Case Study

Patagonia: Driving Sustainable Innovation by Embracing Tensions

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A team of Patagonia leaders and key employees were gathering in a sun-filled conference room in their Ventura, California, headquarters. The morning surf was particularly good that day, which meant start times for meetings were more of a suggestion than a rule. During this meeting the team planned to discuss numerous real-time issues, one of which was a recent Greenpeace study that found traces of perfluorinated compounds (PFCs) in the waters of high-altitude lakes around the world.

For years, Patagonia had urgently sought to rethink the Durable Water Repellant (DWR) treatments derived from PFCs that they used to make high-performance outerwear waterproof. The Greenpeace study illustrated why the project was a top priority. While existing DWR chemicals offered exceptional performance of Patagonia’s products, particularly in extreme conditions, and allowed Patagonia gear to last for years, the by-products of these chemicals were

toxic and persisted in the environment, and thus made their continued use unacceptable. While using any PFCs fulfilled one aspect of the company’s mission—building the best product—doing so failed to uphold the company’s environmental commitments, leading to a major tension between quality and environmental harm.

However, related to DWR, shortened life spans of products were of special concern for the company. A rain shell that stopped preventing saturation functionally degraded into a wind shell long before the garment itself wore out. The garment thus needed to be replaced more frequently, which constituted its own environmental problem—every replacement garment came with its own environmental cost in energy and water used, and waste and greenhouse gases generated—so sacrificing garment life was a serious trade-off for the company.

The DWR that Patagonia as well as other high-quality outdoor outerwear suppliers used as a standard for years was a long-chain (C8) fluorocarbon-based treatment that was highly effective and extraordinarily durable. Unfortunately, as mentioned above, its by-products were toxic and persisted in the environment, a combination that made it unacceptable despite its excellent performance.

Patagonia’s temporary solution was to switch from a C8 fluorocarbon-based treatment to a shorter-chain C6 treatment, also fluorocarbon-based, but with by-products that broke down faster in the environment and with less potential toxicity over time to humans, wildlife, and fish.

Patagonia’s mission statement is to: “Build the best product, cause no unnecessary harm, use business to inspire and implement solutions to the environmental crisis.” Over the last five years, Patagonia had refused to agree to calls by NGOs to eliminate PFCs from products on the grounds that this would compromise Patagonia’s ability to “build the best product”—resulting in more gear tossed into landfills and requiring replacement. This also contributed to Patagonia’s decision not to join ZDHC (Zero Discharge of Hazardous Chemicals), an organization focused on leading the industry towards a reduction in the use of hazardous chemicals by 2020.

As the Patagonia team discussed their ongoing path to address the tensions that arose between the company’s desires for performance, durability, and their commitment to cause no unnecessary environmental harm, they wondered how Patagonia could most effectively embrace these tensions to drive innovation to solve the DWR challenge, and to “use business to inspire and implement solutions to the environmental crisis.”

**Patagonia’s Background and Early History**

Between 2009 and 2013, Patagonia’s revenue doubled to over $500 million, and by 2015 surpassed $600 million with over 2,000 employees. However, even with this growth, the company was still much smaller than competitors such as North Face and Columbia who had $2 billion and $2.3 billion in sales respectively. Over the past 30 years, the company has given over $60 million in cash and in-kind donations to environmental causes and over 1,000 organizations. The company also helped launch two other North American business philanthropies—the

4 Private Canadian competitor, Arc’teryx was smaller than Patagonia.
Patagonia was born out of legendary rock climber, Yvon Chouinard’s inability to find high-quality pitons (pegs or spikes used to drive into a rock or crack to support a climber or a rope) for rock climbers. As word spread about Chouinard’s pitons, he sold them out of the back of his car and off of a blanket in Yosemite for $1.50 each. In 1965, he partnered with fellow climbers Tom and Doreen Frost to create Chouinard Equipment and, by 1970, the company was the largest supplier of climbing hardware in the United States. Initially, the company was simply a way to pay their bills and they took turns minding the company while going on climbing trips.

In 1972, the founders developed aluminum chocks that wouldn’t damage the rocks since they were wedged in by hand and not hammered into cracks. They next expanded into colorful clothing to support the hardware business; by 1972, the clothing line expanded to become its own venture named Patagonia (inspired by rugby shirts found overseas made from materials durable enough to be used for climbing).

In 1973, the partnership between Chouinard and the Frosts ended and Patagonia was established as its own company. Lost Arrow Corporation was created in 1984 as a parent company for Chouinard’s businesses, including Patagonia. In the 1980s, Chouinard Equipment’s legal struggles led to its sale and Patagonia continued to grow its sales from $20 million to $100 million, expanding to Europe and Japan.

In 1985, Patagonia began donating one percent of its total sales to environmental organizations through 1% For the Planet. Chouinard said: “You have to get away from the idea that it’s philanthropy. I look at it as a cost of doing business. Every business should say, We’re polluters, we’re using our nonrenewable resources, and therefore we should tax ourselves. Being part of [1% For the Planet] is also good for business….Think of it as a marketing cost.”

In the early 1990s, the company expanded too quickly and almost went out of business, laying off one-fifth of its employees. Chouinard considered selling the company but instead chose to re-examine the firm’s values and move the company in a more sustainable direction to minimize the environmental impacts of its products. During that time, Patagonia commissioned an environmental study that showed that large amounts of water, energy, and chemicals were used to make the materials for Patagonia’s products and identified its material supply chains as the “most significant contributors to Patagonia’s environmental footprint.” Patagonia was also part of President Clinton’s Apparel Task Force in the mid-1990s. Patagonia’s Director of Sourcing testified before Congress on factory labor conditions. This task force led to the creation of the Fair Labor Association (FLA) of which Patagonia was a founding member.

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5 Founded by Patagonia in 1989, the purpose was to encourage outdoor businesses to contribute to environmental organizations. By 2012, the organization had grown to include 170 businesses.
6 1% For the Planet consisted of 1,200 members in 48 countries who donated 1% of revenues to environmental organizations worldwide.
7 Chouinard was one of the leading climbers of the ‘Golden Age of Yosemite Climbing.’ He participated in the first ascent of the North America Wall in 1964 (with Royal Robbins, Tom Frost, and Chuck Pratt), using no fixed ropes….Chouinard became the most articulate advocate of the importance of style, the basis of modern rock climbing.” [3]
8 Several climbers sued Chouinard Equipment after accidents, although Chouinard said that those suits were baseless and filed by amateurs.
In 2011, Patagonia became a B-Corporation. Through this, Patagonia further solidified its reputation not only for its innovative designs and quality products in the outdoor and everyday clothing, gear, and food industries, but also for its environmental and social conscience.

The company’s four core values are: “1) Quality: Pursuit of ever-greater quality in everything we do; 2) Integrity: Relationships built on integrity and respect; 3) Environmentalism: Serve as a catalyst for personal and corporate action; and 4) Not Bound by Convention: Our success—and much of the fun—lies in developing innovative ways to do things.” In his book, *Let My People Go Surfing*, Chouinard outlined the company’s environmental philosophy: “Lead an examined life; Clean up our own life; Do our penance; Support civil democracy; and Influence other companies.”

### Tensions Between Supply Chain and Sustainability

Patagonia has lived with the tension between performance and environmental impact almost since its founding, according to Matt Dwyer, Director of Materials Innovation & Development: “When they do cross, very magical things happen. If we find something that provides a ridiculous performance benefit and also has a significantly reduced environmental impact, that’s the sweet spot for new disruptive innovations.” On the mission statement, Dwyer added: “We are explicitly trying to build the absolute best product in terms of durability, functionality, fit, multi-functionality, as well as the design attributes such as being long-lasting, timeless, durable, and doing exactly what we say it will. This is hands down the number one goal. We continuously look for ways to minimize environmental harm while building the best product.”

Doug Freeman, Patagonia’s COO, said on Patagonia’s supply chain strategy: “We chase quality and build products that are responsible. We make decisions in the supply chain that link up raw materials sources close to the factory that we’re manufacturing in. We are very good at defining what it is about that product that will make it best available to consumers. We look for partners that are long-term, sophisticated, have deep resources, and have operations in many countries. We like a consolidated supply chain—to be bigger presences in the factories that we are manufacturing in (although we cap our presence at 25 percent of a factory’s business because if we were to leave, we would displace a lot of people). We like to know how the people in the supply chain are being managed. We care deeply about our environmental footprint and we want to build the best product that will be used by people for a very long time—we are against fast fashion and landfills, which lead to our CO2 problem. We are very proud that some of our most popular styles such as our Snap-T fleece and Baggies are styles we introduced 20 to 30 years ago” (Exhibit 2).

One of Patagonia’s supply chain challenges was managing the tensions between the sourcing people (who were focused on price, delivery times, and volume), the quality people, and the compliance people. “It’s a tough conundrum,” said Freeman. “You’re off balance all the time. We are dealing with a factory in the Philippines who makes our climbing gear, which is important to our business. It’s about appealing to the factory to do the right thing. It’s about bringing the suppliers into the conversation and telling them how our business together will grow while telling...”

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13 Patagonia was the first company to become a B-Corp in December 2011. https://www.bcorporation.net/community/patagonia-inc.
14 Patagonia.
them that we see overtime in the workers which we don’t like, and people being hired by employment agencies while we would prefer to see them working full-time. Seasonal workers in our industry, where we make 60 percent of our sales in the fall season (versus other outdoor companies that are at 90 percent), are a reality, but we have to appeal to these factories to do the right thing. It takes a lot of time and it’s really frustrating.”

How Patagonia developed its supply chain strategy and executed upon the strategy was organic, democratic, and decentralized, according to Freeman who joked that the company was the “Socialist Republic of Patagonia.” “As a management team, we try to empower people to make good, collaborative, and very transparent decisions around the values of the company. It’s unique and unlike any company I have ever worked at in that we treat quality, best product, the environment, and the social issues that affect the people in the supply chain, on an equal level as the business of the company.” This meant that a director representing social and environmental responsibility, a quality person, a sourcing manager, and a sourcing director, each had equal say on which factories Patagonia worked with (or didn’t work with). Freeman added: “Most conversations in the apparel industry begin and end around price, minimum quantity, and lead time; ours begin and end around quality, social and environmental responsibility, and best product.”

On the strategy of sustainability, Rick Ridgeway, Vice President of Public Engagement said: “Central to the evolution of my own position at Patagonia is the strategy of decentralizing and integrating sustainability within the organization. That’s a big deal. It’s the natural evolution of any company’s commitment to sustainability that’s genuine. If a company’s really going to embrace sustainability issues, then it has to figure out how to integrate it into the warp and weft of the organization.”

In that spirit, the BUDs (Business Unit Directors of each area such as surf, sportswear, alpine & snow, fieldwear, fishing, and military), PLMs (product line managers), and designers were sometimes the ones who championed certain new technologies or materials such as Yulex wetsuits and lower impact DWR alternatives. “That’s what we hire our BUDs to do,” said Freeman. Jill Dumain, Director of Environmental Strategy added that the top was important too, however: “Yvon always said the revolution has to start at the bottom with the people, but then he saw what happened with Walmart and B-Corp16 and now we’re seeing the top and bottom work together and we’re getting squeezed in the middle.”17

Patagonia’s decentralized culture, however, sometimes led to a “lack of decision making,” according to Freeman. “Sometimes it’s too democratic, too transparent, and people are afraid to make decisions. Sometimes there are too many people in the room and things take a long time. In these cases, the VPs and I say that we need to make a decision and not be so timid.”

Freeman also acknowledged that Patagonia was “short-handed” and was doing the best that it could to deal with the number of environmental and social issues within its supply chain, one of which was PETA’s (People for the Ethical Treatment of Animals) exposure in 2015 of Patagonia’s sourcing of wool from farms in the Ovis 21 network (who mistreated lambs); “We will get caught flat-footed or on our tails. We haven’t gotten to the auditing of our shipping lines.

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We’re not getting into how the publisher is treating people within our catalog production. We only have a handful of people dealing with 190 suppliers. We have a toolbox and we opened it up to the industry,18 but it’s naïve to think we have everything figured out.”

Patagonia recently invested in sustainability and EHS19 management software that would help to measure water, energy, waste, and greenhouse gas emissions from a supply chain and at a corporate level. “We’re trying to make supply chain decisions that lessen our dependence on water,” said Freeman. “A lot of what our team is focused on is new technologies, water-free dyeing, and textiles, as well as bio-based technologies that impart PFC-free finishes on textiles, particularly on waterproof breathables.” Freeman hoped that the software tools that Patagonia implemented would help the company decide what areas to invest in through $20 Million & Change, its new venture arm. “Up until now, deciding what to focus on in the supply chain has been gut instinct and what we’ve been reading,” he said.

The materials group, headed by Matt Dwyer, had two “umbrellas” to help frame projects and initiatives to focus on—environmental issues such as waste, water, energy, and emissions; and high performance, which consisted of projects that focused on performance attributes or new cutting-edge technologies for athletes. Ridgeway acknowledged: “We, to a fault probably, do spread ourselves pretty wide—but our efforts and initiatives are all guided by our mission (Exhibit 3).”

**Durable Water Repellents (DWR)**

By 2015, one of Patagonia’s (and the industry’s) pressing environmental, health, and supply chain problems was the use of Durable Water Repellants on outerwear such as jackets. Conventional DWR treatments involved the surface application of a long chain of fluorocarbons (such as C8) onto a fabric that were highly effective and durable, but that produced by-products that were toxic and persistent in the environment (in animals and humans).

C8 was a type of fluorocarbon or PFC that was petroleum-based and used in various other consumer products such as nonstick cookware, paints and coatings, and stain-release treatments for carpet. Patagonia was not aware of any links between increased fluorocarbons such as C8 in the body due to skin contact from its clothing. “But because we are concerned about the persistence of these chemicals in the environment, we have been working to find alternatives to two fluorinated compounds: perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), which was a by-product of C8.”20

Companies traditionally used C8 because of its effectiveness—strong, long-lasting surface compounds that allowed rain or water to bead up and disperse, essentially waterproofing clothing and jackets, while allowing the fabrics to remain breathable. As Tetsuya Ohara, Patagonia’s Director of Innovation Research explained: “DWR is so important in outdoor gear because people go to inclement weather like snow or rain and if the gear naturally ‘wets out,’ it reduces human temperature and energy and that can be dangerous.”

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18 Referring to the Sustainability Apparel Coalition.
19 Environmental Health & Safety.
20 PFOS, PFOA, and Other Fluorochemicals,” Patagonia, 2013.
Both PFOS and PFOA have been identified by preliminary government-risk assessments as being consistent with a category of a “likely carcinogen.” PFOS levels have been found in wildlife and higher levels of PFOS in humans could lead to chronic kidney disease.\(^{21}\) Likewise, PFOA persists indefinitely in the environment and is a toxicant and carcinogen in animals. PFOA has been detected in the blood of more than 98 percent of the general U.S. population. PFOA has been detected in industrial waste, stain-resistant carpets, carpet-cleaning liquids, house dust, microwave popcorn bags, water, food, some cookware, and Teflon.\(^{22}\)

In 2011, a Greenpeace campaign called “Detox” targeted a group of major apparel and footwear brands and retailers around their use of toxic chemicals. In response, the industry came together to form ZDHC (Zero Discharge of Hazardous Chemicals), an organization focused on leading the industry towards zero discharge of hazardous chemicals by 2020. Members included Nike, Adidas, H&M, Gap, Puma, and others. However, none of the major outdoor companies initially joined this organization as they argued their performance standards for their clothing and outerwear were too strict to move away completely from PFCs.

Legislation, however, soon caught up with the entire industry and took over as the key driver of DWR issues. For example, the European Union has banned PFOS and PFOA. In the U.S., the Environmental Protection Agency (EPA) initiated a voluntary industry phase-out of PFOA and the major global fluorochemical companies (eight of them) have agreed to eliminate PFOAs by 2015.\(^{23}\) In the U.S., the EPA has banned PFOS since 2000 (except for special uses in aviation, photography, and microelectronics). In 2000, 3M stopped making PFOS and eliminated it from its Scotchgard fabric protector. In 2003, DuPont had class-action lawsuits filed against it for its use of PFOA for Teflon on cookware and was in the process of eliminating PFOA from its products.

Australia has issued two alerts on PFOS, recommending use only in essential cases. In June 2005, Sweden proposed a global ban on PFOS. In 2005, the European Commission (EC) issued a proposal for a Directive to restrict the use of PFOS in carpets, textiles, and other clothing. In 2014, Norway banned PFOA in consumer products.

NGOs also had an active role in DWR awareness. In 2012, Greenpeace Germany published a report, “Chemistry for Any Weather,” that summarized the findings of two independent labs it commissioned to evaluate the chemical content of outdoor weatherproof clothes by manufacturers such as Patagonia, The North Face, Marmot, and others. The labs found PFCs in all 14 samples and high concentrations of PFOA/C8 (for water resistance) in all samples. Kirsten Brodde of Greenpeace said: “There are no safe levels for PFCs; they are intrinsically hazardous and should be eliminated completely by the textile industry. An outdoor industry that draws a picture of itself as being green should stay out of the use of all hazardous chemicals and not try to…slow down the process of elimination.”\(^{24}\) At the time of the Greenpeace study, Patagonia was in the process of eliminating PFOA’s from all of its products by 2015 and converting 40 percent of its DWR products to shorter chain C6 technology (see below for discussion of C6).

In 2015, Greenpeace released another study that found traces of PFCs in the waters of high-altitude lakes around the world, from the Torres del Paine National Park in Patagonia, Chile, to

\(^{21}\) [Perfluorooctanesulfonic acid](https://en.wikipedia.org/wiki/Perfluorooctanesulfonic_acid).

\(^{22}\) [Perfluorooctanoic acid](https://en.wikipedia.org/wiki/Perfluorooctanoic_acid).

\(^{23}\) PFOS, PFOA, and Other Fluorochemicals, Patagonia, 2013.

the Lago di Pilato in the Apennine mountain range in Italy. Greenpeace said its study proved how slowly PFCs break down in the environment. “It is ironic to think that companies who depend on nature for their business willingly release dangerous chemicals into the environment,” said Mirjam Kopp of Greenpeace. “They need to set short-term deadlines for completely eliminating the entire group of PFCs in production processes.”

Greenpeace praised Puma and Adidas for their “ambitious elimination targets” for PFCs from its clothing through ZDHC. However, Greenpeace felt that The North Face, Columbia, Patagonia, Salewa, and Mammut were not moving quickly enough.

Freeman said on NGOs: “Greenpeace is really upset that PFCs are showing up in our bodies and the environment. We agree that this is not okay. I’m appreciative of what PETA and Greenpeace bring because they bring awareness and it sparks ingenuity, but it can be a painful process.”

Dwyer said: “DWR is definitely an instance where innovation had to happen in the wrong way, where all of a sudden there was extreme scrutiny on a key component of everyone’s product line. In real life, I prefer that we saw this coming and when the legislation happens, we’re already doing the right thing. That’s our strategy today.”

C8 Alternatives

For years, Patagonia has been researching and testing fluorocarbon-free chemistries (a dozen or more) such as waxes and silicones that also allow water to bead up and disperse versus saturating/wetting out. However, according to the company’s blog, waxes and silicones “are easily contaminated by dirt and oil and rapidly lose their effectiveness, reducing the effective lifetime of a garment. The short life span is of special concern. A rain shell that stops preventing saturation functionally degrades into a wind shell long before the garment itself wears out. The garment must be replaced more frequently, which constitutes its own environmental problem. Every replacement garment comes with its own environmental cost in energy and water used and waste and greenhouse gases generated. So sacrificing garment life is not an option.”

Many fashion companies were also “actively pursuing non-fluorinated applications,” according to Nike’s John Frazier. Dow Chemical provided silicone-based treatments and more limited performance solutions such as wax and oil-based finishes. But again, companies such as Nike did not have the same weather performance requirements as Patagonia or North Face. And these treatments were not “new” innovations, but rather recycled ones from decades ago that had been phased out when PFCs first became popular.

Very large chemical companies such as Dow and DuPont (through its Chemours spin-off), along with specialty chemical companies such as Huntsman, were also researching more effective DWR alternatives. To date, however, their solutions have been chemical-based such as shorter-chain fluorocarbon-based polymers like C6 (also sprayed on), but with by-products that broke down faster in the environment and had “less potential toxicity over time to humans, wildlife, and fish.” According to Patagonia, the problem was that outerwear using C6 was not as effective and in torrential rains, for example, wet out more quickly.

25 http://www.ft.com/intl/cms/s/0/ad0b80e6-55a8-11e5-9846-de406c6bb3f2.html.
Robert Buck at DuPont said that companies like his were focused on shorter chain polymers, but acknowledged that questions about their toxicity remained. Ohara said: “For chemical companies, this is their business—they have to sell chemicals so the approach to solve problems is to always use chemicals.”

Over the past four years, Patagonia has transitioned its product line to short chain DWRs, and by spring 2016, 100 percent of its line will be transitioned. According to Patagonia: “The majority of our current products that are treated with DWR now use C6 fluorocarbon-based water repellents. These are PFOS-free, but PFOA is still detectable on the treated fabric at around 100 ppb (parts per billion). One ppb is comparable to one second in 32 years. It’s a very small amount.”

Martin Foessel, CEO of Beyond Surface Technologies (see below) said: “The problem that I see is that moving from C8 to C6 is not solving the issue. If you’re really concerned about PFOA and if your intent is to go PFOA-free, then your only choice is to walk away from PFCs entirely.”

Since switching over to shorter chain chemistries for its DWR treatments, Patagonia has not heard any negative feedback (it’s Torrentshell jacket, for example was switched over to shorter-chain chemistries in the 2014 line), according to Dwyer: “I actually expected to have heard from customers by now, but we haven’t heard many performance-related complaints yet. Part of it is that we spent seven years working with key suppliers on our fabrics at the mills doing the trials with the chemistry to make sure we were sacrificing the least in terms of performance. We’re actually pretty happy with the quality right now.”

**Investing in DWR Science: Beyond Surface Technologies**

In 2013, Patagonia launched an investment venture arm, “$20 Million & Change,” which invested in responsible and disruptive startups (in food, water, energy, and waste). For apparel, this meant investing deep within the supply chain in search of disruptive technologies and sustainable eco-innovations. By 2015, the company had made 10 investments. One example was a project in Chile that made skateboards out of discarded fishing nets. Another was an investment in CO2 Nexus, a company that has developed a sustainable method of processing (cleaning, disinfecting, and coating) textiles and garments using liquid carbon dioxide—using zero water, consuming less energy, and generating very little waste. Another investment in 2015 was $1.5 million in a Swiss company, Beyond Surface Technologies (BST) that worked to reduce the impact of textile chemicals on the environment through natural raw materials. The BST investment was the second largest investment outside $20 Million & Change’s investment in its solar fund.

Phil Graves, Director of Corporate Development, who ran $20 Million & Change said: “$20 Million & Change is very different from the traditional VC model that is focused on exits through IPOs or acquisitions, which we believe is a broken model. When VCs get involved, they typically put a spotlight on a startup’s short-term growth and profitability, which makes it difficult for an entrepreneur to stay true to their environmental or social mission. Instead, we...
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