
WHITE PAPER

The Future of the Electric Mountain Bike

Market Trends, Ownership Segments, Regulation, and the Power Question

An industry outlook for retailers, brands, and riders

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Executive Summary

The electric mountain bike (eMTB) has completed its transition from novelty to the structural growth engine of the mountain bike category. **Mountain bikes now represent the largest application segment of the broader e-bike market, and mid-drive systems, the architecture that defines a true eMTB, hold a clear majority of the motor share.** The questions facing the industry in 2026 are no longer whether the eMTB will succeed, but which motor architecture wins, how regulators on two continents will treat rising power, and whether the customer's appetite for torque aligns with how they actually ride.

This paper synthesizes current market, regulatory, and behavioral data into a single view. Four themes dominate: (1) the collapse of the old "lightweight vs. full-power" binary into a new "light-full-power" class; (2) an aging, affluent, but slowly diversifying ownership base; (3) a widening regulatory gap between a permissive United States and a tightening European Union; and (4) a growing disconnect between the peak power customers request at the point of sale and the power they use on the trail.

Key Findings at a Glance

Dimension	2026 Snapshot
Category position	Mountain bikes ≈ 39% of e-bike applications; the largest single segment
Motor architecture	Mid-drive ≈ 57% of motor share and rising in premium/MTB
Torque ceiling	Full-power units now span 85–150 Nm; new entrants (DJI Avinox, Mahle M40) hit 105 Nm near SL weight
Buyer profile	Core enthusiast ~54 yrs, ~90–95% male in EU; US skews slightly younger and ~70/30 male/female
Regulatory split	US: 750 W / Class 1–3, permissive trail access. EU: 250 W / 25 km/h pedelec cap
Power gap	Riders buy for peak torque but spend most trail time in low/eco assist modes

Figure ES-1. Summary of the eMTB landscape entering the 2026–2027 model cycle.

1. The Future of the eMTB and Current Trends

1.1 From Binary to Spectrum: The Rise of "Light-Full-Power"

For most of the last decade, the eMTB market organized itself around a simple opposition: heavy full-power bikes (85–90 Nm, 2.5 kg+ motors, 700–800 Wh batteries) versus lightweight "SL" bikes (50–60 Nm, sub-2 kg motors, small batteries) that rode like an analog bike with a tailwind. **That binary is now dissolving.** The defining 2026 trend is a third category, the "light-full-power" eMTB that targets full-power torque (75–90 Nm) in a 19–21 kg package by pairing new compact motors with medium 500–630 Wh batteries and optional range extenders.

The technology enabling this convergence arrived in the form of high-torque-density motors. New units such as the DJI Avinox M1 deliver class-leading peak output at roughly 2.5 kg, and the Mahle M40 reaches 105 Nm at a weight comparable to a lightweight SL motor, blurring the line between the two former camps almost entirely. Maxon's Bikedrive AIR S is the clearest embodiment of this convergence: the Swiss precision-motor specialist tripled the torque of its original AIR drive to 90 Nm (620 W peak) while holding system weight at roughly 2 kg, marketing it as "the lightest full-power motor" and enabling sub-17 kg builds.

1.2 The Motor Technology Arms Race

The competitive center of gravity has shifted from the bike frame to the drive unit. The 2026 motor field spans a remarkable range of outputs and philosophies:

Motor / System	Torque (Nm)	Peak Power (W)	Wt (kg)	Positioning
DJI Avinox M1	105	1,000	2.52	High-tech powerhouse; tightly integrated ecosystem
Mahle M40	105	850	~2.5	"Disruptor" - full-power torque at SL weight
Bosch Perf. Line CX	85 (CX-R to 120)	600–750	~2.9	Benchmark reliability; largest service network
Shimano EP801	85	600	~2.7	Most natural-feeling full-power delivery
Bosch Perf. Line SX	55	600	~2.0	Light, punchy; anchors many SL builds
TQ HPR60	60	~450	~1.85	Highest torque density; near-silent; bike-like
Fazua Ride 60 (disc.)	60	450	~1.96	Discontinued May 2026 (Porsche wind-down); still on many bikes
Maxon Bikedrive AIR S	90	620	~2.0	"Lightest full-power"; 90 Nm at SL weight; near-silent
Pinion / gearbox	85	600	~4.1 (w/ box)	Drivetrain architecture change; low maintenance

Figure 1. Representative 2026 eMTB drive units. Peak power and torque figures are manufacturer-stated; regional software caps often limit legal continuous output.

1.3 Other Structural Trends

- **Integrated drivetrains.** Systems such as SRAM's Eagle Powertrain unify motor, battery, and wireless transmission, signaling a move toward closed, software-defined platforms.
- **Battery modularity.** Range extenders (e.g., the Bosch PowerMore 250 on top of an 800 Wh PowerTube for ~1,050 Wh) let a single chassis serve both weight-conscious and range-hungry riders.
- **Value-tier maturation.** Direct-to-consumer and alloy full-power builds on proven Bosch/Shimano units are compressing price, widening the addressable market beyond early adopters.
- **The "sleeper" aesthetic.** Compact motors and in-tube batteries increasingly let an eMTB look like an analog bike, valuable where trail access or social norms discourage visible assist.
- **Reliability as the next battleground.** As output plateaus at "enough," enthusiast sentiment is shifting toward warranty, serviceability, and drivetrain durability as the deciding factors in purchase decisions.

2. Ownership Segments

The eMTB buyer is not a single persona. The data reveals a core enthusiast base that is older, affluent, and predominantly male, layered with faster-growing adjacent segments that are gradually diversifying the category.

2.1 The Core Enthusiast

Large reader surveys of dedicated eMTB riders paint a consistent picture: an average age around 54, roughly 90–95% male, and deeply experienced, with a large share reporting more than five years of riding. This is a high-engagement, high-spend segment that drives premium sales and sets the technical conversation, but it is aging, echoing the demographic risk seen in the motorcycle market.

2.2 The Broader Buyer Base

Across the wider e-bike population, several patterns bear directly on eMTB retail strategy:

Segment attribute	United States	Europe
Leading age bands	45–54, 55–64, 65+ (Boomer core)	Core ~54; strong 50+ presence
Gender split (eMTB)	~70% male / 30% female	~90% male / 10% female
Income skew	30% of buyers in \$100k+ households	Germany: >€75k common among buyers
Primary motivation	Recreation, terrain access, fitness	Fitness/health cited by ~45% (Italy)
First-time riders	~51% of expo attendees new to e-bikes	Newbies a growing share of unit sales

Figure 2. Ownership characteristics, US vs. EU. eMTB skews older, more male, and higher-income than the general e-bike buyer, though the US base is diversifying faster.

2.3 Growth Segments to Watch

- **Returning & extended riders.** Assist lets aging athletes and those with physical limitations keep riding technical terrain one of the most durable demand drivers in the category.
- **Younger adopters.** Monthly-rider data show a rising 18–44 cohort, indicating adoption is broadening down the age curve even as the headline buyer age remains high.
- **Women.** Female participation in the broader European e-bike market has climbed from ~30% (2019) toward ~42%; eMTB lags this but represents clear upside for brands that build fit-appropriate ranges.
- **Value & DTC buyers.** Price-led alloy full-power bikes are recruiting a more budget-conscious, less brand-loyal customer who prioritizes reliability and warranty over cutting-edge output.

3. Regulatory Issues: United States and European Union

Regulation is the single largest external variable shaping eMTB product design and trail access. The US and EU have adopted fundamentally different philosophies, and the gap is widening as power outputs climb.

3.1 The Core Frameworks Compared

Parameter	United States	European Union
Governing basis	CPSC "low-speed electric bicycle"; 3-class model adopted by ~37 states	Regulation (EU) 168/2013; EN 15194 (EPAC)
Power cap	≤ 750 W nominal	≤ 250 W continuous
Assist cutoff	20 mph (Class 1/2); 28 mph (Class 3)	25 km/h (~15.5 mph)
Throttle	Permitted (Class 2)	Not permitted (pedelec); walk-assist only
Above the cap	1,000 W+ typically requires license	S-pedelec (to 45 km/h) = moped: reg., insurance, license
License / insurance	None for Class 1–3 federally	None for pedelec; required for S-pedelec

Figure 3. US and EU e-bike frameworks. The US permits roughly 3× the nominal power of the EU, a divergence that directly shapes how motors are tuned per region.

3.2 United States: Access Is a Local Question

Federal product rules set the ceiling, but trail access is decided on a state-by-state and unit-by-unit basis. As a practical matter, **Class 1 eMTBs enjoy the widest access**, generally permitted on non-motorized and multi-use trails where bikes are allowed, while Class 2 (throttle) and Class 3 (28 mph) face broader restrictions, often confined to roads and bike lanes.

- Federal lands (USFS, BLM, NPS) treat e-bikes as bikes where bikes are allowed, but individual units and land managers can and do impose stricter rules.
- On-demand class-switching bikes (Class 1↔2↔3) are emerging to let riders stay compliant on public land and unlock more power on private property or roads.
- Hunting and public-land seasons add a further regulatory layer that varies by state.
- California illustrates the tightening edge: 1,000 W setups are treated as license-required, and proposals target off-road-only categories for higher-power machines.

3.3 European Union: Unified Rules, Uneven Enforcement

The EU framework is stable and harmonized on paper, but enforcement varies sharply by member state. The pressing issues are compliance and "tuning":

- **Anti-tuning enforcement.** Germany is the strictest market; riding a chipped bike (assist beyond 25 km/h) without an insurance plate can be treated as a criminal insurance offense, not a mere traffic violation.
- **Infrastructure conflict.** The Netherlands is grappling with modified "fat bikes" on cycle paths, driving pressure for tighter market surveillance.
- **Battery & product safety.** Regulators are pushing harmonized safety documentation (CE / EN 15194 conformity files) to catch unsafe imports faster, an area of rising compliance cost for brands.

- **Design consequence.** The 250 W / 25 km/h cap means high-torque motors sold in Europe are software-limited; the torque race is fought below a fixed speed ceiling, where higher Nm aids climbing rather than top speed.

3.4 Strategic Implication

The regulatory divergence forces a dual-market product strategy. A 105 Nm motor is a legitimate, legal advantage on a US Class 1 climb, but in the EU that same torque exists only to reach and hold 25 km/h more easily on gradients. Brands increasingly ship identical hardware with region-specific firmware, making software, not the motor casting, the true regulatory compliance layer.

4. Market Penetration by Brand

The eMTB brand landscape is bifurcating into two contests: a **volume contest** among large integrated manufacturers, and a **technology contest** among motor suppliers and boutique brands chasing the torque-to-weight crown.

4.1 Volume Leaders

At the manufacturer level, scale players dominate global unit volume. Giant (with Liv and Momentum) leverages vertically integrated Taiwanese manufacturing; Accell Group (Haibike, Winora, and others) is the European multi-brand leader; and Trek and Specialized anchor the premium North American and global trail markets. These incumbents win on dealer networks, service coverage, and supply reliability rather than headline output.

4.2 The Motor-Supplier Layer

Because the drive unit increasingly defines the bike, motor-brand penetration is as strategically important as bike-brand share. **Bosch and Shimano remain the default full-power choice** for most volume platforms, and Bosch's certified service network is a genuine moat. In the lightweight and light-full-power tiers, TQ, Specialized SL, and maxon, whose Bikedrive AIR S now pushes 90 Nm at ~2 kg, divide the field, while DJI (Avinox), Mahle, and ZF are the disruptive new entrants reshaping the premium conversation. A notable 2026 casualty is Fazua: on 8 May 2026, Porsche AG wound down its Porsche eBike Performance subsidiary and discontinued the Fazua brand, ending the Ride 60 lightweight drive, though Porsche has committed to long-term spare parts and service for existing bikes through the dealer network. The closure, which cut more than 500 jobs and was attributed to fundamentally changed e-bike market conditions, underscores how quickly competitive pressure (notably from DJI Avinox) is reshaping the motor-supplier field.

4.3 The Disruptors and the Volume Reality

New high-torque entrants are capturing outsized attention and, in the case of DJI's Avinox platform, meaningful early share. Industry commentary places emerging DJI-powered and boutique brands collectively around the high-single-digit percent of the market. **Critically, most of these boutique nameplates individually lack the volume to be profitable at scale.** The likely 2026–2027 outcome is that the disruptors set the technical agenda while the volume crown is defended or captured by whichever established brand best combines competitive power with price, warranty, reliability, and serviceability.

Tier	Representative players	Basis of competition
Volume incumbents	Giant/Liv, Accell (Haibike), Trek, Specialized	Dealer network, service, supply, price
Premium performance	Yeti, Pivot, Santa Cruz, Canyon	Geometry, build quality, brand cachet
Motor suppliers (full)	Bosch, Shimano, DJI Avinox, Mahle, ZF	Torque, weight, ecosystem, service
Motor suppliers (light)	TQ, Specialized SL, maxon	Torque density, silence, natural feel
Boutique / disruptor	Amflow, Crestline, DirtLab, TransAlp (CH only), DJI-powered brands	Torque-to-weight, novelty, early adoption

Figure 4. eMTB competitive tiers. Value migrates toward whoever pairs adequate power with reliability and service—not necessarily the highest Nm.

5. Market Share by Motor Size and Architecture

5.1 Mid-Drive Dominance

Within the overall e-bike market, **mid-drive motors hold roughly 57% share and are growing**, concentrated precisely in the premium, cargo, and mountain segments where power delivery through the chain matters most. For eMTB specifically, mid-drive is effectively universal; hub motors are largely absent from serious off-road platforms because they cannot deliver torque through the bike's gearing on technical climbs.

5.2 The Torque Distribution

Segmenting the eMTB field by motor output reveals a barbell that is filling in at the middle as the light-full-power class matures:

Class	Torque band	Motor weight	Typical role in the market
Lightweight / SL	50–60 Nm	< 2.0 kg	Natural feel; "analog-plus" riders; growing
Light-full-power (new)	75–90 Nm	~2.5 kg @ ~19–21 kg bike	Fastest-emerging class; convergence point
Full-power (standard)	85 Nm	~2.5–2.9 kg	The market's workhorse and volume core
High-output / flagship	105–150 Nm	2.5 kg+	Halo tier; DJI Avinox, Mahle M40, CX-R

Figure 5. eMTB torque tiers. The 85 Nm full-power band remains the volume core; the new 75–90 Nm light-full-power class is the fastest-growing segment.

5.3 Battery Sizing as the Companion Variable

Motor size does not travel alone. Full-power bikes pair with 625–800 Wh batteries (extendable past 1,000 Wh), while lightweight and light-full-power builds deliberately choose 400–630 Wh to protect weight, leaning on range extenders when needed. **The industry's center of gravity is settling on "enough torque, medium battery, optional extender,"** a configuration that directly sets up the power-consumption question in Section 6.

6. Power Requested vs. Power Used

6.1 The Central Disconnect

Perhaps the most strategically important—and least discussed—dynamic in the market is the gap between the power customers *request* at purchase and the power they *use* on the trail. Marketing, spec sheet comparisons, and peer pressure push buyers toward the highest available torque figure. Actual riding tells a different story.

6.2 Why Requested Power Runs High

- **Spec-sheet shopping.** Torque (Nm) and peak watts are the easiest numbers to compare, so they anchor the purchase decision even when they are not the binding constraint on the trail.
- **Peer and group dynamics.** Riders who ride with full-power groups fear being "left at the back," pushing them toward higher output than solo riding would require.
- **Future-proofing anxiety.** Buyers over-specify to hedge against steeper trails or heavier future use they may never actually undertake.

6.3 Why Used Power Runs Lower

- **The speed cap is fixed.** All legal motor cuts assist at the same speed (25 km/h EU; 20/28 mph US). Above 85–90 Nm, extra torque only helps on the steepest climbs, not on the flats or descents where much trail time is spent.
- **Assist-mode behavior.** Riders spend the majority of trail time in eco/low and mid modes to preserve range and maintain a natural feel, reserving boost/turbo for short, steep pitches.
- **Drivetrain wear.** Experienced owners recognize that higher sustained power accelerates chain, cassette, and drivetrain wear, an incentive to ride in lower modes.
- **"Enough" is lower than marketed.** Enthusiast consensus increasingly holds that 85–90 Nm is more than adequate for the vast majority of riders and terrain.

6.4 Illustrative Usage Profile

Real-world assist-mode distribution on a mixed trail ride typically inverts the purchase emphasis: the top assist mode a customer pays a premium for is used least.

Assist mode	Approx. share of trail time	When it is actually used
Eco / Low	Highest share	Cruising, flats, rolling terrain, range preservation
Trail / Mid	Substantial	General climbing and varied terrain — the default
Boost / Turbo	Lowest share	Short, steep, or technical pitches only

Figure 6. Illustrative assist-mode usage. Directional, based on rider-behavior reporting rather than a single telemetry dataset; the pattern peak modes used least is consistent across sources.

6.5 Strategic Implications for Specialty eMTB Retailers

- **Sell the system, not the number.** Torque-to-weight, battery strategy, and ride feel predict satisfaction better than peak Nm. Reframing conversations away from raw output builds trust and reduces buyer's remorse.

- **Match bike to actual use.** For most recreational and fitness-oriented buyers, a light-full-power or standard 85 Nm build with a range extender option will out-satisfy an over-specified flagship.
- **Lead with reliability and service.** As output plateaus at "enough," warranty, serviceability, and dealer support become the durable differentiators, an advantage a boutique specialist can own.
- **Educate on total cost.** Framing higher sustained power in terms of drivetrain wear helps customers self-select into the mode and bike that best fit how they truly ride.

7. Conclusion and Outlook

The eMTB has won the category. The next phase of competition will not be decided by who can print the largest torque figure, but by who resolves the tensions this paper has mapped. **The light-full-power class will likely become the new center of the market**, collapse the old lightweight/full-power divide, and reward motor suppliers with the best torque-to-weight ratios.

Ownership will broaden, younger, more female, more value-conscious, even as the aging enthusiast core continues to drive premium spend. Regulation will continue to diverge, forcing a software-defined, dual-market compliance strategy and making trail access a persistent local variable in the US and a compliance-and-enforcement question in the EU. And the power gap will remain the industry's quiet truth: customers will keep asking for more torque than they use, creating both a marketing temptation and an opportunity for honest retailers to differentiate on fit, reliability, and service.

For a specialist retailer, the winning posture is clear: **guide customers toward the bike that matches how they actually ride, compete on reliability and support rather than spec-sheet output, and treat the regulatory landscape as a service you provide rather than a constraint you fear.**

Notes on sources. Figures in this paper synthesize 2025–2026 industry market research, motor comparison testing, regulatory guidance for the US and EU, and large-scale rider surveys. Market size and share percentages are drawn from published market research estimates and reflect the broader e-bike market, where eMTB-specific figures are not reported separately; torque and weight specifications are manufacturer-stated and subject to regional software limits. Usage-pattern figures are directional, reflecting rider-behavior reporting rather than a single telemetry dataset.

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Note: URLs are provided in abbreviated form for readability. All sources were accessed in July 2026. This paper is intended as an industry outlook and does not constitute legal, financial, or purchasing advice.