Date of Hearing: June 19, 2024

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY
Cottie Petrie-Norris, Chair
SB 1062 (Dahle) – As Amended April 29, 2024

SENATE VOTE: 38-0

SUBJECT: Energy: conversion of biomass energy generation facilities

SUMMARY: Requires the Department of Conservation (DOC) to develop the Biomass Technology Transition Program to support the conversion of biomass generation facilities using traditional combustion technologies to newer advanced bioenergy technology facilities and proposes related requirements and an additional future grant program.

Specifically, **this bill**:

1) Defines "forest biomass waste" as forest biomass that is removed to reduce or mitigate the risk of wildfire, reduce the risk to public safety or infrastructure from falling trees or tree limbs, or create defensible space, or for forest restoration projects.

2) Requires the DOC, in consultation with the California Energy Commission (CEC), California Public Utilities Commission (CPUC), the California Air Resources Board (CARB), the Governor's Office of Business and Economic Development (GO-Biz), the California Infrastructure and Economic Development Bank (I-Bank), and air pollution control/air quality management districts, to develop and administer the Biomass Technology Transition Program, on or before December 1, 2025, to support the conversion of biomass generation facilities using traditional combustion technologies to newer advanced bioenergy technology facilities that result in reductions in the emissions of criteria air pollutants, toxic air contaminants, and greenhouse gases (GHGs).

3) Requires the DOC to establish benchmarks and guidelines, as specified and consistent where applicable with the State Board of Forestry and Fire Protection's (BOF's) Joint Institute Recommendations to Expand Wood and Biomass Utilization in California, on business plans for the conversion of facilities within the Biomass Technology Transition Program.

4) Requires the DOC, on or before December 1, 2025, to identify generation facilities that meet all of the following requirements:

    a. The facility has a generation capacity of 10 megawatts (MW) or greater that uses, or is in the process of recommissioning or redeveloping those facilities to use, forest biomass waste;

    b. The operators of those facilities have demonstrated to the DOC their sincere interest, to the satisfaction of the department, in converting their facilities to advanced bioenergy technology facilities that result in a reduction in emissions of criteria air pollutants, toxic air contaminants, and GHGs.

5) Requires a relevant local air pollution control district or air quality management district to provide information for each identified generation facility about best available control technologies (BACTs), and other potential advanced emission control technologies that would be required if the generation facility requests a permit, as provided.

6) Requires the operator of a generation facility, on or before January 1, 2032, to develop business plans, which must include a carbon sequestration component, pursuant to guidelines established by the department for the conversion of a facility to an advanced bioenergy facility.

7) Requires the DOC, on or before January 1, 2032, to establish a grant program to support the distribution of advanced bioenergy technologies from those identified generation facilities that meet certain requirements.

EXISTING LAW:

1) Requires the CPUC to direct electrical corporations to collectively procure at least 250 MW of cumulative rated generation capacity from bioenergy derived from organic waste diversion, dairy and agricultural resources, and byproducts of forest management. Requires the CPUC to encourage investor-owned utilities (IOUs) to develop programs and services that facilitate development of bioenergy and biogas. This program is known as BioMAT. (Public Utilities Code § 399.20)

2) Establishes the BOF within the Department of Forestry and Fire Protection (CalFire) to represent the state's interest in the acquisition and management of state forests, protect the state's interests in forest resources on private lands, and determine, establish, and maintain an adequate forest policy. (Public Resources Code §§ 730 and 740)

3) Establishes the Joint Institute for Wood Products Innovation (Joint Institute) under BOF to perform wood products research, development, and testing; and to accelerate research, development, and adoption of advanced forest management and wood products manufacturing. (Executive Order B-52-18)

FISCAL EFFECT: According to the Senate Committee on Appropriations, this bill would incur unknown but likely significant cost pressure (various funds) to provide funding for the grant program established by this bill. The DOC notes that any cost estimates would ultimately be dependent upon the amount of funding allocated to the grant program, but estimates, if the Legislature were to appropriate $50 million in funding, one-time costs of $250,000 (special fund) for a contract to develop bioenergy market benchmarks, and ongoing costs of $486,000 annually (special fund) for grant planning, administration, and oversight. The CARB estimates ongoing costs of about $220,000 annually (special fund) to meet the consultation requirements of the bill.

BACKGROUND:

Biomass to energy – Biomass is renewable organic material that can include wood and wood processing wastes, yard and food waste, agricultural crops, animal manure, and human sewage (municipal solid waste). Biomass can be used as feedstock to generate heat and electricity out of what would otherwise be waste material. There are a number of options available to make use of biomass as a feedstock to generate fuels and electricity, rather than treating them strictly as a

waste stream to be disposed of. Biomass can be converted to energy through four main processes: direct combustion, and thermochemical, chemical, and biological conversion.

Direct combustion, or simply burning the biomass, is the most common method for converting biomass to useful energy. From about 1990 to 1993, California's biomass power generation was at its highest.[1] But by 1996, the energy production from biomass combustion decreased to about 590 MW.[2] As of 2019, there were 23 – compared to 66 at the industry's peak – operating biomass facilities, which represented approximately 3% of the state's electrical generation capacity.[3] Despite the declining number of power plants, the generation capacity of biomass facilities in sum has largely remained unchanged since 2001, per the CEC *Energy Almanac* data.

Non-combustion thermochemical conversion – such as pyrolysis and gasification – breaks down biomass material with heat, usually with little to no oxygen so there is no burning, into fuels which can be then used in conventional equipment (e.g. boilers, engines, and turbines) or advanced equipment (e.g. fuel cells) for the generation of electricity. Chemical conversion breaks down the biomass material through chemical reactions; whereas biological conversion – including fermentation and bacterial decay – breaks down the biomass material through the use of enzymes, bacteria, or other microbes. Scalable non-combustion processes are more nascent pathways, and as a result best practices and emissions profiles are yet to be established.

More pathways, more products, but only if there's a government subsidy for them – Recognizing the need to better understand the current state of the market for woody feedstock, and the potential to scale up a more sustainable and innovative wood products market to meet the state's climate goals, the state budget in 2022 also made allocations for several programs, including: $10 million to CalFire for the Woody Biomass Transportation Subsidy Program to encourage post-fire cleanup and expanded capacity at wood processing facilities; resources to GO-Biz to hire at least one full-time position to lead the development of the Sustainable Wood-Based Product Market Development Roadmap; and $50 million to the DOC to focus on creating carbon-negative hydrogen and/or liquid fuel from forest biomass coming from forest vegetation management within California's Sierra Nevada.[4]

One possible end-use for advanced bioenergy technology facilities is hydrogen. Several grant programs have been financed recently to propel hydrogen projects. The CEC is currently administering a Clean Hydrogen Program incentive program, established by AB 209 (Committee on Budget, Chapter 251, Statutes of 2022) to incentivize hydrogen projects that produce, process, deliver, store, or use hydrogen derived from water using eligible renewable energy resources, or produced from these eligible renewable energy resources. While initially appropriated at $100 million, the Governor's budget proposes to reduce the amount to $65 million. The federal government is also providing significant incentives for hydrogen development. Specifically, the

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[1] CEC; "Biomass Energy in California; https://www.energy.ca.gov/data-reports/california-power-generation-and-power-sources/biomass/biomass-energy-california.

[2] The expiration of governmental subsidies was a main driver for the reduction in biomass power generation during this time.

[3] University of California Agriculture and Natural Resources; "Woody Biomass Utilization"; https://ucanr.edu/sites/WoodyBiomass/Woody_Biomass_Library/Energy/.

[4] An additional $49 million was authorized for GO-Biz to capitalize the Climate Catalyst Fund within the I-Bank to support projects and businesses advancing sustainable forestry practices – though conversion of combustion biomass facilities are specifically excluded from this program due to separate funding for the previously mentioned DOC program.

Infrastructure Investment and Jobs Act (IIJA) included $8 billion to the Department of Energy (DOE) to establish hydrogen research and pilots across the country, known as the Regional Clean Hydrogen Hubs Program. California has been awarded $1.2 billion which is being managed by the Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES). Under the Inflation Reduction Act, the Treasury Department was tasked with developing a federal tax credit to incentivize the production of clean hydrogen, otherwise known as the 45V production tax credit. The tax credit is structured to provide up to a $3 tax credit per kilogram of hydrogen produced, with higher credits granted to lower-carbon-intensive hydrogen.

COMMENTS:

1) *Author's statement.* "California has experienced some of the worst wildfires in state history in recent years. The millions of tons of dry wood waste that have been building up in our forests is one of the many reasons why recent fires have gotten out of control. I have supported the recent efforts to expand the use of biomass energy so we can ensure this harmful waste is removed and wildfire risk is reduced. However, there is more to be done. Biomass facilities across the state are struggling to keep up with emissions regulations and many simply cannot afford to acquire new technologies. This bill will help biomass facilities acquire new emissions reducing technology while also providing them with the financial security needed to allow them to continue clearing our forests of the excess woody debris."

2) *Need for biomass energy.* Wildfires have been growing in duration and ferocity over the past 20 years. Their growing risk is due to a number of factors, from accumulating forest fuels to a warming climate to expanding development in the wildland-urban interface. In response, recent initiatives at the state and federal levels have been established to increase wildfire fuel management, including increased mechanical thinning and timber harvest in federal, state, and private forests and wildlands.[5,6] All of these efforts produce forest waste. Sometimes that waste is left in piles, contributing to wildfire risk; whereas at others times the waste is burned on-site, contributing to air pollution. The need to better manage California's forest waste is apparent. Having a robust biomass market spurring forest management can help drive down the cost of forest waste removal activities.

3) *Hindsight is 20/20, maybe.* To a large extent, biomass energy facilities have lived and died on mandates and intervention. The federal Public Utility Regulatory Policy Act passed in 1978, which required utilities to purchase electricity at an avoided cost – the price the utility would have paid to generate or contract for that power – from independent power sources that used renewable resources or alternative technologies, encouraged utilities to purchase power from qualifying biomass facilities, leading to their boom in the 1980s.[7] As energy prices dropped in the early 1990s and the costs of feedstock soared, utilities began to scale back from biomass contracts. Subsequent policies have followed, requiring the continued procurement of biomass electricity over the last decade, with the costs of those contracts passed onto ratepayers. According to the

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[5] SB 901 (Dodd, Chapter 626, Statutes of 2018)
[6] Memorandum of Understanding, "Agreement for Shared Stewardship of California's Forest and Rangelands between the State of California and the USDA, Forest Service Pacific Southwest Region"; August 2020.
[7] Union of Concerned Scientists; "Public Utility Regulatory Policy Act (PURPA); October 2002; https://www.ucsusa.org/resources/public-utility-regulatory-policy-act.

CPUC, the average contract price of existing BioRAM contracts in 2023 was 12.2 cents/kWh;[8] whereas the average price of all other contracts was 5.8 cents per kilowatt-hour (kWh).[9] The CPUC has cited a number of challenges with accessing fuel for biomass facilities, including insufficient supply chain capacity, long hauling distances, and high transportation costs, which contribute to biomass electricity's high price.[10] These costs are absorbed by ratepayers. As a consequence, the state must weigh the statewide benefits of forest waste management provided by biomass facilities with the costs to ratepayers, both in real dollars and opportunity costs of not investing in more affordable and carbon-free renewable energy sources.

The retrofitting of existing carbon-emitting energy facilities to cleaner energy facilities, rather than the construction of brand new facilities, has possible merits, such as the continued use of existing transmission lines and the facilitated greening of a skilled energy workforce. However, scalable advanced bioenergy technologies have yet to be commercially demonstrated, so this bill might be putting the cart before the horse. Additionally, as mentioned above, the CPUC has cited a number of challenges with accessing fuel for biomass facilities which contribute to the high cost of bioenergy relative to other renewable resources. Although the Governor has infused some funding from the 2022 state budget into programs that aim to find solutions to alleviate these fuel issues, they remain a cost constraint, which casts doubt on the longevity of the new industry that this bill would stand up without continued procurement mandates and subsidies.

This bill establishes a grant program for biomass facility conversion, along with required market benchmarks and offtake agreements for advanced bioenergy fuels, but is silent as to how such programs or agreements will be paid for or achieved. The author has indicated the intention is to use state dollars, if made available, to help support the DOC in implementing this measure. However, this is not explicit. Given the history of using ratepayer dollars to support biomass production, *the committee recommends an amendment prohibiting ratepayer funds from being used to implement this bill.*

4) *Appropriate agencies.* Notably, this bill calls for the creation of a biomass transition program at the DOC. While the DOC works on land management issues, the department's experience in biomass energy production and associated power plants is unclear to the committee. In 2022, the DOC was allocated funding for a new Forest Biomass to Carbon-Negative Biofuels Pilot Program, in alignment with the focus of this bill.[11] However, it was seemingly DOC's first and very recent entrance into the biomass-into-biofuels arena. The DOC has used $6.5 million of the $50 million allocated for administrative costs and planning grants for eight projects.[12,13] But these efforts will be short-lived; the program's budget will be reduced by $43.5 million, effectively

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[8] CPUC; Page 23; *2024 Padilla Report: Costs and Cost Savings for the RPS Program*; May 2024.
[9] CPUC; Page 22; *2024 Padilla Report: Costs and Cost Savings for the RPS Program*; May 2024.
[10] CPUC; 2021 *Padilla Report: Costs and Cost Savings for the RPS Program*; May 2021.

[11] SB 154 (Committee on Budget, Chapter 43, Statutes of 2022); https://www.conservation.ca.gov/cgs/fbp.
[12] Per data request from the Legislative Analyst's Office on June 11th, 2024.
[13] DOC; "Forest Biomass to Carbon-Negative Biofuels Pilot Program Phase 1 Awards List"; https://www.conservation.ca.gov/cgs/documents/forestbiofuels/FBBPP-Phase1-Awards-List-a11y.pdf.

eliminating funding for the program.[14] In contrast, the CEC has been active in the biomass space since at least 2012 with the passage of SB 771 (Kehoe, Chapter 598, Statutes of 2011), which created the Biomass Development Program. That program was intended to accelerate the development of sustainable emerging biomass energy technologies in California by addressing the technical issues and providing long-term support, funding, or seed money in order to achieve prompt commercial readiness and maximize benefits to the state. The CEC has also previously administered the Energy Technology Advancement Program and currently runs the Public Interest Energy Research Program, both of which touch upon biomass facility-related technologies. This bill has been amended to include the CEC in a consulting capacity for developing the Program and market benchmarks, but that role is limited compared to what is required of the DOC in establishing and managing the Program. As such, it may be prudent to consider the best location for the Program's home agency.

5) *Entering foreign territory.* The Program created by this bill is intended to convert existing biomass combustion facilities into "advanced bioenergy technology facilities," which it broadly defines as noncombustion facilities with reduced emissions relative to today's biomass facilities. This seemingly leaves the door open for an exceedingly wide range of possible end-uses. The bill mentions sustainable aviation fuel or other biofuels in addition to renewable natural gas and hydrogen as examples of advanced bioenergy technologies, indicating a focus on conversion of these facilities for fuel production, rather than conversion to cleaner combustion for electricity generation. As a result, the intended outcome of this conversion program is unclear. It may be prudent, should the Legislature choose to appropriate funds to support this Program, to consider which conversions would be the most cost-effective or best able to achieve favorable outcomes, and narrow the Program's scope accordingly.

   This bill also requires converted facilities to include a carbon capture and storage (CCS) component in their business plan, indicating the addition of CCS in the converted facility as a requisite for Program eligibility. Given how nascent the advanced bioenergy industry is, it is unclear if CCS will be necessary in all cases to aid in achieving emissions reductions. Additionally, CCS technologies remain nascent as well; no CCS projects operate in California today. As such, requiring CCS may pose a barrier to the conversion of existing biomass combustion facilities into advanced bioenergy technology facilities, which seems to be counter to the author's intent. *The committee thereby recommends adjusting this requirement of including CCS in a project's business plan to be optional.*

6) *Need for amendments.* As put forth by this measure, the Program will be established by the DOC on or before December 1, 2025 – 11 months after enactment of this bill. Certain market benchmarks would be evaluated on or before January 1, 2030 – five years after enactment. The grant program envisioned by SB 1062 would be established by DOC on or before January 1, 2032 – seven years after enactment. The intervening time had previously been when the procurement mandate would take effect, but amendments in the Senate removed those provisions, leaving a notable gap between the Program's establishment and when grants are issued. The timelines and operations of this bill, therefore, do not seem operational, and may have the unintended consequence of stifling

[14] AB 107 (Gabriel, 2024) passed through the Legislature on June 13th, 2024, but has not been signed by the Governor as of this analysis' publication date

development. *As such, the committee recommends amendments to adjust and clarify the timelines in the bill, per below.* It deserves reiterating, however, that this bill may be putting the cart before the horse since scalable advanced bioenergy technologies have yet to be commercially demonstrated.

The committee recommends the following adjustments to the timelines in this bill: requiring the DOC and relevant agencies to assess market conditions for products from advanced bioenergy technology facilities on or before January 1, 2026; requiring the operator of a generation facility to develop and submit to the department business plans on or before January 1, 2027; requiring the DOC to establish a grant program on or before January 1, 2030; requiring operators to begin conversion of a facility on or before January 1, 2030 should the DOC estimate feasible market demand and technology readiness from its initial assessment on market conditions; requiring the DOC to update the assessment of market conditions on January 1, 2030 and every two years after; and requiring operators to begin conversion of a facility within two years of the department's determination of feasible market demand and technology readiness after January 1, 2030.

7) *Prior legislation.*

SB 740 (Cortese) required that the labor contracts an owner or operator of a stationary source that is engaged in manufacturing hydrogen, biofuels, or certain specified chemicals, or in capturing, sequestering, or using carbon dioxide in specified conditions awards, extends, or renews on or after January 1, 2024, must use a skilled and trained workforce. Status: Chapter 293, Statutes of 2023.

AB 834 (Aguiar-Curry) authorized community choice aggregators (CCAs) to submit eligible bioenergy projects for cost recovery from electric utility ratepayers, pursuant to the BioMAT program, if open capacity exists within the 250 MW program limit, as specified. Status: Chapter 234, Statutes of 2022.

SB 1109 (Caballero) extended by 5 years both the requirement in existing law that an IOU or a CCA purchase generating capacity from eligible bioenergy projects, to December 31, 2023, and the expiration date of contracts with biomass projects that were operative in 2022. Status: Chapter 364, Statutes of 2022.

SB 515 (Caballero, 2019) would have required the CPUC to submit a report on the amount of high hazard zone (HHZ) vegetation eligible for removal, the overall market potential for HHZ fuel in California, and the potential HHZ fuel supply for each current BioRAM contract to the Legislature. Status: Died in the Assembly Committee on Appropriations.

SB 901 (Dodd) addressed numerous issues concerning wildfire prevention, response, and recovery, including provisions related to biomass operations and electricity procurement. Status: Chapter 626, Statutes of 2018.

SB 840 (Senate Budget and Fiscal Review) expedited transmission interconnections for specified bioenergy or biomass projects in order to give them first priority to commence operations over other renewable energy resources. Status: Chapter 341, Statutes of 2016.

SB 859 (Senate Budget and Fiscal Review) required retail sellers of electricity to purchase a total of 125 MW of power from biomass facilities that generate electricity from forest materials removed from specific high fire hazard zones, as designated by CalFire in the Governor's Proclamation of a State of Emergency issued October 30, 2015. Status: Chapter 368, Statutes of 2016.

8) *Double referral.* This bill is double referred; upon passage in this Committee, this bill will be referred to the Assembly Committee on Natural Resources.

REGISTERED SUPPORT / OPPOSITION:

Support

None on file.

Opposition

Center for Biological Diversity

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