SIERRA NEVADA BREWING CO.

BIENNIAL SUSTAINABILITY REPORT

2015

Celebrating a
35-Year Commitment to
Sustainable Brewing
Mills River 2604 miles
Rail Spur 2.6 miles
Capay Farm 15 miles
Asparagus 5 miles
Torpedo Room 150 miles
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Dear Friend,
What we now call “sustainability” has always been a way of life for me, and at Sierra Nevada Brewing Co. we’ve always aimed to use resources efficiently and to eliminate waste. In the beginning, we did it because we had to — money was tight and we couldn’t waste anything. Now, we do it because it’s the right thing to do. Being a good steward of natural resources, the land, and our communities is the cornerstone of the way we do business.

The last few years have been a period of enormous transition at Sierra Nevada as we’ve designed, built and commissioned the Torpedo Room in Berkeley, California, and a second facility in Mills River, North Carolina. Chico will always be our home, but reaching production capacity and seeking to cut down on the environmental impact of shipping beer across the country made a second brewery a necessity. It’s no small feat to build a brewery and it’s been just as challenging to transplant our culture and set roots in a new place. Fortunately, we had 30 years of experience behind us and built upon what we’ve learned in Chico as we planned the Mills River operation.

As much as our attention has been turned east since the last sustainability report, we haven’t lost sight of our mission in Chico. We were certified as a zero-waste facility in 2013, and we continue to look for ways to use and waste less. The success of the microturbines in Mills River has been the impetus of our next big sustainability project in Chico: the replacement of our aging fuel cells with microturbines that will help provide all the electricity our operations need.

I don’t know what comes next, but I do know that my employees and I are dedicated to leaving the smallest environmental footprint we can. I hope you enjoy this look at how we do that.

Cheers,

Ken Grossman
Owner/Founder
Sierra Nevada Brewing Co.
ABOUT US

In 1980, we set out with a simple goal: brew the beers we wanted to drink. We started small with homebrew shop experience, a love of American hops, and plenty of passion. In the process, we helped change the beer world forever. Decades later, we’re still at it and the passion burns brighter than ever. We helped pioneer the craft brewing industry and have gone on to build a company that has become a destination in its own right.

Headquartered in Chico, California, Sierra Nevada Brewing Co. sits at the north end of California’s Great Central Valley and at the base of the breathtaking Sierra Nevada Mountains from which we take our name. In 2012, we began construction of a second brewery in the Great Smokey Mountains in Western North Carolina. Guests were formally invited to the Mills River brewery in 2014, with the finale of our Beer Camp Across America tour followed by the opening of our Taproom in March 2015.

After announcing our expansion to Mills River, we brought a little more attention back to California with the opening of our tasting room—the Torpedo Room—in November 2013, in Berkeley. The Torpedo Room is an opportunity for us to engage with and educate our consumers about the craft of beer, the science behind it, and our culture of appreciation for it.

In addition to state-of-the-art brewing equipment and facilities, each brewery features an onsite restaurant, gift shop and concert and banquet venue. We operate offsite rail and grain transfer facilities at both locations and are engaged in a variety of agricultural and forestry projects. We act as our own distributor in the Chico area and employ drivers who travel Northern California delivering our products to distributors. We also operate onsite wastewater treatment facilities at both breweries as well as an onsite composting program in Chico. Needless to say, we are committed to more than just great beer.
SUSTAINABILITY AT SIERRA NEVADA

At Sierra Nevada Brewing Co., sustainability means recognizing the impacts associated with our operations and making a conscious effort to reduce them. We are committed to leaving the smallest footprint possible without jeopardizing our high standards for quality. We strive to maintain a healthy balance between environmental stewardship, social equity, and economic stability. By engaging in an active sustainability program, we intend to leave a better world for future generations.

MEET OUR SUSTAINABILITY TEAM

Focusing on the environmental lens of sustainable development, the Sustainability Department provides guidance and advice regarding the environmental impacts of brewery decisions. The Sustainability Department also works within operations to reduce the overall environmental impacts of our processes as they relate to energy, water, transportation, zero waste, climate change, and material suppliers as well as working with employees to bring awareness of environmental issues to their roles at the brewery and to their personal lives.

Our Sustainability Department has grown since the last time this report was published and we are now four people strong! Although we have a dedicated Sustainability Department, sustainability remains a part of every single Sierra Nevada employee's job responsibilities. Without the support and participation of all of our employees, our program could not be successful.

Cheri Chastain
Sustainability Manager

Mandi McKay
Sustainability Coordinator, Chico

Leah Cooper
Sustainability Coordinator, Mills River

Chester Clever
Sustainability Support, Chico
STRIVING FOR ZERO WASTE

Our sustainability program extends to every facet of our company from barley to bottle and into your refrigerator. Our fundamental approach is to “close the loop” wherever and whenever possible. We look for opportunities to bring materials leaving our facility—such as heat, water, and packaging—back into our production process.

Introduced to employees in 2011, our zero waste goal emulates sustainable natural cycles in which discarded materials are resources, not wastes, and products and processes are designed and managed to reduce the volume and hazards of waste. The drivers behind our zero waste goal are:

- To improve environmental health by reducing landfill contribution, reducing greenhouse gas emissions, sustaining natural resources and preventing the release of harmful chemicals into land, water and air systems. Doing so also improves our personal health and the health of our communities by ensuring that we have clean air and water.
- To save money by reducing the cost of utilities and resources. Saving money allows Sierra Nevada to offer employees amazing benefits and provide job security.

We work hard to divert solid waste from the landfill, recovering 99.8% of our total solid waste through reuse, recycling or composting (also known as reEarthning). The same resolve is applied to all of the resources we use throughout the brewery, including energy, water, packaging materials, compressed air, food, employee time, parts, services, money and, most importantly, beer.

We have metrics in place to help identify and reduce waste in brewery operations. Tracking mechanisms depend on the type of waste, and metrics are reported brewery-wide through our Key Performance Indicator (KPI) program which is illustrated in the following sections. Audits are regularly conducted throughout the brewery to provide detailed information about specific processes that need improvement.
LEED CERTIFICATION
Although our Chico brewery has not been certified, we have used the Leadership in Energy and Environmental Design (LEED) guidelines as a resource for the continual expansion of the Chico brewery for more than 30 years. Our second home in Mills River afforded us the opportunity to demonstrate our commitment to responsible building operations and pursue LEED certification from the beginning. Our application was submitted in mid-2015, and we expect to have official certification by early 2016.
What is considered a LEED project? Certification for new buildings includes the following categories:

- Sustainable Sites: alternative transportation, site development, and stormwater management
- Water: efficient landscaping, reduced overall consumption, innovative wastewater treatment
- Energy and Atmosphere: optimizing performance and renewable energy
- Materials and Resources: construction waste management, materials reuse, recycled content, and regional materials
- Indoor Environmental Quality: low emitting materials, natural lighting, user controllability of systems
- Innovation in Design
- Regional Priority

The Mills River brewery is built to the minimum LEED Silver standards, but by addressing additional criteria in each category we have set our sights on achieving a higher level of certification.

THE FINEST INGREDIENTS
We believe that the best beers begin with the best possible ingredients. With an eye toward the environment, responsible farming and our agricultural future, we insist on the highest quality and freshest ingredients for every beer we brew. We continually...
work with our growers in order to foster and support sustainable farming practices that produce the highest quality crops. We also brew only with non-genetically modified barley and hops bred using traditional methods.

We brew all of our ales and lagers with whole-cone hops, which are the flowers of the hop plant in their most natural state, maintaining aromatic oils and resins inside. Despite our relatively small size, we use more whole-cone hops than any other brewer in the world. We work closely with hop growers, brokers, and breeders to improve and expand organic and sustainable farming practices.

**ESTATE AGRICULTURE**

**HOPS & BARLEY**

We began growing hops experimentally in Chico in 2002, with three acres of hop bines, and later expanded to eight acres. In 2008, we took this homegrown approach a step further and planted our own 30-acre barley field. In 2013, we planted an additional three acres of hops at our rail spur in Chico, California, and purchased another 80 acres of property that are now planted with barley. In 2009, Oregon Tilth awarded us organic certification for our brewery as well as our hop and barley fields.

Our Estate® Homegrown IPA, brewed with our very own hops and barley and winner of a 2012 Great American Beer Festival gold medal, was our first certified organic beer and remains one of the only estate ales in the world.

In 2013, our estate hop fields in Chico, California, were additionally certified as Salmon Safe fields. Salmon Safe works to preserve West Coast watersheds and protect endangered salmon habitats by transforming land management practices to protect agricultural and urban watersheds. Many of our large hop growers have also achieved certification and are working to protect their local watersheds as well.
ESTATE GARDENS

The emphasis on homegrown ingredients applies not only to our Estate IPA but also to the food served in our restaurant. We source fresh, seasonal food from local farmers and markets. In partnership with the Chico State University Farm, we also maintain our own herd of naturally raised cattle which are fed a portion of our spent brewer’s grain, to supply beef to our Chico Pub.

In 2010, we planted the first acre of our Chico Pub garden adjacent to the hop field followed by a second acre in 2011. In 2014, we grew over 31,000 pounds of produce and herbs (including more than 9,000 pounds of tomatoes!) for the restaurant using organic and sustainable farming practices. We fertilize the garden, hop field and barley field with the compost we produce on site from our spent organic materials, creating a seamless closed loop.

Our Mills River Taproom features locally sourced produce, meats and cheeses, purchased in bulk to reduce packaging waste and provide the freshest flavors. The Mills River Taproom also includes a full-service bakery for all baked goods—again reducing packaging waste—and now features a garden for herbs and produce for use in the restaurant.

Chico’s restaurant garden

Part of the vegetable bounty we grow on site
WILDLIFE MANAGEMENT
As our namesake suggests, Sierra Nevada has an innate respect and appreciation for the natural world and the creatures we share it with. In both Chico and Mills River, we take measures to ensure our operations do not impact native wildlife. In fact, we even take steps to foster beneficial habitat by planting particular flower and shrub species that attract pollinators and installing boxes for bats and ducks that allow them to nest and care for their young safely. In Mills River, we’ve partnered with a local blue bird organization to install boxes in areas where these endangered birds like to build their homes, and local beekeeper hives can be found thriving at both breweries.

MILLS RIVER REFORESTATION
When we chose our location in Mills River, North Carolina, it was at first glance a breathtaking forest setting. Upon closer inspection, we realized that the forest we had just purchased was actually an unhealthy forest with overwhelming non-native and invasive species taking over. Among the first people hired to work at the Mills River brewery were our Natural Resources Specialists who were tasked with bringing the area back to a healthy state. They worked tirelessly (and still have a long way to go!) to improve the overall health of our forest. The result has been a stunning transformation.

Before

Non-native invasive plant species once outcompeted the native fern, dominating the landscapes.

After

Native species are now returning after the non-native invasive species removal.
**ENERGY**

In 2014, we increased our already substantial renewable energy portfolio with additional solar capacity and biogas-fueled microturbines. Our total solar capacity in Chico remains steady with two megawatts of DC power. With the addition of our Mills River brewery, another 600kW of solar was installed atop our packaging hall and beer warehouse and is complemented by small, tree-like solar panel canopies dotting the visitor parking lot. Situated at our Mills River wastewater treatment plant are two 200kW Capstone microturbines fueled by biogas produced anaerobically during the wastewater treatment process. We started decommissioning our aging fuel cell system in Chico in mid-2015, and will replace it with two megawatts of Capstone microturbines. Combined with our onsite solar arrays, the new Capstone system is expected to generate nearly 100% of the electricity needed to run the Chico facility.

In 2014, we generated a total of 10,782,057 kWh using onsite, clean and renewable technologies. According to the US Energy Information Administration, that represents the equivalent of the electricity used in 988 average American households in one year.

**ENERGY EFFICIENCY**

We approach energy efficiency in a holistic and multi-faceted way, and it will continue to remain the target of ongoing efforts. Our energy efficiency projects include automation and process controls, indoor lighting upgrades, variable speed drives on pumps and motors, and a better awareness among employees about the resources they use. We also recover heat from several sources within our breweries, including the brew kettles, Chico’s fuel cells and boilers, Mills River air compressors, and from wort cooling before fermentation. In Mills River, our engineers were able to recover so much heat from the brewing process that a thermal energy storage tank was included in the project to store excess hot water for other uses.

Every gallon of water we consume passes through multiple pumps, filters, and motors before it gets to the brewery and even more once inside the walls, so every drop of water conserved equals energy saved. We actively repair leaky equipment, practice better planning in the restaurant (e.g. waterless defrosting), and equip all hoses with flow controls.

Following LEED guidelines, our Mills River brewery is expected to be substantially more energy efficient.
than traditional breweries of the same size. The building features LED lighting, skylights and large windows in almost every space, extensive thermal energy recovery and building automation, all to drive energy savings.

**TRACKING**

For internal purposes, we track electricity consumption by kilowatt hour (kWh) consumed per barrel (BBL) of beer packaged. One of the roadblocks we face in our energy tracking program is that the entire Chico brewery site—restaurant, CO₂ recovery, wastewater treatment facility, compost system, etc.—is on one electricity meter, making it very difficult to break out brewing-specific energy needs. For this reason, we do not use our kWh:BBL metric to compare ourselves to other breweries.

Our Mills River brewery features a state-of-the-art building management system which allows for more precise tracking of electricity consumption throughout the brewery and helps us identify opportunities for improvement and efficiency gains.

Company-wide electricity consumption tracking began in 2015, with combined KPI’s for both breweries. Until we have more company-wide data available, however, the chart below represents only the Chico brewery.

The chart below represents how an increase in production can impact any tracking metric. In September 2014, as our Mills River brewery was ramping up production, we packaged the fewest number of BBLs in several years at our Chico brewery. This led to the large increase in power consumption per BBL, indicating that economies of scale are an important element of how we interpret this data.
WATER

With one of the worst droughts on record in California and unusually large volumes of rain and snow hampering construction in North Carolina, we’re experiencing a vivid picture of a changing climate. As one of the primary ingredients in beer and a vitally important resource for life, water is, and always has been, on our mind.

We have worked diligently to reduce water consumption and increase water efficiency over the last 30 years and have steadily used less water. To maintain perspective, we measure our water as a ratio of incoming water to barrel of beer packaged. Since 2007, we have seen a 25% reduction in the amount of water required to produce one barrel of beer.

In 2014, we tasked ourselves with achieving a ratio of 4:1. Water conservation taskforces representing all departments have been established at both of our breweries to identify specific water reduction opportunities. The taskforces work on projects large and small in order to address our water consumption.

Some of the projects that were implemented to achieve reductions include:

- Using non-water-based lubricants on conveyor belts in our packaging operations
- Optimizing and automating clean in place (CIP) systems to maintain tank cleanliness while using less water
- Converting to drip irrigation instead of traditional sprinkler systems
- Recovering pipe cool-down water after hot sanitation loops for other uses

![2014 BBLs of Water per BBL of Beer Produced](chart)

*(Pub water consumption is not included.)*
• Removing water-thirsty lawns and replacing them with drought-tolerant plants in Chico
• Setting up regular checks for leaks on hose bibs and irrigation systems
• Using on-demand water heaters where applicable to avoid waiting for water to heat up
• Evaluating where tempering water is used and working to eliminate the need for it

As with electricity, we have found that beer production greatly affects our water consumption—when we brew and package more beer, our water numbers are much lower. For Chico, it should also be noted that although the restaurant and the majority of our irrigation practices have been removed from the data, it still includes our banquet kitchen, tasting room, wastewater treatment facility, CO\textsubscript{2} recovery plant and a handful of other non-production water use points.

MILLS RIVER STORM WATER MANAGEMENT

The climate in Mills River, North Carolina, is dramatically different from our home in Chico, California. Northern California sees rain for only a few months out of the year and is virtually dry for 8-9 months at a time. In North Carolina, however, rain is a regular occurrence throughout the year and presents the opposite challenge of effectively handling large volumes of water.

Our storm water management system in Mills River is state of the art and multi-dimensional. We began with rainwater collection, collecting water from the warehouse and packaging rooftop via twelve 6,500gal capacity cisterns that line the front of the facility. There is an additional 450,000gal underground cistern beneath the parking lot behind the brewery. All collected rainwater is filtered and used to irrigate vegetation on the property and for other non-potable uses.

Permeable pavers were installed in the brewery parking lots to allow water to percolate back into our groundwater supply and to recharge the local aquifer. Bioswales were included in the facility design to hold excess storm water and to let it soak back into the ground slowly.

When cisterns, permeable pavers and bioswales aren’t enough, we channel excess water to the French Broad River down an engineered stream that includes several setting pools. The pools allow sediment to settle out of the water, improving the quality and health of the river and preventing erosion of our hillsides.
WASTEWATER TREATMENT
As production steadily increased in Chico in the 1990s, our demand on the municipal wastewater treatment system also grew. To alleviate our impact we built an onsite wastewater treatment facility in 2002 to pre-treat all of our effluent brewing process water before discharging it to the municipal system (all sanitary water is sent directly to the municipal facility). Water is first screened of any remaining solids (which are composted on site) and then treated in an upflow anaerobic sludge bed (UASB) digester followed by processing in an aeration basin to further break down any remaining solids. We close the loop by capturing the biogas generated during the anaerobic treatment process which is then used to fuel our boilers.

We took a slightly different approach to wastewater treatment in Mills River by processing more solids along with the brewery effluent water. We installed an anaerobic contact sequencing batch reactor (ACSBR) system capable of treating a higher solids content in a longer residence time thus generating more biogas for use in our microturbines. We are processing all of our spent yeast through the digester, whereas in Chico it is diverted for animal feed along with spent grain and hops.

PACKAGING
We’ve introduced several new types of packaging in the last few years to reduce weight, save material, and preserve the quality of our product. The first was a smaller, wraparound-style twelve-pack that hit the
market in early 2012. Our previous twelve-packs extended over the edge of the pallets which resulted in damaged and lost product during shipping and distribution. The smaller wraparound box fits within the pallet dimensions and also eliminated the need for cardboard dividers since the bottles were held more tightly together. This change yielded 243 pounds of weight loss per truckload, increasing fuel efficiency and allowing room for more beer on each truck.

The second packaging change was the launch of our Pale Ale and Torpedo® Extra IPA in cans in 2012. Both cans and bottles have excellent sustainability attributes: they are easily recyclable in most parts of the country and have high recycled content. Cans, however, do not break, making them more suitable for outdoor adventures and their lighter weight reduces transportation impacts.

Due to geographical constraints, shipping inefficiencies and the variety of bottles in the marketplace, a returnable bottle system is not feasible in the United States. However, draught beer sold in stainless steel kegs remains a very sustainable package. Kegs are infinitely reusable and refillable without degrading beer quality. Roughly 20% of our total packaging is in draught form. Remember your reusable cup to reduce your impact even further!

At both of our breweries and at the Torpedo Room, growlers are also available for drinkers to enjoy fresh beer without generating any waste.
RESOURCE RECOVERY

A strong resource recovery program addresses all three pillars of sustainability: environment (reducing energy and water consumption, releasing fewer greenhouse gases), society (creating cleaner air and water while creating jobs for the people who handle and process the materials), and economy (reducing utility costs while converting “waste” into a tradable commodity).

Sierra Nevada’s comprehensive waste diversion program diverts 99.8% of solid waste from the landfill. By following the mantra of “reduce, reuse, recycle, and reEarth (compost)” and integrating the closed loop philosophy, we hope to drive this number even closer to 100%.

For internal tracking, we remove spent grain from the diversion equation to better illustrate our resource recovery efforts. By volume, spent grain, hops and yeast constitute the majority of the material leaving our facility. After spent grain and yeast are removed from the equation, our diversion rate for 2014 was our highest yet at 95.3%.

REDUCE & REUSE

In the zero waste hierarchy, reuse comes after reduce, but they go hand in hand in creating less waste. Reusing materials not only generates less waste, but also consumes less energy and prevents more pollutants than recycling. Our creative reuse efforts include:

- Transporting the majority of our malt to the brewery via rail cars which eliminates thousands of super sacks from the supply chain and trucks on the road.
- Reusing packaging materials (bubble wrap, packing peanuts, etc.) from incoming shipments to ship outgoing merchandise from our Point of Sale Department. We also shred outdated or unusable case boxes to be used as an alternative packaging material instead of purchasing non-recyclable packing peanuts or bubble wrap.
- Rebuilding and reusing broken pallets.
- Sending empty bottle cap boxes to our local t-shirt vendor who then ships clothing for sale in our Gift Shop back to us in the boxes.
- Donating large grain sacks to local landscaping companies and buy-back recycling centers and burlap sacks to local beekeepers.

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<th>All weights in tons</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tr>
<td>Composted</td>
<td>503</td>
<td>691</td>
<td>950</td>
<td>1,070</td>
<td>1,205</td>
<td>1,182</td>
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<td>Other organics diversion*</td>
<td>30,782</td>
<td>33,772</td>
<td>38,974</td>
<td>49,503</td>
<td>50,604</td>
<td>45,228</td>
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<tr>
<td>Recycled</td>
<td>698</td>
<td>851</td>
<td>894</td>
<td>842</td>
<td>876</td>
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<tr>
<td>Landfilled</td>
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<td>163</td>
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<td>114</td>
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<td>Diversion from landfill</td>
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<td>99.8%</td>
<td>99.8%</td>
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<tr>
<td>Diversion from landfill w/o grain</td>
<td>87.8%</td>
<td>90.4%</td>
<td>94.4%</td>
<td>94.4%</td>
<td>95.0%</td>
<td>95.3%</td>
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*Other organics include spent grain that is used for cattle feed as well as wood that is chipped and used as a fuel source in a local biomass energy plant.
• Converting single-sided paper and unusable beer labels into notepads for both internal and consumer use.

• Reusing plastic liners from our bottle cap shipments as trash can liners throughout the brewery.

• Offering an employee classifieds system to find new homes for items or materials that the brewery no longer needs or can’t use (e.g. plastic sheeting from rail cars, barrels, wood, door knobs, etc.).

RECYCLE
The array of materials that we collect for recycling include (but are certainly not limited to): cardboard, shrink wrap, glass, scrap metal, wood, paper, and plastic strapping. One hundred percent of our spent grain is recovered and used as a protein-rich food supplement at cattle and dairy farms within 100 miles of each brewery. A small portion feeds the Sierra Nevada cattle that provide high quality, naturally raised beef for our Chico Pub.

To ensure the recycling program is effective, the Sustainability Department conducts regular audits on all trash, recycling and composting receptacles. Audits involve sorting materials, weighing them, and determining where improvement opportunities exist, which guide our department goals and initiatives.

REEARTH
In 2010, we installed a HotRot composting system at our Chico brewery. The HotRot is a large, in-vessel composter and was the first of its kind in the United States. Due to the lack of regional composting infrastructure, we invested in this state-of-the-art equipment to keep our organic wastes out of the landfill. We compost spent hops from the dry-hopping process, spent grain screened from our wastewater treatment plant, food waste and paper towels from employee break rooms, and all food waste and paper materials (pre- and post-consumer) from both the restaurant and concert venue.

In 2014, the HotRot converted 143 tons of food waste, 116 tons of hops and 48 tons of spent grain into compost. The finished compost provides a nutritious amendment for our onsite organic restaurant garden, hop field, and barley field.

In Mills River, we are fortunate to partner with a local composting company, Danny’s Dumpsters, for our composting needs. We then purchase compost from Danny’s for our landscaping needs which creates a closed loop for our materials.
CONSTRUCTION DIVERSION
As the Mills River brewery began to take shape, we started generating a great deal of construction debris. It took the collective effort of our project management team, the Sustainability Department, and the hundreds of contractors involved in the project to develop and implement our construction zero waste efforts. Through 2014, a whopping 4.6 MILLION pounds of material was diverted from the landfill, helping us achieve LEED credits for materials recovery and giving us a 79.3% diversion rate for the build.

ZERO WASTE CERTIFICATION
In 2013, Sierra Nevada became the first Platinum Zero Waste Facility certified by the US Zero Waste Business Council (USZWBC). The USZWBC certification is based on internationally accepted definitions of zero waste and focuses on the hierarchy of highest and best use for all materials. We chose this certification because of its comprehensive approach to zero waste, giving credit for upstream and downstream activities to eliminate waste before it occurs as well as leadership, employee education and closing the loop. Once construction is complete and we have one year of diversion data we will seek zero waste certification for our Mills River brewery.
TRANSPORTATION

Distributing and delivering beer from our breweries to store shelves is no small feat. We recognize the toll it takes on the environment and we’re doing what we can to minimize our impact. In fact, with growing markets outside of California and particularly on the East Coast, transportation was one of the driving forces behind the decision to build our second brewery.

Rail transport has proven to be a very efficient method of moving goods across the county. In 2009, we built a rail spur just two miles from the Chico brewery to transport malted barley to Chico instead of trucking it. Each rail car contains three to four truckloads of malt and multiple rail cars are moved on each train, making rail transportation significantly more efficient and cost effective than traditional truck transport. In 2014, we transferred 23,916 tons of malt through the Chico facility. We built an identical rail spur for the Mills River brewery five miles from the site.

Additionally, we ship finished product via intermodal transportation. We load trailers at our Chico facility and drive them to the closest rail line headed to the East Coast. In 2012, we shipped roughly 70% of our easterly bound beer by rail.

We operate a fleet of trucks to deliver beer throughout Northern California. To ensure we are using fuel efficiently, our trucks are never empty – always stopping to pick up glass and other packaging materials for the return trip back to the brewery. Hops from the Pacific Northwest are delivered to the brewery in trucks that are then loaded with beer for the return trip to Washington, eliminating empty trucks on the road. Our fleet is also equipped with the latest and cleanest technology to improve fleet miles per gallon, including fenders and flares, drag-reducing mud flaps and speed governors.

<table>
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<tr>
<th>Tons</th>
<th>Miles Traveled</th>
<th>Units</th>
<th>Rail Footprint (Metric Tons CO₂e)</th>
<th>Truck Footprint (Metric tons CO₂e)</th>
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<td>44,232</td>
<td>4,780,953</td>
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One of the trucks in Sierra Nevada’s fleet
ALTERNATIVE TRANSPORTATION

Biodiesel

In another effort to close the loop at our facility, we purchased a BioPro 190 in February 2008, to convert all used vegetable oil from our restaurant into biodiesel for use in our fleet of trucks and agricultural equipment. The processor converts 50-gallon batches of used vegetable oil into biodiesel in a 48-hour period. Although it provides only a fraction of the fuel we need to run our fleet, it utilizes 100% of a waste source that would otherwise be hauled off site. In 2014, we converted 2,850 gallons of used vegetable oil into biodiesel, bringing the lifetime total production of the unit to more than 13,950 gallons.

In Mills River, we are proud to work with a local company, Blue Ridge Biofuels, for our oil recycling and biodiesel needs.

Electric Vehicles

We provide free electric vehicle charging for all vendors, patrons, and employees at both of our breweries. If you find yourself in Chico or Mills River with an electric vehicle, know that you can charge it for free using solar power while you enjoy a meal in our Taproom! We’ve even purchased two electric vehicles for brewery use around Chico, and our sales team—spread across the country—use biodiesel or electric vehicles exclusively.

Bikes

Cycling is near and dear to our hearts at Sierra Nevada. In fact, Ken Grossman first discovered Chico while on a bike tour with friends across California and managed a bike shop before deciding to follow his passion for brewing. We encourage our employees to use all forms of alternative transportation through our Green Machine program, which incentivizes employees to carpool, skateboard, walk, use biodiesel or electric vehicles and, of course, ride their bikes to get to work or for errands. To help employees keep their bikes in good condition, we regularly bring in a bike mechanic to provide free bicycle maintenance and tune-ups. Inspired by one of our local natural food co-ops in Chico, we also designed and installed bicycle maintenance stations at each brewery made from old five-gallon kegs with a bike stand, tools and a pump for guests and employees.
OUR PEOPLE
EDUCATION
The success of our sustainability efforts rests on the continuing education of brewery employees. The sustainability team spends a great deal of time educating employees about sustainability issues, why they are so important to our company, and how employees can best contribute to meeting our goals.

Education takes place in a variety of ways including workshops, bulletin boards, monthly newsletter articles, touch screen displays of Key Performance Indicators, and tailored department trainings. All employees participate in new employee orientation that includes an overview of Sierra Nevada’s sustainability program presented by the sustainability team.

SUSTAINABLE LIFESTYLE SERIES
In 2014, we introduced a sustainable lifestyles series to help employees incorporate sustainable practices into their personal lives. Every month, we introduced a new topic in a variety of ways (newsletter articles, workshops, emails, hands-on activities, etc.) and solicited employee feedback on what they do in their personal lives to address the topic. Topics included energy, volunteering, food waste, composting, alternative transportation, farmer’s markets/gardening, recycling, purchasing habits, and water. We then created a booklet containing all the ideas and suggestions for employees to take home.

HOP — HEALTH OPPORTUNITY PROGRAM
Sierra Nevada’s Health Opportunity Program’s (HOP) mission is to increase awareness about health in our employees and their families and to provide services that support and promote healthy living. Employees who participate in a free annual health assessment are rewarded with reductions in their health insurance premiums. As of early 2015, 78% of employees participate in the program. HOP offers services and programs for injury prevention, ergonomics, massage therapy, nutrition, weight loss, fitness, tobacco cessation, substance abuse, and stress reduction. We believe that the program has steadily reduced health risks and improved employee wellness since its inception in 2008.

In June 2011, our wellness team replaced traditional break room vending machines with H.U.M.A.N (Helping Unite Mankind and Nutrition) machines that provide healthier and more nutritious options made by companies engaged in socially and environmentally responsible business practices. Employees can also now take free, onsite yoga, Pilates or Tai Chi classes to help reduce stress and encourage core strength – yes, it really works!

Free lunchtime yoga class
SAFETY
An important part of running a sustainable business is to make sure employees are safe in their workspaces and not exposed to hazards. To help employees identify the behavioral states that often lead to accidents and injuries, we introduced the SafeStart® program in 2012. SafeStart® trains employees to be aware of their work space and think critically about near misses, which often lead to more serious events. As a result of this heightened awareness our injury rate has decreased consistently over the past three years. As we continue to grow, we are putting a heavier focus on systematic safety programs and strengthening our safety culture.

EMPLOYEES GIVING BACK
Sierra Nevada employees take pride in giving back to the communities we call home through a variety of activities including adopting a sections of highway in Chico and Mills River, litter clean up and removal along our section of the French Broad River in Mills River, holiday gift drives for local foster child agencies, quarterly blood drives, and disaster relief fundraising.

COMMUNITY
It’s been said that it takes a village to raise a brewery. We consider the communities surrounding our breweries in both California and North Carolina, and everyone in between, to be extensions of our family. Without their support, we could never have achieved the success we have today. We’re proud to support various agencies and organizations with the goal of bettering our society, from sustainable agriculture, clean water and wildland protection to bicycle-related advocacy and events. We chose the Wild & Scenic Film Festival as our first national sponsorship in 2009 because of the incredibly powerful message the festival delivers and its promotion of environmental awareness to people across the nation. After the kick-off festival in Nevada City, California, this environmental film festival goes on tour across the country, benefitting numerous environmental organizations. In 2014, the festival reached more than 25,000 people at 140 events in the U.S.

Cycling remains central to founder Ken Grossman’s lifestyle and inspired our partnership with the Sea Otter Classic. Since 2004, we’ve proudly been the title sponsors.

Employees participating in a highway cleanup event
Wild and Scenic Film Festival, our first national sponsorship
beer sponsor for this iconic event in Monterey, California, that brings thousands of people together to celebrate the continued growth of bicycling across the country.

The Sustainability Department also works closely with local bicycle advocacy organizations in Chico and Mills River to promote the annual National Bike Challenge as well as to support efforts to bring new and improved community greenway infrastructures.

In 2009, we began experimenting with and building a solar-powered beer trailer for events to keep beer cold and showcase solar energy to event attendees. After many revisions, the trailer finally hit the road full time in 2011. The current design includes photovoltaic solar panels and a small hydrogen fuel cell back-up unit to keep beer cold if weather conditions prevent adequate solar production.

**BEER CAMP ACROSS AMERICA**

Sierra Nevada was a craft beer pioneer in 1980, and there are now more than 3,500 craft breweries in the United States! One of the strengths of our industry is the willingness to share knowledge and best practices and celebrate while doing it. We took this notion quite literally with our Beer Camp Across America (BCAA) Festival Tour in 2014.

BCAA was an unprecedented collaboration among Sierra Nevada and 12 other craft brewers to brew 12 collaborative beers and create the most ambitious 12-pack in the history of craft beer. All 12 beers were part of the ultimate variety pack which included two cans and 10 bottles. The thirteen breweries then embarked on an incredible three-week trip across the country, stopping to host seven beer festivals along the way. Every single craft brewer in the United States was invited to participate in at least one festival so they too could share their beer with the craft community.

The Beer Camp festivals were an amazing celebration of craft beer collaboration and were executed with zero waste in mind. At each festival, we partnered with local zero waste advocates to make sure we designed our festival to eliminate waste from the start. We then diverted as much material as possible from the landfill and accomplished at least 85% diversion at every single festival!
WORKING WITH OUR PEERS
Sustainability often results in a competition where everyone wins – our people, our products, and our environment. For those working in sustainability, we regularly find ourselves learning from each other’s successes and challenges and find inspiration in the work others are doing. Sustainability is an ongoing effort where one project opens the door for the next and drives everyone to keep doing more. For this reason, there is a great deal of sustainability sharing, not only in the craft brewing community but within industry in general.

Sierra Nevada has had a formal Sustainability Department since 2006, and has learned a lot along the way. We welcome several groups a year from across the state who are interested in learning from our experiences. The department also makes time for speaking engagements to share our lessons learned and hopefully inspire others to engage in similar efforts.

Sierra Nevada co-chairs the Brewer’s Association’s Sustainability Subcommittee, whose purpose is to bring sustainability tools and resources to the rest of the craft brewing community. The subcommittee has embarked on a benchmarking study to better understand the impacts the craft brewing industry has in regard to utilities consumption. This benchmarking work will lead to an online dashboard system for the industry to continue to track progress and share best management practices.

IN CLOSING
If we’ve learned anything in our 35-year history, it’s that we’ll never be done learning. Sierra Nevada is recognized as a pioneer in the craft beer industry. Our success has been driven by a passion for great beer, a fundamental appreciation for our environment, and a restless spirit that chases perfection. Sustaining our company also means sustaining our people and our places, as well as maintaining a business model that meets our needs now and into the future. The efforts outlined in this report are a summary of the past two years and we are proud to share them with you. There are already seeds being planted for the next report, but, until then, we hope to see you in Chico, Berkeley or Mills River on a tour, sharing a meal with friends or sipping a cold Pale Ale.

Thanks for reading!
Cheers,
Sierra Nevada Brewing Co. Sustainability Team
Sustainability@SierraNevada.com
RECOGNITION

2015 Sustainable Business of the Year
Sacramento Business Environmental Resource Center

2014 Corporate Energy Management Award-Region V
Association of Energy Engineers

2013 Platinum Zero Waste Business
U.S. Zero Waste Business Council

2013 Corporate Sustainability Award
NorCal Chapter of the Association of Energy Engineers

2012 Outstanding Closing the Loop Commitment
California Resource Recovery Association

2011 Gold Achievement Award - Organic Materials Reduction
U.S. Environmental Protection Agency

2001-2011 WRAP (Waste Reduction Award Program)
State of California

2010 Green Business of the Year
U.S. Environmental Protection Agency-Region 9

2010-2011 Most Cycle-Friendly Place to Work in Chico
City of Chico

2009 Sustainable Plant of the Year
Food Engineering Magazine

2009-2015 Bicycle-Friendly Business (Silver)
League of American Bicyclists

2008 Clean & Green Award
PG&E®, New California 100

2008 Flex Your Power℠ Award
State of California

2008 Zero Waste Achievement Award
California Resource Recovery Association

2008 Climate Action Champion Award
California Climate Action Registry

2005 Governor’s Environmental and Economic Leadership Award for Sustainable Practices
Governor of California