ARCHANGEL ATOMICS

NUCLEAR FUEL TECHNOLOGY

Confidential and Proprietary

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THE FUTURE OF NUCLEAR FUEL IS A TRILLION TIMES SMALLER

Jacob Jerome Bernal (J. J. Bernal), PhD
Founder & CEO
jjbernal1@archangelatomics.com

THERE IS NOT ENOUGH ELECTICITY FOR AI GROWTH

Global electricity demand is rising, with data center growth contributing significantly to projected increases in total electricity consumption.

Advanced nuclear reactors are the best way to meet that surging demand.

Meeting this forecasted demand will **require constructing multiple nuclear reactors per week!**

Fuel qualification and supply chain readiness are critical components of reactor deployment.

85 - 90 GW

New nuclear capacity needed to meet forecast data center power **demand growth by 2030**

$1.7B+

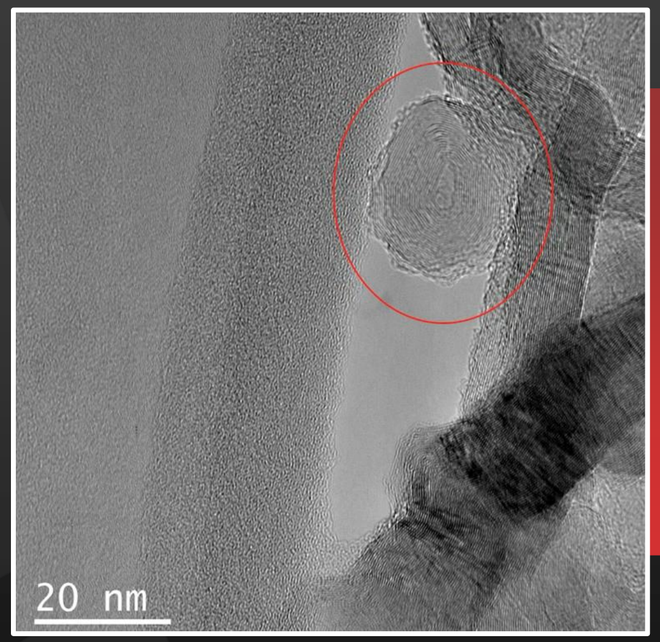
Already invested in reactor companies

Zero

Next gen fuel manufacturers

THE SOLUTION: CARNISO FUEL

CARNISO (**CAR**bon **N**anostructure **ISO**tropic) is a nanoscale fuel architecture concept for advanced nuclear reactors.



CARNISO is designed at a significantly smaller structural scale than TRISO-based fuel architectures.

One trillion CARNISO fuel particles to reach the equivalent volume of a single conventional TRISO particle.

This shift in scale is intended to improve neutron moderation behavior and thermal characteristics.

Performance advantages remain subject to staged validation.

1 Triso
Particle Volume

1 Trillion
CARNISO Particles

1 Second
A single tick of a clock.

1 Trillion Seconds
About 31,709 years.

1 Millimeter
Thickness of a dime

1 Trillion Millimeters
Takes you past the sun

THE CARNISO TRIAD VALUE PROPOSITION

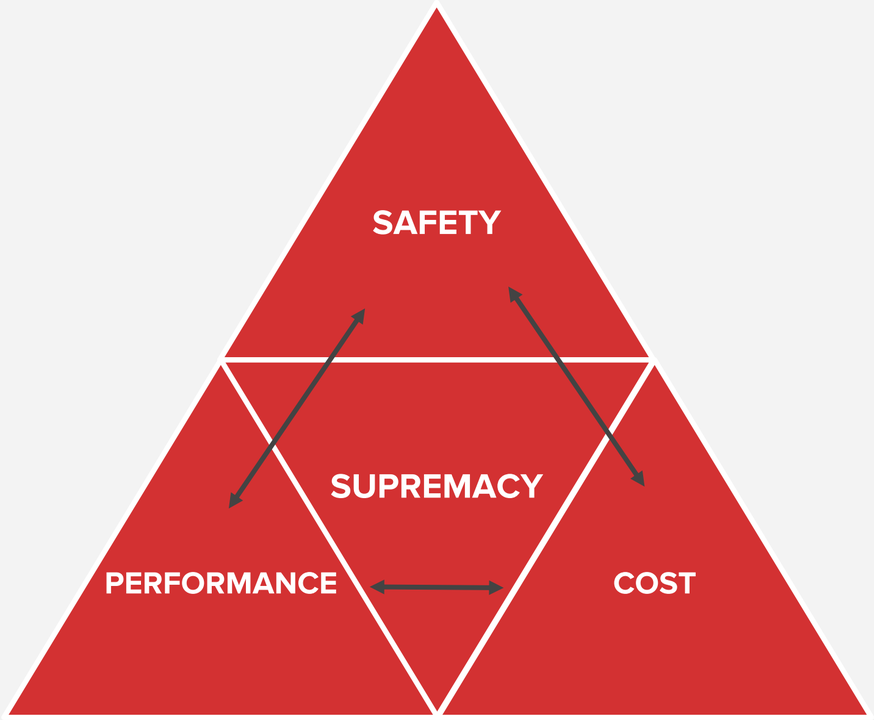
CARNISO fuel is a fundamental reimaging of reactor fuel architecture.

SAFETY: Designed to improve fission product containment under elevated temperature conditions.

PERFORMANCE: Intended to enhance thermal behavior through nanoscale architecture.

COST: Targeting simplified or more scalable manufacturing relative to multi-layer coating processes.

All performance claims are subject to validation through staged R&D testing.

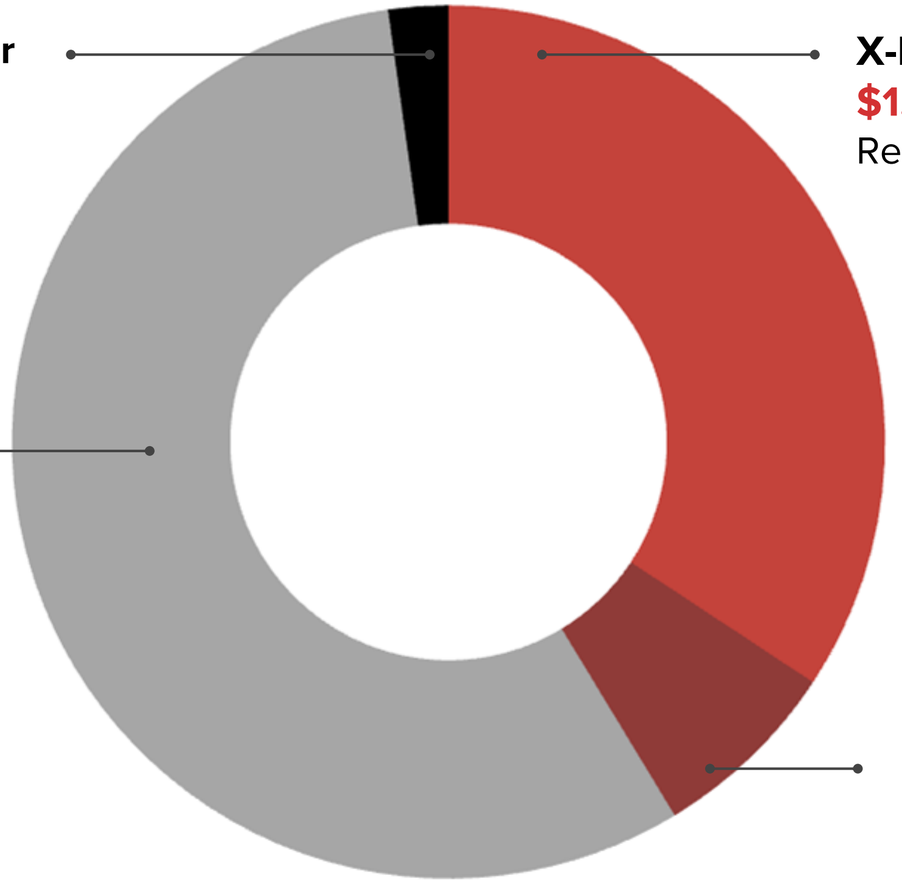


A safer fuel with higher performance at lower costs creates a compounding competitive advantage, enabling reactor viability.

COMPETITIVE LANDSCAPE

Significant capital is flowing into advanced reactor and TRISO fuel supply chain development.

Most commercial fuel development is focused on TRISO-based architectures.



CARNISO is positioned as a nanoscale fuel architecture concept differentiated by structural scale and intended performance characteristics.

Every single competitor is building **TRISO** fuel. **Billions** have been invested in TRISO-specific equipment, processes and facilities that have been developed with 1950s technology. **No one is developing nanoscale fuel.**

NUCLEAR SAFETY DEPENDS ON FUEL INTEGRITY

Major reactor incidents have involved different initiating events. However, **loss of effective cooling can lead to fuel damage** and potential release of fission products.

TRISO is a microencapsulated fuel particle design used in certain advanced reactor systems. It relies on multiple protective coating layers intended to retain fission products.

Advanced reactor performance depends not only on reactor design, but on **the integrity and scalability of the fuel itself.**

TRISO Limitations:

- **Expensive to manufacture**
- **Prone to mechanical degradation**
- **High nuclear waste volumes**

Next-generation reactors are small, modular, and deployable anywhere.

They deserve fuel **designed for the future, not adapted from the past.**

BUSINESS MODEL

BUSINESS MODEL: B2B FUEL TECHNOLOGY

PRIMARY PATHWAYS:

- IP licensing to qualified fuel manufacturers
- Joint development partnerships with reactor developers
- Strategic acquisition following validated performance

Target stakeholders include advanced reactor developers, fuel manufacturers, and strategic energy investors.

TARGET CUSTOMERS

BIG TECH POWER BUYERS

Google amazon Microsoft Meta

REACTOR MANUFACTURERS

X energy® Kairos Power

Any Gen IV reactor builder

TRISO FUEL MANUFACTURER

BWXT STANDARD NUCLEAR

(potential acquirers)

REVENUE PATHWAYS

IP LICENSING

License CARNISO technology to existing fuel manufacturers

DIRECT MANUFACTURING

Build production capacity, sell fuel directly

ACQUISITION EXIT

Sell technology to major player seeking competitive advantage.

DEFENSIBILITY

PATENT STATUS: PENDING

Non-Provisional patent filed **March 5, 2026**

U.S. Serial No. 19/557,873

Defensibility depends on:

- Validated performance data
- IP protection
- Regulatory qualification pathways
- Switching costs within existing infrastructure

Regulatory approval pathways will depend on demonstrated safety and performance data.

ID PROTECTION

Patent-pending on core technology. Exclusive license from the University of Arizona. **First-mover advantage in nanoscale fuel.**

REGULATORY PATHWAYS

If CARNISO outperforms on safety metrics, **the NRC may require it for reactor operations.** Regulation becomes our competitive advantage.

EXISTING INFRASTRUCTURE

Competitors have invested billions in TRISO infrastructure. Switching to nanoscale fuel means starting over. **We're already there.**

THE FOUNDER

Jacob Jerome Bernal (J. J. Bernal), PhD

FOUNDER & CEO

Background in astro- and cosmochemistry.

Research includes carbon nanostructure formation and high-temperature electron microscopy.

The technology originated during postdoctoral research at the University of Arizona.

“I was studying how stars form carbon nanostructures when I accidentally created something that looked remarkably like nuclear fuel—**just a trillion times smaller.**”

J.J. Bernal, PhD

Jacob Jerome Bernal (J. J. Bernal), PhD

FOUNDER & CEO

NSF MPS-ASCEND FELLOW:
University of Arizona Lunar & Planetary Lab (2021-2025). Principal investigator in carbon nanostructure research.

7 PEER-REVIEWED PUBLICATIONS:
Including breakthrough SiC to fullerene research (the exact mechanism underlying CARNISO).

HIGH-TEMPERATURE TEM EXPERTISE:
MEMS heating experiments at Oak Ridge National Laboratory—same facilities for CARNISO validation.

PATENT PENDING:
Developed with University of Arizona Tech Launch. Commercial rights secured.

CURRENT STATUS

- Nanostructure samples have been synthesized and characterized via transmission electron microscopy (TEM).
- Fuel performance validation remains in development and requires additional R&D funding.
- Non-dilutive funding applications, including SBIR, are in process.

TECHNICAL

Proof-of-Concept Samples Synthesized
TEM image confirm nanostructure formation matching theoretical models

FUNDING

NSF SBIR Phase I Submitted
$304K proposal pending approval for initial R&D operations

LEGAL

Exclusive IP Rights Secured
Patent pending + exclusive commercial license from University of Arizona.
Patent application filed 3/5/2026. US serial no. 19/557,873.

COMPANY STATUS

ENTITY
LLC
Incorporated

TEAM
1 (lean by design)

STAGE
Pre-Revenue / R&D

LOCATION
Tucson, AZ

GO-TO-MARKET STRATEGY

PROVE

Complete Phase I non-nuclear R&D validation and establish measurable performance data.

PROTECT

Advance patent protection and secure defensible IP position.

PARTNER

Engage reactor developers and fuel manufacturers following validated results.

LOW CUSTOMER ACQUISITION COST

The product either works or does not sell. If it works, the IP value is enormous without building facilities.

ALIGNED INCENTIVES

Incumbents either license our technology or watch a competitor do it first.

DEVELOPMENT ROADMAP

Phase I

Approx. 1 year

- Non-nuclear synthesis and validation at the University of Arizona
- Reproducing proof-of-concept
- Establishing performance metrics
- Secure patent landscape

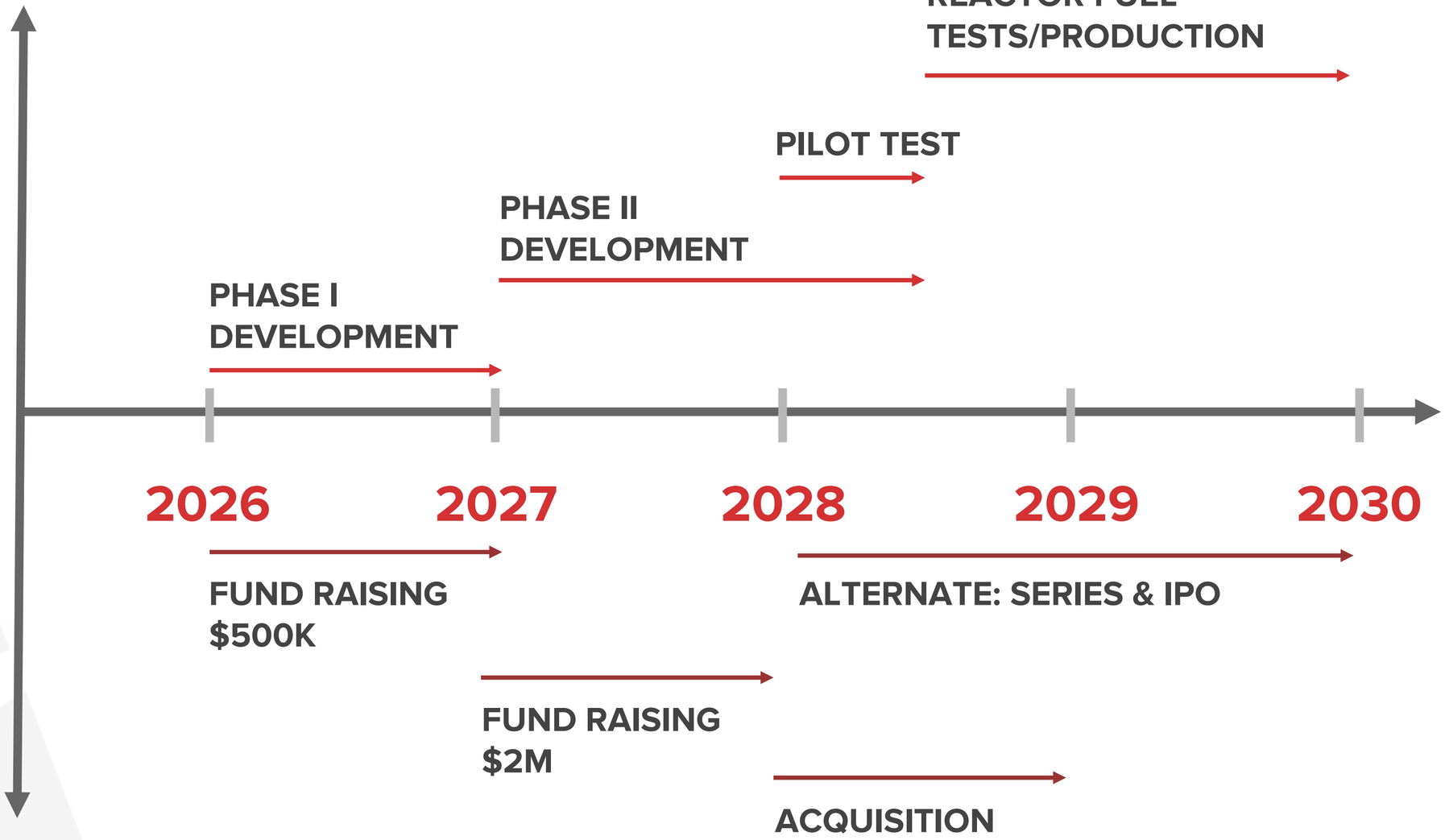
Phase II

- Hot testing at a national laboratory (ORNL or INL), subject to acceptance.
- Addition of nuclear engineering and regulatory expertise.
- NRC engagement
- Industry partnerships

DEVELOPMENT ROADMAP

PROJECT MILESTONE

FINANCIAL MILESTONE



WHY ARCHANGEL ATOMICS

CARNISO is a nanoscale fuel architecture concept targeting improved safety, performance, and cost in advanced nuclear systems.

Patent pending | Pre-revenue R&D stage.

Seed capital enables Phase I validation and advancement toward partnership or licensing pathways.

MARKET CREATION OPPORTUNITY

CARNISO isn't competing in the TRISO market—it's creating a new one with potential for **monopoly control**

EXCLUSIVE TECHNOLOGY ACCESS

Sole holder of University of Arizona license. Patent pending. **Only organization qualified to develop it**.

PERFECT TIMING

AI power demand is creating unprecedented nuclear fuel demand. **Big Tech is spending billions on reactors–and will need fuel.**

CLEAR PATH TO VALUE CREATION

$500K enables proof. Proof enables acquisition or growth funding. Multiple exit paths with 75%+ probability by 2030.

$500K

Capital investment directly enables timely R&D and creates value through proof of technology.

ARCHANGEL ATOMICS

The Future of Nuclear Fuel is a **Trillion Times Smaller**[v]

QUESTIONS?