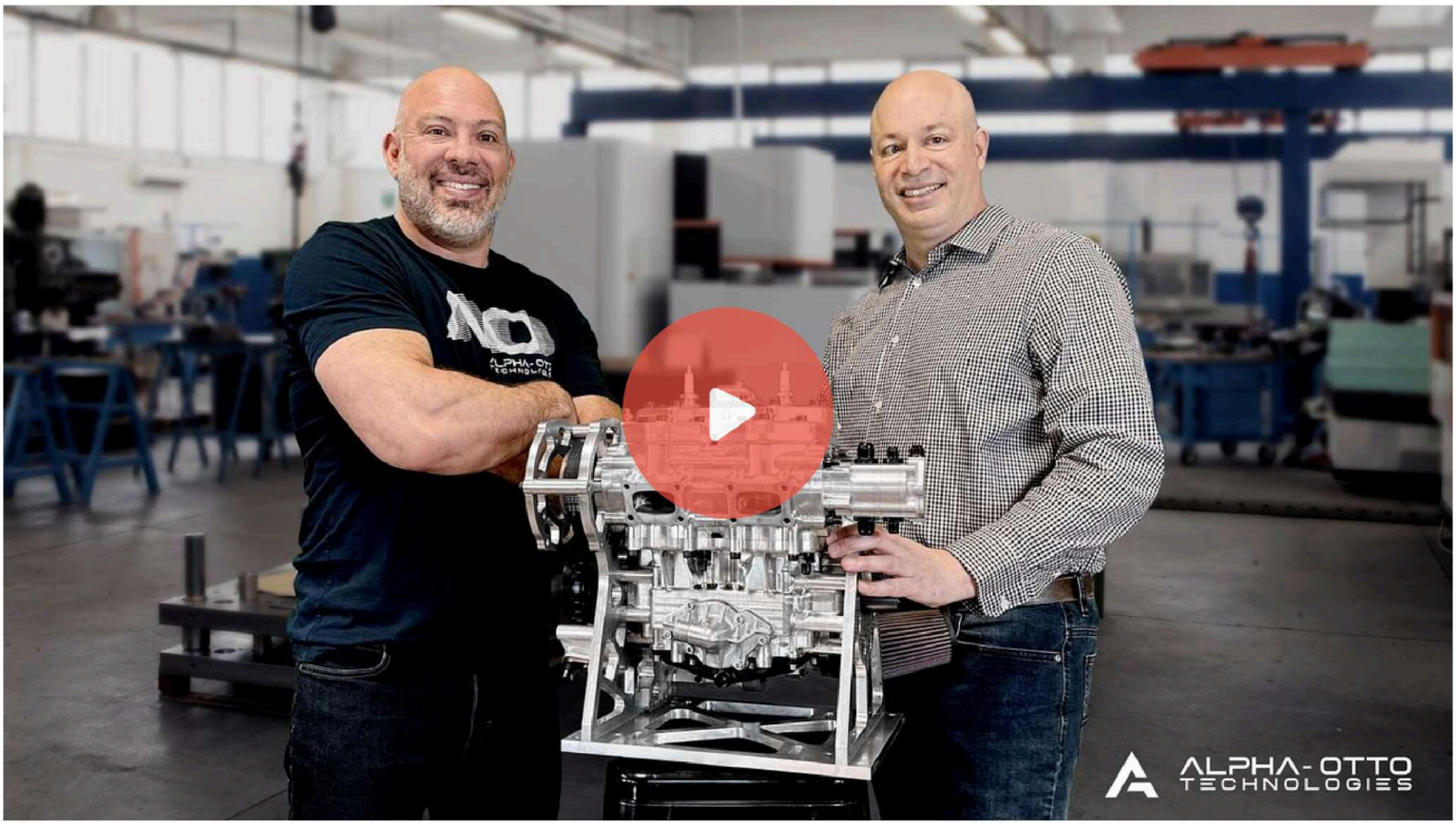


INVEST IN **ALPHA-OTTO TECHNOLOGIES**

Powering the Future with a Smarter, Cleaner Engine

alphaotto.com Fenton, MI

Highlights

1. This technology has the potential to significantly disrupt the $285B global engine industry.

2. Patent-protected engine design and method of operation, ready for commercialization.

3. This is potentially the most efficient hydrogen combustion engine ever developed.

4. A truly fuel agnostic engine - Able to run on almost any fuel with little to no modification.

5. Incredible thermal efficiency, exceeding 50%, in a low-cost, mass producible engine.

6. Experienced founders - each has started previous companies and raised over $1M in investment.

7. $1.2m in federal grants funded R&D and initial prototype development through a prior company.

8. In discussions with major engine OEMs to bring this innovative engine technology to market.

Featured Investor

Ryan Toll
Syndicate Lead

Follow

Invested $5,000

"I have spent much of my adult life trying to find & implement the best ideas I could find -- big or small. I've come to recognize what sorts of ideas change the game, what sorts of people make that happen, and the effort required to make these dreams a reality. Alpha-Otto has the key hallmarks of success that I've come to identify in other successful projects. They have an engine design that opens many new possibilities, while also providing a realistic path from the present realities. I got the chance to speak with John & David myself. They strike me as the right sort of men to bring this technology to market. They have the passion and dedication to work through all the various challenges involved in bringing their vision to life. With the enough backing, they will continue to press forward for years to come. Alpha-Otto's new engine technology is particularly appealing as an investment

because it combines a high ceiling of impact with a broad diversity of paths forward. This engine could do well as an optimization to existing designs, a low-emissions alternative to meet regulatory mandates, a gateway into alternative fuel sources, and more. This variety of prospects gives many options for a future pivot to find the market demand wherever it may be. No one knows the future, but I see plenty of ways that Alpha-Otto can become a part of it. I am happy for the opportunity to enable John & David as an investor. I fully expect them to drive Alpha-Otto forward as far as it can go."

Our Team

David Dusseau CEO

David is an entrepreneur who has founded multiple ventures and brings three decades of leadership and experience to navigating the technical and business challenges inherent in building and scaling a hardware startups.

John Krzeminski CTO

John is the developer of Alpha-Otto's innovative engine tech and brings over 20 years of experience and expertise in powertrain engineering and leading the development of advanced propulsion systems from design to production for Ford, Chrysler, and FEV.

Investing in Alpha-Otto Technologies

Powering the Technologies That Power the Future

Our modern world depends on energy to power everything from our cars, planes, and ships to our data centers, factories, and homes. As global energy demand accelerates—driven by surges in AI, autonomous systems, mobility, defense, and digital infrastructure—existing solutions are falling short. Renewable sources and batteries are vital, but they can't meet every challenge alone. Engines remain the backbone of energy and transportation, powering over a billion machines worldwide; yet most are outdated, polluting, and inflexible.

The breakthroughs in the design and operation of internal combustion engines developed by Alpha-Otto represent a unique convergence of proven engine technology and innovative advancements. This offers investors a first-mover advantage in many engine applications that collectively comprise a multi-trillion-dollar global market. Furthermore, Alpha-Otto's innovations have the potential to redefine the internal combustion engine as a new source of clean and renewable power. Alpha-Otto's cutting-edge engine technology provides a pathway for current engine manufacturers to significantly enhance efficiency, meet tightening emissions standards, reduce costs, and accelerate the transition to the use of cleaner fuels such as hydrogen and ammonia.

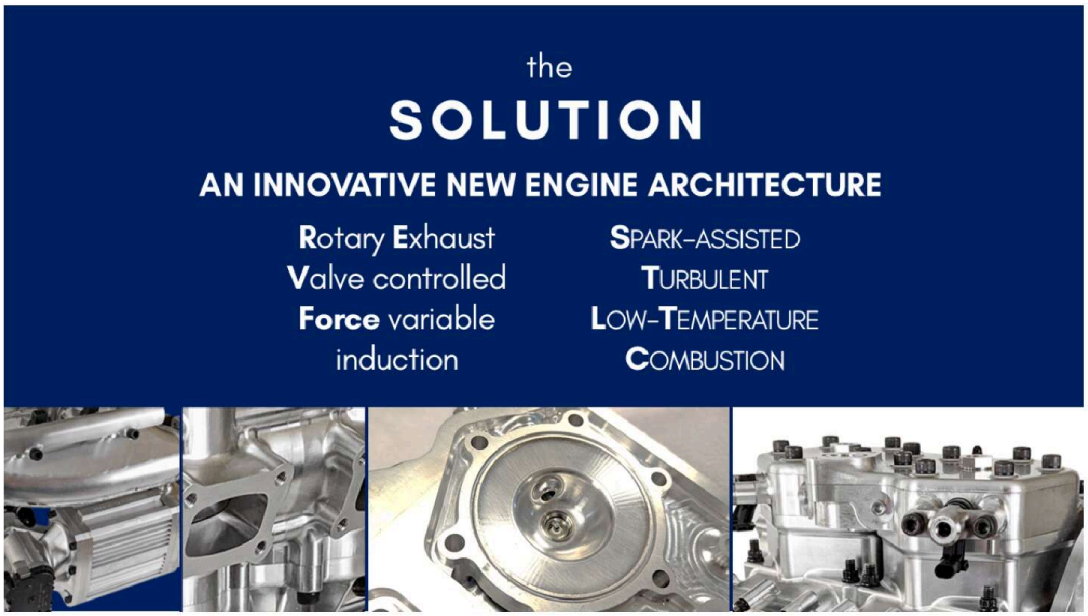
Alpha-Otto will also disrupt the power generation and hybrid-electric powertrain market by introducing the Power Cube, an integration of our revolutionary engine platform with the latest axial flux motor technology. We aim to bring to market what could be among the smallest and most efficient power generators ever developed. This go-to-market strategy targets the highly lucrative and rapidly growing multi-billion-dollar Data Center power market, as well as mobile and distributed power generation for defense, emergency response, and numerous commercial applications.

This breakthrough in engine design and operation, funded by $1.2 million in non-dilutive federal grants through a prior company, is proven, patent-protected, and can be ready for full-scale demonstration within 36 months. Alpha-Otto Technologies is raising funding to finalize our demonstration platform and drive commercialization efforts through ongoing discussions with major engine manufacturers such as Caterpillar, Cummins, and others.

Why Alpha-Otto? Why Now?

- **Legacy Engines are Holding Us Back:** Traditional piston gasoline and diesel engines have served us well, but they still operate with similar levels of efficiency as they did half a century ago. Innovation is needed to revitalize and ensure the future of the ICE.
- **Market-Ready Disruption:** A more efficient hydrogen-compatible engine design will disrupt the 285-billion-dollar global ICE industry, help drive growth in the emerging hydrogen combustion market, which is projected to exceed $45 billion by 2033, and develop multi-billion-dollar market opportunities in distributed power generation and hybrid-electric propulsion.
- **Better Efficiency and Lower Emissions:** New engine technology that can achieve thermal efficiencies above 50% while producing lower to near-zero harmful emissions will significantly reduce the environmental impact of today's ICE and reposition the ICE as a potential clean energy source running on hydrogen or ammonia.
- **Fuel Adaptability:** We need to go beyond complicated retrofits of diesel and conventional ICEs to a new engine architecture that can run efficiently on any fuel, from traditional fuels like diesel, JP-8, and gasoline to cleaner and renewable fuels like ammonia, methanol, ethanol, and hydrogen. This is how we ensure the future of the ICE and our transition to lower-carbon fuels.
- **Proven Technology, Ready to Scale:** Innovation is needed today if the ICE is to survive. New engine designs and working prototypes that are validated through testing, built with standard components to ensure rapid adoption, cost-competitive, and easily scalable using existing manufacturing infrastructure, are

what Alpha-Otto offers and can bring to the market.



Alpha-Otto's Breakthrough Internal Combustion Technology

REV Force™ + STLTC Engine Architecture

Alpha-Otto has developed a revolutionary, patent-protected engine platform that fundamentally redefines what's possible. It is a proprietary, high-power-density, future-proof engine architecture that delivers clean, efficient, and flexible power—built for today's fuels and ready for tomorrow's hydrogen economy.

REV Force™ (Rotary Exhaust Valve-controlled Force variable induction) + **STLTC** (Spark-assisted Turbulent Low-Temperature Combustion) is not a retrofit or incremental upgrade—it is a clean-sheet reimagining of reciprocating engine fundamentals that offers unmatched power-to-weight and airflow control. Key innovations include:

and airflow control. Key innovations include:

- **Power Stroke Every Revolution:** A proprietary two-stroke design that does not burn oil and delivers a power stroke with every crankshaft rotation, dramatically increasing power density and efficiency over conventional four-stroke engines.
- **Dynamic Air and Exhaust Control:** The REV Force system decouples air management from displacement, using a rotary exhaust valve and force-variable induction to precisely control combustion conditions in real time.
- **Spark-assisted Turbulent Low-Temperature Combustion:** This groundbreaking combustion strategy achieves ultra-high efficiency (over 50% thermal efficiency), outperforming most internal combustion engines (ICEs) and rivaling fuel cells. It offers near-zero emissions and unprecedented support for nearly any liquid or gaseous fuel.
- **Fuel Agnostic:** REV Force + STLTC engines reliably operate on hydrogen, methanol, ethanol, ammonia, JP-8, gasoline, diesel, and field-mixed fuels with minimal or no modifications, unlocking new market segments and simplifying logistics for global OEMs and end users.
- **Modular, Scalable, and Production-Ready:** Built with standard components and manufacturing processes, REV Force can be rapidly integrated into existing supply chains, reducing cost and time to market.

Together, these technologies create the cleanest, most adaptable engine system able to replace conventional ICEs, run on clean fuels like hydrogen and ammonia, and when paired with axial flux motor technology, generate electrical power at efficiencies equal to or better than fuel cells and gas turbines. A real innovation able to bring new life to the future of the internal combustion engine.

UNMATCHED PERFORMANCE METRICS

Metric	REV Force (Alpha-Otto)	Conventional ICEs	Diesel Engines	Rotary Engines
Power Density	Up to 3.3 kW/kg	0.7–1.2 kW/kg	0.8–1.5 kW/kg	1.8–2.8 kW/kg
Thermal Efficiency	50%+	30–33%	40–45%	25–30%
Fuel Flexibility	Broadest in class	Limited	Heavy fuels only	Limited
Maint. Interval	2,000+ hrs	50–2,000 hrs	100–2,000 hrs	20–100 hrs
Emissions	STLTC optimizes combustion, resulting in lowest possible emissions	High (legacy tech)	High (legacy tech)	Moderate

Direct Market Opportunity

The global market for internal combustion engines, which encompasses everything from production to service across various major sectors, exceeds $500 billion. When we factor in related industries such as transportation and fuels, the total market size reaches into the multi-trillion-dollar range. Our engine technology is versatile and designed for scalability across all application sectors. Even a small-scale adoption of our engine technology—less than 1%—will represent a multi-billion-dollar market opportunity.

Sector	Example Applications	Market Size (Est.)	Why REV Force™ + STLTC Wins
Power Generation	Gensets - Backup Power, EV Fast-Charging, Data centers, Distributed Generation & Microgrids	$70B+ CAGR 7.2%	Fuel-flexible, Scalable, Ultra-Efficient, and Hydrogen-ready
Transport	Cars, Trucks, Small Aircraft, eVTOLs	$300B+ CAGR 9.4%	Improved Fuel Efficiency and Emissions Compliance
Marine & Recreational	Boats & Watercraft, Off-road Recreational Vehicles	$37B+ CAGR 5.5%	Lightweight, Superior Power Density, Low Maintenance
Industrial & Ag	Pumps, Tractors, oil & gas, Off-road Machinery	$50B+ CAGR 4.4%	Rugged, Simple to Maintain, Fuel Flexibility
Defense & Aerospace	Tactical Gensets, mobile energy systems, Microgrids, UAVs	$35B+ CAGR 8.5%	JP-8 Capable, Low Signature, Battlefield Adaptable
Hydrogen Combustion	Power Generation, Marine, Off-Road/Industrial, Transportation	$18B+ CAGR 10%	Highly Efficient, Low-cost, Reliable Hydrogen Combustion

A Strategy for Success

The internal combustion engine industry has been around for over a century and is dominated by many large, well-established companies. These companies either completely dominate specific market segments or maintain a significant presence across several sectors. For Alpha-Otto to succeed and compete effectively, it is essential that we adopt a collaborative market-driven approach to proving and demonstrating the capability and value of our technology.

Furthermore, developing and commercializing new engine technology is a costly endeavor. As a result, our go-to-market strategy focuses on establishing relationships and forming strategic partnerships with major engine industry original equipment manufacturers (OEMs) who recognize that our technology can provide them with a competitive advantage or align with their strategic goals. Additionally, we plan to introduce our own product offering, which will help demonstrate and validate our technology.

Active Discussions with Major Manufacturers

We are currently engaged in ongoing discussions with several major engine manufacturers. Large engine manufacturers typically take a conservative approach to business and require extensive validation before investing in new technologies. As a result, these discussions can take time. However, our technology has generated significant interest.

Our objective is to advance these efforts over the next one to two years, with the goal of securing Letters of Interest (LOIs), engineering services, or similar development agreements. Ultimately, we aim to establish licensing agreements or strategic partnerships with one or more leading engine industry OEMs to introduce our technology into major market segments and across various applications. These efforts may ultimately lead to an acquisition by a large engine OEM.

An Ingenious Market Introduction Strategy

Meet the Power Cube—designed to be one of the Cleanest, Smallest, Most Powerful, and Efficient Power Generators

available on the market.

Our flagship product, the Power Cube, is designed to be a truly fuel-flexible power generator—pushing the boundaries of what's possible with multi-fuel capability. It boasts exceptional power density and can run efficiently on almost any fuel, including net-zero carbon-emission options like hydrogen and methanol. The Power Cube combines our revolutionary engine platform with commercially available axial flux motor technology to create an ultra-efficient hybrid-electric powertrain. This innovative system is capable of generating up to 100 kilowatts of power from a one-square-meter unit, weighing approximately 100 kilograms or around 250 pounds.

Why A Power Generator

First, the engineering required to calibrate and control an engine used to drive an electric motor to generate electricity is significantly less complex than that of one in a vehicle. And specifically, Alpha-Otto's engine technology pairs very well with highly efficient axial flux motor technology, creating an incredibly compact and efficient hybrid-electric powertrain.

Secondly, stationary or auxiliary (backup and mobile) power generation is not a critical application without inherent

redundancies. This makes stationary power generation an excellent real-world application for testing and demonstration. Additionally, large grants are available from governments and industry to finance the demonstration and pilot testing of clean and renewable power generation technologies, such as the Power Cube running on hydrogen, ammonia, or another net-zero carbon emissions fuel. These grants are an important source of capital to underwrite the costs of early-stage production, testing, and real-world demonstration and validation of Alpha-Otto's engine technology.

Lastly, developing highly efficient hybrid-electric powertrains is a key part of our strategy to redefine the future of the internal combustion engine. As the world shifts towards electrification, the hybrid-electric powertrain—a combination of an internal combustion engine and an electric motor for electricity generation—will become a critical component in hybrid-electric vehicles of all types and an important means of generating electricity for our electrified world. This includes both backup/auxiliary and primary power generation.

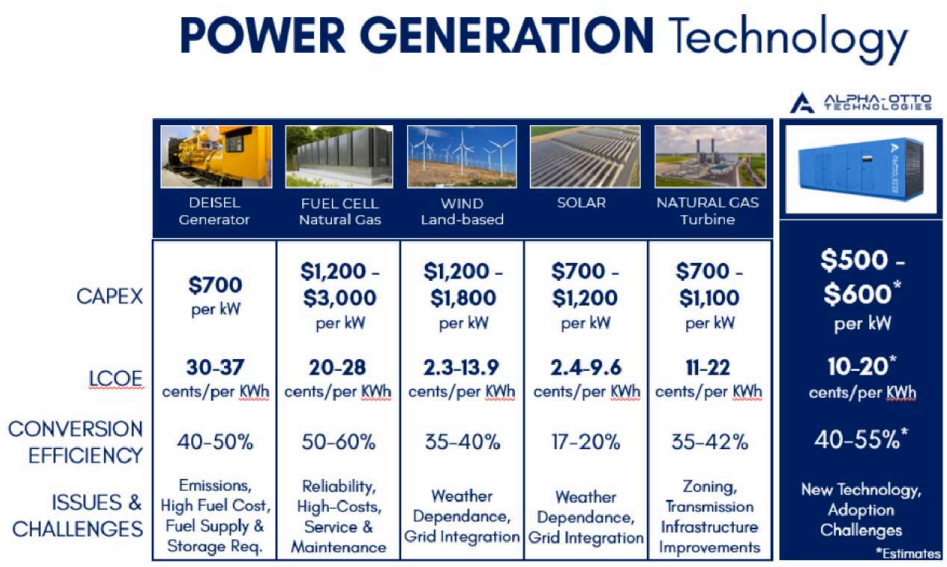
Another high-potential application for the Alpha-Otto hybrid-electric powertrain is for utility-scale power generation, enabling the development of distributed power generation and microgrids. By stacking and clustering multiple Power Cubes into a single unit, similar to how batteries are arranged in a battery pack, it is possible to generate up to 20 megawatts of power in a space the size to a standard shipping container and at efficiency levels similar to that of large gas turbine generators, at a fraction of the cost.

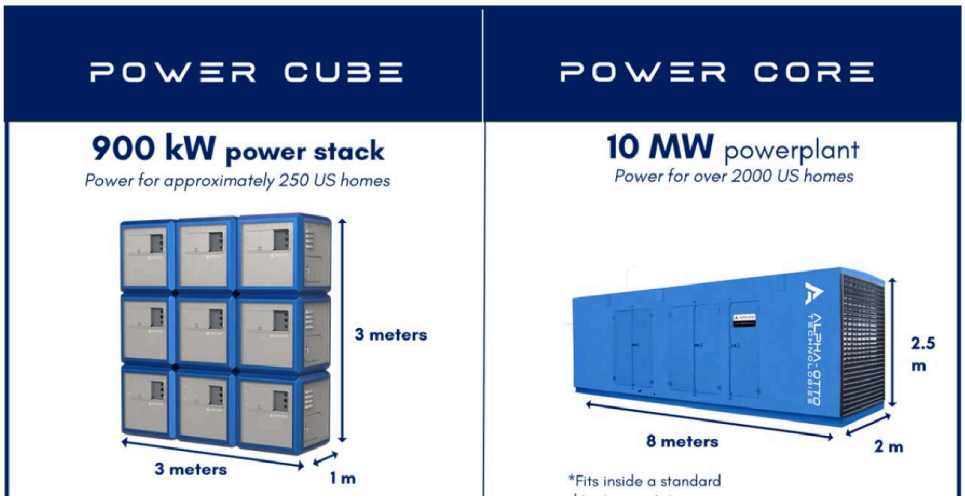
The market potential for this hybrid-electric powertrain technology is significant:

- There is a $70 billion+ global market for mobile and

backup power generators, with significant opportunities emerging for data centers, emergency response, military, microgrids, and distributed generation.

- There are substantial market opportunities for hybrid-electric powertrains in several forms of transportation, which are all projected to see tremendous growth over the next ten years, becoming an over $400 billion market segment by 2035.
- A multi-billion-dollar market opportunity projected to exceed $45 billion by 2033 is developing in the application of hydrogen combustion technology to support and enable growth in a future hydrogen economy.





shipping container

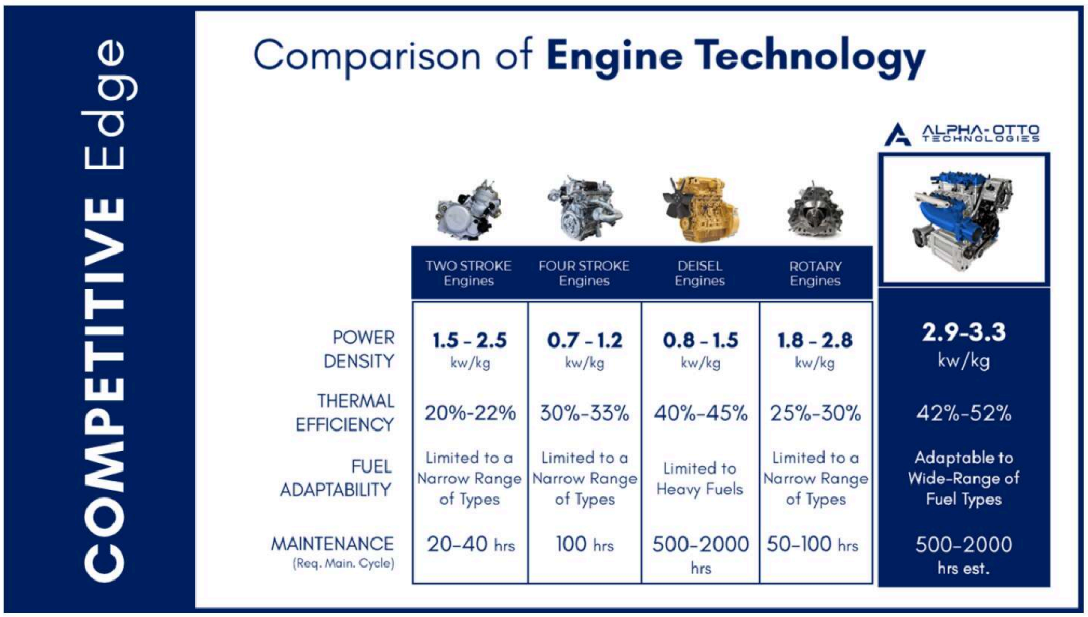
A Business Model for A Competitive Market

Many promising engine technology developers face significant challenges in bringing their innovations to the market. These challenges may stem from their inability to advance beyond continuous product development, a lack of perceived value by the mainstream industry that hinders adoption or acquisition, or difficulties in scaling up production due to overwhelming capital requirements.

In the highly competitive internal combustion engine market, Alpha-Otto does not intend to compete directly with large original equipment manufacturers (OEMs) or to build new production facilities. Instead, our business model focuses on establishing relationships and forming strategic partnerships with established OEMs. Our goal is to identify opportunities for collaboration through licensing agreements or joint ventures to bring engines utilizing our technology to

market on a large scale.

The manufacturing and assembly of Alpha-Otto's products, including The Power Cube, will be outsourced to established vendors. The components of the REV Force™ Engine Architecture are not uncommon or unique to manufacturers and suppliers in the engine industry. This allows Alpha-Otto to scale initial production and product sales using existing suppliers while minimizing capital requirements.



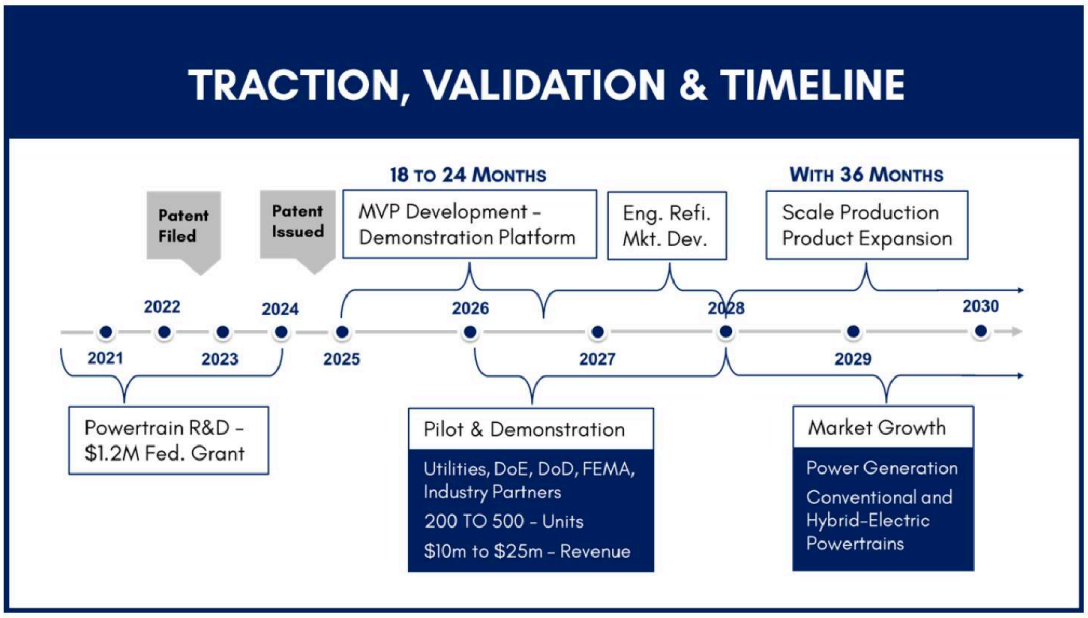
What Gives Alpha-Otto A Competitive Edge?

Competing on benchmarks alone, Alpha-Otto is highly competitive. However, a real competitive edge is defined as more than just better technology that offers improvements measured against a set of common benchmarks; it is also your business model, market strategy, and how you navigate the challenges of building interest in your technology.

Alpha-Otto's business model and market strategy explained above are both strategically focused on building relationships

with OEMs and bringing an impressive initial product offering to the market, positioned to demonstrate capability and validate our technology.

We anticipate that as our technology demonstrates its capabilities, interest from industry, investors, and the media will grow rapidly. This, coupled with our ongoing engagement with industry OEMs, presents a strong path for success and a competitive market strategy.



**Forward-looking projections are not guaranteed.*

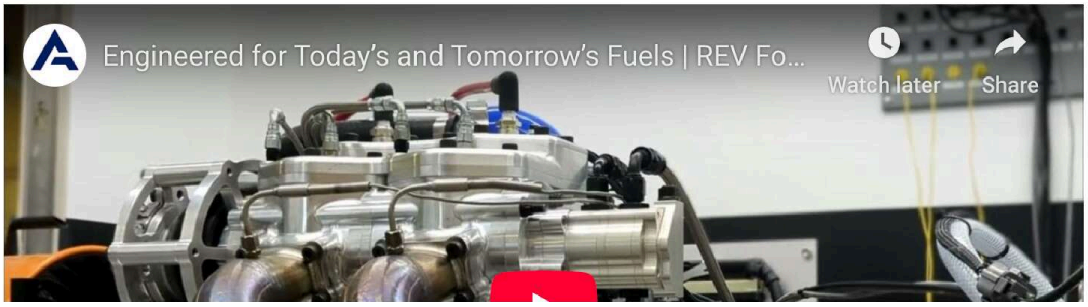
Traction

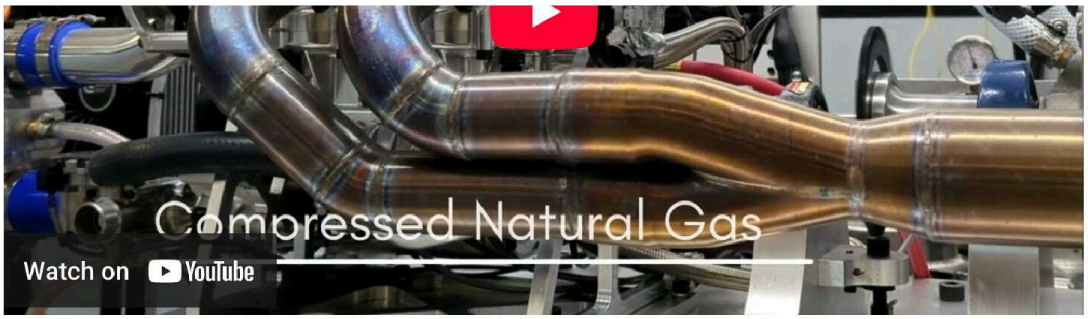
- Secured $1.2 million in U.S. Federal Grants through a prior company, which funded the research and development of the REV Force™ Architecture.
- Designed, built, and tested two generations of prototypes, validating the science and methodology behind the REV Force™ Architecture.
- Designed and built control systems for calibrating and

- Designed and built control systems for calibrating and testing the unique REV Force™ Architecture and Spark-assisted Turbulent Low-Temperature Combustion methodology.
- Built and tested four engineering prototype test properties.
- International and US patents were filed in August 2022 and issued in December 2024.

Validation

- Completed more than 240 hours of testing on generation one and two prototypes.
- Ran prototype engines on various octanes of gasoline, pure ethanol, and kerosene using port fuel injection without any modifications to the engine architecture.
- Ran the generation two prototype on CNG (compressed natural gas) and LPG (liquified petroleum gas), only needed to swap the fuel injectors.
- Successfully operated the engine on 100% pure hydrogen using low-pressure port injection and air-to-fuel ratios as lean as 50:1 and 70:1, resulting in near-zero NOx emissions.
- Emissions testing on gasoline showed a 30% reduction in CO2, nearly zero NOx, and a decrease in all base emissions, resulting from more efficient and complete fuel combustion.





Timeline

Speed to market is a crucial factor in determining the viability of new engine technology. As mentioned earlier, Alpha-Otto has successfully completed several milestones in the development and testing of our innovative engine technology. While there is still much work to be done to fully understand the potential of this new engine architecture, we anticipate having a minimum viable product or commercially demonstrable prototype ready within the next twelve months.

With your support and adequate funding, our initial design—a two-cylinder, 600cc, 127kW engine—will be ready for small-scale production (100-500 units) and early commercialization through demonstration and pilot testing projects within 36 months. For those familiar with powertrain development, this timeline is impressive and represents an incredibly fast pace to market.

This timeline is achievable by leveraging existing engineering and streamlining testing, calibration, and engineering requirements for power generation applications and low-volume production. Unlike large-scale manufacturers that must meet stringent standards before retooling their production lines, Alpha-Otto's focus is on pilot testing and demonstration projects that showcase the viability and potential of our technology to attract interest from potential strategic partners and licensees.

**Forward-looking statements are not guaranteed.*

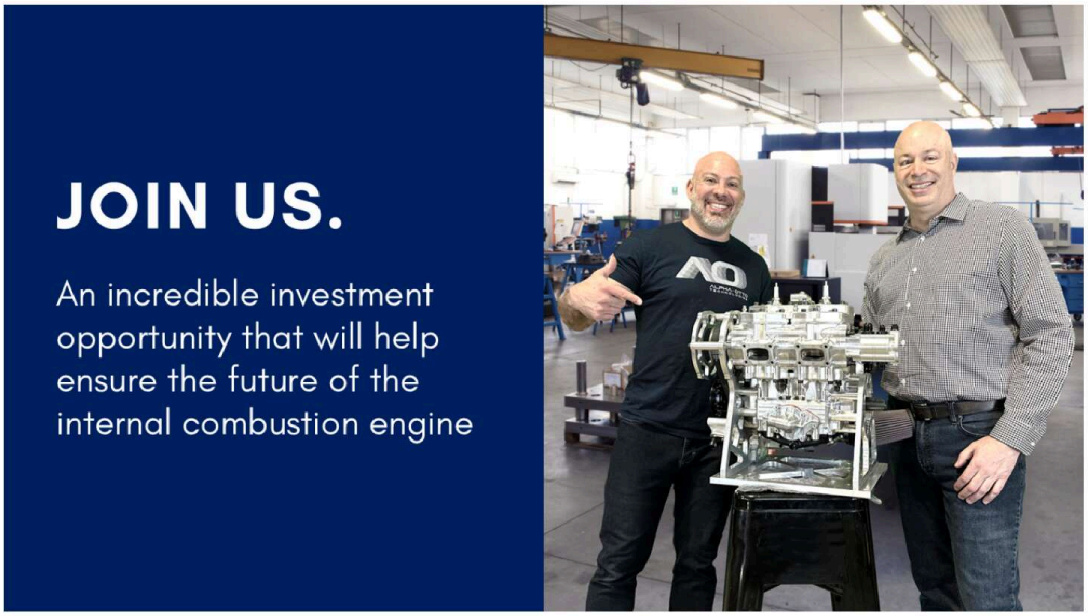
A Visionary Team

Our vision focuses on revolutionizing a crucial technology we depend on every day. We are on a mission to reduce the environmental impact and ensure the future of the internal combustion engine. This inspiration led to the development of the REV Force™ Engine Architecture, a groundbreaking innovation that we are committed to bringing to the world.

The development of the REV Force™ Engine Architecture began over a decade ago when John, drawing on his experience as a powertrain engineer, set out to reimagine how engines could operate. Through years of rigorous research and experimentation, John successfully pioneered a transformative approach that dramatically enhances efficiency, reduces emissions, and enables the stable and effective combustion of clean alternative fuels like hydrogen and ammonia.

In 2022, David, leveraging his experience building and scaling new ventures, partnered with John to launch Alpha-Otto Technology. Our collaboration is driven by a shared

Otto Technology. Our collaboration is driven by a shared commitment to bringing this extraordinary innovation to market. With the support of our advisors and a dedicated, growing team, we are committed to our goal of transforming and redefining the engine as a cleaner, more efficient, and fuel-flexible power solution able to reshape the future of energy.



Join Us

We invite you to join us in revitalizing and ensuring the future of the internal combustion engine. We're raising investment on Wefunder to accelerate the commercialization of the REV Force™ architecture.

Your investment and support will enable us to complete the development of our demonstration engine and platform, which will help us achieve our goal of attracting the interest of major OEMs in the engine and transportation industries. This will also position Alpha-Otto for future investments, strengthening returns for early investors. Additionally, your support will help us develop and launch the Power Cube,

believed to be the first power generator of its kind capable of running on almost any fuel, including hydrogen, thereby redefining the internal combustion engine as a clean power technology for the future.

If you want to learn more or have questions about Alpha-Otto, our innovative engine technology, or our vision for the future, please visit us at **alphaotto.com** or follow us on LinkedIn, Facebook, and YouTube. We are also happy to answer any questions; just click on "ASK A QUESTION" above our Highlights or email us at **info@alphaotto.com**.

Power the future. Invest in Alpha-Otto Technologies.