SENATE RULES COMMITTEE SCR 25
Office of Senate Floor Analyses
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UNFINISHED BUSINESS

Bill No: SCR 25
Author: Blakespear (D) and McNerney (D), et al.
Amended: 6/27/25 in Assembly
Vote: 21

SENATE ENERGY, U. & C. COMMITTEE: 16-0, 3/24/25
AYES: Becker, Ochoa Bogh, Allen, Archuleta, Arreguín, Ashby, Caballero, Gonzalez, Grove, Hurtado, Limón, McNerney, Rubio, Stern, Strickland, Wahab
NO VOTE RECORDED: Dahle

SENATE FLOOR: 36-0, 4/7/25
AYES: Allen, Alvarado-Gil, Archuleta, Arreguín, Ashby, Becker, Blakespear, Cabaldon, Caballero, Cervantes, Choi, Cortese, Durazo, Gonzalez, Grayson, Grove, Hurtado, Jones, Laird, Limón, McGuire, McNerney, Menjivar, Niello, Ochoa Bogh, Padilla, Pérez, Richardson, Rubio, Seyarto, Smallwood-Cuevas, Stern, Umberg, Wahab, Weber Pierson, Wiener
NO VOTE RECORDED: Dahle, Reyes, Strickland, Valladares

ASSEMBLY FLOOR: 74-0, 7/3/25 (Consent) - See last page for vote

SUBJECT: Nuclear fusion

SOURCE: General Atomics

DIGEST: This resolution celebrates the numerous contributions of public and private sector organizations within California for advancing nuclear fusion energy research and supports developing the fusion energy ecosystem with the goal of siting a first-of-its-kind fusion pilot plant in California by the 2040s.

Assembly Amendments of 6/27/25 make minor technical and clarifying changes to the reference to the SB 100 report.

ANALYSIS:

Existing law:

1) Declares the policy of the state to encourage the use of nuclear energy, wherever feasible, recognizing that such use has the potential of providing direct economic benefit to the public, while helping to conserve limited fossil fuel resources and promoting clean air. (Public Resources Code §800)

2) Prohibits any nuclear fission thermal powerplant from being permitted in the state until the federal government approves technologies to reprocess the spent nuclear fuel rods, and the California Energy Commission (CEC) reports to the Legislature affirmative findings of that federal action. (Public Resources Code §25524.1)

3) Requires the CEC, as part of its 2027 Integrated Energy Policy Report (IEPR), to include an assessment of the potential of fusion energy to contribute to the state's power supply. Defines "fusion" to mean a reaction in which at least one heavier, more stable nucleus is produced from at least one lighter, less stable nucleus, typically through high temperatures and pressures, and emitting energy as a result. Defines "fusion energy" to mean the product of fusion reactions inside a fusion device and used to generate electricity or other commercially usable forms of energy. (Public Resources Code §25302.4)

This resolution:

1) Proclaims that the State of California celebrates the numerous contributions of public and private sector organizations within California for advancing nuclear fusion energy research and development.

2) Applauds recent scientific breakthroughs at research facilities in San Diego and Livermore.

3) Recognizes the vast potential of nuclear fusion energy for addressing key climate and national security goals and the contributions of California's private fusion industry.

4) Commends the University of California's Office of the President for its leadership in establishing the Pacific Coalition for Advancing Research, Education, Science, and Technology (CREST) Fusion initiative.

5) Supports developing the fusion energy ecosystem with the goal of siting a first-of-a-kind fusion pilot plant in California by the 2040s.

Background

Nuclear energy. There are two fundamental ways to release energy from nuclear reactions: fission and fusion of atomic nuclei. Nuclear fission is a process where the atomic nucleus splits apart; nuclear fusion is where atomic nuclei combine (or fuse) together. Both processes are theorized to generate energy. In nuclear fission, the process often yields some combination of particles and energy, often with radioactive decay. In nuclear fusion, the process can manifest as either an absorption or release of energy, sometimes with radioactive decay.

Nuclear fission electricity generation is commercially available today, such as the electricity generated at the Diablo Canyon Nuclear Powerplant outside San Luis Obispo. Very generally, for fission-based electricity generation, the atomic splitting releases heat and energy which is used to boil water; the water produces steam, which turns a turbine to generate electricity. Electricity generation based on fusion has yet to become commercially viable, and is still in research and development. There are multiple fusion methods that are currently being pursued for use in a commercial reactor system. Similar to fission, the released energy from a fusion process would be converted to heat, which in turn is converted to electricity via a conventional generator cycle. Although the fusion reaction theoretically does not produce significant or long-lived radioactive byproducts, the high-energy particles irradiate the surrounding reactor vessel and associated components. The irradiated material could pose potential disposal problems similar to those for the irradiated fission reactor vessel.

Nuclear fusion as a zero-carbon energy resources. The need for zero-carbon and renewable energy resources is critical to advance the state's clean energy and climate goals, including those for 100% zero-carbon and renewable energy by 2045 as established by SB 100 (De León, Chapter 312, Statutes of 2018) and the interim targets established by SB 1020 (Laird, Chapter 361, Statutes of 2022). Nuclear fusion energy has the potential to become a source of clean and resilient energy, however, many important science and technological challenges remain. Unlike nuclear fission, there are less waste products, no risk of a nuclear melt down, and fusion power provides more energy for a given weight of fuel than any fuel-consuming energy source currently in use. The aim of any controlled fusion process is to achieve "ignition," which occurs when enough fusion reactions take

place for the process to become self-sustaining, with fresh fuel then being added to continue it. Once ignition is achieved, there is net energy yield – about four times as much as with nuclear fission. According to the Massachusetts Institute of Technology, the amount of power produced increases with the square of the pressure, so doubling the pressure leads to a fourfold increase in energy production.

Fusion energy is nascent technology. Multiple reports have stated that commercially available nuclear fusion technology may be decades away. Determining the potential of fusion energy as a meaningful source of electricity requires a leap ahead of the current stage of research and demonstration, to consider cost and scale. At this stage, cost is astronomical and scale is tiny. Recent technological breakthroughs have also spurred interest in nuclear fusion development. The team at the world's most powerful laser fusion facility, the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory's, conducted the first controlled fusion experiment in history to reach the ignition milestone, meaning it achieved a net energy gain, producing more energy from fusion than the laser energy used to drive it. Using its 192 laser beams, NIF is able to deliver more than 60 times the energy of any previous laser system to its target.

California collaborative. In the hopes of advancing the state's efforts, the University of California's Office of the President established the Pacific CREST Fusion initiative and the concept of a Pacific CREST Fusion special purpose entity which was approved at the January 22, 2025 meeting of the Board of Regents of the University of California. The vision is to have the Pacific CREST Fusion organization be a University of California led not-for-profit organization to advance fusion energy in California through a public-private partnership. The Pacific CREST Fusion initiative is intended to build off the existing laboratories, research capabilities, and private companies to advance nuclear fusion energy. In addition to the Lawrence Livermore National Laboratory, these include other research and development facilities in the state, specifically: the DIII-D National Fusion Facility in San Diego (a General Atomics facility), Lawrence Berkeley National Laboratory, Sandia National Laboratories, and the SLAC National Accelerator Laboratory at Stanford University, as well as, the world-class researchers at the state's universities, including at several of the University of California campuses.

Federal funding opportunities. Under the Biden-Harris administration, the federal government announced and pursued efforts to advance fusion energy, including the U.S. Department of Energy's (US DOE) funding and initiatives to support Bold

Decadal Vision for Commercial Fusion Energy. The Pacific CREST initiative is largely positioning for potential US DOE funding via the Bold Decadal Vision for Commercial Fusion Energy, as well as, public-private collaboration to advance fusion energy research, development, deployment, and demonstration given the growing need for zero-carbon energy resources. However, early actions by the new federal administration, including the plethora of executive orders, federal employee layoffs, and other actions by the Trump administration, have created some uncertainty about the US DOE's continued efforts to advance nuclear fusion energy research and development. This in spite of nuclear energy likely viewed more favorable by the Trump administration compared to other zero-carbon energy resources, namely solar and wind.

Related/Prior Legislation

SB 80 (Caballero) of the current legislative session creates the Fusion Research and Development Innovation Hub Program within the CEC to accelerate the development and growth of fusion energy with the goal of delivering the world's first fusion energy pilot plant in the state in the 2040s. The bill is pending in the Assembly Appropriations Committee.

SB 86 (McNerney) of the current legislative session, authorizes the California Alternative Energy and Advanced Transportation Financing Authority to provide financial assistance, in the form of exclusions from sales and use tax, to electrical generation facilities using nuclear fusion technology. The bill is pending before the Assembly Revenue and Taxation Committee.

AB 1172 (Calderon, Chapter 360, Statutes 2023) required the CEC as part of its 2025 IEPR to include an assessment of the potential for fusion energy to contribute to California's power supply.

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

SUPPORT: (Verified 8/15/25)

General Atomics (Source)
City of Livermore
Cleantech San Diego
Innovation Tri-Valley Leadership Group
Kyoto Fusioneering America
San Diego Regional Chamber of Commerce
San Diego Regional Economic Development Corporation

San Diego State University-Research & Innovation
Stanford University's Extreme Environment Microsystems Lab & nano@stanford

OPPOSITION: (Verified 8/15/25)

None received

ARGUMENTS IN SUPPORT: General Atomics states:

> … SCR 25 recognizes the significant contributions of public and private sector fusion organizations within California for advancing fusion energy research and development, celebrates recent scientific breakthroughs at public research facilities and the important role of California's growing private fusion industry, and recognizes the vast potential of fusion energy for addressing key climate and national security goals. The resolution further commends the University of California's Office of the President (UCOP) for its leadership in establishing the Pacific CREST Fusion initiative and calls for siting a first-of-a-kind fusion pilot plant in California by the 2040s.

ASSEMBLY FLOOR: 74-0, 7/3/25
AYES: Addis, Aguiar-Curry, Ahrens, Alanis, Alvarez, Ávila Farías, Bains, Bauer-Kahan, Bennett, Berman, Boerner, Bonta, Bryan, Calderon, Caloza, Carrillo, Castillo, Connolly, Davies, DeMaio, Dixon, Elhawary, Ellis, Fong, Gabriel, Gallagher, Garcia, Gipson, Jeff Gonzalez, Mark González, Hadwick, Haney, Harabedian, Hart, Hoover, Irwin, Jackson, Kalra, Krell, Lackey, Lowenthal, Macedo, McKinnor, Muratsuchi, Nguyen, Ortega, Pacheco, Papan, Patel, Patterson, Pellerin, Petrie-Norris, Ramos, Ransom, Celeste Rodriguez, Michelle Rodriguez, Rogers, Blanca Rubio, Sanchez, Schiavo, Schultz, Sharp-Collins, Solache, Soria, Stefani, Ta, Tangipa, Valencia, Wallis, Ward, Wicks, Wilson, Zbur, Rivas
NO VOTE RECORDED: Arambula, Chen, Flora, Lee, Quirk-Silva

Prepared by: Nidia Bautista / E., U. & C. / (916) 651-4107
8/15/25 16:03:43

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