



YOSEMITE
CLEAN ENERGY

Climate Summit

Biomass Happens Panel
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The problems Yosemite Clean seek to solve:



CA range and forests destroyed by wildfires in 2016-2024

12.5+ MM acres burned

1.28 MM acres 5 yr ave



CA needs to reduce hazardous fuels on an est. 20 million acres across CA in 20 yrs.

USFS Acres Burned:
2013-2022 - 71.8 MM acres burned

2023 US Senate Report Annual
Wildfire Damage: \$396-893 Billion per year



CA companies and communities facing significant liability

Utilities mandated to manage powerlines

2MM structures at high or extreme risk and homeowners unable to obtain fire insurance

Wildfire Damage

Increasing Costs in USA - Year after Year

US Senate Report, Oct 2023

California's average portion of this would be

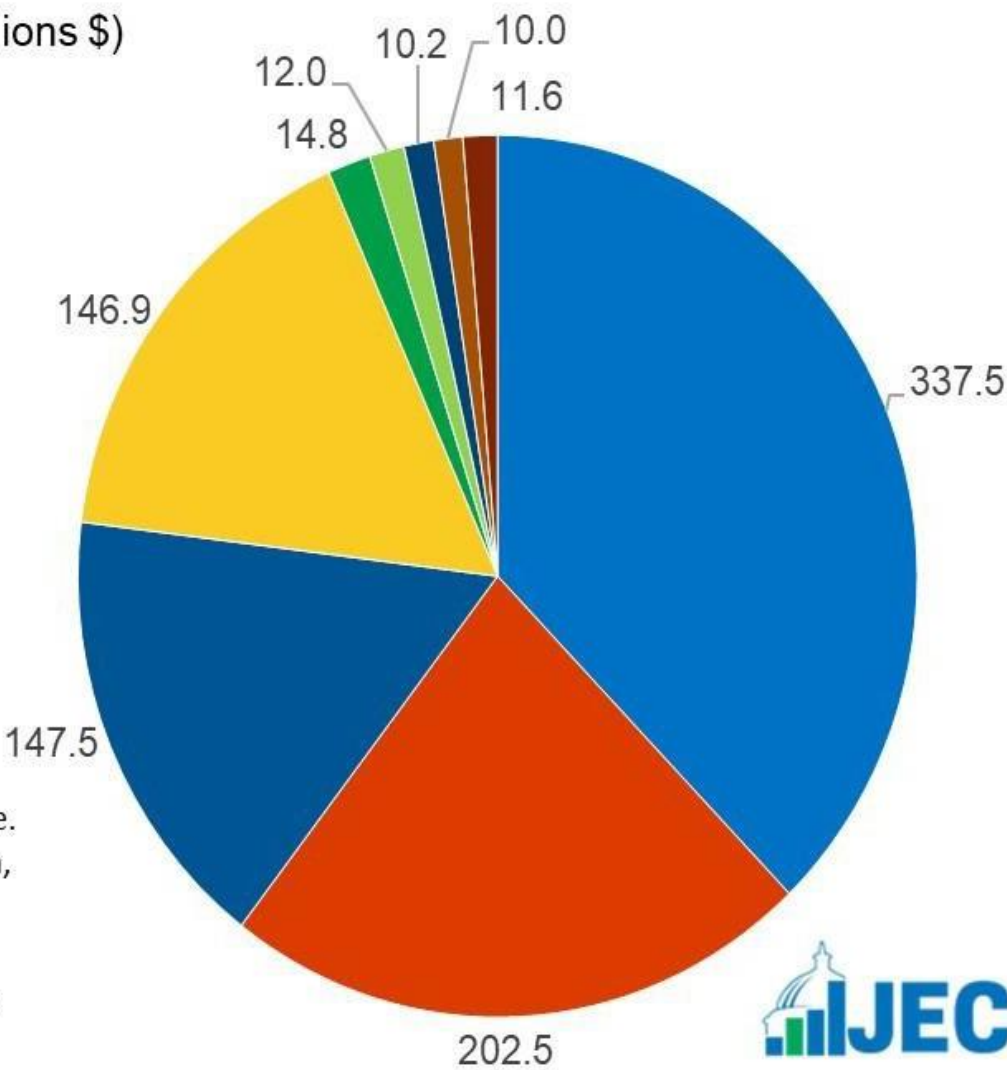
\$60Billion/yr = est. 20% of CA's budget



Climate-Exacerbated Wildfires Cost As Much as \$893 Billion Per Year

Top-end Annual Total Costs and Losses (Billions \$)

- Diminished Real Estate Value
- Exposure to Wildfire Smoke
- Income Loss From Wildfires
- Watershed Costs
- Insurance Payouts
- Timber Loss
- Property Damage
- Electricity Costs
- Other Costs



Note: Chart shows the higher end of the estimated range. Other Costs include evacuation costs, wildfire suppression, direct death and injuries, insurance premium increases, learning loss, tourism loss, and psychological costs.
Source: Analysis by JEC Democratic Staff, all values were adjusted for inflation into 2022 dollars.



Acres Burnt And Biomass Consumed

Between 2018 and 2021, 260,460 acres were burnt as part of prescribed fires (Joint Institute for Wood Products Innovation, 2023),

Over the same time period, over 9,201,666 California acres were burnt ([Frontline Wildfire Defence, 2025](#))

2023 Wildfire consumed an est. 6.9M tons of biomass = 20 tons of biomass burnt per acre of wildfire

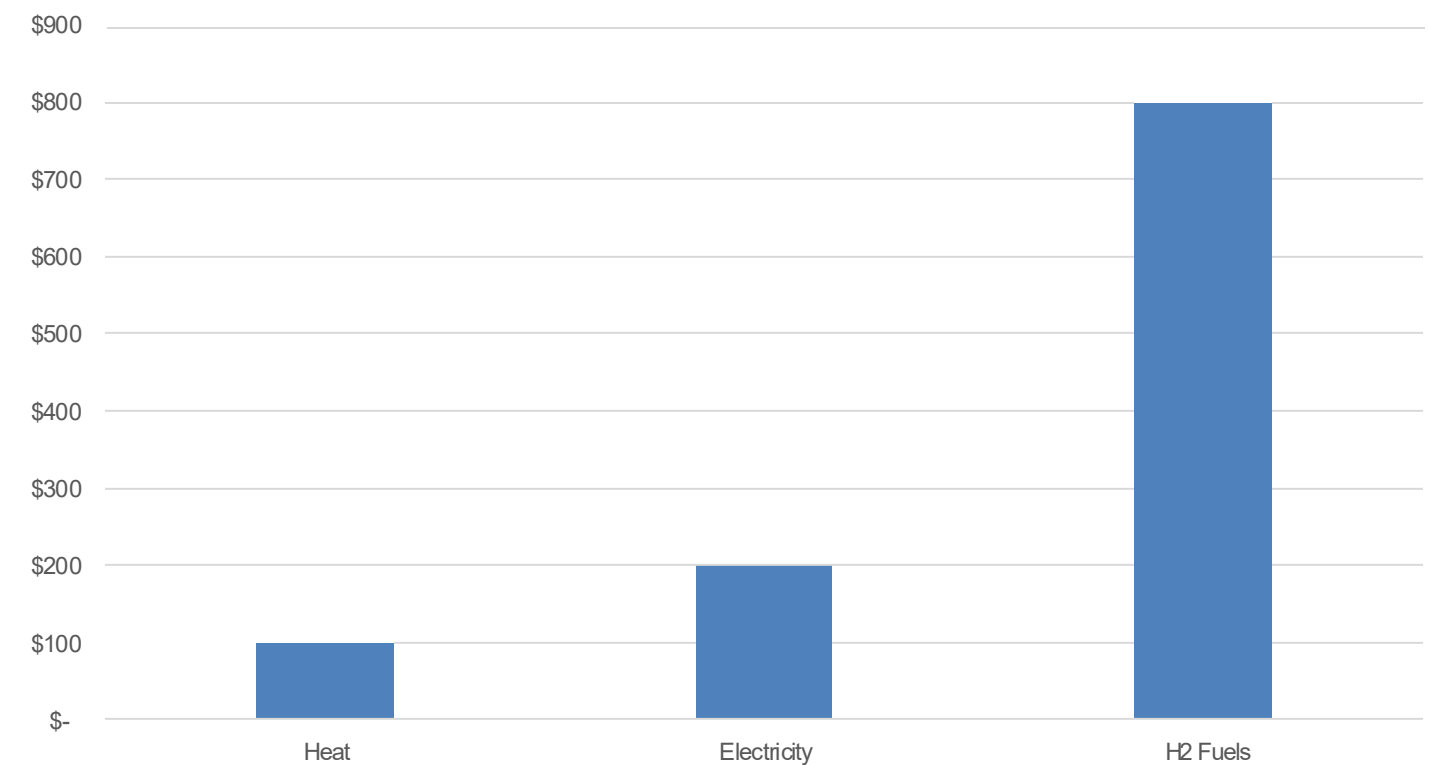
The California State government has indicated a goal of thinning 1 million acres/year over 20 years (500,000 from private and state lands, and 500,000 from USFS lands)

Our Goal: Turn Biomass into H2

New Markets for Non-merchantable Biomass

50 Million Tons per year of CA biomass Forest and Ag Waste could generate an est. 3.5 Billion Kgs of Carbon-negative H2 fuels Annually. Market Value est. \$35Billion: creating new jobs, reducing carbon emissions and provides a nature-based solution. CI Negative H2 could displace nearly 75% of diesel demand in CA from our wasted natural resources (Lawrence Livermore National Lab. 2020)

Value per BDT Biomass



Problem: Wildfire Carbon Emissions

According to UW's CONSUME 3.0, over 3429 pounds of CO₂ are released per ton of woody biomass during open flaming. Over 3089 lb./ton are released during smoldering, and 3089 lb./ton are released during the residual phase.

Yosemite's project will capture an estimated 80,000 MT CO₂/year (utilizing 90,000 BDT waste biomass)

For particulate emissions, 28 lb./ton of PM₁₀ are released when feedstocks are at their dirtiest, and 23.6 lb./ton of PM_{2.5} are released

In 2020, CO₂Emissions from Wildfires were 7x greater in than mean average emissions, accounting for the second largest source of emissions and wiping out 10 years of clean fuel initiatives.

Without managing forest fuels and wildfires, California Climate Goals are UNACHIEVABLE

Up in Smoke: California's Greenhouse Gas Reductions Could be Wiped Out by 2020 Wildfires

Motivation

- Increasing wildfires in California.

Methods

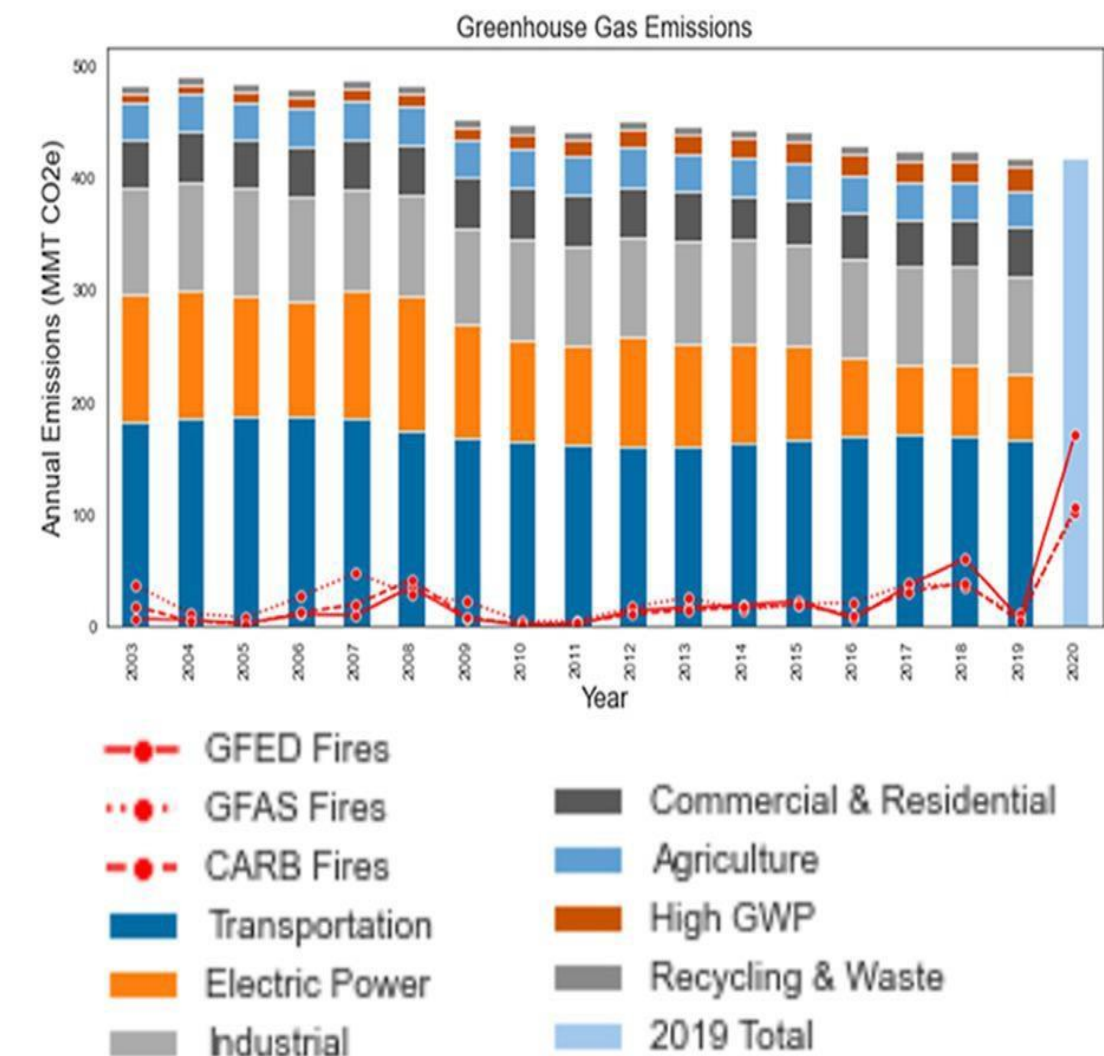
- Fire emissions inventories compared to California's greenhouse gas inventory from 2003-2020.

Results

- Wildfires could be second largest carbon source in California.
- \$7 billion in global damages.

Key Takeaways

- Significant societal benefits from wildfire prevention strategies.



Problem: Wildfire Carbon Criteria Pollutant Emissions

Criteria Pollutants	CONSUME Model (MT/yr)	EPA AP-42 (MT/yr)	YCE Projected* (MT/yr)
PM2.5 + PM10	3870	2250	<15
NOx	288	360	<10
CO	9000	13500	48
CH ₄	630	630	<10

* The YCE Gasification process will capture sequester approx. 90% of CO2 in our process.

* Based on 90,000 MT/yr biomass

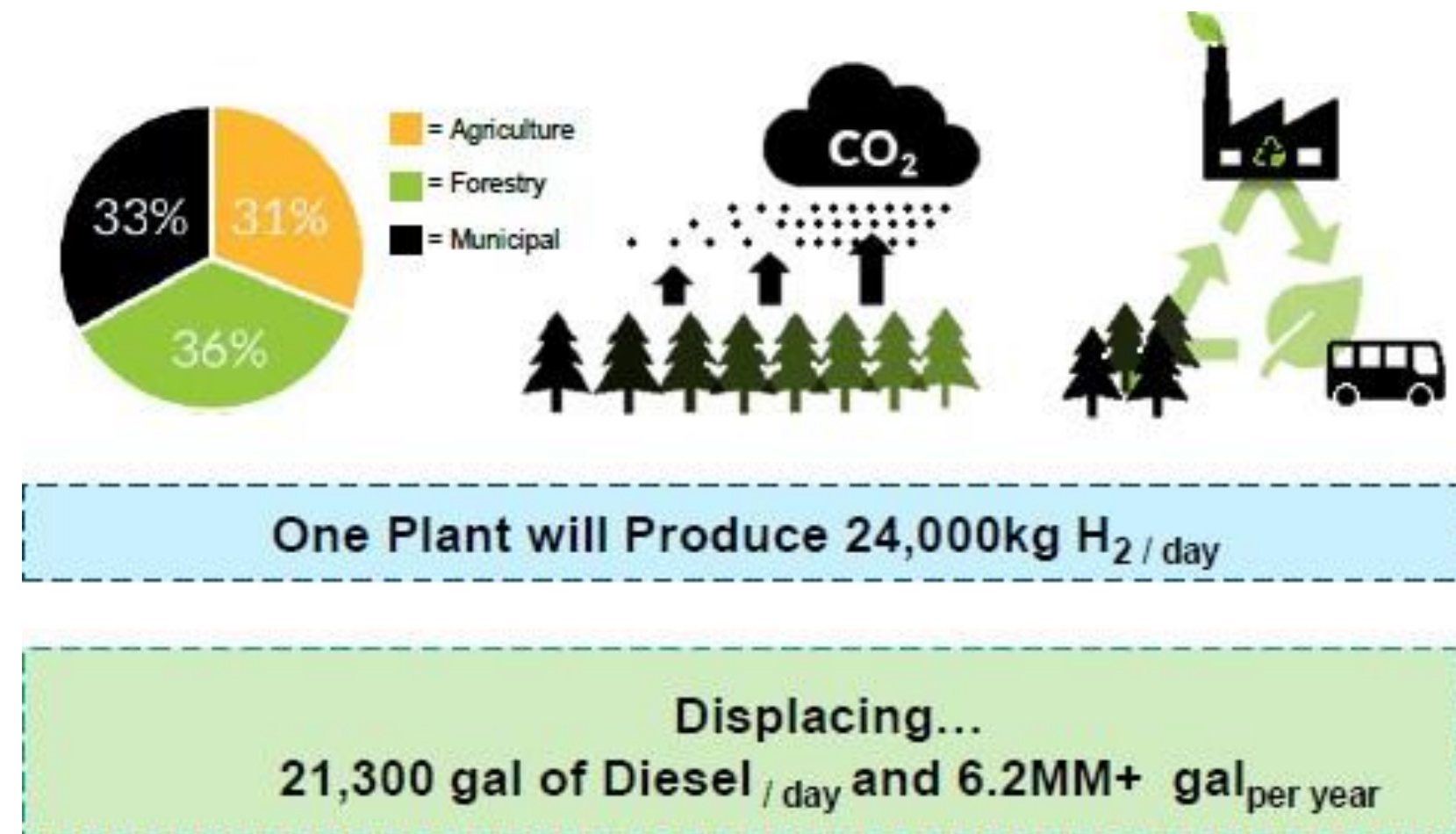
https://www.epa.gov/sites/default/files/2020-10/documents/13.1_wildfires_and_prescribed_burning.pdf
https://www.frames.gov/documents/usfs/fera/consume30_users_guide.pdf

Effects of Particulate Matter

PM10 and PM2.5 have been associated with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease (COPD). Long-term exposure to PM2.5 has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children. The effects of long-term exposure to PM10 can also lead to respiratory mortality and lung cancer.

PM2.5 exposure contributes to 5,400 (uncertainty range of 4,200 – 6,700) premature deaths due to cardiopulmonary causes per year in California. In addition, PM2.5 contributes to about 2,800 hospitalizations for cardiovascular and respiratory diseases (uncertainty range 350 – 5,100), and about 6,700 emergency room visits for asthma (uncertainty range 4,200 – 9,300) each year in California ([CARB](#), 2025).

AN [NIH study](#) of the San Joaquin Valley found that PM2.5 exposure costs \$3,206 million per year: effectively \$1000 per person in the Valley per year.





Policy/Reg. incentives that have helped YCE

- **Gov. Newsom Directive**

Share Stewardship Agreement with US Gov 1MM Acres/yr.

- **CARB – LCFS**

Extension of the Low Carbon Fuel Standard regulations 11/8/2024. Mandates included stricter carbon intensity (CI) reduction targets, increasing the 2030 CI reduction goal from 20% to 30%

- **Cal Fire Grants**

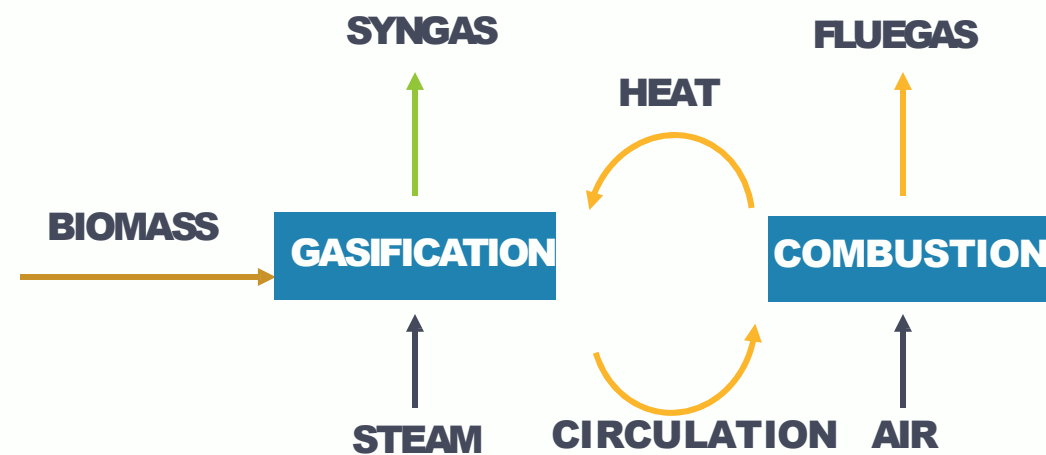
Supported by Cap-n-Trade funds via California Climate Initiative

Solution: Biomass Technology

Technical University Vienna/Austria

Repotec

Dual-Bed Gasifier



Successfully commercialized in
Europe for over

22 years



Using proven, innovative gasification
technology to make

Carbon Negative

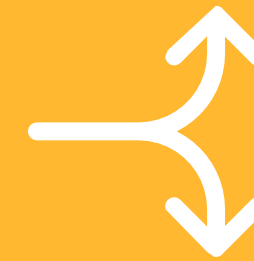
syngas and produce:



Green Hydrogen

- Regional exclusive technology agreement for Repotec's dual-bed gasification technology
- Downstream syngas reformation - licensing Topsoe proprietary technology
- CCS provided by California Resource Corp.
- End-product flexibility for future plants: SAF, Green Diesel, RNG, H2, Electricity

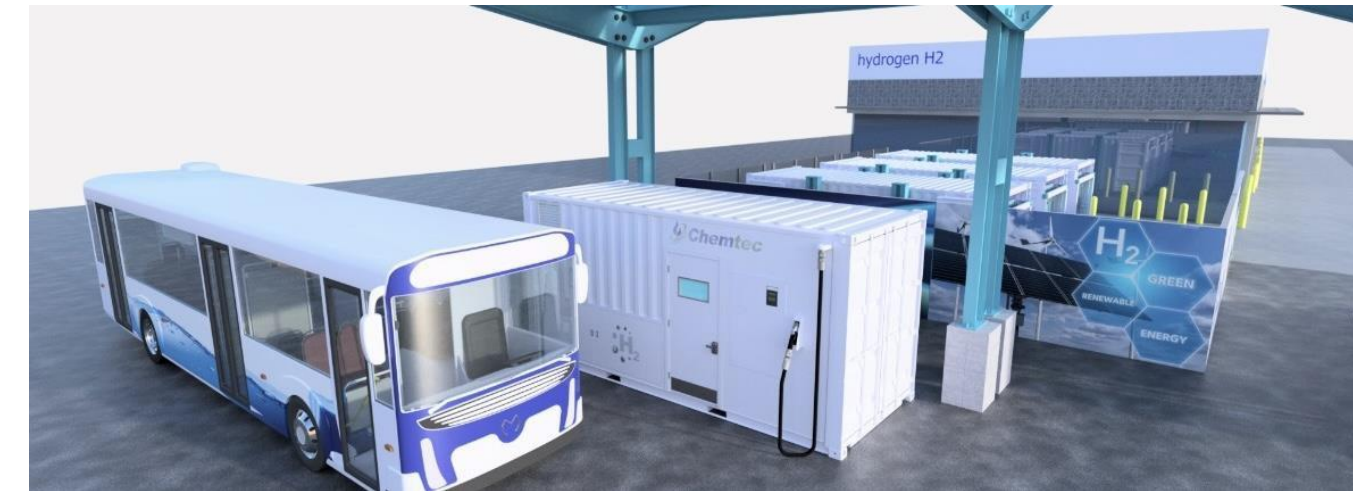
Scaling H2 From “Stump to Pump”



Key Policy and Regulatory Factors

Decarbonization Incentives for the H2 fuel ecosystem

- **LCFS** - is great, and we also need
 - **H2 Project dev. cap fund** to support scale up
 - **OEM** – incentives for purchasing vehicles
 - **H2- Infrastructure** –Extension of HRI \$
 - **H2 Permitting** – Streamlining permitting across Local, state, ports to be able to reach scale



Avoided Emissions CO2e Credits – Forest Biomass Incentive (SB 88)

- **UC, Cal Poly, Lawrence Livermore and CARB**
Need to tackle avoided emissions and how to monetize this for H2 producers

Partners



Thank you!

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