

CREATING A BETTER BIKE INDUSTRY



Examining  
the climate  
impact  
of the  
products  
we use

STORY BY AMOS HORN  
PHOTOS COURTESY VELOCIO

Two months ago, my partner and I went from two cars to one, replacing our second vehicle with eBikes. I now drive less, get more exercise (even with the help of an electric motor), and am trying to be a bit more climate conscious. But am I? The environmental benefits of bikes over cars have been well documented, including (with citations) on Adventure Cycling's own website at [adventurecycling.org/usbrs-environment](https://adventurecycling.org/usbrs-environment). We all know about less carbon emissions, less fossil fuels, less wear on roads, and other benefits. But what about the bike itself, or the clothes I wear? What's being done to address the climate impact of manufacturing or to keep post-consumer waste out of the landfill?

While the outdoor industry, for example, has a number of companies like Chaco Footwear and Patagonia that have environmental impact built into their business models in terms of production, materials, and longevity, the bike industry has been slow to adopt the same practices. Its actions passively assent that as long as you're riding a bike and not driving a car, everything is okay. Instead, brands have successfully promoted speed, flashy new tech, and products you "need" to have as a cyclist. This carbon frame is lighter, that jersey is cooler, these wheels are more stiff and compliant. It's a recipe for success, if success is defined exclusively by the bottom line.

But that's beginning to change. Some companies are taking a closer look and making changes to address their environmental impact. For those leading the charge, success is still defined by the bottom line, but it's also defined by a lower carbon footprint, less waste, and a product that is better for the planet and not just for the customer.

### **NO SMALL TASK**

Addressing the impact of a product or a company is not so cut-and-dried as making a few quick changes. It's a huge undertaking that permeates every detail of the process from creation, to customer, to end-of-life. Just take a look at Trek's recent Sustainability Report ([trekbikes.com/sustainability](https://trekbikes.com/sustainability)), released June 2021, following its first

emissions audit conducted in 2020.

The complete 39-page report looks at everything from the company's water use and emissions from commuting employees to its facilities and bike creation. The report even breaks down the impact of specific bikes, from frame assembly to rotors, wheels, and everything in between. In other words, the data goes deep, which also means the problem runs deep.

Trek identified 10 areas to improve upon — reduce reliance on air freight, consolidate shipping to retailers, increase use of renewable energy, reduce corporate travel, increase use of alternative materials, create zero-landfill manufacturing facilities, establish and protect new trails, remove plastic waste, increase access to bike share programs, and increase cycling mode share. All of these are massive undertakings that will take years to improve upon.

Trek isn't simply running an audit and putting out a report with claims, though. The company is backing up those claims with internal actions. This year, the company created a completely new position, installing Mike Burns as the sustainability manager and tasking him with collecting information and tracking metrics to make sure Trek is following up on its report. "We have over 40 projects right now related to sustainability," Burns explained. "My hope is to take all of those and make sense of it and figure out what our priorities should be."

The Sustainability Report is impressive, and the steps Trek is taking will make a meaningful difference. It also likely won't be the last document we see like this from Trek. The company has started down a road of transparency and communicating with its customers and plans to continue on the same trajectory. "The discussions we've had up to this point are to keep this as a reoccurring, ongoing thing versus a milestone at the end of the year where we talk about all the things we did," said Burns. Trek is looking internally in a way that only a portion of the bike industry has begun to do, even if Trek only did their first audit last year.

It's not just bikes, though. Everything that goes with cycling has

its own climate impact. As cyclists, we buy specific bags to carry our essentials, we wear certain shoes, and we have our favorite outfits. Many of these are made overseas, using virgin (as opposed to recycled) fabrics, and show up at our doorstep or local bike shop packed in plastic. While we all have our favorite cycling jacket we wear every fall, or favorite jersey or panniers that have withstood decades of use, other products only last a couple of seasons, following their plastic packaging to the landfill and restarting the whole cycle with a new product to take its place.

The bikes we ride and the products we use have room for improvement, and everybody in the bike industry could be more responsible. Manufacturers can look internally at ways to reduce their footprint, and consumers can be more conscious about the products they are using. There's a proverb that is applicable here: The best time to plant a tree was 20 years ago; the second-best time is now.

### **IT'S NOT ALL BAD NEWS**

There is one person who was thinking about all of this 20 years ago. Troy Jones is the social and environmental manager at Specialized and the co-chair of PeopleForBikes's Sustainability Working Group, a collaborative group among bike industry professionals to address climate change. "I've wanted to foster collaboration on social and environmental issues in the bike industry since chairing the OIA [Outdoor Industry Association] Fair Labor Working Group in early 2000."

Since the turn of the millennium, Jones has accomplished a lot. He helped REI address its supply chain impacts early on and was one of several people instrumental in convening the PeopleForBikes Sustainability Working Group. He is the current chair of the Responsible Sport Initiative, a joint endeavor to drive social and environmental advancements in bike industry supply chains.

"Collaboration is key to making significant improvements in our shared supply chains," Jones said. "Collaboration is always challenging, but especially in a competitive industry."



Radiator Mesh Jersey alongside one of the biodegradable bags Velocio uses to package all of its products.

The Responsible Sport Initiative (RSI) is collaboration in action. Started in 2012 initially to combat poor working conditions in factories, the RSI now includes Specialized, Accell, PON (owners of Cervélo, Santa Cruz, Cannondale, and more), Canyon and Scott Sports, among others. It's an influential group that represents a huge piece of the bike-industry pie. In other words, when these brands aren't competing for market share and are instead working together to improve the supply chain, there are serious improvements that can be made.

Anchoring the RSI are its collaborative efforts toward auditing suppliers and weeding out any problems or bad actors. All RSI member brands are committed to performing a minimum number of audits per year, which consist of approximately 250 questions covering labor laws, human rights, environmental compliance, and more. If an audit comes back with any problems that aren't in compliance with the RSI's standards, a plan is put into place to fix the issue.

Occasionally, these issues fall under the umbrella of zero tolerance, in which case all brands working with the supplier are notified and corrective action by the supplier is requested immediately. "The short explanation is that the RSI allows brands to do the work once and share it," said Jones. "So if I have a budget to do 10 audits a year, I can actually take part in as many as 30 audits if I share each of them with two other brands. Same goes for staff time

and effort; I'm only administering 10 audits and reaping the benefit of 30."

Suppliers must follow a code of conduct, supply chains can be evaluated to determine risks and opportunities, and social and environmental responsibility audits (like Trek's) can be more thorough, while still maintaining confidentiality for the brands. "The Responsible Sport Initiative is a great example of the power of collaboration to allow us to learn from the good and bad in other industries and be better," said Jones. "Not nearly enough bike brands are aware of the social and environmental impacts in their supply chain, but there is a collaborative tool available to help them do so."

Working together, these influential brands can also set an example for smaller businesses that operate with fewer products and simpler supply chains. Brands like Velocio are leading that charge.

Founded in 2014, Velocio treats function, design, and sustainability as core principles, one not being held higher than the other, and it has done so since first opening its doors. Its website is refreshingly blunt: "Making highly technical cycling apparel is ultimately bad for the environment." Velocio is doing what it can to change this reality.

Inevitably, running an apparel business means creating new products and releasing new lines each season (the bottom line still reigns supreme). Those new products will eventually become old products, and they will either wear out or get tossed to the

wayside by a consumer who wants the latest and greatest. Like Velocio said, apparel is ultimately bad for the environment. But within the confines of its business, Velocio is doing its best. The brand uses recycled materials where it can, offers a repair program, and the Velocio: Renewed program takes a product approaching the end of its life and fixes it up to be sold and used again (hopefully) for years to come. You might notice some shared qualities with Patagonia's sustainable business model referenced above.

"Today, sustainability should be part of doing business, regardless of what that business is, and we're committed to pursuing that," Brad Sheehan, CEO and designer at Velocio, said. "At the end of the day, if we're going to create something that's representative of our brand, and of the people behind the brand, we want it to represent what we believe in and we want to be additive to the discussion on how we preserve the natural resources and environment that we have, not as one that just reaps the benefits of it."

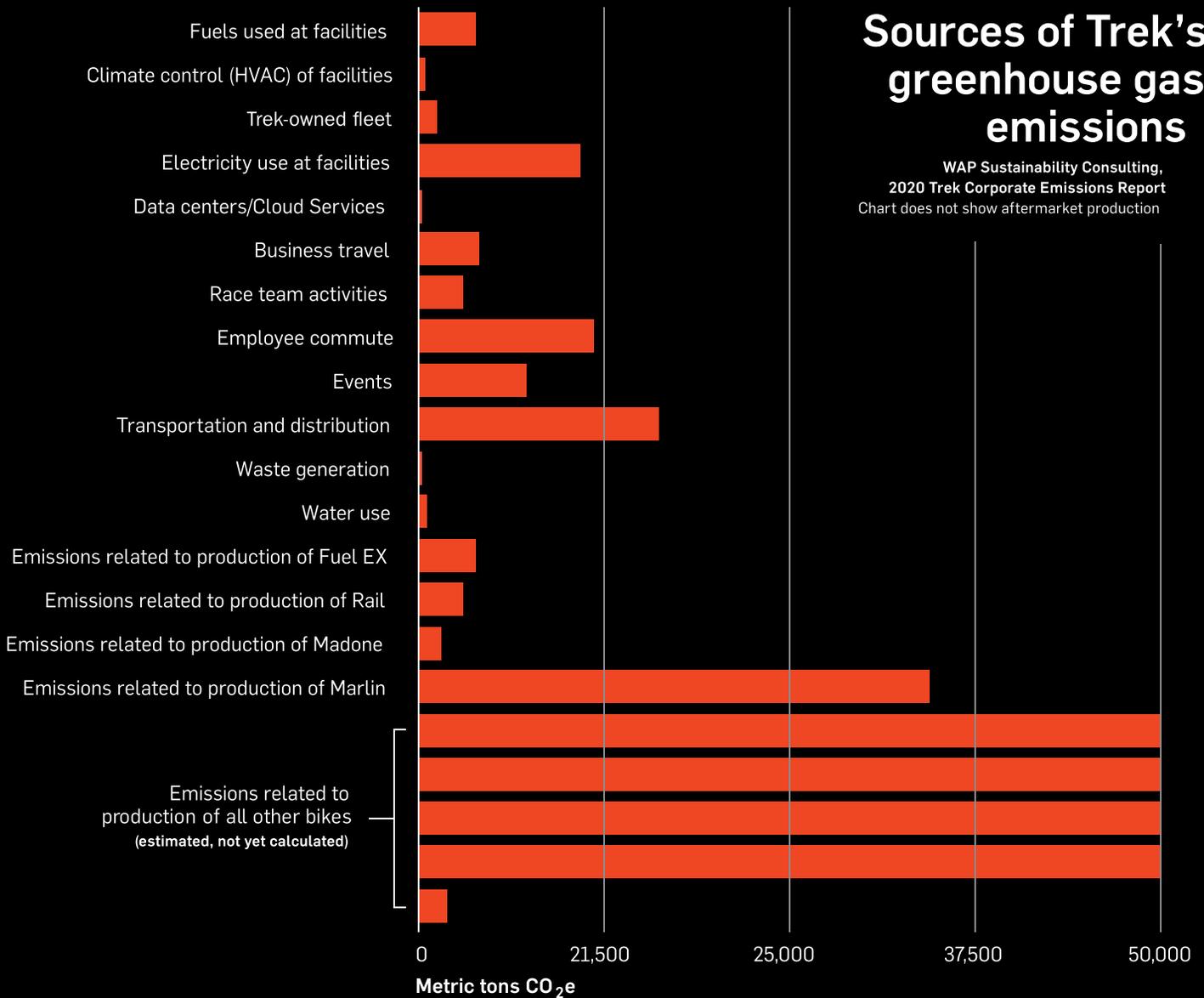
One of the most important changes Velocio is championing is the use of recycled and natural fibers. Its Spring/Summer jersey line is made completely with these materials — the largest ingredient is recycled polyester. That means the jerseys are sewn with yarn made from plastic that was once ocean trash, pulled from the water and repurposed for another life.

In conjunction, the brand sources fabrics near their EU manufacturers, avoids air freight whenever possible, and packages all their clothes in biodegradable bags and compostable mailers. Every piece of the puzzle is focused on reducing waste — and mirrors much of what Trek's Sustainability Report hopes to improve upon.

"There are no big successes when it comes to being an environmentally friendly company. It's a lot of small incremental improvements and constant re-evaluation of what we're doing and what we can do better," said Sheehan. "What we will continue to do is to pursue improvement in every aspect of our business and make decisions based on investment

# Sources of Trek's greenhouse gas emissions

WAP Sustainability Consulting,  
2020 Trek Corporate Emissions Report  
Chart does not show aftermarket production



Trek's total annual carbon footprint is about 300,000 metric tons (or 300 million kg) CO<sub>2</sub>e. That's around the same footprint made by 65,000 passenger vehicles in a year.

into sustainability and reducing environmental impact, not from the perspective of convenience and cost, but to ensure that we're living up to the standard we've set for ourselves."

## THE PROLIFERATION OF CARBON

Back in the world of component and bike manufacturing, carbon has become increasingly popular for everything from handlebars to bike frames, and it's no wonder why. The material is incredibly strong, featherlight, and has tons of marketing dollars behind it. But it's also a chemical-heavy, environmentally taxing material to produce.

Carbon is produced from microscopic filaments that are put together by

the thousands, which then must be bonded together, usually with an epoxy resin. Different brands have different compositions and approaches, which all come together to be turned into a frame, fork, or any other mold the material is put into. It's a complex process that requires time, energy, and chemicals.

In a 2014 report "The Complete Impact of Bicycle Use" compiled by Duke Environment and commissioned by Specialized, researchers analyzed what it takes to make a carbon frame. Although it took less energy than aluminum frame production, it used a staggering amount of water — over 65,000 liters for one frame. And while they found overall energy use to be comparably low for a carbon frame

vs. aluminum, a carbon frame also produces the most waste, namely sandpaper, latex bladders, and carbon fiber waste — all items that are not easy to recycle. In other words, carbon fiber has some serious problems when it comes to the environment.

Enter Enve Composites. The well-known brand has been creating carbon components stateside since 2007. The vast majority of carbon fiber bike products are made overseas, but Enve has been championing U.S.-made carbon since its inception. Just the act of bringing this production in-house has positive climate implications — less transportation and more oversight throughout the process equals less

COURTESY TREK

# CARBON PRODUCTS AREN'T GOING ANYWHERE BECAUSE THE BASE MATERIAL — CARBON GRAPHITE — WILL LAST VIRTUALLY FOREVER.

pollutants. Additionally, the brand has built a state-of-the-art facility in Utah that allows them to recycle raw and post-processed material.

Perhaps more importantly, though, manufacturing in the U.S. has allowed Enve to create incredibly durable products. “There are literally thousands of bikes out there still being ridden to this day that have ENVE components and wheels we produced back in 2010,” said Jake Pantone, Enve’s vice president of product and brand. Thousands of products still rolling years after they were sold is thousands of products kept out of the landfill. Enve has even stepped in at certain times to take this matter into its own hands, occasionally offering a trade-in program that allows the company to collect old wheels to be refurbished, donated, or recycled. The most recent iteration of this program in 2019 even collected non-Enve wheels.

Longevity is not unique to carbon (there are plenty of old steel, aluminum, and titanium bike parts still kicking), but it’s a double-edged spoke when referring to the lasting power of the lightweight material. Carbon products aren’t going anywhere because the base material — carbon graphite — will last virtually forever. As long as a product doesn’t break due to a crash or mishandling, its usable lifetime is, well, a lifetime. But when it does break, or get replaced with a newer, better version, it’s an incredibly hard material to dispose of for all the same reasons it is so durable.

“Recycling these scrapped parts is difficult, and in some cases the recycling process itself is a net-negative impact on the environment,” said Pantone. A carbon bike product in its final form is made of the long carbon fibers and bonding agents that are necessary to hold it all together. Before anything can happen to the fibers, the bonding agents need to be removed. Those can’t be recycled or reused in any way. It’s wasted chemicals.

Once the fibers are free of all bonding elements, they can be recycled by chopping them up into short fibers, which poses another problem. The appeal of carbon fiber is its strength-to-weight ratio, made possible by the long fibers working together. When you chop those long fibers up, the short fibers don’t have the same characteristics necessary to be reused in a similar way as the original product.

Revel Bikes wants to solve this problem. Partnering with a manufacturing company out of Utah, Revel has developed a carbon rim that binds together with nylon instead of epoxy. The end result is a rim that Revel claims is stronger, more reliable, has a smaller footprint on the environment, and can be recycled much more easily.

“With our fusion fiber, there’s still waste, but not a single bit goes to the landfill. It all gets put back into the recycling room,” said the owner of Revel Bikes, Adam Miller. “Pull the vinyl decals off, drop the rim or the scrap material

into the chipper, it gets chipped up into little one-inch-long fibers, and then that can be reheated up to curing temperature and melted and turned into any shape.” Without the epoxy chemicals to burn off, recycling — or more accurately, downcycling, as Miller said — becomes a much more cost-effective, feasible, and healthy process.

But still, what do you do with all the waste? Revel has made tire levers with its recycled rims, and the company is trying out other ideas as well. But zoom out, and the amount of carbon being used in the industry, almost all of which uses epoxy (harder to recycle, less-usable short fibers), would create a huge amount of short fibers that can’t be turned back into another bike or rim.

Jones has seen the problem directly affect Specialized’s carbon recycling program. “There was a proliferation of waste and one day [our recycling partner] called us up and said, ‘Hey, unless you have a use for the [short fiber] material, don’t bother sending it.’” That was four years ago. Since then, Specialized has been researching ways to use the short fibers. The company has enough projects in development to soon enable it to reuse all warrantied carbon frames, but that is not the final goal.

Specialized wants to find a solution that will allow the company to work with other brands as well. “We haven’t developed a use that’s significant enough that would allow us to say, hey Trek, Giant, whoever, send us all your

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frames and we'll see they stay out of the landfill," Jones said. But they're close. Such a product that could use all the bike industry's short fibers wouldn't be perfect — the process of recycling is still intensive — but it's a big step in the right direction, and it would keep a huge amount of waste out of the landfills.

### WHO CARES?

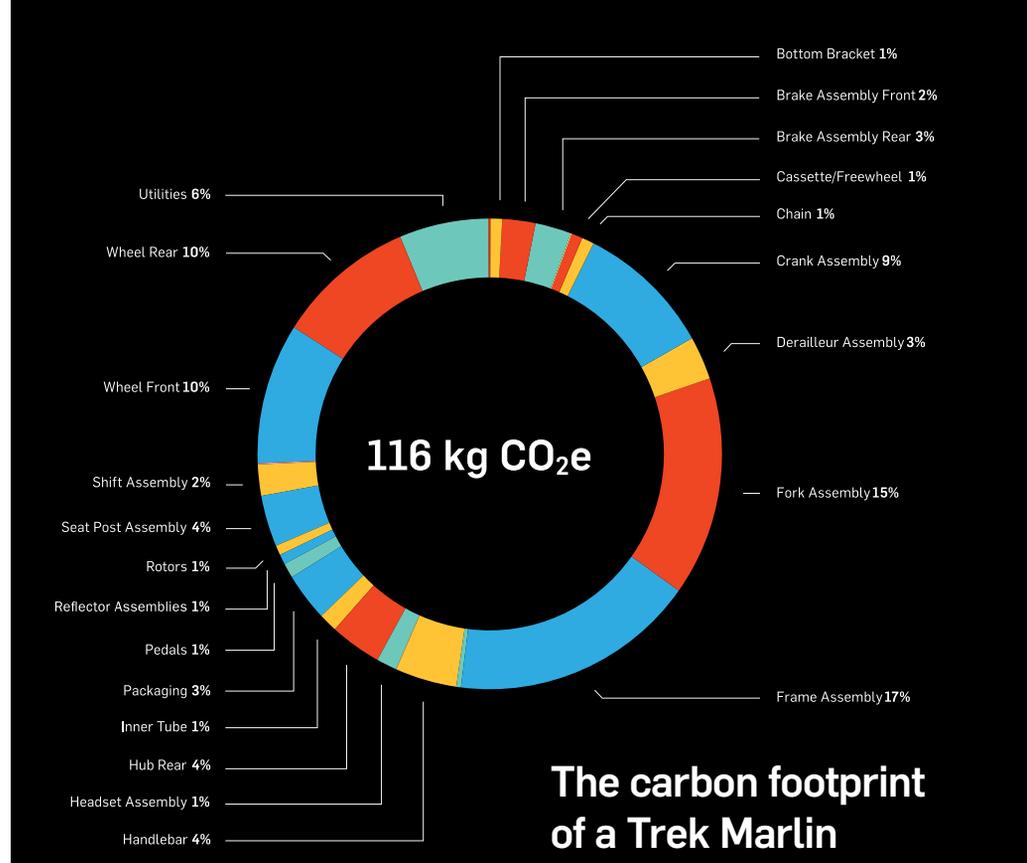
The PeopleForBikes's Sustainable Working Group, the Responsible Sport Initiative, Trek's Sustainability Report, recycled polyester, and U.S.-made carbon are all incredible strides toward a more climate-friendly bike industry. But it's not enough, and brands aren't solely responsible for the slow pace at which cycling is addressing climate change.

The lack of action can also be traced back to us, the consumers. Buying trends and popular items aren't predicated on any social or environmental issues; they're based on performance and image. "Brands have invested in creating emotional ties that prevent critical evaluation of a brand's actual behavior," said Jones. When a bike wins a Downhill World Cup, or Unbound Gravel, more of those bikes are sold.

Sheehan of Velocio expanded on why climate impact hasn't been at the forefront of the consumer's mind. "The thing about sustainability that's tough is that it's not new tech. It's largely unseen and doesn't have short-term impacts or improvements. It's a long game, and it's not something we'll likely see the true benefits of in our lifetime."

Until recently, there hasn't been a driving force behind encouraging brands to make changes. "If customers aren't asking for it, governments aren't requiring it, shareholders aren't requiring it, and most employees have other priorities," said Jones, "why would a company take on a really challenging body of work?"

In the last couple of years, though, perception has started to shift and continually more customers are demanding climate-friendly initiatives of the products they buy. Legislation is also changing: the Break Free From Plastic Pollution Act, introduced in 2021, pressures companies to make improvements. In the meantime, some companies are taking the initiative on



their own, seeing the direct impact climate change has on so many communities and hoping to be part of the change and part of the conversation.

### ARE BIKES BETTER?

I ask myself again, am I being more climate-friendly by replacing my car with an eBike? Not only does my bike's creation take a toll on the environment, but it also has a large battery inside the frame. Where the bike industry has lagged behind environmental initiatives in some areas, it isn't letting the same thing happen with eBike batteries. Call2Recycle has recently launched a program to create battery collection sites through bike retailers, where batteries can be dropped off and sent in for recycling with the latest tech available. The hope is this partnership will expand, with every eBike manufacturer signing up to better control the end-of-life cycle for its batteries.

Looking back at Trek's Sustainability Report, the company's most popular (and one of its simplest) bikes, the Marlin, has a carbon footprint equivalent to driving a car 292 miles. Trek's much more complex electric-assist mountain bike, the Rail, pushes that number up to 576 miles in a car, according to the EPA Greenhouse Gas

Equivalencies Calculator. Knowing that if I need to, I can eventually recycle my battery, and looking at the numbers Trek provides in its report for different bikes, I can be confident I'm being a better environmental steward by riding my bike more and driving a car less.

The bike industry is not wrong in promoting the benefits of bikes over cars, but that doesn't mean we can look the other way either. Through overseas manufacturing, fast fashion, post-consumer waste, and complex supply chains, the bike industry still has opportunity for improvement. Sustainability audits, the RSI, and the Sustainable Working Group are significant steps in the right direction, but there are many brands that still have yet to take that first step. And as long as we as consumers aren't demanding progress, we'll be leaving the slow pace of change up to regulation and hoping companies will do the right thing. I'm not sure that's enough. **AG**

*Amos Horn was born and raised in the backwoods of Vermont. Nowhere was close enough for walking, so he adventured by bike. It started with rides to the neighbor's house and became an obsession that spans bikepacking, gravel riding, mountain biking, fat biking, and whatever else has two wheels. He's also a writer, which means most of the time he's clicking away in front of a computer, often about biking. [amoshorn.com](http://amoshorn.com)*

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