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Clean Energy Inventions

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A portfolio of disruptive inventions has been accumulated after more than two decades of research and collaboration with numerous inventors, a few of whom are among the world's most productive. These inventions are so radical that some may require tens of millions of dollars each to fully exploit. $1 billion would establish a comprehensive proactive clean energy inventions evaluation and development organization headquartered in Nevada. Divisions would include Board of Directors, Corporate Library, Consultants, Teaching Institute, Technical Evaluation and Advisory Board, and Incubator of Russian and Ukrainian Inventions.

Larger Generators

Hydro-magnetic dynamo, focus fusion, hydrino generator, thorium power pack, global wireless transmission of electrical power, I.N. Frantsevich Institute of Problems of Materials Sciences thorium-232 energy accumulator, cosmic induction generator, colliding plasma toroid fusion reactor, wind turbine conversion, electrino fusion power reactor, induction coil coating increases generator output by one-third, Magnatron – light-activated cold fusion magnetic motor, Spintronic generator, WIN zero point electrical energy converter, plasma biomass gasification, nano-membrane pyro-gasification process, high-temperature incinerator, gas-phase catalytic fusion, phase-conjugateresonator Tesla coil, protein nanowires, ball lightning fusion reactor, Nano-Boxx thermionic converter, direct energy conversion, solar radiant energy, and geothermal atmospheric liquefied thorium reactor.

Smaller Generators

Casimer-layered electrodynamic generator, thin-film power generating disks, Testatika free energy machine, high-density charge clusters technology, energy catalyzer, cold fusion reactor with electric-to-thermal energy conversion, hybrid cold fusion hydrogen reactor, fiber-based cold fusion power cell, buried contact multijunction thin film solar cell, thermoelectric generator, converter of zero-point electromagnetic radiation to electrical energy, neutrinovoltaic generator, LANR, pulsed abnormal glow discharge reactor, self-recharging energy generating gel cells, electronically shaded photo-voltaic glass, MulTask Dome multiple-output omni-directional solar power generator, high expansion magnetohydrodynamic liquid metal generator, Power Chip thermo-ionic generator, liquid HyFuel, gravity force generator, multifactorial hydrogen reactor, laser-induced fusion, protium H+ stoichiometric hydrogen gas generator, advanced solar photo-voltaic crystal lattice cells, closed-loop phase-change gas system, geoexchange heat pump, self-recharging capacitive discharge thermal generator, ceramic electrodynamic wafer, solid-oxide fuel cell, splitter of water molecules, motionless electromagnetic generator, Richardson fuel-less electrical generator, Hawkings' generator of cold electricity, radiant energy pump/electricity generator, controlled electron capture reaction, Hendershot magnetic motor, N-1 homopolar generator, atomic isotope generator, closed-path homopolar generator, switched energy resonant power system, high-voltage injection of rain water into cold fog, magnetic propulsion engine, Nova phase change engine, LUMELOID™ light-polarizing photovoltaic film, LEPCON™ femto diode photovoltaic glass sheet, Spiteri water pump, magnetic drive generator, OASIS electric power unit, maximum velocity wind turbine, laser-induced fusion in ultra-dense deuterium, Bedini SG charger, Nova-Neal compression engine, cold fusion thermionic generator, portable electromagnetic generator, and reactionless synchronous generator.

Miscellaneous

Super-conductive manganite substrates, amplified ionization filtration technologies, Sola-Q self-focusing omni-directional solar cooker, Aaftaab furnace, domestic lens, hydrosonic pump, IPMS-Chernovitsky super ceramics, IPMS micro-channels and filters, IPMS-Kiev and Arzamas-16 super magnets, capacitive step-down transformer, super steam technology, and new propulsion devices for space including electrino fusion power reactor, gravito magnetic device, space drive engine, Moe-Joe orgone energy cell, Walden inertial propulsion, magnetic vortex drive engine, double magnetic fields plasma reactor, magneto-gravitational converter (Searl effect generator), microwave engine, electron spiral toroid Spheromak micro-fusion reactor, internal rotating plasma rings, nuclear electric rocket, David Burns' anti-gravity spacecraft, inertia-less craft and anti-gravity, atomic powered plasma rocket engine, tubular shaped interstellar space craft, gravity control, and meta-stable helium.

Advanced Self-Powered Electric Transportation Vehicles

Switched reluctance motor, fuel saver that nearly doubles miles per gallon of gasoline, Stanley A. Meyer's water fuel cell-powered car, waterfueled internal combustion engine with Garrett electrolytic carburetor, Brown's gas carburetor, water-to energy electrolysis process, Richardson blade-less Tesla-type steam turbine, water engine, noble gas plasma engine, Clem over-unity vegetable oil engine, motive power generating device, multi-chambered rotary compression engine, closed-cycle Freon/rotary turbine, 90+ mpg carburetor, conical vortex heat exchange engine, four

environmental heat engines, liquid electricity engine. Volcheck: engine powered by gas with unusual expansion properties, Muller motor/generator, conversion of aluminium internal combustion engine to magnetic motor, perm-mag motor, Walden amplified magnetic motor, other over unity magnetic motors, orgone energy motor, torsion field radio, advanced computer-controlled suspension systems, monocoque (unibody) basalt/carbon fiber foam body/frame made with IPMS high temperature gas plasma detonator, low-temperature diamond or titanium nitride coating of vehicle parts, Cool Chips thermo-ionic refrigerator, IPMS thermal electric cooling devices, Sky Train, compressed air driven air conditioner/heater, salt water flow cell, Sirius ultra-capacitor battery, melanin battery/generator, electrostatic motor, Manelas battery charger, high rotor pole switched reluctance motor, axial-flux electric motor, and one of possibly more than a dozen candidate on-board fuel-less battery chargers.

Batteries/Energy Accumulators

Diamond nuclear voltaic battery, QUENSOR™, Casimer effect self-charging energy cell, Bedini battery charger, catalyst induced hydrino transition cell, Maxwell Technologies ultra-capacitor, IPMS crystal lattice energy storage/battery device, nickel-iron battery, Baldwin's super-capacitor, nickel metal hydride batteries, solid-state lithium-ion batteries, liquid metal battery, John Hutchison's self-charged battery, endless electric field generator, Brown nuclear battery, Moe-Joe orgone energy cell, Yasunori Takahashi's ultra-capacitor, thin-film electrolytic cells, organic quinine-based redox flow battery, Fisker flexible solid-state battery, graphene polymer battery, graphene magnesium battery, thermal energy battery, solid-state lithium-metal battery, and torsion field energy storage applications.

Radioactive Waste Treatment Methods

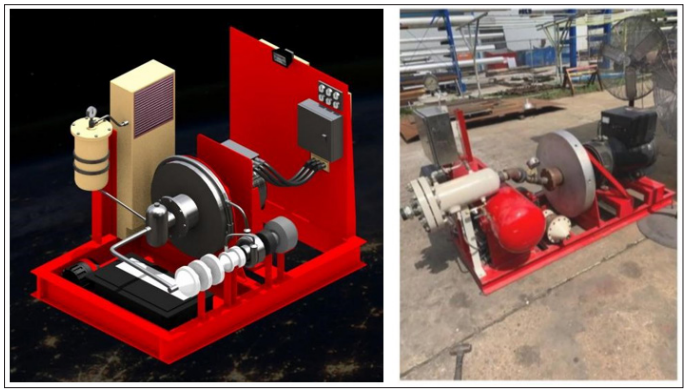
Refresher-regenerator, Purdue University patent, Hawkings' generator makes yard-long white spark of cold electricity several inches in diameter - substances inserted in spark sometimes transmute to heavier elements, Gillembardo's method, collective ion accelerator treats both solid and liquid nuclear waste, Radha Roy's transmutation process, dematerialization devices A, B, C and D using highest powered positive ions ever, Russian process uses liquid lead bismuth to trigger transforming in the form of neutrons, Barker invented easiest, most effective, and least messy method for remediation of radioactive waste, implosion machine is electric arc welder modified to duplicate nature's ball lightning, photo-deactivation using gamma rays, transmutation of low-level nuclear waste into glassy substance with super high voltage, 96% reduction of radioactivity by welding with Brown's gas – further reduction is possible by utilizing liquefied Brown's gas, combining Brown's gas with bucking magnetic fields inside a plasma ball, Thomas Bearden's electromagnetic conditioning method, accelerator-driven transmutation of waste, Brown's gas-metal matrix process, photo remediation, ZIPP fusion process, RIPPLE fission process, low-energy nuclear transmutation electrolytic cells, plasma induced/injected transmutation, Kervran reactions, recovery of uranium from incinerated low-level radioactive waste using super-critical CO2, AmoTerra process, geomelting can encase nuclear waste in glass that is harder than concrete and lasts 200,000 years, higher group symmetry electrodynamics, plasma gasification melting, e.coli – Birmingham University, flame-free incineration in a catalyzer, John Hutchison's raygun, fusion-fission hybrid reactor, 'oranur effect' method, graphene oxide, thorium reactor, bacteria neutralizes liquid nuclear waste, and low-energy nuclear remediation with ultra-low momentum neutron generator.

Self-Confined Low-Energy Fusion

A way has been found around the problem of fusion confinement. The answer lies in that plasma itself, in the right environment, will generate its own magnetic field. Naturally, a plasma will self-organize within its own magnetic field, which can keep a plasma confined and stable for long durations of time. This observation has been a crucial piece in the process of experimenting with a simplified approach to fusion energy. This simplified approach to fusion has successfully sustained a low-energy nuclear fusion reaction for over an hour straight, without the use of an external confinement system.

Utilizing discoveries in material science and electrochemistry, an aqueous solution was developed in which a low-energy nuclear fusion reaction will naturally occur, after the introduction of a small amount of input power via a special submerged electrode. The proprietary 'fusion fuel' used in the long-duration demonstration, is a derivative of water combined with a precise ratio of benign chemicals. Together the water-based formula and simplified approach are capable of generating hyper-efficient power, by quickly boiling the water and producing steam that can turn a turbine to generate continuous carbon-free electricity.

Recirculating Heat Pump Turbine



The Recirculating Heat Pump Turbine (U.S. Patent 10,480,343 B1) utilizes the dynamic properties of a heated, compressed working fluid, typically humid air, to produce a constant energy output. The turbine implements a Carnot cycle with an efficiency of approximately 90%, using the surrounding air as its low-temperature reservoir. Power is initially supplied by a lithium-ion battery, which runs an electric motor to compress the working fluid. Once the device has achieved the targeted rotational speed, the clean exhaust from the core turbine is salvaged to run the compressor, allowing the motor to shut off until required. At the same time, the angular momentum of the drive shaft is used to

power attached DC generators. A second battery is kept fully charged by the generators to create a continuous energy supply to the electric motor, which slowly drains the first battery as it supplements exhaust input to the compressor. Control circuits monitor pressure, heat, humidity and other parameters, tweaking the operation of the components to maintain a constant output. Maintenance is simple, consisting mostly of ensuring the batteries are functional and that the working fluid has enough moisture to power the device. The recirculating heat pump turbine can be scaled from powering vehicles to very large base load generators. Compressed air optionally mixed with deuterium and helium-3 may produce a fusion reaction.

Magneto-Inertial Fusion of Deuterium and Helium-3

Fusion is the process the sun and stars use to make energy. Fusion occurs when two atoms combine together to form a single atom under intense heat and pressure. The combined atom has less mass than the original two atoms. In accordance with $E = mc^2$, energy is released in the process.

A plasma accelerator utilizes a patented high-efficiency closed-fuel cycle to fuse pairs of deuterium isotopes into helium-3, the ideal fuel for fusion electricity. Deuterium and helium-3 fuel is heated to plasma conditions. Magnets confine this plasma into Field Reversed Configuration (FRC) plasmoids. Magnets accelerate two FRCs to 1 million mph from opposite ends of the 40foot accelerator. They collide in the center.

When the FRCs collide in the center of the system, they are further compressed by a powerful magnetic field until they reach fusion temperatures of 100 million degrees Celsius. At this temperature, the deuterium and helium-3 ions are moving fast enough to overcome the forces that would otherwise keep them apart and they fuse. This releases more energy than is consumed by the fusion process. As new fusion energy is created, the plasma expands.

As the plasma expands, it pushes back on the magnetic field. The change in the magnetic field induces current, which is directly recaptured as clean electricity. Pulsed fusion can be run at full power for a few pulses, or have power output adjusted as needed by adjusting the repetition rate. The cost of electricity production is projected to be $0.01 per kWh without assuming any economies of scale from mass production, carbon credits, or government incentives.

Airthium's High-Temperature Heat Pump

Vast amounts of heating energy are required across all industrial sectors to melt, dry, sterilize or otherwise process materials and products. Airthium provides solutions for reliable, low-cost, efficient and clean industrial heat supply up to 550°C/1022°F with the help of a first-of-a-kind very high temperature heat pump. Airtrium's heat-pump powered boilers and dryers are especially suited to the food, paper, automotive, and mining industries.

A heat pump converts electricity into heating and cooling power. While electrical resistors can also convert electricity into heat with 100% efficiency, heat pumps are more efficient, typically delivering 2 to 5 kWh of heat for 1 kWh of electricity. Heat pumps work by redirecting the flow of thermal energy ('heat') from cold matter to hot matter, similar to how a fridge works.

Airthium disrupts the high-temperature heat pump market by the unique features of its product, enabled by a breakthrough in the underlying thermodynamics. The result is a new, highly reliable, robust, efficient and low cost very high-temperature heat pump. The technology exploits the Ericsson cycle, which differs from the conventional Stirling cycle by the achievement of high temperature, fast, near iso-thermal gas compression. Energy transfers inside Airthium's system are nearly ideal, with an efficiency reaching up to 86% of the theoretical limit, while current best in-class technologies achieve only 64%.

Airtrium's heat pumps can replace gas-fired Peaker power plants, which provide backup power when there is no sun or wind, by a hybrid daily and seasonal renewable energy storage system, powered by the same engine as the heat pumps.

Sodium-Air or Lithium-Air Battery

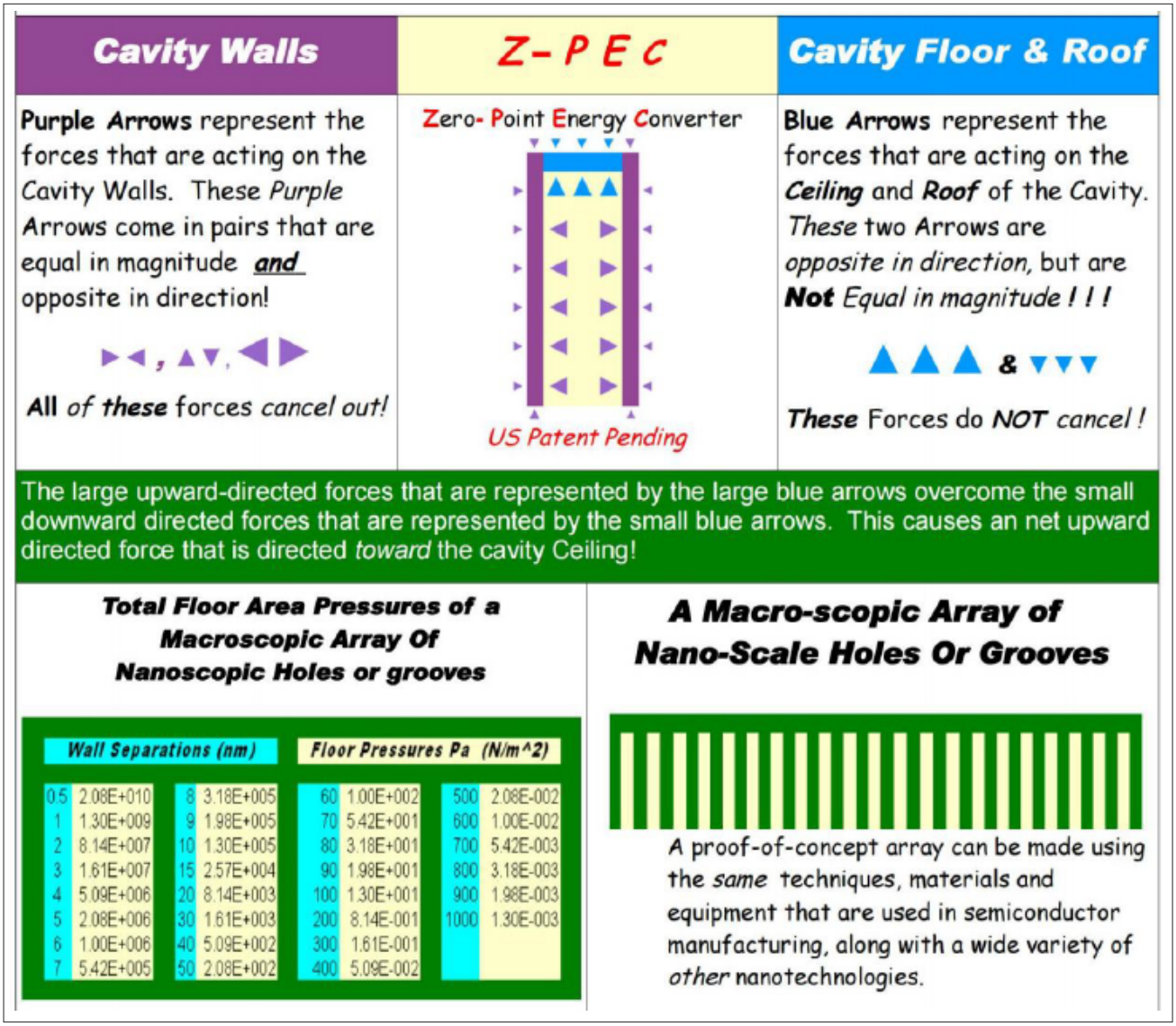
The Argonne National Laboratory has teamed with the Illinois Institute of Technology to develop a solid-state battery with the world's highest energy density. The future driving range of standard EVs may be raised to a thousand miles or more. It promises to do so cheaply without cobalt.

The typical lithium-ion battery in electric cars stores about 200 watt-hours per kilogram (Wh/kg). Their lab experiment has already reached 675 Wh/kg with a lithium-air variant. The team believes it can reach 1,200 Wh/kg.

The current prototype is based on lithium, but the same type of battery could be developed with sodium. Switching to sodium would halve the driving range, but it would still be double today's generation of batteries.

The battery uses a solid electrolyte made from a ceramic polymer based on nanoparticles. It achieves a reaction of four molecules at room temperature instead of the usual one or two. It is able to extract oxygen from the surrounding air to run the reaction. It can operate over a thousand cycles of charging and discharging. It is safer and less likely to catch fire than today's batteries.

Casimer Self-Propulsion



The cavity sides are like the two plates of Casimir's original experimental proposal. A cavity roof is added that prevents the other two plates from moving together. The surface of the ceiling that lies inside the cavity experiences an enhanced quantum-flux radiation pressure; but the outside surface of the ceiling, the roof, experiences the weaker ambient flux that exists outside the cavity flux enhancement zone. Therefore, there is a continuous net radiation pressure acting toward the cavity roof. This net electromagnetic radiation-pressure will power all of our machines and propel all of our vehicles all of the time, everywhere, for free.

Inventions and Images Credits

Self-Confined Low-Energy Fusion. The inventors are employees and associates of ISA Industries. https://www.isaindustries.com/blogs/news/low-energy-nuclear-fusion.

Recirculating Heat Pump Turbine. The text and diagram are from aetherdynamicpowersystemsllc.com. The photograph is from inventor Kim Zorzi's July 25, 2023 email to Gary Vesperman.

Magneto-Inertial Fusion of Deuterium and Helium-3. The inventors are employees of Helion Energy, Inc. https://www.helionenergy.com

Sodium-Air or Lithium-Air Battery. https://finance.yahoo.com/news/coming-evbatteries-sweep-away-140709581.html

Casimer Self-Propulsion. The inventor is William Scott Smith. The image and text are from the pdf file attached to Smith's August 3, 2009 email to Gary Vesperman.

Airthium's High-Temperature Heat Pump. Y-Combinator Backed Airthium's Breakthrough Engine Aims to Replace Fossil Fuels and Decarbonize Industrial Heat and Power Generation (yahoo.com)