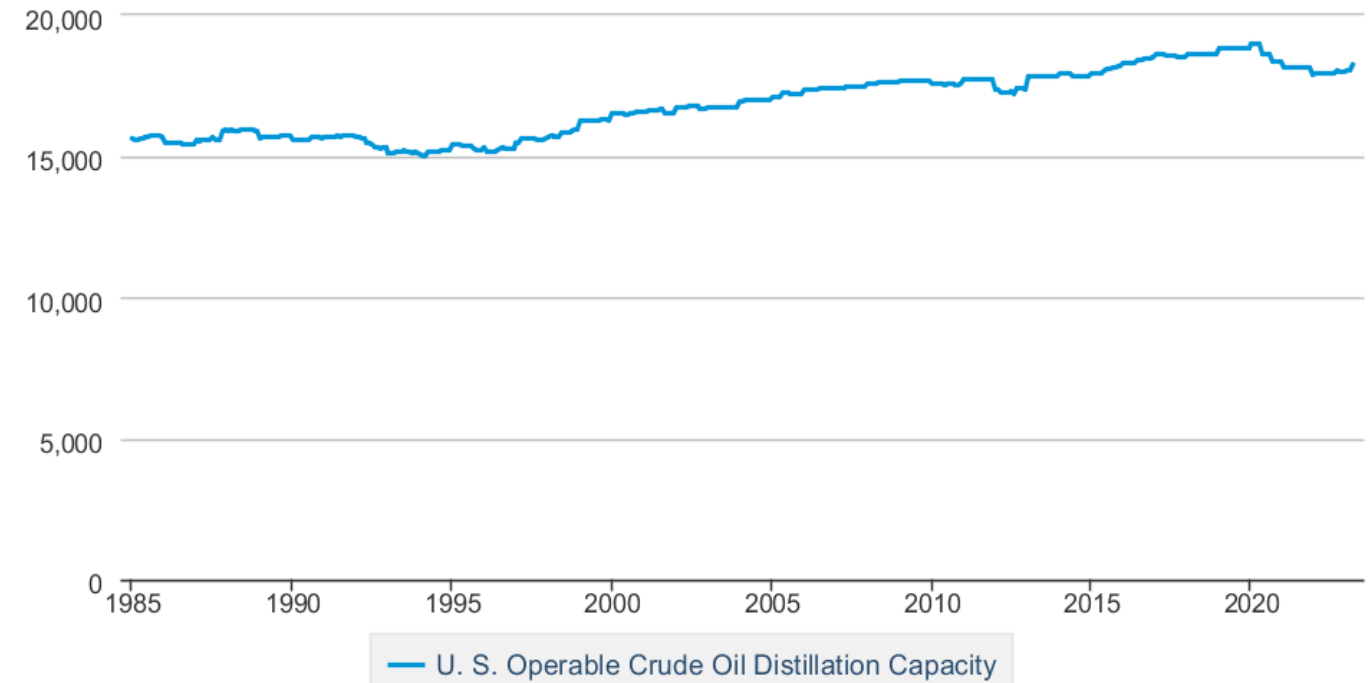
- More refining capacity coming online domestically and internationally

But there has not been a new refinery built since the 1970s

- While true, over the past 45 years there has been significant refinery additions
- Domestic Additions:
 - ExxonMobil: 250,000 b/d crude unit at Beaumont (now 619,000 b/d)
 - Marathon: 40,000 b/d of capacity at Galveston Bay
 - Valero: coker at Port Arthur 102,000 b/d
 - Citgo: Lake Charles 38,000 b/d
 - Cenovus restarted Toledo and Superior
 - Chevron adding capacity at Pasadena (2024)

U. S. Operable Crude Oil Distillation Capacity

Thousand Barrels per Calendar Day



Data source: U.S. Energy Information Administration

Global Refining Additions

- Al Zour (Kuwait) 615,000 b/d
- Dos Bocas (Mexico) 340,000 b/d
- China 320,000 b/d Shenghong, Lianyungan
400,000 b/d Jiayang
- Nigeria 650,000 b/d Dangote
- Saudi Arabia 400,000 b/d Jizan
- Oman 230,000 b/d Oman/KPC

Contrast some of those projects with the U.S.

Refining capacity lost

- **2019 Philadelphia Energy Solutions (Pennsylvania)**
- **2020 Shell Convent (Louisiana)***
- **2020 Marathon Gallup (New Mexico)**
- **2020 Marathon Martinez (California) ***
- **2021 Phillips 66 Alliance Belle Chasse (Louisiana)**
- **2023 Phillips 66 Santa Maria (California)***
- **2025 Lyondell Houston (Texas, moved to 1q 2025)**

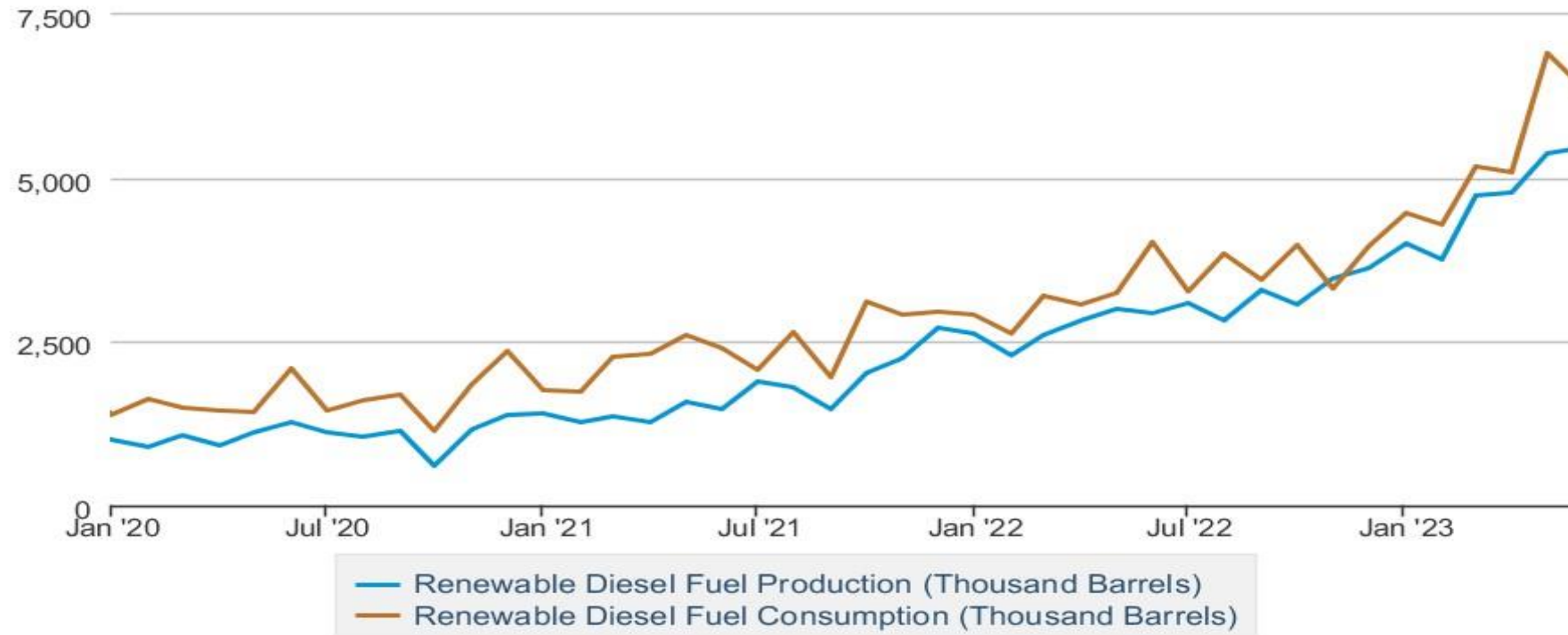
GLOBAL RATIONALIZATION ~ 2 MILLION B/D



- Renewable diesel CAPACITY is now more than biodiesel
- Nearly all of the renewable diesel currently produced is consumed in California
- About 40-50% of California's diesel needs are met by renewable diesel
 - 2022 California collected taxes on ~3.1 billion gallons of diesel (excluding covid year that's lowest since 2016)
 - First half of 2023 ~1.5 billion gallons
- Forecast within the next 10-15 years 100% of diesel in California will be renewable diesel
- It is a drop-in replacement
- Potential issues?

Table 10.4b Renewable Diesel Fuel Overview

Thousand Barrels



Data source: U.S. Energy Information Administration

U.S. renewable diesel fuel and other biofuels plant production capacity as of January 1, 2023

State	Respondent	City	MMgal/yr	Mb/d
PADD 2			398	26
Kansas	Seaboard Energy Kansas LLC	Hugoton	85	6
North Dakota	Dakota Prairie Refining LLC	Dickinson	192	12
Oklahoma	CVR Renewables Wynnewood LLC	Wynnewood	121	8
PADD 3			1,839	120
Louisiana	Diamond Green Diesel LLC	Norco	982	64
	Renewable Energy Group	Geismar	101	7
	Shell Oil Products U.S. ¹	Norco	54	4
Mississippi	Jaxon Energy, LLC	Jackson	25	2
New Mexico	HF Sinclair Renewables Holding Co LLC	Artesia	141	9
Texas	Diamond Green Diesel LLC	Port Arthur	537	35
PADD 4			393	26
Montana	Montana Renewables LLC	Great Falls	184	12
Wyoming	Cheyenne Renewable Diesel Co LLC	Cheyenne	92	6
	Wyoming Renewable Diesel Co	Sinclair	117	8
PADD 5			370	24
California	Altair Paramount LLC	Paramount	42	3
	Chervron USA Inc ¹	El Segundo	31	2
	Kern Oil & Refining ¹	Bakersfield	6	(s)
	Phillips 66 Co	Rodeo	180	12
Washington	BP Products North America ¹	Blaine	111	7
U.S. Total			3,000	196

(s)=Less than 0.5 MMgal/yr
or Mb/d

¹ Refineries co-processing renewable feedstock and petroleum.

Note: Totals may not equal sum of components due to independent rounding.

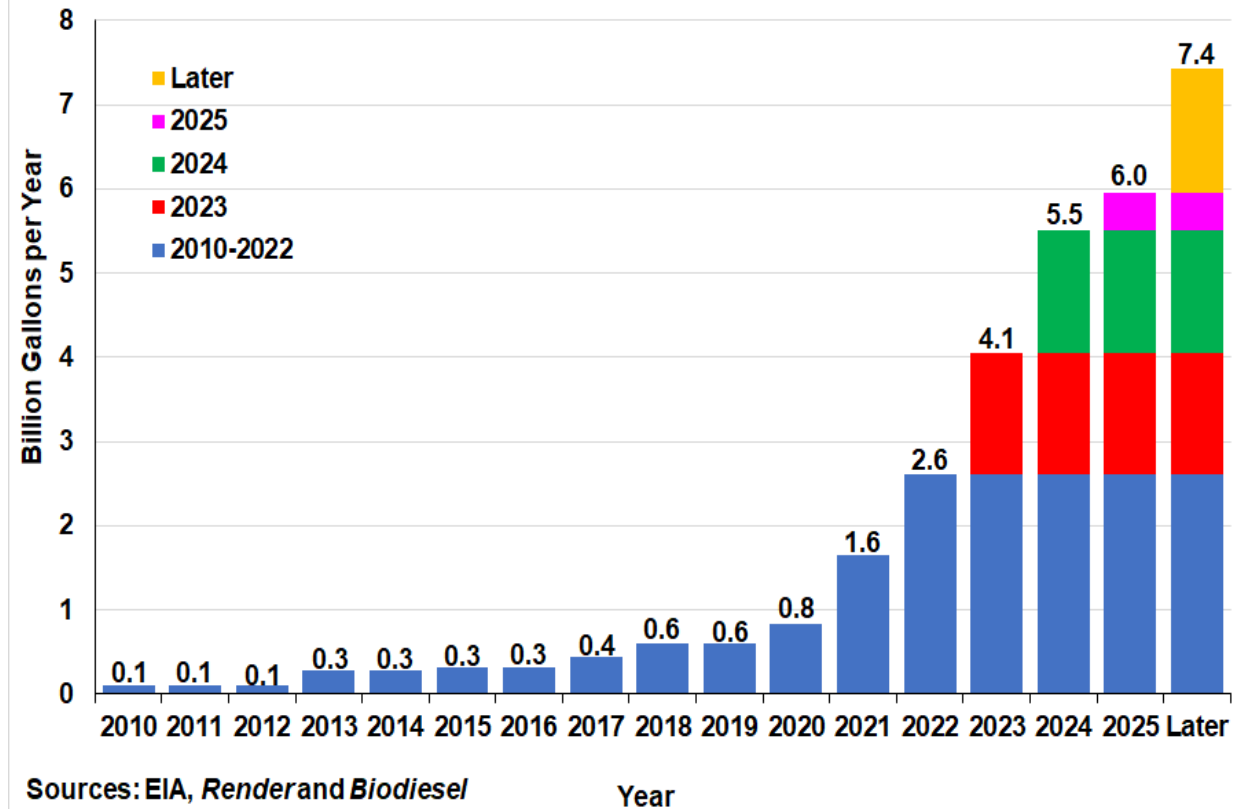
Table 1. Projected Expansion of Renewable Diesel Nameplate Production Capacity in the U.S., 2023 and Later

Company	City	State	Annual Nameplate Capacity (million gallons)	Year	Type
Marathon	Martinez	CA	260	2023	Expansion
REG	Geismer	LA	250	2023	Expansion
Global Clean Energy	Bakersfield	CA	210	2023	Conversion
Vertex Royal Dutch Shell	Mobile	AL	200	2023	Conversion
PBF	Chalmette	LA	150	2023	Conversion
Kern Energy	Bakersfield	CA	150	2023	Conversion
Chevron	El Segundo	CA	122	2023	Conversion
BP Cherry Point	Blaine	WA	55	2023	Expansion
Camber Energy	Reno	NV	44	2023	Conversion
P66	Rodeo	CA	680	2024	Conversion
Marathon	Martinez	CA	480	2024	Expansion
Grön Fuels LLC	Baton Rouge	LA	215	2024	Greenfield
Love's	Hastings	NE	80	2024	Conversion
World Energy, AltAir	Paramount	CA	290	2025	Expansion
World Energy	Houston	TX	125	2025	Conversion
Fulcrum Bioenergy	Gary	IN	31	2025	Greenfield
Next Renewable	Port Westward	OR	575	Unknown	Greenfield
Greentech Material	Baton Rouge	LA	336	Unknown	NA
PBF	Chalmette	LA	156	Unknown	NA
CVR Energy	Coffeyville	KS	150	Unknown	Conversion
Emerald	Plaquemire	LA	100	Unknown	Greenfield
Aemetis	Riverbank	CA	90	Unknown	NA
ReadiFuels Iowa	Sioux Center	IA	36	Unknown	NA
Strategic Biofuels	Caldwell Parish	LA	29	Unknown	NA

Sources: EIA, *Render* and *Biodiesel* Magazines, and other industry sources. NA denotes not available.

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Figure 1. Annual U.S. Renewable Diesel Nameplate Production Capacity, Actual for 2010 - 2022 and Projected for 2023 - 2025 and Later



Sources: EIA, *Render* and *Biodiesel* Magazines, and Other Industry Sources

Year

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Feedstocks are likely to be the biggest concern/hurdle

Used cooking oil is the “holy grail”

Soybean oil can be expensive

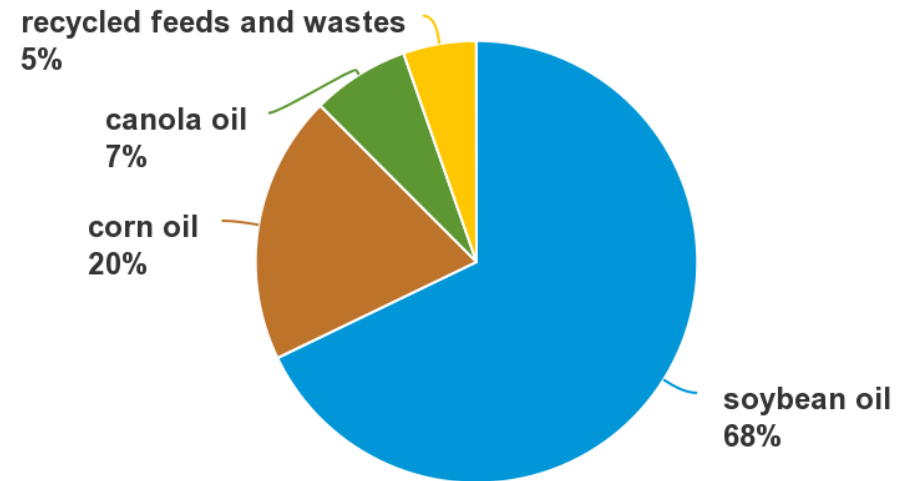
More states are implementing or looking at LCFS style programs

Food vs. Fuel 2.0?

Producing renewable diesel uses a lot of hydrogen

Feedstock inputs to U.S. biodiesel, renewable diesel, and other biofuels production, 2021

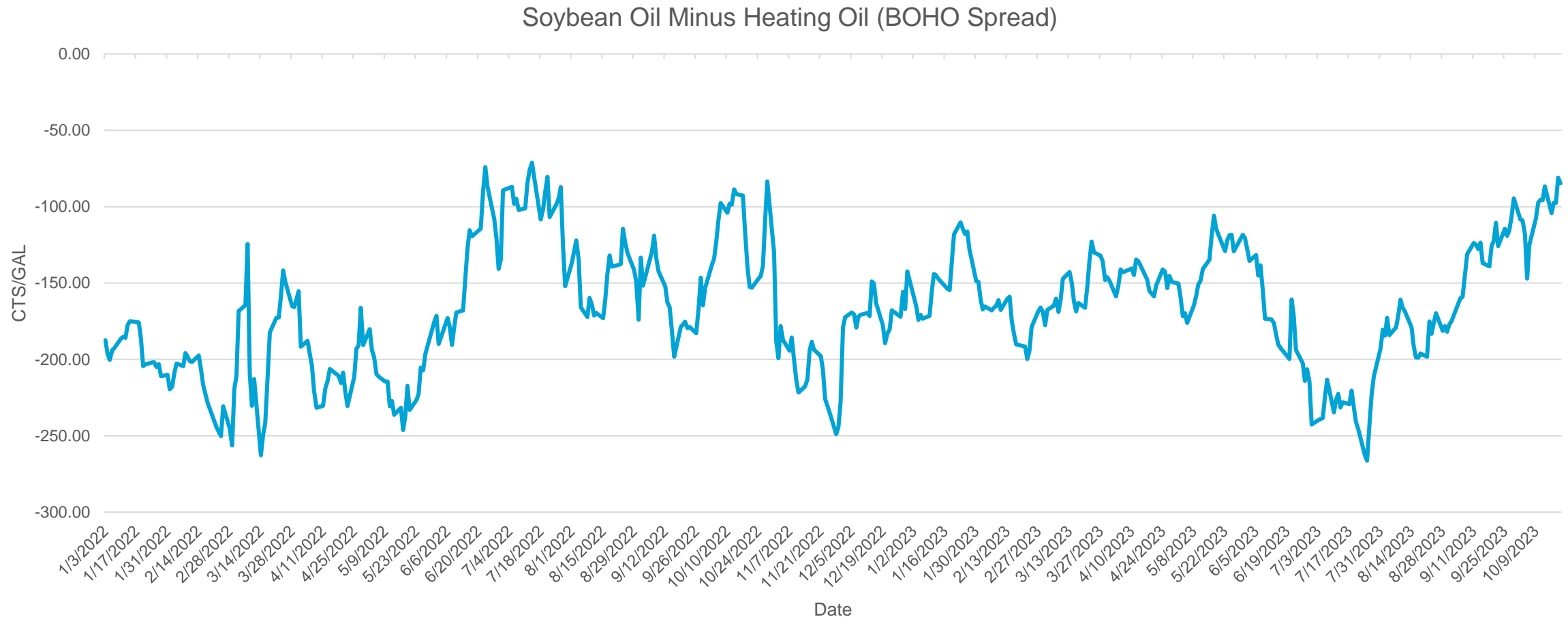
Total = 23.82 billion pounds



Data source: U.S. Energy Information Administration (EIA), *Monthly Biofuels Capacity and Feedstocks Update*, March 2022
Note: Feedstocks for ethanol production are not included.

This is why various biofuels need government subsidies

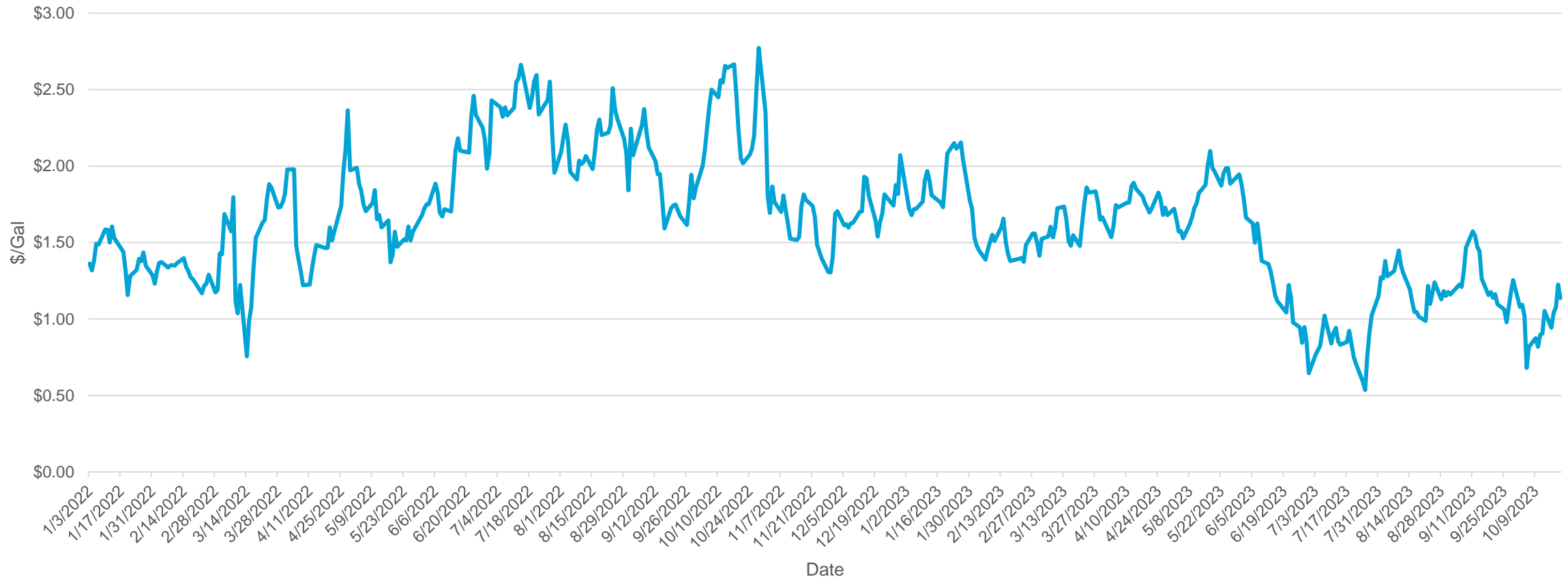
Measuring profitability of making renewable diesel (and biodiesel)



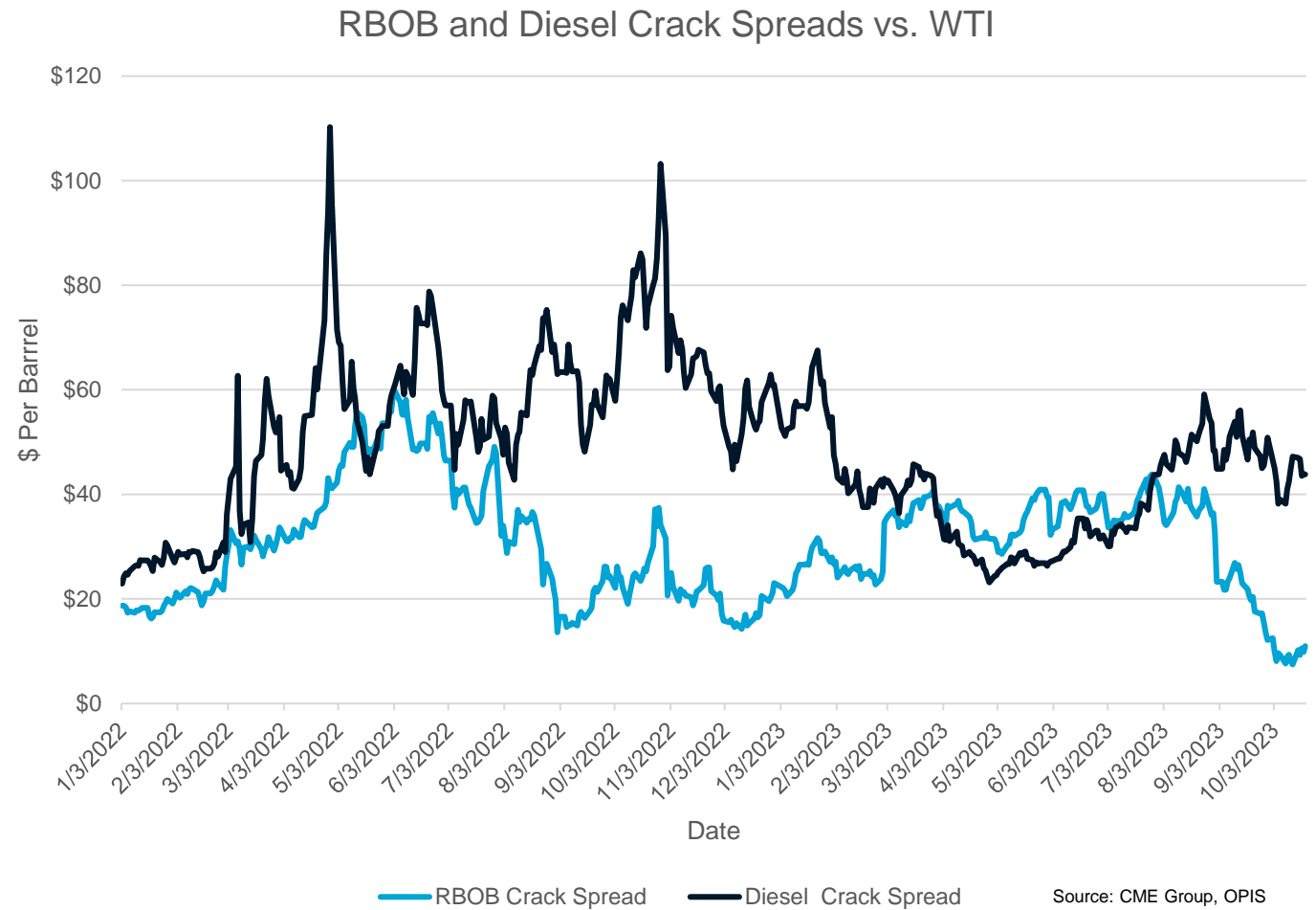
Even with the subsidies/credits RD is not as profitable as it once was

Renewable diesel margin before blenders tax credit and transportation costs

RD Margin Indicator



RBOB and ULSD NYMEX crack spreads



- There is enough domestic refining capacity, but you can argue that it is “misplaced”
 - In 2005 AL, LA, MS and TX accounted for 8.1 million b/d of U.S. refining capacity
 - In 2023, those same four states stand at 10 million b/d (with recent additions counted)
- Hot summer didn’t help
- Refineries transitioning to make biofuels
- Backwardation is becoming an issue again (diesel and crude oil especially making it difficult for supplies to build)
- Imports have been lower than normal and we export A LOT more

Then and Now – Export Considerations

Commodity	Current Export Level	2005 Export Level
Crude Oil	3.835 million b/d	34,000 b/d
Finished Petroleum Products	3.187 million b/d	1.086 million b/d
NGL	2.501 million b/d	170,000 b/d* (2010)
Ethanol	86,000 b/d	19,000 b/d* (2010)
Finished Gasoline	837,000 b/d	148,000 b/d
Jet Fuel	140,000 b/d	46,000 b/d
Distillate	1.220 million b/d	189,000 b/d

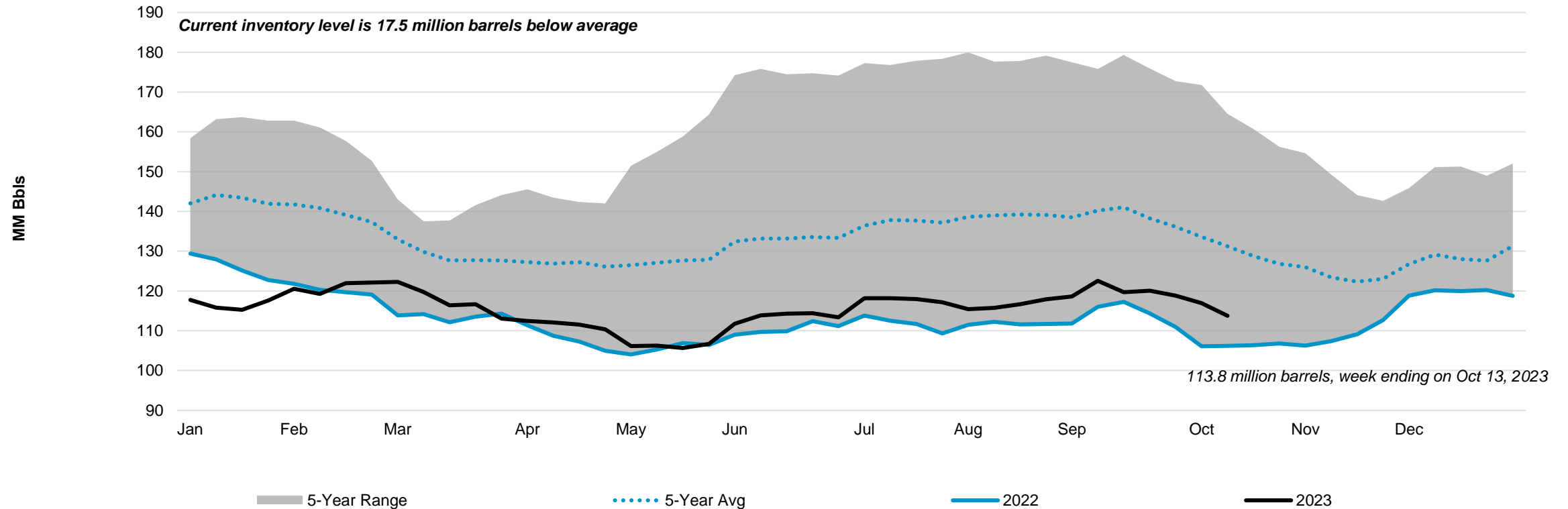
Source EIA, OPIS

Conclusions: Based on July Petroleum Supply Monthly from EIA. Crude exports are up >100x (with a caveat). NGLs up 15x. Gasoline and distillate exports are up more than 425%

- I was nervous at this time last year and I worry again
- Diesel is where the Saudi production cuts have hurt the most
- No one talks about ULSK
- Refinery runs are yielding less diesel and it was worse @ end of Sept.
 - 10/13/2023 gross runs 15.9 mb/day distillate production 4.761mb/day ~30%
 - 10/14/2022 gross runs 16.2 mb/day distillate production 5.0mb/d ~31%
- Will have a chance to catch up..too much gasoline?
- Northeast/New England inventories historically low
- Can the Northern Hemisphere avoid a cold winter? If not...look out

U.S. distillate inventories are low heading into the winter

U.S. Distillate Inventories

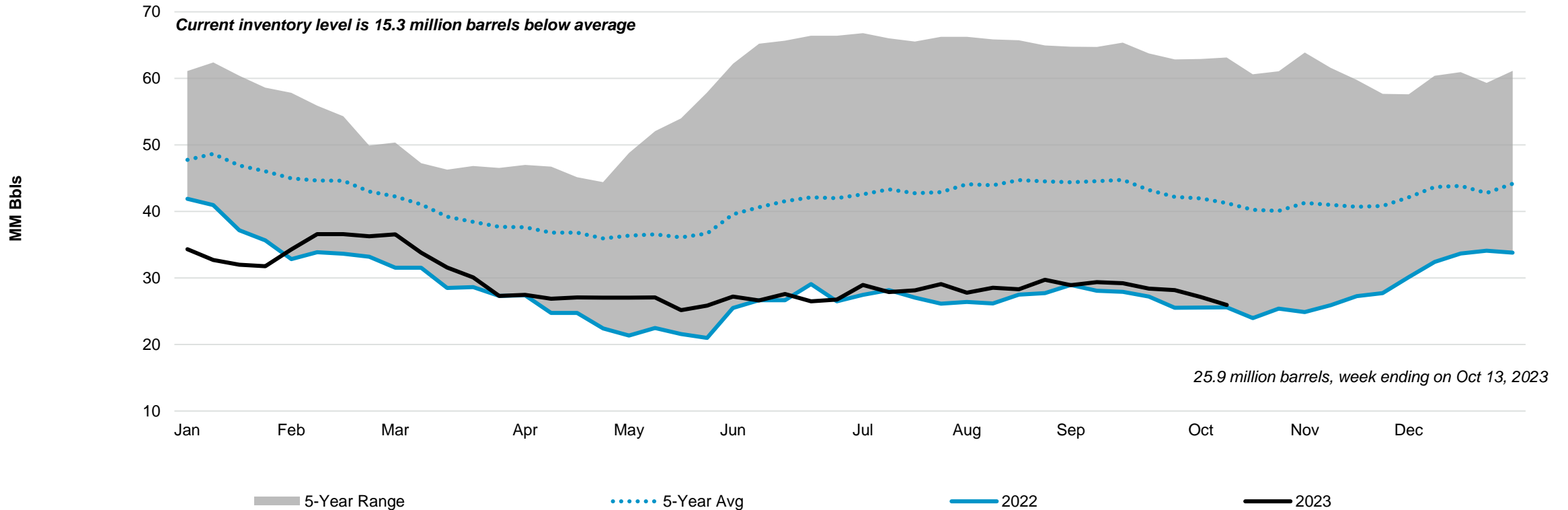


Source: U.S. Energy Information Administration

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The East Coast has the largest supply deficit

U.S. PADD1 Distillate Inventories



Source: U.S. Energy Information Administration

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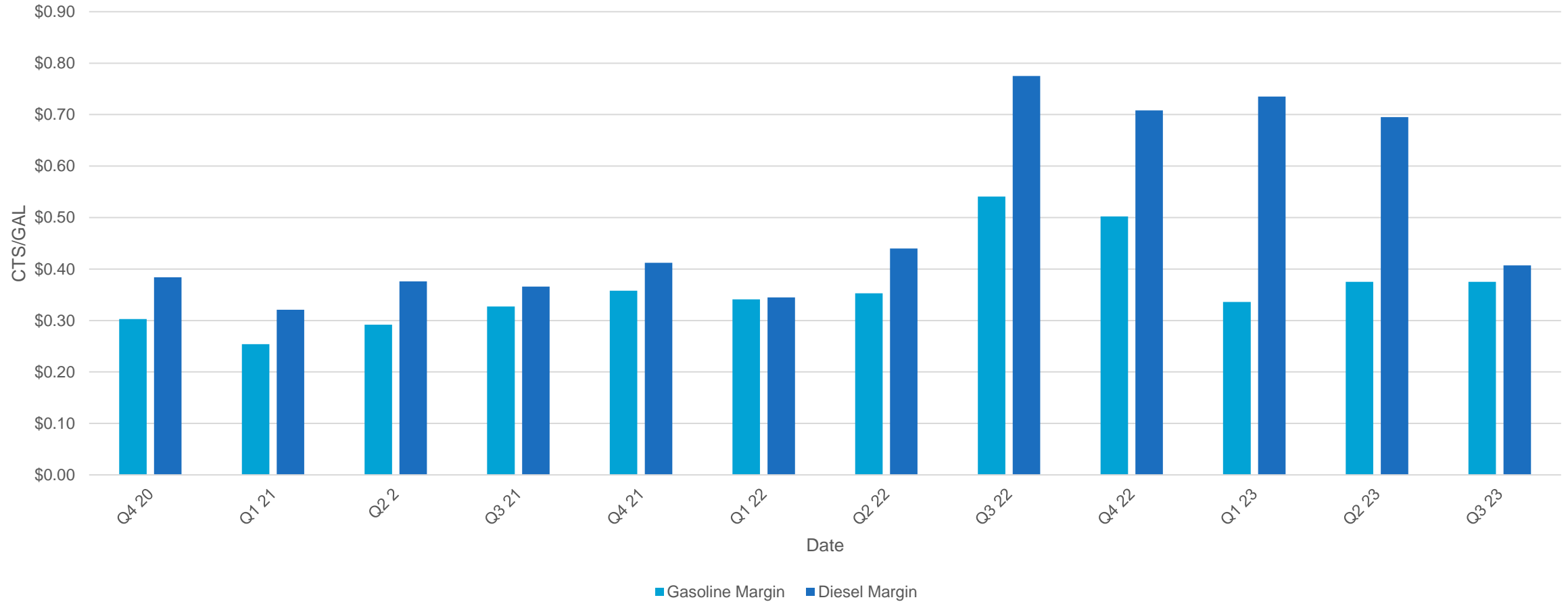
A look downstream

Where do we stand on margins,
demand and other factors

- Hard to see gasoline demand getting back to pre-pandemic levels for gasoline. Market volatility should continue to make margins “feast or famine.”

Gross rack to retail margins have been strong

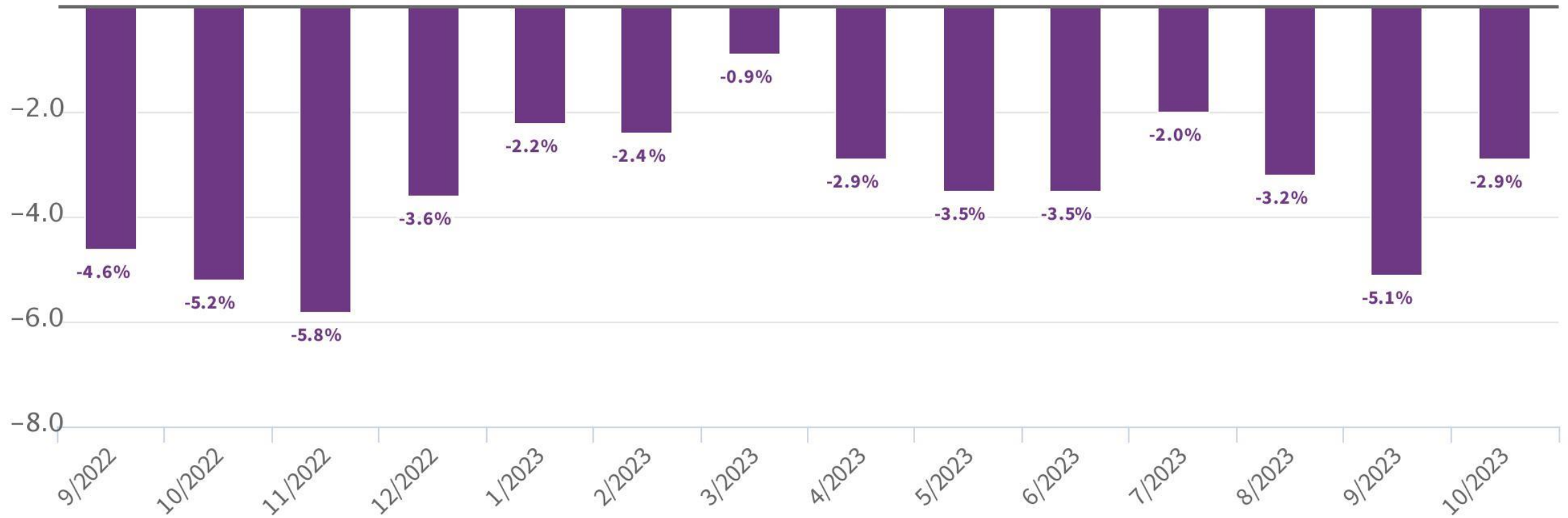
Gross Rack to Retail Margins



Why margins are going to have to stay elevated

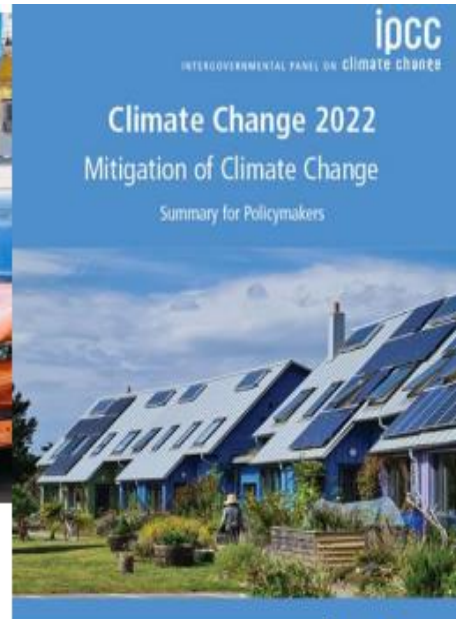
U.S.

Monthly Volume Change Compared to Previous Year



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Or is it decarbonize wow?
Decarbonization does not necessarily mean electrification



EU lawmakers approve effective 2035 ban on new fossil fuel cars

By **Kate Abnett**

February 14, 2023 10:57 AM EST - Updated 7 months ago



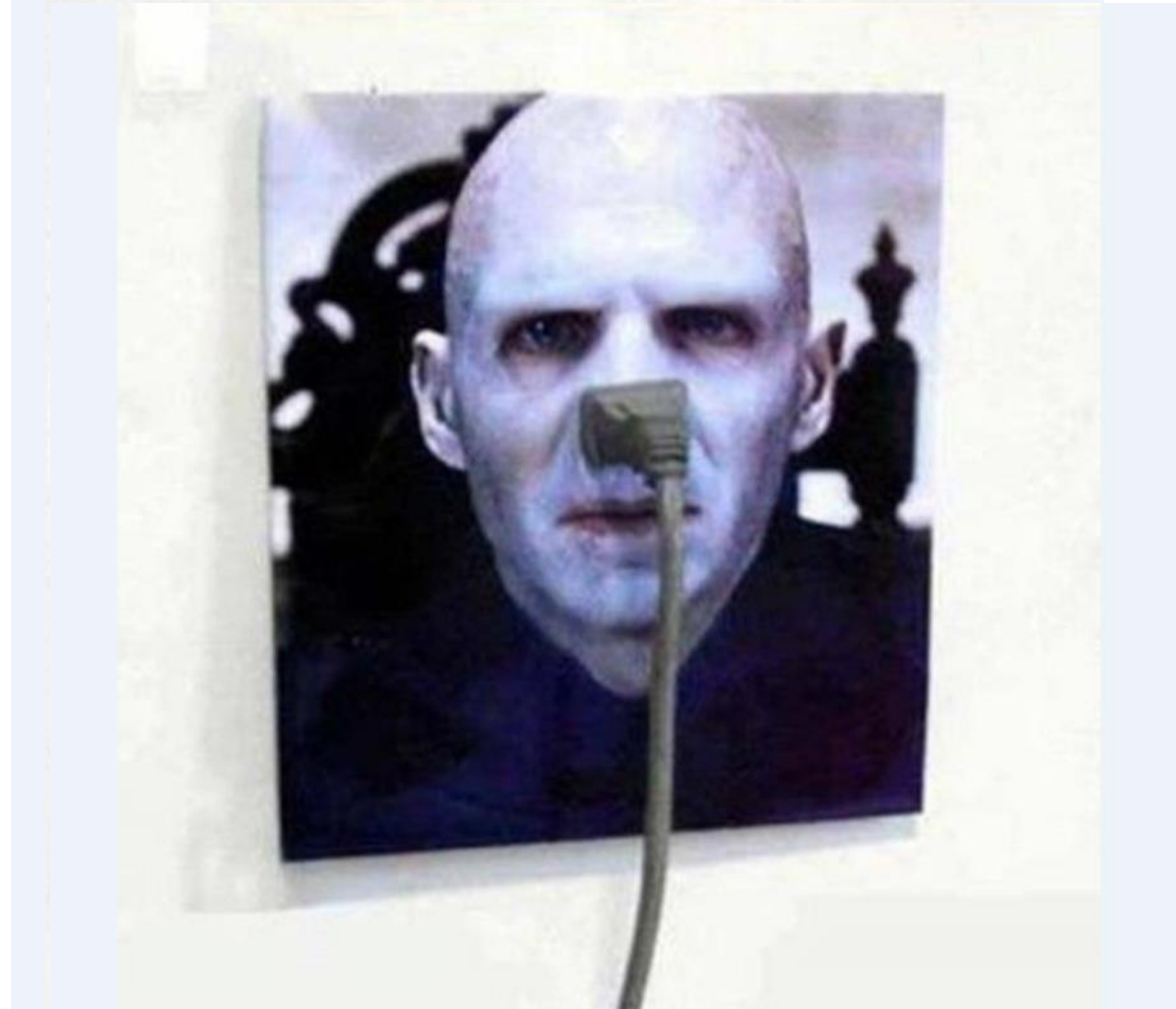
Biden Says Climate Change Poses Greater Threat Than Nuclear War



President Joe Biden speaks during a press conference in Hanoi on Sept. 10. Photographer: Saul Loeb/AFP/Getty Images



Should you be worried?



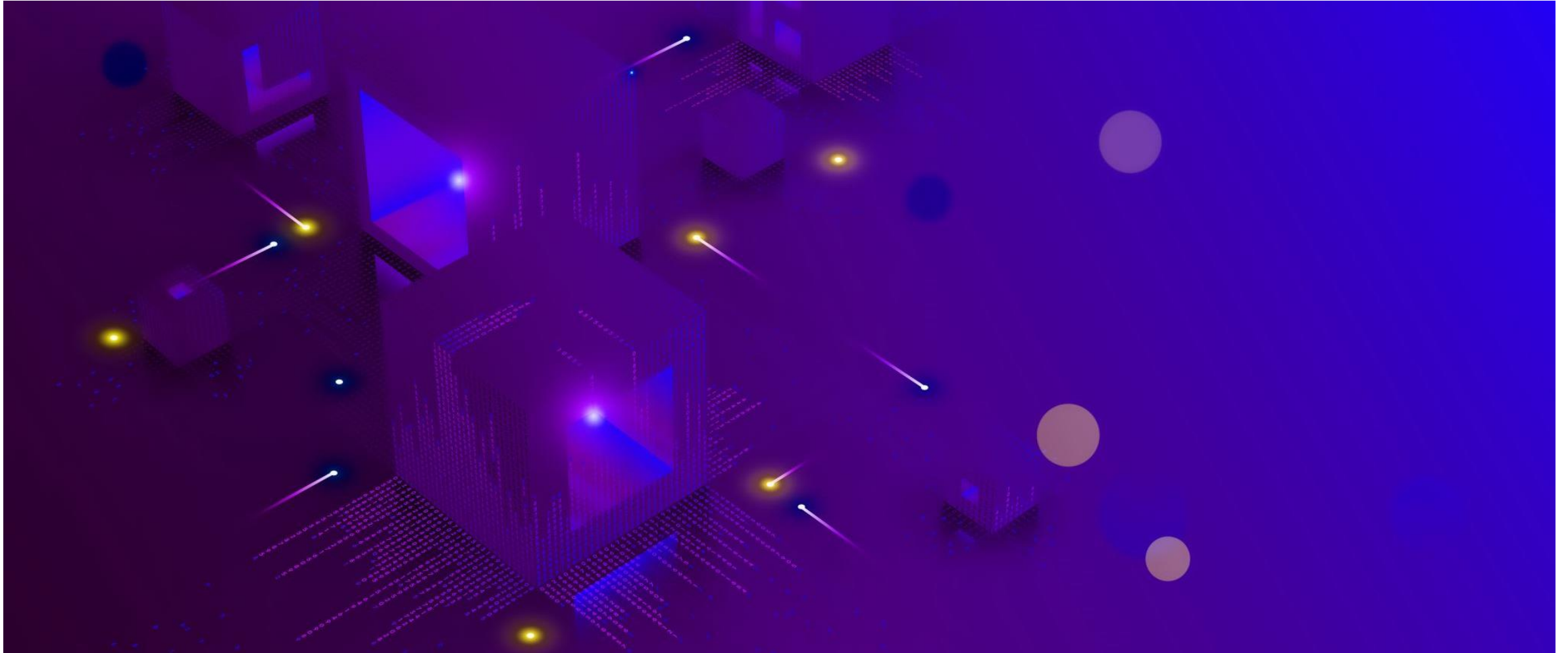
Another Quarter,
Another Record: EV
Sales in the U.S. Surpass
300,000 in Q3, as Tesla
Share of EV Segment
Tumbles to 50%

Thursday October 12,
2023

--Cox Automotive

- EV sales are projected to hit 7% in 2023
 - Sales are on pace of 1 million sold in the U.S. in 2023
- For perspective Ford F-150, Dodge Ram and GM Sierra solid 1.5 million units in 2022
- There are varying forecasts for sales the most aggressive see only half of sales being electric in 10 years
- In 2022 there were ~290 million registered cars in the U.S
- Cars are staying on the road longer
- They are also getting prohibitively expensive

Before we wrap it up I'd like to leave you with some final thoughts to consider



Some final thoughts...

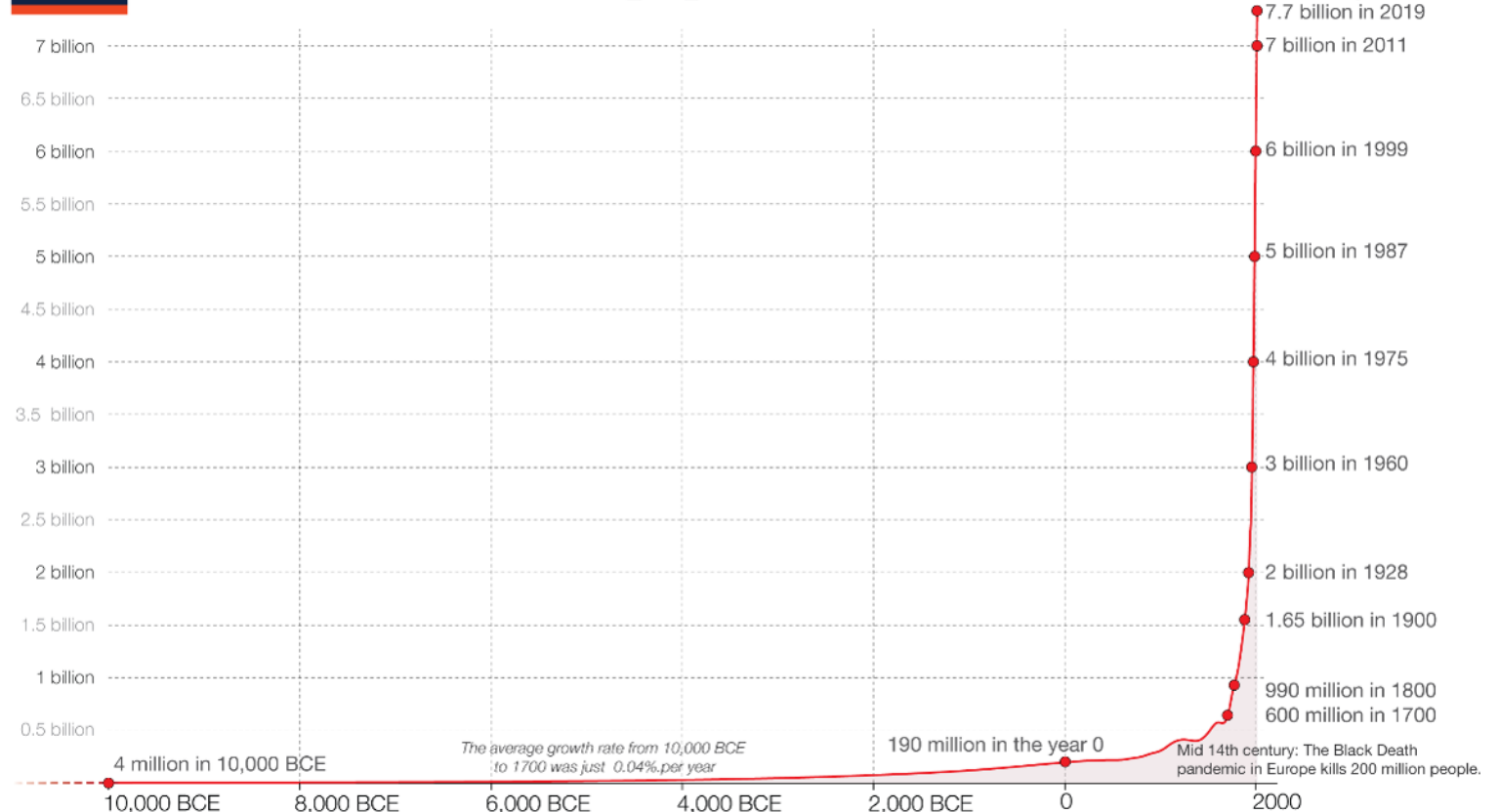
- Fossil fuels are not going away despite what you may see in the news. We can revisit this in 25 years
- The U.S. has the most reliable data and even that is delayed and/or flawed
- This winter (primarily an East Coast thing) could be tough for diesel
- Despite vehicle miles traveled being back to pre-covid levels, gasoline demand is still below pre-covid levels and may not reach those again
- Remember...you can learn a lot from history
- And one final thought....and statistic

It took all human history up to 1803 to reach one billion population – then, 124 years.

Now, about 8-10 years.

Our World in Data

The size of the world population over the last 12,000 years



Based on estimates by the *History Database of the Global Environment (HYDE)* and the United Nations. On OurWorldinData.org you can download the annual data. This is a visualization from OurWorldinData.org, where you find data and research on how the world is changing.

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Thank you...Any questions, comments?



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