July 2018

Applied Energetics

Ticker: AERG

Corporate Overview of Applied Energetics

Multigenerational Opportunities in Advanced Technologies

**Science & Electronics**
- Laser Guided Energy/LGE Transfer
- Micro-Semiconductor
- Advanced Additive Processes
- Bio-Chem ID Processes
- Advanced Hybrid 3-D Printing
- Optical Physics Atomic Level
- Internet of Things
- Advanced Manufacturing 4.0

**Medical**
- Surgery
- Imaging
- Microfluidics

**Defense**
- Counter Electro-Optics
- Counter Vehicle
- LIDAR Remote Sensing
- Counter IED
- Lethal/Less Than Lethal Weapons
- Mobile Ops Urban Terrain
- Perimeter Protection
- Infrastructure Protection

**Novel Patent Protected IP, Including Laser Guided Energy (LGE)**

Opportunities: Department of Defense, Advanced Manufacturing 4.0, AE Additive and Internet of Things
Laser Guided Energy (LGE) and Ultra-Short Pulse Lasers (USP)

Applied Energetics, Inc. (AE), based in Tucson, Arizona, specializes in development and manufacture of advanced high-performance lasers, high voltage electronics, advanced optical systems, and integrated guided energy systems for defense, aerospace, industrial, and scientific customers. AE pioneered and holds all intellectual property rights to the development and use of Laser Guided Energy (LGE).

- Applied Energetics (AE) was founded in 2002 as Ionatron, and is the creator of Laser Guided Energy (LGE), a multi-dimensional and transformational directed energy technology. Early work was primarily ‘confidential’ Department of Defense (DoD) and CIA projects.
  - The company booked over $86 million in revenues during its first 8-years, starting in 2002.
  - Went into corporate shell status in 2014 to preserve capital and IP due to government budget cuts.
- Applied Energetics emerged from shell status as a normal operating company in April of 2017
  - Current emerging opportunities include DoD, Advanced Manufacturing 4.0, Additive Processes and Internet of Things (IoT).
- LGE is a privately funded transformational technology.
  - Applied Energetics owns all LGE Directed Energy Intellectual Property rights including uses for DoD.
  - LGE is a unique and rare ownership circumstance of a multi-dimensional Directed Energy technology.
- Leverages over $150 million (all sources) already invested in R&D.
  - Has approximately $59~ million federal tax loss carry and $5.3 million Arizona state tax loss carry.
- LGE Energy Transfer and Ultra-Short Pulse (USP) technologies fit perfectly into the GE’s “pathway of Innovation in Manufacturing 4.0 and Technology 4.0” as transformative technologies of the future.
- Internet of Things (IoT) are advancing rapidly, and analysts point to an explosive upward growth curve ahead.
  - IoT integrates well with AE’s related advanced technologies, offers many novel opportunities.
- Blockchain is an early stage technology that is quickly evolving, offers tremendously diverse uses.
  - Once integrated into AE’s IP and Technology, it is expected to provide secure, traceable and highly efficient novel solutions.
- AE in opportunistic position; R&D activities resuming in Tucson, AZ, business plan in place to expand operations and personnel.

Applied Energetics - Novel Directed Energy Technologies
Lasers and Optical Physics

Lasers and Optical Have Advantages Inherent to Industry 4.0, Technology 4.0 and Advanced Manufacturing 4.0

- Quality and Process Control
- Optical Profiling and Microscopy
- Infrared Imaging and Temperature Monitoring
- 3D Linear and Non-Linear Imaging
- Marking and Labeling

Materials

- Secondary Heating and Processing via CW and Quasi-CW Lasers
- Control of Nano-materials Particle Size Distributions and Atomic Separation Techniques
- Remote Sensing for Purity of Materials

Processes

- Laser Particle Acceleration for Electron Beams
- Secondary Emissions in the X-Ray and THz Spectrums for Materials Analysis and Imaging

Rapidly Growing Optical Physics Will Play a Critical Role in the Highly Advanced Manufacturing Industry of the Future
Advanced Manufacturing 4.0

- **Technology 4.0 is a Subset of Industry 4.0**
  - Rapid and highly flexible advanced manufacturing
  - Fully digitally based with a high degree of automation
  - High degree of in-situ process control and information flow
  - Humans transition from production to control and oversight

- **Advanced Manufacturing 4.0 Technologies Include**
  - Highly advanced 3D printer processes labeled ‘confidential’ by AE
  - Complex materials and devices created in real time from fundamental feedstock
  - Advanced hybrid 3D additive and subtractive processes
  - Post fabrication material modifications and assembly
  - Fully integrated sensors and analytical techniques for process and quality control
  - Artificial intelligence for system optimization and control

- **How Applied Energetics LIPC/LGE /USP Fits into Advanced Manufacturing 4.0**
  - USP Laser generated plasmas can allow for the breakdown of bulk feedstock materials to the atomic level if required and provide transport pathways for tailored combination and deposition with spatial control
  - USP LGE provides a tailorable electrical power source and additional fields that provide control over the plasma generation, transport, deposition, and secondary effects such as heating and surface modifications
  - USP alone provides high resolution subtractive and material modification processes that allow for very fine detail without adding deleterious heating unless required
  - Intense laser field interactions, external electric and magnetic fields, plasmas generation and control, bulk material processing and transport, surface modifications and fine subtractive processes are all inherently enabled by the combination of LIPC/LGE //USP

**LIPC/LGE/USP Could Become Buzz Words in Hybrid Advanced Manufacturing**
Applied Energetics believes that AE Wireless Laser Guided Energy Transfer and Ultra-Short Pulse (USP) Laser Technologies are transformational technologies. When applied to advanced manufacturing processes, it will allow complete melding of complex designer materials, while targeting sophisticated highly technical 3D projects, including very sophisticated 3D printer and specialty tailored surface functionalities.

- Dramatically improves material throughput, uniformity, and repeatability over a large set of material types by combining USP Laser Induced Plasmas and Guiding Channels with tailored electrical energy and power
- Retains high resolution and accuracy for additive processes by spatially and temporally controlling ionic transport and their terminal physical placement
- Allows for real time combinatorial alloy formation and deposition using separate feed materials
- Allows for new processes to be developed that are not possible with just the laser DED such as
  - Real time and in-situ feed material particle size distributions, compositions and gradients for metals and dielectrics
  - Simultaneous deposition of mixed material types such as Metals, Dielectrics
- Simultaneously exploits USP laser processes
  - Subtractive processes such as athermal drilling, cutting, and surface modification with and without field enhancements
  - Modification of dielectric physical properties such as refractive index
- Sets up huge markets with long growth curves

**Applied Energetics Offers a Generational Opportunity**

**LGE and USP Are Transformational New Technologies**
**Laser Guided Energy**

**Directed Energy – A New Generation Of High Tech Weapons**

- **Historically Two Key Types of Directed Energy Weapon Technologies Exist**
  - High Energy Lasers: Weapons which are lightweight and require enormous amounts of photons, generated to cause effects, have long logistics chain: expensive
  - High Power Microwave: Directed microwaves to cause an effect, limited target environment: expensive

- **Now, a Third: Laser Guided Energy (LGE)**
  - Specialized lasers create a “Guiding Channel” in the atmosphere.
  - A high voltage source is connected to the channel.
  - A specially shaped electrical discharge propagates down the channel to an extended range.
  - The electrical discharge contacts a target and a target specific electrical discharge is applied.
  - In contrast to High Power Laser and High Power Microwave, LGE uses electrons as the weapon that then directly causes the damaging effects at the target.
  - This allows for extremely high peak power and energy to be coupled to the target with tenability; relatively compact, short logistics chain, with low cost in manufacturing quantities.

- **A new weapon technology that is “Fundamentally Owned” by a single developer is very unusual and represents a “Generational Opportunity”**.

**LGE is Fundamentally Different:**

*Electronically Tunable Weapon Effects Created at the Target*
AE’s Banshee Counter-IED JIN in Helmand Province, Afghanistan

Banshee

JIN-Joint IED Neutralizer
Roadside Bomb Disposal
Incredible Mission Success

- AE JIN is a Wholly Owned Technology
- 211 Convoy Missions Supported
- 15,000 Miles of Convoy Escort, 1589 Hours Operation
- 100% Availability for Convoy Support
- 0 Incidents Involving Vehicles Following the Cleared Path by Banshee

Extremely Rapid, Innovative, and Successfully Engineered Weapon Development Program
Applied Energetics has developed Long Range Laser Guided Electrical Energy Technologies (Wireless Man Made Lightning) for Department of Defense Missions.

- **LGE Demonstrated Counter-Measures**
  - Human Effects: Non-Lethal to Lethal
  - Electronics (cell phones, computers, etc.)
  - Automobiles
  - Improvised Explosive Devices
    - Vehicle
    - Roadside - Buried
    - Suicide
  - Infrastructure
    - Buildings
    - Wired Communication Links
    - Electrical Grid

- **Companion Laser Capabilities**
  - Counter-Situational Awareness
  - Counter-Sensor/ Sniper
  - Remote Sensing for Bio/Chem/Explosives
  - Secondary Radiation Generation for Advanced Sensing and Imaging

**LGE and Related USP Laser Technologies can be Leveraged to Advanced Manufacturing Processes**
Studies on IoT literature and projects show a disproportionately strong prominence of technology in the IoT projects, which are often driven by technological interventions rather than business model innovation. **AE believes business models are viable, will see rapid growth and be very profitable.**

Data Security at the time of designing IoT should ensure that data collection, storage and processing will be secure at all times by adopting a “defense in depth” approach by encrypting data at each stage. **AE expects the use of Blockchain can ultimately simplify and secure these processes. Eventually, almost everything in the Universe could touch upon IoT’s in one way or another and use some form of advanced Blockchain.**

IoT’s amorphous computing nature is also a problem for security. **Again, AE defers to Blockchain in some form. These are complex issues, but resolvable.**

---

**Applied Energetics Believes It’s IP Well Suited For Internet of Things**

**IoT’s Offer Experiential Growth Going Forward**

- Applied Energetics has Intellectual Property (IP) and advanced R&D that it believes is well suited for Internet of Things (IoT). (IoT’s are wireless devices with connectivity to other things, and can exchange data.)
- IoT’s offer potentially explosive growth going forward. Experts estimate that by 2020, IoT’s will consist of about 30 billion objects and have an estimated global market value of approximately $7.1 trillion. (Wikipedia)
- Humans in surveyed urban environments are each surrounded by an estimated 1000-5000 trackable objects labeled as part of the Internet of Things.
- The Internet of Things could ultimately encode and follow an estimated 50 to 100 trillion objects.
- Blockchain technology is new, dynamic and evolving quickly. Applied Energetics understands its value, believes the technology will be deep, secure and diverse. All indications point to an exciting novel technology, with tremendous upside potential in commercial and defense environments worldwide.
- Applied Energetics’ technical innovations, including IoT’s, DoD and Manufacturing 4.0 projects will be designed with thought toward pathways for integration into advanced Blockchain technologies.
Applied Energetics Inc.

Safe Harbor Statement

The documents presented on this presentation (or directly accessible from) may contain forward-looking statements. These statements relate to future events or Applied Energetics Inc. future financial performance. Any statements that are not statements of historical fact (including without limitation statements to the effect that the Company or its management "believes", "expects", "anticipates", "plans" (and similar expressions) should be considered forward looking statements. There are a number of important factors that could cause Applied Energetics actual results to differ materially from those indicated by the forward looking statements. Applied Energetics disclaims any obligation to update any forward looking statement.

Applied Energetics, Inc. is a corporation organized and existing under the laws of the State of Delaware. Our executive office is located at 2480 W Ruthrauff road, Suite 140 Q, Tucson, Arizona, 85705 and our telephone number is (520) 628-7415.

Additional Information

Applied Energetics, Inc.'s internet address is www.appliedenergetics.org. The company makes available, free of charge, all SEC filings at www.aergs.com. Its annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act, are available as soon as reasonably practicable after they are electronically filed or furnished to, the SEC. You also may request a copy of each document at no cost, by writing or calling us at the following address or telephone number:

Applied Energetics, Inc.
2480 W Ruthrauff Road, Suite 140Q
Tucson, AZ 85705
C 520.628.7415
F 520.842.2588
Attention: Chief Financial Officer

Updated 7-21-2018