

Current State of Magnetic Miles Energy Research and Plan for Future Development

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Competing Technology:

The following is an update on the changes in the industrial LENR community over the past year or so.

E-CAT SKL Device (Leonardo Corp.-Italy):

Rossi has new financial/manufacturing partners whose identity has not been revealed. He has all but abandoned the “heat” reactor in favor of the SKL. The details on his “new” technology are scarce, but what has been released is that it is an electricity and heat source with electricity representing 80% of the energy output. Rossi claims that the SKL device is still at the prototype stage but has investment funds secured. A demonstration was scheduled for January, 2020 but was postponed.

<https://e-catworld.com/2020/05/03/several-agreements-have-been-signed-for-the-commercialization-of-the-e-cat/>

Brilliant Light and Power (U.S.A.):

Brilliant light and Power’s - Sun Cell technology uses a moderately high temperature plasma to drive a turbine which in turn drives an MHD electrical generator. The energy output is reported to be two to four times the input energy as verified by recent independently preformed testing. They have multi-million dollar backing and seem to be finishing the “proof of concept” stage of development.

https://brilliantlightpower.com/pdf/Short_Business_Presentation.pdf

Aureon Energy (Canada):

SAFIRE, until recently has been an academically focused, moderate temperature (20,000C) plasma facility that has recently been targeted for commercialization by Aureon Energy of Ontario, Canada. The device, an electrically driven plasma with a novel spherical electrode system, is still in the proof of concept stage. The targeted markets are nuclear remediation and electrical energy generation with predictions of a five-year development period before market entry. This is a new entry into the industrial applications of LENR. The development history is impressive and the facilities world class.

<https://aureon.ca/opportunity>

<https://www.safireproject.com>

Industrial Heat LLC (U.S.A.):

As of June 13, 2019, Industrial Heat, evaluated at \$918 million, has invested in several LENR groups including Rossi (which did not end well). They have recently raised over \$100M in new development capital, with investments made by Brad Pitt (Hollywood actor) and Lauren Powell Jobs (the widow of Apple co-founder Steve Jobs) in an attempt to turn “fantasy into reality” i.e. commercialize cold fusion technology.

<https://www.ft.com/content/024cfc4a-8df6-11e9-a1c1-51bf8f989972>

<http://www.sifferkoll.se/sifferkoll/is-industrial-heat-carpet-bombing-the-lenr-community-with-vaporware-patent-documents-is-litigation-their-only-business-idea/>

Current Status of the Magnetic Miles LENR Project:

The most significant change in the Magnetic Miles LENR project over the past year has been the passing of Devon Meyers, the lead technical developer for the project. Although he was officially not part of the project for a year or so prior to his passing, his presence is and will be deeply missed. Since Devon's passing, for financial reasons, the LENR laboratory was dismantled and put into storage, with further LENR developments put on hold.

Prior to lab closure, the pulsed LENR power source was almost at a stable operating state, thanks to the dedicated efforts of Lenny and Russ. This required an almost complete overhaul of the equipment and experimental apparatus and included the purchase of new equipment capable of measuring the characteristics of the pulsed LENR discharge with greater precision than was available earlier.

At that time, the major goal of the project, was the accumulation of 400 hours of discharge time on a single set of electrodes, which would then be sent to an outside laboratory to have the accelerated transmutation rates for thorium into lead and tungsten into hafnium verified. It was felt that this would then provide a good basis to position the technology with an institution better suited to further develop the technology along the nuclear remediation path. During this process, a data base of test results was to be compiled that would allow other aspects of the technology to be explored. The desired plasma state lasted however for very limited time periods. After operational times limited to a minute or so, the electronics that control the power source would fail. The difficulty is that successful operation of the apparatus must occur within a very small operational window in a large playing field of variables. Unfortunately, when the apparatus was not operating in this window, the equipment would become severely electrically overloaded with the result being catastrophic. Redesigning the switching apparatus in the power supply (doubling the IGBT's to handle the voltage transients) was suggested by Russ Davis, but implementation of the modification never occurred due to lack of funding.

The "University of Utah" was approached regarding potential collaboration: From Utah, *"No concrete progress on Utah partnership to report...I continue to reach out to ... people in the sciences/engineering that would provide the support that is needed. I am not unhopeful..."* Nothing has changed in this over the past year. Further, the results of a \$10 million joint Google and multi-university study to demonstrate excess energy in a deuterium LENR apparatus were released a year ago, and were not positive. They concluded that the prospect of excess energy is still ambiguous in LENR, and requires further study. They also a point to a possible narrow operating window for the reaction not dis-similar to what Magnetic Miles faces, although in an entirely different mode of operation. It is hard to say if the study influenced overall academic interest or not, given the current world situation.

<https://e-catworld.com/2019/05/28/nature-google-funded-team-fails-to-generate-cold-fusion-in-400-experiments/>

What's Next:

Repeatable, Reproducible and Reliable

From a scientific standpoint, for the MM device as is true for a great many of this type of device, the satisfactory operating point for the machine is sensitive to the many operating and environmental conditions it experiences, often seemingly attainable only by the actions of the inventor who “feels” his way to the successful operating point for the apparatus. Finding a “needle in a haystack” might be a valid comparison. Typically, sensitive devices such as the MM device, become inoperative when left in storage for long periods, or get moved to a new location for demonstration purposes, etc., inviting conclusions such as charlatanism, fraud, etc. from the intended audience. Past experience has suggested that it takes a couple of months of effort on the part of the inventor to restart the device once it had been non-operation for a period of time. Yet to demonstrate the technology to an interested party, the operation of the apparatus needs to be repeatable, and reproducible, able to be reconstructed and operated by personnel that did not originate or develop the idea at a location differing from the development site. So far, the process has proven repeatable, having been started and stopped many times by Devon, and for brief intervals by Russ and Lenny, but only partially reproducible, since the apparatus has remained essentially in the same form over its history.

It is my opinion that being reproducible is the necessary next step in the commercialization of Magnetic Miles' LENR process. Once the device is satisfactorily running in a repeatable and reproducible manner then reliability issues can be addressed. This plan is essentially unchanged from that of a year ago. The commercial paths defined in earlier reports remain intact. Of the four streams defined earlier – nuclear transmutation and waste remediation, direct electrical energy production, hydrogen gas production, heat energy production, only the first two remain viable for Magnetic Miles but with hydrogen production now being investigated.

The development of nuclear reactor or waste remediation technology is well beyond the current resources of Magnetic Miles other than a simple demonstration of the occurrence of the transmutation reaction. The lengthy electrode exposure times required, necessitates a power supply that can run reliably for long periods.

For the direct electrical energy path, an academic colleague responding to my query regarding what is needed from the LENR industry was “Direct Electricity, is the holy grail and that is where we will be in a generation, hopefully sooner. So that is what I would focus on. If we have that, we can get to everything else we need with high efficiency.” This has been the path of Magnetic Miles LENR for several years now and continues to be a viable path.

The markets and recent history for hydrogen technology has been reviewed by the author for this audience on previous occasions. Given the renewed interest in hydrogen as a fuel, it might be prudent to put this candidate technology platform back on the development list. As reported earlier, the anomalous generation of hydrogen, far in excess of that produced by traditional electrolysis, is receiving renewed interest by the automotive and manufacturing sectors, and more recently for on-site production on ocean going vessels. As mentioned on previous occasions, Joi Scientific of Hawaii had entered into a licensing agreement with MarineMax, a large Yacht manufacturer headquartered in Clearwater, Florida using their hydrogen production technology which was claimed to produce hydrogen far in excess of what was expected based on traditional thinking.

However, Joi's claims of excess hydrogen production have been recently proven to be fraudulent. This leaves a void waiting to be filled in commercial hydrogen production technology.

<https://cleantechnica.com/2019/11/01/joi-scientifics-hydrogen-illusion-comes-tumbling-down/>

The current Magnetic Miles device produces large volumes of gas which supposedly had been purposefully configured to be non-explosive. The make-up of this gas is unknown, but literature suggests that it may be "gray fog" as reported by Graneau, formerly at MIT and Northeastern University. Gray fog is a stable form of hydrogen where hydrogen molecules or atoms are encapsulated in a sheath of water molecules, making the explosive gas largely inert, but also easily released when its explosive capability is required (automotive applications for example). This topic is currently experiencing a resurgence under the name of "Brown's gas", exotic vacuum objects, water clusters, etc., in the nanotechnology field. The Magnetic Miles apparatus could be reconfigured to produce hydrogen. Whether or not it is Gray fog is to be determined. This would be a new experience for the lab, requiring equipment and devices to contain the gas and measure their explosivity.

For the excess heat energy path to commercialization, Magnetic Miles has anecdotally observed significant heating and cooling within the apparatus, the source of which is poorly understood. It is still felt that this option is a last resort, since this is a "me-too, race to the finish" and would consume vast amounts of financial resources.

The table below summarizes the next steps necessary to get the LENR project back in operation. The bulk of the equipment should be in place to carry on with the transmutation and direct electrical energy streams. For budgetary purposes, the year has been broken into four quarters, each quarter costing in the ball park range of \$30K-\$60K for lab space, utilities, and personnel and \$15K-30K for equipment upgrades, additions, and repairs, with a corporate review scheduled for the end of each quarter.

It is thought that it will take about three months to get the laboratory fully operational with a ball part cost of \$35K to \$70K, assuming that the equipment already in place is operational. This includes the purchase of new video recording equipment to make sure that a detailed development record is provided.

Another three months or so will be required to restore the measurement equipment to a satisfactory state of operation, develop the powers supply to a reproducible and more reliable state, and get the discharge arc to operate in a non-equilibrium yet stable state, as described in earlier reports. The feasibility of hydrogen as a technology stream will also be investigated. Demonstrations for external funding, partnerships, etc. should begin in this quarter.

The third quarter will primarily be spent accumulating discharge time on the tungsten electrodes, and the replication of the sheath experiments, or something equivalent, that allows the determination of the properties of the available "excess" electrical energy.

The fourth quarter will see external verification of the expected accelerated nuclear reactions, and the search for an academic, institutional and/or industrial partner to take the pre-technology

concepts to market. In addition, a direct electric generation concept will be recommended for further development. It is premature to provide a budget for a hydrogen stream.

Task List Summary – Year 1

Time (mo.)	Fixed Costs (\$) ¹	Equipment Costs (\$) ²	Laboratory Re-Make	Power Source	Transmutation	Direct Electricity	Hydrogen Generation ³	
1	10K-20K	5K-10K	Find Lab space Find personnel					
2	10K-20K	5K-10K	Assess equipment status Purchase/repair equip't	Purchase parts -batteries, IGBT's				
3	10K-20K	5K-10K	Install equipment -recording camera's -voltage/current probes	Install power supply	Lab fire safety EMP shield		Feasibility of hydrogen generation	
TOT.	30K-60K	15K-30K	CORPORATE PROGRESS REVIEW⁴					
4	10K-20K	5K-10K	Re-assess lab equip't - voltage probe - current probe -isolation unit -DAQ readiness	Power supply mod's	Install equip't -modify arc			
5	10K-20K			power supply mod's	Install equip't -modify arc	Stabilized plasma		
6	10K-20K			power supply mod's	Install equip't -modify arc	Stabilized plasma Demonstration		
TOT.	30K-60K	5K-10K	CORPORATE PROGRESS REVIEW⁵					
7	10K-20K	5k-10K			Accumulate discharge time	Sheath re-do		
8	10K-20K				Accumulate discharge time	Sheath re-do		
9	10K-20K				Accumulate discharge time- Prelim. Lab Analysis Seek partner	Power extraction methods		
TOT.	\$30-60K	5K-10K	CORPORATE PROGRESS REVIEW⁶					
10	10K-20K	5k-10K			Accumulate time Seek Partner	Extraction concept		
11	10K-20K				Accumulate time Seek Partner	Extraction concept		
12	10K-20K				External lab analysis Seek Partner	Power extraction		
TOT.	30K-60K	5K-10K	CORPORATE PROGRESS REVIEW⁷					

¹ Based on data provided for period March – July, 2017 for which average monthly cost was \$14K (corporate data)

² Rough estimate – existing equipment operational state and future equipment purchases costs not known

³ Hydrogen stream feasibility study. Results of study could impact rest of plan.

⁴ First quarter-lab operational, personnel in place, equipment repaired, updated, etc.

⁵ Second quarter-power supply issues solved, accumulating discharge time, plasma stabilized, demonstration ready

⁶ Third quarter-preliminary transmutation results -seek partner, plasma understood -electric concepts analyzed

⁷ Fourth quarter- finish transmutation run -seek transmutation partner, electric generator proof of concept.