



# Applied Energetics Inc.

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## Additional Information

Applied Energetics, Inc.'s internet address is [www.aergs.com](http://www.aergs.com). The company makes available, free of charge, all SEC filings at [www.aergs.com](http://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.**  
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**Tucson, AZ 85705**  
**Office 520.628.7415**

**Attention: Financial Manager**  
**Website: [aergs.com](http://aergs.com)**

# Applied Energetics Inc.

Advanced Directed Energy Technologies

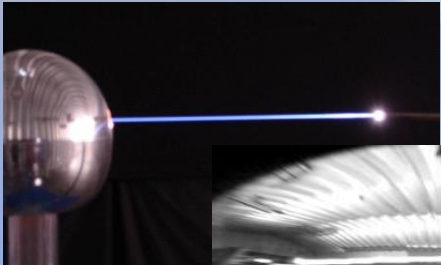
*Positioned to Connect a Revolutionary Technology Platform with  
End Markets Through Science and Business Development*

Scientific Lab Under Via AOS Arrangement  
Corporate Headquarters

Tucson, AZ

Office, Development Team  
Washington, D.C.

*1st Quarter 2019*





# Applied Energetics Inc.

*A Platform of Directed Energy Technologies*

**Ultra Short Pulse (USP) Lasers, Laser Induced Plasma Channel (LIPC®)  
Laser Guided Energy (LGE™) and Banshee C-IED Technology with LGE™**

## **Rapidly Growing Markets for LGE™ Technologies**

“Revenues of Directed Energy Weapons Systems Were Projected at \$1.82 Billion Globally in 2017 Growing to \$4.56 Billion by 2025” - According to Studies by Market Forecast

Ultra-  
Short  
Pulse  
Lasers

Plus



LGE™



## Company Description

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

## History /Background

**Company:** Applied Energetics

**Symbol:** AERG

**Founded:** 2002 as Ionatron/2008 Changed name to Applied Energetics

**Market Trades:** OTC Markets QB

**Current Price:** \$ .15 **Current Market Cap (As of 03/31/2018):** \$30.6 million

**Net Federal Operating Loss Carry:** \$62.1 million

**Authorized Shares Outstanding:** 204 million

**Previous Research Coverage:** Suntrust and Raymond James

**R&D Funding:** Over \$100 mil. of past and current R & D

**Founders:** Tom Dearmin, Stephen McCahon, Joe Hayden

## Technology/Roadmap

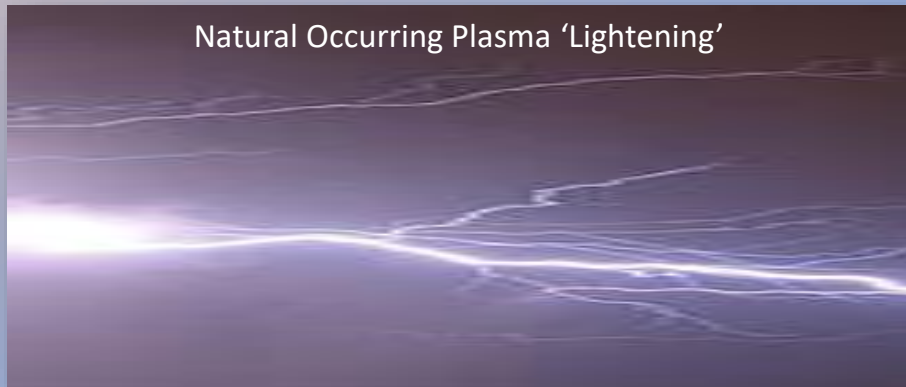
**Patent Portfolio:** 25 regular patents, 11 additional patents under DOD classified GSPA secrecy order and trademarks for both LIPC<sup>®</sup> and LGE<sup>™</sup>

## Three Distinct Technologies:

- Laser Guided Energy:** Breakthroughs in LGE capabilities to support perimeter protection, counter IED, close-combat urban warfare and commercial applications with advanced manufacturing.
- Banshee Platform:** Proven Counter-IED platform for the military, future Banshee's are expected to integrate with LGE in next generation platforms.
- Short Pulse/Ultra Short Pulse:** Breakthroughs in power scaling and wavelengths to increase defense applications in counter UAS, counter optical, stand-off detection, open air communication.

## Moving Forward:

- **Viability:** LGE and Banshee C-IED are considered certified “**viable new technologies of the future**” by agencies of the US Government
- **Leading Edge Technology Platform:** Targeting Department of Defense and commercial markets with opportunities in Short Pulse, Laser Guided Energy and related Directed Energy technologies



*\*AE's sophisticated laser technology creates filaments which brake the bond between oxygen electrons from oxygen molecules in the atmosphere creating a laser induced plasma channel. The laser then transverses a conductive path which allows controllable electrical pulses of up to a million volts down the LIPC channel to achieve the desired effect at the target. We call this Laser Guided Energy (LGE).*





*Concentrated in Urban  
Environments*

## *Warfare Needs*

*In the 21<sup>st</sup> Century*

*Automated and  
Autonomous*

*Heavy Emphasis on Sensors*

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

#### ❖ In the Market Today, Two Key Types of Directed Energy Weapon Technologies Exist

- **High Energy Lasers:** Weapons that 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
- **Limiting Factors:** Both require a continuous wave, time and energy

#### ❖ Now, a Third: Laser Guided Energy (LGE)



- Specialized lasers create a “Guiding Channel” in the atmosphere, then 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*

*Represents a “Generational Opportunity”*



# Advanced LGE Technologies Involve Potentially Huge Markets

## LGE Markets are Large with Long Tails

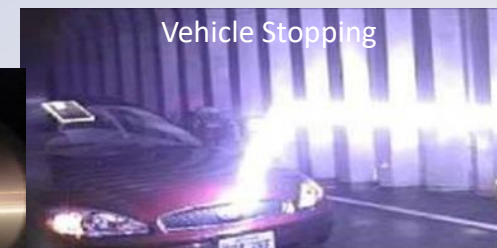
Applied Energetics has Developed Long Range Laser Guided Electrical Energy Technologies (Wireless Electricity).

### ❖ LGE Demonstrated Counter-Measures

- Human Effects: Non-Lethal to Lethal
- Electronics (cell phones, computers, etc.)
- Automobiles
  - 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  
Many Advanced Processes with the DoD***



# Next Generation Banshee's Will Include 'LGE' Capability



## **Banshee's** **JIN-Joint IED Neutralizer** **Roadside Bomb** **Disposal** ~ **Proven** **Mission Success**



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

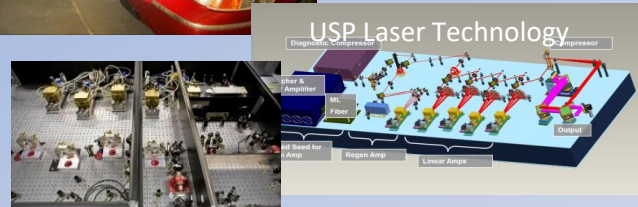
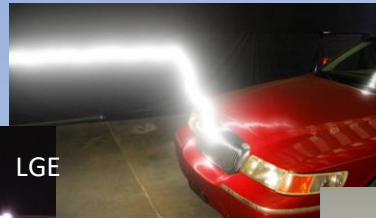
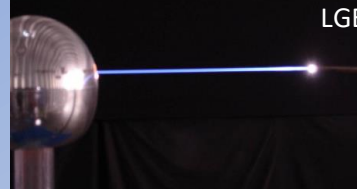
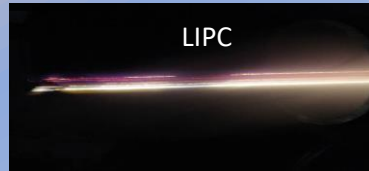
***Extremely Rapid, Innovative, and Successfully Engineered***  
***Weapon Development Program***





# Additional Opportunities Associated with LGE – Advanced Manufacturing 4.0

## Legacy Laser Induced Plasma Channel (LIPC), Laser Guided Energy (LGE) and Ultra-Short Pulsed (USP) Laser Technology Development Opportunities



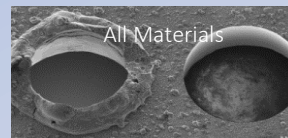
Re-Purpose to Industry 4.0 –  
Smart Factory and  
Advanced Manufacturing

### Advanced Material Fabrication USP Material Plasmas

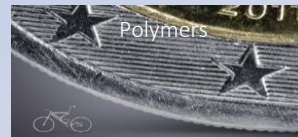


1. Applicable to nearly all materials
2. Real time control of composition, particle size, and kinetic energy
3. Low to high temperature processes allowed

### Advanced Processing Armal Machining



High Precision



Modification

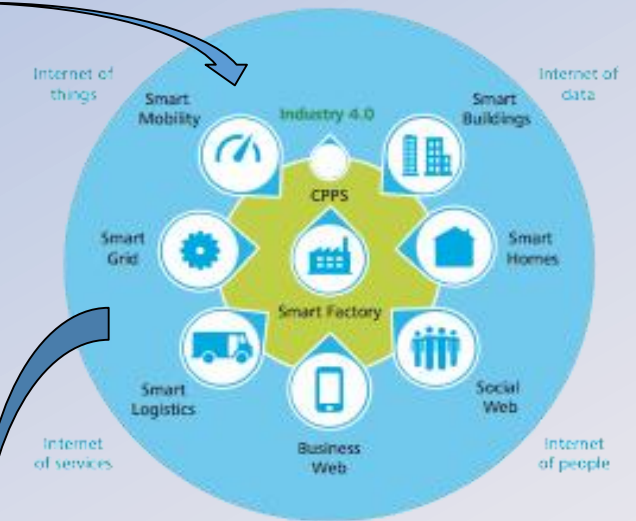


### Advanced Hybrid Manufacturing

Additive, Subtractive,  
Modification at High Precision  
Enabled by Fundamental Processes

- Intense Laser Fields
- External Electric and Magnetic Fields
- Generation, Temperature, and Control over Material Plasma Transport
- LIPC Electrical Power Transfer

## Industry 4.0



### Focus on Exponential Technologies



*Fits perfectly in GE's "Pathway of Innovation in Manufacturing 4.0 and Technology 4.0"*



## IP Generator - Long-Term R&D Capability for Development of Advanced Photonics, Optical Physics, and Specialized Laser Applications

### ❖ Optical Physics and Material Science Laboratory

- ~ 3300 sq. ft. Leased Facility

### ❖ On-going USP Laser Development

- Advanced Yb:YAG Thin Disk/Short Rod Amplifiers
- Spatially Dispersed Amplifier Development Testbed

### ❖ Thin Film Optical Materials Growth and Photonics

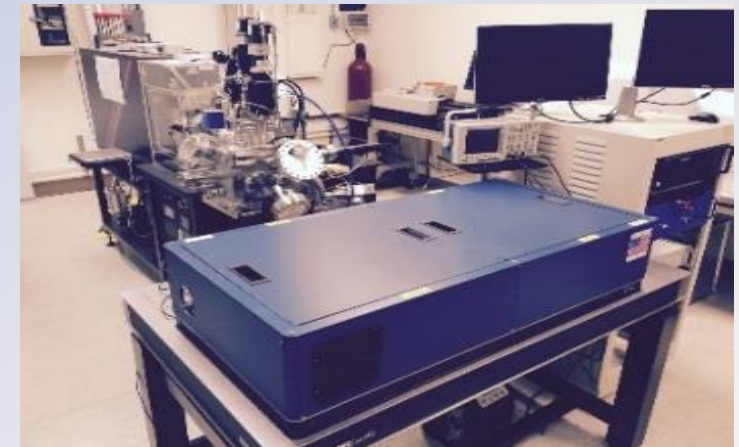
- USP Laser Based Photonic Pattern Writing Workstation
- Advanced Optical Thin Films via Pulsed Laser Deposition

### ❖ Advanced Imaging Systems

- Linear and Non-Linear Imaging through turbid media
- 2D and 3D imaging through multimode optical fibers
- Nonlinear imaging and Active Beams through multimode optical fibers

### ❖ Material Science and Characterization

- Variable Pressure Scanning Electron Microscope
- Atomic Probe Microscope
- Optical Surface Profiling



***AOS Provides a Low Cost, High Return Research and Development Capability***



# Applied Energetics Inc.

## Board of Directors

**Brad Adamczyk** – Principle Executive Officer, Hong Kong, Director

**Jon Barcklow** – V.P. Business Development, Washington D.C., Director

**John Schultz** – Director, Los Angeles, CA

## Lead Scientist

**Stephen McCahon Ph.D.** – Via AOS TA, Advanced Technology, Tucson, AZ

## Project Manager Consultants

**Patrick Williams** – Advanced Business Programs, Washington D.C.

**Greg Quarles Ph.D.** – SAB\*, Advanced Business Programs, Washington D.C.



# Applied Energetics Inc.

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