SENATE COMMITTEE ON ENERGY, UTILITIES AND COMMUNICATIONS
Senator Steven Bradford, Chair
2023 - 2024 Regular

Bill No:	AB 1921	**Hearing Date:**	6/18/2024
Author:	Papan		
Version:	5/16/2024 Amended		
Urgency:	No	**Fiscal:**	Yes
Consultant:	Nidia Bautista		

SUBJECT: Energy: renewable electrical generation facilities: definition

DIGEST: This bill adds linear generators using renewable fuels to the definition of "renewable electrical generation facility."

ANALYSIS:

Existing law:

1) Defines "renewable electrical generation facility" as a facility that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts (MW) or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current. To meet the definition of a renewable electrical generation facility, the facility must be in state, have its first point of connection to the transmission network of a balancing authority area primarily located within the state, or has its first point of interconnection to the transmission network outside the state, within the Western Electricity Coordinating Council and meets certain specified requirements. (Public Resources Code §25741)

2) Incorporates the definition of "renewable electrical generation facility" into various programs, including:

   a) The California Renewables Portfolio Standard Program, which requires the California Public Utilities Commission (CPUC) to establish a renewables portfolio standard (RPS) requiring all retail sellers to procure a minimum quantity of electricity products from electrical generating facilities that meet the definition of "renewable electrical generation facility." (Public Utilities Code §399.12, §399.30)

   b) The net energy metering (NEM) program, in which residential customers, small commercial customers, and commercial, industrial, or agricultural customers of an electrical utility, who use a renewable electrical generation

facility, are eligible to participate, as specified. (Public Utilities Code §§2827, 2827.1)

c) As public works project for any facility, after December 31, 2023, that receives service pursuant to the NEM tariff with requirements to pay the construction workers prevailing rates, except for projects on single-family homes or those on residential buildings that are under 15 kilowatts, and other exemptions. (Public Utilities Code §769.2)

d) The California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) financing assistance programs for "alternative sources" which include renewable electrical generation facility. (Public Resources Code §26000 et seq.)

This bill revises the definition of "renewable electrical generation facility" to include a facility that uses linear generators that use fuels that meet the existing requirements of the RPS, including fuel source and delivery method requirements.

Background

Linear generators. Traditional energy production relies on rotational motion, usually the spinning of a turbine. The spinning energy generates electricity with use of conductor wires and magnets. For example, a hydraulic turbine converts the flow of water into mechanical energy that spins a rotor that is attached to coiled wires and magnets to create a magnetic field that generates electricity. However, linear generators use back-and-forth motion to create electricity.

For example, a particular design includes a center reaction cylinder with two opposed oscillators (circuits to create continuous, alternating waveform) and outer air springs. The reaction section has ports for fuel exchange, and each oscillator has magnets attached to them for electricity production via the surrounding copper coils. The arrangement forms a linear generator core that is long and skinny. In this example, a machine rated at 115 kilowatts (kW) is about 5.5 meters long and about one meter high and wide. (Svrcek, Matt, "*This new breed of generator can run on almost any fuel."* IEEE Spectrum: February 18, 2023. Svrcek is one of the co-founders of the linear generator company.) Though in development for over a decade, linear generators have in recent years become commercially available. According to the same article, linear generators were installed at tens of sites, producing 230 to 460 kW of electricity at each.

Renewable Portfolio Standard (RPS). Since the original RPS bill was adopted, SB 1078 (Sher, Chapter 516, Statutes of 2002), the electricity retail landscape and

market for renewable energy has changed dramatically, while the urgency to address climate change has grown. The Legislature has modified the goals and details of the RPS program several times since the original enactment. The most recent major changes were made by SB 100 (De León, Chapter 312, Statutes of 2018), which set a new obligation of 60 percent of retail sales from RPS-eligible generation by 2030. SB 100 also added a new obligation that the remaining 40 percent of retail sales be from zero-carbon resources.

The RPS program is statutorily prescriptive regarding which technologies and fuel types are eligible. Currently facilities that use biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 MW or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current are eligible. The new category of "zero-carbon" adopted under SB 100, however, is statutorily undefined.

Renewable fuel. Recent linear generator designs claim to be fuel flexible, whereby they are able to switch between different types or blends of fuel, from biogas, natural gas, hydrogen, and ammonia (mentioned in the IEEE Spectrum article noted above). Amendments taken in the Assembly narrow the eligible linear generators to only those that satisfy the fuel requirements in the existing RPS statutes, including requirements for fuel sources and delivery methods.

Need for this bill. According to the author:

> California continues to lead the way on ambitious climate goals. If we are to meet our 2030 and 2045 targets, it's imperative that we use every technology at our disposal. AB 1921 gives us another tool in the toolbox. This bill would include linear generators using renewable fuels in the list of "renewable electrical generation facilities." Linear generators play a vital role in providing clean, renewable back-up power generation and they need to be a part of our portfolio in order to meet our climate goals and ensure technology parity.

Verifying RPS eligibility. According to the California Energy Commission (CEC), as of April, they have not received any applications for RPS eligibility verification by a linear generating facility. However, the CEC does not foresee issues with verifying eligibility for RPS compliance by linear generators as proposed by this bill. However, the CEC would need to update the RPS Eligibility Guidebook.

Dual Referral. Should this bill be approved by this committee, it will be re-referred to the Senate Committee on Environmental Quality.

Prior/Related Legislation

SB 1420 (Caballero), among its provisions, adds renewable hydrogen, as specified, to the types of renewable energy a facility may use to qualify as a renewable electrical generation facility. The bill is pending in the Assembly Committee on Utilities & Energy.

SB 663 (Archuleta, 2023) defines renewable hydrogen and adds renewable hydrogen as a renewable energy resource under the RPS. The bill died on the Senate Floor.

AB 1550 (Bennett, 2023) requires, by January 1, 2045, all hydrogen produced and used in California for either the generation of electricity or the fueling of vehicles to be "renewable hydrogen of biological origin" or "renewable hydrogen of nonbiological orign: and makes a facility that generates electricity using two specified categories of hydrogen an eligible renewable energy resource.

FISCAL EFFECT: Appropriation: No Fiscal Com.: Yes Local: Yes

SUPPORT:

Bioenergy Association of California
Electrochaea Corporation
Microgrid Resources Coalition
Prologis Management, LLC
Silicon Valley Leadership Group
Southern California Gas Company
TSS Consultants

OPPOSITION:

None received

ARGUMENTS IN SUPPORT: The Bioenergy Association of California, Electrochaea, and TSS Consultants state:

> Linear generators are an important generating technology because they provide clean, firm power with virtually no emissions. By clarifying that linear generators using renewable fuels are RPS eligible, AB 1921 will help California meet the requirements of SB 100 while ensuring energy reliability and helping to meet California's climate and clean air policies. …Linear generators did not exist when the RPS was adopted and so were not included

in the list of eligible technologies codified in Public Resources Code section 25741. Adding linear generators that use renewable fuels to that code section will clarify that they are RPS eligible and will facilitate their use in California.

-- END --