Climate Change Series – Reducing & Eliminating the Root-Cause

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1. Introduction

The root cause of Climate Change is the emission of greenhouse gas (GHG) by humans, mostly by burning fossil-fuels. We have already started to reduce, albeit slightly, through renewably- and nuclear-generated-electricity and electric vehicles (battery-electric- (BEV) and fuel-cell electric- (FCEV) vehicles. FCEVs only eliminate most GHG emissions when fueled by green hydrogen (produced from very-low GHG electricity). These young-technologies will point the way to the future.

One of the things I love about my home-state (California) is how we see opportunities where others see horrible problems. A past example of how we respond can be seen in World War II. The US was under threat to be invaded by Japan, that probably meant the West Coast, and thus California. Rather than packing up its stuff and heading east, California converted itself into the greatest industrial (mostly aircraft- and ship-building, electronics development and production, and nuclear development) state in the union, and also showed the way forward through our Hollywood Movies. This completely changed the economy of our state immediately after WWII.

Now, we are now presented with another problem / opportunity.

California is bracing for the closure of two major oil refineries, including one in the Bay Area. State lawmakers are sounding the alarm on what that could mean for gas prices.[1]

At just under $5 per gallon in Walnut Creek (north side of the eastern SF Bay Area), some drivers are forking out over $100 to fill up the tank. With two refineries preparing to shut down, that's expected to drive up prices.

In the East Bay, the Valero Benicia Refinery is expected to close in April 2026. Down in Southern California, owners of the Phillips 66 refinery are also planning to stop operations in the next year.

California Governor Gavin Newsom wants to phase out fossil fuels. He set a goal to ban the sale of gas-powered cars in the state by 2035 to cut down on emissions. But the U.S. Senate is blocking that goal…

Either way, fewer refineries will mean higher prices. It's a simple case of supply and demand. That has some state lawmakers concerned about the future…

One estimate from the University of Southern California shows gas prices could jump by 75 percent when the refineries close. That would add up to more than $8 a gallon next year.

Your author has realized that this too represents an opportunity to show the way forward, and to start to end the world's addiction to fossil fuels.

[1] Joey Horta, KRON via MSN, "Gas prices could soar with refineries closing in California," https://www.msn.com/en-us/money/markets/gas-prices-could-soar-with-refineries-closing-in-california/ar-AA1FIr0Q?ocid=BingNewsSerp

2. The Way Forward

California must lead (again) and show the world how to do this. A major problem with fossil-fuels lies in one word: “fossil.” This means is that we are using biomass from millions of years ago, that was buried underground and converted into petroleum or coal, pumping or digging this up, converting this to fuels (and other useful products, but mostly fuels), burning these fuels, and thus reintroducing lithic-sourced CO_2 into the atmosphere. “Lithic” means “relating to or made of stone,” which petroleum and coal are.

If replacement-fuels could be efficiently made from agriculturally-sourced biomass, most of the CO_2 emissions would be offset by the CO_2 that the biomass would absorb when growing.

3. The Transition

The immediate problem currently is that these two refineries are shutting down next year. This will not only create a disruption for all transportation owners/drivers in our state (including aeronautical and marine), it will create a big problem for the current owners of the refineries. First of all, they will lose the profits from these facilities. Second, local and state officials will demand that they take these refineries “back-to-grass” and fully mitigate all pollutants at these sites (as a side-opportunity / challenge, this will create major employment for attorneys for the next decade or two). Finally, this will damage the reputations of these firms.

I have a better idea:

1. The State of California and these two firms should create an independent corporation, partially owned by California and partially by the two petroleum companies (Valero and Phillips 66).
2. Initially the goal of the corporation will be to avoid the disruptions from shutting these two refineries down, and offer continued employment to the current refinery-employees.
3. The new corporation will be given a new name, that will draw from words like California, Valero, Phillips 66, and clean energy.
4. The profits from operating these will be banked for the first few years.
5. Drawing from these funds, the State of California will fund the following development.
    a. Selected State Universities with strong agricultural programs will spearhead the development of new non-food energy-crops.
    b. These energy crops will be grown, harvested and processed into compounds that will replace the lithic-petroleum in the two refineries. This process will be ramped up over time to replace all lithic-petroleum.
    c. Once the operations of the two refineries no longer use petroleum, the processes developed for all of the above will be licensed to other refineries, first in California…
    d. And then the US and world will follow.

Why does your silly author think we can do this? Because we (the US) already have done at least most of this?

Answer #1: See the 2023 post summarized and linked below.

E85: *If you live in an agricultural area, you probably already know what E85 is. I don't, but every week or two I drive from my primary residence (Livermore, CA) to my mountain home in Arnold, CA. About half way there via my normal route, I pass a gas station that is right in the middle of California's Central Valley, one of the largest food-stuff producers in the U.S. I have in the past noted that (1) they sell E85 (fuel that is roughly 85% bio-ethanol) because they have a large sign out front that advertises this, and (2) E85 is a lot less expensive than gasoline.*

Of course, during the peak gasoline prices recently, I wondered if either of the vehicles that I drive to Arnold could use this. When I'm curious about something, particularly when it is related to the Energy Industry, it usually ends up as a paper / post on Energy Central, and thus the post linked below.

https://energycentral.com/c/ec/e85

Also, we are the one place in the world where this can be done:

The state's (California's) ascent to the world's fourth-largest economy is powered in no small part by its $59 billion agriculture sector, which dominates national production and global exports of key commodities.[2]

Last month Gov. Gavin Newsom announced that California had officially overtaken Japan to become the world's fourth-largest economy. While the state is often celebrated for its tech industry and tourism, its agricultural sector remains a foundational force driving this global standing.

Home to over 400 commodities, California leads the nation in farm production, accounting for more than a third of U.S. vegetables and three-quarters of fruits and nuts — a critical engine not just for domestic consumption but also for international trade and the global food supply.

The state's agricultural exports totaled $23.6 billion in 2022, led by almonds, dairy and dairy products, pistachios, wine and walnuts, according to the California Department of Food and Agriculture.

"California isn't just keeping pace with the world — we're setting the pace," Newsom said in the news release. "Our economy is thriving because we invest in people, prioritize sustainability and believe in the power of innovation. And, while we celebrate this success, we recognize that our progress is threatened by the reckless tariff policies of the current federal administration. California's economy powers the nation, and it must be protected."

In 2024, California's growth rate of 6% outpaced the top three economies: U.S. (5.3%), China (2.6%) and Germany (2.9%). The state's economy grew strongly over the last four years with an average nominal gross domestic product growth of 7.5% from 2021 to 2024, Newsom said. Preliminary data indicates India is projected to surpass California by 2026.

[2] Jill Dutton, The Packer via unitedag, "How agriculture makes California a leader in the global economy," May 8, 2025, https://www.unitedag.org/news/how-agriculture-makes-california-a-leader-in-the-global-economy/

Newsom said California is the leading agricultural producer in the U.S…

And we also have some of the leading agricultural universities in the US.

The following 12 California Universities are ranked in the top-100 Agricultural Science Universities in the US:

University of California - Davis[3]

#2 in the United States

Enrollment 39,707

University of California - Berkeley

#9 in the United States

Enrollment 45,699

Stanford University

#23 in the United States

University of California - Riverside

#24 in the United States

Enrollment 26,426

University of California - Los Angeles

#40 in the United States

Enrollment 46,678

University of California-San Diego

#43 in the United States

Enrollment 42,376

University of California - Santa Barbara

#46 in the United States

Enrollment 26,068

University of California - Irvine

#63 in the United States

Enrollment 36,582

California Institute of Technology

#68 in the United States

University of Southern California

Los Angeles

#76 in the United States

[3] EduRank, "58 Best Agricultural Science schools in California, US," March 02, 2025, https://edurank.org/biology/agriculture/california/

University of California - Santa Cruz

#78 in the United States

Enrollment 19,764

University of California - San Francisco

#86 in the United States

Enrollment 3,126

4. How Much Pain?

Currently the US, including California and other states are performing the research and development required to reduce and finally eliminate greenhouse gas emissions, and thus slowly (over the next century or two) start to mitigate climate change. However, this is a huge problem and will require a massive effort by the world's economies to move any solutions out of the labs and into production.

Believe it or not, we (the world's populations) are only seeing the first minimal effects of climate change. See the recent post below for details on some of these effects and possible mitigations for each.

Climate Change Series – Effects Mitigation: *There are two posts that cover methods to mitigate human-caused climate change. The first of those deals with methods to directly mitigate the current and immediate-future effects of climate once they are occurring, and a link to this post is below.*

https://www.energycentral.com/energy-biz/post/climate-change-series---effects-mitigation-CHyI5SbSab6ogLb

Final author's comment: This is the second post mentioned in the above paragraph, and the last post of this series.