Reference Number	Name of Institution	Technology Title	Technology Summary	Technology Focus Area	IP Position	Licensing Availability	Technology Readiness Level (TRL)	IP Orientation Webinar
M24-025P^	Arizona State University	Bio-Inspired Inspection Robot	Researchers at Arizona State University have developed a bio-inspired robot designed specifically for tubular construction inspection. The robot is outfitted with specialized frictional pads that allow it to climb and navigate a variety of tube surfaces, including those with difficult geometries like 90-degree bends, flanges, and both ferromagnetic and non-ferromagnetic materials. The robot's movement and attachment abilities are inspired by the movement and abilities of lizards. Additionally, the robot incorporates cutting-edge ultrasonic imaging methods—including Lamb waves and multi-helical ultrasonic imaging (MHUI)—to identify and describe damage like corrosion and cracks without using conventional contact procedures. It also contains passive acoustic monitoring and a dry couplant phased array to improve damage localization and assessment capabilities, providing a complete and effective solution for the inspection and maintenance of vital industrial components.	Robotics	Utility Filed	Exclusive		U.S. and non-U.S. citizens
M23-054P	Arizona State University	Zigzag Flow Reactor for Thermochemical Energy Storage	Researchers at Arizona State University have developed a thermochemical energy storage reactor design, a Zigzag Flow Reactor (ZFR), ideally suited for thermochemical energy storage (TCES). The ZFR utilizes temperature and oxygen partial pressure dependent transition of continuous reduction states of non-stoichiometric metal oxide (MOx) particles. The ZFR has been designed to allow for flow of the MOx particles that are heated and reduced (emit O2) in the presence of a counterflowing inert sweep gas. The reduced particles are stored until the thermal energy is needed wherein the particles are exposed to O2, the MOx is then oxidized and the stored thermal energy is emitted. The process is reversable and repeatable and the ZFR is simple and scalable. Importantly, the ZFR design with counterflow sweep gas carefully controls and maximizes power density.	Heat and Power Management	Utility Pending	Exclusive		U.S. and non-U.S. citizens
M23-008P	Arizona State University	Membrane Contactor for Simultaneous Desalination and CO2 Removal from Seawater	Researchers at Arizona State University, University of Pittsburgh, and University of California Irvine have developed a novel membrane contactor that can simultaneously remove CO2 from seawater and perform desalination. While current systems only desalinate the water, this technology integrates Direct Ocean Capture (DOC) with existing large-scale infrastructure via Seawater Reverse Osmosis (SWRO) plants, enabling the synergistic co-production of clean drinking water and CO2 for storage with a single membrane. This device enables carbon capture from seawater by electrochemically lowering the pH of water at the membrane surface, converting dissolved bicarbonate ions (HCO3-) to gaseous CO2. This CO2 can be extracted and stored elsewhere, providing an efficient and cost-effective alternative to direct air capture while simultaneously managing climate change and changing ocean pH levels.	Hydrogen and Renewable Energy	Utility Filed	Exclusive		U.S. and non-U.S. citizens
M22-297P	Arizona State University	Spark – High Efficiency Micro-Power Generator for Portable Applications	Researchers at Arizona State University have developed a small (<50W) thermally integrated passive solid oxide fuel cell (SOFC) that is lightweight and can achieve high electrical efficiency. This SOFC is 6 lbs. and can achieve over 20% electrical efficiency with an estimated specific energy exceeding 700 Wh/kg and power density exceeding 700 Wh/L for 72 consecutive hours. This technology incorporates key advances in reforming, heat recovery and robust design that are essential to creating the compact system which offers portable power applications, providing practicality especially for remote use.	Hydrogen and Renewable Energy	Utility Filed	Exclusive		U.S. and non-U.S. citizens
M20-154P	Arizona State University	Amphibious Pipe Inspection Robot	Researchers at Arizona State University have developed an untethered and unmanned amphibious submersible robot for maneuvering through irrigation pipes to locate and detect obstructions and infrastructure imperfections. The robot can traverse complex deformable terrain, dry and semi-wet media, as well as swim underwater. Onboard visual and sensors allow for self-navigation and self-extraction. Its four legged-wheels or “whegs” maximize traction and slippage when on land (e.g., granular, gravel, and rocky terrain) and wetland (e.g., saturated and muddy environments). As the robot transitions from dry to wet conditions, the two back propellers provide forward thrust. Since the robot is naturally buoyant, two additional propellers oriented vertically enable vertical propulsion in water. This allows the robot to easily maneuver in 3D space. The robot is capable of self-navigating and self-extracting through visual feedback provided by a front-mounted laser scanner and camera system. Additionally, the robot features a six-degree-of-motion robotic arm with a sonar image sensor at its end effector, allowing for localized analysis. Although the system has been designed for irrigation pipe inspection, its versatility can extend into other domains.	Robotics	US11499665B2 Issued	Exclusive		U.S. and non-U.S. citizens
M19-212P^	Arizona State University	Bio-Inspired Robot for Tube Inspection	Researchers at Arizona State University and at New Mexico State University have developed a bio-inspired robotic device for detection and evaluation of crack and corrosion defects in tubes. The robotic device includes a pair of gripper blocks, each gripper block including a motor and a plurality of toes. Each of the plurality of toes includes a network of couplant-free ultrasound transducers for non-destructive testing of surfaces. In addition, each toe includes frictional pads that can be used for effective climbing of tubes or other surfaces. The pair of gripper blocks can be linked by a bendable “backbone” which is capable of elongation to allow the robot to maneuver along pipes and surfaces. The robotic device may also include a tail equipped with various transducers for further examination of tube surfaces.	Robotics	US11504854B2 Issued	Exclusive		U.S. and non-U.S. citizens
M19-029P	Arizona State University	Power-Generating Thermogalvanic Bricks	Researchers at Arizona State University have designed a thermogalvanic power-generating brick that converts temperature differences across its width into useful power. Emphasis is placed on the engineering of thermal resistance to avoid counterproductive loading of any heating, ventilation, and air conditioning (HVAC) systems used to maintain interior temperatures. In developing economies that may lack HVAC systems, naturally occurring temperature differences can still be exploited for energy generation. Structural integrity is provided largely by the brick’s internal periodic frame model, while a substance used as filling supports thermogalvanic electrochemical processes and provides thermal resistance. Much of the design can be 3D-printed using recycled plastics.In addition to exterior wall construction, the bricks can be used for partitioning areas within buildings, such as occupied and non-occupied spaces (e.g., attics, basements). This invention transforms conventionally passive structural elements into active sources of power, day and night.	Heat and Power Management	US11346103B2 Issued	Exclusive		U.S. and non-U.S. citizens
2024-009	Auburn University	Non-Destructive, In-Situ Monitoring of Corrosion in Cables	This technology non-destructively evaluates cable corrosion by analyzing the cable's electric signal transformation characteristics at specific "middle" frequencies. It utilizes a vector network analyzer to measure S-parameters over a frequency range (e.g., 40 MHz to 1 GHz) where corrosion significantly impacts signal characteristics due to the skin effect, but other environmental factors have minimal influence. A peak analysis method is then applied: S-parameter readings are smoothed, their first-order derivative is calculated, and this derivative is transformed into the frequency domain using FFT. The number of peaks detected in the resulting frequency domain signal directly correlates with the severity of corrosion, with higher peak counts indicating greater corrosion. Subdividing these frequency ranges allows for the assessment of corrosion at different depths within the cable.	Robotics	19/069,649 Pending	Exclusive or Non-Exclusive	TRL 4	U.S. and non-U.S. citizens

BSU234	Boise State Unviersity	Methods and Processes for Manufacturing an Advanced Electrochemical Sensor	Electrochemical measurements can provide valuable information and are employed in a vast range of applications. For example, electrochemical sensors are used to detect gases, measure blood sugar level, and as ion selective electrodes. While many sensors function as desired, some have limitations in terms of obtainable information, particularly when deployed in harsh environments. In recent years, advanced manufacturing (AM) techniques have brought revolutionary advancement in such fields as medical, aerospace/defense, and electronics. The present invention is about the application of an AM technique that can be employed to fabricate advanced electrochemical sensors. The fabricated sensors are expected to provide high quality data, hitherto unpublished. Such a sensor could prove to be the tool needed to effectively function in a variety of industries (both nuclear and non-nuclear) and endure harsh conditions.	Robotics	US11635404B2 Issued	Exclusive	TRL 5	U.S. and non-U.S. citizens
19-056	Colorado State University	Preventing the Clogging of Crude Oil Pipelines	Researchers at Colorado State University have developed methods to identify specific aggregation inhibitors for asphaltenes present in crude oil pipelines. Asphaltene aggregation is estimated to clog more than 72,000 miles of pipeline in the U.S. alone – creating not only huge economic burden, but also devastating environmental impacts during cleaning or repair. Methods here include proprietary algorithms to identify appropriate aggregation inhibitors (both natural or synthetic) or combinations thereof.	Operations and Facilities	US20210139792A1 Issued	Exclusive	TRL 3	U.S. and non-U.S. citizens
9363	Georgia Tech University	Polyethylene Glycol Functionalized Aromatic Polyimide Groups for High Performance CO2 Capture Applications Beyond Natural Gas Purification	The current disclosure presents an unrealized opportunity for high performance CO2 capture applications, such as cement, steel, power plant flue gases, etc. Here we disclose membranes with high CO2 permeance with high CO2/N2 selectivity based on a specific structure involving 6FDA-DAM:DABA functionalized with Polyethylene glycol. Beyond the specific structure reviewed here, it would be obvious to one skilled in the art that the DABA functionalized polyethylene glycol (PEG) polyimides revealed here can be tuned for many CO2 capture applications, and all of these composition of matter and applications are claimed in this disclosure.	Carbon Capture and Utilization	US20250108342A1 Pending	Exclusive	TRL 2-4	U.S. and non-U.S. citizens
7892	Georgia Tech University	A Method for Recycling Metals from Spent Lithium-Ion Batteries	This technology offers a new approach to extracting valuable metals, including lithium, cobalt, and nickel, from end-of-life lithium-ion batteries through a chemical digestion and novel magnetic separation process. Unlike traditional methods, it does not require battery disassembly or use of hazardous chemicals, making it cost-effective, energy-efficient, and environmentally safe.	Solutions for a Circular Economy	US20210242514A1 Issued	Exclusive	TRL 2-4	U.S. and non-U.S. citizens
LSU-2022-033	Louisiana State University	Enhanced Autonomous Mission System for Mobile Robots	Researchers at LSU have developed an integrated computer system that enables mobile robots—like Boston Dynamics' Spot and DJI's RoboMaster EP—to operate autonomously rather than relying on constant human control. This system features a graphical user interface that coordinates essential tool and function modules, allowing users to map environments, plan missions, and execute them without manual operation. By reducing the need for direct programming and enabling control of multiple robots, the invention boosts functionality, productivity, and overall value. It opens opportunities across industrial settings, inspections, safety patrols, surveillance, information gathering, and public safety applications.	Robotics	US Utility Patent 63/350,629 Pending, Filed 6/8/2023	Exclusive and Non-Exclusive	TRL 1-2	U.S. and non-U.S. citizens
2020-5203	Penn State University	Smart Lost Circulation Materials (LCMs) for Sealing Large-Width Fractures During Drilling (Oil and Gas, Geothermal, and Other Wells)	Revolutionary shape memory polymer-based Lost Circulation Materials (LCMs) that address critical drilling challenges by sealing large-width fractures in wellbores. The technology leverages advanced materials science where LCMs are programmed into compact temporary shapes that easily navigate through drilling equipment, then expand up to 10 times their original size when exposed to wellbore temperatures. This creates robust, interlocking networks that effectively seal fractures up to 12mm wide - a capability far beyond existing solutions that can only seal fractures less than 5mm wide. The technology has been validated in laboratory testing and is supported by industry partner Cudd Energy with $15,000 in matching funds.	Hydrogen and Renewable Energy	Nationalized PCT 18/695,840 Pending	Exclusive or Non-Exclusive	TRL 5	U.S. and non-U.S. citizens
22-3892-1	Princeton University	Modular Multi-Material Additive Manufacturing System for Automated Deposition of Concrete, Polymer, and Silicone	An automated 3D printer uses a tool-changing mechanism and software-controlled extrusion to switch between concrete, polymer and silicone nozzles, managing flow, temperature and parking to prevent oozing and create integrated multi-material reinforced structures.	Robotics	US20230294363A1 Pending	Exclusive and Non-Exclusive	TRL 4	U.S. and non-U.S. citizens
6664	Texas A&M University	PCB Rotor Brushless Magnet-Free Wound Field Synchronous Machine See External Supplementary Document	Advancing electric vehicle propulsion through high power rare-earth-free electric motor development.	Solutions for a Circular Economy	Pending US Utility	Exclusive	TRL 3-4	U.S. and non-U.S. citizens
4667	Texas A&M University	System and Apparatus of Power Electronic Intelligence at the Network Edge	The disclosed invention, PINE technology, is a power electronic interface that is at the end-user level, which consists of a front-end Pulse-width modulation converter connected to the distribution utility terminals. Applications: Power distribution	Heat and Power Management	US11637426B2 Issued	Exclusive	TRL 3-4	U.S. and non-U.S. citizens
2024-068	Texas Tech University	Ultrawide Bandgap Semiconductors for Extrinsic Photoconductive Switching Devices	Researchers at Texas Tech University have developed a novel class of ultrawide bandgap (UWBG) semiconductor materials designed for use in photoconductive semiconductor switches (PCSS). These materials offer the potential to overcome current limitations in high-power switching applications by enabling simultaneous high-voltage and high-current operation, a capability not currently achievable with existing UWBG technologies.In addition, while semiconductor neutron detectors (SNDs) have emerged as the best candidate for detecting thermal neutrons in low-mass, low-power and harsh environment applications, most existing SNDs use a thin neutron conversion layer of 6Li or 10B, which limit their detection efficiency and result in poor energy resolution. Additional Publications: https://doi.org/10.1063/5.0250015 https://doi.org/10.1063/5.0277907	Electrical Infrastructure and Energy Management Systems	Pending PCT/US2025/02095	Exclusive	TRL 4	U.S. and non-U.S. citizens
2024-035	University of Cincinnati	Rechargeable Liquid Metal-CO2 Battery for Large-Scale Energy Storage	Current research has sought to eliminate dependence on toxic lithium-ion batteries by creating a new battery system which enables a longer lifespan and carbon reduction capabilities. Metal-carbon dioxide batteries [MCBs] have posed a potential solution to these safety and environmental concerns. Dr. Junhang Dong and his team have invented a new type of MCB which offers a disruptive enhancement of power density without the use of precious metals. This battery can operate in flow battery mode to decouple power and storage capacity that offers modularity and scalability. It also avoids solid blockage issues, is rechargeable, and produces a carbon negative effect. Additional journal article available here.	Heat and Power Management	PCT US2024/052226 Pending	Exclusive	TRL 4	U.S. and non-U.S. citizens
2023-083	University of Cincinnati	Energy-Efficient and Stable Modified Amines and Methods for CO2 Separation	Dr. Joo-Youp Lee has developed a sorbent chemical for CO2 separation, combining amine functionalized with epoxide chemicals impregnated onto a mesoporous silica support. This innovative sorbent includes amines like polyethylenimine and epoxides such as isobutylene oxide, offering enhanced CO2 binding capabilities. The technology is novel in its use of microwave energy for sorbent regeneration, allowing efficient CO2 desorption and continuous operation across multiple monolith structures. PATENT: https://patents.google.com/patent/WO2024216296A1/en?oq=WO2024216296A1 INVENTOR: https://researchdirectory.uc.edu/p/leejo	Carbon Capture and Utilization	PCT WO2024216296A1 Filed	Exclusive	TRL 4	U.S. and non-U.S. citizens

2025-022 & 2025-023	University of Connecticut	Metal Oxide for Electrochemical Oxidation of Methane to Liquid Fuels and Eletroversion of Alkanes to Alcohols	This technology enables the direct conversion of methane (CH_4) into liquid alcohols, such as methanol and ethanol, at T < 100 C and ambient pressure. The process simultaneously produces H2 as a valuable byproduct, offering a dual-output system that transforms methane into both chemical feedstocks and high-value energy carriers. Features include •Mild Operating Conditions: Unlike traditional methane-to-methanol process (two-step, high T and high P), this process operates efficiently at low temperatures (< 100C) and ambient pressure, significantly reducing energy consumption and operational costs. •Selective Catalysis: The technology employs advanced catalysts that are free to precious metal and can facilitate the selective oxidation of methane to alcohols. •Integrated Hydrogen Production: The co-generation of hydrogen adds economic value and aligns with the growing demand for H2. •Environmental Benefits: The reactor is modular and can be installed in locations where methane is emitted or vented.	Hydrogen and Renewable Energy	Provisional 63/802,914 and 63/802,912 Filed	Non-Exclusive	TRL 4	U.S. and non-U.S. citizens	
2021-089/2021-090	University of Connecticut	Physics-Informed Partial Least Squares Regression Modeling for Failure Detection in Power Electronic Devices; Nonlinear Autoregressive Exogenous Modelling for Power Electronic Device Modelling	The proposed plug and play diagnostic device (P2D2) will be placed in line with any motor or generator to monitor current and voltage signals that are going into the motor or out of the generator, and determine if specific faults have occurred in the machine. This can also be utilized for health monitoring where degradation of insulation as well as mechanical components, e.g. bearings, can be seen as time and frequency signatures in the machine's current. Health data of the machine can be displayed on the device itself or sent via 5G or Wi-Fi to the cloud where aggregated health information from the field can be used with AI tools. The P2D2 can also be expanded for use with electric drive diagnostic for semiconductor and capacitor failures in the drive itself beyond the rotating machine.	Robotics	Pending Non-Provisional 17/492,442 and 17/492,391	Non-Exclusive	TRL 4	U.S. and non-U.S. citizens	
2016-044	University of Connecticut	AI-Powered All-In-One Solid-State Compact Milli-Electrode Arrays (MEA) for Real-Time In Situ Nitrogen Monitoring	This compact and miniature sensor array monitors nitrogen contaminants (e.g., NH4+, NO3-) and key water parameters (e.g., pH, conductivity, temperature, redox potential) in real-time in situ mode in water, soil, and crops.	Robotics, Solutions for a Circular Economy	US10753900B2 Issued	Exclusive and Non-Exclusive	TRL 4	U.S. and non-U.S. citizens	No - NEEDS IP ORIENTATION WEBINAR
2024-041	University of Delaware	Lignin-Derivable, Isocyanate-Free, High-Performance Thermoplastic Polyurethanes (TPUs)	Traditional TPUs rely on carcinogenic diisocyanates from fossil feedstocks. This invention uses lignin-derived bisguaiacols/bissyringols to create non-isocyanate polyurethanes (NIPUs) that are safer, sustainable, and more processable. The polymers demonstrate higher elongation-at-break and toughness without sacrificing tensile strength or thermal stability, outperforming petroleum analogues.	Hydrogen and Renewable Energy	Pending PCT	Exclusive and Non-Exclusive	TRL 3	U.S. and non-U.S. citizens	
2021-023	University of Delaware	Catalytic Hydroconversion of Polypropylene-Based Plastic Waste to Lubricant Base-Oils	A catalytic hydroconversion process converts polypropylene waste into high-value lubricant base-oils under mild conditions. The approach uses bifunctional catalysts to break C–C bonds efficiently while limiting undesired cracking, resulting in controlled molecular-weight hydrocarbons suitable for lubricant applications.	Solutions for a Circular Economy	US12403455B2 Issued	Exclusive and Non-Exclusive	TRL 3-4	U.S. and non-U.S. citizens	
2024-146	University of Maryland	Near-Critical Liquefaction-Extraction (NILE) for Biofuels	The Near-critical Liquefaction-Extraction (NILE) process transforms biomass and biowastes into high-quality hydrocarbon oils using supercritical CO_2 in a high-pressure reactor operating between 150–400 °C and 100–400 bar. It efficiently extracts and fractionates oils, separating them from water and solids while minimizing metal and oxygenated compounds. Energy-efficient dewatering is achieved through supercritical CO_2, which is recycled along with co-solvents. Advanced heating methods ensure rapid, uniform heating, enhancing oil yields and quality for biofuel production with reduced environmental impact.	Hydrogen and Renewable Energy	Pending	Exclusive	TRL 4	U.S. and non-U.S. citizens	
2023-079	University of Maryland	Advanced Sorbent Membranes for Efficient Lithium Ion Extraction	Advanced membranes are created using radiation-induced polymerization to efficiently extract and recycle lithium from sources like brine and waste, enabling sustainable and environmentally friendly lithium recovery for applications such as battery production.	Solutions for a Circular Economy	Pending	Non-Exclusive	TRL 4	U.S. and non-U.S. citizens	
2022-027	University of Maryland	Millisecond Catalytic Wall Reactor for Autothermal Non-Oxidative Conversion of Methane to Ethylene	A novel wall reactor uses dual catalysts and built-in heating to convert methane directly into ethylene and hydrogen in milliseconds, achieving high conversion, selectivity and stability with minimal coke and potential for carbon-neutral operation.	Heat and Power Management	Pending	Exclusive	TRL 3	U.S. and non-U.S. citizens	
2021-316	University of Minnesota	Modular Convection-Enhanced Evaporation (CEE) System for Brine Management	Researchers at the University of Minnesota have developed both a modular convection-enhanced evaporation (CEE) system for brine management and a novel control algorithm/software that optimizes the operating settings of CEE in real-time to minimize energy consumption while maintaining a constant evaporation target. The software makes CEE a stand-alone unit (or group of units) able to operate in different weather conditions in an energy-efficient status. The software and the modular system provides a flexible design that can be easily manufactured and customized for different sized operations, and has lower thermal and electric consumption, footprint area, and total costs.The proposed CEE system is composed of a set of packed hydrophilic evaporation surfaces at uniform spacing. Liquid is released along each evaporation surface forming thin film, a fan attached to the CEE unit forces air flow over the films and the difference in vapor pressure between the air and liquid induces evaporation; a heating element is usually integrated in the system to preheat the fluid. The innovative design of the CEE device enables 5 times less energy consumption than traditional solutions, reducing the overall operating costs and carbon footprint. A case study (Alamogordo, NM) showed competitive costs of less than 1 USD per cubic meter of evaporated liquid. This new system has low maintenance costs, and it is particularly relevant for brine management for decentralized desalination plants and small industries. Additional Publication: https://doi.org/10.1016/j.desal.2021.115057	Solutions for a Circular Economy	US11951416B2 Issued	Exclusive	TRL 4	U.S. and non-U.S. citizens	
20170206	University of Minnesota	Heat to Electricity Using Phase Transformations in Ferroelectric Oxides	A device with a ferroelectric oxide crystal layer in a capacitive arrangement and a switch converts heat to electric energy in a small temperature difference regime. The method uses oxide crystals that undergo highly reversible phase transformations from a strongly ferroelectric phase to a paraelectric phase upon heating. As the crystal is cooled through the phase transformation it releases (latent) heat, transforms to the ferroelectric phase, and develops a strong polarization. If this crystal is the dielectric of a capacitor that is connected in parallel to a reference capacitor, it will draw charge from the reference capacitor. Sloshing of this charge back and forth between the active and reference capacitor through a load resistance constitutes the direct conversion of heat to electricity. This technology has many applications, such as waste heat recovery in data centers and handheld devices, solar-thermal sources, household waste heat, waste heat from power plants, waste heat from heavy industry and air conditioning systems, powering of satellites, geothermal sources.	Heat and Power Management	US10950777B2 Issued	Exclusive	TRL 2-3	U.S. and non-U.S. citizens	
20150113	University of Minnesota	Biodiesel from Scum Oil and Waste Oil	A new waste remediation process converts scum from waste water treatment plants (WWTPs) into ASTM compliant biodiesel. The six-step method begins with a filtration step that separates water/oil/solid while converting soap to free fatty acid (FFA). A combination of acid washing and acid catalyzed esterification with glycerin removes soap and impurities while converting FFA to glycerol esters, and glycerol washing separates biodiesel and glycerin after base catalyzed transesterification with methanol. After producing fatty acid methyl esters (FAME) and glycerol, FAME/glycerol/methanol will be separated and FAME recovered. The crude FAME is then distilled to produce high quality biodiesel that can be used directly in transportation vehicles. This method has high conversion rate (it has converted 70% of dried and filtered scum to biodiesel), low material cost, low energy input and low waste discharge. Additional Publication: https://doi.org/10.1016/j.biortech.2015.01.081	Hydrogen and Renewable Energy	US9745530B2 Issued	Exclusive	TRL 4	U.S. and non-U.S. citizens	

2025-017	University of Southern California	Calcium Carbonate-Based Biodegradable Composites as an Alternative Material to Industrial Plastics	Persistent pollution caused by conventional plastics poses significant risks to marine ecosystems and human health. Thus, there is a need for the development of biocompatible and biodegradable materials that mimic the properties of plastics that are also safe for environmental and public health. To address this, we engineered a plastic substitute by integrating calcium carbonate (CC), an abundant mineral naturally found in seashells, into poly (1,8-octanediol-co-citrate) (POC), a synthetic biodegradable elastomer already used as the binder of FDA-approved orthopedic fixation devices containing calcium minerals. We hypothesized that POC-CC is a biocompatible plastic substitute that can degrade in marine environments while maintaining sufficient strength for industrial applications. To test this, POC-CC was synthesized with varying CC concentrations (0, 15, 30 wt%). Weight degradation rate in ocean water, pH of ocean water after long-term incubation, elastic modulus, and the morphology of POC-CC using SEM was evaluated over 6 months. Our results show the degradation rate increases with increased POC content, and the addition of CC maintains the pH of ocean water. Additionally, to evaluate biocompatibility, Scenedesmus sp. algae was incubated with the POC-CC supernatant after incubation with simulated ocean water for six months. High cell viability was found, confirming the biocompatibility of POC-CC with marine microorganisms. Lastly, a model can holder was made with POC-CC to demonstrate its proof-of-concept as an alternative plastic material. In sum, we demonstrate POC-CC as a new material and the feasibility of its use as a biodegradable plastic alternative.	Solutions for a Circular Economy	Provisional Application Pending	Exclusive	TRL 3	U.S. and non-U.S. citizens
2023-131	University of Southern California	On-Site Generation of Clean, Ultra-High Pressure Hydrogen via Catalytic Reforming of Methanol and Other Alcohols	Generation of clean and ultra pure hydrogen at high pressures via homogeneous and heterogeneous catalytic reforming of methanol and other alcohols in alkaline media has been developed. The carbonates and bicarbonates left over in the aqueous media after reforming are again converted back to methanol and alcohols completing a carbon neutral cycle.	Hydrogen and Renewable Energy	PCT WO2024243583A2 Pending	Exclusive	TRL 3-4	U.S. and non-U.S. citizens
17-069	University of Wyoming	Materials Derived from Coal using Environmentally Friendly Solvents	Powder River Basin coal and byproducts are low-value and costly to manage, while the U.S. relies on imported rare earth elements (REEs) and advanced carbon materials. This platform uses recyclable ionic liquids in aqueous media to selectively depolymerize coal, enrich REEs in the residue, and convert coal-derived tars into carbon-fiber precursors via electrospinning. Bench-scale validation on real PRB feedstocks suggests a low-waste route to higher-value coal-derived products.	Solutions for a Circular Economy	US11761058B2 Issued	Exclusive and Non-Exclusive	TRL 3	U.S. and non-U.S. citizens

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