

USA IMPACT REPORT 2021

A woman with long, dark, wavy hair is shown from the chest up, looking off to the right with a thoughtful expression. She is wearing a dark top. The background is blurred, suggesting an indoor setting.

ABOUT NEW ENERGY NEXUS

VISION

An abundant world with 100% clean energy for 100% of the population, in the shortest time possible.

PROBLEM

There are not enough diverse and thriving clean energy entrepreneurs to match the scale of the clean energy transition in the USA.

MISSION

New Energy Nexus aims to support diverse entrepreneurs to drive innovation and build equity into the global clean energy economy.



DENISE RUSHING

Managing Director, New Energy Nexus California

What are your major achievements of 2021?

We are really pleased to have secured \$43 million in follow-on funding for the continuation of the CalSEED Initiative through 2026 from the California Energy Commission. This is evidence of the value of our program in California supporting early-stage entrepreneurs. Through CalTestBed, we distributed \$5.5 million in lab testing vouchers to 25 clean energy (TRL 5-7) entrepreneurs, cultivated a network of over 1000 stakeholders, and culminated the year with the acclaimed 2021 National CalTestBed Symposium. The program was also honored with the 2021 Federal Lab Consortium Award for Outstanding Partnership.

What major challenges have you identified and overcome in 2021?

Our greatest challenge was the pandemic and supply-chain-related delays for both CalSEED and CalTestBed. As a result, we experienced an extended program timeline for CalSEED awardees, and schedule delays for CalTestBed projects.

What are you focusing on in 2022?

In 2022, we will continue the valuable programs offered through CalSEED and CalTestBed, including securing an \$11 million extension of the CalTestBed program taking it through December 2025. CalTestBed will also conduct a solicitation for its third cohort of entrepreneurs.

CalSEED will onboard Cohort 5, comprising 23 entrepreneurs, and support seven more through CTO, and 13 through a Business Plan Competition. We'll also prepare the next concept award solicitation for early 2023 and implement a robust marketing and comms strategy to attract more diverse applicants.

Securing equitable outcomes for local communities and under-represented communities will be key as we catalyze lithium battery-related supply chains in California. Our aim is to create ecosystems and market opportunities for related start-ups.

Q+A



KATE FRUCHER

Managing Director at The Clean Fight NY

What are your major achievements of 2021?

We successfully completed our programming for Cohort 1, focused on solutions that can help decarbonize New York's built environment at scale. The nine companies in Cohort 1 had 88 meetings with our customer partners and raised \$109 million in follow-on funding, while 90% of cohort companies established a base or grew their existing workforce in New York - an excellent outcome proving the value of these programs.

We also launched Cohort 2, focused on mass market buildings in New York. We are pleased to see some progress in building a more equitable ecosystem: of the selected companies, 44% were women and/or non-white while 67% of management teams were POC or women.

We were also awarded a \$1 million EPIC Grant from the Department of Energy and \$375,000 from NYSERDA to launch Supercharge New York to support energy storage innovation.

What major challenges have you identified and overcome in 2021?

We are continuing to work to ensure that our critical justice, equity, diversity and inclusion (JEDI) goals are met, including by having > 30% of our applicants include woman and/or people of color in their leadership, > 40% of selected companies reflect the same, and that significant diversity is reflected in our evaluators, event speakers, partners, and support providers. We achieved this on all fronts, by broadening our outreach strategies and doubling our outreach efforts.

Another challenge is developing a strategy to expand our work and deepen our impact by introducing new program elements. There are many models of innovation, but far fewer models of adoption, which is the focus of our work with growth-stage companies. We developed an expansion strategy to test different models of adoption in order to increase our impact.

What are you focusing on in 2022?

In 2022, we're launching our new program Supercharge NY's Cohort 3, in partnership with NY BEST and Binghamton University. This will apply The Clean Fight's accelerator model to help grow New York's energy storage industry, positioning it as a US hub for energy storage innovation, research, development, and manufacturing;

We are also launching our new programming to test different models of adoption, including grand challenges, speed tests and policy labs.

2021 IN NUMBERS



57

STARTUPS SUPPORTED

*23 CalSEED startups pending approval from the California Energy Commission



1,964

EVENT PARTICIPANTS



20%

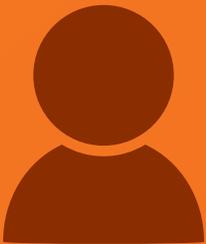
COMPANIES WITH WOMEN IN EXECUTIVE ROLES



\$13,550,000

AWARDED

*including \$5.5M CalTestBed lab vouchers



44%

COMPANIES WITH PEOPLE OF COLOR/ UNDERREPRESENTED PEOPLE IN EXECUTIVE ROLES



\$247,500,000

FOLLOW-ON FUNDING



358

JOBS CREATED

SUPPORTING STARTUPS ACROSS EACH STAGE OF THEIR JOURNEY

CalSEED									
CalTestBed									
The Clean Fight									
Technology Readiness Level (TRL)	1	2	3	4	5	6	7	8	9

WHAT WE DO

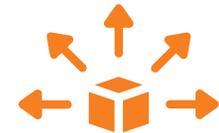


New Energy Nexus, previously known as the California Clean Energy Fund (CalCEF), has been accelerating investment and building the clean energy innovation ecosystem in California since 2004. In 2019, we expanded our US presence with The Clean Fight New York, a NYSERDA funded program, and also launched Third Derivative, which we founded with RMI. Along with our global programs, these efforts advance our vision of a diverse and vibrant ecosystem that connects all who work towards solutions that power the transition to a 100% clean energy economy for all.

This transition requires entrepreneurial ingenuity in many different contexts connected by overlapping networks requiring:



Breakthrough technologies.



New distribution and financing models.



Enterprises that serve all energy customers, not just a select few.



High quality and well compensated employment opportunities in the sector that are available to all.

WHAT WE DO



CalSEED (California Sustainable Energy Entrepreneur Development Initiative) provides concept and prototype awards to early-stage innovators, granting them up to \$600,000 in non-dilutive funding, tailored professional development resources, and access to the best accelerator and incubator programs in California. These funding and support services provide a launch pad to help entrepreneurs succeed in their clean energy startup journey.

Among the first four cohorts, 95 companies received \$24.2 million in CalSEED funding, with nearly \$11.9 million awarded to entrepreneurs from underrepresented groups and women in C-suite positions. CalSEED also impacts low-income and disadvantaged communities in California by way of \$4.4 million in funding to startups located in these areas. In 2021, 24 new startups were selected to join the program in cohort 5 (pending approval from the California Energy Commission). In 2021, the California Energy Commission reauthorized funding for the CalSEED program through 2026.

CalTestBed is a unique initiative funded by the California Energy Commission. It supports California-based entrepreneurs with access to more than 60 world-class testing facilities at nine University of California campuses and Lawrence Berkeley National Lab with the aim to de-risk and accelerate the commercialization of their innovations. In 2020, 25 CalTestBed testing vouchers were awarded at a cumulative value of \$5.5 million, with testing commencing in 2021.

The Clean Fight is New York State's first accelerator to work with high-impact growth-stage companies. It works with visionary customer and capital partners to accelerate the adoption of market ready climate solutions that have the greatest potential to equitably impact the broader New York market.

The focus of the first and second cohorts on our program has been clean buildings, a key challenge for decarbonizing the State. Eight to 10 growth stage companies are selected for each cohort, receiving tailored acceleration services, including hands-on matchmaking with customer partners and industry leading investors. The cohort companies can also apply for up to \$500,000 each in catalytic grant

WHAT WE DO



capital to fund demonstrations or financing rounds. The inaugural cohort of nine companies graduated in 2021, and have raised over \$110 million in follow-on funding and leveraged the \$1.25 million distributed in grant funding over 14 times. The Clean Fight is supported by NYSERDA (New York State Energy Research and Development Agency) and recently received additional support from the Department of Energy to build its third cohort focused on energy storage innovation and manufacturing in New York State.

The Clean Energy Business Roundtable (CEBR) is an event series to convene Californian business leaders, regulators and legislators for important conversations about the opportunities and challenges for the State's energy transition. With New Energy Nexus convening the conversation, these stakeholder groups can exchange ideas and resolve roadblocks to make rapid progress on initiatives towards decarbonizing California. Our 2020 report *Building Lithium Valley: Opportunities and Challenges Ahead for Developing California's Battery Manufacturing Ecosystem* grew out of these conversations.

Lithium Valley: In collaboration with local partners, we are helping to seed a circular economy centered on a fully integrated advanced battery and electric vehicle (EV) manufacturing supply chain in Inland Southern California with public purpose and value at its core. Our goal is to help build a strong public-private-community partnership that includes community and environmental organizations, tribal nations, industry, labor, policymakers and government agencies and to support local entrepreneurs and innovation in the Salton Sea region.

Li-Bridge: In collaboration with NAATBatt and NY BEST, we are engaging industry, national labs, and government agencies to make recommendations on implementing the National Blueprint for Lithium Batteries which was released by the Federal Consortium on Advanced Batteries (FCAB) in June 2021. Our goal is to help build a mission oriented innovation ecosystem that supports the build out of a domestic advanced battery manufacturing supply chain from raw materials to recycling.

SOLUTION SPOTLIGHT

THE CLEAN FIGHT



“New Energy Nexus and The Clean Fight positively impacted Radiator Labs’ growth by way of supportive programming and high-level corporate and investor introductions. The team at The Clean Fight was terrific to partner with in the mission to decarbonize the world’s legacy buildings.”

Marshall Cox,
CEO of Radiator Labs

RADIATOR LABS

Reducing emissions from New York’s radiator-heated buildings

Around 75% of New York’s buildings are radiator-heated. Radiator Labs’ “Cozy” is a smart, internet-connected cover for radiators that enables occupants to control room temperatures in radiator-heated buildings. Their radiator enclosures capture, disperse and regulate heat, preventing excess energy usage, costs and discomfort from the overheating of buildings.

Impact

In combination with in-window heat pumps, Radiator Labs is providing a cost-effective path to electrification, with 80% of the greenhouse gas emission reduction at 20% of the cost. Buildings outfitted with Radiator Labs’ “Cozys” can save up to 45% on heating costs and their installations are 100% financeable through subsequent energy savings.

In 2021 Radiator Labs completed 15 projects installing approximately 3,500 units, mitigating approximately 1,800 tons of carbon annually.

Support from New Energy Nexus

Radiator Labs leveraged their \$150,000 financing grant from The Clean Fight to expand their team with the addition of 3 full time employees in New York City.

Additionally, Radiator Labs utilized a \$97,000 pilot grant from The Clean Fight to support a hybrid electrification demonstration in New York City, and a \$150,000 pilot grant to support an energy efficiency project at a housing cooperative in the Bronx co-funded with ConEd rebates.

The Clean Fight award also supported the development of Radiator Labs zero-cost upfront service offering designed to make the system accessible to low-income and disadvantaged communities.

SOLUTION SPOTLIGHT

THE CLEAN FIGHT



“[New Energy] Nexus was instrumental in helping 75F make key connections in the New York City marketplace. We completed a high-impact installation with Bright Power - a nation-wide leader in strategic energy solutions for building professionals - and our hiring plans are moving swiftly. We’re very grateful to be part of this program.”

Deepinder Singh,
Founder & CEO of 75F



75F

Making dumb buildings smart

Commercial buildings are the fourth largest emitters of CO2 globally. 75F is working to transform building controls, preemptively managing the heating and cooling of commercial buildings in order to reduce energy use.

75F makes dumb buildings smart. Their solution uses wireless sensors, equipment controllers and predictive software to create micro-zones in buildings, allowing for automated and personalized temperature and airflow. Designed to work out of the box, 75F’s technology makes green building automation accessible to markets that historically face cost and complexity barriers.

Impact

The typical 75F installation is projected to reduce a commercial building’s energy use by 30-50%. Deployed nationally, 75F could save 336 million MT of CO2. That’s equivalent to keeping 69 million cars off the road or closing 90 coal-fired plants.

75F has received funding from Next47, the global venture capital firm backed by Siemens, bringing 75F’s Series A to \$28 million and it has announced a collaboration with Daikin Applied Americas to design and deploy a new generation of wireless controls and sensing technology in 2022.

Support from New Energy Nexus

75F leveraged the \$26,000 pilot grant from The Clean Fight to help fund its first New York City installation in the Bright Power headquarters in New York in partnership with Tunstall corporation - a potential sales channel partner. This pilot project served as a case study, highlighting the cost-effectiveness and short payback period of 75F’s Energy Management System in a common New York City office setting.

Additionally, 75F utilized a \$200,000 financing grant from The Clean Fight as part of their \$700,000 commitment to New York state expansion over the next two years. As part of this expansion, 75F is hiring three employees in New York and establishing its first office space in the city.

SOLUTION SPOTLIGHT

CALSEED &
CALTESTBED



“ReJoule will maximize the value of EV batteries by streamlining their life cycle from cradle to cradle. Our industry partners can’t wait to see the results of third party testing [from the CalTestBed initiative].”

Zora Chung,
Co-founder and CFO



REJOULE

Increasing EV battery efficiency and lifetime

CalSEED and CalTestBed awardee ReJoule maximizes the value of every battery by giving used EV batteries the potential to power and store energy on the grid. ReJoule has developed a hardware that provides unprecedented insights into a battery’s state (of health, charge, power) in a manner that makes testing easy and improves the lifetime, safety, and energy efficiency of batteries with real time data.

Impact

ReJoule received \$3 million in follow-on funding from the California Energy Commission (CEC) and \$1 million from the National Science Foundation. With their grant from the CEC ReJoule, partnered with Ford Motor Company, Cleanspark, and GRID Alternatives repurpose used EV batteries. Ford provided their used batteries and technical consultation on the project, Cleanspark provided their energy management software and expertise in deploying microgrids, GRID alternatives provided solar installation, and workforce development in the disadvantaged communities where the sites are.

Support from New Energy Nexus

Rejoule received both the CalSEED concept and prototype award as well as a CalTestBed testing voucher to test their second life battery Energy Storage Systems at UC Riverside.

With \$600,000 in non-dilutive funding from CalSEED plus an additional \$154,540 in testing vouchers from CalTestBed, ReJoule was able to develop and test their prototype - a lightweight, desktop computer-sized device that can diagnose whether a battery is suitable for a second life in less than five minutes, and as little as 30 seconds.

SOLUTION SPOTLIGHT

CALSEED



“CalSEED was an instrumental program supporting Sepion’s early stages finding product-market fit and retiring technical risk. The management team at New Energy Nexus genuinely care about supporting climate-focused entrepreneurs, and it shows. We wouldn’t be where we are today without their support and the CalSEED program.”

Peter Frischmann, CEO

SEPION

Delivering more efficient lithium-metal batteries

Sepion combines the latest in nanoscience, polymer chemistry, and cell engineering to deliver lithium-metal batteries that extend electric vehicle range by 40% and reduce cost of energy by 15%.

Sepion’s advantage lies in its breakthrough, proprietary membrane technology that protects lithium during charging and discharging while being specifically designed to integrate with lithium-ion manufacturing infrastructure, dramatically lowering the barriers to market entry.

Impact

Transportation accounts for 29% of US greenhouse gas emissions. Sepion can accelerate the pace of electrification for consumer and heavy duty vehicles by developing battery products that enable electric vehicles to outcompete combustion engine vehicles in both performance and cost. Since receiving support from CalSEED and CEC Sepion has increased its membrane production capacity 60-fold, established relationships with multiple tier-one battery cell and EV manufacturers, and implemented recurring Diversity, Equity and Inclusion training.

Support from New Energy Nexus

We supported early de-risking of Sepion’s lithium-metal membrane product through the CalSEED concept award and later through the prototype award. This capital helped Sepion retire enough technical risk to successfully close an oversubscribed Series A in November 2021 and attract Solvay as a strategic investor. With the influx of private capital the company is preparing to expand operations in the Bay Area and scale membrane production to meet quotas for customer validation.

SOLUTION SPOTLIGHT

CalSEED



“I value the fact that we can raise awareness for our technology with members of the California Energy Commission. CalSEED has gone above and beyond to forge relationships between entrepreneurs and members of the CEC, as well as private entities looking to get involved in the New Energy Nexus program and cleantech in general.”

CoFounders, Matt Miller, CEO and Dan Poirier, COO

NATIVUS

Reengineering air-conditioning to benefit planet and people

Air-conditioner heat exchanger design has remained unchanged for over 100 years. Traditional air-conditioners blow air over stationary finned-refrigerant coils which leads to fouling and drag, lowering overall efficiency. Nativus' Rotary Heat Exchanger achieves much higher efficiency while significantly decreasing the cost of operation by combining a rotating heat exchanger with a centrifugal fan.

Impact

Nativus is developing technology that is highly scalable, with a specific focus on the disadvantaged and low-income communities who suffer the most from the effects of poor air quality, pollution, and climate change. Its design has been reengineered from the inside-out to be much more efficient at cooling than traditional room units, saving users a significant amount of money.

Support from New Energy Nexus

Nativus was able to leverage its CalSEED relationship to obtain private and public funding, including a Phase II SBIR award through the National Science Foundation.

SOLUTION SPOTLIGHT

CALSEED



“Since winning CalSEED and embracing the program we have since won many great programs from the Shell Gamechanger by NREL to the Halliburton Labs Scale Up program with many in between. Today we are excited and ready to launch and scale Icarus Quartet for widespread deployment with a meaningful targeted impact on the industry.”

**Mark Anderson,
Founder & CEO**



ICARUS RT

Increasing solar panel power output

Solar panels remain remarkably inefficient, converting only about 21% of the solar energy they absorb into electricity. Icarus RT's technology significantly can increase power output and lower the overall cost per kilowatt.

The Icarus Quartet system will maximize solar assets, while reducing the impact of behind-the-meter generation on the grid. At utility scale, Quartet helps control intermittent generation and avoid curtailment. With the Icarus system, California can address the need for low cost, sustainable stored solar energy, continue to advance its 100% RPS goals, and stimulate the economy.

Impact

Icarus improves the performance of PV arrays by boosting power output approximately 12% while doubling the overall energy output. A hybrid system cools the panels, collects and stores the waste heat, and converts it into hot water, substantially reducing reliance on natural gas, and therefore reducing CO2 emissions. It is also estimated to improve lifetime performance and the extended life of solar panels by 10-20%.

Support from New Energy Nexus

We supported Icarus to utilize new materials, new design and manufacturing techniques and build an engineering team to achieve commercial readiness for the Icarus Quartet hybrid PV/T system.

Icarus has also partnered with Chemours, Cleantech San Diego, Southern California Energy Innovation Network, Cleantech to Market, GCxN, Interphase Materials and, UC San Diego Jacobs School of Engineering.

SOLUTION SPOTLIGHT

CALTESTBED & CALSEED



“The CalTestBed award was a great support. Not only to perform tests and qualifications of our technology, but also to connect us to industry and university experts. If we wanted to do the same tests and qualifications that we performed at UCLA through CalTestBed in a different environment, it would cost us significantly more and would take us much longer.”

Dr. Davoud Zamani,
Co-founder



ALD TECHNICAL SOLUTIONS

Developing advanced materials to increase electric power capacity

ALD Technical Solutions is a woman-owned clean tech startup that develops innovative applications of advanced composite materials in clean and renewable energies.

ALD Technical Solutions Composite WiRE Wrap (CWW) technology is novel, lightweight, fast and easy to install. The long lasting, reliable, environmentally friendly and cost effective structural composite reinforcement system will be installed and cured in-place around existing Aluminum Conductor Steel Reinforced (ACSR) transmission lines.

Impact

The technology is currently in testing. ALD Technical Solutions aims to increase electric power capacity and decrease the sag of transmission lines with the goal of improving safety.

Support from New Energy Nexus

ALD received a concept award from CalSEED, and has received a CalTestBed voucher for ~\$300,000 to conduct prototype testing at the UCLA Smart Grid Research Center.



SOLUTION SPOTLIGHT

CALTESTBED & CALSEED



“If scaled widely, the Takachar technology can enable rural communities to create significantly more value from their unmerchantable crop and forest residues, thereby reducing the risks of wildfires, air pollution, and carbon footprint. The CalTestBed program has drastically cut down the costs of laboratory testing of some of our mission-critical samples and enabled us to go a lot further.”

Kevin Kung, Founder and CTO*

Photo is of Vidyut Mohan, CEO and co-founder of Takachar.

TAKACHAR

Reducing emissions from agricultural waste

Around \$120 billion of agricultural waste is generated every year. The burning of agricultural waste causes air pollution impacting human health and the global atmosphere. Most crop and forest residues (biomass) are loose, wet, and bulky, making them difficult to collect and centralize.

Takachar's small scale, low-cost, portable system can be latched on to the back of tractors and pick-up trucks to deploy to rural farms and hard-to-access logging landings. These systems process the waste into higher-value, densified bio-products before transportation.

Impact

If scaled, Takachar's technology could reduce smoke emissions from agricultural waste by up to 98% which will help improve the air quality. It could cut a billion tons of carbon dioxide a year.

Takachar was awarded a prestigious Earthshot Prize in 2021, and garnered more than \$2 million in follow-on funding.

Support from New Energy Nexus

Takachar has been granted \$600,000 in non-dilutive funding from CalSEED and a voucher of ~\$260,000 through CalTestBed to conduct prototype testing at UC Santa Barbara's Renewable Natural Gas Development Laboratory.

WHO WE ARE



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Thank you to all our funders who made this work possible and all our partners for actively supporting us!



CalTestBed CalSEED The Clean Fight



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