POLESTAR IPS FZCO LTD.
Braking Without Friction.

Executive Summary

Company Overview

Polestar IPS FZCO Ltd. is pioneering a transformative leap in motion control with its patented **Frictionless Braking System (FBS)**, a hydraulic braking technology that eliminates particulate pollution. The system replaces traditional friction-based brakes with a zero-emission, regenerative solution that captures kinetic energy and reuses braking heat for productive commercial applications.

Polestar IPS FZCO Ltd. operates out of the Dubai Digital Park in the Dubai Silicon Oasis, United Arab Emirates. The company is actively developing a hydraulic braking mechanism that replaces conventional friction-based brakes across automotive, commercial, and aerospace platforms. This B2B operation focuses on technology advancement, with an exit or monetization strategy built around licensing to entrenched OEM manufacturers.

Investment Highlights

- **Solves Hidden Pollution:** Eliminates carcinogenic brake dust particulates.
- **Exceptional Founder Pedigree:** Lead by Charan Nelms, inventor of the Q-Damper system — a gold standard in Formula One for over 30 years.
- **Unique Energy Recovery:** Captures and recycles kinetic heat to power auxiliary vehicle systems.
- **Validated Technology:** Independently validated by Powertrain Technology Ltd. (PTL).
- **Proven IP Position:** Three granted patents across the EU, UK, USA, Morocco and Turkey, with national phase applications pending globally.
- **Scalable Business Model:** Designed for universal application across automotive, heavy freight, rail, and aerospace.

Business Overview

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Financial Snapshot:

- **Current Revenue:** Pre-revenue stage; research and development phase.
- **Funding to Date:** £2 million privately funded by the founder over 14 years.
- **Capital Ask:** £16.5 million ($23 million) for a 49% equity stake.
- **Target Milestone:** Full scale development to Technology Readiness Level 9 (TRL 9) over a 5-year period.

Investment Thesis: As mobility transitions toward electrification, the industry has aggressively addressed tailpipe emissions but neglected the massive environmental cost of braking particulates. Polestar IPS offers a fully patented, independently validated hydro-mechanical solution that aligns perfectly with incoming ESG mandates and stringent regulations like Euro 7. By eliminating friction, this technology provides long-term defensibility and sets a new global manufacturing standard for clean mobility.

Market Opportunity & Analysis

Market Size & Dynamics

Total Addressable Market (TAM)

The technology is universally applicable across massive sectors, including automotive passenger vehicles, mass transport, heavy freight, rail, and aerospace.

Grant Capital Availability

Significant non-dilutive capital is available in this sector; the European Union has dedicated clean air grants for brake particulate reduction technologies.

Serviceable Addressable Market (SAM)

Commercial refrigerated fleets and electric vehicles present immediate entry points due to the system's thermal energy recovery and range extension capabilities.

Market Trends

→ Regulatory Tailwinds

Impending regulations such as Euro 7 are actively targeting non-exhaust emissions, creating forced adoption for cleaner braking technologies.

→ Electric Vehicle Efficiency

The EV market heavily prioritizes efficiency. Every watt of saved or recycled energy translates directly into increased vehicle range, making thermal recycling highly desirable.

→ Health and ESG Focus

Heightened awareness regarding the carcinogenic nature of brake dust is pushing OEMs to seek alternatives that satisfy the highest ESG investment mandates.

Competitive Landscape & Go-To-Market

Incumbent Inertia

The braking industry is controlled by massive Tier 1 suppliers with entrenched OEM relationships.

Competitor Deficiencies

Conventional braking systems, despite electronic advancements (ABS, EBD), fundamentally rely on friction, which wastes kinetic energy as airborne heat and dangerous particulates.

EV Regenerative Braking Gap

While EVs utilize regenerative motor braking, it does not fully eliminate the need for friction brakes or the associated dust — a gap that Polestar IPS fills.

Go-To-Market Approach

Rather than competing with entrenched Tier 1 manufacturers in physical production, Polestar IPS aims to license or sell the IP outright to OEMs and suppliers.

Market Penetration Strategy

The technology is highly compatible with internal combustion, hybrid, and electric platforms, ensuring it can be adopted by legacy automakers transitioning their fleets.

Company Information

Company History & Background

01

Founding

Polestar IPS FZCO Ltd. was officially formed on March 20, 2025, operating under Dubai License No: 60065.

02

Founder's Legacy

The company is driven by founder Charan Nelms, an elite automotive designer whose prior invention, the Q-Damper System, has been heavily utilized across Formula 1 and professional racing for three decades.

03

Development

The current Frictionless Braking System is the result of 14 years of dedicated R&D to address the neglected environmental cost of braking.

Business Model

- **Revenue Generation:** The company focuses on a highly scalable B2B model predicated on licensing IP to Tier-1 suppliers and OEMs, ensuring recurring revenue potential.
- **Low Maintenance:** The system's design minimizes wear components, significantly reducing lifetime maintenance costs compared to standard friction systems, making it highly attractive to commercial fleet operators.

Products & Services — Frictionless Braking System (FBS)

Hydraulic Cam-Integrated System

Links directly to the transmission output shaft, replacing abrasive discs and pads.

Zero Particulate Emissions

Ensures cleaner air by entirely removing carcinogenic brake dust from the stopping process.

Passive Anti-Lock Brakes

Built-in hydraulic self-modulation ensures anti-lock behavior without requiring an electronic control unit (ECU).

All-Weather Reliability

The fully enclosed hydraulic nature means braking performance is completely unaffected by water, dust, or road contaminants.

Traction & Validation

- **Independent Validation:** Powertrain Technology Ltd. (PTL), an engineering firm of ex-Ricardo engineers, conducted an independent technical evaluation and confirmed the technology's strong technical feasibility..
- **IP Maturation:** The company has transitioned from initial filings to granted patents in key international jurisdictions.

Technology & Intellectual Property Deep Dive

Intellectual Property Portfolio

Overseen by **Mathys & Squire LLP**, Polestar IPS boasts an extensive, globally recognized patent portfolio consisting of three main families centered around *"A braking system"*.

1

Family 1 — Hydraulic Brake

Granted: UK, European Patent Office (Unitary Patent), Spain, Morocco, the USA, and Turkey.

Pending: Brazil, Canada, China, India, Mexico, and South Africa.

2

Family 2 — Kinetic Energy Recovery

Granted: UK. Allowances and first Office Actions have acknowledged novel/inventive subject matter in the US, with grants expected shortly.

Pending: Brazil, Canada, China, India, Mexico, and South Africa.

3

Family 3 — Integral Anti-Lock Braking

Granted: UK, European Patent Office, Spain, Morocco, the USA, and Turkey.

Pending: Brazil, Mexico, Canada, China, India and South Africa

Core Mechanism and Operation

Hydraulic Conversion

Double-acting hydraulic cylinders act on a cam surface attached to the transmission output shaft. This converts the rotational kinetic energy of the vehicle directly into hydraulic pressure.

Valve Control

A specialized handbrake function routes hydraulic oil through a valve system. Turning the valve "ON" locks the mechanism and immobilizes the shaft, while turning it "OFF" allows fluid to flow through the master cylinder circuit to provide highly controlled braking.

Thermal Energy Management

As kinetic energy forces fluid through a variable orifice, thermal energy is generated. Captured heat is transferred via a heat exchanger to supplement cabin climate control or drive an ammonium-hydrogen absorption method to cool refrigerated cargo.

Financial Analysis & Projections

Historical Financial Performance

Founder Backed

The company is entirely debt-free and has been meticulously funded by the founder, Charan Nelms. Over 14 years, Nelms has privately invested **£2 million** into R&D and patent prosecution.

Current State

The company operates efficiently in a pre-revenue stage, concentrating resources exclusively on securing global intellectual property and attaining technical validation from esteemed third-party engineering firms.

Financial Projections (5-Year Horizon)

- **Development Timeline:** The company projects a focused 5-year development cycle. The primary objective is advancing the Frictionless Braking System from its currently validated state to Technology Readiness Level 9 (TRL 9), denoting a fully operational and market/flight-ready product.
- **Scalability:** Following TRL 9, revenue models project massive scalability by utilizing out-licensing structures rather than capital-intensive proprietary manufacturing.

Capital Requirements

£16.5M

Total Capital Ask

Approximately $23 million USD

49%

Equity Offering

Stake offered in exchange for capital injection

Use of Proceeds

Capital will be strategically deployed to:

- Finalize commercial prototype development (transitioning from TRL-6 to TRL-9) Fund
- rigorous international safety certification
- Maintain the expansive global patent portfolio
- Build a dedicated commercialization team

Key Financial Metrics

- **Capital Efficiency:** By relying on expert consultancy groups like Powertrain Technology Ltd. for prototype development, Polestar IPS bypasses the immense overhead of building internal production infrastructure.
- **Return Profile:** Investor returns are targeted through high-value exits—such as outright IP acquisition—or recurring high-margin licensing royalties secured from entrenched automotive Tier-1 suppliers.

Investment Highlights

Disruptive Environmental and Health Impact

The Polestar Frictionless Braking System directly solves a critical and historically hidden pollution crisis by entirely eliminating brake dust particulates. Brake dust is a known carcinogen and a primary source of dangerous, non-exhaust vehicle emissions. With incoming global regulatory frameworks—specifically Euro 7—heavily targeting these non- exhaust particulates, traditional friction brakes are facing unprecedented regulatory pressure. The Polestar system offers an immediate, future-proof solution that perfectly aligns with the most stringent global ESG (Environmental, Social, and Governance) investment mandates.

Exceptional Founder Pedigree and Technical Expertise

The company's founder, Charan Nelms, possesses a proven and elite track record of automotive innovation. His prior technical invention, the Q-Damper (Quadrant) shock absorber, has served as the gold standard in Formula One and professional racing suspensions for over 30 years. This deep, established history of creating functional, highly complex, and widely adopted automotive technology significantly de-risks the technical feasibility of his new Frictionless Braking System.

Unique Energy Recovery and Thermal Efficiency

Unlike conventional friction braking systems that waste kinetic energy by converting it into useless airborne heat, the FBS captures, contains, and recycles that thermal energy. This recycled heat can be utilized to power secondary vehicle systems, such as cabin heating or heavy-freight refrigeration units. This specific capability provides a massive, tangible efficiency bonus to the electric vehicle (EV) market; by offsetting auxiliary power drains, every watt of saved energy translates directly into increased driving range for EVs.

Independently Validated Concept by Elite Engineers

The Frictionless Braking System is not a theoretical concept; its fundamental hydraulic logic and operational validity have been independently evaluated and confirmed by Powertrain Technology Ltd. (PTL). PTL, a prestigious UK-based engineering consultancy comprised of former Ricardo engineers, has formally confirmed the system's technical feasibility. Furthermore, PTL has expressed explicit interest in managing the engineering development process to advance the system to a commercial prototype (TRL-6).

Defensible and Proven Intellectual Property Moat

Polestar IPS operates behind a formidable and proven intellectual property moat managed by Mathys & Squire LLP. The company holds three distinct, granted patents across the European Union, the United Kingdom, and Turkey, covering the hydraulic brake, the kinetic energy recovery system, and the passive anti-lock mechanisms. With further national phase applications pending in major markets including the US, China, and India, the technology is thoroughly insulated against replication by incumbent automotive suppliers.

Risks & Mitigation Strategies

Extended Time-to-Market (Five-Year Horizon)

Risk: The project demands a five-year development cycle to reach full commercial readiness (TRL 9). This long lead time introduces notable execution risk, as competitor technologies (such as advancements in EV regenerative braking) or shifting regulatory standards could evolve before the product is ready for mass adoption.

Mitigation: The company mitigates this timeline risk through its robust, granted patent portfolio, which provides a standard 20-year window of protection, ensuring a long-term commercial moat. Furthermore, regenerative braking in EVs cannot fully eliminate friction brakes or their dust. Polestar IPS offers the only true zero-particulate solution, ensuring it remains the definitive compliance technology for upcoming Euro 7 mandates.

High Capital Intensity and Valuation Sensitivity

Risk: Seeking £16.5 million for a 49% equity stake represents a massive capital request for a pre-revenue, hardware-centric project. The high burn rate associated with physical prototype engineering and extensive international patent maintenance may necessitate additional "top-up" funding, potentially leading to investor dilution before the system generates revenue.

Mitigation: To maintain capital efficiency and prevent budget overruns, the company does not intend to build proprietary manufacturing facilities. Instead, it relies on highly specialized, third-party ISO-certified engineering firms like Powertrain Technology Ltd. to handle complex prototyping. Additionally, the founder has already absorbed and de-risked the initial 14-year R&D phase with £2 million of personal capital.

Entrenched Global Competition

Risk: The global braking industry is highly consolidated, dominated by massive Tier 1 suppliers that hold deep-rooted, long-standing relationships with Original Equipment Manufacturers (OEMs). Overcoming this industry inertia to replace traditional friction systems requires a massive, complex shift in global manufacturing standards and rigorous safety certifications.

Mitigation: The business model is strategically designed to avoid competing directly with Tier 1 suppliers in mass manufacturing. The company's primary exit and growth strategy relies on licensing or outright selling the technology directly to these OEMs and suppliers. The system is also designed for dynamic integration into existing internal combustion and EV platforms, smoothing the adoption curve.

High-Speed Fluid Dynamics and Thermal Management

Risk: The system operates by converting kinetic energy into hydraulic pressure and heat. Under high-speed or sustained heavy braking, there is a technical risk of brake fluid boiling if the thermal management system is inadequately sized. Failure to control fluid temperatures can lead to vapor lock or fluid breakdown, severely compromising braking performance.

Mitigation: The system architecture explicitly integrates advanced heat management protocols. Heat exchangers will be strategically positioned on the low-pressure side of the brake valve to ensure efficient cooling without affecting brake pedal responsiveness. This essential cooling process simultaneously enables the system's unique heat-recovery capability.

Primary Operational Risks

Critical Seal Leakage: Because the system relies entirely on hydraulic pressure and restricting oil flow to achieve braking, even a minor seal leakage can lead to total system failure.

Precision Manufacturing Requirements: To prevent failure from leaks, the system requires micron-level accuracy during assembly. Achieving this "perfectly tight" seal requires high-precision servo presses and complex force-closed-loop technology, which increases production complexity.

Thermal Management Dependencies: Braking is achieved by restricting oil flow through a master cylinder, which generates heat. While Nelms suggests recycling this heat for climate control, the system is heavily dependent on sensors and thermal management to ensure the oil does not overheat and lose its effectiveness.

Investor Types & Target Investors

The following table outlines the primary investor categories relevant to this capital raise, including typical check sizes, stage focus, and key motivations.

Investor Type	Typical Check Size	Stage Focus	Key Motivation
Angel Investors	$25k – $250k	Pre-Seed, Seed	High-risk, high-reward. Often former entrepreneurs looking to mentor and invest based on team and vision.
Venture Capital (VC) Firms	$500k – $50M+	Seed to Growth	Professional fund managers. Seek 10x+ returns on capital. Require massive market potential and clear path to exit.
Family Offices	$1M – $100M+	Varies Widely	"Patient capital." Manage wealth for single ultra-high-net-worth family. Longer investment horizons and strategic alignment focus.
Private Equity (PE) Firms	$10M+	Late/Growth Stage	Focus on mature, cash-flow positive businesses. Use operational improvements to generate returns.
Strategic Corporate Investors	$1M – $50M+	Varies	Large corporation investing for strategic advantage4gaining window into new tech, potential acquisition target, or partnership.
Venture Debt Providers	$1M – $25M+	Revenue Stage	Complement to equity funding. Provide capital without additional dilution for qualified companies with recurring revenue.

CAPITAL MARKETS OVERVIEW

Current capital market conditions, defined by stringent new ESG disclosure mandates and a recalibration of global automotive supply chains, create a highly strategic window for clean-tech mobility investments that offer immediate, hardware-level compliance solutions.

Global Clean-Tech & Venture Capital Climate

- **Shift to Real-World Deployment:** Venture capital and growth equity are increasingly pivoting away from early-stage conceptual software toward mature (TRL 6-9) hardware deep-tech that delivers measurable environmental impact. While broad venture volumes have stabilized post-peak, growth equity for scalable B2B industrial technologies remains highly resilient.
- **ESG Mandates and Capital Allocation:** Driven by the EU's Industrial Accelerator Act and the stringent Corporate Sustainability Reporting Directive (CSRD) frameworks taking full effect in 2026, institutional funds are aggressively deploying capital into technologies that verifiably decarbonize industrial and transportation supply chains.
- **Focus on Capital Efficiency:** Investors are prioritizing asset-light, highly defensible business models. IP-heavy enterprises that pursue strategic out-licensing agreements rather than capital- intensive proprietary manufacturing command premium valuations in the current high-interest environment.

Automotive Sector Investment Trends

- **Electrification Headwinds & The Hybrid Pivot:** With battery-electric vehicle (EV) adoption rates cooling in key Western markets due to infrastructure gaps and tariff-related supply chain volatility, legacy automakers are heavily pivoting back to hybrid and advanced ICE platforms. This extends the commercial lifespan of these vehicles, making universally applicable emissions-reduction hardware highly valuable.
- **Non-Exhaust Emissions in the Crosshairs:** As tailpipe emissions reach strict regulatory minimums, global regulators—specifically through Euro 7 mandates—are aggressively targeting brake dust and tire particulates. ESG funds and strategic corporate venture arms are actively seeking technologies that solve this newly regulated compliance bottleneck.
- **Thermal Efficiency as a Range Multiplier:** In the EV sector, battery cost and vehicle range remain paramount. Technologies that provide kinetic energy recovery and thermal recycling are highly sought after by OEMs looking to offset auxiliary power drains (like cabin heating or refrigeration) without requiring larger, heavier battery packs.

Favorable Environment for Polestar IPS

- **Immediate Regulatory Alignment:** By offering a true zero-particulate braking solution, the technology sits squarely at the intersection of incoming environmental legislation and the automotive industry's urgent need for compliance.
- **Agnostic Platform Application:** The system's direct compatibility across ICE, hybrid, EV, and heavy- freight platforms insulates the investment from the current volatility and shifting timelines of the global EV transition.
- **B2B Licensing Appeal:** Entrenched Tier-1 automotive suppliers, currently facing severe margin pressures and declining OEM profitability, are actively seeking to acquire or license validated, next-generation IP to maintain market share rather than funding expensive internal R&D over long timelines.

Process Information

Core Strategy
Targeted Investor Approach

Post Oak Group conducts a strategic, targeted capital raising process designed to maximize valuation through increasing competition in auctions.

Process Steps

01

Phase I – Investor Mapping & Outreach
Comprehensive mapping of relevant investors based on sector focus, stage, and check size. Initial outreach with executive summary and company overview.

02

Phase II – NDA Execution & Pitch Deck Distribution
Interested investors execute NDAs and receive the confidential pitch deck, financial projections, and supporting materials.

03

Phase III – Management Presentations
Shortlisted investors receive management presentations (virtual or in-person) and access to detailed Q&A materials.

04

Phase IV – Term Sheet Negotiations
Qualified investors submit term sheets outlining valuation, investment terms, board composition, and investor rights.

05

Phase V – Due Diligence & Documentation
Selected lead investor(s) conduct confirmatory due diligence while legal documentation is negotiated and finalized.

06

Phase VI – Closing & Onboarding
Final closing mechanics, fund transfer, and new investor onboarding and integration.

Contact

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