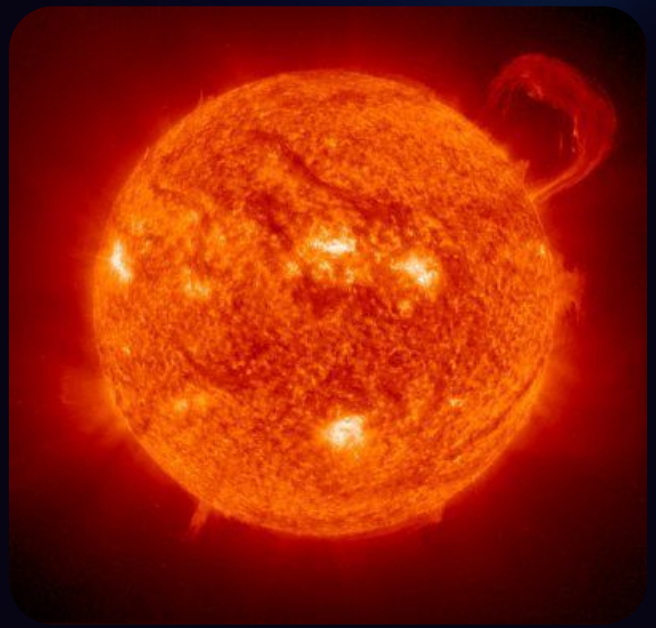
Focus Fusion

Fusion Energy In This Decade:



Clean, Safe, Decentralized

♾️ Unlimited

Cheap, clean, safe and unlimited source of energy — the same process that powers the Sun.

🌍 Transformative

Designed to entirely replace fossil fuels at a fraction of today's energy cost.

⚡ Decentralized

Compact, portable generators: no long distance grid and no turbines needed!

The Problem

The Global Energy Crisis & Pollution

📉 The Market Need

The world urgently needs high-energy-density power that is cheap, safe, scalable, and produces zero waste.

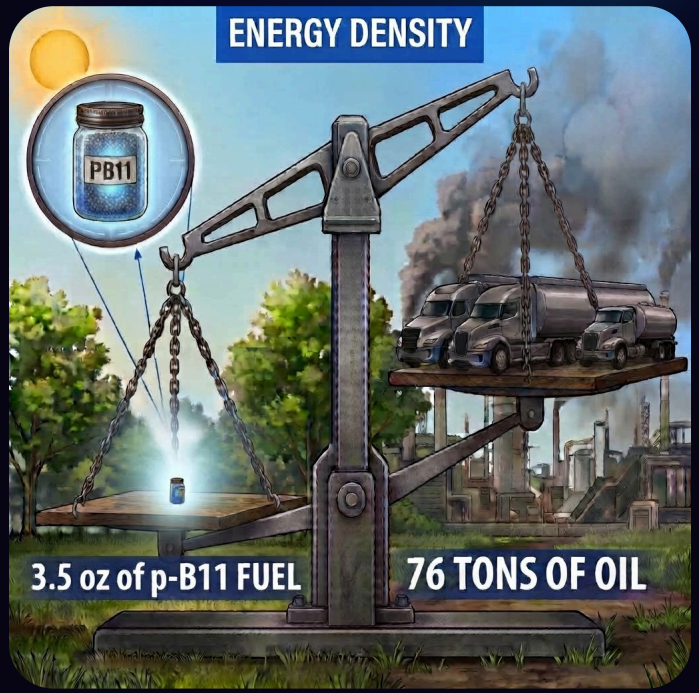
No existing technology delivers all four. Focus Fusion is designed to deliver all four.

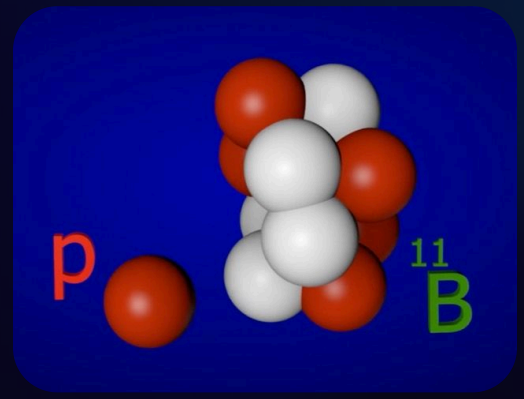
🌐 A Systemic Failure

Today's energy sources have fatal flaws — pollution, radioactive waste, geopolitical risk & prohibitive cost. The US electric grid is increasingly unreliable. A fundamentally new approach is required.

The Solution

Hydrogen-Boron (pB11) Fuel — Key Advantages





p - is a proton from Hydrogen

B11 - is an isotope of boron

Zero Nuclear Waste

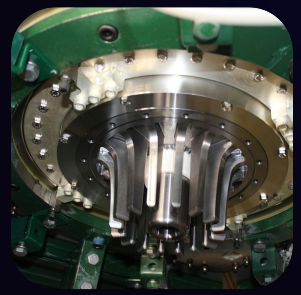
Zero Emissions

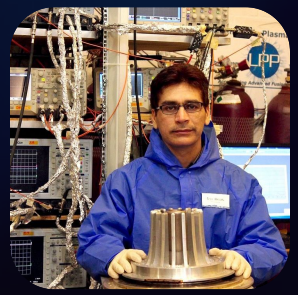
Million times more energy per ton than oil, highest energy density of any fuel

100 grams of pB11 fuel or hydrogen-boron

Solution

Dense Plasma Focus Device (DPF) — Key Advantages





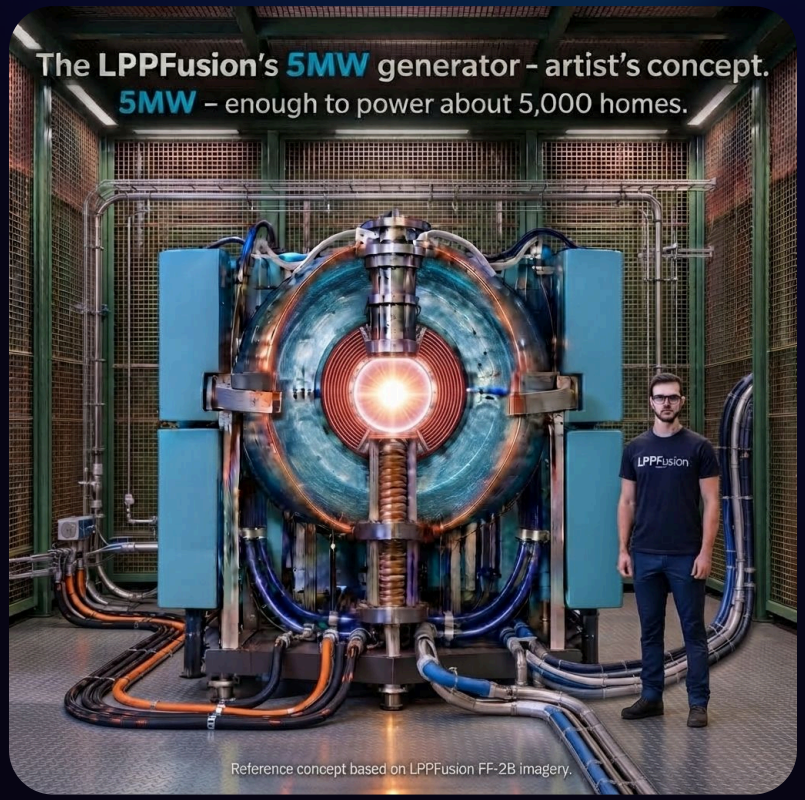
Far Cheaper & Smaller

The DPF device is designed to be far cheaper and smaller than any existing energy sources — tokamaks, fission plants, or conventional generators.

Aligned With Nature

Instead of fighting natural plasma behavior with massive external magnets, the DPF uses plasma instabilities as a feature, not a bug.

Solution - 5MW Focus Fusion Generator



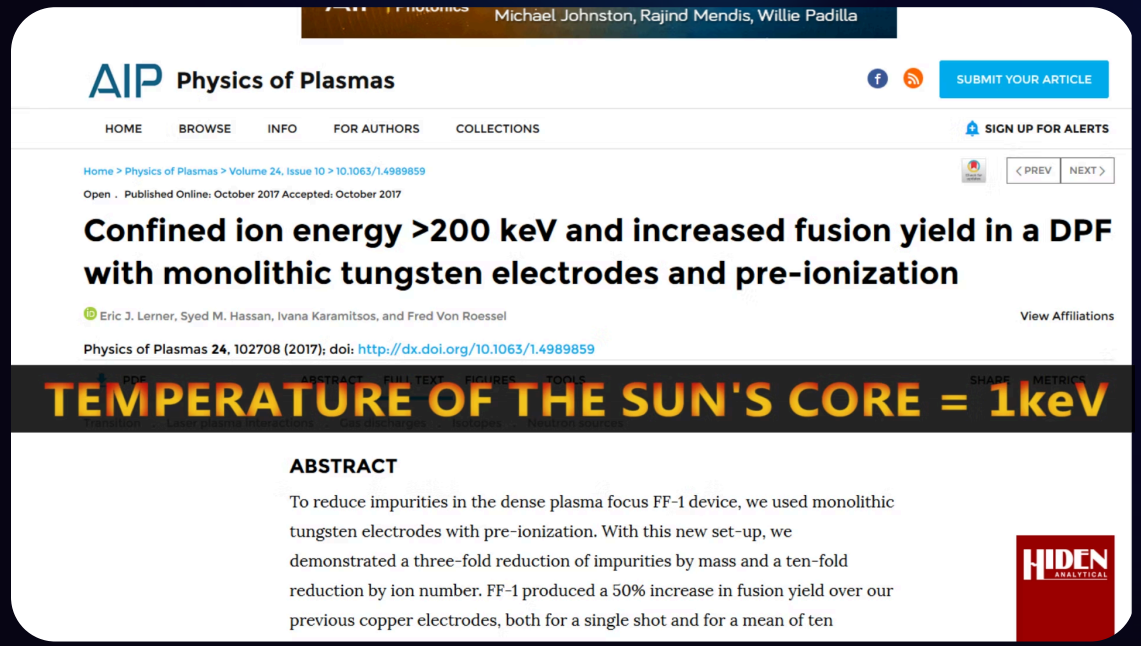
A Focus Fusion generator consists of a DPF device powered by pB11 fusion fuel.

- **Direct conversion to electricity—no turbines needed**
- **Ideal for decentralized power**
- **Decentralized & Portable**
- **Compact**
- **200 Pulses/sec, 25kJ Net Energy/Pulse**
- **Capital Cost/Watt: $0.1**
- **Cost per kWh:$0.5c**

* The above are forward-looking design targets based on current engineering assumptions. Not measured results. Actual specifications may differ.

Published, Peer-Reviewed

Science You Can Verify



PEER-REVIEWED OPEN ACCESS

Physics of Plasmas — AIP Publishing

LPPFusion's results have been independently reviewed and published in Physics of Plasmas (AIP) and Journal of Fusion Energy (Springer), the most respected peer-reviewed journals in plasma physics.

This is verified science — open for any physicist in the world to scrutinize.

Read the paper:
https://pubs.aip.org/aip/pop/article/24/10/102708/795184/Confined-ion-energy-gt-200-keV-and-increased

Beyond Fusion Yield

Why scientific plasma output, fusion yield, is a critical milestone but is only half the equation - and why grid delivery requires wall-plug net energy

Wall Plug Efficiency Ratio

$$\frac{\text{Total Fusion Energy Out}}{\text{Total Energy In (from wall plug)}}$$

There are two ways to measure fusion progress; only one of them tells you the full story. **Fusion yield** number only tells you how much energy comes out of plasma reactions, regardless of how much went into the system. **Wall-plug efficiency** is how much energy came out of a device divided by how much electricity went into it. A ratio above 1.0 means net energy gain. Everything below is still an experiment — regardless of how it's marketed. Knowing the difference is the key when assessing what fusion approach to support.

> "Quoting high energy output without measuring wall-plug input is like quoting a car's top speed without mentioning a rocket booster was required to get there." - Eric Lerner

Competitive Landscape

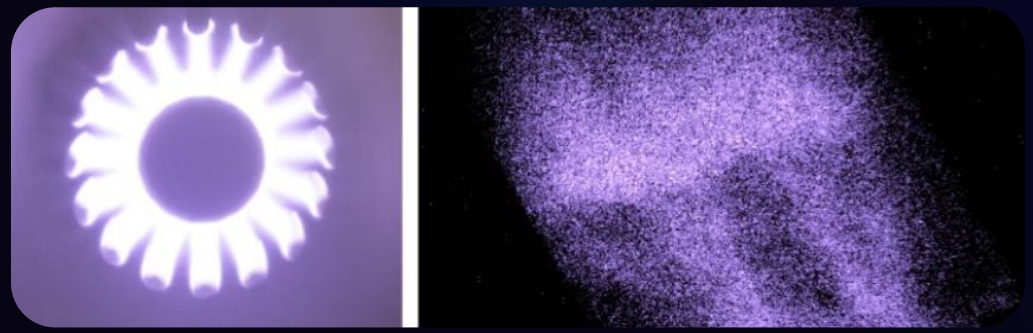
Leading Fusion Yield Performance The fusion industry has attracted billions in venture capital. But funding is not the same as results.

Company	Funding	Fuel Approach	Fusion Yield Published	Wall-Plug Efficiency Published
TAE Technologies	$1.3B+	Various approaches	✓ Yes	Not published
Commonwealth Fusion	$2B+	Deuterium-tritium tokamak	Limited	Not published
Helion Energy	$1B+	Deuterium-helium-3	No	Not published
MIFTI	Undisclosed	Dense Plasma Focus	Limited	Published — 80x below LPPFusion
LPPFusion	Self-funded	Hydrogen-boron (pB11)	✓ Yes	✓ Highest of any private company

Why Now?

- **Temperature is no longer the open question:** pB11 fusion requires higher temperatures than any other fuel approach. That was the reason the field considered it impractical. LPPFusion has achieved and published those temperatures.
- **The efficiency claim is peer-reviewed:** Several private fusion companies have published fusion yield data. None has published wall-plug efficiency comparable to ours. Wall-plug efficiency leadership is not a projection or an internal estimate. It is published in the Journal of Fusion Energy and Physics of Plasmas, and open to challenge.
- **Global Support:** Backed by supporters across 19 countries over 20+ years, without venture capital dilution constraints.
- **Strong IP Protection:** 5 key international patents granted across major industrial jurisdictions.

Recent Progress



- New Record Fusion Yield
- Confirmed Major Theoretical Predictions
- Completed Preparations for New Round of PB11 Experiments

Founders

"The Wright Brothers are our model, not Elon Musk."

– Eric Lerner

Ivy Karamitsos

CO-FOUNDER & OPERATIONS

Cross-functional ops spanning corporate governance, finance, IT, and full spectrum media.

Building the business engine required to commercialize fusion.

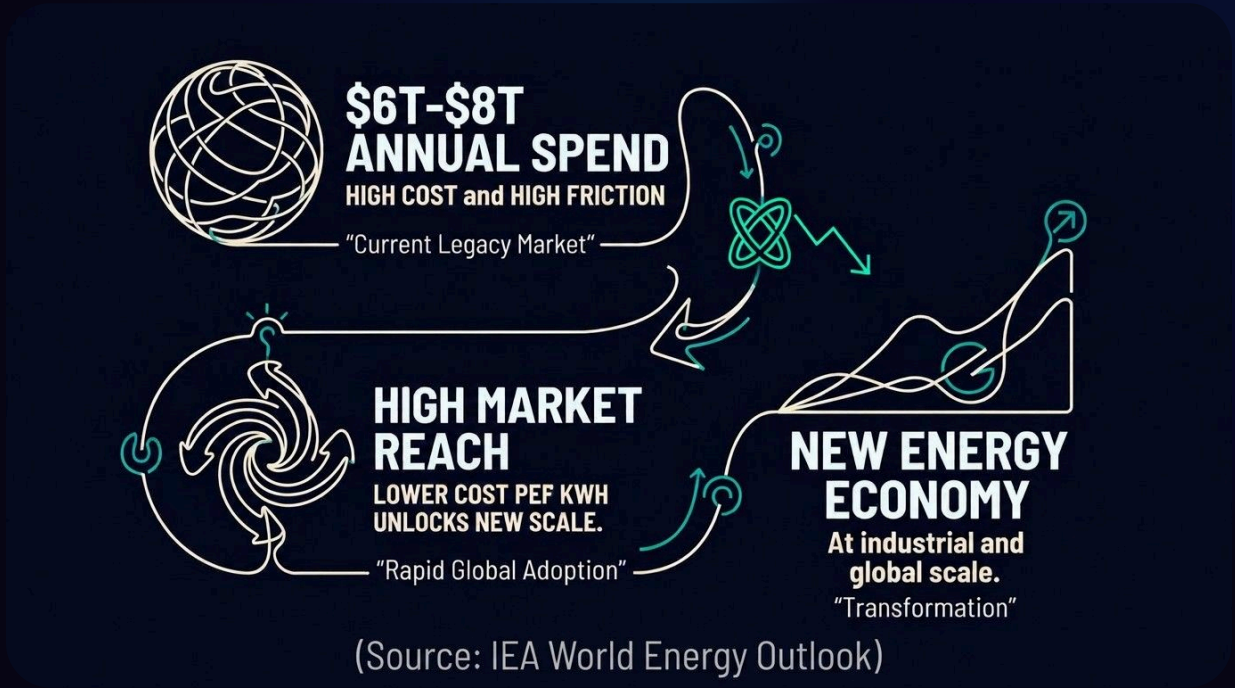
Eric Lerner

CHIEF SCIENTIST & FOUNDER

Decades of leading DPF research. Pioneer in p-B11 aneutronic fusion with extensive peer-reviewed publications. The scientific visionary behind Focus Fusion.

Market Opportunity

High Market Disruption and Fusion Adoption (Price Deflation)



(Source: IEA World Energy Outlook)

The global energy market represents $6–8 trillion in annual spend — built on fossil fuels, fission, and expensive grid infrastructure. Every dollar of that is a target for disruption.

At a projected 0.5 cents/kWh, Focus Fusion is designed to compete on price against existing energy sources.

Roadmap and Milestones

Stage 1 — Completed

Record temperatures achieved and published. Wall-plug efficiency leadership peer-reviewed. Patents in EU, US, Canada, China, Australia

DONE

Stage 2 — Next Milestone

Demonstrating measurable fusion yield with pB11 fuel under full experimental conditions.

IN PROGRESS

Stage 3 — Net Energy

Optimize pB11 fusion yield. Upgrade FF2B to full power (12 capacitors vs. 8). Fine-tune FF2B to achieve net energy output.

NEXT PHASE

Stage 4 — Commercialization

Before 2030s. Mass production of generators. Timelines are goals, not commitments.

TARGET

Risks — What Could Go Wrong, Stated Plainly.

Risk	Details
Technical	No fusion company has commercially demonstrated fusion energy — not TAE, not Commonwealth, not Helion, and not LPPFusion. Significant scientific and engineering challenges remain.
Timeline	Fusion research timelines are inherently unpredictable. Experiments produce unexpected results in both directions. No milestone is guaranteed on any date.
Competitive	TAE, Commonwealth and Helion have raised $1.3B+, $2B+ and $1B+ respectively against LPPFusion's $12M. Government programs are also spending billions.
Approach-specific	pB11 produces zero radioactive waste but requires higher temperatures than DT or D-He3. Those temperatures have been achieved; sustaining and scaling them is the challenge ahead.

Challenges & Our Solution

Industry Fusion Challenge	How LPPFusion Solves It
Extreme Ignition Temperatures Achieving and sustaining the billions-of-degrees temperatures required for p-B11 fusion has been considered a fundamental barrier by mainstream fusion programs.	Advanced p-B11 Focus Fusion approach bypasses thermal scaling limits by using natural plasma instabilities — the plasmoid self organizes to extreme temperatures without massive external heating systems.
Radioactive Waste Management Fission and DT-fusion both produce long-lived radioactive waste requiring centuries of storage — a political, environmental, and economic liability.	Aneutronic p-B11 fuel reaction produces zero high-level radioactive waste. The only byproduct is helium. No high-level waste storage. Substantially reduced decommissioning burden.
Unpredictable Timelines Large-scale fusion projects (ITER, NIF) have repeatedly missed milestones by decades, eroding the public confidence.	Low-cost compact generator design enables rapid hardware iteration and upgrade cycles in months — not decades. The Wright Brothers model, not the Apollo model.

Eric Working On Our Experimental Device

Compact enough to fit in a room, powerful enough to change the world.

Small Team, Outsized Impact: While billion-dollar programs build reactors the size of buildings, LPPFusion builds one that fits in a room.

Team, DPF Electrodes

Lerner (right), Dr. Hassan (left) and Karamitsos (middle) talk over electrodes.

Patents

The United States of America

The Director of the United States Patent and Trademark Office

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extensions.

John Doll

Acting Director of the United States Patent and Trademark Office

证书号第1138466号

发明专利证书

发明名称：用于产生粒子束和核聚变能量的方法和设备

发明人：E·J·勒纳;A·布莱克

专利号：ZL 2007 8 0007065.7

专利申请日：2007年02月28日

FIE 082300618

专利权人：劳伦斯威尔等离子物理公司

授权公告日：2013年02月13日

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2013年02月13日

第1页（共1页）

Australia

Patent #2007314648

Canada

Patent #2,642,749

European Union (Belgium, Germany, Spain, France, Great Britain, Italy)

Patent #EP1989714B1

About LPPFusion

LPPFusion, Inc. is a research and development company focused on achieving controlled fusion energy using the Dense Plasma Focus device and hydrogen-boron (pB11) fuel.

Learn more: lppfusion.com · **info@lppfusion.com**

Published research: **https://pubs.aip.org/aip/pop/article/24/10/102708/795184/**

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