



Emerging Technologies Summit

MAKING THE CONNECTION:
From Energy Efficiency Innovation to Delivery

April 19 – 21, 2017

California's Energy Innovation Ecosystem

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California's Energy Innovation Ecosystem

Emerging Technologies Summit

April 20, 2017



ETCC Summit Presentation – April 2017
Sherri Pittman, Managing Director



Optimizing the energy transition

**100%+ clean energy economy
for the 100%**



California
Clean Energy Fund

100%+ clean energy economy for the **100%**

Drive
innovation

**Support
Entrepreneurs**
in the clean
energy economy

Build equitable
outcomes

We provide human and financial capital to entrepreneurs

Our funds, programs and networks work across the entire business lifecycle



CalSEED

Investing in California Energy Entrepreneurs

**\$24MM to ~100 entrepreneurs
over 5 years**



The **California Sustainable Energy Entrepreneur Development** initiative grants up to \$600,000 to early stage clean energy concepts and provides professional development resources



Concept Award

\$150,000

Concept Development & Assistance

Mentorship from entrepreneurial experts and industry leaders

Introduction to resources to advance the concept



Prototype Award

\$450,000

Successful Concept Awardees prepare for Commercialization

Business Plan Competition to push awardees to think in a commercialization area



CALIFORNIA
ENERGY COMMISSION

Program Benefits

CalSEED Awardees will access benefits to develop a concept and prepare for the Prototype Award Business Plan Competition.

Grant dollars	A powerful network	Mentorship
Operational and technical resources	Online training	Legal counsel
Regional Innovation Clusters	Cleantech Open Accelerator	A community

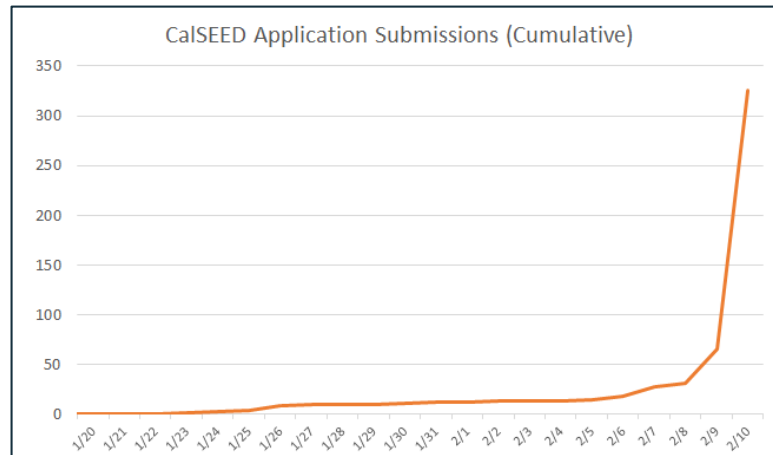
Our Partners

An innovative public-private partnership between the State of California and a diverse group of leaders leading California's energy transformation

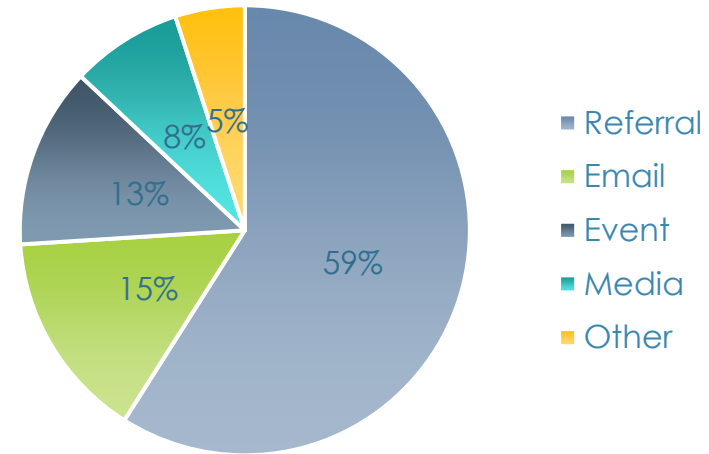


CalSEED – First Call for Applications

326 Applications!

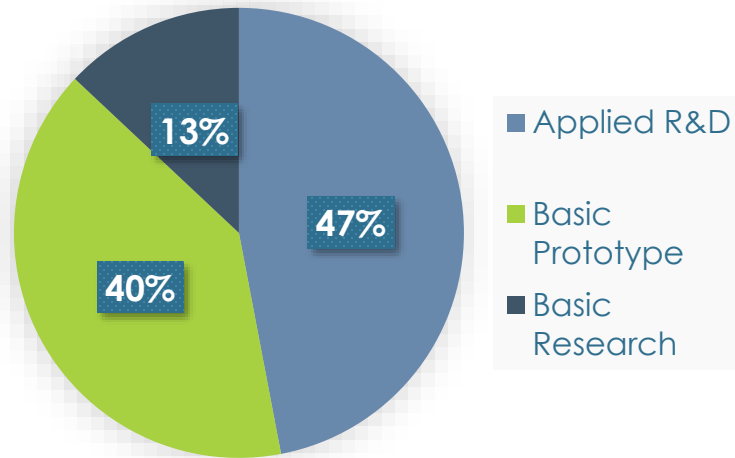


How Did You Hear?

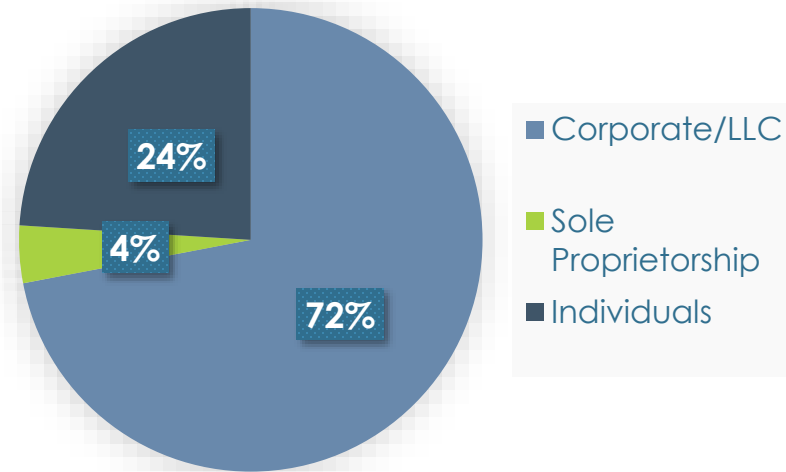


CalSEED – First Call for Applications

Innovation Stage



Applicant Type



Top Innovation Categories:

Energy Generation	15.9%
Energy Efficiency	14.1%
Energy Storage	11.7%
	41.6%

Contact Us

info@calseed.fund

CalSEED

Investing in California Energy Entrepreneurs

Bay Area

Regional Innovation Cluster

A program of Cyclotron Road

Emerging Technologies Summit

Ontario, CA

April 20, 2017

“

Today, our highly optimized, venture-capital-driven innovation system is simply not structured to support complex, slower-growing concepts that could end up being hugely significant--

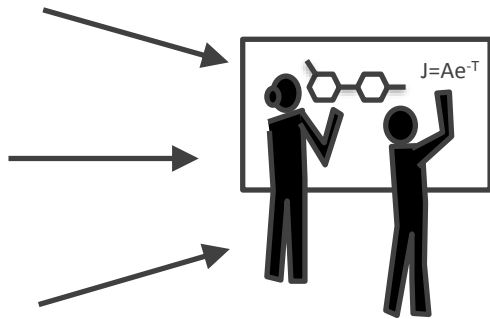
the kind that might lead to disruptive solutions to existential challenges in sustainable energy, water and food security, and health

”

- **L. Rafael Reif**
President, MIT



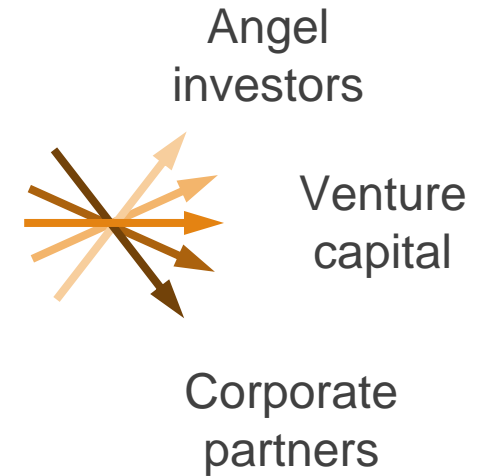
The Cyclotron Road Experiment



① **Spin-in** top entrepreneurial scientists



② **Support** with world class facilities, expertise, and mentorship



③ **Position** people and technology for market

Support



- ② **Support** with facilities, experts, networks, and experience

WHAT YOU GET

Runway

- Up to 2 years of living stipend, health insurance, and travel allowance (Fellowship)

Labs

- Cross-cutting access as a Berkeley Lab affiliate and \$100k toward initial Lab work. Innovators retain ownership of their IP.

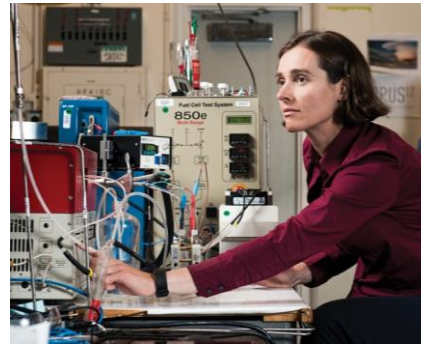
Mentorship

- Hard tech entrepreneurship mentorship, training, and connections from Cyclotron Road team and network

Results

World-class Talent

- Highly selective:
5% acceptance rate
- Candidates from top
research institutions
- Many would not have
a home otherwise



5%



Caltech



Stanford
University



PRINCETON
UNIVERSITY



Massachusetts
Institute of
Technology

Berkeley
UNIVERSITY OF CALIFORNIA

Results

Cohort 1 Outcomes

- 100% have built a demo prototype or are funded to do so
- \$10M in follow-on grants and \$5M in private investment
- All 6 teams funded for next stage of development, from a broad spectrum of \$



100%



polySpectra VISOLIS CARBON NEGATIVE MATERIALS mosaic OPUS¹² SPARK THERMIONICS CalWave

Next steps

Existing DOE Program

Attracting the very best
first-time innovators

- 2 years in residence at Cyclotron Road and LBNL
- Berkeley Lab connectivity – access, expertise, credibility
- Dedicated seed funding
- High Touch 1:1 mentorship



CEC Program Opportunity

Complementary program to serve the best ***experienced*** power sector innovators

- 1-year in residence at Cyclotron Road and LBNL
- Berkeley Lab connectivity – access, expertise, credibility
- Connection to Cyclotron Road cohorts
- No seed funds
- Lighter Touch focused mentorship
- Customized curriculum

Serving the broad community

In-residence Programs

In-residence programs available to innovators based on eligibility requirements:

DOE Program:

Intensive training program for first time innovators – applications open October 1

CEC Program:

Innovation accelerator for experienced entrepreneurs – rolling admission: apply now

Innovator Services

Innovator services available to all active program participants:

- Research labs and experts
- Curriculum & bootcamp
- Advisory network
- Demo day & events
- Staff office hours
- Resource library
- Manufacturing cost modeling & design
- Shared service provider resources
- Industry & investor liasing
- Financial support instruments

Public Resources

Open source resources and best practices to support the broader hard energy tech ecosystem

- Public resource library
- Public curriculum
- Public events
- Publications & blog

“

the United States needs a more systematic way to help its bottled-up new-science innovators deliver their ideas to the world.

”

- **L. Rafael Reif**
President, MIT

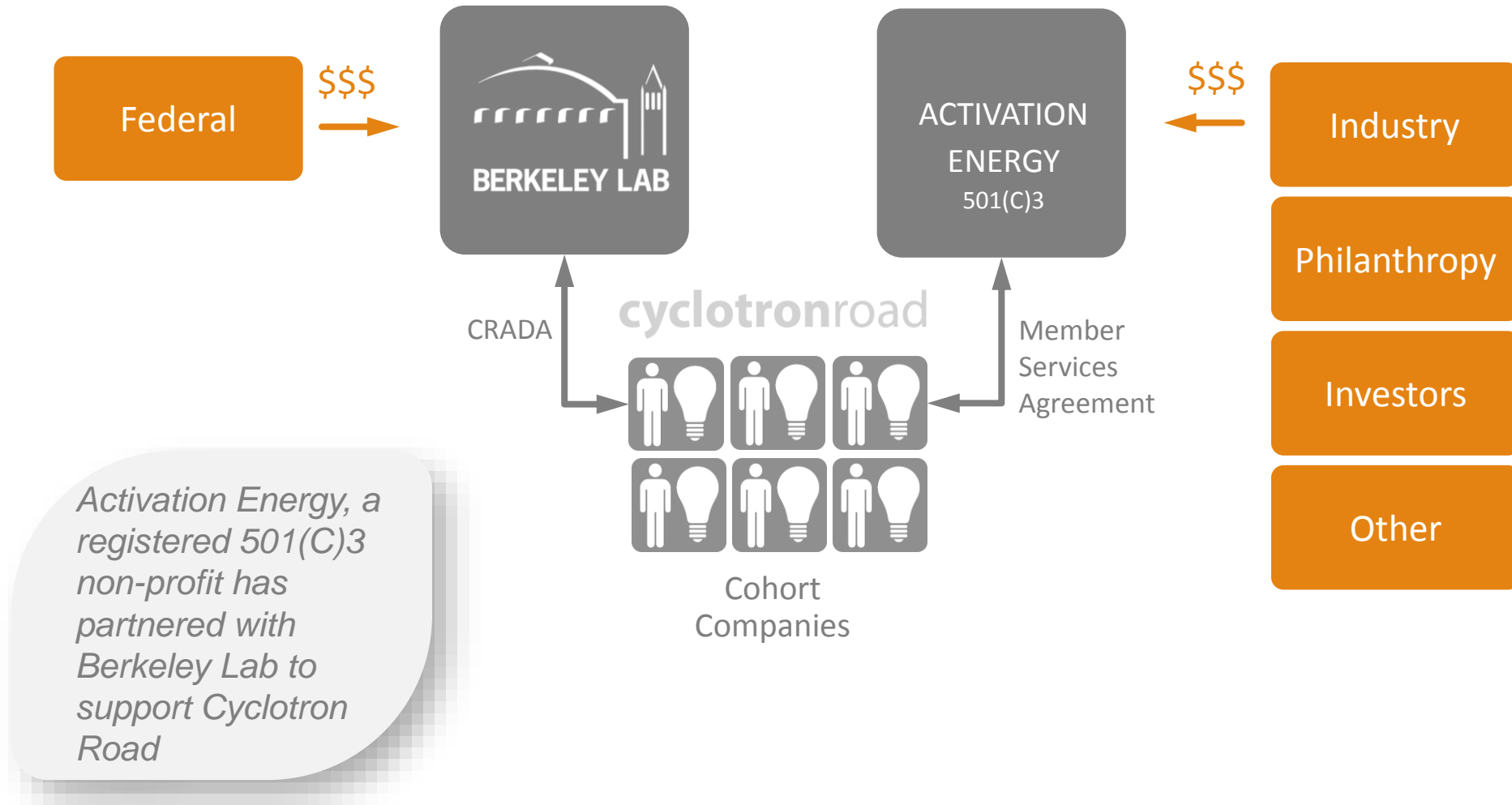




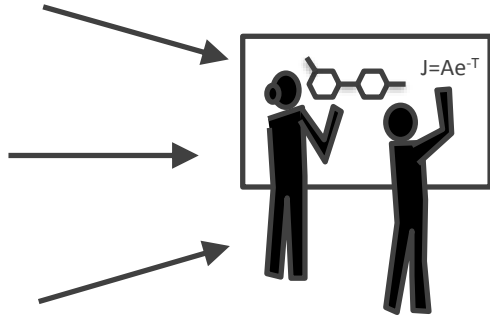
cyclotronroad

Backup Slides

Public-Private Partnership



People



- ① **Spin-in** top science innovators

ELIGIBILITY

- First timer w/ min 5 yrs R&D experience
- Focused on science innovation & DOE mission
- Have not yet raised private sector funding

SELECTION CRITERIA:

People (70%)

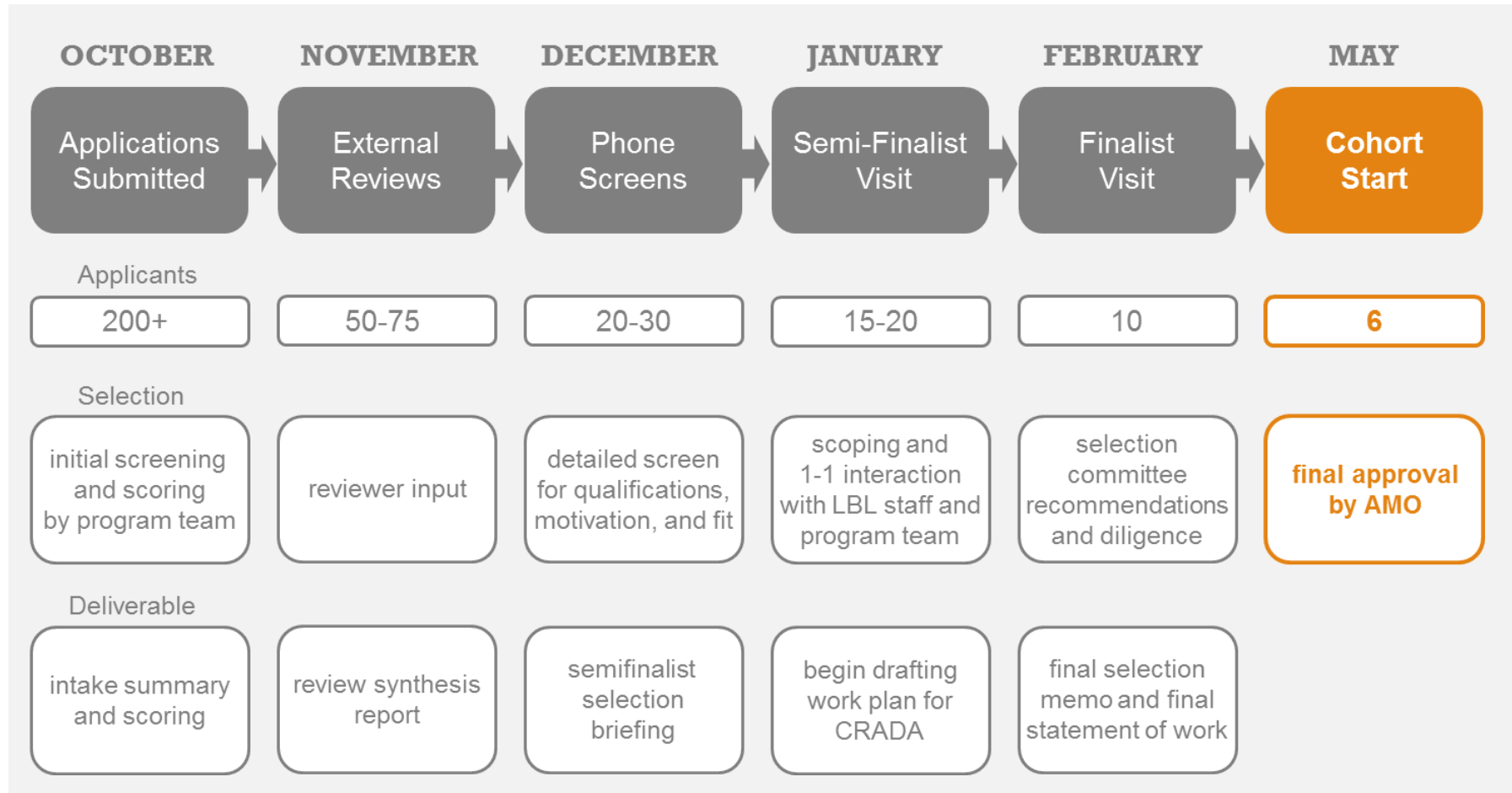
- Technical strength
- Outcome orientation
- Professional excellence

Concept (30%)

- Impact on U.S. energy
- Technical merit
- Cyclotron Road fit

Application Process

PROCESS OVERVIEW



What do we provide?

RESOURCES

- Fellowship (\$85k living stipend, \$20k travel, insurance x 2 years)
- Research funds (\$100k lab funds)
- Lab space (2 years)

EDUCATION

- Kick-off bootcamp (1 week, in development)
- Techno-economics course (10 week)
- Focused courses (ad hoc)

MENTORSHIP

- Quarterly Advisory Board meetings
- Monthly one-on-ones

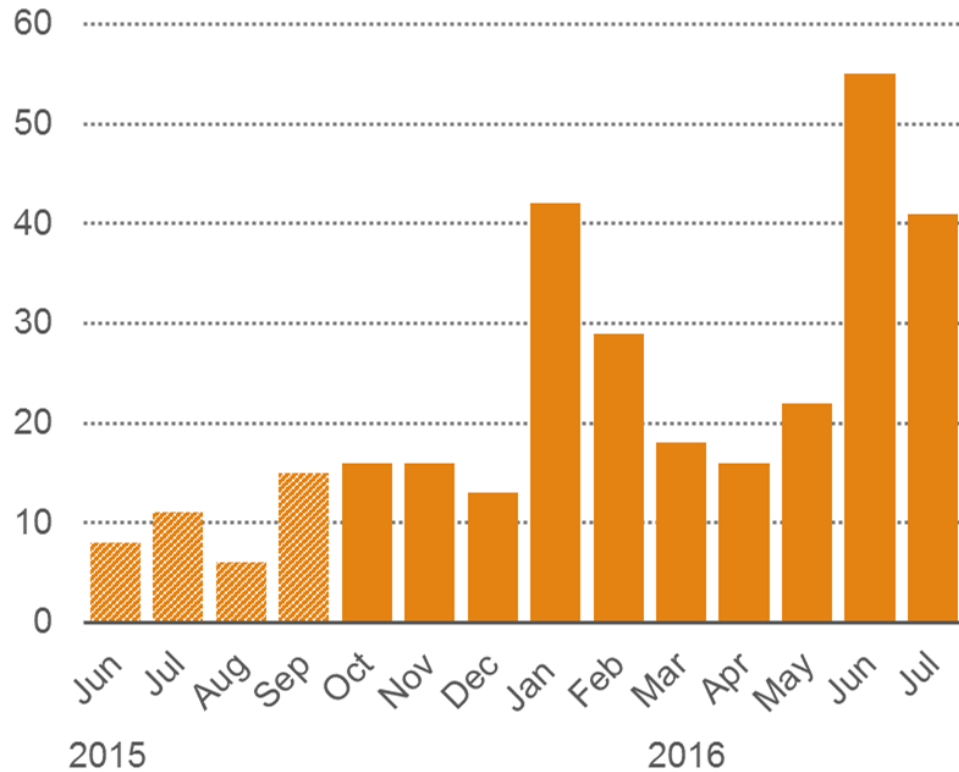
NETWORKING

- Invited guests (> 300 per year)
- Invited speakers (weekly)
- Network events (yearly)

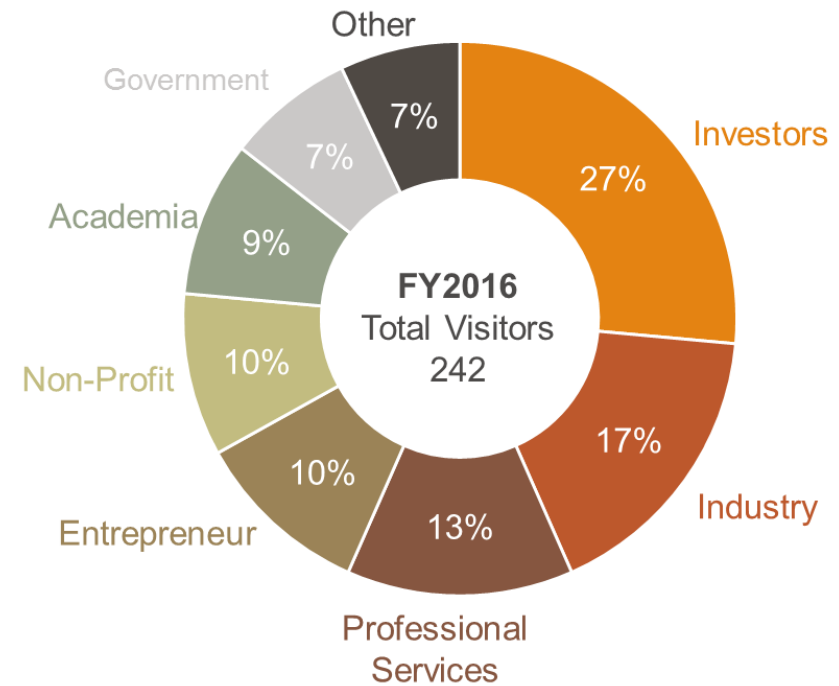
Networking

HIGH CONNECTIVITY TO INNOVATION ECOSYSTEM

Monthly Cyclotron Road Visitors



Cyclotron Road Visitor Type



For more information:

Jeff Anderson

Cyclotron Road

jeff@cyclotronroad.org



BLUETECH VALLEY

Central Valley Innovation Cluster

BlueTechValley Innovation Cluster



Ventures:

CA entities

Technology affecting energy

Technology Readiness Level

(TRL) 1-9

BlueTechValley (BTV)

Water, energy, and ag tech

Local, regional, global innovators and entrepreneurs

Subject-matter experts, mentors, training, opportunities



Ventures

Clusters

Execution

Screening
Services
Incubator
Third-party
testing

Regional
assets
Training
Collaboration

Events
Accelerator
Funding





BLUETECH VALLEY

5370 North Chestnut Avenue, MS/OF 18, Fresno, CA 93740

Phone: 559.278.2066 | Fax: 559.278.6033 | bluetechvalley.org

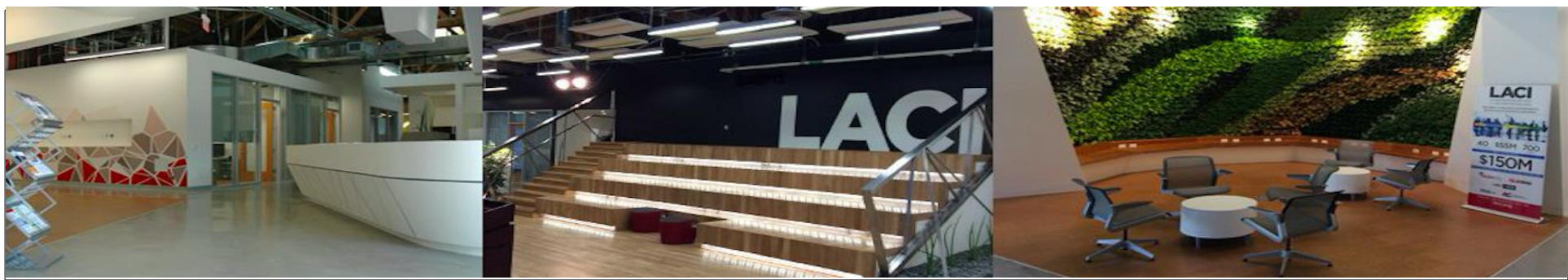




LACI

Los Angeles Regional Energy Innovation Program

April 2017





LACI

“For Entrepreneurs,
By Entrepreneurs”

More than a theme...

Cleantech Commercialization Process



To Build Our Regional Economy, We've Started with What We Know...

- Size
 - Population of ~15M people (~10M in LA County); LA County GDP > Taiwan GDP
- Research and Academia
 - Foundational and Applied Research: 3 UCs, 7 CSUs, and private
- National Logistics Hub
 - 2 Ports handle 40% of inbound shipping containers for the U.S
- Manufacturing Hub
 - L.A. County = largest manufacturing center in the U.S. (more than Michigan)

...and then Identified Key Challenges our Clean Energy Entrepreneurs Face

- Lack of regional energy needs assessment and planning
- Hyper-local networks and services
- Uneven access to service and entrepreneurs across the region
- Lack of dialogue between innovators and customers
- Innovation gets “stuck”

Entrepreneurs need access to the right resources, at the right time

Vision

*To create a **regionally-inclusive**, robust, **entrepreneur-centric** clean energy technology development and commercialization program that helps the region achieve the state's statutory energy goals and benefits residents throughout the four-county region.*

Opportunity to Build our Region's Capacity

- Nurture a genuinely ***inclusive regional clean energy cluster*** to serve and represent ratepayers and entrepreneurs in all four Counties
- Create a process to ***efficiently allocate regional clean energy development and commercialization resources*** in order to derive maximum benefit for IOU ratepayers, entrepreneurs, and the regional economy

ASSESS

Energy Research



ENGAGE

Regional Hubs



SERVE

Business & Tech Services



Regional Hubs

- Santa Barbara – Community Environmental Council, UCSB
- Ventura County – California State University, Channel Islands
- Los Angeles County – LACI
- Orange County – Cleantech OC

Key Regional Activities:

- Assess and prioritize the region's energy needs
- Create inventory of the region's clean energy ecosystem stakeholders
- Create a pipeline of clean energy innovation
- Connect entrepreneurs with business and technical services
- Host and promote clean energy events
- Identify clean energy technology pilot sites
- Connect customers with new clean energy technologies and services solutions

Thank you!

Amanda Sabicer

VP Regional Energy Innovation Cluster

amanda@laincubator.org

LACI

San
Diego
Regional

**ENERGY
INNOVATION**
NETWORK

Overview for 2017 Emerging Technology Summit – April 20, 2017





SAN DIEGO

ABOUT CLEANTECH SAN DIEGO





MISSION:

To accelerate clean technology innovation and adoption of sustainable business practices for the benefit of the economy and the environment.

What do we do?

Position the greater San Diego region as a global leader in the cleantech economy.

How do we do it?

Foster collaborations across the private-public-academic landscape, leading advocacy efforts to promote cleantech priorities, and encouraging investment in the San Diego region.

Who's with us?

More than 100 local businesses, universities, governments, and nonprofits committed to advancing sustainable solutions for the benefit of the economy and the environment.





Private Sector
Members





PORT of
SAN DIEGO




2016 U.S. Cleantech Leadership Index

2016 U.S. Clean Tech Leadership Index

SAN DIEGO, CA

KEY FACTS

 **\$828M**
in VC funding in the last 3 years

 **#2**
in installed solar per capita

 **14,366**
EVs (680% more than in 2012 Index)

#3 OVERALL
in Metro Index (Top 5 in 3 of the 4 Index categories)

 **1000+**
LEED and Energy Star buildings

1 of 3
cities in Index with a 100% renewable electricity pledge

CALIFORNIA:
#1
in Leadership Index all 7 years (and #1 in Policy)

San Diego Regional **ENERGY INNOVATION** NETWORK

Helping entrepreneurs bring their energy innovations to market



WHO ARE WE SUPPORTING?

Innovative entrepreneurs
developing solutions to the
region's energy needs

SAN DIEGO REGIONAL ENERGY
INNOVATION NETWORK

SAN BERNARDINO
COUNTY

RIVERSIDE COUNTY

SAN DIEGO
COUNTY

IMPERIAL
COUNTY

San
Diego
Regional

**ENERGY
INNOVATION**
NETWORK

EPIC GRANT GOALS

ENERGY

Accelerate the commercialization of innovations that are strategically focused on overcoming barriers to meeting state energy goals

Provide benefits to ratepayers:



SAN DIEGO REGIONAL ENERGY TECHNOLOGY PRIORITIES

Energy Efficiency & Demand Response	Clean Generation/Renewables
<ul style="list-style-type: none">• Envelope Efficiency• Lighting Efficiency• HVAC Efficiency• Pump/Other Equipment Efficiency• Energy Management Software	<ul style="list-style-type: none">• Hydroelectric• Wind• Solar• Geothermal• Wave• Related Technologies
Smart Grid & Energy Services	Clean Transportation
<ul style="list-style-type: none">• Mechanical Energy Storage• Electrochemical Energy Storage• Electrical Energy Storage• Thermal Energy Storage• Smart Grid/Metering Hardware, Software, Data Analytics• Microgrids	<ul style="list-style-type: none">• Battery Electric Vehicle Technologies• Hybrid Electric Vehicle Technologies• Electric Vehicle Charging Infrastructure• Software Platforms

PARTNER ORGANIZATIONS

Outreach



Technology/Market Support



Policy/Regulatory Guidance



Business Acumen

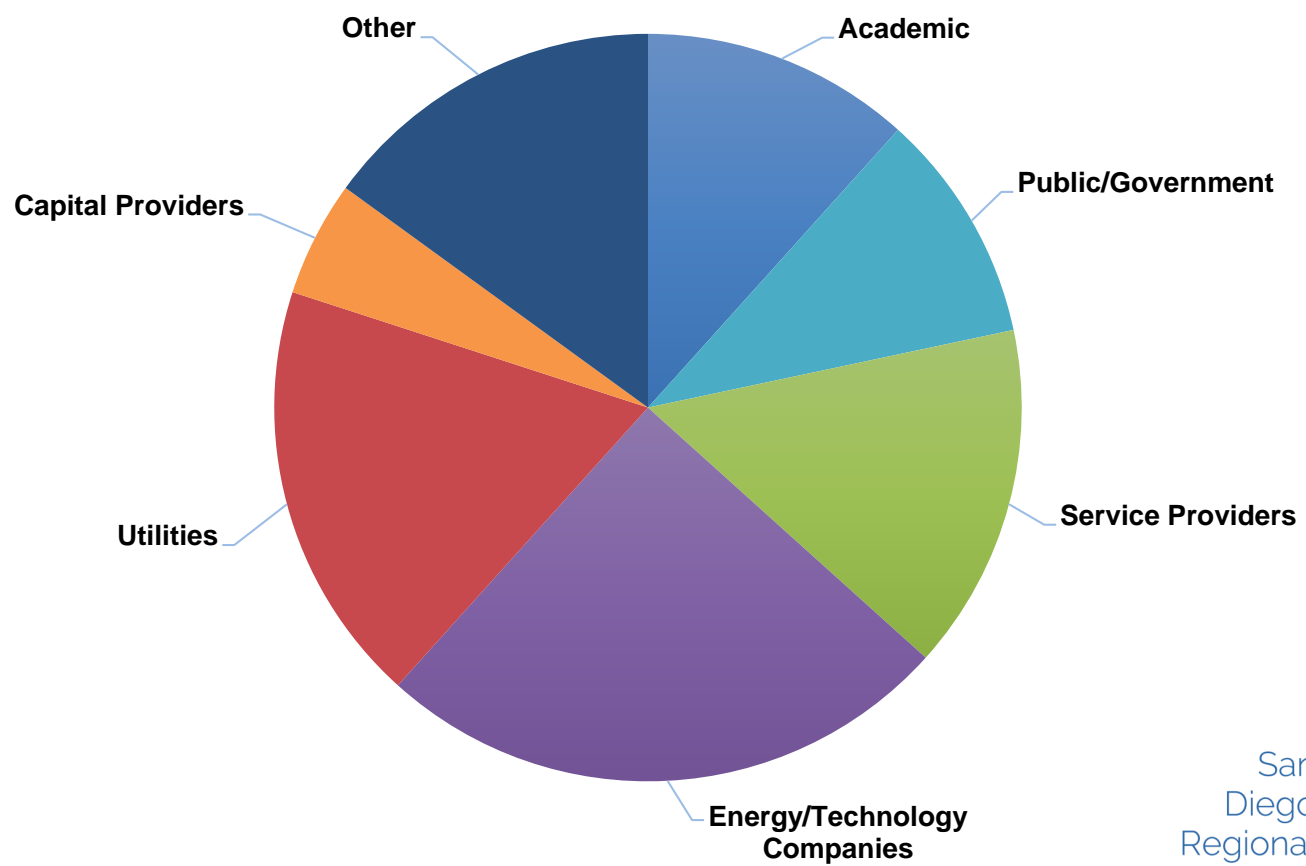


Program Management



SAN DIEGO

TECHNICAL ADVISORY COMMITTEE TOTAL: 62 PARTICIPANTS



CUSTOMIZED SERVICE PLANS

CONNECT	CSE
Springboard <input type="checkbox"/>	Market intelligence <input type="checkbox"/>
Consideration for CapitalMatch <input type="checkbox"/>	Policy briefings <input type="checkbox"/>
CorporateMatch <input type="checkbox"/>	Energy policy education series <input type="checkbox"/>
Frameworks Workshops <input type="checkbox"/>	Connections to key San Diego public clients <input type="checkbox"/>
SDSU	Guidance on state energy programs & incentives <input type="checkbox"/>
Imperial Valley Proof-of-Concept Center <input type="checkbox"/>	Tech & knowledge transfer activities <input type="checkbox"/>
Defense Innovation Cluster <input type="checkbox"/>	UCSD
795 MBA Capstone Program <input type="checkbox"/>	Innovation and Commercialization Office <input type="checkbox"/>
SDSURF Tech Transfer Office <input type="checkbox"/>	Institute for the Global Entrepreneur <input type="checkbox"/>
USD	Proof-of-Concept Lab Testing <input type="checkbox"/>
SMSE: Business Development Services <input type="checkbox"/>	Field Scale Pilot Testing <input type="checkbox"/>
SMSE: Rapid Prototyping Facilities <input type="checkbox"/>	Center for Energy Research <input type="checkbox"/>
USD-EPIC: Regulatory & Policy Assessments <input type="checkbox"/>	IEEP
USD-EPIC: One-On-One Expert Advising <input type="checkbox"/>	Provide referrals for pilot projects <input type="checkbox"/>
EvoNexus	IVEDC
Consideration for admission to incubator <input type="checkbox"/>	Provide referrals for pilot projects <input type="checkbox"/>
	SDVG
	Provide referrals for capital providers. <input type="checkbox"/>

CUSTOMIZED SERVICE PLAN PAC/TAC REFERRALS

Partner Advisory Committee & Technical Advisory Committee Referrals

- Provide Contacts for Market/Technology Validation
- Provide Contacts for End-User, Third Party Validation Trials
- Provide Contacts for Advisory/Financial Support

CUSTOMIZED SERVICE PLANS










Accelerated path to commercialization

- Advisory Support
- Mentoring
- Workshops/Training
- Testing Facilities
- IP and Export Assistance
- Market Intelligence

- Proof-of-Concept Pilots
- End-User Pilots
- Networking Forums
- Access to Capital
- Technology Commercialization

San Diego Regional **ENERGY INNOVATION** NETWORK

ACCEPTED COMPANIES

Energy Efficiency & Demand Response	Clean Generation/Renewables
 Conectric  CORRELATE  EVOLUTIONARY ENERGY SOLUTIONS An Energy Efficiency Firm	 IqrenEnergy  PRIMOWIND
Smart Grid & Energy Services	Clean Transportation
 ITEROS  SENSEOPS™ CLEANS PARK	 eMotorWerks  NUVVE

QUALIFICATION REQUIREMENTS

WHO IS ELIGIBLE:

- Must have a business office in California
- Must have a business presence in San Diego, Imperial, Riverside, or San Bernardino County
- Must have a breakthrough “electric” energy technology that fulfills regional and/or state strategic needs
- Technology Readiness Levels 1-9
- Company must ultimately deliver benefits to California electric ratepayers

IF YOU QUALIFY AND ARE INTERESTED IN PARTICIPATING

Applications are accepted on a rolling basis

ENERGY ENTREPRENEURS: APPLY NOW

Online forms at:
cleantechsandiego.org/SDREIN

SAN DIEGO

A Clean Energy Playground



Marty Turock
Strategic Projects
martyt@cleantechsandiego.org

SAN DIEGO

San
Diego
Regional

ENERGY
INNOVATION
NETWORK

Helping entrepreneurs bring their energy innovations to market

