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25-EPIC-01 Application Submission- Advanced Combustion Technologies, inc

Additional submitted attachment is included below.

CALIFORNIA ENERGY COMMISSION

CALIFORNIA NATURAL RESOURCES AGENCY

Electric Program Investment Charge 2026–2030 (EPIC 5) Research Concept Proposal Form

The California Energy Commission (CEC) is currently soliciting research concept ideas and other input for the Electric Program Investment Charge 2026–2030 (EPIC 5) Investment Plan. For those who would like to submit an idea for consideration, please complete this form and submit it to the CEC by **August 8, 2025**. More information about EPIC 5 is available below.

To submit the form, please visit the e-commenting link: https://efiling.energy.ca.gov/EComment/ECommentSelectProceeding.aspx and select the Docket **25-EPIC-01**. Enter your contact information and then use the "choose file" button at the bottom of the page to upload and submit the completed form. Thank you in advance for your input.

1. Please provide the name, email, and phone number of the best person to contact should the CEC have additional questions regarding the research concept:

   Chaslav Radovich, chas@ACThydrogen.com, 714-323-1110

2. Please provide the name of the contact person's organization or affiliation:

   President/CEO, Advanced Combustion Technologies, Inc.

3. Please provide a brief description of the proposed concept that you would like the CEC to consider as part of the EPIC 5 Investment Plan. What is the purpose of the concept, and what would it seek to do? Why are EPIC funds needed to support the concept?

   A novel, hybrid, plasma-assisted electrolysis, green hydrogen production system that produces hydrogen with a significant decrease in the power consumption that is needed to produce hydrogen. The system's initial testing has shown that the unit produces hydrogen gas significantly below the Gibbs Free Energy consumption of 39.4 kw/kg of hydrogen. The purpose of the concept is to move the technology into commercialization to supply green hydrogen to the power generation sector at a cost that is competitive with all current fossil fuels. This

technology is currently at TRL 5 in testing at the University of California Irvine, Samueli School of Engineering. Once this testing is completed, August 2025, the information gained, and the lessons learned from this testing will be incorporated into the current design to produce a next generation hydrogen production unit (HPU) to be installed at an operational Cogeneration facility located in Oceanside California.

We are seeking EPCI funds to help offset the costs associated with the implementation of this pilot plant project and to incorporate the physical changes into the HPU to create a TRL Level 6/7 pilot plant unit for the installation of the system at the Oceanside plant. Our Company, Advanced Combustion Technologies, Inc. in coordination with North American Energy Resources, Inc. (NAER Inc.) will build, install and operate the hydrogen production system at the Oceanside San Luis Rey Wastewater Treatment plant. This system will produce hydrogen that will be supplied to the currently installed reciprocating engine to augment the current fuel supply that consists of methane digester gas being supplied by the wastewater treatment plants anerobic digesters and a small amount of natural gas. The owner of the Cogeneration plant, California Power Partners, Inc., is currently beginning a three (3) year extension with the City of Oceanside to supply power and heat to the wastewater treatment plant. The San Diego County Air Pollution Control District has approved the pilot plant installation, as has the City of Oceanside. We have all contracts in place with the owner of the plant, California Power Partners and plan to have the unit installed and fully operational by the end of this year.

Providing support for this objective by the State will help to fulfill a portion of the state's mandates for clean energy, and the achievement of the State's Statutory Energy Goals. It will also provide a path to clean, green hydrogen for power generation with no Co2 emissions at a significantly lower price than any other green technology currently in the market place both now and it the future.

4. In accordance with Senate Bill 96[i], please describe how the proposed concept will "lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory energy goals." For example, what technical and/or market barriers or customer pain points would the proposed concept address that would lead to increased adoption of clean energy technology or innovation? Where possible, please provide specific cost and performance targets that need to be met for increased industry and consumer acceptance. For scientific

analysis and tools, provide more information on what data and information gaps the proposed concept would help fill, and which specific parties or end users would benefit from the results, and for what purpose(s)?

Our Company's technology can provide fuel that will be competitively priced with all current fossil fuel sources making the technology economically viable as a fuel source for large scale power generation. This technology has significantly surpassed all current hydrogen electrolysis technology in the marketplace, producing green hydrogen below unity for power consumption, at a cost that is commensurate or lower in cost than current petroleum-based fuels such as natural gas, methane, or propane. The fuel is also carbon free, thus also fulfilling the Mandates for Zero-Carbon Energy Production.

Because our fuel production method is positioned at the top of the Hydrogen Industry Hierarchy, the economic benefit of our technology's implementation reaches literally everyone in the state through increased electricity availability and lower electricity cost.

Further, our fuel can be utilized at existing gas fired power plants by providing green hydrogen or as "syn-gas" utilizing a small amount of the fuel stocks, aiding in the provision of a smooth and seamless, disruption free transition at the Power Industry Infrastructure level, lowering fuel costs and reducing carbon emissions.

The technology can be miniaturized; due to its high hydrogen output and its low electrical input this allows the technology to be utilized in the automotive industry by eliminating the need for the highly compressed hydrogen by producing hydrogen on demand utilizing demineralized water as the feed stock to produce the hydrogen. The unit will produce its needed electrical power from some of the hydrogen that is being produced. The balance of the hydrogen can be utilized by a fuel cell which in turn will recover the demineralized water or can be combusted in a hydrogen engine. The hydrogen fuel produced by the ACT unit when compared in price to gasoline would be equivalent to $.50 gallon.

5. Please describe the anticipated outcomes if this research concept is successful, either fully or partially. For example, to what extent would the research reduce technology or ratepayer costs and/or increase

performance to improve the overall value proposition of the technology? What is the potential of the innovation at scale? How will the innovation lead to ratepayer benefits in alignment with EPIC's guiding principles to improve safety,[ii] reliability,[iii] affordability,[iv] environmental sustainability,[v] and equity?[vi]

ACT technology meets all of the above EPIC's guiding principles as explained below.

The ultimate goal for the technology is to produce green hydrogen at a cost that of around $2.50 to $4.00 per MMBTU. This equates to an equivalent fuel cost for power generation of $.016 - $.025 kW/hr and an equivalent cost of gasoline at $.50 per gallon. This fuel will be zero (0) Co2 emissions, is 100% renewable and has a fixed cost that will not be subject to commodity fluctuations in pricing of fossil fuels.

The ACT technology has several working prototypes for the past three years that have been used to refine the design and prepare and move the technology towards commercialization. The major remaining step is the installation of a pilot plant application that will be providing hydrogen fuel in a real world application for power generation sector.

With any power generating facility, that can provide firm power, the major cost and risk resides with the cost of the fuel, since it is a commodity. With the ACT hydrogen system, the fuel price is fixed for the life of a project at a price, that when compared to other fuel sources and their volatility in the commodity market, will be extremely low allowing power generation plants to provide zero Co2 emissions at a low fixed price, which will equate the overall lowering on energy prices to the rate payer.

Since hydrogen fuel is produced on site and utilized as it is made, this lowers transportation costs, lower Co2 emissions and a much safer fuel source since it is on demand fuel. In reality, the fuel storage at a hydrogen fueled power generation plant is pure water which is the feed stock.

The design of the system is focused on the number of Hydrogen Production Units (HPU's) to match the amount of fuel that is required. The more fuel that is required the number of HPU's increases. Since the footprint of an HPU unit is very small, approximately 40 sq ft, for a unit that can produce between 10-20 kg/hr of hydrogen and the fact the units can be stacked the footprint even for a major power generation

facility would not be prohibitive. With this approach, this gives a power generation facility built in redundancy for its fuel supply, if an HPU unit were to be taken offline only a small fraction of the fuel supply would be impacted. With the built in redundancy a standby unit would automatically come online to replace the down unit.

The system will be installed into a cogeneration facility located in Oceanside California to augment the fuel supply of an existing 750 KW reciprocating engine facility to replace the natural gas fuel supply that is currently being utilized to supply needed fuel to the engine that is currently fueled by anerobic digester gas and natural gas. It represents a rapid and extremely valuable resource for the State in terms of accelerating the time frame for deploying, solutions for power production with real, measurable, value, RIGHT NOW, as opposed to concepts that may or may not pan out in the future.

6. Describe what quantitative or qualitative metrics or indicators would be used to evaluate the impacts of the proposed research concept.

   Data regarding the efficacy of our Technology has been generated by an organization that is well known in the field of power plant fuel systems. That report is available upon request. Further, we are engaged with the DOE's Hydrogen Fuel Cell Research Facility at the University of California at Irvine, in the final phase of testing of our Technology, which is slated for being completed in August of 2025.

7. Please provide references to any information provided in the form that supports the research concept's merits. This can include references to cost targets, technical potential, market barriers, equity benefits, etc.

   As mentioned above our Company is currently working with NAER Inc. that is in the process of installing a hydrogen production pilot plant, utilizing our technology, at the San Luis Rey Water Treatment Facility in Oceanside, California. The engineering and design are complete the major equipment is under contract. By the addition of the hydrogen production at the facility it will allow the Cogeneration Unit to run at full load of 725 KW, which will significantly lower the City's electrical costs for the treatment plant. The City will also have additional savings in that it will no longer have to provide natural gas to the Cogeneration facility to make up for the shortfall in the digester gas.

8. The EPIC 5 Investment Plan must support at least one of five Strategic Goals:[vii]
    a. Transportation Electrification
    b. Distributed Energy Resource Integration
    c. Building De-carbonization
    d. Achieving 100 Percent Net-Zero Carbon Emissions and the Coordinated Role of Gas
    e. Climate Adaptation

    Please describe in as much detail as possible how your proposed concept would support these goals.

    Advanced Combustion Technologies, Inc.'s Water Hydrolyzer Fuel Cell is an industrial-scale fuel production system that supports the following EPIC 5 Strategic goals:

    a. Transportation Electrification

        ACT's technology footprint is minimal so power can be produced on-site and on-demand for use in powering Municipal Public Service Transportation and Utility alleviating the impact of this resource requirement on the state's energy grid.

    b. Distributed Energy Resource Integration

        Working with NAER Inc., who has over 38 years of experience in the power generation sector has engineered and designed standard distributed generation packages that range from 500 kW to 49 Mw. These systems are pre-designed modular systems, that easy to install in a plug and play type of design that include the ACT's hydrogen fuel technology as the fuel source for these distributed generation systems.

        As long as water is available any site can be completely independent from the grid, it will have zero (0) Co2 / Co emissions. These systems reside on a small footprint for example a 5 MW distributed generation system would only require approximately 7,500 sqft of space for the installation. These distributed generation systems can easily provide an enormous increase in the amount power available through the Energy Grid without costly and long-turnaround deployment of Power Plant Construction. As the technology is modularly

scalable, it can be added to existing power plants currently in operation with no disruption.

NAER Inc is also working with XLR8 America https://xlr8america.com/ to provide distributed generation systems for remote EV charging locations that will utilize the ACT technology as it's fuel source bringing EV charging to under serviced remote locations.

c. Building De-carbonization

As ACT's Technology produces "Green" hydrogen for use as fuel on an industrial scale, replacing Carbon heavy fuels currently in use at Fossil fueled fired Power Plants that drive Industry in the State gently over time through syn-gassing and using a gradual phase-out approach to existing fuels, as it suits the conditions of the facility on a case by case basis or abruptly as is the best approach for the installation of a new power plant rather than for example, a "retro-fit" of an existing facility.

d. Achieving 100 Percent Net-Zero Carbon Emissions and the Coordinated Role of Gas

As outlined above, ACT's Technology is in and of itself 100 percent Net-Zero Carbon Emission. The salient point about the technology in this context is that it is very non-disruptive in the way that it interfaces with existing Carbon Heavy Fuels currently in use at power plant facilities.

e. Climate Adaptation

As the demand for power soars in the current economy today, ACT's Technology provides a sound, 100% Carbon Neutral solution for power production, which will contribute dramatically and positively towards the world's transition away from practices that might contribute to "Climate Change".

About EPIC

The CEC is one of four EPIC administrators, funding research, development, and demonstrations of clean energy technologies and approaches that will benefit electricity ratepayers of California's three largest investor-owned electric utilities.

EPIC is funded by California utility customers under the auspices of the California Public Utilities Commission.

To learn more about EPIC, visit: https://www.energy.ca.gov/programs-and-topics/programs/electric-program-investment-charge-epic-program

EPIC 5 documents and event notices will be posted to: https://www.energy.ca.gov/proceeding/electric-program-investment-charge-2026-2030-investment-plan-epic-5

Subscribe to the EPIC mailing list to stay informed about future opportunities to inform the development of EPIC 5: https://public.govdelivery.com/accounts/CNRA/signup/31897

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i See section (a) (1) of Public Resources Code 25711.5 at: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC&sectionNum=25711.5.

ii EPIC innovations should improve the safety of operation of California's electric system in the face of climate change, wildfire, and emerging challenges.

iii EPIC innovations should increase the reliability of California's electric system while continuing to decarbonize California's electric power supply.

iv EPIC innovations should fund electric sector technologies and approaches that lower California electric rates and ratepayer costs and help enable the equitable adoption of clean energy technologies.

v EPIC innovations should continue to reduce greenhouse house gas emissions, criteria pollutant emissions, and the overall environmental impacts of California's electric system, including land and water use.

vi EPIC innovations should increasingly support, benefit, and engage disadvantaged vulnerable California communities (DVC). (D.20-08-046, Ordering Paragraph 1.) DVCs consist of communities in the 25 percent highest scoring census tracts according to the most recent version of the California Communities Environmental Health Screening Tool (CalEnviroScreen), as well as all California tribal lands, census tracts with median household incomes less than 60 percent of state median income, and census tracts that score in the highest 5 percent of Pollution Burden within CalEnviroScreen, but do not receive an overall CalEnviroScreen score due to unreliable public health and socioeconomic data.

vii In 2024 the CPUC adopted five Strategic Goals to guide development of the EPIC 5 Investment Plan. A description of the goals can be seen in Appendix A of CPUC Decision 24-03-007 available at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M527/K228/527228647.PDF