



SUSTAINABLE BUILDINGS

Buildings in Austin are responsible for about 50% of our emissions. Currently, the majority of those emissions come from electricity consumption in buildings. Since our electricity is becoming increasingly cleaner through Austin Energy's transition to renewables, additional strides can be made by reducing emissions associated with the natural gas sector, addressing refrigerants, and more sustainably managing construction materials. Additionally, energy efficiency incentives and easy access to utility data continue to be powerful tools in reducing energy burden — the percentage of household income that goes toward energy costs — making them key to achieving equity.⁴⁴

A key area of addressing climate change is how we manage refrigerants. Globally, and especially in warm climates like Austin, refrigerants have played a critical role in modern life by enabling the comforts of air conditioning and refrigeration. Unfortunately, they are a significant part of our carbon footprint and have between 1,000 and 9,000 times the global warming potential of CO₂. According to Project Drawdown, refrigerant management and alternative refrigerants are among the top strategies we can use to reverse global warming successfully.⁴⁵ This is an area that Austin has yet to address.

Globally, when operational and embodied carbon from building materials and construction are taken into account, buildings are responsible for nearly 40% of global emissions. While operational emissions have been the largest area of focus in climate planning, embodied carbon accounts for about 11% of global emissions from buildings. As operational carbon decreases, the relative impact of embodied carbon will become larger.⁴⁶ For perspective, the embodied carbon in a home can be equivalent to up to 15 years of operating the home, and for commercial buildings, it can be upwards of 30 years.^{47, 48, 49} Using lower carbon materials can often come at lower or no additional cost, making this an important and accessible strategy — particularly when evaluated through a lifecycle lens.⁵⁰

Improving our buildings isn't just about reducing greenhouse gas emissions. Since Americans spend nearly 90% of their time indoors, it's important to consider the public health impacts of our interior surroundings.⁵¹ The materials we use to paint, furnish, and clean our homes and the appliances we use, such as natural gas stoves, can negatively impact indoor air quality.^{52, 53, 54, 55, 56, 57, 58} Additionally, because of efforts to seal building envelopes for energy savings, indoor air is often two to five times more polluted than outdoor air.⁵⁹ The COVID-19 pandemic has made us very aware that ensuring safe and healthy indoor air quality in buildings is an important part of public health. As we advocate for selecting low-carbon materials and more efficient appliances, we should also consider their impacts on human health.

It's also important to consider reducing energy and water costs in our community. In Austin and across the nation, income disparities are largely tied to race, illustrating the need to address racial equity by focusing on lowering energy costs. In Texas, low-income customers spend an average of 10% of their income on energy, compared to 3% for non-low-income households.⁶⁰ In addition to making recommendations to reduce energy use and burden, this plan also collaborated with water stakeholders to evaluate ways to further embed equity into water conservation strategies and

evaluate water's role in reducing emissions. We also want to ensure that we expand building improvement jobs to low-income communities and communities of color to strengthen opportunities for our local workforce. We recognize that buildings are part of a larger urban ecosystem and that alignment and collaboration with transportation, land use, and natural systems will ensure sustainable development.

Community Feedback

In ambassador-led conversations, participants referred to buildings as the homes, cultural spaces, and centers that make up neighborhoods and communities. Concerns noted the loss of culture because of the changes in neighborhood demographics. Specifically, the loss of Black-owned businesses, neglect of community spaces previously frequented and celebrated by the Black community and the ongoing threat of continued loss were discussed.

Participants noted that sustainable buildings present an opportunity to reduce utility costs and create a healthier environment through clean, renewable energy. However, these spaces should remain inclusive and accessible to all, and particular attention should be placed on ensuring that communities of color see themselves represented in them. Climate and buildings discussions can often veer into technical detail, but on a fundamental level, buildings are the spaces that people live, learn and congregate in, and they should represent community needs and perspectives.

Winter Storm Uri

In February 2021, the Austin community experienced the devastating effects of Winter Storm Uri. Across the state of Texas, this storm led to approximately 4.5 million electricity customers losing power, 12 million customers receiving a “boil water” notice, and as many as 700 deaths⁶¹. While this storm highlighted the vulnerability of the electricity grid to extreme weather and the importance of weatherization of generation facilities, it also highlighted the deep inequities that exist at the building level. Neighborhoods that were not located near critical facilities were more likely to lose power, and homes with poor insulation became uninhabitable more quickly. This event served as yet another reminder that constructing and renovating homes and buildings to be more climate-resilient is vital to addressing equity.

Austin Energy Resource, Generation, and Climate Protection Plan to 2030

The [Austin Energy Resource Plan](#) commits the utility to provide affordable, dependable, and safe electricity service to residents and businesses while pursuing the City's climate change and sustainability goals, including the Austin Climate Emergency Resolution. Austin Energy will maintain an energy supply portfolio sufficient to meet customer demand while eliminating emissions from its electric generation facilities as rapidly as feasible within the limitations set by the Austin City Council.

Austin Energy commits to providing access to the benefits of this 2030 Plan for low-income communities and communities of color.

When the goals and strategies outlined in the Austin Energy Resource Plan are implemented, we will reduce our current community-wide greenhouse gas emissions 29%, or 3.7 million metric tons by 2030.

The plan calls for:

- 93% carbon-free generation by 2030, 100% by 2035
- 1,200 megawatts (MW) of conservation, including 225 MW of peak capacity
- 1% of retail sales per year in energy efficiency savings, at least 25,000 customer participants annually, 25% limited-income
- 375 MW of local solar, 200 MW of customer-sited solar
 - Expand shared solar
 - Provide moderate and limited-income customers preferential access to community solar
- 40 MW of local thermal storage
- Commitment to equity evaluation for programs



GOAL 1:

By 2030, achieve net-zero carbon* for all new buildings and reduce emissions by 25% for existing buildings while lowering all natural gas-related emissions by 30%.

**For this goal, net-zero carbon implies operational carbon, which refers to the CO₂ emitted from operations, such as lighting and heating, during the in-use phase of a building. A net-zero operational carbon building is highly efficient and entirely powered by on- or off-site renewable energy.*

Strategy 1: Ensure benefits flow to low-income communities and communities of color

Pursue a comprehensive energy poverty mitigation strategy by partnering with trusted community organizations, affordable housing developers, and schools in equitable outreach and program development. Programs should focus on energy burden reduction, improved air quality, neighborhood resilience during extreme weather, and increased passive survivability of buildings. This will ensure that the benefits of repair, energy conservation, and renewable energy incentives and programs flow to low-income communities and communities of color.

What is passive survivability?

Passive survivability refers to a building's ability to maintain critical life-support conditions in the event of extended loss of power, heating fuel, or water.

How we'll get there:

- Create partnerships and work with any future Community Climate Ambassador cohorts to gain feedback and insights on improving program accessibility. Support and expand upon existing low-income weatherization programs.
- Support and collaborate on initiatives to advance neighborhood preparedness efforts and share resources on repair and recovery programs. Educate property managers and tenants on the benefits of weatherization and how to maintain building operations during disaster events.

- Ensure a City cross-departmental approach that also emphasizes partnerships with green infrastructure stakeholders to ensure trees and greenery are utilized and placed strategically to shade buildings and help further conservation.
- Encourage reducing impervious cover and shading for infrastructure such as benches, public transportation facilities, public water fountains, and charging stations to ease the urban heat island effect and reduce heat impacts on residents.
- Mitigate increased utility costs to households and small businesses to ensure that decarbonization does not disproportionately affect low-income communities. Prioritize low-income communities and communities of color while distributing incentives to address energy burden.
- Collaborate with resilience planning processes to focus on neighborhoods that disproportionately experience extreme heat, flooding, blackouts, and other climate-related emergencies.

Strategy 2: Enhance understanding of energy consumption

Enhance resident and building owner understanding of energy savings opportunities, benefits, and climate impacts of energy consumption. This will be done through direct outreach, culturally relevant communications, expanding benchmarking requirements for all existing buildings, and better access to energy and water data.

How we'll get there:

- Expand information access for utility consumption through billing systems, mobile and web applications, and reporting requirements. Create streamlined processes for building owners to access whole-building utility data to support energy and water reduction goals.
- Focus on opportunities to partner with affordable housing and multi-family properties and better expand information access to low-income customers.
- Create workforce development and training opportunities for students of color in schools and universities.
- Collaborate with schools, youth-serving, and youth-led organizations to integrate energy education within the curriculum and planned activities.
- Evaluate ways in which automated communications systems can help facilitate data sharing and communication during disasters.

Strategy 3: Achieve energy-efficient, net-zero carbon buildings

Achieve goal milestones for net-zero carbon buildings through new building energy codes, amendments, and other methods. Engage owners and operators of existing buildings to decarbonize through incentives and education for contractors and occupants. Collaborate with local utilities to implement equitable emission reduction strategies.

How we'll get there:

- For new construction and major building renovations, incentives, education, or code amendments will enable a high level of energy efficiency, building systems and appliance electrification, peak-load shifting, microgrids, and distributed generation.
- Energy efficiency will be a primary strategy for existing buildings to help reduce energy burden and greenhouse gas emissions, complemented by grid stabilization and equitable rate structures. On-site renewable energy, reducing energy demand, smart building technologies, gas-to-electric equipment replacement, and other natural gas emissions reduction measures will further decarbonize existing buildings.
- Equitable natural gas emission reduction strategies may include but are not limited to renewable natural gas, expanded energy efficiency programs, system leak detection and reduction, and other new technologies and programs.
- Offer incentives to HVAC and water heater distributors and retailers that make lower-carbon options like heat pumps and heat pump water heaters the cheapest options without additional paperwork burden on consumers and business owners.
- Ensure all new programs are created with equity principles, are guided by community input, and value cultural differences. Collaborate with affordable housing developers, public-serving entities, and small businesses to prioritize net-zero carbon buildings in low-income communities and communities of color. Pursue ways to expand energy services, such as weatherization, to best serve all multi-family residents.

Strategy 4: Ensure equitable workforce development for emerging technologies

Prioritize investment in local emissions reduction and create equitable workforce development and training opportunities for emerging technologies by partnering with local unions, education, and advocacy organizations that serve low-income communities and communities of color. Increasing these opportunities can positively impact families, aid in relationship building, and support community capacity to drive decision-making in future projects and programs.

How we'll get there:

- Develop workforce opportunities by partnering with local universities and schools, such as Huston-Tillotson University, Austin Community College, Texas State Technical College, and the Career and Technical Education Program at Austin Independent School District, as well as local unions and advocacy organizations.
- Pursue partnerships and support from local clean technology companies to help create internship, apprenticeship, training, and employment opportunities for individuals.
- Expand repair programs that serve residents most in need, such as the elderly and those with disabilities, by increasing workforce and organizational capacity. Programs should ensure the health, habitability, and compliance of affordable housing and multi-family units.
- Consider scholarships to help with training for low-income communities.

- For affordable housing and other properties that are City-owned, operated, or funded, create or participate in a local or state bulk purchasing program. This will help secure volume price discounts on lower-carbon technologies, such as heat pumps, heat pump water heaters, solar photovoltaic and solar thermal systems, battery storage systems, etc. Explore opportunities with suppliers to pass on discounted pricing to area residents and businesses.



GOAL 2:

By 2030, reduce community-wide greenhouse gas emissions from refrigerant leakage by 25%.

Strategy 1: Capture and destroy old refrigerants

Develop a refrigerant destruction program that places a price on older high ozone-depleting substances and global warming potential (GWP) refrigerants. The program could be run by the City or a contractor and would increase the capture of old refrigerants and safely destroy harmful gases.

How we'll get there:

- Examine the feasibility of designing and deploying the program.
- Explore similar programs in other cities and determine potential funding opportunities.

"[We should] implement special programs for Black, Indigenous and people of color-owned businesses that may want to renovate to make their buildings more sustainable."

– Austin community member

Strategy 2: Improve building codes to encourage cleaner refrigerants

Closely follow developments in revised building codes that allow the use of low and no GWP refrigerants, such as California's state building code changes and U.S. Green Building Council® policies, and move forward with code amendments and other local action as soon as feasible.

How we'll get there:

- In the meantime, partner with organizations that are innovators in low to no GWP refrigerants and highlight successes in marketing efforts.
- Leverage any market trends to stimulate voluntary action.

Strategy 3: Create incentives for leak detection and repair

Partner with grocery stores, convenience stores, restaurants, restaurant supply companies, refrigerated warehouses, and HVAC tune-up and repair companies to create an incentive for

designing and tracking refrigerant leak detection, prevention, and repair. Regularly maintaining units and repairing leaks can help prevent leakage during disasters such as flooding and windstorms.

How we'll get there:

- Ensure incentives can engage a diversity of sectors and business sizes in participation.
- Prioritize outreach and program development to support local, small businesses owned by people of color.

Strategy 4: Awareness and training for HVAC service providers

Create an awareness, education, and training campaign for local HVAC service providers, building owners, operators, inspectors, and maintenance leads on the importance of refrigerant management and strategies for leak detection, prevention, and repair.

How we'll get there:

- Ensure training and education are provided in multiple languages and are accessible to workers of color in this industry.
- Approach stakeholders with empathy and emphasize the importance and benefits of this work.
- Lead by example by implementing a refrigerant leak detection, prevention, and repair program at City-owned facilities.

Strategy 5: Reduce the volume of refrigerants

Emphasize the link between design and refrigerant use by reducing and preventing the use of refrigerants to the extent possible, particularly those with high GWP.

How we'll get there:

- Ensure codes and incentives that favor passive design, reduction, and efficiency are expanded and prioritized.
- Educate stakeholders on best practices for and highlight examples in culturally inclusive marketing and communications.



GOAL 3:

By 2030, reduce the embodied carbon footprint of building materials used in local construction by 40% from a 2020 baseline*.

**The embodied carbon associated with the construction and materials must not exceed 500 kg CO₂e/m² (~100 lbs CO₂e/sf) per project.*

Strategy 1: Lead by example through design and construction standards

In partnership with other cities and states, develop City of Austin design and construction specifications and purchasing agreements to result in healthy, low-carbon buildings.

How we'll get there:

- For example, encourage lower-carbon building materials, whole-building lifecycle analysis, healthy building certifications, and building reuse and deconstruction in City-funded projects. Purchasing policies should be structured to promote building product transparency and preferred outcomes.
- Ensure healthy building strategies and certifications are prioritized in community centers, libraries, and other community facilities serving low-income communities and communities of color first.
- Employ circular design strategies to ensure building and building material longevity, such as designing for a building's durability, deconstruction and potential future uses.

What is embodied carbon?

The embodied carbon of a building represents all the emissions associated with its lifecycle, including extraction, manufacturing, transport, construction and maintenance, demolition and disposal or reuse of materials.

Strategy 2: Incentivize lower-carbon materials

Enhance and integrate lower-carbon building materials and deconstruction practices into City incentive programs, like the expedited permitting process and Austin Energy's Green Building program, to transition voluntary design guidance into planning and development agreements over time.

How we'll get there:

- Develop an embodied carbon baseline to measure success effectively. Since this is a new initiative, education and actionable information about the embodied carbon of local building materials are under development. A push for transparency and gathering more information is the important first step.
- Consider feasibility and cost to determine the most effective pathways to stimulate voluntary action.
- In addition to low-carbon materials, consider ways to incentivize design for durability and plans that include material capture for recycling and reuse. Consider the health impacts of toxic and hazardous materials, particularly during natural disasters.
- Invest in culturally relevant marketing to highlight success cases and drive participation.

Strategy 3: Educate stakeholders on materials best practices

Create a performance framework and educational programming for industry professionals and the general public, focusing on low-income communities and communities of color, to reduce the lifecycle and negative health impacts of building materials and construction practices.

How we'll get there:

Provide resources that address and help mitigate the health impact of materials from the point of extraction to operation, including the availability of environmental and health product declarations. Environmental Product Declarations can help ensure the health of people exposed to material extraction, manufacturing, and lifecycle processes. Health Product Declarations focus on the transparency and reporting of harmful ingredients used in building products. Both declarations work to protect communities at different potential points of exposure and empower decision-makers to select better products proven to push the industry to cleaner and more transparent processes and products.

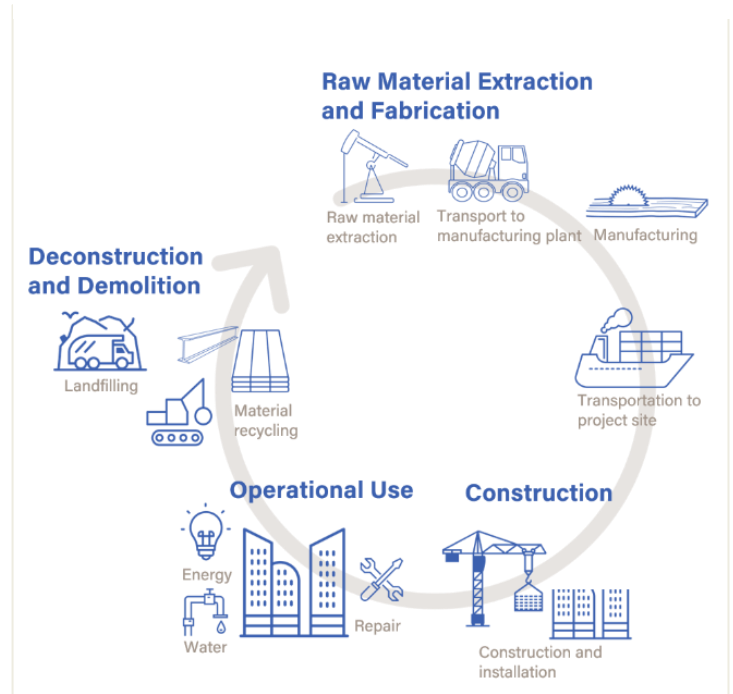
Strategy 4: Stimulate decarbonization with local producers

Prioritize partnerships within local materials markets to decarbonize high-impact materials, specifically: glass, steel, aluminum, concrete, drywall, insulation, and carpet.

How we'll get there:

- Leverage and align with existing local and national efforts to create equitable outcomes in materials decarbonization and look for opportunities for coworking and collaboration among businesses.
- Encourage the growth of local businesses that can create building materials from current construction, manufacturing, and municipal sources.

The Lifecycle of a Building



GOAL 4:

By 2030, equitably achieve a community-wide water demand of approximately 152,000 acre-feet per year by implementing strategies in the Water Forward Plan.



Water Forward

Water Forward, Austin Water's Council-approved 100-Year Integrated Water Resource Plan, contains near- and long-term strategies to increase water conservation and reuse, provide drought resiliency and protect our core Colorado River supplies. The 2030 goal listed above is based on

Water Forward's 2020 and 2040 water demand goals. The Climate Equity Plan's water strategies support the equitable implementation of the Water Forward Plan.

Austin Water also has existing programs that address water conservation in residential areas, specifically around high water users. These include conservation-oriented tiered water rates, proactive outreach to high water use neighborhoods, free irrigation audits, and information about wastewater averaging season.

One acre-foot equals about 326,000 gallons, or enough water to cover an acre of land, about the size of a football field, one foot deep.

Strategy 1: Engage residents in water efficiency technological transitions, and conservation programs

Enhance community engagement strategies and create partnerships with community organizations to advance equity through Water Forward strategies, including [My ATX Water](#) (Advanced Metering Infrastructure), incentives, and ordinances.

How we'll get there:

- Collect, analyze and respond to demographic data on incentive program participation.
- Gather input on program experience, including low-income residents' experience with My ATX Water.
- Discuss the benefits of automated tracking systems in helping with leak awareness and insurance claims during disaster events.
- Develop and implement targeted outreach efforts to enhance water conservation program participation, collect input, and better engage residents in decision-making processes.

Strategy 2: Evaluate water conservation, customer assistance, and workforce development program participation criteria

Evaluate program criteria to identify opportunities to address structural barriers that prevent program participation. Collaborate with City departments and community organizations to explore strategies to expand enrollment in the Customer Assistance Program and increase participation in other programs serving low-income customers.

How we'll get there:

- Undertake equity assessments of program design to identify and recommend strategies to extend eligibility to multi-family properties, modify existing leak repair programs, streamline application processes and increase outreach to qualified customers not currently enrolled in these programs.

- Create partnerships across City departments and with community organizations to enhance workforce development opportunities in water and green jobs.

Strategy 3: Reduce emissions at the water-energy nexus

Assess how water demand reduction is associated with energy consumption in residential and commercial buildings and Austin Water facilities. Identify and pursue synergistic water conservation and energy management optimization efforts through programs and partnerships.

How we'll get there:

- Complete an evaluation of energy usage across Austin Water facilities and develop a plan to reduce usage spikes and decrease demand.
- Develop methodologies to quantify how customer reduction in water demand also reduces the City's energy usage and related emissions.



At the Mueller HEB, an innovative propane refrigeration system with zero ozone depletion potential and very low global warming potential allows for 95% less refrigerant than conventional systems. (AEGB 4-Star Rating and LEED® Gold Certification) Photo: Ray Briggs