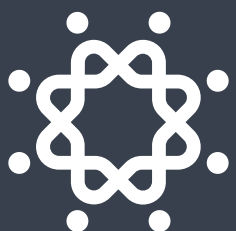




Fellows Pitchbook

EEI 2023



Breakthrough
Energy
Fellows

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WHAT IS THE BE FELLOWS PROGRAM?

Lack of sufficient financial and professional resources are two of the biggest challenges facing any team developing and commercializing a new technology. The Breakthrough Energy Fellowship helps address these barriers by providing Fellows with significant financial and professional support. Business Fellows receive a stipend for living expenses and Innovator Fellows receive R&D funding for technology and product development. All Fellows will have access to scientific and business expertise, including a tailored curriculum, mentorship and leadership coaching, and the world-class Breakthrough Energy network of partners to help Fellows successfully bring their technologies to market.

The program is designed to ensure early-stage projects have the resources they need for commercialization. The Fellows program focuses on funding teams to derisk critical technical milestones to advance the innovation on its path to commercialization and venture capital investment.

The Breakthrough Energy Fellows Program, over time, will find and support hundreds of the best and brightest individuals and teams, from across the globe, working to develop, scale, and commercialize technologies that have the potential to reduce carbon emissions by at least 500 million tons per year by 2050.

WHAT IS AN INNOVATOR FELLOW?

Innovator Fellows are scientists and engineers with exceptional climate innovations who are working toward full commercialization of their technology. Throughout the Fellowship, they work closely with the BE Technology Management team to accomplish technical milestones that advance their innovation to market. The BE Fellowship Experience team ensures Fellows have access to important curriculum and resources to guide their leadership and company-building journey. All Fellows who are part of a project team, regardless of day-to-day roles on their team, are considered Innovator Fellows.

WHAT IS A BUSINESS FELLOW?

Business Fellows are entrepreneurial and experienced experts who complement the Innovator Fellows' skills to help accelerate Innovator Fellows' path to market. Business Fellows have deep expertise and experience in markets, economics, business models, rapid scale-up of technologies, and overall industry expertise across the program's identified focus areas. They are, above all, passionate leaders who are excited about the power of science and engineering to transform the world's biggest industries.

TECHNOLOGY FOCUS AREAS

The Cohort 1 & 2 BE Fellows are focused on:

- Cement
- Hydrogen
- Food and agriculture
- Long duration (seasonal) energy storage
- Carbon dioxide capture, storage, and sequestration
- Wind
- Water
- Solar
- Heating & Cooling
- Advanced Materials
- Fuels and Chemicals
- Steel

PROJECT OVERVIEWS



AIKIDO TECHNOLOGIES

San Francisco, California

About the Project

Thanks to technological advances and policy incentives, the costs of onshore wind and solar photovoltaic (PV) energy have declined by 75% and 74% respectively since 2008. However, offshore wind – despite being stronger and more consistent than onshore wind – remains more expensive.

To bring floating offshore wind closer to cost parity with other forms of renewables, Aikido Technologies is developing three game-changing technologies to cut the levelized cost of electricity of floating wind: the Aikido Turbine, Controller, and Platform. The Controller can be added on to existing, conventional wind turbines to reduce installation time and vessel requirements; the Aikido Platform streamlines the logistics of assembling, transporting, and deploying large, floating wind units. Aikido's novel system integrates the platform and turbine into a fully assembled unit that can be transported horizontally to enable floating offshore wind turbines to be deployed from 80% of ports in the U.S -- even those blocked by bridges. Once in place, a simple water ballasting procedure upends the platform into its operational configuration. During the Fellows program, Aikido will focus on piloting the Aikido Controller and Platform using a 2MW conventional turbine.

Aikido Technologies' approach reduces the air draft, transit draft, and width required for transport. This is critical to leveraging existing maritime infrastructure and ensuring that local manufacturing sites can be used to build these large, steel structures for projects in the U.S. and abroad.

aikidotechnologies.com



ALUMINIO

San Francisco, California

About the Project

Silver materials used in solar cells are both scarce and costly – accounting for 10% of the world's annual silver supply and 10% of the cost of solar materials. This material limitation has slowed the adoption of the most efficient solar cells around the world, as consumers and manufacturers worry about long-term panel price increases.

Aluminio is developing a new approach to replace over 90% of the silver in solar cells with aluminum, a less expensive and more abundant material. To aid with implementation, they also have designed a high-speed, high-precision process, which can be used to increase the output of existing production lines. Together, these approaches will make it easier and more affordable to scale solar energy technology.

aluminio.tech



HOLOCENE

Knoxville, Tennessee

About the Project

Removing carbon dioxide already in the atmosphere is essential to achieving net-zero global emissions by 2050. Large-scale solutions to capture and permanently store carbon are needed to supplement natural, ecological processes like photosynthesis that store CO₂ in trees and soil.

Holocene is developing a regenerative direct air capture system that employs two novel organic chemistry compounds: one to increase the absorption capacity of water for carbon dioxide and one to remove the carbon dioxide through precipitation. The concentrated CO₂ is to be stored underground or aboveground in alkaline wastes. Both chemical compounds are fully recycled through the process and can be integrated with traditional chemical engineering processes and widely available equipment. By using low-temperature regeneration of the compounds used in the direct air capture process, Holocene's solution requires less energy than current technologies, has the advantages of solution-based continuous processes, and can be operated with renewable energy power sources.

Holocene can provide low-cost and easily-scalable carbon removal from the atmosphere.

theholocene.co



MANTEL

Boston, Massachusetts

About the Project

Capturing carbon dioxide is essential to achieving net-zero global emissions by 2050. Carbon capture is especially important in the hard-to-abate industrial sectors, like steel making.

Mantel is developing the first liquid-phase, molten salt-based carbon capture process that is compatible with the high temperatures found inside boilers, kilns, and furnaces. Most existing carbon capture technologies require low temperatures to operate, which leads to high levels of thermal loss (i.e., wasted energy) and results in reduced efficiency and increased operating costs.

By operating at high temperatures and using liquid materials, Mantel is able to take advantage of the heat generated from the capture process to produce additional useful energy. Mantel's solution is tailored to meet the needs of heavy-polluting industrial processes that are extremely difficult to decarbonize and help the global economy reach net-zero.

mantelcapture.com

