Technology Showcase

The Global Clean Energy Action Forum Technology Showcase convenes new technological advances, innovations, and the latest research results across clean energy solutions. Come experience over 50 engaging and interactive exhibits whose innovative solutions are helping to meet global clean energy goals.

The Showcase will sit in the heart of the exhibit hall so that Ministers and all attendees can experience these technologies.

Exhibit Summaries

**AIT Austrian Institute of Technology: Austria in Mission Innovation**

The booth “Austria in Mission Innovation” showcases Austria’s engagement in Mission innovation through the Net-Zero Industries Mission and the Urban Transitions Mission as well as energy innovations made in Austria. The highlight of the showcase exhibit represents an augmented reality (AR) interactive experience which shows digital twins of buildings and industrial plants. The so-called AR - Industrial Simulator can be used to further optimize process-related energy consumptions in the industry.

**Anax Power: Clean Power from Natural Gas, Without Combustion**

The 500kW Anax Turboexpander (ATE) generates clean, distributed electricity from natural gas, without combustion. The technology repurposes the energy lost in the gas let-down process at pressure reducing stations (PRS) to drive a generator that is installed in parallel with the PRS. Since there is no combustion, gas transmission companies, producers, utilities, and large industrial sites can improve their return on existing infrastructure, reduce their carbon emissions, and create value through the sale of power. This system also enables these companies to offset their existing power consumption with cleaner
and more cost-effective power. The technology is called a natural gas turboexpander generator, and it uses the gas' pressure, flow, and waste heat to generate 500kW of power per unit. Units can be installed to generate as much power as the gas flow can support.

**AR Challenges Ltd: W2E System Based on the Circular Economy, Zero Waste and Distributed Green Energy**

AR Challenges will present its W2E waste processing system. It is a unique, advanced system based on the circular economy, zero waste to landfill, and ALL waste processing and distributed energy via thermal hot air supply. AR Challenges Ltd. Works in waste to DME and bio-jet fuels as well.

**AUROS Group: Decarbonize Existing Buildings Using Building Science and Data Science**

AUROS will feature its patented methods for integrating physics-based building performance simulations with live, trended data from building operations to prove performance achievements, expose gaps in performance and demonstrate the open, integrated approach to data that is essential to assess the potential of existing buildings to fully decarbonize. We will provide login credentials to all attendees for any mobile device to access (read only) trended data along with simulated data for a variety of building types and performance parameters, for the purpose of demonstrating how this approach to data reduces risks of investment and ensures building owners have secure access and control over their building performance data.

**Azena: Reducing Carbon Emissions with Azena’s AI-enabled Remote Monitoring Suite**

Energy companies aim to reduce carbon emissions to achieve net-zero greenhouse gas emissions by 2050. Reliable, automated monitoring of facility assets is key to accomplishing this goal in a cost-efficient manner. AI-enabled video analytics can help monitor sites for gas and liquid leaks, smoking flares, and other environmental violations. During this showcase, attendees will learn how Azena turns security cameras into smart sensors that monitor facility assets 24/7 and send notifications about anomalies to site operators to act immediately. This helps energy companies not only to quantify and verify emissions over time, but also to increase site safety and productivity. Our team will demonstrate AI video analytics for Flare Monitoring, Tank Level Monitoring, Gas Leak Detection, and other use cases. Learn more at: www.azena.com/energy-solutions

**Beyonder AS: To Sustainability and Beyond - Turning Norwegian Sawdust into Batteries**

Beyonder will showcase new world class sustainable battery technology. Beyonder's patented process makes high power batteries to help solve the world's challenges with the green transition. Attendees will create sawdust from wood and participate in the process of creating carbon from the sawdust, turning wood waste into active battery material. You will also get a small souvenir. Beyonder will demonstrate how the active material, together with a revolutionary new technology is used to improve performance and increase lifetime in battery cells. The cells are then integrated into a battery pack. The pack enables us to solve several of the current energy challenges, allowing renewable power into electricity grids around the globe, electrifying heavy duty vehicles, land based as well as seaborn, and provide solutions for fast and powerful charging infrastructure.

**Blockchain Triangle: Digital Finance Platform for ESG, Infrastructure & Climate Compliance**

Blockchain Triangle delivers climate compliance solutions to banks, asset managers, and capital markets servicing corporates in Industrials, Materials, Energy and Utility segments, and to governments including municipality and state governments.

**Breakthrough Energy: Breakthrough Energy Fellows: Innovating the World to Net-Zero by 2050**

The Breakthrough Energy booth will showcase eight climate technologies in interactive, engaging pitches by the Breakthrough Energy Cohort 1 Fellows from around the world. Attendees will hear about the latest progress in developing industrial decarbonization technologies in hydrogen, cement, steel, fertilizer, and electrofuels. Attendees will learn about opportunities where their governments or organizations can help accelerate the development and deployment of each technology. Fellows will provide an array of interactive multimedia resources to accompany their pitches and will be available to answer questions afterwards. The Breakthrough Energy Fellows (BE Fellows) program identifies and supports the best and brightest individuals and teams 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. In some cases, this means nurturing ideas until they are ready for venture capital investment. In others, it means enabling technology acquisition, non-traditional financing, government partnerships, joint ventures, or other pathways.
Global Clean Energy Action Forum

Business and Investment Development Agency
CzechInvest: Innovative Battery Technologies from the Czech Republic

Innovative technologies are the driving force of many world economies. As a member of the European Union, the Czech Republic stands side by side with other 26 member countries in pursuing the ambitious objective to make Europe the world’s first climate-neutral continent by 2050. Being the second most industrialized country of the European Union makes the aspiration to achieve carbon neutrality more challenging for the Czech Industry. The strong prevalence of automotive industry and inevitable energy transition towards renewable has demonstrated the essentiality of new highly effective battery technologies. The Czech Republic's robust science and research infrastructure joined forces with innovative SMEs as well as large stakeholders to become a leader in battery technologies. Existing initiatives strive to contribute to the transition of current, fossil-fuels-based economy towards carbon neutrality, to the technological transformation of industry and to promote projects with high value-added that will impact all aspects of our society.

CALSTART: ZET (Zero-Emission Truck) Global Expo

Diesel emissions from medium- and heavy-duty vehicles (MHDVs) are on the rise and threaten our collective ability to meet Paris Agreement climate goals. Essential to solving the climate crisis, zero-emission trucks (ZETs) provide a path to potentially avoiding the worst impacts of climate change. However, many nations lag when it comes to adopting the policies, programs, tools, and incentives needed to grow this critical transportation segment. Why? Many do not realize ZETs are widely available for purchase today, they meet a myriad of user needs, and they bring economic and operational benefits. The ZET (Zero-Emission Truck) Global Expo puts a range of vehicles - refuse haulers, semi tractors, step vans, box trucks, and more - on display with the goal of showcasing the reality and benefits of ZETs today.

Carbon Clean: Carbon Clean Technology to Achieve ‘Net Zero’

Carbon Clean’s vision is to deliver industrial decarbonization on a gigaton scale. Today, we are on track to achieve this vision of capturing 1 billion tons of CO₂ by the mid-2030s. Our mission is to revolutionize the carbon capture industry with breakthrough innovation and products that move the sector away from costly, large, and complex technologies to modular and standardized solutions that can be delivered in a matter of weeks. CycloneCC our breakthrough technology is at the heart of this showcase. It is a fully modular, prefabricated and skid-mounted carbon capture solution that reduces the overall cost of carbon capture by up to 50% and has a footprint that is up to 50% smaller than conventional carbon capture units. CycloneCC has been successfully pilot tested and is currently being commercialized with select partners, including CEMEX, Chevron, and Veolia, with commercial roll-out scheduled for 2023.

Carbon Engineering Ltd. and 1PointFive: Building Direct Air Capture today, for a net-zero future

Removing the vast amounts of carbon dioxide (CO₂) from the atmosphere deemed necessary by scientists will require creativity and collaboration in the decades to come. Solutions like Carbon Engineering’s (CE) Direct Air Capture (DAC) technology - that pull CO₂ directly from the air at megaton scale - are poised to play a critical role. CO₂ captured through this process can be safely and securely stored deep underground to deliver permanent carbon removal or used as a feedstock to produce low-carbon products - like transportation fuels. To help deploy large numbers of DAC projects, CE and 1PointFive, a subsidiary of Occidental's Low Carbon Ventures business, have joined forces to execute commercial-scale DAC facilities globally. In the continued spirit of collaboration, CE and 1PointFive are pleased to jointly invite guests to learn about DAC-based climate solutions and dive into an up-close and interactive look at industrial facilities currently underway.

Carnegie Mellon University: Batteries for Electric Aviation

The team is developing and scale up lithium metal batteries for electric aviation. The team will develop and scale up a commercial, modular large-pilot line for customer validation with a clear path to larger GWh/y production capacity of new Li metal-based batteries.

Climformatics Inc.: Actionable Climate-Smart Proactive Risk Resilience for Solar Energy Utilities

Climformatics is a women-owned company working in climate/weather modeling, and machine learning to build a predictive tool to predict localized solar power and climate variables one-day to one-year ahead, and thus help solar utilities to Proactively Prepare and Protect solar utilities and economically disadvantaged communities from catastrophe climate risks. We recently won the DOE Solar Prize ‘Ready’ award and the CALSEED concept award from California Energy Commission.

The content of this document is considered draft and is subject to change.
In the short term our solutions not only predict the solar radiation, number of sunny days in a season and year well ahead of time but also predict temperature, precipitation, cloudiness, wind, humidity. We can accurately estimate the expected solar power in a solar power installation, hence enabling utilities to estimate their contribution to grid reliability. In the long term, it benefits solar power infrastructures and installations from location siting information prediction, long term sustainability, grid vulnerability assessment for extreme weather events.

**Daheco Engines & Energy, LLC (DE&E): Non-Battery Aerated Electric Storage & Retrieval (AES&R)**

DE&E will showcase its technologies (under development) that makes possible unlimited energy storage and retrieval without the use of batteries. A new class of Airlectrified™ piston engine, tanks, and controls use grid or renewable electricity to store energy as UHPA (ultra-high-pressure air) and when needed generate electricity powered on the stored UHPA. Called an AES&R, the system is expected to achieve over 80 percent overall efficiency from electricity to air to electricity (E2A2E). As a secondary use, the same exact engine can operate on both electricity and UHPA simultaneously for use in any form of mobility creating great power and extended range / kWh.

**Dalrada Financial Corporation (DFCO): Dalrada Heat Pumps Provide Carbon-Reducing Heating and Cooling without Combustion**

Dalrada’s Likido®ONE heat pumps are 7 times more efficient than traditional heat pumps and boilers and offer a combustion-free process that decarbonizes heat while providing impressive cost savings. Buy American Act (BAA) and Trade Agreements Act (TAA) compliant, this next-generation heat pump uses 100 percent renewable energy or grid electricity and needs only 25% of fuel energy to enable the harvesting of 75 percent of recovered energy from non-generated sources, including waste heat, air, water, or ground sources. The fully contained, modular design is an easy-to-build, space-saving solution ideal for a variety of industries. Common applications include hotels and spas, hospitals, schools and universities, food production and processing, and food manufacturing, among others. Dalrada Financial Corporation’s Likido®ONE heat pumps run on a FedRAMP-secure platform and help support the global initiative of transitioning to Net Zero through renewable and sustainable energy innovation, delivering essential technology for reducing carbon emissions and improving overall energy efficiency.

**Department of Energy, Office of Recruitment and Advisory Services: DOE, Human Capital, Office of Recruitment and Advisory Services**

As the largest funder of clean energy technology in the country, DOE has led the way on the innovations that have brought us the wind, solar, and energy efficient technology we know today. Now, with the investments from the Bipartisan Infrastructure Law, DOE’s Clean Energy Corps will be able to do even more. With a focus on deploying next generation clean energy technology, the Clean Energy Corps will help America meet its goals of a carbon-free power sector in 2035 and a decarbonized economy in 2050. But we cannot do it without YOU. The Clean Energy Corps is hiring NOW. We need talented, diverse, kind, and hardworking people like you to join this team. DOE offers YOU the chance to be a part of the clean energy revolution and make a difference in the fight against the climate crisis. Join us! Apply Now to the Clean Energy Corps!

**Eos Energy Enterprises, Inc.: Deploying Zinc-based Battery Storage to Accelerate the Clean Energy Transition**

Eos Znyth™ battery storage technology is a commercially proven long-duration energy storage solution built to address the challenges of transitioning the world to clean energy. Eos energy storage systems, based around our revolutionary static zinc battery technology, overcome the limitations of conventional lithium-ion technology for long-duration applications. Manufactured in the U.S.A. and deployed around the world, Znyth modules are simple, safe, durable, flexible, and available to serve a variety of use cases. Our static zinc batteries are nonflammable, noncorrosive, and tough enough to maintain peak performance in extreme temperatures, eliminating the need for costly fire suppression or HVAC systems. Able to accommodate an expansive range of operating parameters, Eos energy storage systems have the flexibility to pair with renewables and make our grids more resilient. With these positively ingenious energy storage solutions, Eos Energy Enterprises is accelerating the shift to clean energy.

**Explorer Vessel**

A hybrid electric passenger vessel, designed to accommodate fuel cells. There will be programming on the vessel throughout the day. This vessel engages in significant student programming in its “everyday” life. **Explorer Riverboat – Rivers of Steel**
Grassroots Energy Inc.: Bio-Hydrogen Innovation - a Carbon Negative Approach

Grassroots Energy has developed an innovative Bio-Hydrogen production using organic wastes to remove the need for energy-intensive feedstock sterilization to produce nearly 100 percent Hydrogen. Grassroots’ biphasic dark and photo fermentation system uses proprietary microbes to produce Hydrogen in an energy efficient way. The CO₂ is sequestrated using an algal pathway to make the Bio-Hydrogen generation carbon negative. The residue from the operations is enriched into organic fertilizers, making it a circular economy model. The Bio-Hydrogen can be used either blending with Renewable Natural Gas (Biomethane) or stand-alone energy source. Grassroots Energy is currently pursuing economic and technical feasibility studies in India and UK with mini grid developers and Industrial applications like paper pulp, cement, automotive, food processing, glass manufacturing etc. Grassroots Energy’s approach is quite competitive to produce green hydrogen over alternatives.


The energy transition demands low-cost, environmentally friendly, flexible, and resilient solutions, and GTI Energy is accelerating actions to protect the planet for future generations. Producing, moving, storing, and using energy responsibly to meet carbon emission reduction goals is core to all that we do. GTI Energy is leading efforts to deliver a versatile portfolio of affordable low-carbon options that can help assure that people in all communities have access to clean and affordable energy and economies worldwide have the resources needed for growth. GTI Energy will engage attendees in an interactive experience that moves through the energy value chain, highlighting our vision for managing carbon and growing economies and spotlighting a wealth of impactful innovative solutions that transform lives, economies, and the environment.

Idaho National Laboratory: Digital Engineering in Advanced Nuclear to Support Carbon-Free Energy

Using a Microsoft HoloLens mixed-reality headset, participants will view a small, remote community and make decisions regarding how its energy is produced. The user will be able to select different energy sources including microreactors and will see the consequences in terms of carbon emissions. Users will also see how the use of digital twins can help reduce operational disruption in microreactors by predicting issues that can be addressed before components fail.

InceptEV: Predictive Software for Electric Vehicle Performance and Charging Infrastructure

InceptEV is a simulation-first electric vehicle data company for fleet operations planning, optimization and charging infrastructure for both public and private deployment. InceptEV uses its proprietary data and technology to predict fleet performance prior to purchasing assets and forecast operational requirements. This allows InceptEV to provide clients with the information needed to purchase the right vehicles for their application, intelligently manage their assets and deploy the charging infrastructure needed for their operations. At the Showcase, attendees can utilize the software to simulate electric vehicles operating within your area and estimate their performance. Using InceptEV software, attendees will have an opportunity to see how different electric vehicles, including eVTOL aircraft, operate around the world and see what is impacting their performance. InceptEV will also have examples of how the software can be used for charger deployment and how it can be impacted by factors such as the availability of work/home charging.

KAUST: King Abdullah University of Science & Technology

King Abdullah University of Science and Technology (KAUST) strives to be a global leader, recognized for science and engineering excellence and its contribution to delivering effective solutions to national and global challenges. Research into Circular Carbon Economy (CCE) technology solutions has been an integral part of KAUST’s portfolio, including CO₂ capture, Nature-Based Solutions, Renewable Energy and CO₂ utilization. With the recent launch of the KAUST Circular Carbon Initiative (CCI), we aim to connect more deeply the different strands of our CCE research, to create a strong and well-informed network of researchers at different career stages, to identify and seek to engage missing expertise, and to proactively contribute to the ongoing efforts of the Kingdom of Saudi Arabia to implement a CCE National Program.

Liatris Inc: High-Performance, Eco-Friendly, Non-Flammable Insulation

Founded in 2018, Liatris is an advanced materials company which is making life more affordable, comfortable, and safe through management of thermal energy. Liatris aims to deliver the cleanest and fastest energy savings by mass-producing insulation that is easy to install, economical, efficient, and environmentally friendly. In 2019, Liatris was selected as the top technology out of >400 entrants in Sto’s Building Solutions, Renewable Energy and CO₂...
Materials Challenge, and has received DOE, NSF, and various other commercial and grant funding. Liatris’s first product will be a non-combustible insulation board for building exteriors, and it will show fire testing on small prototypes, along with high-throughput materials development using robotics.

**Lucid Motors: Lucid Air - MotorTrend Car of the Year 2022**

The longest range, fastest charging electric vehicle in the world. **Luxury Electric Cars | Lucid Motors**: The Lucid Electric Vehicle is a disruptor in the EV space across the globe. Range and efficiency are widely recognized as the most relevant proof points by which EV technical prowess is measured – and the Lucid Air sets new standards in both, while also offering world-beating performance wrapped in a luxury-forward design. In September 2021, Lucid Group’s Lucid Air Dream Edition Range received an official EPA rating of 520 miles of range, making it the longest-range electric vehicle ever rated by the EPA, delivering at least 100+ miles of additional range over its closest competitor. Audiences will experience the Lucid Air technology by interacting with a vehicle and speaking with Lucid’s knowledgeable representatives.

**Lumen Energy: Deploying C&I Solar at Scale**

Lumen Energy will demonstrate how it offers a software-based solution to help building owners rapidly assess the complex solar economics of their buildings and deploy solar across their portfolio with the help of its EPC network.

**Mark Morrison IACMI - Improving Everyday Lives Through the Power of Composites**

IACMI – The Composites Institute is a 130+ member community of industry, universities, national laboratories, and federal, state, and local government agencies working together to improve everyday lives through the power of composites. Our mission is to convene, connect and catalyze the composites community to accelerate advanced composites design, manufacturing, technical innovation, and workforce solutions to enable a cleaner and more sustainable, more secure, and more competitive U.S. economy.

**MicroEra Power, Inc: Smart Thermal Energy Storage to manage HVAC and Electrical Loads**

The United States aims to be carbon neutral by 2050. Buildings amount to over 30 percent of all CO₂ emissions in the United States. Building owners, however, lack control over their heating and cooling energy usage. Electrification efforts will increase grid peaks that would force building owners to use expensive and carbon intensive electricity. MicroEra Power’s THERMAplus offers commercial building owners a thermal energy storage system to manage peak electricity usage. This significantly improves HVAC efficiency and reduces energy costs by up to 50 percent. Our exhibit features a miniature prototype of our thermal energy storage. Our innovation features an active material with 7 times the thermal density of water and is tunable to provide both heating and cooling with the same active material. THERMAplus is a cost-effective approach for shifting peak electric loads to off-peak, renewable-intensive periods. This provides value to building owners and utilities.

**Ministry of Economy, Trade and Industry (METI): ICEF (International Cool Earth Forum) Innovation Cases**

Innovation for Cool Earth Forum (ICEF) is a platform for climate and clean energy innovation discussion among industry-academia-government leaders from around the world. Since 2014, the ICEF Annual Meeting has been held every year by the Government of Japan. This Showcase display will highlight Solidia Technology, the leading provider of decarbonization technologies and sustainable solutions to the construction and building materials industries, which was selected as one of the ICEF2020 innovation cases ([https://www.icef.go.jp/innovation/](https://www.icef.go.jp/innovation/)).

**Mitsubishi Electric Power Products: Mitsubishi Electric Power Products Inc. - Power-I**

As the world strives for the grid of the future, adoption of intelligent digitalization technologies becomes increasingly critical. Mitsubishi Electric Power Products Inc. Power-I system is an advanced analytic platform that utilizes state of the art computer vision technology and machine learning to perform virtual inspections and analysis of utility assets.

**NASA**

NASA’s Hyperwall is a video wall capable of displaying multiple high-definition data visualizations and/or images simultaneously across and arrangement of screens. The Hyperwall helps explain phenomena, ideas, or examples of world change. NASA satellite, telescope, and model data are used to highlight particular themes in Astrophysics, Earth Science, Heliophysics, and Planetary Science. Many of the existing Hyperwall stories reveal change across space and time, while others display large-scale still-images. NASA scientists will provide presentations and answer questions on Thursday and Friday.
About NASA’s Hyperwall | NASA’s Earth Observing System: Hyperwall | NASA Center for Climate Simulation

NASA’s Earth Science Division fields the world’s leading-edge Earth observations and scientific research to understand and adapt to our changing planet. The division produces actionable science and Earth science applications that directly benefit people across the world.

National Renewable Energy Laboratory (NREL): Electrons to Molecules: H2@Scale

Electrons to molecules focuses on electricity-driven processes for future generations of renewable hydrogen, net-zero fuels, chemicals, and materials. As a facet of NREL’s vision and part of DOE’s H2@Scale initiative, researchers interconvert renewable and clean energy to chemicals and fuels, as well as produce products spanning hydrogen production and utilization, electrochemical reduction of carbon dioxide and other waste gases and solar fuels (direct solar conversion). To advance renewable hydrogen production, NREL conducts research with industry and international partners on innovative systems including advanced electrolysis, biomass fermentation and biofuels processing, and direct solar-activated water splitting including solar thermal and photoelectrochemical concepts. This exhibit will feature some of these innovative hydrogen production technologies, methods, and simulation and testing tools while also illustrating how hydrogen can play a critical role in cross-sector coupling for decarbonizing industry and transport sectors, facilitating carbon dioxide capture/utilization, and revolutionizing infrastructure and economies.

Northwest Energy Efficiency Alliance (NEEA): A World of Advanced Windows Solutions

There is a world of windows solutions that are equally innovative, efficient, and reasonable to deploy to achieve the planet’s necessary clean energy goals. Across both residential and commercial applications, advanced window technology can help achieve energy and cost savings, as well as maintain our need for light and views. While windows brighten our days and constitute only 10 percent of the surface area of a typical home, traditional windows are poor energy performers. As the world prioritizes net zero energy buildings, addresses carbon emissions, and confronts the challenges of decarbonizing the grid, there is a pressing need to dramatically increase the availability and use of highly efficient window products, which are a key foundational tool in the needed toolbox to achieve decarbonization. This exhibit will showcase several advanced windows solutions, which event participants will be able to move and examine.

NuScale Power

NuScale Power is poised to meet the diverse energy needs of customers across the world. It has developed small modular reactor (SMR) nuclear technology to supply energy for electrical generation, district heating, desalination, commercial-scale hydrogen production and other process heat applications. The groundbreaking NuScale Power Module™ (NPM), a small, safe pressurized water reactor, can generate 77 megawatts of electricity (MWe) and can be scaled to meet customer needs. NuScale’s 12-module VOYGR™-12 power plant can generate 924 MWe, and NuScale also offers four-module VOYGR-4 (308 MWe) and six-module VOYGR-6 (462 MWe) power plants, as well as other configurations based on customer needs. Our 28” x 18” NPM model shows two NPMs positioned in their reactor building bays. One NPM is stationary, while the other can be removed from its bay for a closer look. The lower 1/3 of this NPM can be removed to showcase the reactor fuel area.

Plug: Green Hydrogen at Work™

Plug is building an end-to-end green hydrogen ecosystem, from production, storage, and delivery to energy generation, to help its customers meet their business goals and decarbonize the economy.

ProsumerGrid, Inc.: Grid+DER Planning Studio

ProsumerGrid, Inc. has developed an innovative software tool that allows governments, electric utilities, strategists, and policy makers to perform advanced planning studies and de-risk investments in electric grids with massive amounts of distributed energy resources (DERs) such as solar PV, energy storage, demand response, generators (fuel independent), CHP, wind, electric vehicles (EVs) and microgrids. ProsumerGrid’s Grid+DER Planning Studio represents a quantum leap in the industry’s capability to analyze, design or redesign complex emerging DER-based electricity grids. This analysis helps to ensure that the DER-based grid operates with the desired levels of resilience and sustainability at optimal cost.

Pulsenics: Electrochemical Performance Data, Instantly

Pulsenics meaningfully improves the reliability and economics of the energy-intensive electrochemical industry by introducing capabilities to diagnose and control the performance of electrochemical systems without disruption.
**RAPID Manufacturing Institute: RAPID**

RAPID, a Manufacturing USA Institute, builds strong partnerships with its members to rethink how process development and manufacturing happen in the process industries. RAPID and its members continue to develop new PI-enabled and modular process operations that increase yield, reduce energy use and waste generation, and minimize capital and operating costs.

**RJ Lee Group, Inc.: Tire-Derived Pyrolysis Oil Fractionation to Achieve Higher Value Chemicals**

RJ Lee Group's patented technology is a refinement process for tire-derived pyrolysis oil. It will increase the value of oil derived from tires on the order of 4 times that of the raw oil. This creates additional value from an abundant waste product. The new products are reintroduced as additives in manufacturing processes instead of being burned, thereby reducing the CO$_2$ footprint of waste tire disposal.

**Solarflux Energy Technologies, Inc.: The FOCUS: An Efficient Solution to Decarbonizing Industrial Heat**

The Solarflux FOCUS is a parabolic dish concentrator, an efficient concentrating solar power (CSP) technology. The FOCUS is designed to provide clean, low-cost thermal energy to the hard-to-decarbonize industrial process heat market which accounts for approximately 25 percent of global energy consumption. The FOCUS is the first parabolic dish designed from the ground up for scalable volume production, and incorporates several innovations, including a novel monocoque mirror design, patented optics, and an intelligent adaptive tracking solution.

**Solarspace: Solarspace, A New Generation of Concentrated Solar Power (CSP)**

SolarSpace is a new generation of Concentrated Solar Power (CSP) technologies. It is modular, self-sustaining, solar powered Micro-Grid that offers a solution to cost-effectively deliver near-24/7 carbon-free energy in the form of heat, cooling, and electrical power. Large mirrors focus sunlight onto a small focal point reaching 1,000°C in less than 8 seconds. This heat is converted into sound waves, and sound waves into electric power or cooling without any moving parts with unprecedented efficiencies.

**Star Scientific Ltd: HERO®, the Catalyst for Our Zero-Emissions Future**

Star Scientific Ltd.’s unique, award-winning catalyst, the Hydrogen Energy Release Optimiser, HERO®, is the breakthrough technology the world needs to convert clean hydrogen to industrial-scale, continuous heat and energy without combustion.

**Svante: Svante Carbon Capture & Removal Solutions’ VR Experience**

Discover what it is like to stand in front of a large-scale carbon capture technology plant with Svante’s immersive virtual reality experience.


The U.S. Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E) provides R&D funding to advance high-potential, high-impact energy technologies that are too early for private-sector investment. ARPA-E awardees are unique because they are developing entirely new ways to generate, store, and use energy. The agency focuses on transformational energy projects that can be meaningfully advanced with a small amount of funding over a defined period. In addition to bringing ARPA-E team members, ARPA-E’s booth will feature four of project teams. LongPath Technologies (Boulder, CO) will display its basin scale continuous oil and gas emissions abatement network; AutoGrid Systems (Redwood City, CA) will exhibit its Highly Scalable Virtual Power Plant (VPP) PLATFORM for Mass Storage and Electric Vehicle Deployment; The University of Pittsburgh (Pittsburgh, PA) will highlight its Natural Gas/Direct Air Capture Hybrid Plant; and Antora Energy (Fremont, California) will showcase its solid state thermal battery.

**Antora Energy: Antora delivers zero-emissions industrial heat and power, on demand – Antora’s thermal energy storage soaks up excess solar and wind electricity and uses it to heat blocks of carbon, so they glow like inside a toaster. This thermal energy is then delivered to customers as electricity or industrial process heat up to 1500°C, on demand. The result is zero-carbon industrial heat and power at cost parity with fossil fuels. To date, Antora Energy has raised more than $50M from the likes of Bill Gates’ Breakthrough Energy Ventures and Lowercarbon Capital. Antora also received R&D funding from and will be exhibiting alongside the U.S. Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E).**
AutoGrid Systems Inc: Highly Scalable Virtual Power Plant Platform for Storage and EVs - Autogrid’s goal is to scale the FlexTM platform to perform real-time co-optimization of 100,000 storage assets & expand FlexTM features and functionalities to address the Electric vehicle Fleet use case. FlexTM’s value-stacking lowers the total cost of ownership of DERs (Distributed Energy Resources) and accelerates adoption of clean energy. Scaling this platform for micro-grids, storage, and Electric Vehicle Fleets will unlock 387 GW of flexible capacity in the United States by 2025, displacing conventional sources of generation. The project is funded by and will be exhibiting alongside the U.S. Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E).

LongPath Technologies, Inc.: LongPath Technologies: continuous, quantitative carbon emissions monitoring across large areas - LongPath Technologies deploys large area continuous carbon emissions monitoring networks based on Nobel Prize winning frequency comb laser technology. LongPath’s exhibit shows real-time monitoring from one of the nodes in its network. Each node can cover 20+ square miles of oil and gas, waste, mining, or agricultural infrastructure, and provides real-time quantitative emissions rates of greenhouse gases from specific sources across the coverage area. The project is funded by and will be exhibiting alongside the U.S. Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E).

University of Pittsburgh: Natural Gas/Direct Air Capture Hybrid Plant - The University of Pittsburgh has designed a novel system that couples a NGCC power plant with membrane and solid sorbent carbon capture systems to attain a net-zero or net-negative CO₂ footprint.


The Critical Materials Institute (CMI) is a U.S. DOE Energy Innovation Hub accelerating innovative solutions to develop resilient and secure supply chains for rare earth elements (REE) and other materials critical to the success of clean energy technologies. CMI focuses on technologies that improve materials efficiency and mitigate the risk of supply disruptions. Featured is its acid-free dissolution technology that enables recovery of REE and cobalt from scrap and end-of-life devices. This more environmentally sustainable process rivals all existing recycling technologies considering the combination of the product purity, safety, efficiency, and economic impacts for these materials. Also featured is its aluminum-cerium alloy which has excellent high-temperature strength, high castability and exhibits dramatically improved corrosion resistance. In addition, CMI plans to display the first magnet in two decades to be produced with materials sourced entirely from the United States.

University of Michigan, Fastest Path to Zero: Tools for Engaging with Advanced Nuclear Technologies

University of Michigan’s Fastest Path to Zero tools to assist with siting nuclear facilities include: Public and Local Attitudes about Nuclear Energy (PLANET), Advanced Nuclear Site Locator (ANSL), and Siting Tool for Advanced Nuclear Development (STAND). ANSL explores social, political, and economic data, identifies potential obstacles, and generates reports of your findings. PLANET estimates U.S. county level public opinion for nuclear technology on perceived benefits, risk, and support for building new reactors. STAND identifies potential host communities for advanced nuclear technologies, and provides comparative analysis across socioeconomic, proximity, safety, and regulatory data. The Department of Nuclear Engineering and Radiological Sciences, in partnership with the Center for Academic Innovation, has also created a new virtual reality experience for education and outreach. The Virtual Ford Nuclear Reactor is a virtual replica of the original Ford Nuclear Reactor that lets people explore the historic facility and conduct reactor physics experiments.

Westinghouse Electric Company: Advanced Nuclear- Shaping Tomorrow’s Energy Future

At Westinghouse’s display, attendees will discover how its Advanced Nuclear technology will bring emission free, reliable, and resilient energy to the world. Its interactive exhibit will demonstrate technology from the AP1000, energy storage, digital and advanced solutions, as well as showcase real samples of its innovative heat pipe technology, which is at the core of our eVinci micro-reactor.

Xmark Labs, LLC: Nosy™: Save Energy, Streamline Maintenance, Improve IAQ In Commercial Buildings

Nosy is the dark data detective - a building-wide sensor platform that uncovers your building’s dark data and delivers open data to building owners. Nosy was designed for retrofits in the 99 percent of buildings that are not defined as “smart.” Nosy reduces energy waste, and streamlines building maintenance and servicing. It also helps to improve indoor air quality for building occupants. GCEAF is Nosy’s first public event and will provide an interactive demonstration of its revolutionary low-cost Augmented Reality Digital Twin and other interactive demonstrations.