Electric Vehicle Market. Global Motorcycle, Scooter, and Hybrid Two-Wheeler Market Research Report 2025

Executive Summary: Market Transformation and Strategic Positioning

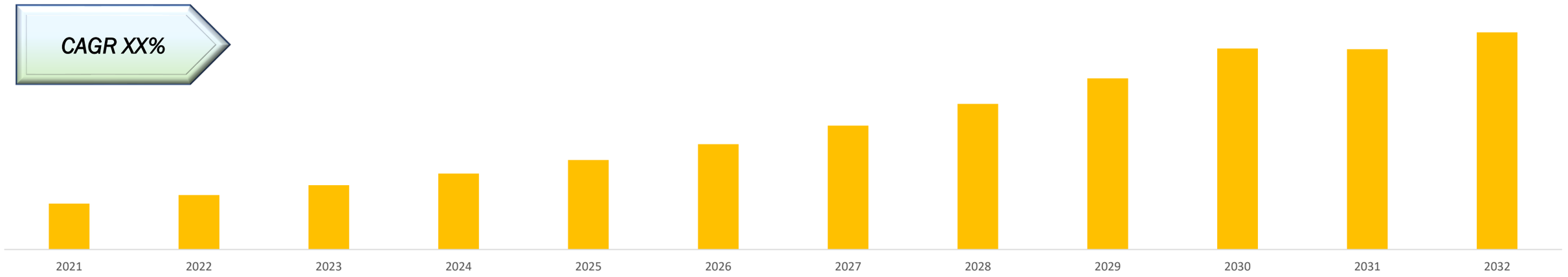
$6.4B	$XXB	XX%	82.2%
2024 Market Value	2032 Projection	CAGR Growth	Asia Pacific Share
Current global two-wheeler market valuation	**Expected market size by 2032**	**Compound annual growth rate through 2032**	**Regional dominance in electric two-wheeler sales**

The global two-wheeler market is undergoing a fundamental transformation, with hybrid and electric vehicles emerging as key growth drivers. This robust expansion is primarily fueled by **sustainable urban mobility demand, regulatory pressures, and technological advancements**, with the Asia Pacific region dominating the landscape.

The market presents a significant opportunity for innovative technologies like TokaTrac's hybrid drivetrain, which offers a strategic bridge between internal combustion engines (ICE) and fully electric vehicles (EVs), positioning itself at the forefront of this market transformation.

Global Motorcycle, Scooter, and Hybrid Two-Wheeler Size & Forecast

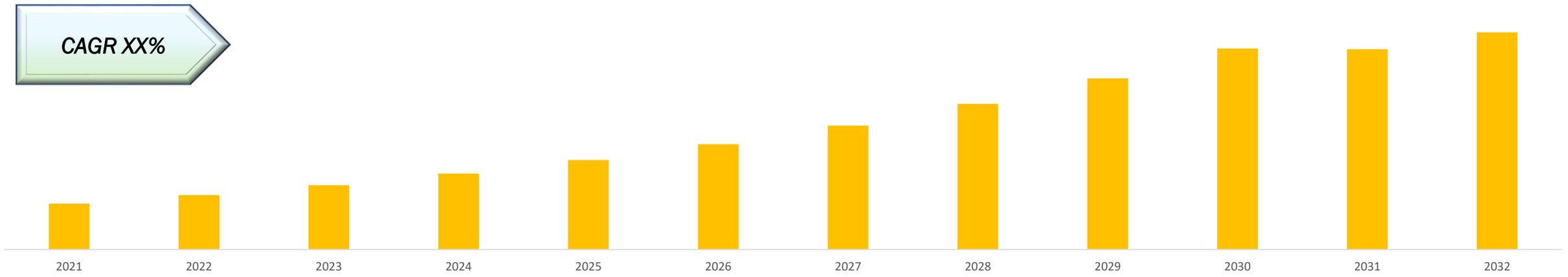
- Global Motorcycle, Scooter, and Hybrid Two-Wheeler Market Size, 2021-2032



- The escalating cost of fuel has made gasoline-powered two-wheelers increasingly expensive to operate. This economic pressure is a paramount driver for the adoption of electric scooters (E2Ws), which offer significantly lower running costs.
- In India, where two-wheelers make up over 70% of the vehicle fleet, the combination of rising fuel prices, lower operating costs, and government subsidies through programs like FAME-II has made E2Ws a financially compelling choice for both individual consumers and the rapidly growing last-mile delivery sector.
- Fleet operators, in particular, are prioritizing E2Ws for their high mileage and lower cost-per-kilometer.

Regional Motorcycle, Scooter, and Hybrid Two-Wheeler Size & Forecast

- Regional Motorcycle, Scooter, and Hybrid Two-Wheeler Market Size, 2021-2032



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Market Trends and Drivers

Regulatory & Sustainability Pressures

Stringent government regulations on emissions and internal combustion engines (ICE) are accelerating the transition to cleaner alternatives. Many countries and cities have announced plans to phase out ICE vehicles, creating strong policy push for electric and hybrid adoption.

Rising fuel prices and growing environmental concerns are key consumer-level drivers, making fuel efficiency and sustainability primary purchasing factors.

Technological Innovation

The market is characterized by rapid technological innovation, with advancements in battery technology, powertrain efficiency, and charging infrastructure lowering EV adoption barriers.

The emergence of swappable battery consortia like the Swappable Batteries Motorcycle Consortium (SBMC) and Gachaco is addressing critical charging infrastructure gaps, particularly in dense urban environments.

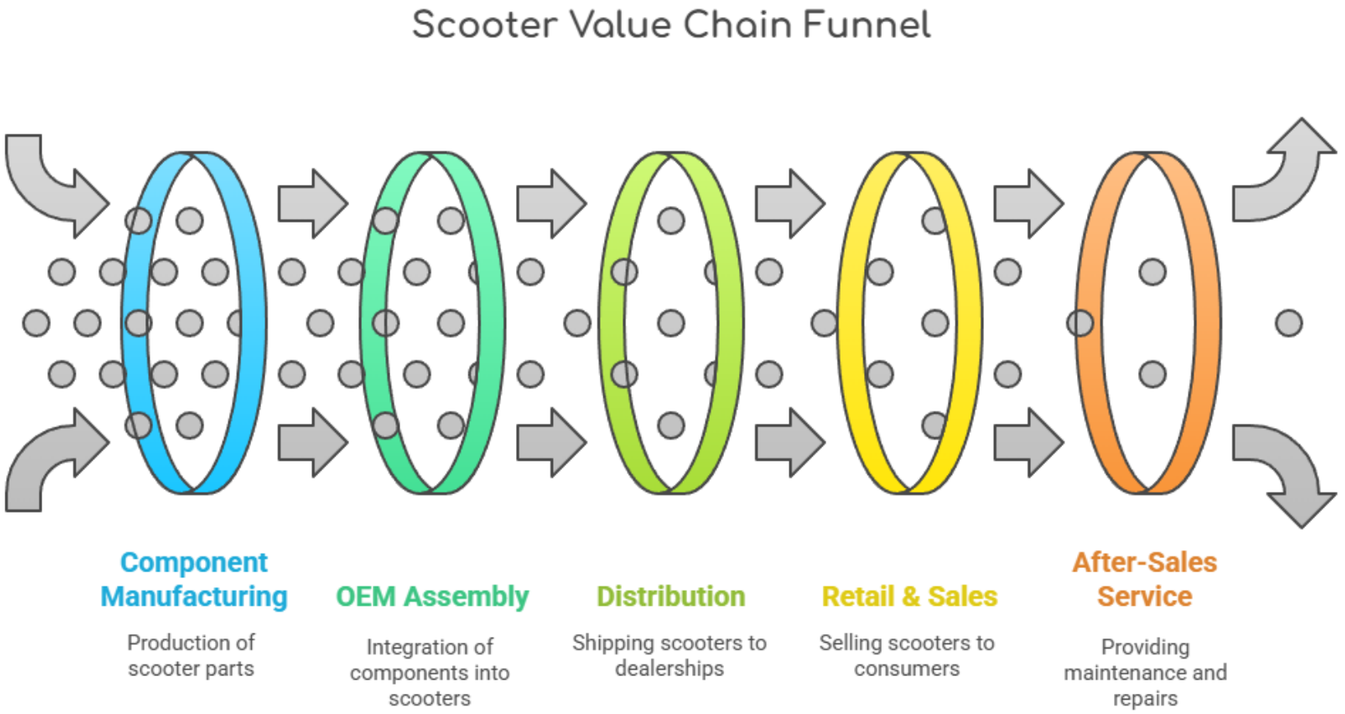
Asia Pacific Dominance

The **Asia Pacific region** is the undisputed epicenter of the global two-wheeler market, particularly for electric and hybrid models. Countries like India, China, and Southeast Asian nations are experiencing rapid urbanization, driving demand for efficient, affordable, and eco-friendly personal transportation.

The region's dominance is solidified by major manufacturers and a large consumer base, making it a critical market for any new entrant or technology provider.

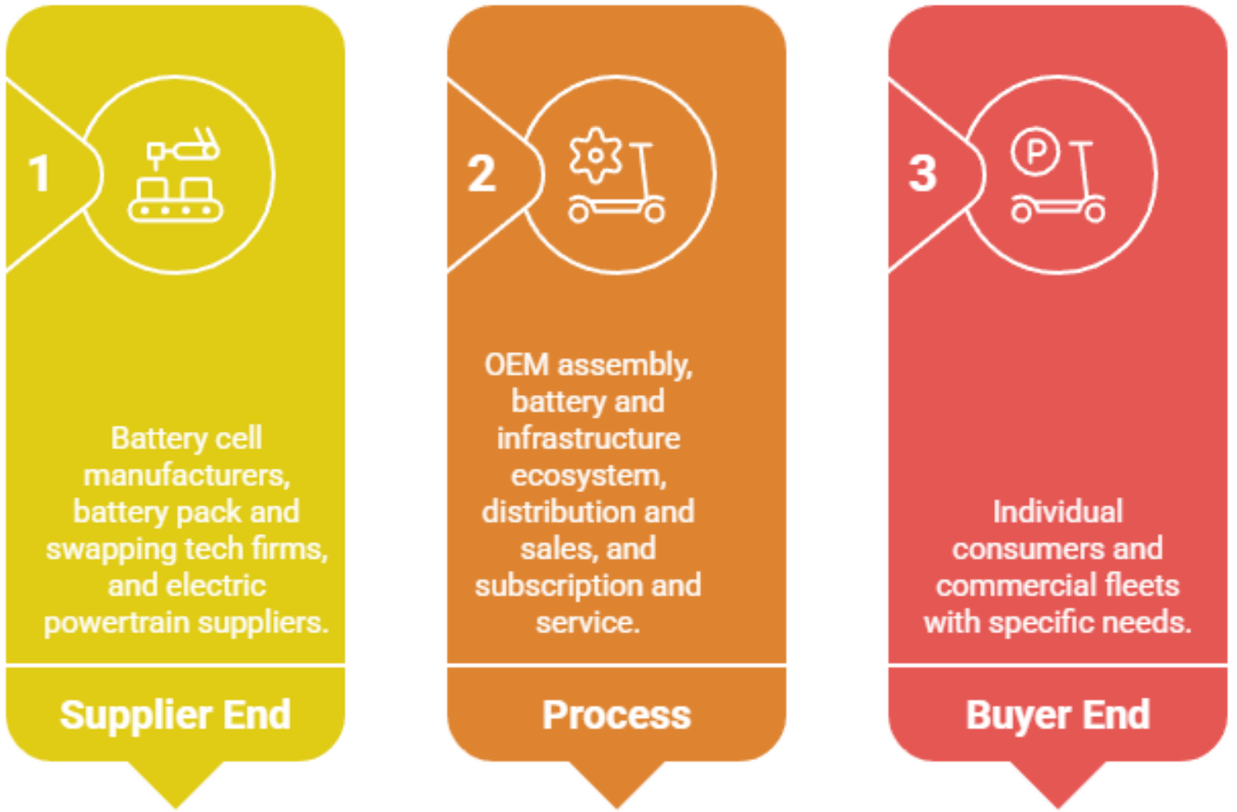
This innovation is creating clear market segmentation between budget-friendly Chinese EVs, premium European brands, and legacy OEMs transitioning through hybrid models, establishing distinct competitive tiers in the evolving marketplace.

Value Chain: Traditional Internal Combustion Engine (ICE) Scooter



Value Chain: Electric Two-Wheeler (E2W) with Swappable Batteries

Electric Scooter Ecosystem



1.CATL (Contemporary Amperex): The world's largest EV battery manufacturer, supplying lithium-ion cells to many E2W OEMs.
2.Sun Mobility: An Indian company that pioneered the swappable battery technology and provides the entire battery-as-a-service (BaaS) ecosystem.
3.Gogoro: A Taiwanese company that developed the Gogoro Network, a city-wide battery swapping infrastructure used by multiple OEMs.
4.Zero Motorcycles: A U.S.-based EV manufacturer that produces its own high-performance Z Force electric powertrain.
5.AESC (Automotive Energy Supply Corporation): A major supplier of lithium-ion batteries for electric vehicles, including two-wheelers.

1.Ather Energy: An Indian EV startup that partners with Sun Mobility for swappable batteries and offers its own connected scooters.
2.Ola Electric: A leading Indian E-scooter manufacturer that has its own battery swapping network initiative.
3.Gogoro Inc. : The company that both manufactures electric scooters and operates the Gogoro Network ecosystem.
4.Simple Energy: An Indian EV brand that relies on a battery swapping model to address charging infrastructure challenges.
5.Swap Energy: An Israeli company that provides swappable battery solutions and is expanding its network in India.

1.Uber Eats: A global food delivery platform with a large fleet of electric scooters in many cities, utilizing swap technology for efficiency.
2.Zomato (Blinkit): Utilizes an electric scooter fleet for its quick-commerce delivery arm, adopting swappable batteries for rapid turnaround.
3.Swiggy Genie: Relies on a fleet of delivery riders using E-scooters equipped with swappable batteries for maximum uptime.
4.Uber Bikes: A two-wheeler ride-hailing service in India that uses a battery swapping model for its fleet of electric scooters.
5.Urban Commuters: In High-Density Cities: Individual riders in cities like Bangalore, Delhi, or Taipei who value the convenience of not needing to charge at home.

Value Chain: Premium Hybrid Motorcycle

1.Continental Powertrain: A leading Tier-1 supplier providing advanced electric powertrains and hybrid systems for the automotive industry.
2.Bosch Mobility Solutions: Supplies high-precision sensors, control units, and safety systems for premium hybrid vehicles.
3.Denso Corporation: A major Japanese supplier of thermal systems, electronics, and powertrain components for high-performance vehicles.
4.NXP Semiconductors: A supplier of advanced semiconductor chips for automotive control systems, crucial for complex hybrid power management.
5.Albemarle: A leading producer of lithium, a critical raw material for the high-performance 48V batteries used in these vehicles.

1.Kawasaki Heavy Industries: The manufacturer of the Ninja 7 Hybrid, a pioneering mass-production hybrid motorcycle.
2.Honda Motor Co., Ltd.: The developer of the PCX Hybrid scooter, which uses a similar hybrid system concept for the premium scooter segment.
3.Bajaj Auto: Partnered in the development of the Kawasaki Ninja 7 Hybrid and manufactures it in India, providing advanced engineering capabilities.
4.Yamaha Motor Co., Ltd.: Has a multi-pathway strategy that includes hybrid technology and is developing prototypes in this space.
5.TokuTrac: A technology innovator developing a patent-pending, clutchless hybrid CVT drivetrain as a potential solution for premium OEMs.

1.Professional Motorcycle Testers & Journalists: Early adopters who evaluate and review new technology for the public, such as those from Motorcycle.com or Bike India.
2.Tech-Savvy Riders in Developed Markets: Consumers in North America and Europe who are affluent, value innovation, and are early adopters of new technology.
3.Motorcycle Enthusiast Clubs: Premium motorcycle clubs whose members are passionate about high-performance and cutting-edge engineering.
4.Brand-Loyal Customers of Premium OEMs: Existing loyal customers of Kawasaki, Honda, and Yamaha who are likely to be first in line for their new, technologically advanced models.
5.Racing and Performance Riders: Enthusiasts who participate in track days or amateur racing and are interested in the performance benefits of hybrid technology.

Hybrid Motorcycle Value Chain

Buyer End

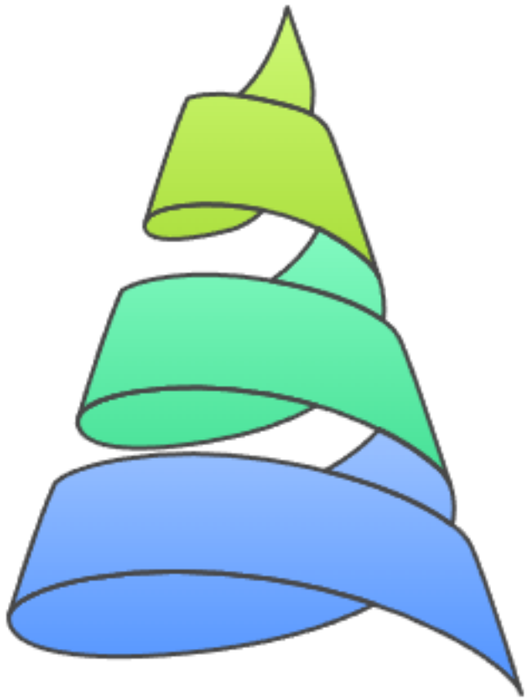
Enthusiast riders and early technology adopters

Process

R&D, manufacturing, and distribution activities

Supplier End

High-performance component and technology providers



Competitive Landscape Analysis

Tier 1: Global Legacy Powerhouses

The market is dominated by large, established Japanese manufacturers with massive R&D budgets and global dealer networks.

Company	Market Position	Key Strengths	Strategic Focus
Honda	World's largest motorcycle manufacturer	Global scale, strong brand, extensive R&D (near $1T annual)	Hybrid leadership (PCX HYBRID), GEM 50 initiative, Gachaco battery swap
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Tier 2: Premium Specialists

European brands leverage their premium positioning and brand heritage to target affluent early adopters.

Ducati

Models: V21L (MotoE), unnamed e-road bike

Technology: Leverages VW Group R&D

Position: First-mover in electric racing, premium superbike transition

[illegible]

[illegible]

Tier 3: Pure-Play EV Disruptors & Tier 4: Niche Innovators

[illegible]

[illegible]

Technology and Product Differentiation: TokaTrac's Advantage

Patent-Pending Clutchless CVT Technology

TokaTrac's hybrid solution acts as a superior alternative to existing technologies, featuring a revolutionary patent-pending, clutchless CVT (Continuously Variable Transmission) designed to bridge the gap between ICE and EV limitations.

Seamless Power Delivery

Elastohydrodynamic lubricant drive eliminates lag under load, providing smooth, continuous power transfer unlike traditional belt-driven systems.

Superior Thermal Management

Excellent heat dissipation with low vibration and noise, preventing overheating issues common in hybrid applications.

Maintenance-Free Design

Clutchless, shaft-driven, fully enclosed system requiring near-zero upkeep, weighing only 2.3 kg for optimal efficiency.

Advanced Energy Recovery

Geared, bidirectional system enables highly efficient regenerative braking, maximizing energy capture and extending range.

Scalability Advantage: TokaTrac technology is scalable up to 45 kW, making it suitable for a wide range of scooters, motorcycles, and industrial applications. Its compact and lightweight design is ideal for urban mobility where space and efficiency are paramount.

Core Technical Advantages

TokaTrac's technology offers distinct advantages over conventional belt-driven CVTs and traditional ICE systems:

Feature	TokaTrac Advantage	Competitor Limitation
Power Delivery	Seamless, lag-free (Elastohydrodynamic lubricant drive)	Lag under load, heat buildup in belt CVTs
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[illegible]	[illegible]	[illegible]
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Market Positioning and Scalability

1

Bridge Technology 2025-2030

Offers instant torque and quiet operation of an EV with range and refueling convenience of ICE

2

[illegible]

[illegible]

3

[illegible]

[illegible]

TokaTrac behaves as the "bridge technology" for the critical 2025-2030 transition period, addressing the immediate market need for improved hybrid solutions while the industry evolves toward full electrification.

Strategic Recommendations

The report concludes with a clear path to market leadership for TokaTrac:

01

Optimal Market Positioning

Position the technology as the leading **hybrid bridge solution** for urban mobility, directly addressing the **performance, range, and affordability** needs of the Asia Pacific market. This positioning leverages the region's 82.2% market share in electric two-wheeler sales.

02

Key Partnership Opportunities

Target **established OEMs** like Kawasaki, Honda, and Yamaha for **strategic licensing and co-development** agreements. This approach allows for rapid integration into existing manufacturing platforms, significantly reducing time-to-market and leveraging established dealer networks.

03

Aggressive Go-to-Market Strategy

Aim for **partner prototype testing by Q3 2025** to demonstrate the technology's viability and secure industrial partnerships, thereby establishing a **first-mover advantage** in the premium hybrid segment during the critical market transition period.

> *"The convergence of regulatory pressure, technological advancement, and consumer demand creates an unprecedented opportunity for TokaTrac's hybrid drivetrain technology to capture significant market share in the rapidly expanding two-wheeler market."*

Market Opportunity

$13.4B projected market by 2032 with 7.4% CAGR growth

Technology Advantage

Patent-pending clutchless CVT with superior performance metrics

Strategic Timing

Perfect positioning for 2025-2030 hybrid transition period