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inGeniti - EPIC 5 Form Research Concept Filled - 08Aug2025

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:

Name: Bhartendu Sinha
Title: Founder & CEO
Email: bhartendu@inGeniti.com
Phone: +1-949-939-6573

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

inGeniti, Inc. (Nevada C-Corp, HQ in Irvine, CA)

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?

Concept: universal electric appliance access, monitoring, control & optimization is a capability that the energy sector has long sought but been unable to realize, till now.

Easy Smart, Easy Energy Efficiency, Easy Electrification & Easy Demand Response are universal and open-API grid-edge solutions built on inGeniti's patent-pending

Optima hardware and cloud/app/portal software. A single plug-and-play module (Safe-4/8/12, Vault, Shelter-50) transforms any legacy or smart load, storage or generator (110-480 Volt, 1-3 Ph, any Amps) into a secure, controllable DER without panel upgrades or intrusive access to appliance hardware / APIs. Utilities gain fleet-scale visibility; customers gain appliance-level protection, monitoring and AI-based optimization. EPIC funding will complete UL certifications, advanced firmware and applications, and three California utility demonstrations to validate: (i) Easy Smart: universal capability to access, monitor and control any loads, storages & generators anywhere; (ii) Easy Energy Efficiency: ~25% energy saving on heating, cooling, and pumping loads without causing user discomfort; (iii) Easy Electrification: simple, low-cost alternative to service-point upgrades and smart panel installations; (iv) Easy Demand Response: 10x faster/cheaper/simpler Peak Load reduction solutions vs. capacity upgrades.

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)?

Barrier 1 – Fragmented device mgmt: the world has ~10 billion mid-high-power devices – mostly lacking monitoring and control methods. Target: a single app for orchestration of ≥90% of connected load types (100% once physical actuators are implemented as per the roadmap, for mechanical button/switch control).

Barrier 2 – High energy efficiency retrofit cost: replacing legacy HVAC/pumps costs $2-7k; Easy Energy Efficiency allows ~25% energy savings without user discomfort (customizable to any %) via proven firmware algorithms – at an affordable cost of <$300 per appliance, with easy self-installation, and no with network dependence.

Barrier 3 – Costly service capacity: Residential/commercial upgrades cost $20-30k per site over 2-3 years; Smart Panel installations cost $8-10K with 1 day downtime. Target: Optima will limit point-of-service and/or circuit current for ~$1k, reducing the average upgrade cost ≥90% and install time to <1 hour, with a self-installation.

Barrier 4 – Ineffective Demand Response: user inconvenience and limited reach. Optima's five-minute telemetry and autonomous cycling & scheduling deliver highly controllable capacity per site without discomfort to consumers, with easy option for consumer's temporary/permanent opt-out.

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]

- Bill reduction: ~25% reduction without user discomfort (customizable to any %) in average heating, cooling & pumping energy-bills for customers; pay-back in 6-12 months for the paying utility or customers.
- Equity: affordable energy efficiency and electrification for low-income customers & small manufacturers without costly panel work, service point upgrades, or upgrades to smart appliances.
- Environmental: based on energy efficiency, target 0.5–1 t CO_2 avoided per residential customer site annually; target >10 t CO_2 per MW of peak load reduced in commercial sites and/or factories.
- Grid balancing: achieve 1 MW peak load reduction for < $0.5M capex spend over 3-6 months (vs. $2-3M conventional capex spend requirement over a three-year grid upgrade).

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

- Number of Optima devices installed, types of loads connected.
- Installed cost per controllable kW versus baseline alternative cost ($/kW).
- Device and site-level energy savings (kWh, $).
- Aggregated demand-response yield (kW, kWh).
- GHG reduction (t CO_2e).
- Customer satisfaction rating (1-5) and opt-out rate (%).

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.

(A) Cost and upgrade comparison table: Peninsula Clean Energy - Case Study of Whole-Home Electrification at Nine Low-Income Homes In San Mateo County – Table in 5.1
(B) Energy Efficiency savings potential: inGeniti - Investor Deck - August 2025 – Pages 2 & 10
(C) Device Universality and TAM: inGeniti - Smart Grid Solutions - BRIEF - Pages 4 and 6-8

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.

- Transportation Electrification: Enables low-cost, simple EV-charger additions without any requirement for service upgrades or smart panels installation.
- DER Integration: Standards-based open-API Optima architecture enables integration and orchestrates of not just any load, but also any inverter for solar/storage and any mechanical buttons/switches/levers via actuators – allowing for low-cost Microgrids with full integration of DERs. Extension to inverters and/or actuators may or may not be within scope of first project – the decision will be based on CEC interest, funding and timeline available.
- Building Decarbonization: Retrofit-free Energy Efficiency cuts ~25% energy savings without user discomfort (customizable to any %) for any heating, cooling & pumping loads.
- Net-Zero Carbon: Granular per-appliance data enables approximate carbon-emission reporting, carbon-aware scheduling and carbon-credit aggregation.
- Climate Adaptation: Climate-aware Time of Use Scheduling or Cycling of each individual load (with opt-outs for critical loads or on requested days) enables climate-adaptive load management, during wildfire PSPS, heat events, etc.

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