



Transducing Energy Devices, LLC

PERMANENT FUEL-LESS ELECTRICITY

THE IDEA

In 2005, the Principals of Transducing Energy Devices, LLC began the R&D for a fuel-less electricity generating device. The decision was taken to focus on the use of a defined free energy source.

In 2014, a device was designed based upon using the freely-available energy from permanent magnets and was named the "Permanent Magnet Induction Generator" (PMIG). A single significant technical hurdle remained - the design of a key component.

In order to resolve the last hurdle, the company commenced fund raising.

THE OPPORTUNITY

A successful PMIG could decentralize the production of electricity and replace most of the energy sources and energy equipment, worldwide. Because R&D to date indicates sufficient power to be useable in most energy applications (e.g., automobiles, houses, boats), the use of fossil fuels, fossil fuel engines, wind, solar, nuclear reactors, and the electrical power grid could be obsoleted.

The financial opportunity is so immense that it is best gauged as some percent of a country's GDP that is currently spent on conventional energy. In the USA, energy production accounts for 5.9% of GDP and in Mexico it is 8.8% (Investopedia 2013).

The opportunity to improve the environment worldwide is also immense because of the reduction in global pollution that would result from the switch away from combustion of carbon-based fuels to a PMIG for basic energy needs.

FUNDING

The Company is currently raising capital to complete the R&D begun by the Principals in 2005 for a fuel-less electricity generating device, the Permanent Magnet Induction Generator (PMIG). A single technical hurdle remains. This funding is to be used to resolve the remaining hurdle.

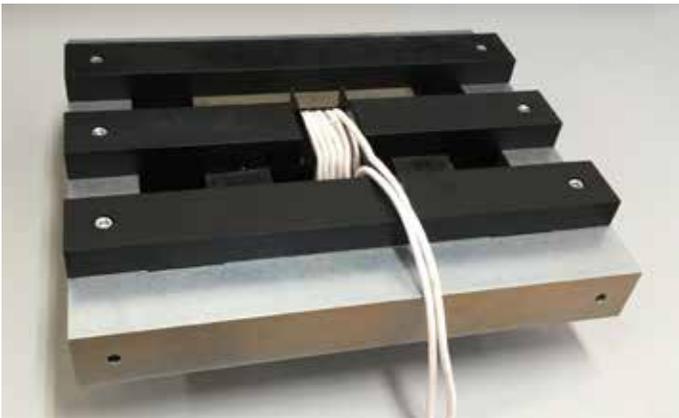
There are opportunities for eligible, accredited investors to invest. However, before investing, the law requires that you complete a suitability questionnaire so your accredited status may be determined. Also, a Non-Disclosure Agreement ("NDA") is required by the Company. Upon receipt of the completed questionnaire and executed NDA, we will contact you by phone to confirm. Once confirmed, we will send our Private Placement Offering Memorandum ("PPOM").

THE PMIG DEVICE

Description

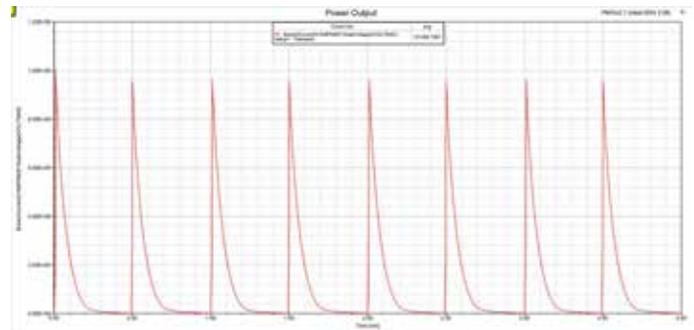
The PMIG is a standalone device less than a cubic foot in volume with an estimated weight of 75 lbs (34 Kg). It is self-exciting, nonpolluting, and usable in both moving and stationary applications. Permanent magnets supply the input magnetic flux (energy) for free.

It should generate electrical power without the input of external energy such as fuel, sunlight, heat, wind, and chemicals and do so in sufficient quantities to be useable in most energy applications, e.g., automobiles, houses, boats. An illustration is below:



Test Results at 1 kHz

A computer simulation that assumed hypothetical Reluctance Switches with preferred magnetic characteristics produced a gross average output power of 100,000 Watts at 1 kHz before losses from: the soft magnetic material comprising the conductive parts of the magnetic path, the waveform conditioning, and the feedback power siphoned off to operate the Reluctance Switches. The output power waveforms, which of necessity are “spikes,” are shown below:



INTELLECTUAL PROPERTY (IP)

A US Provisional Patent Application was filed in December, 2016. (Two previous US Patent Applications have been published, one in 2009 and the other in 2014. Neither has been issued and will be abandoned.) The Company's patent counsel is John Posa of Belzer PC, Savannah, GA.

MISSION

The Company is a Michigan LLC that was formed in 2005 for the specific purpose of performing R&D for the creation of an over-unity electrical energy device.

THE COMPANY

Founders

THEODORE C. ANNIS

- Managing Member of Transducing Energy Devices, LLC
- Magnetics design

EDUCATION

- B.S. Physics, Xavier University, Cincinnati, Ohio
- MBA, Xavier University

J. PATRICK EBERLY, PHD

EDUCATION

- Ph.D. Computer Engineering, University of Cincinnati Graduate School, Cincinnati, Ohio
- M.S. Electrical Engineering, University of Cincinnati Graduate School, Cincinnati, Ohio
- B.S. Physics, Xavier University, Cincinnati, Ohio

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FREQUENTLY ASKED QUESTIONS

1. *The PMIG sounds like a perpetual motion machine. I thought that these are impossible.*

The PMIG has no motion; it is solid state. Its energy source, the permanent magnet, is a perpetual energy source. Although there is indeed such a condition as perpetual motion (e.g., heat), it does not apply here.

2. *How do you get something from nothing?*

The PMIG has a persistent, non-depleting energy source, the permanent magnet. This is “something” as opposed to no energy source (the “nothing”).

3. *What kind of “system” is the PMIG?*

It is not a thermodynamic system. It has no working (multistate) molecular medium such as a gas, a liquid, or a solid. It has no storage medium other than the temporary electromagnetic storage of its output coil. Further, typical closed thermodynamic systems do not contain an energy source. Applying the well-known First law of Thermodynamics to the PMIG is not valid. It is like applying the physics of fluid dynamics to rigid-body rotation.

It is not a mechanical system.

It is a magnetic system with a built-in energy source, the permanent magnet. Its physics is described by Maxwell equations [a] $\nabla \cdot \mathbf{B} = 0$ and [b] $\nabla \times \mathbf{E} = -j\omega\mu\mathbf{H}$. Its boundary cannot be arbitrarily defined as physicists are wont to do when discussing a system. Equation [a] defines its boundary. Equation [b] indicates that “electricity” is generated by changing the magnetic field supplied by the permanent magnet in magnitude or direction or both.

4. *It appears that there is more to the permanent magnet than is realized.*

Yes. The permanent magnet is more than a simple (magnetic) spring. Although the discussion of its physics is too lengthy for these FAQs, one major point is that it cannot be considered in isolation, but must be considered as part of a larger system that includes its immediate surroundings. This simple and important fact trips up engineers and physicists, as can be seen in the IEEE, Transactions on Magnetics, Vol. 36, No. 1, January 2000 paper by Peter Campbell titled: “Comments on Energy Stored in Permanent Magnets.” In it, he references a statement in a prior discussion on the same subject by Lovatt and Watterson which is: “... there is still some confusion about the energy stored in a permanent magnet.” Campbell does not resolve the confusion because he fails to consider the larger system.

5. *Permanent magnets tend to be small and do not seem to have much usable energy. This energy field is conserved, is it not? And... $\nabla \cdot \mathbf{B} = 0$.*

The PMIG is conceptually different than a battery with which one thinks of a large, finite amount of energy stored in a volume of material and metered out over time into a load until the battery is depleted.

The PMIG has a “small” amount of magnetic field energy available at any instant and this energy is never depleted. Remember that power = energy/time. If the magnet’s small and persistently-available energy can be manipulated within a short time period and manipulated repeatedly, the power output is “large.”

6. *How does one capture the energy from a permanent magnet?*

Useful energy cannot be captured from it directly. Useful energy is created by changing the state of the permanent magnet system. Such a change directly creates electrical power (second Maxwell equation above).

The PMIG converts its energy source into a power source by shuttling the freely-supplied magnetic field between two different paths thereby producing electricity ($V = -d\mathbf{B}/dt$) which presents as electrical power (Volts X Amps) in the output coil with resistive load that surrounds the common part of the magnetic paths. The resistive load to which the output coil is connected harvests this electrical energy out of the PMIG as the power is generated. The permanent magnet accomplishes four functions: 1) it freely and forever produces a magnetic field, which is an energy field; 2) it responds to reluctance changes in the magnetic path with more or less MMF; 3) it freely replaces the energy lost due to eddy currents; and 4) it is a stationary part of the Lenz interaction that takes place between it and the stationary output coil when electrical energy is harvested into the resistive load.

7. *I heard that magnets weaken and run down. Is this a problem?*

Research indicates that modern permanent magnets may lose 1% or less of their strength over ten years, which is not a problem. Research into the lifespan of a permanent magnet typically yields scanty information, likely because it is not often an issue in magnetic applications. We did learn that the magnets used in heavy lifting applications need to be replaced about every 25 years.

8. *How would the PMIG be used in an automobile?*

Electric automobiles are a commercial reality, as they were in the early 1900s. They now use lithium-ion drive batteries that are recharged from house electricity, from an on-board gasoline engine/generator, and from charging stations. The PMIG would charge the drive battery directly and constantly and thereby eliminate both the need for plugging into the house electricity and the on-board engine/generator. The result would be a “completely green automobile.”

9. *What is a CoP (Coefficient of Performance), and is it different than efficiency?*

Efficiency = output / (environmental input energy + input energy from fuel)

CoP = output / (energy from fuel)

Examples demonstrating the difference are:

- An electric motor with a 75% efficiency has a CoP = 0.75
- A solar cell has an efficiency of about 20% and a CoP = ∞
- A heat pump using 55°F ground water has a CoP between 2 - 5
- Nuclear devices have a CoP = ∞
- The PMIG has a CoP = ∞ after initial excitation

10. *Is there an opportunity to discuss the physics?*

Yes. There are three areas that we'd like you to research before the discussion:

1. That the energy limitation ascribed by the First Law of Thermodynamics does not apply to a system, either open or closed, with an energy source.
2. Search the science books or literature regarding the energy in a permanent magnet and extract a \mathbf{BH}_{\max} plot.
3. You must explain why the \mathbf{H} -vector inside a permanent magnet is 180 degrees out of phase with the \mathbf{B} -vector external to it. (Explanations using electrical analogies are fine.)