Date of Hearing: April 7, 2021

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY
Chris Holden, Chair
AB 322 (Salas) – As Introduced January 26, 2021

SUBJECT: Energy: Electric Program Investment Charge program: biomass

SUMMARY: Requires the California Energy Commission (CEC) to allocate at least 20% of funds appropriated for the Electric Program Investment Charge (EPIC) to bioenergy projects for plant and woody biomass conversion, giving preference to new and emerging bioenergy projects that do any of the following:

a. Use noncombustion conversion technology,

b. Convert biomass feedstock that would otherwise be burned,

c. Produce hydrogen or biogas for use in noncombustion generation technology,

d. Are carbon negative on a life-cycle basis,

e. Generate combined heat and power,

f. Use advanced technology emissions controls

EXISTING LAW:

1) Establishes the EPIC fund, and mandates the California Public Utilities Commission (CPUC) to set the rates that the investor owned utilities (IOUs) collect and transfer to the CEC to administer the eligible EPIC programs. (Public Resources Code § 25710-25712)

2) Defines "biomass conversion" as the production of heat, fuels, or electricity by the controlled combustion of, or the use of other noncombustion thermal conversion technologies on, the following materials: Agricultural crop residues; bark, lawn, yard, and garden clippings; leaves, silvicultural residue, and tree and brush pruning; wood, wood chips, and wood waste; and nonrecyclable pulp or nonrecyclable paper materials. (Public Resources Code § 40106)

3) Requires IOUs to collectively procure at least 250 megawatts (MW) of generated resources from bioenergy projects, and the CPUC to allocate amongst the IOUs shares of the 250 MW from bioenergy derived from organic waste diversion, dairy and agricultural sources, and byproducts of forest management. Requires the CPUC to encourage IOUs to develop programs and services that facilitate development of bioenergy and biogas. This program is known as the Bioenergy Market Adjusting Tariff (BioMAT). (Public Utilities Code § 399.20)

4) Directs the CEC and the CPUC to consider and, as appropriate, adopt policies and incentives to support the development and use in the state of renewable gas, including biomethane and biogas. (Health and Safety Code § 39730.8)

5) Requires the CEC to allocate EPIC funds for technology demonstration and deployment to projects in disadvantaged (25%) and low-income communities (10%). (Public Resources Code § 25711.6)

FISCAL EFFECT: This bill is keyed fiscal and will be referred to the Appropriations Committee for its review of the fiscal effect of this bill.

BACKGROUND:

EPIC Program – In December 2011, the CPUC established the EPIC fund and designated the CEC and California's three major IOUs[1] as administrators of the program.[2] The purpose of the program is to invest in research projects that "create and advance new energy solutions, foster regional innovation, and bring ideas from the lab to the marketplace."[3] The guiding principles of EPIC projects are to promote greater reliability, lower costs, and increase safety, while advancing technologies critical to achieving the state's environmental and energy goals. The CEC administers about $162 million per year of EPIC funds, approximately 80% of the total program budget.[4] The CEC has three silos to which it allocates EPIC funds: applied research and development, technology demonstration and deployment (TDD), and market facilitation.

- *Applied Research and Development*: Activities supporting pre-commercial technologies and approaches designed to solve specific problems in the electricity sector, including research leading to advancements in clean energy technologies, demand-side technologies, and renewable energy. The CEC has historically allocated approximately 40% of their EPIC budget to Applied Research and Development.

- *Technology Demonstration and Deployment*: Installing and operating pre-commercial technologies or employing operational strategies at a scale large enough and in conditions reflective of anticipated operating environments to assess functional and performance characteristics, and financial risks. The CEC has historically allocated approximately 40% of their EPIC budget to TDD.

- *Market Facilitation*: Installing and operating pre-commercial technologies or employing operational strategies at a scale large enough and in conditions reflective of anticipated operating environments to assess functional and performance characteristics, and financial risks. The CEC has historically allocated approximately 15% of their EPIC budget to Market Facilitation.

Bioenergy technology in California – Combustion technologies include gasification and pyrolysis, which produce gaseous or liquid fuels. Noncombustion technologies include biochemical processes like anaerobic digestion, fermentation, or enzymatic hydrolysis, which

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[1] Pacific Gas & Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E)
[2] CPUC D. 12-05-037
[3] *Electric Program Investment Charge 2019 Annual Report*, CEC Staff Report, CEC-500-2020-009, April 2020, https://ww2.energy.ca.gov/2020publications/CEC-500-2020-009/CEC-500-2020-009-CMF.pdf
[4] *Electric Program Investment Charge: Proposed 2018-2020 Triennial Investment Plan*, CEC Staff Report, CEC-500-2017-023-SF, April 2017.

produce biogas or hydrogen.[5] Most electricity generated from bioenergy is produced by direct combustion.[6]

In 2019, electricity from bioenergy combustion in California totaled 5,758 gigawatt-hours (GWh) or 2.87 percent of California's in-state generation portfolio. A total of 86 operating biomass power plants (waste-to-energy plants that burn organic material) with an installed capacity of about 1,289 MW are in California.[7] There are 23 bioenergy power plants fueled by woody waste,[8] and 30 facilities that generate combined heat and power using biomass or landfill gas.[9] As of this analysis, there is at least one organic biomass-to-hydrogen production facility planned[10] and one functioning biomass-to-ethanol facility[11] in California. Unlike other biomass operations in the state, both of these plants will utilize noncombustion technology.

Most biomass fuel in the state does not come directly from the forest but is sourced from agricultural residues, urban woody waste and sawmill residues.[12] Forest sourced biomass is typically the most expensive fuel for power plants, and transportation is the limiting factor. The maximum viable haul from the forest to the biomass power plant is 50 miles to be financially feasible.[13] Since 1980, the number of biomass plants in California has decreased significantly because of expiring long-term contracts and by high operation and transportation costs.[14]

Allocation of EPIC funds – In 2012 the CPUC decided to set aside 20% of TDD funds (~$26 million) for bioenergy projects in the three-year period of the first EPIC investment plan (2012-2014), citing the varied potential benefits of community-scale biomass conversion (e.g. forestry and fire management, environmental benefits, decreased greenhouse gas emissions). The CPUC decision also stated that the allocation would be re-evaluated for subsequent investment plans, as "it [was] unclear why the Commission should continue indefinitely to offer electricity ratepayer subsidies to a particular type of facility or fuel that appears to continue to be expensive relative to other options."[15]

However, due to timing delays between the EPIC plan approval and the program's beginning, the CEC did not establish the separate minimum for bioenergy, and instead awarded $18 million to bioenergy projects through the competitive solicitation process for the 2015-2017 investment period. In doing so, they cited other recent sources for bioenergy funding, including the State's greenhouse gas emission allowance program and the Department of Food and Agriculture's Dairy Digester Research and Development and the Alternative Manure Management Program, totaling approximately $70 million. [16]

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[5] https://ucanr.edu/sites/WoodyBiomass/Woody_Biomass_Library/Energy/
[6] https://www.energy.gov/eere/bioenergy/biopower-basics
[7] https://ww2.energy.ca.gov/almanac/renewables_data/biomass/index_cms.php
[8] https://ucanr.edu/sites/WoodyBiomass/Woody_Biomass_Library/Energy/
[9] U.S. EIA, Form EIA-860 detailed data with previous form data (EIA-860A/860B), 2019 Form EIA-860 Data, Schedule 3, 'Generator Data' (Operable Units Only)
[10] https://www.sgh2energy.com/worlds-largest-green-hydrogen-project-to-launch-in-california
[11] https://www.aemetis.com/company/facilities/ethanol-production-facility-in-keyes-ca/
[12] https://ucanr.edu/sites/WoodyBiomass/Woody_Biomass_Library/Energy/
[13] Ibid.
[14] *Application of the California Energy Commission for Approval of EPIC Proposed 2018-2020 Triennial Investment Plan*, CEC, 17-EPIC-01, May 2017.
[15] CPUC D. 12-05-037, p.53
[16] CPUC D. 15-04-020

Legislation requires the CEC allocate at least 25% of TDD funds on projects based in or benefitting disadvantaged communities, and at least 10% of TDD funds on projects based in or benefitting low-income communities. The committee is unaware of any legislatively mandated allocations of EPIC funds towards specific technologies.

Board of Forestry Recommendations to Expand Biomass – On November 14, 2020, the Joint Institute for Wood Products Innovation and the Board of Forestry and Fire Prevention released a set of recommendations to promote biomass utilization in California.[17] The report includes a comprehensive list of market and regulatory challenges in bioenergy, and offers solutions for various state agencies. They identified the lack of EPIC funding as a potential solution, referencing the CPUC decision to allocate 20% of program funds in the first investment plan. They state, "Additional funding is needed to demonstrate the next generation of technologies, including biomass gasification combined with fuel cells, biomass energy with carbon capture and sequestration (CCS), biogas for energy storage, generation of hydrogen from forest biomass, and assessment of lifecycle carbon benefits of biomass gasification or pyrolysis with biochar production and use."[18]

COMMENTS:

1) *Author's Statement.* "Increasing the production of bioenergy is critical to reducing open burning, wildfire hazards, and landfilling of organic waste (as required by SB 1383, Lara, 2016), as well as meeting California's clean energy goals. According to the Board of Forestry, more funding is needed to support new and innovative biomass projects that will create clean electrical generation by turning material like dead trees and agricultural waste, that often would be open burned, into renewable energy. AB 322 will help achieve this goal by reallocating 20 percent of EPIC funds to new bioenergy projects, as was mandated when the program was originally created. Investing in California's biomass projects is crucial to meeting our climate goals while reducing waste, pollution, and invigorating the next generation of clean energy production in the state."

2) *Environmental needs.* California generates large volumes of woody waste from forest thinning and wildfire mitigation, agricultural waste, and urban wood waste. This waste is typically burned, either in controlled burns or wildfires, which emits black carbon and other short-lived climate pollutants. The state has recently increased their wildfire mitigation efforts and forest thinning measures, which has generated more forest waste. The author claims that converting this biomass waste to energy using noncombustion technologies could mitigate air quality concerns of burning waste, while providing a source of clean energy. The bill seeks to address air quality and waste diversion needs by specifying funding for noncombustion biomass conversion technologies. However, opposition states that bioenergy projects emit criteria pollutants and carbon emissions and only marginally better than open burning. The Assembly Natural Resources Committee may wish to further address the environmental and air quality benefits raised by the author.

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[17] https://www.bioenergyca.org/wp-content/uploads/2020/11/Joint-Institute-Wood-and-Biomass-Utilization-Recommendat.pdf
[18] *Joint Institute Recommendations to Expand Wood and Biomass Utilization in California*, Board of Forestry and Fire Regulation, p. 16

3) *Bioenergy priorities in EPIC.* The EPIC program funded a total of $73.3 million over two investment periods (2012-2014, 2015-2017) toward bioenergy technology development, demonstration and deployment. This amount is nearly equally split between woody biomass to energy projects using thermochemical conversion technology such as gasification ($35.4 M), and biogas projects involving biochemical or anaerobic digestion process to convert organic wastes (e.g., dairy manure and food waste) to biogas ($37.8M).

   In their 2018-2020 EPIC investment plan proposal, the CEC identified cost as the primary obstacle to expanding bioenergy usage, including the cost of controlling air emissions and, for gasification, the cost of damage caused by tar formation and other impurities.[19] Other factors contributing to bioenergy's high costs include transportation of biomass waste-feedstock, system impact studies, and interconnection. According to the CEC, "Technological development is still needed to achieve [levelized cost of energy (LCOE)] at or below the $120/MWh to maintain economic attractiveness for power purchase contract from utilities… To succeed in the market without public subsidies, technology advancements are needed to improve the LCOE of bioenergy and address air emission concerns".[20] Their EPIC investment proposal highlighted the need for community-scale projects that use locally sourced waste-biomass, advanced pollution control equipment, and low emission generators. Their 2018-2020 strategic objective[21] addresses these needs and places a greater emphasis on thermochemical or noncombustion conversion of woody biomass.

4) *Other sources of bioenergy funding.* A number of federal and state bioenergy programs already exist for bioenergy development that would seemingly meet many of the goals of this bill. The Woods Innovations Program (U.S. Forest Service) provides an average of $47 million per year, including match and leveraged funds from private, non-profit, and university partners, to forest management and wood energy projects.[22] The Organics Grant Program (CalRecycle) invests an average of $5 million annually into the expansion or establishment of organic waste diversion infrastructure, including bioenergy facilities.[23] Finally, the BioMAT program at the CPUC offers contract prices to eligible bioenergy projects up to 250 megawatts mandated by SB 1122 (Rubio, Chapter 612, Statutes of 2012).[24]

5) *Conflicts with EPIC program goals.* While biomass conversion is a mature technology and has operated in the market since the 1980s, the bill specifies that EPIC funds be allocated towards new and emerging bioenergy technologies that maximize ratepayer and public benefits, mirroring the overarching EPIC program goals as stated above. Some of the specified technologies address the emission concerns outlined in the aforementioned 2018-2020 EPIC investment proposal, like noncombustion technologies, carbon-negative projects, and use of advanced emissions controls. However, the bill also includes technologies beyond what is highlighted in the CEC's 2018-2020 strategic objective,

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[19] *Proposed 2018-2020 Triennial Investment Plan,* CEC Staff Report, April 2017
[20] Ibid., p. 160
[21] Strategic Objective 4.4 Improve the value proposition of bioenergy
[22] https://www.fs.usda.gov/naspf/wood-innovations-home/2021-wood-innovations-grant-program-request-proposals
[23] https://www.calrecycle.ca.gov/climate/grantsloans/organics
[24] https://www.cpuc.ca.gov/sb_1122/

such as the use of biomass feedstock that would otherwise be burned, and the production of biogas and hydrogen. Funding these technologies would conflict with the EPIC program's focus on pre-market development if projects mainly improve existing technologies.

Furthermore, setting aside funds for specific technologies could limit the success of the EPIC program. The investment planning process relies on guidance from multiple stakeholders to identify technological and scientific gaps as they emerge, and affords the CEC the necessary flexibility to best serve ratepayer interests while technologies evolve. Technology-specific allocations reduce funding to other non-bioenergy projects that may better maximize benefits to ratepayers, and limit the CEC's ability to focus on their guiding principles. Presumably, projects that maximize ratepayer benefits, such as those specified in the measure, could be awarded funds through the existing investment planning process.

As such, the committee may wish to consider striking the specific technologies listed in the bill.

6) *Is increased funding justified?* Out of the five bioenergy demonstration and deployment projects funded through EPIC, only one has been successfully completed. This project, located in Plumas County, constructed and demonstrated the use of a biomass combustion technology that generates combined heat and power. The remaining four projects are jointly funded through the BioMAT program. These projects are still in development and installation phases. EPIC has funded $13 million to laboratory scale or first pilot demonstration projects for woody biomass research and development, but these have not progressed towards larger scale developments to the committee's knowledge.

   The total budget for the 2018-2020 EPIC investment plan is $555 million, with $444 million administered by the CEC.[25] By mandating a 20% allocation of EPIC funds to bioenergy projects, this bill would carve out $88.8 million if allocating funds administered by the CEC from the most recent investment plan. This is greater than the total amount awarded to bioenergy projects across all investment periods over the past nine years.

   It's unclear whether nearly doubling the amount awarded per investment period award is justified. Without a more complete evaluation of biomass projects funded by EPIC or clear demonstration of funding needs, it is difficult to determine whether the 20% allocation is an appropriate level of funding for future projects.

   The committee may wish to consider amendments that strike the percent allocation and instead direct the CEC and CPUC to consider bioenergy projects in future investment cycles.

[25] CPUC D. 18-01-008

7) *Prior Legislation.*

SB 1122 (Rubio) Established the BioMAT program and required the CPUC to implement a cost recovery process for energy purchased by IOUs from bioenergy renewable generators less than 5 MW in size. Status: Chapter 612, Statutes of 2012.

SB 1383 (Lara) Among its provisions, required the CEC and the CPUC to develop recommendations for the development and use of biomethane and biogas as part of the 2017 Integrated Energy Policy Report, and to adopt policies and incentives to increase the production and use of biomethane and biogas. Status: Chapter 395, 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

Aries Clean Energy, LLC
Association of California Water Agencies (ACWA)
Bioenergy Association of California
Bloom Energy
Brad Thompson Company
California Biomass Energy Alliance
California Hydrogen Business Council
California Tahoe Alliance
Fall River Resource Conservation District
Green Hydrogen Coalition
Hitachi Zosen Inova
Los Angeles County Solid Waste Management Committee/integrated Waste Management Task Force
Northern Sonoma County Air Pollution Control District
Pioneer Community Energy
Pit Resource Conservation District
Placer County Air Pollution Control District
Resource Recovery Coalition of California
San Joaquin Valley Air Pollution Control District
Sempra Energy Utilities
Sierra Business Council
Tss Consultants
Wisewood Energy

Oppose

Center for Biological Diversity
Elders Climate Action, Norcal and Socal Chapters
Leadership Counsel for Justice & Accountability

Natural Resources Defense Council
Sierra Club

Analysis Prepared by: Jane Park / U. & E. / (916) 319-2083