

Earth Day Austin

2022





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We're CarbonBetter, a minority-owned sustainability consulting and energy logistics firm headquartered in East Austin. We help companies align what's good for their businesses with what's good for our planet. To celebrate Earth Day 2022 in Austin, we reached out to other Austin businesses to take a step toward a net-zero future with us through participating in a free day of climate action. We believe that progress comes step by step; a series of distinct choices and small changes create large shifts. We intend for this inaugural Earth Day Austin 2022 Impact Report to be the start of a regular rhythm of action, spurring on changes in the way business leaders advance sustainability initiatives in their businesses and the communities they serve.

“We want to make climate action more accessible for our local business community through this Earth Day event, because every step in the right direction matters.”

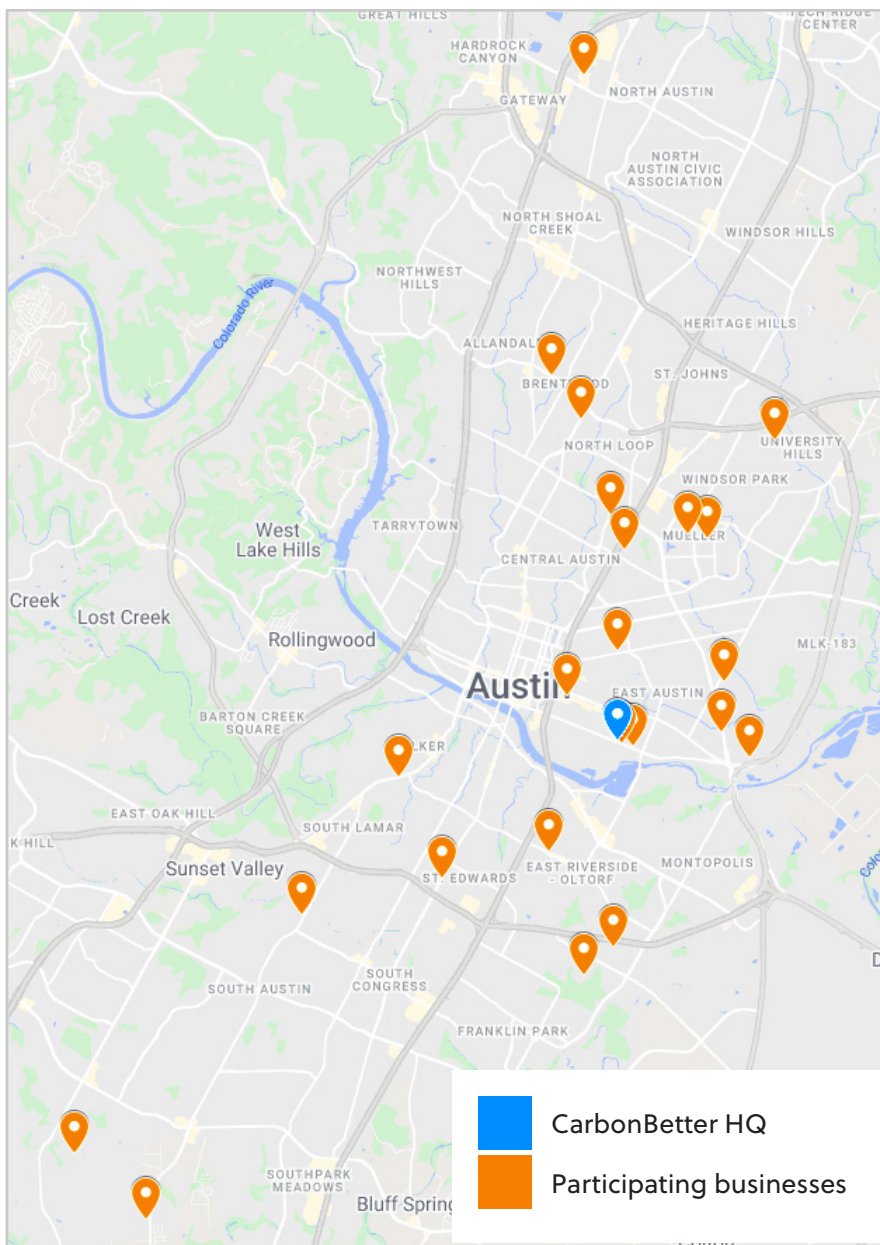
Tri Vo, Founder and President

Our goal for this day of climate action is to show that small steps by many add up to a big positive impact. We understand that while most businesses desire to be more sustainable and reduce their environmental impact, they may not have the right support. We're here to help. The CarbonBetter Climate Services team donated time and resources to estimate and offset the operational carbon footprint of participating Austin businesses for Earth Day, April 22, 2022, at no cost. In total, CarbonBetter measured and offset the carbon footprint of 29 local businesses that requested to join us on this annual endeavor. The carbon impacts of participating community businesses and the positive impacts made through carbon offsetting are summarized in this report. Together we can influence the societal shifts necessary to fight climate change, and it starts with this one day of action.

Participating Austin Businesses

Before we dive into the Earth Day Austin 2022 impacts, we want to highlight some of our participating businesses. Whether on their first steps towards being more sustainable or actively exploring options for continuous improvement, these businesses - and the way they're navigating sustainability in the context of a variety of industries - can inspire you to take action. Industries represented in Earth Day Austin 2022 include retail, manufacturing, consumer packaged goods, restaurants, bars, offices, breweries, and distilleries.

We are excited to share that 62% of participating businesses are actively taking steps to address sustainability in their business, and of those that were not already actively taking steps, 64% said it is important to them to do so, but that they need more information on where to start. We're excited to help these participants kick-start their sustainability journeys through Earth Day Austin 2022.



Of the businesses actively taking steps towards sustainability, 45% regularly employ waste and water reduction efforts, and they select partners with similar sustainability goals, while 48% regularly select sustainable packaging choices. We hope that this initiative will encourage more businesses to seek out guidance when needed to take those first steps towards sustainable business practices.

A list of the participating businesses can be found in the "All Participating Businesses" section of this report.

About CarbonBetter

CarbonBetter is a privately held firm specializing in energy logistics, sustainability and decarbonization services, and clean energy and carbon offset project consulting. We're a creative and diverse team tackling the complex climate challenges that are changing our world by helping organizations transition to a net-zero future—accelerating the societal shifts that will save our planet. We're proud to be a certified minority-owned business. Learn more at www.carbonbetter.com/about/.

62%

of participating businesses are actively taking steps towards sustainability

45%

of participating businesses employ waste & water reduction efforts & select partners with similar sustainability goals

48%

of participating businesses regularly select sustainable packaging choices

Our Carbon Footprint

→ UN Sustainable Development Goals

The United Nations (UN) has published seventeen Sustainable Development Goals (SDGs) as a call to action to meet the UN's 2030 Agenda for Sustainable Development goals. The Earth Day Austin 2022 day of climate action directly supports the following SDGs:



For participating businesses, we have quantified the carbon emissions from natural gas and electricity usage on April 22, 2022, producing a measurable, transparent, and traceable summary of the carbon impacts. Whether quantifying your impacts for a day or a year, we believe that carbon impacts and progress towards decarbonization should be shared in ways that reach your customers, competitors, and community. By sharing the carbon impacts of participating businesses and highlighting their successes, our goal is that the collective impacts will go beyond the numbers and enable participants to drive change.

There are many ways to calculate emissions, and there are a lot of assumptions and choices that you have to make. In whatever approach you choose, transparency and traceability are essential. To that end, we have documented the assumptions and key calculation inputs for Earth Day Austin 2022 herein. To facilitate quantifying carbon emissions across a range of business types and operations, assumptions were necessary to keep the process simple and efficient without creating too complex of a data-gathering task for participating businesses.

Calculation Approach

In order to quantify the impact of each participating business, we sent out a questionnaire to collect some basic information about their operations here in Austin. To do our calculations, we needed to know:

- What is the approximate square footage of their physical business space?
- Does the business use natural gas?
- What is the main type of business operation (food service, retail, etc.)?

In the absence of looking at every individual business's utility bills, we categorized each business space by square footage and "Principal Building Activity" according to the U.S. Energy Information Administration's (EIA) 2012 Commercial Buildings Energy Consumption Survey (CBECS)¹, and then used the survey's associated consumption rates for electricity and natural gas to determine the approximate consumption per day for each business.²

→ Carbon Emissions

Carbon dioxide (CO₂) that is produced and released into the atmosphere.



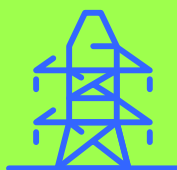
“If suitable compostable packaging was readily available at an affordable price, we would absolutely make the switch.”

Funky Mello



Scope 1

Direct emissions
from operations



Scope 2

Indirect emissions
from purchased energy



Scope 3

All other emissions
from operations

What's Included?

Greenhouse gas (GHG) emissions, in this case specifically carbon emissions, are grouped into Scopes. Scope 1 emissions are from direct combustion onsite and fleet vehicles. Scope 2 emissions are indirect emissions from purchased energy. Scope 3 emissions are all other sources of emissions, such as corporate travel and supply chain. When evaluating the climate impacts for Earth Day Austin 2022, we included Scope 1 GHG emissions from natural gas consumption and Scope 2 emissions from purchased electricity. To minimize the data gathering effort and the complexity of the calculations for participating businesses, we excluded fleet vehicles, combustion of fuels other than natural gas, and Scope 3 emissions sources.



“We are fortunate enough to work with partners that use recyclable products. This helps reduce waste and water usage. All of our machines are environmentally safe. The majority of the materials we use are recyclable. All of our goods sold are GMO, gluten, sulfite, and preservative-free. All of our drinks are made with real cane sugar with no added sugars included.”

Austin Daiquiri Factory

Calculating Scope 1 Emissions (Natural Gas)

In order to evaluate the approximate natural gas consumption of each business, we multiplied the square footage of the physical business space with the estimated natural gas energy intensity value - given in cubic feet per square foot - for that business's size and CBECS Principal Building Activity³ in order to get the total natural gas consumption for that space in cubic feet per year. Dividing the consumption per year value by 365 days then gave us the total natural gas consumption for that same space in a single day, reflective of April 22, 2022. We converted this value into British thermal units (Btu) per day using the April 2021 Texas natural gas heat content factor, 1,018 Btu per cubic foot, from the U.S. EIA's Heat Content of Natural Gas Deliveries to Consumers database.⁴ Using that single day value of natural gas consumption in Btu, we then calculated the amount of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) emissions using the emissions factors in kilograms (kg) per million Btu (mmBtu) from the Environmental Protection Agency's (EPA) April 2021 GHG Emission Factors Hub.⁵ We calculated the total amount of carbon dioxide equivalent (CO₂e) emissions by multiplying the CH₄ and N₂O emissions by their respective global warming potentials (GWP) and summing with the CO₂ emissions.⁶ Emissions factors used in our natural gas calculations are provided in the table below.

Natural Gas Emissions Factors and Calculation Inputs

Emissions Factor	Value
CO ₂ Emissions Factor	53.06 kg/mmBtu
CH ₄ Emissions Factor	0.001 kg/mmBtu
N ₂ O Emissions Factor	0.001 kg/mmBtu
CH ₄ GWP	25
N ₂ O GWP	298

The sum of the GHG emissions associated with natural gas consumption on Earth Day 2022 for all participating businesses totaled 900 kg of CO₂e which equates to 0.9 metric tons of CO₂e.



“We currently generate 90 pounds of cacao husks every month and we use some of it for our home garden, some for our friends and family to be used in their garden, and then whatever is left over goes to local farms.”

Madhu Chocolate



Calculating Scope 2 Emissions (Electricity)

To calculate the approximate electricity consumption of each business, we multiplied the square footage of the physical business space with the electricity energy intensity value - given in kilowatt-hours (kWh) per square foot - for that business's size and CBECS Principal Building Activity⁷ to get the total electricity consumption for that space in kWh per year. Dividing that value by 365 days then gave us the total electricity consumption for that same business in a single day. We converted this value into megawatt-hours (MWh) per day using the established conversion factor of 1,000 kWh per MWh. Using that single day value of electricity consumption in MWh, we then calculated the amount of CO₂e emissions using the Electric Reliability Council of Texas's (ERCOT) emission factor for CO₂e emissions, reported in kg per MWh, from the EPA's 2020 eGRID database.⁸ By multiplying the single day value of electricity consumption in MWh by the ERCOT emission factor - 372.874 kg of CO₂e emissions per MWh - we were then able to quantify the emissions per day and convert the results from kg to metric tons of CO₂e. The GHG emissions on Earth Day 2022 for all participating businesses from electricity usage totalled 2,480 kg of CO₂e which equates to 2.48 metric tons of CO₂e.

B.D.F.O.

“The biggest challenge we face right now in making our business more environmentally sustainable is the ease of access to verified, sustainable, and affordable manufacturing of our products. Things are changing for the better, which is encouraging, and it's rewarding to be an active part of this process.”

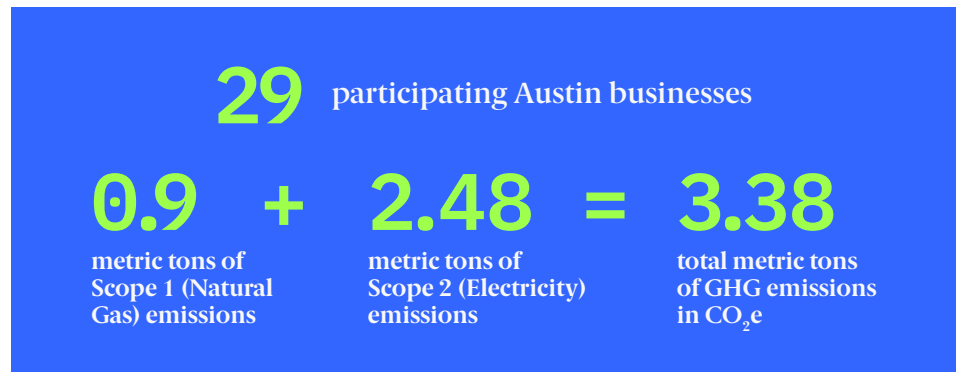
B.D.F.O. Lifestyle

→ Carbon Dioxide Equivalent (CO₂e)

A measure used to compare the emissions from greenhouse gases based on their global warming potentials by converting amounts of emissions from other gases to the equivalent amount of CO₂.

Total Earth Day Austin 2022 Carbon Impacts

In total, all participating Austin businesses emitted 2.48 metric tons of electricity-related GHG emissions and 0.9 metric tons of natural gas-related GHG emissions on Earth Day 2022, for a grand total of 3.38 metric tons of CO₂e. Since one carbon offset credit is equivalent to one metric ton of CO₂ emissions, that necessitated the purchase of 3.38 metric tons of carbon offset credits and direct removals to match the emissions of all participating Austin businesses.



To put these emissions into perspective, according to the EPA's Greenhouse Gas Equivalencies Calculator⁹, 3.38 metric tons of GHG emissions is equal to the amount of emissions produced by:



8,390 miles driven
by an average gasoline-powered passenger vehicle



3,740 pounds
of coal burned

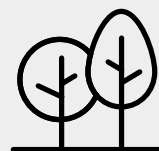


411,152 smartphones
charged

Through the purchase of carbon offset credits, those 3.38 metric tons of emissions have become equal to the amount of carbon captured by:



55.9 tree seedlings
grown for 10 years



4 acres
of U.S. forests in 1 year

Offsetting our Carbon Footprint

One of the most impactful and important ways to reduce carbon is to directly implement projects at your facility that reduce emissions. For a collaborative day of climate action like Earth Day Austin 2022, it would not be feasible to implement energy efficiency projects, improved equipment, or more efficient processes at the participating businesses.

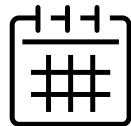
Another way to reduce carbon impacts is to indirectly reduce emissions through carbon offsets, also known as carbon credits. If you buy one carbon offset, you have essentially balanced out one metric ton of your carbon emissions. Credits are created by either carbon sequestration (capturing carbon from the environment and storing it) or carbon avoidance (preventing carbon from entering the environment). Offsets are meant to "reduce greenhouse gas (GHG) emissions, increase the storage of carbon, or enhance greenhouse gas removal from the atmosphere."¹⁰

Offsets can be purchased to offset Scope 1, 2, and 3 GHG emissions. They can address both direct and indirect emissions through global emission reductions from external projects and are generally part of an organization's long term plan to reduce emissions. Offsets are required to be real and verified by a third-party. It is important to note that offsets do not directly negate the original emissions source.

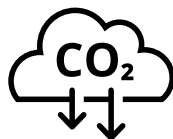
→ What is a Carbon Credit?



1 credit = **1 less metric ton** of greenhouse gasses in the atmosphere



Credits can be generated **immediately** after the project begins or **many years down the road**



Credits are an actual reduction or avoidance of greenhouse gas emissions from a **verified technology**



Projects can take place **anywhere in the world**

Carbon credits can be a tool to reach net-zero for carbon, which means you've balanced out all of your carbon emissions with the equivalent amount of carbon reductions. For Earth Day Austin 2022, participating businesses reached net-zero for a single day of operations through our offsetting efforts. It's important to note, not all carbon offsets are created equal. In selecting carbon credits for Earth Day, we gave consideration to a variety of factors, including the rigor of the registry that the carbon credit was issued on, project documentation, the vintage (year) of the carbon credit's issuance, the geographic location, and the co-benefits of the project (how it adds value beyond carbon reductions).

Selected Carbon Offset Projects

While it would have been ideal to choose carbon credits from projects close to home in Texas, we were limited to projects available on the marketplace from which we could purchase the appropriate volume of credits to match our Earth Day impacts. We wanted to invest in a diverse cross section of projects to fund exciting technologies with valuable co-benefits. We selected the following projects to offset the emissions from participating Austin businesses on Earth Day 2022:



1

Restoring Biodiverse Forests

The “CO₂OL Tropical Mix”^{III} project on the Gold Standard registry, with initial issuances of credits in 2014, is unique because it combines the production of high-quality hardwood timber and organic cacao with the sequestration of carbon via the reforestation of 7.5 million native trees. The process of combining traditional reforestation techniques with sustainable agricultural production is known as “agroforestry.”

Reforestation is difficult - in addition to funding the planting of trees, the trees have to actually be planted in the ground, be cared for and maintained, and someone has to ensure the trees grow and are not cut down. To address these challenges, the agroforestry model incentivizes communities to take care of planted trees while caring for crops the community relies on for income. Some benefits of the agroforestry model include increased crop yield and food security, and diversified ecosystems and tree products.

Benefits of Agroforestry



Increased crop yields and food security



Diversified agroecosystem and tree products



Product processing and value adding



The project's reforestation component earns carbon credits by stabilizing and rebuilding vulnerable and damaged habitats in Panama in an ecologically sustainable and scientifically supported manner. The reforested land also helps with water retention, which prevents flooding and soil erosion, provides shelter for migratory and native species, reduces the risk of pests and their associated insect-borne illnesses, and reduces the use of pesticides in the area, in addition to the direct carbon sequestration of the trees. Another important facet of this project is that 25% of the project area has been designated as a nature reserve, ensuring even stronger protections for the forest and the plants and animals that live there, including 15 threatened animal species from the International Union for Conservation of Nature (IUCN)'s Red List.¹²

This project provides year-round, steady work opportunities and income for both men and women in the areas of activity that enable the nearby communities' long-term growth. A mix of native shade species and cacao (*Theobroma cacao*) trees has been planted in parts of the project area. In addition to the cacao planting, agroforestry comes into play with this project through the planting of a non-native species, Teak (*Tectona grandis*), to create

sustainable and diverse forested areas with high-quality hardwoods for managed harvest that generate additional income outside of the carbon credit funding. The cacao and Teak production portions of this project help to alleviate poverty in the region while also providing vital education in forest management techniques that will enable the local community to continue farming cacao in a sustainable manner that will provide them with a stable source of income for years to come.





2

Pulling Pollution Out of the Air

While not a traditional carbon credit project generating certified offsets on a registry, Climeworks¹³ is leading the charge for direct air capture (DAC) of CO₂, a technology that pulls CO₂ molecules straight out of the atmosphere. Through Earth Day Austin 2022, we have invested in the removal of 500 kg of carbon from the atmosphere using Climeworks' innovative DAC technology. The purchase of this CO₂ removal helps Climeworks scale their technology to actively remove more excess CO₂ from the air, which helps fight climate change.

Climeworks launched Orca, the world's largest and first climate-positive DAC and storage plant in September 2021 in Iceland.¹⁴ Climeworks' DAC machines are completely supported by renewable energy or energy-from-waste, and they are made up of modular CO₂ collectors that can be stacked to create machines of any size, making them a viable option for any industry. According to an independent life cycle assessment conducted on the machines, at least 90 tons of CO₂ absorbed from the air by the machines are permanently eliminated, with only around 10 tons re-emitted on average.

Together in a two-step operation, their CO₂ collectors siphon out carbon dioxide from the surrounding air. A fan is used to draw air into the collector where CO₂ is captured on the surface of a highly selective filter material. Then after the filter material has absorbed all of the CO₂, the collector is closed and the temperature is raised to between 80 and 100 degrees Celsius, releasing the CO₂. Finally, the high-purity, highly concentrated CO₂ can be collected. Once the CO₂ has been collected, it is permanently and safely converted into stone via rapid mineralization, a natural reaction between CO₂ and basalt rock. By design, geological CO₂ storage is intended to be permanent. Through our investment in DAC removal by Climeworks, a portion of Austin's carbon footprint is being pulled from the atmosphere and turned to stone.

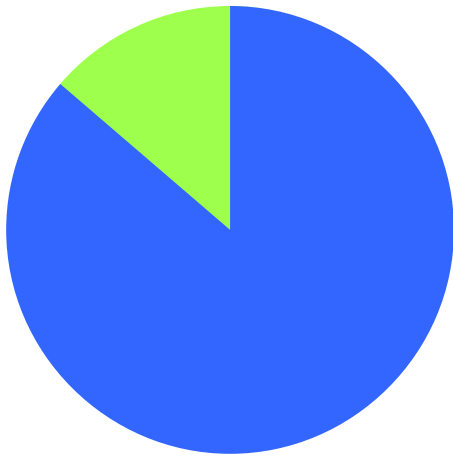
3 Supporting Access to Clean Water

The “TerraClear Ceramic Water Purifier Project in Lao PDR”¹⁵ is on the Gold Standard registry, and had initial issuances of credits in 2012. We picked this project because we learned the importance of having consistent access to safe drinking water here in Austin during Winter Storm Uri in February 2021. Due to much of our infrastructure being designed for the Texas heat and not the bitter cold, we faced issues with potential contamination of the water supply as well as many people remaining without access to any water at all for days due to broken pipes. Experiencing first hand how scary it felt to be without access to safe drinking water, we felt compelled to support a project that addresses that daily reality for over half a million people, and gives them the opportunity to survive and thrive - an important co-benefit that goes beyond the carbon impacts of the project.



A significant report published by the Lao Statistics Bureau and UNICEF in 2018 indicated that 86.3% of people in the Lao People's Democratic Republic (PDR) have *E. coli* in their household drinking water¹⁶, a bacteria that increases the risk of diarrhea and other extraintestinal diseases. Although a large majority of the population boils water with wood or charcoal to make it safe to drink, many families cannot afford the time to gather firewood nor the price of charcoal, so they continue to drink contaminated water.

In the first phase of the project, between June 2012 and July 2019, the company TerraClear stepped in to address the problem of limited access to safe, clean drinking water by selling and distributing their Lao Ceramic Water Purifier (CWP) to 70,181 households. The CWPs are produced in Lao PDR and create sustainable job opportunities for the local industry. Through the installation of water filtration devices via this project, approximately half a million people now have access to safe drinking water!



86.3

percentage of residents of
Lao PDR with *E. coli* in their
household drinking water

Overall, this project has aided in the reduction of sickness and mortality in children and adults, the improvement in youth attendance at school, and the increase in adult productivity in the region. In tandem with the human health co-benefit of this project, the installation of these filters reduces carbon emissions by lowering the demand for non-renewable biomass, such as wood or charcoal, to boil water as a form of treatment.



Water filters sold and distributed to households:

70,181



0.5

million lives impacted



4 *Keeping Plastic Out of Landfills*

The "Greentech's Emissions Reductions from PET Recycling, Romania"¹⁷ project is on the Gold Standard registry, and had initial issuances of credits in 2020. This project is the first project in Europe to apply verified carbon credit methodologies for Polyethylene Terephthalate (PET) recycling. The recycling operation minimizes GHG emissions that would otherwise be produced during the manufacture of virgin plastic products. Recycling PET instead of making new plastic reduces the manufacturing process' overall energy use and GHG emissions, as well as the environmental impact of natural resource exploitation for raw materials. PET recycling also cuts down on the total volume of plastic waste disposed of in landfills each year. Through this project, PET fiber, a synthetic fiber commonly known as "polyester," is made from recycled PET and is utilized in a variety of industries, including the automotive and hygiene industries.

Increasing our global capacity to recycle plastic is an essential component of our fight against climate change. According to a comprehensive study by The Pew Charitable Trusts and SYSTEMIQ entitled "Breaking the Plastic Wave," a staggering 40% of today's worldwide plastic waste winds up in the environment.¹⁸ The good news is that, according to that same report, industry leaders and governments are rapidly gaining access to solutions that would reduce annual land-based plastic leakage into the ocean by around 80% below the estimated business-as-usual scenario by 2040. This project is just one of the numerous ways that businesses can help the environment by lowering their carbon footprint and the quantity of plastic waste they produce.

Co-benefits of the project include important economic and social contributions to the local community, such as job creation and improved working conditions, increased workplace gender equality as women are promoted into managerial positions, and access to environmental management and recycling training classes.

All Participating Businesses



www.austindaiquirifactory.com

B.D.F.O.

www.bdfolifestyle.com



www.bentopicnic.com

book.woman

www.ebookwoman.com



www.brentwoodsocial.com

Café Crème

www.cafecremaustin.com



www.canworksprinting.com



www.carbonbetter.com



www.classicchildhood.com



www.countercultureaustin.com



www.crankygrannys.com



www.cubbiekit.com

FIERCE WHISKERS
DISTILLERY

www.fiercewhiskers.com

FRIED HUSTLE

www.friedhustle.com



www.funkymello.com

All Participating Businesses (Continued)



<https://independencebarber.com>

!INTEGRATE
Agency

www.integrateagency.com



www.juaninamillion.com



www.lemeals.net



www.madhuchocolate.com

Naturally
AUSTIN

www.naturallyaustin.org



www.natureshiddentreasures.com



www.oval.bio

patika

www.patikacoffee.com



www.socialjusticejewelry.com

taste of
Ethiopia
BE AUTHENTIC

www.tasteofethiopiaaustin.com

THE LITTLE
GAY SHOP

www.thelittlegayshop.com



www.tsodelivery.com

*We asked if each business would like to remain anonymous; therefore, this list is reflective of businesses who wished to be included by name in our report.

Looking Ahead

While measuring, reducing, and offsetting business emissions is essential for delivering proven results that mitigate climate change, no step in the right direction is too small. In just one day of climate action, 29 Austin businesses came together to offset over three metric tons of GHG emissions from operations on April 22, 2022. In doing so, these businesses funded four meaningful carbon offset projects around the world!

Involvement in our Earth Day Austin 2022 Impacts Report is just one way the local business community is advancing solutions to fight climate change. Participating companies shared that they are routinely considering the climate impacts of their decisions related to materials, packaging, manufacturing, and operations, and steps toward sustainability in all of these areas make a real difference. CarbonBetter helps clients of all sizes and at every stage of their sustainability journey make decisions like these, always celebrating and sharing progress over perfection.

The CarbonBetter team is already looking forward to Earth Day Austin 2023 to help even more local businesses reach net-zero for Earth Day, because every small step in the right direction helps create the societal shifts that will save our planet.



Want to be in this report next year?

Join the interest list for the Earth Day Austin 2023 report.

<https://carbonbetter.com/earthday2023>

→ Footnotes

¹ <https://www.eia.gov/consumption/commercial/data/2012/index.php?view=consumption>

² For any businesses less than 1,000 square feet in size, we used the natural gas and electricity energy intensity values from the 1,001 to 10,000 square feet range as a surrogate.

³ <https://www.eia.gov/consumption/commercial/data/2012/index.php?view=consumption>

⁴ https://www.eia.gov/dnav/ng/hist/nga_epg0_vgth_stx_btucfM.htm

⁵ <https://www.epa.gov/climateleadership/ghg-emission-factors-hub>

⁶ <https://www.epa.gov/climateleadership/ghg-emission-factors-hub>

⁷ <https://www.eia.gov/consumption/commercial/data/2012/index.php?view=consumption>

⁸ <https://www.epa.gov/egrid/download-data>

⁹ <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

¹⁰ <https://ghgprotocol.org/standards/project-protocol>

¹¹ <https://registry.goldstandard.org/projects/details/1796>

¹² <https://www.iucnredlist.org/>

¹³ <https://climeworks.com/>

¹⁴ <https://climeworks.com/roadmap/orca>

¹⁵ <https://registry.goldstandard.org/projects/details/323>

¹⁶ <https://www.unicef.org/laos/reports/lao-social-indicator-survey-lsis-2017>

¹⁷ <https://registry.goldstandard.org/projects/details/1640>

¹⁸ https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave_report.pdf