

## Super Cycles: This Time It Might Be for Wheel

**E-bikes, the latest mobility craze for aging Baby Boomers, may have enough juice to help one venerable component maker engineer a breakaway.**

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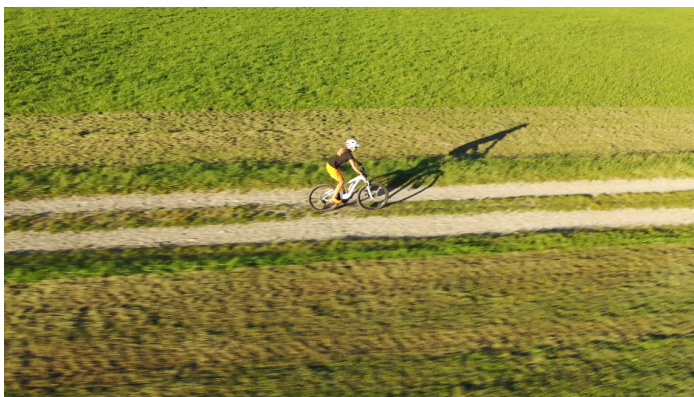
## Key Takeaways

- There is no other way to say it—bicycles have long been a highly cyclical industry, with producers riding periods of booming fitness- or environmentally-driven demand followed by painful gluts.
- With their integrated motor assisting propulsion, e-bikes are especially popular with the 60+ crowd, potentially expanding the addressable cycling market by a third.
- Compared to the intense competition among new brands and retailers, the e-drive—essentially the guts of the product—offers a more attractive industry structure for investors looking to participate in an e-bike supercycle.
- For Shimano, a 100-year-old mechanical bike component maker with No. 2 share in e-drives, this is a pivotal moment to achieve a higher level of sustained growth.

With less than half the year gone, Turin Bicycle in Chicago couldn't keep up with a huge wave of new customers. The tiny neighborhood shop had already sold 3,000 bikes but could have sold many more, the owners said, if only their supply could meet the gangbuster demand. The reasons for the rush of buyers? Increased concern about the environment, a focus on personal health, changing government regulations, and the biggest generation in history starting to spend more of its rising income.

For those looking to buy an e-bike—a bicycle with an integrated electric motor used to assist propulsion, and the hottest segment in a booming cycling industry—this situation will sound familiar. The waiting list is up to four months long at direct-to-consumer manufacturer Rad Power Bikes, which claims to be the largest e-bike seller in the US, with US\$100 million in sales in 2019. The company has seen at least 100% sales growth each year since 2016 and late last year told National Public Radio that it was on track for 300% growth for 2020. Powered by those numbers, the Seattle-based startup raised US\$150 million from investors in February 2021. Across all brands, e-bike sales in the US grew by 53% in 2020, according to the World Bicycle Industry Association.

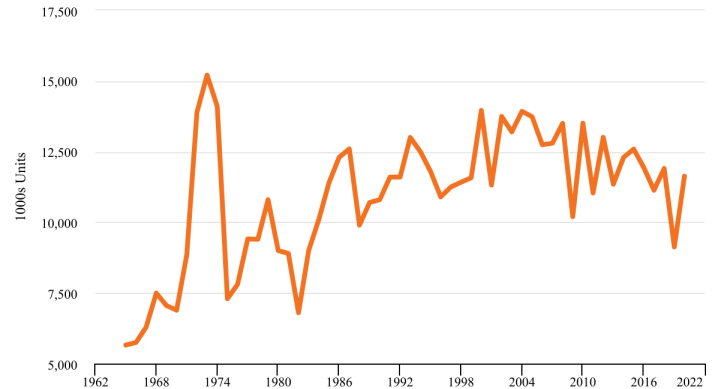
But Turin in Chicago isn't seeing those kinds of numbers at present, because the 55-year-old store primarily sells *mechanical* bikes. Its gangbuster year we previously referred to? That was 1970, as described in a *Life* magazine story at the time. The article, titled "The Bicycle Madness: As Sales Boom, Millions Discover Fresh Horizons Through the Power of the Pedal," could have been written today. It heralded the dawn of a bicycle supercycle, a magical time of opportunity for branded bike makers, component makers, and retailers. New products were hitting the market almost nonstop and discerning customers had to wait months to get the bike of their dreams. From 1970 to 1975, bicycle sales in the US nearly tripled, to over 15 million units. In the last three years of those years, more bikes sold than cars.



Then, in 1976, sales fell by half. The first oil shock had receded<sup>1</sup> and America renewed its love affair with cars. Many of the bikes that had been sold were stylish but poorly made imports (back then, from Italy), deadening the enthusiasm of riders. As well, governmental promises to build more bike-friendly infrastructure fizzled.

## US Market Bicycle Sales

20-inch-wheel (i.e., for children 6-9 years old) and above



Source: Schwinn Reporter, Bicycle Manufacturers Association data, Bicycle Institute of America data, US International Trade Associate data, and Gluskin Townley Group & Human Powered Solutions Analysis.

Will today's e-bike boom end the same way? The bike industry predicts sustained sales growth, claiming "This time is different."

They might be right.

## Who Buys E-Bikes and Why

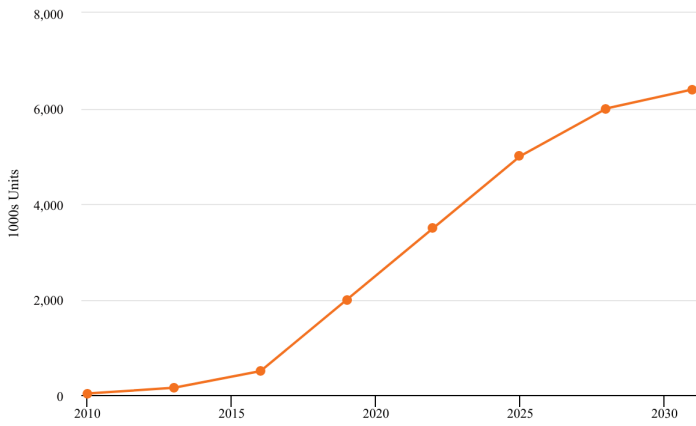
When the COVID-19 pandemic kept people out of the gym and away from their usual leisure activities—social gatherings, movies, dining out—many saw biking as a great alternative: safe, solitary, healthy, and environmentally virtuous. For the 70 million baby boomers in the US, many of whom were behind the mechanical bike boom a half-century ago, e-bikes have become the preferred option.

"People have RVs and throw two e-bikes on the back," says a busy e-bike retailer outside of Nashville. "Around here, they live in neighborhoods where everything is close, so they either have a golf cart or an e-bike."

In the US, approximately 10,000 baby boomers turn 65 every day. Many of them want to stay fit and active, "but they appreciate a little bit of help going uphill," says Lee Gao, an analyst at Harding Loevner who covers China, home to a number of e-bike-related companies.

Another growing market is younger urban dwellers who got used to getting around by e-bike over the past year. When COVID-19 fears drove people off public transportation, bike share programs in cities across the US saw huge spikes in their e-bike ridership; those in some cities like Madison, Wisconsin went entirely electric to handle the higher volumes. Some of those riders are now trading up from the shared stripped-down models to trendier rides like the compact, foldable Gocycle, which *TIME* magazine named one of the 100 Best Inventions of 2020. But with the price of a Gocycle starting at US\$4,000—and even a basic, quality e-bike generally running at

### Projected Mid- to High-End (US\$2,350+) Global E-Bike Sales



Source: Merida.

least US\$1,500—many sellers are finding older demographics an easier target. “Most of my customers are over 40,” said a salesman at Phat-ego E-bikes in Seattle.

There are 170 million bicycles in the US. The average person replaces their bike every 10 years, equating to roughly 17 million new bicycles of all kinds sold in the US each year. Sergei Pliutsinski, another Harding Loevner analyst, estimates that by making recreational biking more attractive to people in their 60s and 70s, e-bikes expand the addressable market by a third. Add in the urban commuter demographic, he says, “and you could eventually be looking at 25 million units sold a year. For any traditional bike company branching out into e-bikes, that’s potentially a big deal.”

William Jeng, senior vice president of Merida, a Taiwan-based bike maker that has a minority stake in the high-quality Specialized brand and is a producer for its e-bikes and mechanical bikes, predicts strong growth in e-bike sales for at least the next five to eight years. “It will take at least that long for everyone who wants one to get around to buying one and for demand to start to level off,” Jeng says. He adds that, after the US, growth will come from developed markets like Australia and New Zealand, followed eventually by emerging markets like China and Brazil.

## Government Incentives

One of the drivers of e-bike growth is government encouragement. Tariffs, tax credits, regulatory changes, and new bike-friendly infrastructure could all play a role in accelerating e-bike demand.

In the United States, there’s bipartisan support at the federal level for all things e-bike. In November 2019, the Trump administration gave an exemption for a 25% tariff on e-bikes and e-bike components from China. The exemption expired January 1, 2021, but industry observers expect the Biden administration to be friendly to e-bikes. Secretary of Transportation Pete Buttigieg recently tweeted, “We’ve got to invest in transit, EVs, and bike infrastructure to prepare for the future and meet our climate

goals.” Advocates are lobbying for US\$10 billion in the Biden administration’s proposed infrastructure bill to be earmarked for building bike paths and charging stations. There are a bevy of city and state initiatives across the country to add hundreds of miles of bike trails. Finally, and perhaps most significantly, a bipartisan e-bike bill is working its way through Congress that would provide a tax credit equal to 30% of an e-bike’s purchase price, up to a US\$1,500 credit per bike.

In Europe, where market penetration is higher, there have been tax incentives and other government subsidies for e-bikes for years, as well as dense development of bike trails. This has contributed to more usage for daily transportation and an e-bike being seen less as an expensive bike and more as a cheap alternative to a car. Of the approximately 20 million bikes sold in the EU<sup>2</sup> in 2020, 22% were e-bikes,<sup>3</sup> compared to just over 2% (477,000 e-bikes) of the total in the US.<sup>4</sup>

“Europe is more adapted in terms of traditional bike infrastructure,” says Gao. “It’s a natural progression for those markets to start buying more e-bikes. The US is more difficult, but the regulations and infrastructure are starting to move in the right direction.”

## E-Bike Winners

There are three areas where revenues are generated in the e-bike supply chain: raw materials and components, assembly and branding, and retail. According to an analysis by Harding Loevner, a US\$2,300 premium e-bike breaks down as shown below.

The retail market in the US is highly fractured among hundreds of outlets, most of which are mom and pop shops.



Source: Harding Loevner.

Some manufacturers like Rad Power Bikes have achieved a certain scale with direct-to-consumer sales, though they seem to skew toward younger purchasers more comfortable buying large-ticket items online. Dozens of brands are making e-bikes, with new ones popping up all the time; many of these are small operations as well. Battery makers like LG, Samsung, and Panasonic are benefiting from the boom, but the bike battery business is dwarfed by their interest in electric cars. The same is true to a lesser extent for motors, where major conglomerates like Germany's Bosch and Japan's Yamaha compete with China's Bafang, a pure e-bike motor maker. That leaves components, where Shimano, based in Japan, is the undisputed leader.

Unlike the companies competing to supply batteries and motors for e-bikes, Shimano is also a dominant player in the mechanical bike market, with a 70% market share in components, compared to 15% for its closest competitor, SRAM, according to Pliutsinski. (See "Retooling a Classic" on page 5.) On the US\$100 worth of components that Shimano provides for either a mechanical or e-bike, about US\$40 is profit, a superior margin to any of the other firms along the bike value chain. According to Harding Loevner's estimates, motor makers and bike brands have about a 30% margin, the retailer a 26% margin, and the battery maker and frame maker/assembler 16%.

In addition to increased demand for its traditional components, perhaps the biggest opportunity for Shimano lies in the systems that tie the motor and battery together with electronics and software, forming the guts of the e-bike's electric drive train. A quality e-drive ensures that the motor and battery communicate efficiently, working seamlessly with the rest of bike to provide the added oomph of the motor when needed. Despite not making its own motors or batteries—or having any heritage in electronics or software—Shimano's latest EP8 e-drive is considered a first-rate product. According to reviews, it is smaller, lighter, and at least as powerful as competitors' offerings and, perhaps most importantly for enthusiasts, has remarkably little drag when it reaches its maximum speed threshold and the motorized assistance cuts off. These e-drives have lower margins than Shimano's mechanical components business, but as volume rises those margins should widen.

Shimano's initial experiments with e-drives, starting in 2010, were not as successful as its later offerings. Since 2016, though, it has been steadily eating into Bosch's dominant share of the e-drive market. Even with outsourcing the motor and battery, Pliutsinski says, "there is enough value in putting the system together that the more market share Shimano can grab, the more the numbers really start to click." Currently, he estimates, Bosch has a 40% share of the market while Shimano has 20%, with the remaining 40% split between Yamaha, a handful of Chinese companies, and a long tail of small players. From here, Pliutsinski says, the battle could come down to distribution, where he thinks Shimano has a definite edge. "Bosch has a good product and it got it out there first, but its track record of competing in niche areas against pure-play companies is not that impressive. In power tools, for example, it is well behind Techtronic and Makita. As both companies look to scale, Shimano is the one that already has its tentacles into the

manufacturers, the trade shows, and all the individual bike shops, and I'm just not sure Bosch has the focus to overcome that."

Of course, there is also a possibility that, as the pandemic finally subsides and people slip back into their old car-centric routines, this potential supercycle, like the one in the early seventies, will peter out, and slacken the tailwinds for Shimano and Bosch. Merida's Jeng, however, is cautiously optimistic. "The e-bike boom started five to seven years ago," he says. "COVID-19 was a strong push for sure, but not the main reason." In fact, Jeng argues that the primary threat to continued growth is the pandemic's disruption of supply chains. "Higher demand plus lower production and shipping bottlenecks are what have led to the shortage of e-bike supply worldwide."

At Propel, an e-bike retailer in Brooklyn, across the world from the headquarters of Shimano, more models are back in stock and can be acquired within a week or two (though wait times for the most popular can stretch up to a year). For now, customers seem to be making do.

"All the customers want to learn everything they can about the bikes—it's trendy," one sales associate told us. "I think it's going to go a lot more mainstream in the next few years."

## Retooling a Classic

In 1921, Shozaburo Shimano opened Shimano Iron Works in Sakai, a city in western Japan just outside of Osaka, with a centuries-old reputation as the center of the sword-crafting industry for the samurai. A local knife craftsman with a meticulous approach to complicated projects, the 26-year-old started the company with a five-yen-per-month lease for a tiny plot of land on the site of a demolished lacquer factory and a single lathe rented from a local iron works from whose owner he had gained respect. The following year, he introduced his first product, a bicycle freewheel (the device that allows the rear wheel to spin freely when the rider stops pedaling). At the time, it was considered one of the most difficult parts to fabricate.

Today, exactly 100 years later, Shimano is the leading maker of bike components like gears, derailleurs, and brakes, with factories in Asia, Europe, and North America and revenues of US\$3.5 billion. While the company has come a long way from its single rented machine, the core of Shozaburo Shimano's vision remains: a focus on high quality, difficult-to-produce parts. In cycling, the complexity of the parts in which Shimano specializes, combined with its unmatched reputation in the marketplace, means that the barriers to entry for competitors are high. The company's free cash flow has long been strong and, like other successful Japanese businesses, its balance sheet is pristine. Nevertheless, when an upcycle ends, as it last did in 2016 following a boost to its sales from an explosion of Chinese bike sharing and a US craze for combination mountain-road (i.e., "dual-sport") bikes, even Shimano will experience a dip and have to manage an excess of inventory. From 2010 through 2015, the company's sales and net profits grew at an impressive average compounded annual growth rate (CAGR) of 12% and 32%, respectively. However, in the decade's second half, CAGR was effectively flat.

Today, Shimano's flagship campus in Japan testifies to the company's ethos and ambitions. Raw materials are formed, milled, given surface treatments, and tooled into thousands of bike components. USRobotic forklifts, monitored from an elaborate control room, move materials and parts around the factory floors. In a nod to its own business and the most up-to-date trends, the company has parking on campus for 1,000 bikes. Shimano has all the hallmarks of a company built for the future. The question now is whether it can achieve in e-bikes its accustomed high barriers to entry and superior profit margins by riding the super cycle to breakaway growth.

## Contributors

Analysts Lee Gao and Sergei Pliutsinski contributed research and viewpoints to this piece.

## Endnotes

<sup>1</sup>After the first oil crisis, resulting from the OPEC oil embargo of 1973, a second oil shock arrived in 1979 caused by a drop in oil production in the wake of the Iranian Revolution. That, too, coincided with a rise in bicycle demand, though not as dramatic as the previous surge.

<sup>2</sup>European Mobility Atlas.

<sup>3</sup>Confederation of the European Bicycle Industry.

<sup>4</sup>US Bicycle Market Overview 2020, National Bicycle Dealers Association.

## Disclosures

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