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EPIC 5 Research Concept Proposal Form - Integral Consulting 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:

   Grace Chang, gchang@integral-corp.com, 831-576-281

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

   Integral Consulting 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?

   CStories: A digital stakeholder and outreach engagement tool to deconflict potential conflicts over resources and societal competition between energy industries. Regardless of technology – whether it is for transportation electrification, distributed energy resource integration, building decarbonization, or climate adaptation – stakeholder engagement will be necessary for effective and efficient technology adaptation. CStories combines traditional stakeholder engagement methods with design charrettes to create user-centric digital tools to benefit sociocultural, ecological and environmental, regulatory, and technological challenges, all of

which will contribute to economic benefits to energy industries while respecting environmental justice issues.

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)?

   Abundant data describing spatial footprints of high-energy areas and potentially conflicting human uses or sensitive habitats are available in disparate databases. However, sensibly combining these disparate datasets into specific recommendations for siting and managing energy projects such as those required for transportation electrification, building decarbonization, or grid resiliency remains elusive. This problem is exacerbated by competing values held by a diverse set of stakeholders, including disadvantaged communities that may lack technical expertise. The motivating force behind the CStories concept is to give *all* stakeholders a data-driven voice in the energy transition process. By equipping stakeholders with online tools to perform comprehensive planning and technology adoption, multiple concerns can be addressed while communicating interests in an informed conversation that games communities, developers, and regulators toward consensus and mutual understanding.

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]

   A data-driven, multi-use decision-support dashboard for energy transition technologies, developed in close collaboration with stakeholders, will

address sociocultural, ecological and environmental, regulatory, and technological challenges, all of which will contribute economic benefits to technology adoption. Spatial multi-use (land and ocean) and environmental justice concerns are expanding; therefore, conflicts over earth's resources are projected to increase. For example, DNV (2022) reports intensification of spatial competition between marine industries and predicts that by 2050, offshore wind will grow to account for 50% of ocean capital expenditure and provide nearly as much energy as offshore oil. Further, marine aquaculture output will be comparable to that of reported wild catch. A nine-fold increase in demand for ocean space for aquaculture and energy production is forecasted. Pressures on the shipping industry and its resulting congestion at sea and in ports will continue to increase. Careful and collaborative stakeholder engagement and resource management will be crucial. The proposed dashboard will contribute to effective and equitable processes for many energy sectors. Below is a summary of anticipated benefits:

Sociocultural: Consideration of socioeconomics of communities including cultural ecosystem services (i.e., non-material benefits such as spiritual enrichment and aesthetics), subsistence fishing, job loss/creation, local tax structures, real estate values, and tourism opportunities; preservation of cultural resources; protecting interests of commercial and recreational fishers and farmers (food supply); increasing energy literacy and environmental stewardship; and maintaining visual appeal.

Ecological and Environmental: Awareness and protection of sensitive habitat and wildlife, e.g., essential habitat, migration routes, endangered species, biologically important areas, sensitive and protected areas, Audubon important bird areas, artificial reefs, etc.

Regulations and Policy: EJ and expansion of public participation and interests in energy planning, siting, and technology development; and increased efficiency in environmental assessments. Benefits to federal and state permitting agencies, and applicable to other traditional and emerging sectors (e.g., transportation, security, recreation, aquaculture, and desalination).

Technological: Energy siting and technology development to optimize resources and minimize conflicts; reduction in the time required for permitting projects; assessment of meteorological and environmental conditions that may result in risks to deployed technology (e.g., hurricane forces, extreme waves); reductions to the levelized cost of energy (LCOE). Benefits to technology developers and operators of energy facilities, as well as for other offshore activities, developers and operators of aquaculture,

desalination, and other blue economy facilities, military operations, and homeland security.

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

   Systematic pre- and post- tool development surveying will inform the process and quantify success in evaluating understanding and empowering communities. Measures of success will compare pre-CStories survey answers with post-CStories answers to the same set of questions. Success will be measured by evaluating the average difference between pre- and post-dashboard survey answers that demonstrate improvement in community knowledge and increased sense of having a voice in the energy planning and technology development process.

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.

   CStories was originally developed as part of a Phase I Small Business Innovation Research project to Integral Consulting (DE-SC0022609). The final report can be found here: https://www.osti.gov/biblio/1967926. Results are also published in the European Wave and Tidal Energy Conference (EWTEC) proceedings (see https://ewtec.org/wp-content/uploads/2023/09/Programme-EWTEC23-3-7-September-2023_v46.pdf).

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 Decarbonization
   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.

   Stakeholder engagement will be necessary for effective and efficient technology adaptation regardless of technology, whether it is for transportation electrification, distributed energy resource integration,

building decarbonization, achieving 100% net-zero carbon emissions, or climate adaptation. Recent studies emphasize the need to disengage from traditional decision-making processes that may be driven by economic interests. Rather, planning should be promoted through public processes that allocate human activities across multiple spatial and temporal dimensions to meet social, economic, and ecological objectives (e.g., McKinley et al., 2019; Schupp et al., 2019; Hoerterer et al., 2020; Pennino et al., 2021; von Thenen et al., 2021). von Thenen et al. (2021) emphasize the need for careful consideration of spatial aspects to understand vulnerabilities across different economic and social systems. Pennino et al. (2021) stress the importance of supporting EJ and consideration of disadvantaged community interests. The term "blue justice" is discussed by Bennett et al. (2019) in the context of necessitating exploration of Blue Economy effects on indigenous communities' historical marine uses and rights, including access rights to food and livelihoods, equity in the distribution of economic benefits, and importantly, inclusivity in marine spatial planning and decision-making. Implementation of adaptive governance with continuous integration of new data as environmental dynamics and social interactions change over multiple dimensions is suggested for equitable decision-making (von Thenen et al., 2021; Pennino et al., 2021). Scientific data access, effective dissemination, and integration with the decision-making processes would strongly benefit productive stakeholder communications. However, it is crucial for these data to be presented in a manner in which non-technical audiences can interpret status and trends (Spector et al., 2021).

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