Why Biofuels?

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Greenhouse gas (GHG) emissions targets in California (CA) can be more readily achieved by collecting and converting in-state biomass resources into renewable liquid and gaseous fuels. There are many advantages of renewable biofuels that make them attractive now and in the future.

Lower Emissions than Traditional Fuel or Net-Negative Emissions

Plants only contain the carbon dioxide (CO_2) they capture from the atmosphere during their lifetime using photosynthesis. This means that any emissions released during forest and agricultural biofuel production do not introduce new CO_2 into the atmosphere, making the process less carbon intensive and possibly even carbon neutral in some situations, unlike fossil fuels. Additionally, renewable biofuels facilities can be equipped with carbon capture and storage (CCS) technologies. CCS captures the CO_2 released during biofuel production which can then be stored in geologic formations, making such fuels carbon negative. Biofuels also burn cleaner than fossil fuels, resulting in fewer GHG emissions, regardless of whether CCS is used. Fuels from municipal solid waste (MSW) diverted from landfills also reduce methane, a strong climate pollutant.

Wildfire Risk Reduction and Air Quality Benefits

Using forest biomass from sustainably managed forests and agriculture residues from crops for liquid or gas biofuels will have compounding benefits, such as healthier forests, avoided wildfires, improved water retention and quality, and improved air quality. When replacing fossil fuels, these cleaner, renewable biofuels further improve air quality.

Energy Security

In 2021, CA imported 294 million barrels of crude oil from foreign countries, which accounts for 56% of the state's crude oil supply. CA produced 29% (151 million barrels) of its own crude oil, while the remaining 15% (78 million barrels) was imported from Alaska. By relying more on domestic renewable energy, CA can reduce its dependence on fossil fuels as well as unstable global fuel supplies and prices. Renewable biofuels sourced from forest biomass, agricultural residues, and MSW have the potential to contribute to the renewable energy mix in the state, enhancing its energy security as they can replace traditional gasoline, diesel, and jet fuel.

Job Creation

Near-term benefits of renewable biofuels production from locally sourced biomass include rural economic development and increased livable wage jobs in underserved communities in manufacturing, engineering, and business and marketing. Long-term benefits include additional job creation in sectors such as real estate, finance, and transportation as rural communities reap the financial benefits of their role in the renewable biofuels industry.

California's Biomass Sources

California's extensive and varied biomass (plant or animal material used as fuel to produce electricity or heat) resources primarily come from forest biomass, agriculture residues, and MSW. Each has its place in CA's 2045 net-zero GHG emissions economy.

Forest Biomass

Agriculture Residues

Municipal Solid Waste

Most of the forest biomass is concentrated in the northern portion of the state, agricultural residues in the Central Valley, and municipal solid waste in Southern California. This presents a remarkable opportunity for renewable biomass supply across the state.

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