#### How does ARPA-E support NREL?

NREL has played a key role in approximately \$2.93 billion in R&D funding from ARPA-E since 2009. This funding has been used for over 1,270 potentially transformational energy technology projects, including developing new solar cell material growth techniques, improving grid control, and reducing energy use in transportation.

What is ARPA-E funding?

ARPA-E funding refers to financial support from the Advanced Research Projects Agency-Energy (ARPA-E). Jody Robins and his team are utilizing this funding to tap into a vast, untapped source of clean electricity--geothermal energy. Geothermal rock is harder, higher-temperature, and less porous than the rock typically found in oil and gas wells, making drilling more difficult and expensive.

What makes ARPA-E projects exciting?

The high-risk, high-reward nature of ARPA-E projects what makes them exciting. NREL researchers use their most creative problem-solving approaches to tackle these projects. This year, ARPA-E-funded projects will be showcased at the 12th annual ARPA-E Energy Innovation Summit, to be held on May 23-25 in Denver, Colorado.

How does ARPA-E work?

ARPA-E supports projects to the point where they can secure follow-on funding so that they can further develop their technologies and then ultimately deploy game-changing energy technologies. The Advanced Research Projects Agency-Energy (ARPA-E) funds game-changing energy technologies that are too early for private-sector investment.

What is the mission of ARPA-E?

ARPA-E's mission is to advance promising technologies that are not yet ready for private-sector investmentwith the goal of developing new ways to generate, store, and use energy.

What does ARPA-E mean for energy storage?

For ARPA-E, that means getting the levelized costof energy storage--which takes into account all costs



incurred and energy produced over a lifetime--down to less than five cents per kilowatt-hour,Litzelman says,which would be a 90% reduction from 2020.



Since ARPA-E's inception, the OPEN program has served as an opportunity to advance transformative energy breakthroughs in critical areas that fall outside the scope of the agency's focused technology programs. Supplying greenhouse gas-free abundant primary energy will meet the growing need for energy while satisfying net zero goals



March 1-2, 2021 DAY 1 ??? March 1 TIME (ET) TITLE SPEAKER 11:45 AM SPEAKER/PRESENTER SIGN-ON and TECH CHECK Day 1 Speakers and ARPA-E Staff Only 12:20 PM ATTENDEE SIGN-ON BEGINS All Attendees May Sign On Now 12:30-12:35 MEETING STARTS Host Introduction & Logistics Nancy Hicks Sr. Events Manager, Booz Allen Hamilton ???



ARPA-E sat down with Eric McFarland, CEO of Urban Electric Power (UEP), to discuss the challenges of leading a start-up company, the company's partnership with ARPA-E, and its participation in New York Energy Week. Question: Tell us about your technology and UEP's relationship with the CUNY Energy Institute? Eric McFarland: Urban Electric Power ???





This Exploratory Topic seeks to develop a set of publicly available planning tools for identification, evaluation, and prioritization of energy storage-related technology developments whose deployment would significantly reduce GHG emissions from the rail freight sector. Projects will be informed by, and consistent with, the economic and logistical constraints of the rail freight ???

ARPA-E hired Dr. Philseok Kim during the height of the pandemic to lend his wealth of expertise in materials to the energy landscape. Previously the co-founder and CTO of Adaptive Surface Technologies, spun-out of an ARPA-E-funded Harvard University project focused on non-slip coatings to prevent marine fouling and improve the fuel economy of the ???

enhancing wind turbine designs to creating underground energy storage and improving carbon capture and storage technologies. Beyond direct support, ARPA-E awards have helped companies leverage more than \$200 million in additional private investment. This brief provides an overview of ARPA-E and highlights of supported projects. ! THE ARPA-E PROGRAM





To create energy storage that addresses Li-ion limitations, the project team has identified an unlikely source: inactive upstream oil and gas (O& G) wells. NREL will repurpose inactive O& G wells to create long-term, inexpensive energy storage. Team member Renewell Energy has invented a method of underground energy storage called Gravity Wells that will ???

Under ARPA-E's statutory charter, one of our key goals is to develop technology that contributes to the reduction of energy-related emissions. Our recently announced FLExible Carbon Capture and Storage (FLECCS) program - led by Program Director Dr. Scott Litzelman - focuses on this goal, by developing CCS technologies that enable power generators to be ???



ARPA-E held a two day workshop in Chicago from December 7th to the 8th inorder to discuss a potential funding opportunity being considered for long-duration energy storage (defined as 8-50 hours). Evolved Energy was invited to offer perspectives on the need and prospects for this type of storage. Under consideration were chemical and thermal ???





Overview of ARPA -E Vehicular Energy Storage Programs May 8, 2013 . ARPA-E Mission 1 . Evolution of ARPA -E 2 2007 RISING ABOVE THE GATHERING STORM PUBLISHED 2007 AMERICA COMPETES ACT SIGNED Need: Full Situational Awareness and Response 15 Operational state -Weather - Terrain - Drive profile State of the cells -Thermal - Chemical

ARPA-E provides up to \$30 million to develop storage technologies for secure, resilient grid. Save Energy, Save Money. Save Energy, Save Money. Heating & Cooling Energy storage will play an increasingly critical role in the resilient grid of the future. Storage systems provide important services, including improving grid stability



Since 2009, ARPA-E has developed more than 40 focused technology programs to push the boundaries of science and technology and fundamentally change how we get, store, and use energy. As a complement to its focused programs, ARPA-E periodically releases "open" funding solicitations. These programs identify high-potential projects that ???





PROPEL-1K aims to develop emission-free, high-energy, and high-power energy storage solutions to electrify domestic aircraft, railroad, and ships. Projects must achieve energy density targets of so-called "1K" technologies that equal or exceed 1,000 watt-hours per kilogram and 1,000 watt-hours per liter at the end of life and at the net

Today's global economy relies heavily on energy storage. From the smallest batteries that power pacemakers to city-block-sized grid-level power storage, the need for batteries will grow at a compounded rate of over 15 percent in the coming years. Lithium-ion batteries are today's gold standard for energy storage but are limited in terms of cell performance and are built with non



WASHINGTON, D.C. ??? The U.S. Department of Energy (DOE) today announced \$15 million for 12 projects across 11 states to advance next-generation, high-energy storage solutions to help accelerate the electrification of the aviation, railroad, and maritime transportation sectors. Funded through the Pioneering Railroad, Oceanic and Plane ELectrification with 1K ???





July 13th & 15th, 2021 The Advanced Research Projects Agency-Energy (ARPA-E) held a virtual workshop on CO2 Mineralization for in situ Storage and ex situ Enhanced Metals Recovery on July 13th & 15th, 2021. The primary purpose of this workshop was to discuss research opportunities targeting enhanced mineralization of atmospheric carbon as a tool for both ???

ARPA-E ANNOUNCES \$30 MILLION TO USE QUANTUM COMPUTING FOR GROUNDBREAKING CHEMISTRY AND MATERIALS SCIENCE . ARPA-E Investor Update Vol. 23: Zap Energy's Fusion Power Plant Demo. 10/16/2024. How Could Phytomining Bolster U.S. Critical Mineral Supply Chains? 08/27/2024.



New Technology Need: Low-Cost Energy Storage Solutions . Grid-scale Rampable Intermittent Dispatachable Storage (GRIDS) Program Metrics Limited Sites Cost Target Pumped Hydro . Underground Compressed Air 2-5X Lower . 1hr . 10min . Minimum Response Time Seconds Minutes Energy Storage Costs (\$/kWh) \$10 \$100 \$1000 . \$100 . \$1K ???





Much of ARPA-E's funding is awarded to projects in specific energy-related technology areas, but ARPA-E also provides open funding opportunities for high-potential projects that address the full range of energy-related technologies and concepts. and the extent to which they meet technical needs currently underserved by other parts of the



WASHINGTON, D.C. ??? Today, the Advanced Research Projects Agency-Energy (ARPA-E) announced approximately \$11.5 million in funding through its new Inspiring Generations of New Innovators to Impact Technologies in Energy 2024 (IGNIITE 2024) program focused on early-career scientists and engineers converting disruptive ideas into impactful energy ???



News Media Contact: (202) 586-4940 WASHINGTON, D.C. ??? The U.S. Department of Energy (DOE) today announced up to \$30 million in funding for projects as part of a new Advanced Research Projects Agency-Energy (ARPA-E) program: Duration Addition to electricitY Storage (DAYS). DAYS project teams will build innovative technologies to enable ???





Antora Energy, a leader in zero-emissions industrial heat and power, has been selected by the Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) to begin award negotiations



Dr. Charles Werth is a new ARPA-E Program Director. His research prior to joining ARPA-E focused on the intersection of mass transport, fluid flow, interfacial and geo-chemistry, redox reactions, microbial physiology, and material science for the development of sustainable water treatment, groundwater remediation, and geological carbon sequestration ???



So believes ARPA-E, the Department of Energy's blue-sky research program, which this week announced \$28 million in R& D grants for 10 projects aimed at delivering energy storage systems that can





WASHINGTON, D.C. ??? The U.S. Department of Energy today announced \$11.5 million in funding for 12 projects as part of Phase 1 of the Advanced Research Projects Agency-Energy's (ARPA-E) FLExible Carbon Capture and Storage (FLECCS) program. FLECCS project teams will work to develop carbon capture and storage (CCS) processes that better enable ???

. t t t. The ARPA Model: Different by design The Need: The state-of-the-art CO. 2 . capture technology, aqueous amine solvents, Transformational approaches to energy storage to enable wide deployment at very low cost . Thank you. Brenda HH PhD aendl dler, Ph.D. Brenda.Haendler@hq.doe.gov . 28. Title: