



NBB's Steps to Being Green

At New Belgium Brewing Company, we believe in: Environmental Stewardship: minimizing resource consumption, maximizing energy efficiency and recycling.

❖ **First wind powered brewery in the USA (largest in the world).** Since we became 100% wind powered in 1999 through a unanimous employee vote, we have purchased 6,622,398 kWh of wind energy and:

- ~ Saved 8,277,998 pounds of coal from burning.
- ~ Reduced CO2 emissions by 15,231,515 pounds.

(Dates reflect information gathered YTD August, 2002)

❖ **On-site process water treatment.**

~ In May of 2002 we finished construction on a "bio-digester" wastewater facility to treat all process water. This process generates reusable byproducts, such as methane and nutrient rich sludge, as it cleans the water. The methane will be used to fuel a co-generation plant and the sludge will be used as a soil builder. This will lower our BOD (biochemical oxygen demand) and TSS (total suspended solids) by 98%, making our water readily usable for non-potable processes and clean enough to discharge directly into either the groundwater or Poudre River. Water is an essential ingredient for our beer, as well as for the function of our brewery. Before this facility was built, we already consumed less than the norm of 1 bbl (brewer barrel) of beer to 8 bbl of water (we were 1:5). With the wastewater facility, we aim to lower that number even more (1:3 or less) by reusing the water for evaporative cooling, steam generation and cleaning.

❖ **Alternative light sources which include:**

~ *Sun tube lights.* These lights consist of a tube outfitted with a translucent dome on one end and an opaque dome on the other. The end with the clear dome sits atop the roof facing up towards the sun. The light gets captured into the dome and travels down the tube, which is lined with either copper or a reflective aluminum. What comes out through the opaque dome, which is facing downwards (suspended from the ceiling as with any light), is bright sunlight minus the heat. The opaque color of the dome inside the room effectively spreads the light instead of one direct stream. We use sun tubes in packaging, the warehouse, the bright beer cellar, the new brewhouse expansion and the control building for the process water treatment facility.

~ *Motion/Light sensor lights.* Much of the brewery uses this type of lighting to cut down on the amount of energy lost from lights being left on when no one is working in the area and when the natural light is bright enough for working conditions. We have these sensor lights in the warehouse, cold storage and throughout our office addition (offices, kitchen, bathrooms and employee lounge areas). We plan on retrofitting with sensor lights where applicable.

~ *Skylights and daylighting.* The sun is our primary source for daylighting. There are many large windows around the brewery, specially coated with a glaze that allows lots of sunlight into the room but minimizes the amount of glare and heat. We have also installed light shelves on some of the windows in our office areas. These shelves act as a reflector, bouncing the direct light of the sun onto the ceiling, thereby creating indirect sunlight, which is the most useful and pleasing type of light. We have also incorporated skylights in spaces where people do not work, such as hallways. We have included glass block panels on the floor of a second story hallway, which allows for sunlight to pass through and light a hallway directly beneath it during parts of the day.

❖ **Renewable heating and cooling systems which include:**

~ *Steam stack.* On the top of our brew kettle in the brewhouse we have a steam stack heat exchanger. As the brew kettle brings the wort to a boil, the steam is released and passed through a steel pipe. Inside this pipe is a coil filled with cool city water. As the steam passes over the coil, the water inside is heated to about 70°C and is then stored in a hot liquid tank. We use this hot water for all brewing and process needs, including CIP (cleaning in place).

~ *Wort chiller.* When we are finished brewing the wort in the brewhouse we pass it on to the fermentation cellar. However, before we can ferment the wort into beer, we have to chill it down to a cooler temperature as to not kill the yeast. To do this, we pass the wort through a plate and frame heat exchanger, which cools the wort and in return heats cool city water. This water is also stored in the hot liquid tank.

~ *Loading dock de-icer.* During the winter months we replace the water in our freon compressor with glycol. This glycol gets heated as a result of the compression process and is then cycled through a series of tubes under the warehouse loading docks. The heat from the glycol is enough to keep the docks free of ice.

~ *Natural draft cooling.* Capitalizing off the cold Colorado weather once more, we replace glycol-cooled air with naturally cold air in our cold storage unit during the wintertime. We plan on using this cooling method in future brewery expansions.

~ *Radiant floor heating.* In our tasting room we use radiant floor heating. Steam produced from a boiler (separate from the brew kettle) is passed through a series of tubes underneath the floor. The result is heat that can be kept at about 10° cooler than other forms of heating, such as forced air or radiators, and still maintain a comfortable temperature.

~ *Swamp cooling systems.* We have two swamp cooling systems, one for the office addition and one for the chilling system. In both cases, a fan blows outside air onto warm water, thus cooling the water. For the office addition, this colder water is used directly to cool the building. For the chilling system, the colder water is passed over coils containing hot ammonia, which once condensed cools glycol. The glycol is then used to maintain fermentation vessel temperatures.

~ *Co-generation.* The methane generated from the anaerobic digestion of our water treatment facility will be piped back to the brewery and used to fuel a co-generation plant. This engine will provide electricity to the brewery, allowing us to function off the grid for a few hours each day. It will also provide heat, which we will use to warm the water going back out the water treatment facility.

❖ **Recyclable and reusable which include:**

~ *Brewing by-products.* After we have finished lautering (straining) the mash, we have approximately 5500 lbs. of spent grain leftover. After the whirlpool, we have approximately 5 hl (hectoliters) of trub (protein, hop and spice solids) that we mix with the spent grain. We blow that mixture into a silo around the side of the building where we make it available for dairy farmers to buy as cattle feed. From the fermentation cellar we sell approximately 560 hl of yeast slurry (unusable yeast) per week also as cattle feed. Spent DE (diatomaceous earth, our filtration ingredient) is sent to a local organic farm for use as a soil amendment.

~ *Brewery-wide waste.* Our recycling/reusing program includes corrugated cardboard, cardboard tubes, co-mingled (aluminum, glass, tin and plastic bottles), Styrofoam, amber glass, plastic, paperboard, chipboard, stretch wrap, wood, wire, magazines, office paper and paper supplies, ink cartridges, computers, plastic bags, newspaper, malt bags, oil, steel, spent solvents, mercury and other similar recyclable hazardous materials, and is always being added to. All employees are encouraged to bring in their own recycling which cannot be picked up curbside. This is a perk many employees happily take advantage of.

~ *Cleaning products.* Many of the cleaners we use in the packaging area are citrus based. We also used water-based solvents. Many of our spent chemicals go through a neutralization process that breaks them down into salt and water.

❖ **Recycled, reused and friendly which include:**

~ *Office furniture.* We have supplied our offices with furniture from Studio Eg, consisting of compressed newspaper and woodchips, recycled tires and cardboard. Our carpet comes from Interface and is cradle to cradle (the contents are perpetually cycled in a closed loop so there is no landfill waste- this is NOT recycled PET plastic carpet) and our wall hangings are made from recycled and recyclable fibers and cellulose. We have also switched over most of our computer monitors to thin screens, which have less waste and less hazardous materials.

~ *Office supplies.* All the paper products we use are made from recycled material. This includes everything from office paper to toilet paper. We also have a commitment to donating our ink cartridges to local non-profits and children of employees who can redeem them for funds.

~ *Packaging materials.* Our bottles, mother cartons, chipboard dividers and 6 pack carriers all contain recycled material and are recyclable. The quality assurance camera used in our packaging area uses digital technology instead of the standard gamma ray.

~ *Groovy goods.* Most of the shirts we sell are Patagonia Beneficial T's which are made from organic cotton and use non-toxic dyes. In fact, New Belgium is the largest corporate consumer of organic cotton shirts from Patagonia (the largest supplier of blank organic cotton shirts) in the country. We are constantly exploring alternative fabrics and dyes, such as hemp shirts with clay dyes. January 2001 we introduced a handmade cookbook that is made from reused/recycled materials.

❖ **Made in the USA and local which include:**

~ *Brewery wide.* We depend on over 300 local, and many more regional, companies to supply us with the tools we need to run our day to day business operations in every department.

~ *Groovy goods.* We have a commitment to doing our best at purchasing through local providers and from companies that manufacture their goods in the USA (this is to avoid sweatshop labor) such as GoWest for T-shirt and banner printing and Belvedere Chocolates for the hand-made New Belgium Chocolates.

~ *Artwork.* All of our label artwork comes from a local watercolor artist named Anne Fitch. Anne was originally Kim and Jeff's neighbor in old town Fort Collins. Our in-house graphic design artist creates all of our other artwork. We use local printing companies and use recycled materials whenever possible.

Printed on tree-free old money paper.

Questions? Comments? Please contact Hillary Mizia at 970-221-0524