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In a lab in Scottsdale, Ariz., IEC is preparing a magnetic generator for commercial use and is using this 'Crystal device' to demonstrate how its theories work. JESSE RIESER FOR THE WALL STREET JOURNAL

ONE MAN'S UNLIKELY QUEST TO POWER THE WORLD WITH MAGNETS

Dennis Danzik has invented a whirligig that calls for the suspension of disbelief and the laws of physics. If it works as advertised, it would rank with the harnessing of steam, electricity and the atom.

AUTHOR
DAN NEIL

UPDATED MAY 16, 2019 5:54 P.M. ET

READING TIME
LONG READ

The astrophysicist Carl Sagan liked to say that extraordinary claims require extraordinary evidence. But Dennis Danzik's assertions blow past extraordinary and motor right on to fantastic.

Mr. Dennis Danzik, the science and technology officer for Wyoming-based Inductance Energy Corp., **says he has invented a magnetic generator, a flywheel system** that extracts usable energy from the interplay of exotic magnets—also known as a free-energy device, a cousin to the fabled perpetual-motion machine.

Mr. Danzik winces at the phrase "perpetual motion," with centuries of humbug behind it. "It's a generator," he said during an interview at IEC's lab and training facility in Scottsdale, Ariz. Left running, **the machines, known as Earth Engines,** will eventually exhaust themselves. He just isn't sure when.

"We really don't know how long the magnets will perform," Mr. Danzik said. **IEC hired him in 2015** to improve design on a diesel generator for oil fields. When that project didn't pan out, company Chief Executive Bill Hinz asked what other ideas he had.

When Mr. Danzik described the generator he had in mind, **Mr. Hinz**—a former president and CEO of AlliedSignal Aerospace—uttered the appropriate epithet of incredulity. But after several more demonstrations, he **became the Earth Engine's second believer.**

Dennis Danzik, IEC's science and technology officer, has built several devices based on his theories. PHOTO: JESSE RIESER FOR THE WALL STREET JOURNAL

One might expect Mr. Danzik, 61 years old, an industrial engineer but not a trained physicist, to tread lightly, perhaps starting with a small lab apparatus to prove his theories. **Actually, he has built several, including Crystal, a 1,222-pound demonstrator fabricated out of Lexan polycarbonate, so as to be literally transparent to visitors and skeptics**. As you read this, IEC is live streaming the Crystal from its lab in Scottsdale.

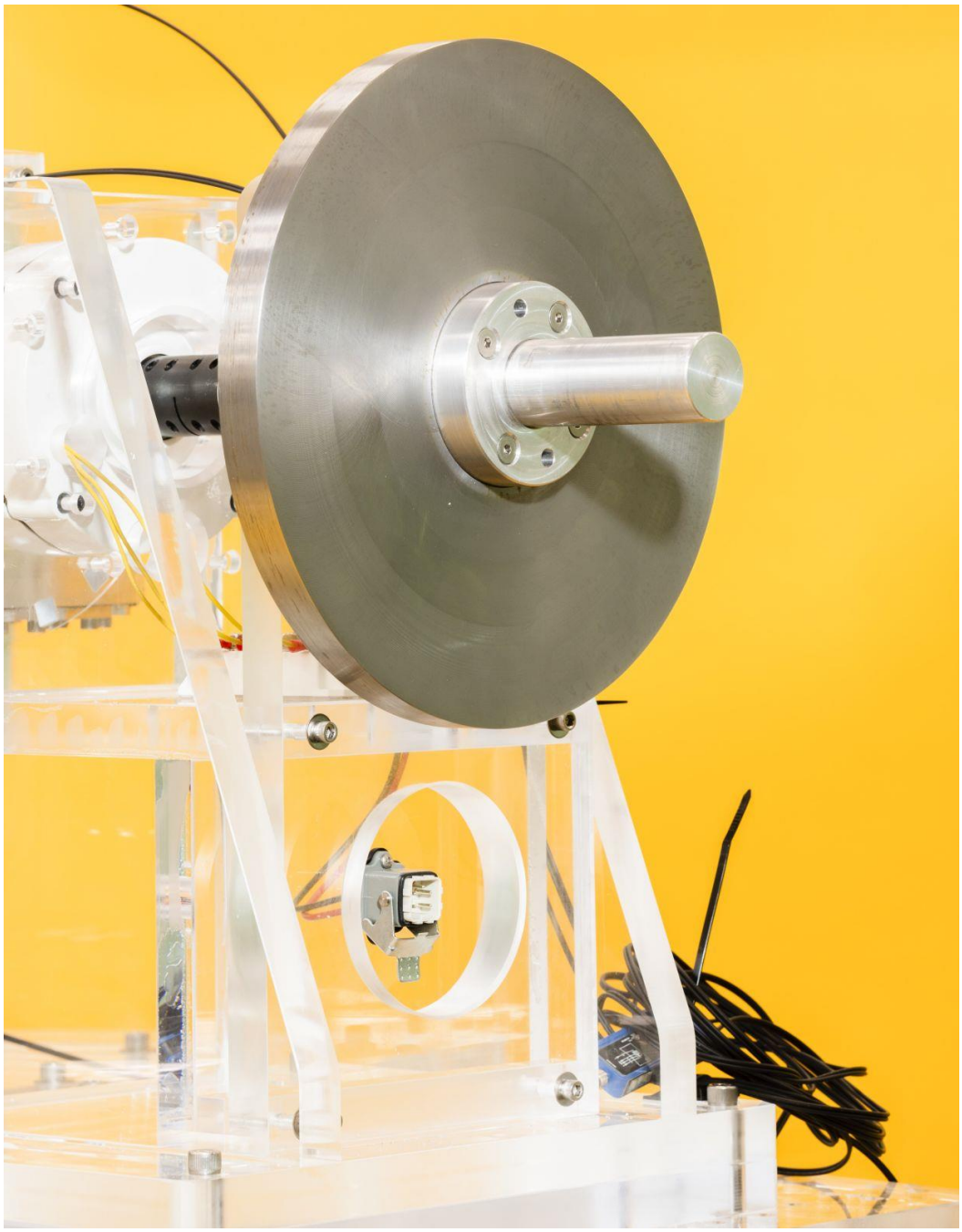
If Crystal is working as advertised, Mr. Danzik will have revealed a new field in, well, fields, the dynamics among his proprietary magnets and their ability to do work. He will have also achieved something that has eluded great minds from Leonardo da Vinci to electrical pioneer Nikola Tesla. How is that even possible? "Tesla didn't have rare-earth magnets and digital machine control," Mr. Danzik said.

Science has already spoken on the matter—and says there is no need to see the Earth Engine.

"**Perpetual-motion machines are bunk**, and magnets are the refuge of charlatans," **wrote Don Lincoln, senior scientist at U.S. Department of Energy's Fermi National Accelerator Laboratory in Chicago**, in an email. "The key is energy. How much energy do you put into it compared to how much you get out? If there's more energy out than in, we throw away the textbooks and send [Mr. Danzik] half a dozen Nobel Prizes, because one isn't enough.

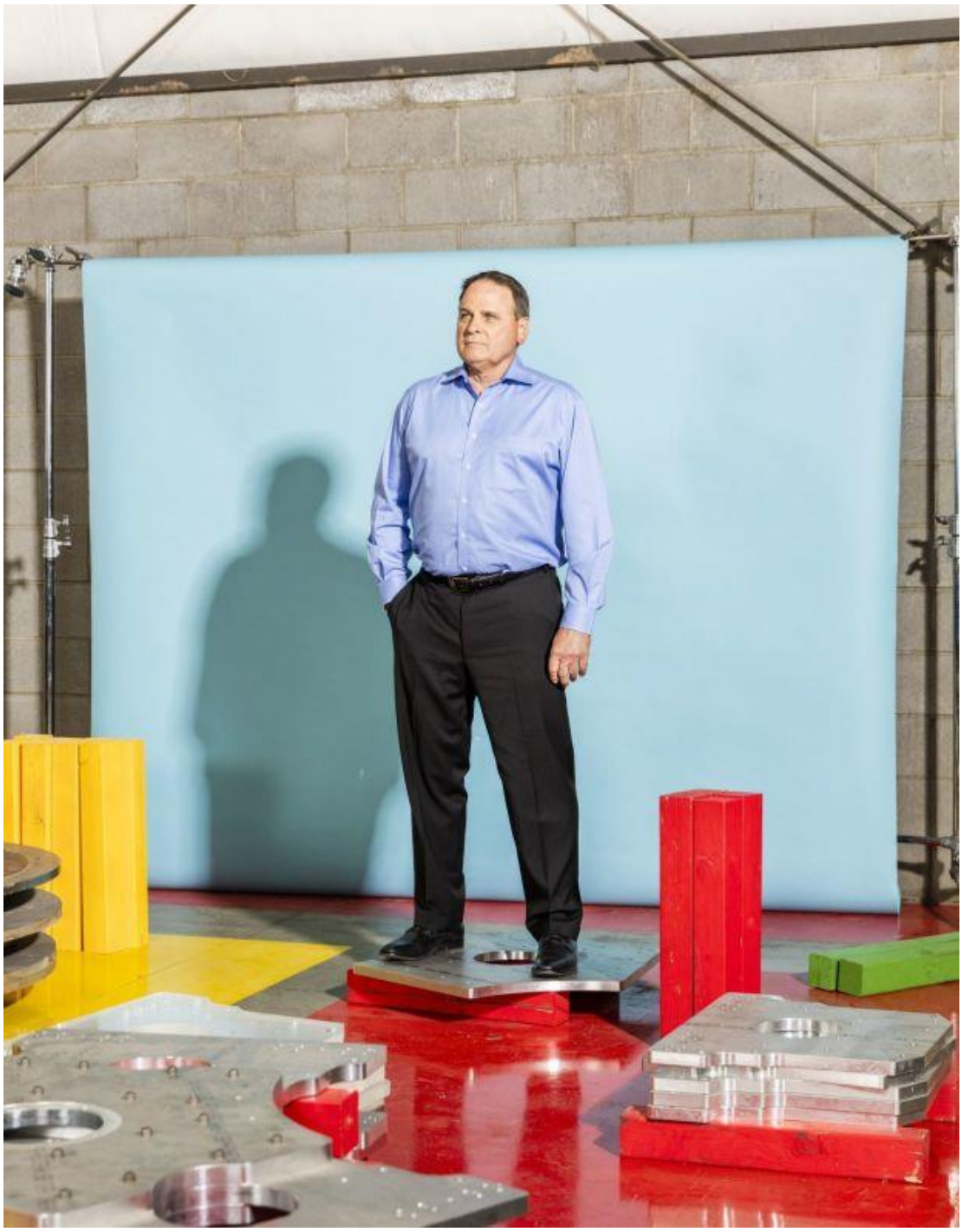
But Mr. Danzik isn't waiting by the phone for Stockholm to call. "**I can and have demonstrated [the phenomenon] without fail, thousands of times**," **he wrote in an email to The Wall Street Journal**. "At this point I am concentrating on a practical application, with a commercial benefit."

This is where the IEC's strange story takes a stranger turn. In another part of the building, **the company is already manufacturing generators** based on his radical ideas. Big ones. IEC says its first commercial model, the **R32 Earth Engine**, hucks **two 900-kilogram flywheels** at speeds between 125 and 250 rpm, generating 240V or 480V at 100 amps. On the high side, that's **48 kilowatts**, about what a small backup diesel generator puts out. But unlike a diesel generator, the company says, the R32 produces no emissions, no noise (the unit comes in a vacuum-sealed, tamper-proof housing) and uses no fuel.



Details of IEC's Crystal device that demonstrates the ideas developed by Dennis Danzik. PHOTOS: JESSE RIESER FOR THE WALL STREET JOURNAL

IEC's largest investor, Mike Halverson, owns a company in North Las Vegas, Nev., that manufactures modular shooting ranges for off-grid locations, complete with power backup. **An R32 test unit installed at his facility in January ran for 422 hours**, IEC says, **averaging 4.4 kW output,** before it was brought back to the lab for analysis. That's enough energy to light up three average U.S. homes for a month or charge up a score of dead-flat Tesla Model S's.



Mike Halverson, IEC's largest investor, tested an IEC Earth Engine at his manufacturing facility. The company says it ran for 422 hours. PHOTO:JESSE RIESER FOR THE WALL STREET JOURNAL

The limiting factor in field installations isn't making power, Mr. Danzik said, but storing it, in banks of batteries that cost far more than the generators themselves.

But again, wouldn't the limiting factor be that the Earth Engine shouldn't make, it *just can't* make, any power at all, according to every rule in the physics book? Most conspicuous is the first law of thermodynamics, also known as the conservation of energy. **Where is this energy coming from?**

Then there's Gauss's law for magnetism, the second of Maxwell's famous equations, which say magnets can do no work because they have no inherent energy, because the attractive force of one pole cancels out the repulsive force of the other. This magnetic reciprocity has been the sticking point, literally, with such cycling whirligigs throughout history.

Visitors to the Scottsdale facility will find themselves brooding over two amazing possibilities, one of which must be true, no matter how hard to accept: The first is that **Mr. Danzik has indeed found a way to squeeze enormous, unexpected energy from permanent magnets—** "nature's batteries," he calls them. Such a discovery would rank with the harnessing of steam, electricity and the atom.

Dennis Danzik, seen in IEC's lab, an industrial engineer, says about the devices he has invented, 'Honestly, there are things about the phenomenon I don't understand.' PHOTO: JESSE RIESER FOR THE WALL STREET JOURNAL

The second scenario is somehow harder to believe. That Mr. Danzik, a lovely man in schoolboy glasses and ostrich boots, is the David Copperfield of magnetics and that IEC's concrete-floor workspace is his stage, concealing generators, cables and motors. One would also have to cast Mr. Hinz—a ultrahigh-net-worth grandfather of eight—in the role of magician's assistant.

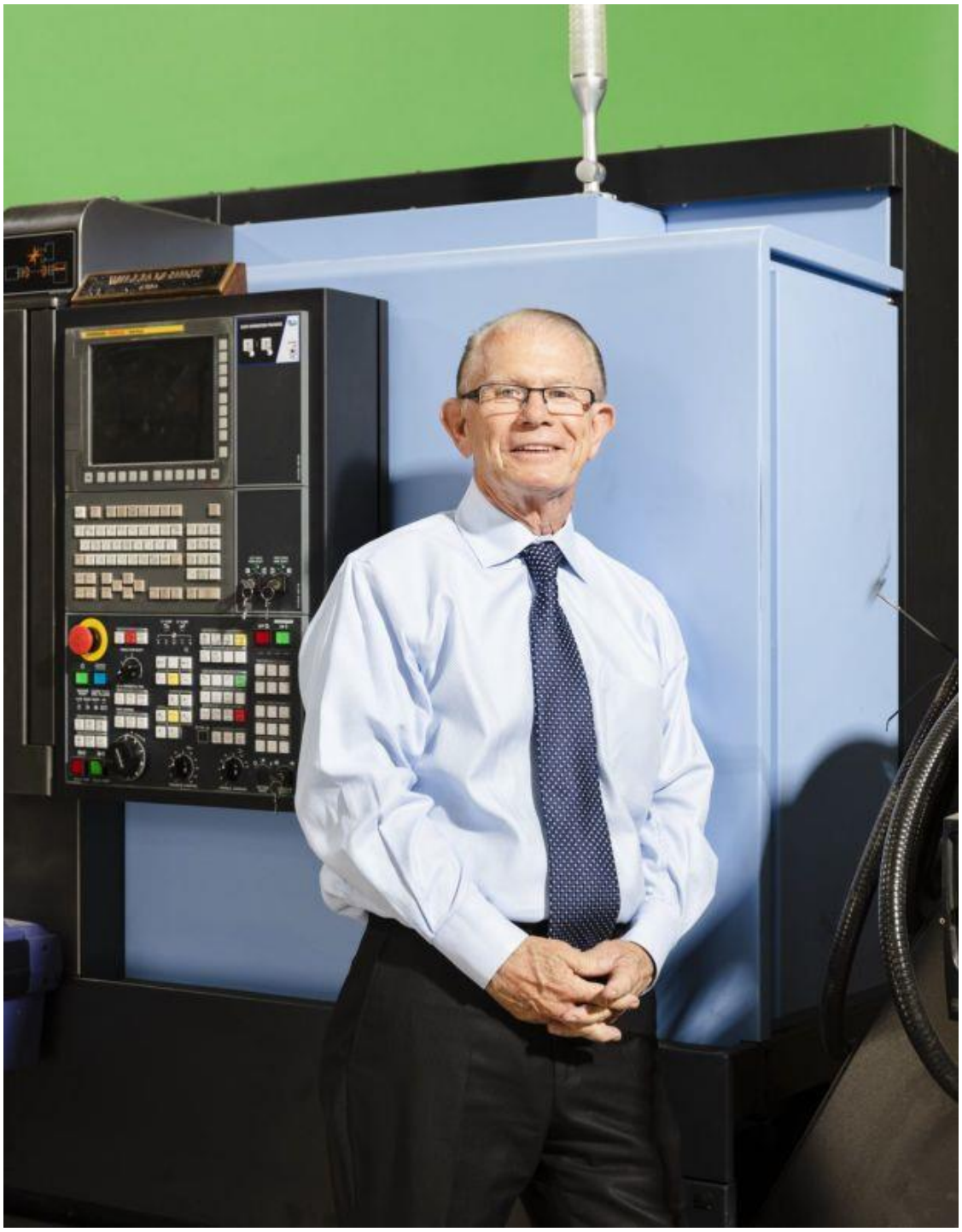
There are certainly reasons to be wary. IEC has yet to file any patent paperwork for experts to examine, which **Mr. Hinz** said was due to **fear the technology would be poached in a patent counterclaim**. **Nor has it allowed** independent **analysts to tear into an Earth Engine** to examine the core IP, what Mr. Danzik describes as the "**geometry and geology**" **of the magnets.** Crystal, the see-through demonstrator, conceals **its most proprietary bits in an opaque box.**

"These guys should get a fair shake," said Dr. Lincoln, from Fermi Labs. "But a fair shake means handing a couple of copies of their gizmo to a group of snarky engineers and scientists and let them have at it." Any physicist interested in seeing the machine has an open invitation, says Mr. Danzik.

This isn't **Mr. Danzik**'s first wonder-tech business venture. He **was previously chief executive officer of RDX Technologies Corp**. , which invested in a refinery that was **developing a process to make diesel fuel from municipal waste**. In 2015, RDX announced that it had fired Mr. Danzik. Mr. Danzik and other business entities involved with RDX have been engaged in a protracted legal battle that is headed for trial Aug. 6 in federal court in Arizona.

If the Earth Engine is an illusion, it's a spectacularly elaborate one with no clear way of paying off. **IEC isn't selling, or even leasing, the machines, to keep the secret guts secret**. Instead, **it will charge by the kilowatt-hour delivered** in the field—and a pittance, too, **8 to 45 cents per kWh.** Oil-field operations can easily pay the equivalent of $1 per kWh for diesel.

With about 30 employees, a $100 million valuation and about $16 million of investors' money in play**, IEC has plans for another round of fund-raising**, but Mr. Hinz said it is in no hurry. "**What we really need now are more smart people**," he said.



Jesse Rieser for The Wall Street Journal PHOTO: IEC'S CHIEF EXECUTIVE BILL HINZ IS A FORMER PRESIDENT AND CEO OF ALLIEDSIGNAL AEROSPACE.

But if the Earth Engine doesn't make power, none of these smart people is likely to get paid and IEC is likely to get litigated to ashes. And, just to reiterate**, the generators *can't* work, according to deep and well-established science.** Compared with overturning Gauss and Maxwell, it's more likely the entire facility is filled with hallucinogenic gas or that visitors are under hypnotic mind control. And yet the R32 roaring away in the test bed sure seems like it's working.

Some have had their faith in classical physics shaken. **Tim Tight, a tech adviser in the Bay Area** with a master's in engineering and an M.B.A., both from Stanford, visited IEC in April, after hearing about the Earth Engine for more than a year. "**It sounded too good to be true,"** he said. He returned from his visit a believer and began reaching out to friends and former classmates at Stanford, looking for a Ph.D. physicist to explain "why the machine…isn't violating the laws of thermodynamics."

Not all who have visited Crystal have come away persuaded. "I don't doubt the sincerity of Dennis and his team" said Peter Rez, a physicist from Arizona State University, in an email. But even if it did manage to extract some energy, it would amount to nearly nothing. It would have to be. "The conservation of energy is intact," he wrote.

"I'm not a physicist," **Mr. Danzik said. "Honestly, there are things about the phenomenon I don't understand**. If I understood more I could make it better." For example, Mr. Danzik wants to know how the relatively small amount of electricity used to polarize his magnets allows them to exhibit nearly inexhaustible magnetism for years. Most physicists would agree: It's a good question.

Dr. Sagan would have demanded extraordinary evidence for the Earth Engine. It could be argued Messrs. Danzik and Hinz has delivered the only evidence that would suffice: the dollars-and-cents, skin-in-the-game kind. If the generators are turning, and the dairy's lights are on and the pump-jacks

are cycling, perhaps it's incumbent on science to explain how and not the other way around.

Mr. Hinz, at least, **seems convinced. "I wouldn't sell this company for a billion dollars."**

For Extra Credit: How It Is Supposed to Work

A magnet is any material or object that produces a magnetic field. Among the strongest magnets are those derived from rare-earth minerals. In the case of the Earth Engine, superstrong magnets paired with computer control and the good old flywheel allow IEC to claim it can "suspend entropy."

Mr. Danzik says he became convinced he could extract energy from powerful magnets (mostly ordinary iron) **that are clustered in a way that magnifies their effect**. Such arrays are well known. For example, Tesla cars use electromagnetic motors with what are called **"Halbach" arrays**, which are about 30% stronger than typical neodymium magnets.

Dennis Danzik has been experimenting with magnets since childhood. PHOTO: JESSE RIESER FOR THE WALL STREET JOURNAL

The magnets IEC uses are also highly one-sided, or "**anisotropic**," which means **their field is stronger on one face than the other**—say, 85% North and 15% South.

In the R32, **magnets located in three black towers interact with ones placed in the two one-ton, counter-rotating flywheels**. As the flywheel rotates, **small battery-powered motors move the tower magnets' orientation at moments of highest drag**. This allows the magnets to accelerate as they approach and not slow down as much when they pass.

The net force imparts angular momentum to the flywheels that can then be harvested, mechanically or electrically, IEC claims.

The biggest riddle involves the conservation of energy. **Conventional physics holds that magnets have nearly zero inherent energy.** Mr. Danzik believes that is because we calculate magnets' strength by how much current they induce in a loop of wire. He argues that **with the emergence of anisotropic, rare-earth magnets, we need a new set of equations to calculate a new physical quantity**, which he describes as '**the resulting center shaft torque produced from angular momentum derived from the force of paired magnetic fields.**"

If it all checks out, this new quantity would have to be measured in a new unit: the Danzik.

Write to Dan Neil at Dan.Neil@wsj.com

https://ie.energy/

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24Hours a Day
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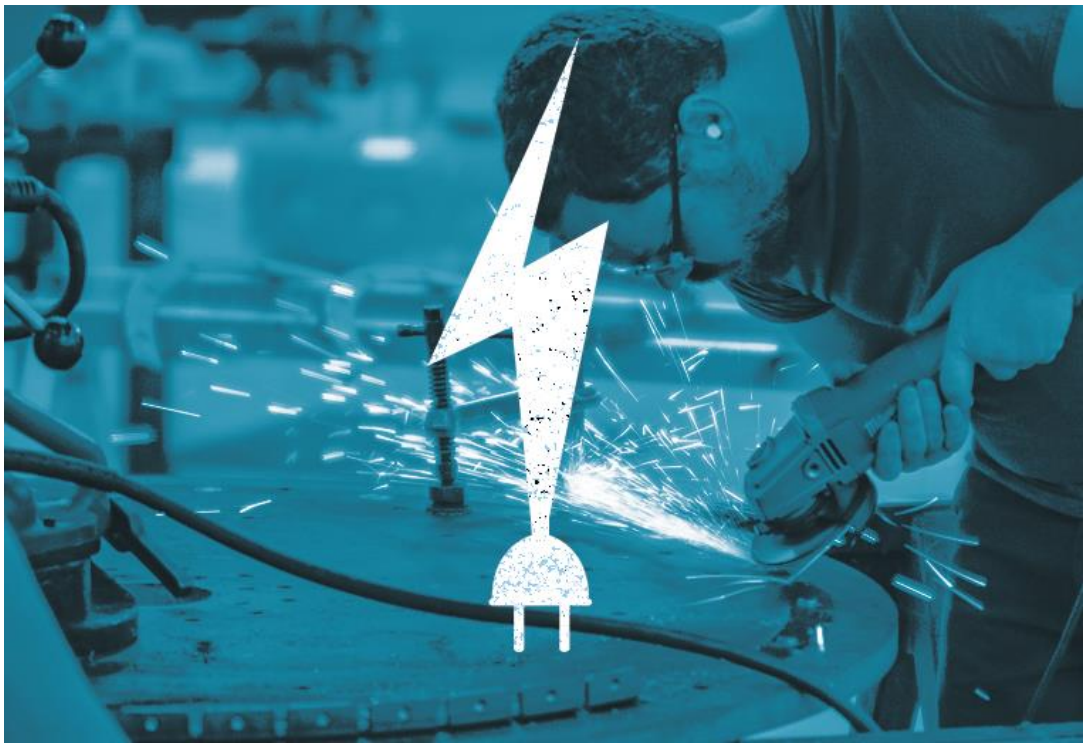
Traditional power delivery moves from large centralized power plants to substations, and then to our homes or businesses through a complex network of distribution cables. Since the 1880s we've been plugged in to our utility grid, similar to old-fashioned telephone lines. What if there is a better way? What if, like the cell phone revolution, we can unplug from the utility grid?



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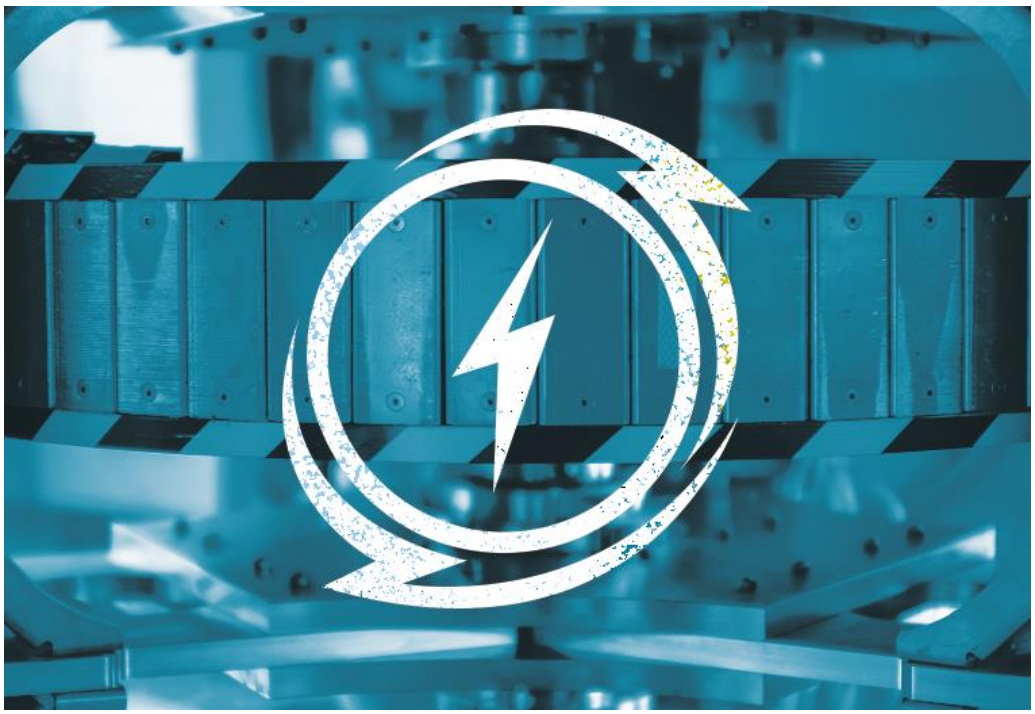
Air and water, remote or industrial, Earth Engine horsepower delivers pumping power using no fossil fuels or electricity.



Power Beyond

IE is dedicated to innovation and the development of magnetism science, pushing beyond the limits of today's technologies.

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Earth Engine

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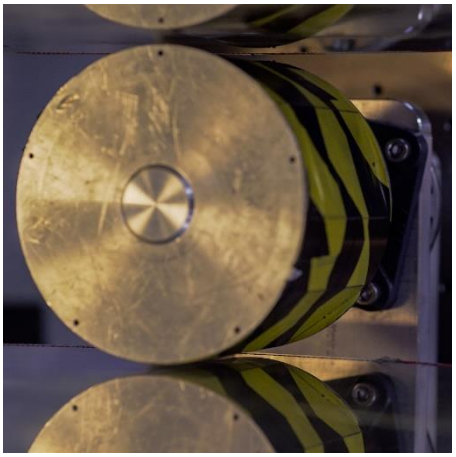
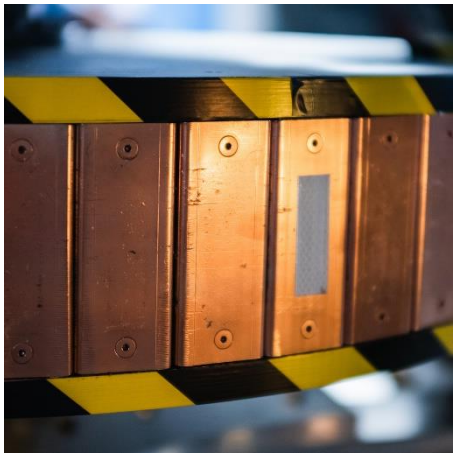
Earth Engine is in production

Currently, **IE has developed, manufactured, and is installing 7.5 to 25-kilowatt engines**, capable of driving up to 4,000 pounds of inertia power and delivering in excess of 25 kilowatts.





Earth Engine is changing the world

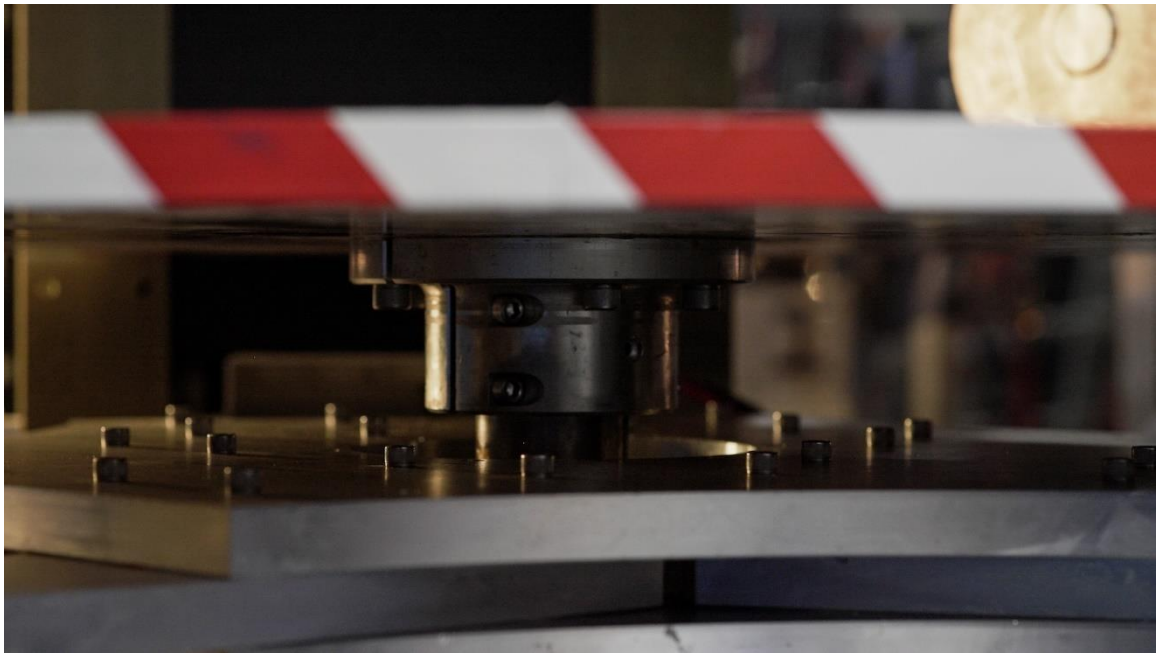
Earth Engine is the solution to the fatiguing, overloaded, and in some countries, non-existent utility infrastructure.

How is this possible?

Earth Engine operates on the same principle as the 'Slingshot Effect' space travel phenomenon, which enables a spacecraft to increase velocity via a gravitational assist.

In 2009, Dennis Danzik, an industrial engineer, scientist, and graduate of the MIT product development program**, postulated that the same effect might be replicated on a smaller scale using magnets containing rare earth.**

The problem Danzik faced was that a magnet's 'push' is always equal to its 'pull.' But **in the summer of 2012**, Danzik succeeded in altering the 'polarity' of a magnet. **He made one pole stronger than the other**, inventing an **Asymmetrical Magnet array**, and **the applied science of Magnetic Propulsion was born.**



Frequently Asked Questions

How much energy does it produce?

How does this compare to other energy sources?

How can I invest in Inductance Energy, or sell the Earth Engine technology?

Is this a perpetual motion machine?

Get in Touch

Inductance Energy staff members are ready to help answer your questions.

Contact IE

About IE

Inductance Energy (IE) is the worldwide exclusive licensee of Magnetic Propulsion and its many applications in industrial, commercial and consumer products.

888-693-3414
info@ie.energy

About IE

Get in Touch

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1111 E Lincoln Way, Suite 212
Cheyenne, WY 82001

National Training Center:
7543 E Tierra Buena Lane
Scottsdale, AZ 85260

Nevada Office:
1280 W Rockpebble Avenue
North Las Vegas, NV 89030

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- Get Involved

https://ie.energy/about/

About IE

Led by an experienced senior management team, we are revolutionizing the growing global demand for energy.

Community of like-minded, driven professionals

Success of any business comes from the team of people that are unified under one mission. Pooling the knowledge, experience, and effort as a fortified force. Our exceptional leadership is building a community of team members that strive every day for greatness. Working each day to be better than the next. Pushing the limits of the applied science of Magnetic Propulsion. We are searching for the brightest minds, creative thinkers, and focused professionals to join our expanding community.

Join Our Team

Our Team

We are a community that is greater than the sum of its parts.

William Hinz

Chief Executive Officer

Mr. Hinz brings more than 40 years of senior executive experience serving as chairman, CEO, corporate director and president for a wide variety of global companies bringing leadership in manufacturing entrepreneurship, financial management, and restructuring expertise to companies ranging from startups to multi-billions in revenue.

Prior to joining Inductance Energy, he served as CEO of Easy Energy Systems Inc., CEO of Traile-rPro Technologies,. CEO and chairman of HB-Medtek (TASE) Inc., Executive Vice President of Operations and then President of Stolper-Fabralloy Company, Group President and CEO of Triumph Aerospace. Mr. Hinz career began at AlliedSignal Aerospace (now Honeywell) where he rose through the ranks to hold various executive level positions from Senior VP of Repair & Overhaul, President & CEO of European Operations, and finally President and CEO of Aerospace.

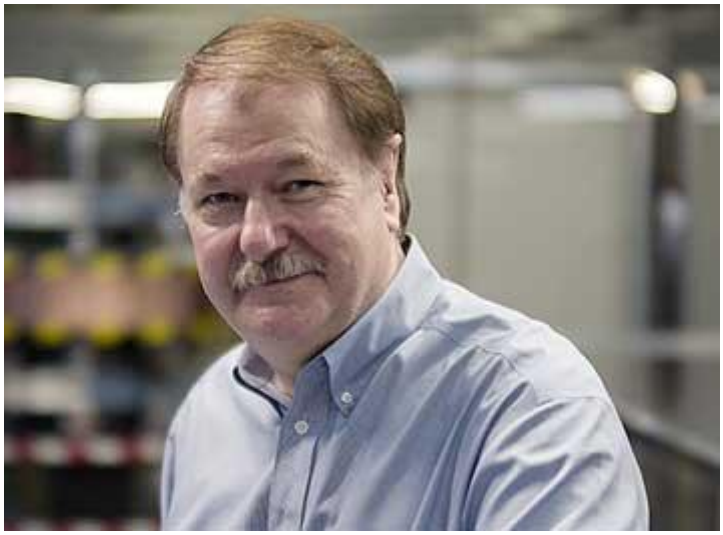
Mr. Hinz spent most of his career in the aerospace and medical industries. Most recently, he served as chairman and platform leader of the aerospace and automotive industries for a New York based private equity firm focused on the acquisition and turnarounds of US based manufacturers, such as MD Helicopters, American LaFrance, and Global Automotive Systems.

Richard Ethington

Executive Vice President of Finance

Mr. Ethington is a financial professional with more than 15 years' experience in financial and management consulting, including business modeling, projections and valuations, portfolio management, due diligence, market research, and qualitative analysis.

Prior to joining Inductance Energy, Mr. Ethington owned and operated RKE Global, a management and data science consultant firm. He was also active in launching The inNEVation Center at Switch, Las Vegas Nevada, a technology startup and accelerator firm, and served as Associate Managing Director at the Ministry of Higher Education and Scientific Research in Abu Dhabi, United Arab Emirates. Mr. Ethington holds B.S. degrees in both Finance and Entrepreneurship from the University of Utah.



Dennis M. Danzik

Engineering/Science Division

Dennis Danzik's 33 year career as an engineering professional in the U.S. and 14 foreign countries includes vetting and economic target development for well over 500 products in the U.S. A., Australia, New Zealand, Poland, United Kingdom, Israel, Egypt, Costa Rica, Venezuela, Philippines, Japan, Canada, Mexico and others.

Mr. Danzik works under contract on an exclusive basis within the science of Magnetic Propulsion, and works in product development and as an advisor to the executive team and board of directors.

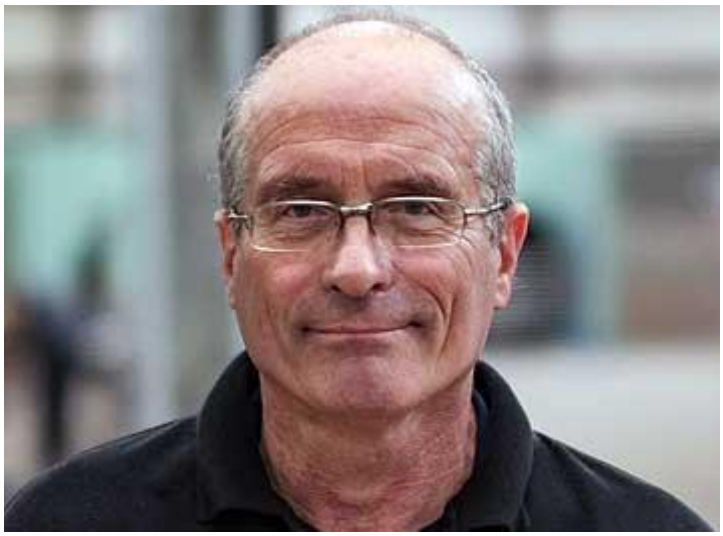
Mr. Danzik holds degrees in industrial engineering and mathematics. Dennis completed his graduate work in product development at the Massachusetts Institute of Technology Sloan School (2009). Mr. Danzik completed a fellowship in engineering at the University of Exeter in 1998. He holds status as a registered member of the National Society of Professional Engineers, ASTM, and the Institute of Industrial Engineers, and holds patents in six fields of polymer processing and material science.

Mr. Danzik is currently a student of Physiology and Radiology (magnetic resonance) at the Harvard Medical School.

Vince Meli

Director of Engineering & Automation

Mr. Meli is a 32 year practicing multi-disciplined engineer with a concentration in machine automation and machine language programming. Vince has managed hundreds of engineering projects in the USA and foreign countries.



Ronald Ellis

Director of Operations and Training

Ron manages all Inductance Energy industrial design and machine operations, including production. Ron is a professional industrial designer and master machinist with over 25 years of continuous experience in fabrication, high tolerance machine work, military, industrial, hydraulic, electrical and a variety of unique mechanical designs and actual construction. Ron is a Solid works professional, with experience in AutoCAD and machine programming.

Robert Storino

Director of Machine Operations

Bob developed his skill as a master machinist in Pittsburgh and moved to Arizona over 20 years ago. Bob is also a skilled machine programmer in a variety of machine languages. Bob's experience includes fabrication, close tolerance, assemblies, sub-assemblies, military, industrial, consumer, and prototyping.

Anthony Wallenburg

Director of Industrial Design

Tony is well known as one of Arizona's superstars in industrial design and his experience spans over two decades in defense, consumer, industrial, and every assembly discipline connected to those industries, as well as hundreds of market segments in tens of thousands of parts and assembly designs. Mr. Wallenburg will head Inductance Energy's industrial design training and instruction divisions.

Dustin Hamby

Director of Special Projects

Mr. Hamby was voted one of Arizona's "Top 35 Entrepreneurs Under 35" at the age of 27. Specializing in marketing and brand development, Mr. Hamby brings over 18 years of business start-up experience across a multitude of industries - Most notably within the renewable energy sector and waste water industry.

https://ie.energy/get_involved/

Get Involved

There are many ways to get involved with Inductance Energy.

Invest with Accelerated Depreciation

IE has opportunities to invest in many areas of the technology and the company.

Read More

Become an Approved Jurisdiction

Approved Jurisdictions manufacture, distribute, and sell power from the Earth Engine.

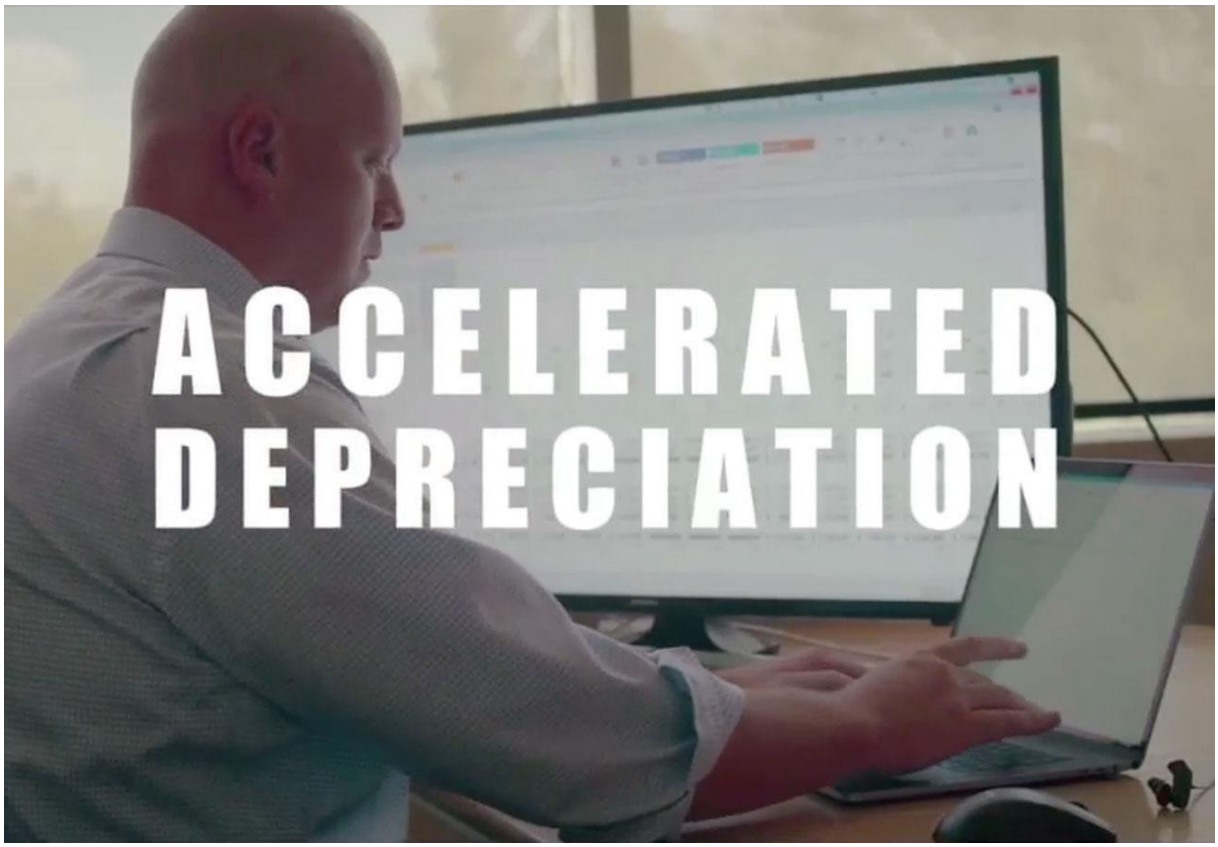
Read More

Strategic Investment Partners

The task of deploying Earth Engine throughout the global economy is immense.

Read more

- **Accelerated Depreciation**
- **Become an Approved Jurisdiction**
- **Strategic Investment Partners**



Invest with Accelerated Depreciation

Get involved with IE by investing in the placement of Earth Engines. Investors in Earth Engine deployments have the ability to take 100% accelerated depreciation in the first year and receive a 10 year annuity based on the electrical power delivered.

Get in Touch

Invest in Inductance Energy

Today's modern society gold rush comes in the form of Magnetic Propulsion. Investment opportunities are still available in the birth of this disruptive technology. You now have the ability to invest in Inductance Energy on many levels.

Approved Jurisdictions

IE is seeking qualified operators to deploy Earth Engines throughout the global economy. Regional businesses will be stand-alone operations that license the rights to manufacture and sell IE technologies. Contact IE to see if you qualify for a regional business opportunity.

Technology Licensing

IE owns and develops technologies that will revolutionize the world, but employs a limited research and development team. Opportunities for other companies to license certain technologies in pursuit of new products and services will be considered. These will likely be offered with a license or royalty fee agreement.

Invest in Earth Engine

Earth Engines will be placed into long term agreements and commitments, presenting a contracted, predictable recurring revenue stream to high net worth individuals, capital investment groups, institutional investors, etc. With a 2018 tax depreciation that allows for 100% accelerated depreciation, investors pursuing depreciation write-offs can invest in Earth Engine technology in exchange for depreciation and a share in future revenues, resulting in a very healthy internal rate of return. Single or multiple engines deployed and in service with customers can also be packaged into annuity offerings with similar benefits to investors.

Media & Event Requests

The advanced nature of Earth Engine drives an immense amount of interest for viewing of the technology. IE has Mobile Display Laboratories that feature functioning Earth Engines for demonstrations and educational opportunities. If you are a media outlet, educational facility, or promoting a technology event and would like to have an IE Mobile Display Laboratory featured, please contact IE for details.

Employment Opportunities

The birth of a new technology brings exciting opportunities. IE is looking for the best of the best in science, engineering, manufacturing, management, accounting, sales, and marketing.

Get in Touch

Contact our investment team to learn more about the many ways to get involved with Inductance Energy.

Send Message

See also:

http://www.borderlands.de/Links/IEC-News.pdf