

# CalTestBed

## Application Manual

March 2020

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# CalTestBed

## Application Manual



## Introduction

The California Test Bed Initiative—CalTestBed—is a laboratory voucher and commercialization development program for innovators and entrepreneurs working to bring early to mid-stage clean energy concepts to market. It is made possible by an \$11 million grant from the California Energy Commission.

CalTestBed accelerates entrepreneurs by awarding vouchers worth up to \$300,000 to test and validate technologies at one of nearly 30 testbeds across the UC system and Lawrence Berkeley National Laboratory. CalTestBed recognizes entrepreneurs' struggles in making the leap from technology validation to commercialization and has formed a partnership with the UC Office of the President and University of California system to assist clean energy entrepreneurs in validating their technology at world-class testing facilities.



UNIVERSITY OF CALIFORNIA Office of the President



Lawrence Berkeley National Laboratory

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## Important Application Dates

The CalTestBed program will award up to 70 vouchers to eligible applications in three solicitations.

### Relevant Application Dates

<b>Workshops and Webinars</b>	CalTestBed will host a webinar to help answer any questions about the application process. Additionally, recordings, questions and comments, and presentations will be posted on the <a href="http://CalTestBed.com">CalTestBed.com</a> website.	At least one week before the solicitation opens.
<b>Application Window Open</b>	The eligibility application will be available on the <a href="http://CalTestBed.com">CalTestBed.com</a> website.	March 27, 2020 – April 8, 2020
<b>Application Due</b>	Deadline for all applications. Mail-in applications must be postmarked by this date.	Midnight on April 8, 2020
<b>Review Process</b>	Approved applicants are screened internally for eligibility and reviewed by the CEC. Once approved, applicants are notified and project summaries are sent to TestBeds to confirm laboratory capability.	April 9, 2020 – July 17, 2020
<b>Laboratory Consultations</b>	Qualifying applicants will participate in a 3-hour consultation with the laboratory Principle Investigator, campus representative, and a neutral subject matter expert to create a Statement of Work including scope, schedule, and budget.	Starting week of July 20, 2020
<b>Testing Begins</b>	Voucher recipients begin testing at laboratory testbeds.	Dependent on scheduling.

### Announcements

Prospective applicants should confirm dates and deadlines at [CalTestBed.com](http://CalTestBed.com). Up-to-date announcements can be accessed at the CalTestBed website.

## CalTestBed Benefits

As a CalTestBed Voucher Recipient, you will gain access to a number of benefits that will help you refine your prototype and advance your product toward commercialization. These benefits include:

- A **voucher worth between \$10,000 to \$300,000**, redeemable at one of the participating testbeds to cover the cost of testing and validating your technology.
- A **powerful network and cumulative resources** of unified DER testbeds across the UC and LBNL systems.
- Opportunities to present your product to **targeted customer groups** and receive feedback on the commercial value of your technology.
- Access to experienced clean energy entrepreneurs, industry experts, prospective partners, and utilities at an **annual symposium**.
- **Additional funding opportunities** through the Empower Innovation Network platform.
- A **community and ecosystem** of fellow CalTestBed voucher recipients.



Awards Valued Between  
**\$10,000 - \$300,000**

## What Types of Innovation Will CalTestBed Fund?

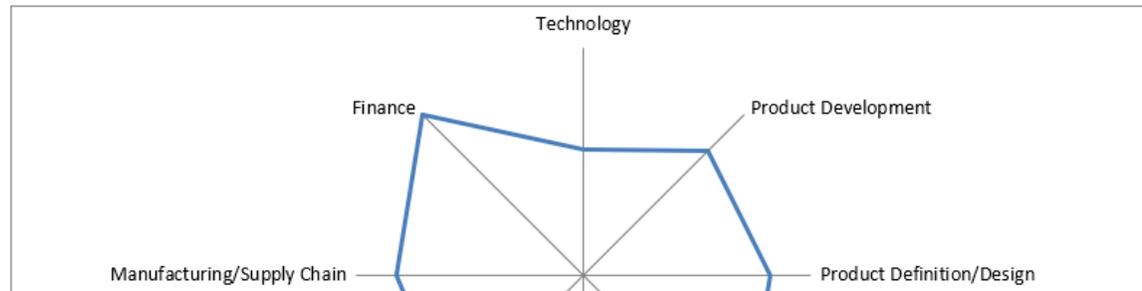
CalTestBed is focused on mid to later-stage technologies that add value to the electrical grid but lack access to private-sector capital to support testing and validation. More specifically, CalTestBed seeks hardware or integrated innovations that fall between Technology Readiness Levels (TRL) 5 - 7 that would greatly benefit from laboratory-level testing.

- **TRL 5:** Laboratory-scale, similar system validation in relevant environment; Basic technological components are integrated so that they system configuration is similar to (matches) the final application in almost all respects.
- **TRL 6:** Engineering-scale models or prototypes are tested in a relevant environment. The major difference between TRL 5 and 6 is the step up from laboratory-scale to engineering-scale and the determination of scaling factors that will enable design of the operating system.
- **TRL 7:** Full scale, similar (prototypical) system demonstrated in relevant environment. This represents a major step up from TRL 6, requiring demonstration of an actual system prototype in a relevant environment.

Technology Readiness Level:

Commercialization Readiness Level:

Category	Answer
Technology	Preliminary testing of technology components in a laboratory environment
Product Development	Actual product/system has been produced under expected conditions and environment
Product Definition/Design	Comprehensive customer value proposition and understanding of product/system design



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## What Types of Innovation Will CalTestBed Fund?

CalTestBed will fund hardware and integrated solutions. A qualifying integrated solution must feature a piece of hardware that works in conjunction with a software program to deliver the technology's benefits. An existing prototype ready for laboratory-grade testing is required.

Innovations selected for a voucher must benefit California's electricity grid through increasing reliability, lowering costs, or improving safety.

***Standalone software solutions that complement existing energy infrastructure are not eligible.***



## What Types of Innovation Will CalTestBed Fund?

All CalTestBed applicants must define their innovation within the following ten technology types:

Building Technologies	Energy Efficiency	Energy Storage	Grid Technologies	Industrial & Agricultural Innovation	Internet of Things	Material-Based	Renewable Generation	Transportation	Water Technologies
Hardware or integrated solutions that support energy efficiency in buildings including occupancy-based controls and building management system optimization, after treatment coatings for fenestration, insulation, and building envelopes.	Hardware or integrated solutions that demonstrate energy efficiency including appliances, solid-state lighting, non-vapor compression cooling, advanced electric heat pumps that use refrigerants with low or zero GWP.	Hardware or integrated enabling technologies for lithium-metal and lithium-sulfur batteries, Flow batteries, Ultra- or super-capacitors, Non-lithium battery chemistries, enabling technologies for green hydrogen for long duration, energy storage (including technologies such as electrolyzers).	Hardware or integrated solutions that modernize the electric grid, through enabling more clean energy and energy efficiency such as demand response, distributed energy resource management systems, electric vehicle to grid integration, etc.	Hardware or integrated solutions that work in the industrial and/or agricultural context to enable clean energy and/or energy efficiency in industrial and agricultural processes.	Hardware or integrated solutions , that are used to enable clean energy or energy efficiency through the automatic acquisition, storage manipulation, management, movement, control, display, switching, interchange, transmission or reception of data.	Hardware or integrated solutions that utilize novel materials to enable clean energy generation or greater energy efficiency.	Hardware or integrated renewable energy technologies that advance electricity, heat, and/or fuel from renewable sources including solar, wind, heat-exchange, and bioenergy technologies.	Hardware or integrated technologies that enable electric and alternative fuel vehicles, and related electric charging and alternative fueling infrastructure.	Hardware or integrated technologies that embrace forward-thinking applications and solutions that utilize waterflow for energy generation including hydro, wave, and tidal while advancing clean and safe water goals.

## Regional Innovation Clusters Local hubs for project development resources, including:

CalTestBed partners with Regional Innovation Clusters across the state as communication and channel partners to support clean energy entrepreneurs.

### LACI

**Los Angeles Cleantech Incubator (Energize California: Los Angeles Regional Innovation Cluster)**

LACI is located in the Cleantech Corridor. LACI offers research and development labs, prototype manufacturing workshops, office space, coaching, and mentoring, as well as access to potential investors and a growing network of cleantech experts. To learn more about the Los Angeles Regional Innovation Cluster, visit <http://laincubator.org/>.



**BlueTechValley (Water Energy and Technology Center: Central Valley Regional Innovation Cluster)**

The BlueTechValley Innovation Cluster is located in the heart of the San Joaquin Valley, the perfect proving ground for new water-efficiency and related technologies. Strong partnerships with a number of universities, incubators, grant developers, and acceleration programs enable BlueTechValley to provide a range of technology and business development services. To learn more about the Central Valley Regional Innovation Cluster, visit <http://bluetechvalley.org/>.

### Activate

**Activate (Activation: Bay Area Regional Innovation Cluster)**

Activate partners with funders and leading research institutions to support the Activate Fellowship, a new path for entrepreneurial scientists and engineers to transform their discoveries into world-changing technologies. To learn more about this Bay Area Regional Cluster, visit <http://www.activate.org/>.



**Cleantech San Diego (Southern California Regional Energy Innovation Network: San Diego Regional Innovation Cluster)**

Cleantech San Diego works directly with cleantech entrepreneurs to develop customized plans that include access to advisory support, technology commercialization services, and proof-of-concept and pilot testing. The San Diego Regional Innovation Cluster specializes in a range of energy technologies, including energy storage, smart grids, solar energy, and electric vehicles. To learn more about the San Diego Regional Innovation Cluster, visit <http://cleantechsandiego.org/san-diego-regional-energy-innovation-cluster/>.

## Access and Inclusion

California is recognized as a leader in progressive clean energy and climate policies, as well as in technology innovation. Many communities in the state, however, still lack access to clean energy resources. As California continues to promote clean energy and sustainable innovation, we must ensure that clean energy solutions address the interests and needs of the state's most underserved or disadvantaged populations. New Energy Nexus is committed to making equity a key component of the CalTestBed Initiative.

### Equity In

#### Attract a Diverse Pool of Applicants

CalTestBed has developed an outreach plan for maximizing access and inclusion based off the CalSEED program – which has successfully recruited entrepreneurs from every major region of California of varying socioeconomic backgrounds. Small and diverse-owned businesses are critical for California's transition to a clean energy economy. CalTestBed seeks to ensure that diverse and underrepresented communities – including disadvantaged, LGBTQ+, rural, and veteran communities – across California participate in the CalTestBed Initiative and become an integral part of the transition to an emerging green economy. To this end, the CalTestBed Initiative will build on the bold recruiting strategy developed for the CalSEED program to ensure that all socioeconomic ranges across California have the opportunity to accelerate their clean energy ideas.

### Equity Out

#### Encourage Clean Energy Solutions that Lead with Equity

The CalTestBed staff recognizes that disadvantaged and low-income communities in the state lack access to clean energy resources. This is largely due to the limited economic investments in these communities. Disadvantaged communities and low-income communities are in need of long-term job opportunities, innovative programs that reduce the cost of basic necessities, and clean energy investments that reduce these communities' disproportionate exposure to polluting energy infrastructure. The CalTestBed Initiative strives to address these issues by accelerating entrepreneurs' ability to rapidly test their products to discover innovative ways to bring equitable clean energy solutions to our most vulnerable populations.

### CalTestBed Encourages Projects That:

- Target air pollution reduction benefits to underserved and heavily polluted communities.
- Respond to a clean energy or sustainability need within underserved and low-income communities.
- Increase access to green technologies and resilient infrastructure within underserved and low-income communities.
- Include meaningful community engagement with underserved and low-income communities throughout the development of the project.

## Eligibility Criteria

CalTestBed is open to applicants working on innovations with existing prototypes – designed to provide benefit to California rate-payers. CalTestBed applicants must have a presence in the state when they apply. Proposed projects must fall between Technology Readiness Levels (TRL) 5-7 as defined by the U.S. Department of Energy. Additionally, the CEC has developed a TRL Calculator that will be integrated into the application process.

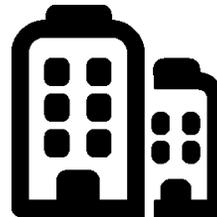
Additionally, your proposed innovation must meet some basic requirements. At a minimum, it should:

1. Align with EPIC goals
  - a) Reduce costs for California ratepayers
  - b) Increase grid reliability
  - c) Improve the safety of California's energy mix
2. Fall within TRL 5, TRL 6, or TRL 7
3. Qualify within a listed technology area as noted in the TestBed Directory

Those who can apply include:



**Individuals / Teams**  
Apply without an organizational affiliation.



**Businesses**  
Startups, small businesses, and large companies.



**Non-Profit Organizations**  
Those with official non-profit tax designations.

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### Process Overview

The CalTestBed program consists of six main components outlined on the following pages:



Apply Online



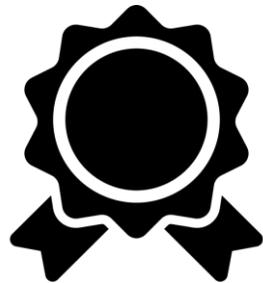
Eligibility and  
Technical Review



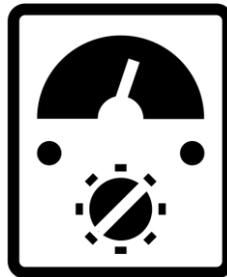
Lab Scoping  
Consultations



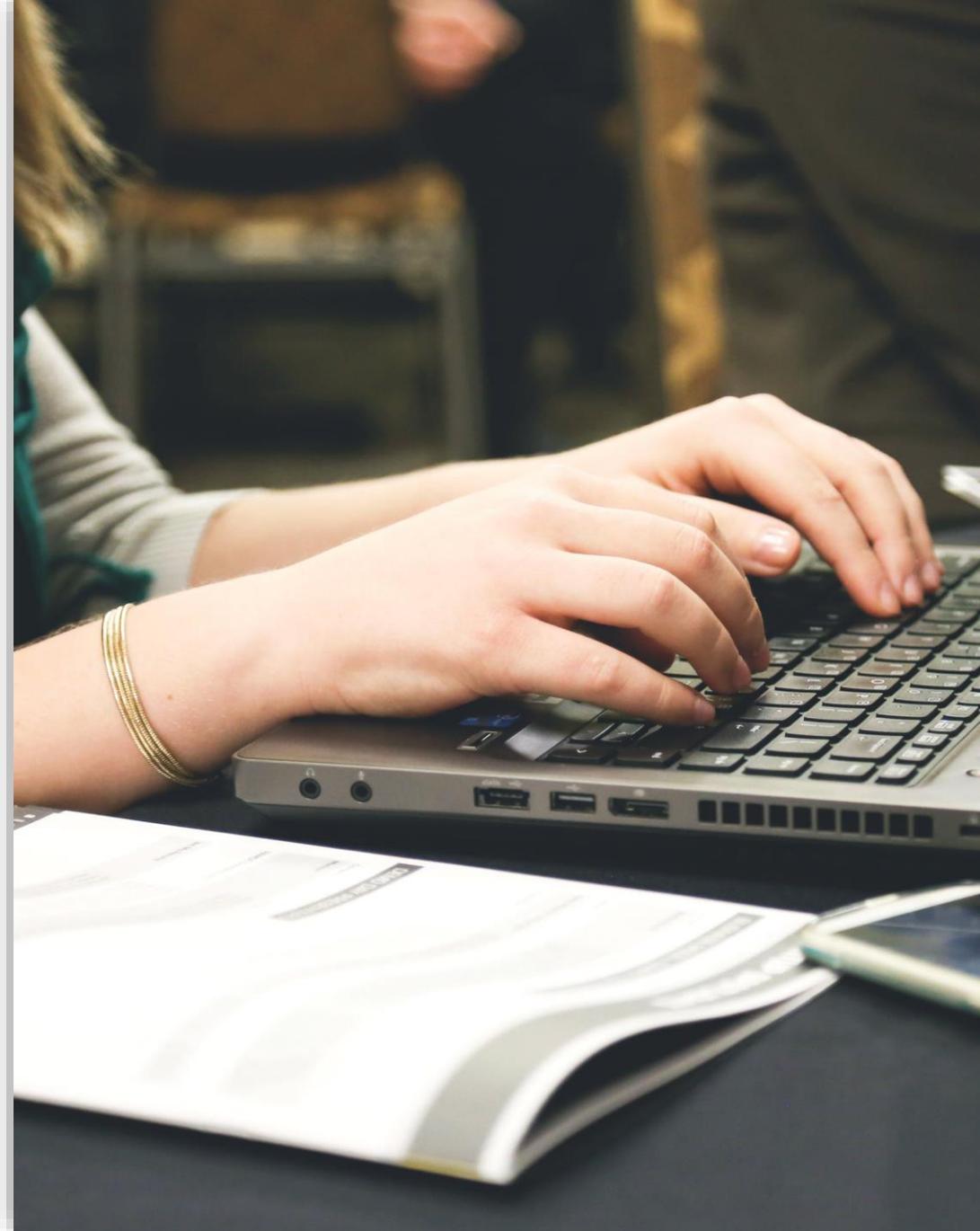
CEC Recommendation  
and Approval



Voucher  
Awarded



Testing  
Begins



## Application, Technical Review, CEC Review, & Scoring

Interested parties will apply directly on [www.CalTestBed.com](http://www.CalTestBed.com). Applicants will be required to complete both Part 1 and Part 2 sections of the application in whole to be considered.

**Part 1** of the application includes a set of initial eligibility questions to ensure that the project meets geographic, Technology Readiness Level (TRL), EPIC alignment, and technology type guidelines.

**Part 2** of the application will require long-form responses to four scoring categories: Innovation, Scalability, Feasibility, and Market Potential. Each of these responses are limited to 500 words. An explanation of these categories, critical questions needing to be addressed, and key points to be considered can be found in Appendix A. Reviewers from the CalTestBed Technical Review Committee (TRC) will score all applications against these criteria using the scoring rubric shown in Appendix B. Scores will be normalized, ranked, and the TRC will determine finalists that will be recommended to the CEC for approval. Once approved by the CEC applicants will move to the consultation phase.



**IMPORTANT! The application will also require that you select your top three choices from the participating testbed partners. You must familiarize yourself with these facilities and their capabilities using the CalTestBed Directory.**

## Laboratory Scoping Consultations

Participating testbed facilities will be sent individualized lists of finalists along with project descriptions to confirm yes/no technical capability to conduct tests. If any proposed tests are unable to be conducted at the first laboratory choice, the list will be sent to the applicant's second choice, and then the third, if necessary. If it is determined that the capabilities do not exist within the CalTestBed network, the application will be deemed ineligible.

If the testing capability is confirmed by the proposed laboratory, then a three-hour consultation will be scheduled between the applicant, the facility Principle Investigator, a campus representative, and an independent third-party subject matter expert through an online appointment system.

**The outcome of the consultation is to develop a realistic Statement of Work which includes project scope, schedule, and budget.**

## Voucher Award and Begin Work

The final list of qualifying approved applicants will be submitted to the CEC for approval of Statements of Work and final voucher amounts. Afterward, CalTestBed will notify voucher recipients of the next steps. Approved applicants will then be connected to their priority campus for onboarding and scheduling of work before commencing their testing.

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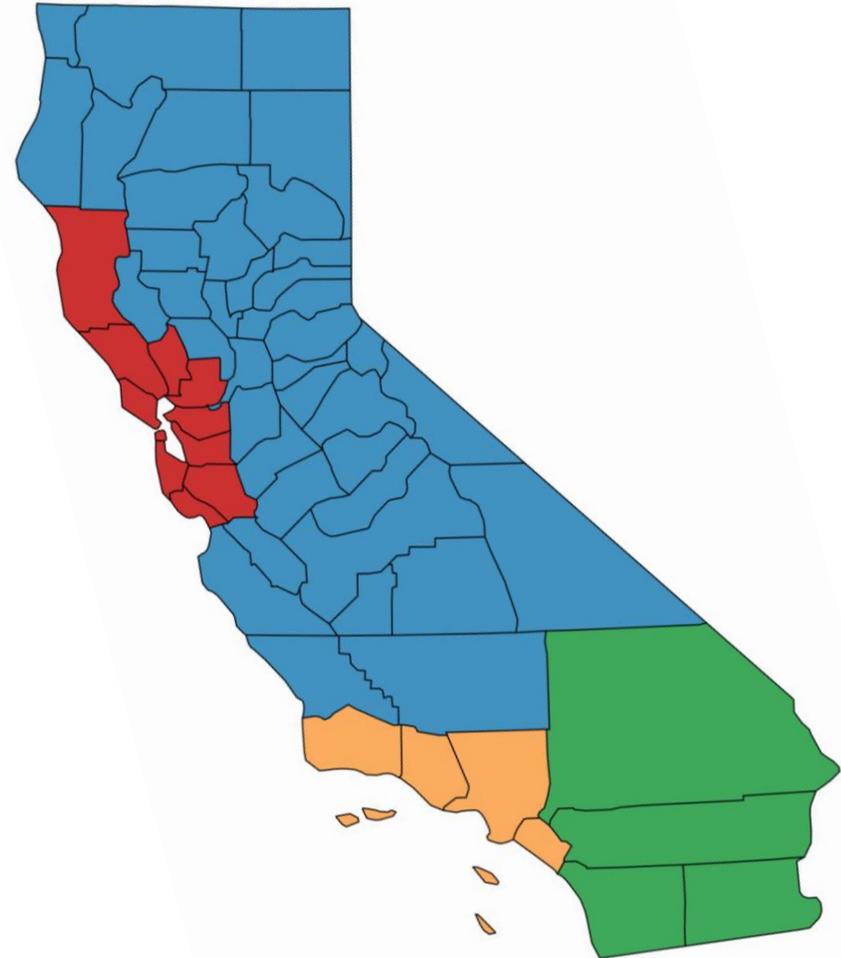
### Regional Solicitation Selections

To ensure geographic diversity across the program, CalTestBed will be selecting **6-8** of the top ranked applications from four geographic regions to participate in the Laboratory Scoping Consultations.

These regions include:

- **San Francisco Bay Area**
- **Central Valley**
- **Greater Los Angeles**
- **Greater San Diego**

The applicant region will be determined based on an official business address (or home address if applying as an individual).



## Appendix A – Scoring Categories **Scoring Category 1: Innovation**

In this section, you will describe your innovation in detail and list your goals for the project. It is very important that you explain how the innovation you are proposing to test will represent an advance over current state-of-the-art products. We will also ask you to discuss any existing or anticipated products that could compete with your proposed innovation once it is fully developed and entered in the market.

### Critical Questions

1. What problem/challenge does your proposed innovation address?
2. What makes your product qualified to tackle this given problem, compared to your competitors? What obstacles stand in the way of solving this problem?
3. Is there a breakthrough technology innovation? A new business model?
4. Will the innovation create greater reliability, lower costs, reduce emissions, and/or increase the safety of California's electricity grid? If so, how?
5. Describe what aspects and/or assumptions of your innovation require lab-level demonstration facilities to prove or disprove.

### Key Points

- Your ability to show, in detail, why your project is innovative.
- CalTestBed wants to hear your perspective on the state of the current market.
- Your ability to outline how your innovation is qualified to tackle the stated problem.
- Your ability to prove the financial and/or environmental value proposition to California ratepayers.

## Appendix A – Scoring Categories **Scoring Category 2: Scalability**

In this section, we will ask you to describe how your innovation - once fully developed and on the market - will be able to scale to benefit California utility ratepayers. CalTestBed wants to understand that you have a clear understanding of market stakeholders that influence your design, manufacturing, and customer relationships.

The CalTestBed team understands that many early-stage innovations that may be funded may not deliver meaningful scale growth in the immediate future. That's why it is vitally important for you to include a discussion of the long-term scaling solutions of your innovation in your application.

### Critical Questions

1. What kind of tools and systems are embedded in your design process? How easy or difficult is it to implement changes?
2. What kind of manufacturing processes do you expect to scale your product? Do those facilities exist? Updated? Created from scratch?
3. What level of infrastructure exists, or needs to be created to support your innovation at scale?
4. Have you defined your “ideal customer” characteristics? Do you anticipate being reactive to a wide audience, or proactive on a small one?
5. Is your innovation a highly-customized and compromised solution for every customer? Or is it a highly-repeatable, standardized product offering sold in a consistent way?
6. How well have you defined your market differentiation? How easy will it be to describe your innovation and its position as truly unique to prospective customers?
7. How well have you described the outcomes your customers can expect from utilizing your product?
8. Where will you scale? In what way?

### Key Points

- CalTestBed is devoted to assisting entrepreneurs develop products that will benefit California ratepayers.
- CalTestBed takes pride in working with innovators who have a positive impact on California's disadvantaged and underrepresented communities.

## Appendix A – Scoring Categories **Scoring Category 3: Feasibility**

In this section, we ask you to demonstrate that your innovation makes operational and economic sense. CalTestBed wants to support projects that have well-defined viability criteria and clear, quantified risk factors.

Successful applicants will show a strong understanding that the long-term product viability is achievable, which may or may not include other supportive financial mechanisms in place (i.e. grants, awards, etc.). Thoughtful responses will include a roadmap for the technology and show that business model is in place for the years following CalTestBed participation and how the voucher program can help advance your product's TRL level.

*CalTestBed is not interested in projects where product viability entirely rests on the outcome of the demonstration.*

### **Critical Questions**

1. Have you evaluated how your product will be produced? Identified what the variable production costs are and why they vary? Are they in your control?
2. Have you analyzed how to assure continuing access to critical supplies of raw materials and component parts at reasonable prices?
3. Have you identified weaknesses and described how you can overcome them?
4. Have you conducted testing on other aspects of your innovation? What large aspects remain? How important are they to the success of your innovation?
5. Have you analyzed how long your product may stay relevant?
6. Have you secured other public funding to help with demonstration and/or commercialization next steps? These may include:
7. CEC, DOE, SBIR, Accelerator/Incubator prizes, Competition prizes, etc.

### **Key Points**

- CalTestBed does not need to see a full-fledged business plan but does need to evaluate projects with the highest likelihood of benefit to California ratepayers. Be sure to include any relevant information to help your justification.

## Appendix A – Scoring Categories **Scoring Category 4: Market Potential**

In many ways your choice of market is the most impactful decision you will make. In this section, we ask for information on your innovation’s market and details on the types of entities you’ll be selling to. This might include leveraging a large/growing market, or identifying a new one, but we want you to detail how you arrived at your conclusions and outline any research you’ve conducted.

### Critical Questions

1. Is there a beachhead market identified? Is it niche? How does it relate to expanding in other markets?
2. Do you have the knowledge and relationships in place to be considered a leader in your market? If not, do you have a plan to fill the holes so you do?
3. How quickly can you establish yourself as a leader in your market? How much capital will be required?
4. Do you have a solid understanding of your customers’ typical budget? How does your innovation impact it?
5. How is your target market’s industry changing? Is it? How does your innovation relate to this change, or lack thereof?
6. Have you identified any hindering or favorable federal, state, or local policies/regulations that could help the adoption and commercialization of your product?  
Are there similar competing products with better incentives to your customers?
7. What tools and metrics have you used to analyze your target market?

### Key Points

- Illustrate how your innovation has broad appeal.
- Clearly demonstrate the value proposition for customers, companies, and investors.

### Appendix B – Scoring Rubric Used by the Technical Review Committee to Evaluate Applications

			"Very Poor"	"Not Very Good"	"Okay / Good"	"Good, Maybe Great"	"Great"
			Cannot be considered for a voucher.	Minimal chance of being considered.	Some chance of being considered.	Good chance of being considered.	Excellent chance of being considered for a voucher.
			Judging Score				
Weight	Criteria	Description	1	2	3	4	5
25%	Innovation	Problem/Challenge is identified. Innovation is described in detail and goals are listed for the project. Product can address problem/challenge. Clear explanation how the innovation (and the demonstration of the innovation) will represent an advance over current state-of-the-art products. Discussion on any existing or anticipated products that could compete with proposed innovation once fully developed and entered into the market. Competition identified and addressed. Technology or business model can be considered "breakthrough." Technology creates greater reliability, lower costs, reduces emissions, and/or increases the safety of California's electricity grid. Assumptions that lab testing will help prove or disprove are provided.	Problem is unclear or solution will not work. No clear advancement over current technologies. Competition is strong. Not a "breakthrough". No benefit to CA ratepayers.	Problem seems too difficult to solve or is not relevant. Solution seems ill-poised to accomplish targeted goals. Applicant demonstrates minimal advancement over current technologies, with no reference to data or previous research. Technology faces stiff competition and does not justify use of public funds to benefit CA ratepayers.	Applicant identifies a reasonable problem with a solution. Applicant claims advancement over current technologies, but some reference to data and previous research. Technology appears to have some competition. Satisfactory benefit to CA ratepayers.	Applicant outlines a clear problem with a convincingly good solution, but would not be described as "game-changing". Demonstrates technology with clear advancement over current solutions. Existing but limited competition. Solution seems poised to succeed. Applicant frames the innovation with clear benefit to CA ratepayers.	Problem and solution clearly outlined as game-changing. Major advancement over current technologies with low or non-existent competition odds. Significant benefit to CA ratepayers.
25%	Scalability	Once the innovation is fully developed on the market, applicant shows a clear understanding of market stakeholders that influence design, manufacturing, and customer relationships. Tools and systems that could assist scaling are embedded in the design process. Ability to implement change in design is addressed. Manufacturing infrastructure exists, or lack thereof is addressed. The "ideal customer" is defined. Product repeatability/standardization is addressed. Market differentiation is outlined. Ability to describe the innovation and its position in the market is obvious to customers. Where and how scaling happens is described.	No understanding of market, market stakeholders, or longer-term design considerations. No scaling tools used or addressed. No standardization or repeatability. Product is identical to competitors. No ideal customer outlined.	Applicant shows poor understanding of the market, does not identify key stakeholders. Discussion of long-term design is limited. Design flexibility and manufacturing are not deemed achievable or are too risky. No metrics for standardizing success, or lots of customization required for repeatability. Ideal customer is described but is not clear.	Applicant demonstrates satisfactory research on how product fits in the market and who the relevant stakeholders are. Applicant discusses long-term design considerations but achievability may include a level of risk. Design flexibility and manufacturing processes are well discussed, but may have some holes. Some metrics for standardizing scaling success are provided. Convincing ideal customer defined.	Applicant shows strong understanding of market stakeholders through data-driven research. Applicant demonstrates they have thought clearly about long-term design considerations as well as how to leverage scaling tools and processes to grow the technology. Design flexibility is deemed possible and manufacturing processes are proven reasonable. Plans on scaling are thoughtfully demonstrated. Achievable metrics for scaling success are	Complete understanding of market stakeholders and long-term design considerations. Scaling tools and processes are well-thought out and detailed. Design flexibility is highly likely. Manufacturing processes are completely valid and achievable. Plans on scaling are directly included.
25%	Feasibility	Demonstrates that the innovation makes operational and economic sense. Other supportive financial mechanisms (i.e. private funding, grants, awards, etc.) are in place, are being considered, or are confirmed as not needed. Clear business model has been developed for years after CalTestBed. Explanation on how the voucher will help accelerate the technology TRL but product viability is not tied to CalTestBed voucher funding. Production and production variables/concerns are addressed. Raw material production and pricing influence is discussed. Potential technology weaknesses are identified and discussed. Other untested aspects of the technology are outlined and addressed. Commercialization next steps and/or funding is well-considered.	Innovation makes no operational or economic sense. Add-on funding not addressed. No business case after CTB. Product viability is tied to CTB voucher. No production description. No product weaknesses identified or discussed.	Innovation proves little economic or operational sense. Limited thought given to plans after CTB. Technology may be too dependant on CTB voucher funding with no clear plans/possibility of raising follow-on funds to support technology development. Minimal thought/details given to component material sourcing or supply chain.	Innovation has good economic and operational sense, but appears risky due to lack of concrete data or dependance on lofty technological goals. Plans after CTB are provided but with a barebones roadmap. Innovation has little outside funding to support development. Component material sourcing is lightly described or there is cause for concern on supply chain sourcing.	Innovation demonstrates strong operational and economic sense. Plans after CTB are clear, but could be fleshed out more. Good balance of outside capital to support project outcomes while proving a need for CTB funding. Component material sourcing is clear and possible, with little cause for concern. Product weaknesses and their solutions are discussed and convincing.	Innovation makes perfect operational and economic sense. Plans after CTB are crystal clear. Need for voucher funding is well described but not reliant upon funding. Component material sourcing is very feasible. Product weaknesses and their solutions are discussed.
25%	Market Potential	Customers are identified. Leveraging a large/growing market, or identification of a new market is clear, with details on conclusions and/or research outlined. Beachhead market is identified, discussion on how it relates to similar markets is included. Knowledge and relationships are in place to be considered a market leader, and/or a discussion on how to become such is included. Timing and capital requirements on market leadership is discussed. Typical customer budgets is well-understood and how the innovation impacts customer budgets is outlined. Understanding of market/industry historical changes and relation to that change is discussed. Hindering or favorable federal, State, and/or local policies/regulations/incentives that could help the adoption of the technology is mentioned.	No customers or market potential. Market is small or not clear. No beachhead market identified. Cannot be considered a market leader in a reasonable amount of time. No understanding of customer budgets or market influencers. Current or future policy could prove detrimental to the product	Market is identified but applicant shows poor/little understanding of its growth. Product is entering the market at a time that is clearly too early/too late. Beachhead is identified, but may be too vague. Innovation has little chance of being a market leader or would take too long to reach there. Applicant loosely understands customers and their respective budgets. Innovation could be harmed by regulation.	Market has potential, but does not seem particularly strong or product may be entering at a time too early/too late to succeed. Beachhead is identified and feasible, though may not be sized correctly. Innovation has a chance of being a market leader eventually. Customer budgets are described but not in enough detail. Innovation is not bolstered by favorable incentives, but not likely harmed by any either.	Product is entering the market at a time before too many barriers to entry. Market growth projections are backed by data and research. Innovation can become a market leader with little risk and in a reasonable amount of time. Applicant has demonstrated thoughtful research towards understanding typical customers and their budgets through research and concrete examples. Product can/could benefit from policy incentives.	Market is clear, large, and/or growing quickly. Beachhead makes perfect sense. Innovation can become a major market leader in a short amount of time. Typical customers and their budgets are perfectly understood. Very strong favorable incentive from regulation.
100%			TOTAL SCORE				

## Appendix C – Application Eligibility Questions

The following questions will determine your project’s eligibility with the CalTestBed Initiative:

1. Innovation Name (10 words):
2. Contact Information:
  1. Name:
  2. Position/Title:
  3. Organization:
  4. Phone Number:
  5. Email:
  6. Website:
3. Address:
  1. Street Address:
  2. City:
  3. State:
  4. Zip Code:
  5. County:
4. Are you or any of your leadership team members located in California?
5. Do you have an established company address in the state of California?
6. I understand that if I plan to conduct business in California, I must be registered with the appropriate county in California and/or in good standing with the California Secretary of State in order to win an award. (Yes/No)
7. I have reviewed the sample contract and understand that I will be required to agree to the terms and conditions as a requirement to apply. (Yes/No)

## Appendix C – Application Eligibility Questions

The following questions will determine your project's eligibility with the CalTestBed Initiative:

8. Which of the following technology types apply to your proposed innovation? (Select one)
  1. Hardware (physical component/s that require(s) design and testing):
    1. Choose the answer that best describes your current state of development:
      1. Performing basic scientific research based on observed principles.
      2. Inventing practical applications. Basic principles have been observed.
      3. Analyzing, modelling and/or experimenting with innovation components.
      4. Basic functionality of components is being validated in a lab environment.
      5. Validating the technology in relevant (or simulated / non-laboratory) environment.
      6. Validating the technology at >50% scale in a relevant or simulated environment.
      7. Technology works smoothly and is considered operational.
    2. Integrated Solutions (innovative combination of existing or new software and hardware):
      1. Choose the answer that best describes your current state of development:
        1. Developing a novel idea to integrate existing solutions.
        2. Building/coding the integrative hardware or software piece(s).
        3. Analyzing and experimenting the effectiveness of the integrated solution.
        4. Hardware components of integrated solution identified. Early integration software or application beta developed.
        5. <50% scale demonstration developed.
        6. 50% to full scale demonstration developed.
        7. Commercialization of solution in progress or complete
  9. Please complete the TRL Calculator.

## Appendix C – Application Eligibility Questions

The following questions will determine your project's eligibility with the CalTestBed Initiative:

10. Which category most applies to your proposed innovation? (Select one)
  1. Building Technologies
  2. Energy Efficiency
  3. Energy Storage
  4. Grid Technologies
  5. Industrial & Agricultural Innovations
  6. Internet of Things
  7. Material-Based
  8. Renewable Generation
  9. Transportation
  10. Water Technologies
11. In one paragraph, describe your innovation. (100 words)
12. In one paragraph, how does your innovation benefit California electricity ratepayers? (100 words)
13. Have you raised funding for this technology in the past? (Optional, but helps provide context to the CalTestBed reviewers.)
  1. Public
    1. How much funding did you receive? (10 words)
  2. Private:
    1. How much funding did you receive? (10 words)
14. Please rank your top three laboratory choices, selecting from the CalTestBed Directory.

## Appendix C – Application Technical Questions

**The following questions will determine your project’s score against other CalTestBed Initiative applicants:**

1. What Innovation are you proposing? Please complete a one-page Project Summary (upload).
2. Describe the technology to be tested as it relates to Scoring Category 1: Innovation. Use the Scoring Category guidelines in the Application Manual for reference. Be careful to avoid divulging confidential or proprietary information, as these applications are subject to public record requests. (500 words max)
3. Describe the technology to be tested as it relates to Scoring Category 2: Feasibility. Use the Scoring Category guidelines in the Application Manual for reference. Be careful to avoid divulging confidential or proprietary information, as these applications are subject to public record requests. (500 words max)
4. Describe the technology to be tested as it relates to Scoring Category 3: Scalability. Use the Scoring Category guidelines in the Application Manual for reference. Be careful to avoid divulging confidential or proprietary information, as these applications are subject to public record requests. (500 words max)
5. Describe the technology to be tested as it relates to Scoring Category 4: Market Potential. Use the Scoring Category guidelines in the Application Manual for reference. Be careful to avoid divulging confidential or proprietary information, as these applications are subject to public record requests. (500 words max)

## Appendix C – Application Financial and Legal Certifications

**To be eligible for this voucher program applicants must agree to the Terms and Conditions in the Voucher Recipient Agreement available through the Smart Simple platform. Additionally,**

- The applicant understands that no voucher funding will be provided to the voucher recipient directly, and the value is redeemable for testing and validation only at participating testbeds.
- The grant applicant acknowledges that all costs associated with proposal preparation are borne by the applicant and that receipt of a proposal by the CalTestBed Initiative does not constitute a contractual relationship with the grant applicant.
- The applicant has performed a thorough search of existing published literature and patents and determined that their technology is original.
- The applicant has disclosed if it has any past or current funding received from any private, state, or federal agencies for work that is similar or related to the innovations proposed in this grant application.
- The applicant owns all proprietary ideas, concepts, patents, branding and intellectual property detailed within this application.
- The applicant understands that submitted applications are subject to public records requests and has not disclosed confidential information in this application.

## Appendix D – Frequently Asked Questions

### About CalTestBed

#### **What is the primary purpose of CalTestBed?**

The primary purpose of CalTestBed is to increase access to elite testbeds for entrepreneurs to test and validate their innovations, in order to bring new clean energy technologies to market. Testbeds are scattered across the country and often operate amongst themselves. Testing and validation has historically been underfunded, which has slowed the commercialization and deployment efforts of clean energy innovations. CalTestBed unifies an ecosystem of nearly 30 testbeds across the University of California system and Lawrence Berkeley National Lab and conducts a solicitation, review, and selection process to match qualified applicants with laboratory capabilities, in effect streamlining and accelerating the process for entrepreneurs to bring their technologies to market. CalTestBed provides vouchers to California entrepreneurs, researchers, and businesses to redeem at participating testbeds for testing and validation of their technologies.

#### **Where does the funding for CalTestBed come from?**

CalTestBed is a funding initiative of the California Energy Commission's Electric Program Investment Charge (EPIC). The purpose of EPIC is to accelerate the development and adoption of new low-carbon technology solutions for California's electricity sector. To find out more about EPIC and other Energy Commission activities and funding opportunities for research and development, please visit: <http://www.energy.ca.gov/research>.

#### **How does CalTestBed differ from other funding opportunities through EPIC?**

CalTestBed awards address a critical gap in access to world class testing and validation for prototypes, which is critical to bringing new energy innovations to market. To find out more about other EPIC funding opportunities, visit: <http://www.energy.ca.gov/contracts/epic.html>.

#### **How much are the vouchers worth?**

CalTestBed provides voucher awards ranging from \$10,000-\$300,000.

## Appendix D – Frequently Asked Questions

### About CalTestBed

#### **How often do you accept applications?**

The number of application cycles will vary based on a variety of factors including the volume of applications received in each cycle. We anticipate having the initial solicitation at the end of Q1, 2020 with annual solicitations following.

#### **Should I reach out to a Regional Energy Innovation Cluster?**

You are encouraged to take advantage of our regional cluster partners, but you are not required to do so for the CalTestBed application and your relationship with clusters will not affect the scoring of your application.

#### **Should I reach out to a participating testbed?**

No. You are not required to have an active relationship with a participating testbed. Voucher applicants will have the opportunity to list their top three testbed choices in the application process and voucher recipients will be matched with appropriate testbeds through a deliberative process by CalTestBed.

#### **Does CalTestBed have an office?**

CalTestBed is administered by the New Energy Nexus, whose offices are in Oakland, CA. New Energy Nexus works with multiple partners throughout the state to manage the application process and provide professional development services to entrepreneurs.

## Appendix D – Frequently Asked Questions

### Eligibility

#### **Do I have to be in California?**

Yes. For the Q1 2020 solicitation you must have a California address at time of application to be eligible. We will ask for your address in the eligibility application; you must list your official business address or, if applying as an individual, the personal address of the lead applicant.

If you are selected to win a voucher, you must be registered with the appropriate county in California and must be in good standing with the California Secretary of State before accepting the award. This is not required at time of application.

#### **Do I have to be a US citizen?**

No.

#### **Can I apply for funding without being a company?**

Yes. CalTestBed is open to awarding individuals and businesses.

#### **Am I eligible to apply for CalTestBed if I have already received an EPIC award through another program?**

Yes.

#### **I've already been funded by CalSEED. Can I apply to CalTestBed?**

Yes.

#### **Can I apply with the same idea in the next funding round?**

Yes. If your project was not funded, you are free to apply again.

## Appendix D – Frequently Asked Questions

### Eligibility

**I have two ideas. Can I submit two applications?**

No. For this solicitation we are only accepting one application per lead applicant. You may be on the team for a different application with a different innovation, but not as the lead applicant. Similarly, we are only accepting one application per idea – duplicate applications from multiple team members will be rejected.

**Does this program require any match funding?**

Match funding is not required and having match funding does not increase your chance of receiving an award.

**Will you sign an NDA?**

CalTestBed will not sign an NDA.

**If we are not signing an NDA, how will my ideas be protected?**

Applications will not be published but will be in the public record and available upon request. We recommend giving enough detail so that the review team can adequately judge your application without disclosing confidential and proprietary information.

**Is there a specific technology that will score higher than others on the application?**

CalTestBed does not score specific technologies higher than others, but does require the innovation to fit within the requirements outlined in the Application Manual.

**Does my project have to be a technology?**

You are required to have a prototype ready for testing to be eligible for a CalTestBed voucher.

**Does my project/technology/idea qualify?**

CalTestBed applicants must have a prototype ready for testing, and the testing requirements must be included in the testing capabilities listed in the CalTestBed Directory.

## Appendix D – Frequently Asked Questions

### Eligibility

#### What types of innovations are eligible for funding?

CalTestBed is focused on funding prototype technologies (TRL 5-7) that have the potential for providing benefits including lower cost, greater reliability and improved safety for to the ratepayers of California. We are specifically looking for hardware and integrated solutions. **No stand-alone software solutions will be considered.**

	Hardware	Integrated Solutions
<b>Description</b>	Physical components – tools, machinery, durable equipment - that require design and testing	An innovative combination of software and hardware to maximize functionality and value
<b>Examples</b>	New inverter technologies; photovoltaic panels; manufacturing equipment; sensors for energy efficiency; electric vehicle components; grid-friendly vehicle charging infrastructure; novel battery chemistry or components; transmission and distribution infrastructure improvements; high-voltage electrical equipment	Solutions which leverage software and hardware to increase efficiency and resilience of the grid and/or solve community access issues (e.g., vehicle to grid concepts)
<b>Out of Scope</b>	Project financing for already existing technologies; manufacturing line scale up; infrastructure projects; natural gas projects	Single non-replicable solutions. Concepts that are not novel or innovative in application.

## Appendix D – Frequently Asked Questions

### Eligibility

**I have an idea for a product that is currently selling. Does this disqualify me from applying?**

CalTestBed is targeting innovations at the prototype level. This encompasses innovations at Technology Readiness Level (TRL) 5-7. For further guidance, please consult Page 10 of this manual which provides a reference to the US Department of Energy’s TRL guide.

**How do I know if my technology is in the appropriate stage to be considered for a CalTestBed voucher?**

We use the DOE’s definitions of the maturity of a concept, called Technology Readiness Levels, to determine eligibility for CalTestBed vouchers. We are looking to fund prototypes between TRL levels 5-7. Please refer to page 10 of this manual for determining your TRL level. TRL has traditionally been designed for hardware technologies, but we have translated the equivalents for integrated solutions as well.

## Appendix D – Frequently Asked Questions

### On the Application

#### **What time on April 8<sup>th</sup> are the applications due?**

Online applications are due by 11:59pm Pacific time on April 8<sup>th</sup>. All mail-in applications must be postmarked by April 8<sup>th</sup>.

#### **How long does it take to complete the application?**

We estimate that the complete application will take approximately five hours to complete. You should expect to spend additional time gathering the necessary documents and completing a few supporting attachments.

#### **Can I ask for help with the application process?**

Assistance is available in the form of local events, webinars, and the application manual. CalTestBed staff are not available for one-on-one application assistance.

*Do not contact participating testbeds directly.*

#### **I can't log in to the Grant Management Portal. What do I do?**

Contact us at [info@caltestbed.com](mailto:info@caltestbed.com).

#### **Can I include images or graphs in the application?**

No, please describe your innovation and testing requirements using text only.

#### **Can I edit my application?**

You can Save Draft to preserve your progress in an application, but you cannot edit a submitted application.

## Appendix D – Frequently Asked Questions

### On the Application

#### **Can I change my project name?**

If you want to change your project name, you can do so by starting a new application. You will not be penalized for doing so since the review team will only review fully completed applications.

#### **What happens if I accidentally submit an incomplete application?**

All applications will undergo a preliminary review to ensure each application meets the minimum requirements. The CalTestBed team will contact any applicant who needs to provide additional information. At that time, you will be notified and will have 24 hours to fix the issue.

#### **How long does it take for CalTestBed to review the applications?**

Depending on the amount of applications, the CalTestBed team expects the review process to take 3-4 months. Please refer to the project schedule on Page 4 for critical dates.

#### **Will CalTestBed request more information after the application process?**

Once applications have been deemed eligible and are among the top scoring after the technical review, the applicants will progress to the consultation phase which entails scheduling three-hour structured discussions with a Principal Investigator at one of the applicant's top three lab choices to develop a Statement of Work which includes scope, schedule, and voucher budget. A neutral third-party subject matter expert will be sitting in on these discussions.

# CalTestBed

## Application Manual

## About Us

CalTestBed is administered by New Energy Nexus and funded by the California Energy Commission.

New Energy Nexus supports diverse entrepreneurs to drive innovation and build equity into the global clean energy economy. New Energy Nexus is driven by the immense opportunity that clean energy represents to accelerate the clean energy transition. We are committed to a world where everyone has equal access to clean, sustainable energy; 100% for the 100%.

New Energy Nexus works across the entire lifecycle of clean energy development, commercialization, and deployment. Since 2004, the team has leveraged \$1.5 billion in investment, supported more than 100 clean energy enterprises, and launched industry-leading centers focused on developing practical solutions to some of today's most pressing clean energy challenges.

New Energy Nexus is proud to administer the CalTestBed program in collaboration with the tremendous ecosystem of partners that brings the program to life.



# CalTestBed

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