

Editor's Note: This report was prepared before the IPCC released the first part of its Sixth Assessment Report on August 9.

That report only adds to the urgency of the students' recommendations!

Build Sustainably — for Business Success and a Livable Future

August 2021

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Introduction

Developers have the potential to guide some of the most influential changes to reduce climate change. LEED-certified buildings create an 8–10% increase in asset value and increase occupancy rates, so not only are these projects good for communities and the planet, they have a higher return on investment as well.

Buildings account for 50% of city greenhouse gas emissions in Bethlehem. With the upkeep and management of buildings representing such a large share of emissions, it means there is great potential for innovative approaches and technologies. In the coming decades, green building will become the norm and standards will keep progressing, as seen with the growth of LEED and Living Building Challenge. The Bethlehem Climate Action Plan (CAP) calls for a 33% reduction in emissions by 2025 and 60% by 2030. Our research shows many opportunities for development and contracting to become more efficient and sustainable.

In this fact sheet, we want to help bridge the gap to the future of development. We provide resources for special financing for clean energy projects, as well as information on ways companies around the globe have made their processes and projects more sustainable.

Sustainability & Higher Return on Investment (ROI)

Qualities like lower energy bills, better air quality, daylighting, and safe, toxin-free materials are marketable. While upfront costs are sometimes higher, lower operating costs save money in the long run. And incentive programs such as C-PACE and federal tax incentives make sustainable building even more affordable.

For the best returns, go for LEED Gold or better, or Living Building Challenge; basic LEED certification is a minimum.

Direct the architect to select building materials with low embodied carbon, including the materials and processes that go into making and delivering them.

Use green roofs and pervious pavement to reduce stormwater runoff. While this does not reduce GHG emissions, it helps reduce flooding, a predictable result of climate change.

Consider the building's "afterlife" by trying to build for a long time, while also looking ahead for greener, more efficient technology that will not be obsolete in future years. Consider using mass (massive) timber instead of concrete or steel, as these buildings have the potential to reduce emissions by over 25%.

Many corporations are starting to focus on "corporate responsibility" — meaning that they also will be looking for greener buildings.

Require sustainable practices in all construction contracts. (see next page)

SPOTLIGHT

SUSTAINABLE BUILDINGS YIELD HIGHER RENTS

A recent study completed by Bentall Kennedy found that LEED-certified projects command 3.7% more in rent and have 4% higher occupancy rates than non-certified buildings, on average.

Using 10 years of data collected by the real estate company, the analysis also found that ENERGY STAR-certified buildings collect 2.7% more in rent and have 9.5% higher occupancies.

[\[More info\]](#)

Construction

Some key practices are:

- Order temporary power hook-ups early, to reduce or eliminate the need for generators
- Enforce a No-Idling policy for all vehicles & equipment on site
- Use LED lights for all job-site lighting
- Track all construction and other waste
- Meter on-site emissions — and use the data to lower emissions
- Create an environmentally-conscious culture on the site, starting with small things, like recycling.
- Require all subcontractors to follow sustainable practices and review practices with them.
- Educate all employees and subcontractors on why sustainability in the workplace is important; for environmental and economic reasons.
- Switch large and small equipment to electric-powered (when available)

The following pages provide information on C-PACE (Commercial Property Assessed Clean Energy) financing and Federal tax credits for renewable energy.

Bethlehem Climate Action Plan – CO₂-Reduction Strategies

| Buildings | |
|--------------------|--|
| CAP Ref | Strategy |
| B1.1-3 p.84-85 | Benchmarking requirement for commercial, government, and multifamily buildings Utilize the free Energy Star Portfolio Manager to benchmark total energy and water use for all buildings. |
| B1.4 p.85 | Require disclosure of energy performance for purchase of homes, including energy intensity and average annual costs |
| B1.5 p.86 | Require ASHRAE Level 1 energy audits for building permit approval |
| B2.1 p.86 | Fuel switching requirement for new boilers in commercial buildings Requires converting to low-GHG options when replacing boilers such as electric |
| B2.2 p.87 | Establish a building retrofit program to replace appliances and systems with electric, renewable natural gas, or other low-carbon fuel options in residential and commercial buildings |
| B3.1 p.88 | Develop a program to replace appliances and systems with high-efficiency options |
| B3.2 p.88 | Implement net-zero emissions (NZE) standards for substantial renovations of existing buildings |
| B3.3 p.89 | Require retro-commissioning for large commercial and residential buildings |
| B3.4 p.90 | Promote implementation of Commercial Property-Assessed Clean Energy (C-PACE) |
| B3.5 p.90 | Support Residential Property Assessed Clean Energy (R-PACE) in Pennsylvania |
| B3.6 p.91 | Require cost-effective energy-saving measures on large buildings to help mitigate urban heat island effect (white or reflective roofs, green roofs, and/or solar panels) |
| B3.7 p.91 | Initiate or expand upon residential energy efficiency programs, especially those serving low-income communities |
| B3.8, B4.1 p.92 | Encourage existing multi-tenant building owners and new developers to submeter their buildings to support increased energy conservation |
| B3.9 p.92 | Partner with utilities to increase awareness of opportunities for energy audits, incentives for energy efficiency improvements, and other energy-saving measures |
| B4.2 p.94 | Implement net-zero emissions (NZE) standards for new buildings (residential and commercial) |

C-PACE

C-PACE (Commercial Property Assessed Clean Energy) is a financing solution for long-term investments in a commercial property. With C-PACE, building owners enjoy the advantages of energy upgrades immediately and pay for them over time through a voluntary assessment loan that is repaid annually along with property taxes. C-PACE is an active program in several counties in PA, including Lehigh and Northampton, providing long-term and low-cost financing for clean energy and water efficiency projects.

New construction projects that utilize the following building standards and/or equipment are eligible for C-PACE financing for 100% of the cost for these energy conservation measures (ECMs).

- Net Zero Building: DOE and National Institute of Building Sciences (NIBS)
- Green Building Initiative: Green Globes for New Construction
- LEED: New Commercial Construction (LEED-NC) and Commercial Interiors (LEED-CI) projects
- LEED: Core and Shell (LEED-CS) projects that exceed current building code requirements
- Living Building Challenge projects
- EPA Energy Star
- PHIUS Passive House Commercial Requirements (rigorous energy efficiency based on climate)

Soft costs that are necessary to install the C-PACE project or for the C-PACE Capital Provider to perform their due diligence/underwriting are also eligible. Eligible soft costs may include fees for energy or water surveys, design and engineering, project development, permits, surveys, legal fees, other third-party reports, inspections, financing, any required reserves or deposits, recordation, capitalized interest, and commissioning; the applicant may also request consideration of additional soft costs.

Loan Specifications

Interest rates for C-PACE financing are fixed and typically run 5–7% — but the financing term of up to 30 years results in smaller payments compared to other types of loans. Unlike a traditional bank loan, no down payment is required for C-PACE financing, and tax returns, financials, FICO or business credit scores are not required for approval.

C-PACE loans can be made to any property owner in good standing located in a participating county with funding from “any public or private financing note, mortgage, loan, deed of trust, instrument, refunding note, or other evidence of indebtedness or obligation used to finance a qualified project.” They are typically underwritten using a Savings to Investment ratio, calculated by dividing the savings (all savings you can reasonably achieve) by the cost to amortize the loan over time.

Can Mixed-Use Properties utilize C-PACE?

If you have a mixed-use property, you may use C-PACE for clean energy investments in the commercial part of the property, as long as that part of the property has its own property assessment (so the C-PACE financing applies only to the commercial property). Owners may also be able to use C-PACE to finance a solar installation or an energy-conserving roof, including roof replacement, green roof, or new insulation, even if the commercial entity is separated from the roof by residential floors. To be eligible for C-PACE financing, the commercial portion of the building must generally be separately titled from the residential portion of the building. Consult the C-PACE Administrator at the Sustainable Energy Fund for more information.

Federal Tax Credits

Renewable Energy Tax Credits – Under the Consolidated Appropriations Act of 2021, the renewable energy tax credits for fuel cells, small wind turbines, and geothermal heat pumps now feature a gradual step down in the credit value, the same as those for solar energy systems. (26% for systems placed in service after 12/31/2019 and before 01/01/2023, and 22% for systems placed in service after 12/31/2022 and before 01/01/2024). The tax credit covers the following types of systems (including installation costs): :

- Geothermal Energy
- Residential Small Wind Turbines
- Solar Energy Systems & Solar Panels
- Fuel Cells
- Biomass Fuel Stoves

Commercial Building Tax Deductions – Up to \$1.80 per square foot available to owners or designers of commercial buildings or systems that demonstrate a 50% reduction in energy usage accomplished solely through improvements to the heating, cooling, ventilation, hot water, and interior lighting systems. Partial deductions of up to \$.60 per square foot can be taken in some cases.

For additional information, see IRS guidance:

[Commercial Guide](#) • [Homeowner guide](#)

Energy-efficient commercial buildings –
IRS Notice [2006-52](#) and [2008-40](#).

Further Information on ITC

Annual solar installations have grown by over 6,500 percent since 2006, a compound annual growth rate of 48%. The solar industry has grown from 17,000 employees in 2005 to nearly 174,000 today, while the cost of solar energy has gone down by more than 73%.

SPOTLIGHT STORY:

J-CENTRAL, PHILADELPHIA

A mixed-use property with 30,000 square feet of ground floor commercial space, including retail storefronts, spaces for entrepreneurs, artists and local businesses.

Financing of \$1.5 million dollars; clean energy measures included LED lighting, increased insulation, window replacements, energy recovery units, low-flow plumbing, and more.

Reduced total carbon footprint by 2,700 metric tons of CO₂ equivalent.

SPOTLIGHT

CONCORD KEYSTONE SORA WEST

A mixed-used complex proposed for Conshohocken, PA, will include an 8-story, 127-room hotel, restaurant, rooftop lounge, a plaza, and restored fire station, with a total footprint of 91,858 sq feet. Financing is just shy of 10 million dollars.

The Sustainable Energy Fund oversaw the C-PACE project application process to ensure compliance with the Act 30 Statute and C-Pace Guidelines.

Clean energy measures include upgrades to the building envelope, new HVAC system, LED lighting, and new hot water heaters. Annual energy savings of 349,644 kWh in electricity and 4,914 therms of natural gas. (7–61%).

See attached recaps of Mitigation and Adaptation Strategies from the Bethlehem CAP.

About the Alliance and the 2021 Summer Internship Project on Climate Action Planning

The Alliance for Sustainable Communities–Lehigh Valley is a nonprofit organization that focuses on a wide variety of environmental and social justice issues that contribute to more-sustainable communities. Based in Bethlehem, PA, the Alliance has been active since 2003 and offers summer, fall, and spring internships to college students in the area to work on projects with the aim of creating a more sustainable Lehigh Valley.

In previous years, we've tackled Campus Sustainability, Sustainability in Healthcare, Interdisciplinary Teaching on Climate and Sustainability, Brewing Sustainability (sustainability for the craft brewing industry), and Sustainability for Independent Cafés and Restaurants, and Climate Action Planning for the Lehigh Valley.

This summer, Devon Jewell (Moravian Academy '23), Harrison Kim (Parkland High School '22), Alexandra Ludman, (University of Delaware '21), Margaux Petruska (Lehigh University '21), and Isaac Weber (Dartmouth College '22) researched and developed priorities for implementing the Bethlehem Climate Action Plan.

Acknowledgments

We appreciate the opportunity to meet with several local and national developers and contractors about their experience with sustainable development, as well as community members who provided their expertise and insight into what is possible in the area of climate action and sustainable development.

Katie Bartolotta – Green Builders United

Larry Eighmy – The Stone House Group

Sigi Koko – Architect, Build Naturally

Breena Holland – Lehigh University

J. William Reynolds – Councilman, City of Bethlehem

Kelly Sanders – C-PACE program, Sustainable Energy Fund

Anna Smith – former director of CADCB

Dan Sobrinski – VP Energy and Sustainability, WSP Consulting

Project Reports

- [Implementing Bethlehem's CAP](#)
- [Build Sustainably — for Business Success and a Livable Future](#)
- [Climate Change Education](#)

Project email: climate-action@sustainlv.org.

Bethlehem CAP – Mitigation Strategies

| Environmental Justice and Equity | |
|----------------------------------|--|
| CAP ref. | Strategy |
| EJ.1.1/65 | Create a Bethlehem Climate and EJ Plan |
| EJ.1.2/65 | Create a Bethlehem Climate and EJ Council |
| EJ.1.3/65 | Codify EJ considerations into city ordinances and planning/zoning decisions |
| EJ.2.1/67 | Evaluate Strategies in this CAP for their benefits to frontline communities |
| EJ.2.2/67 | Incorporate the financial cost of health impacts from pollution and climate-related impacts into budget and policy analyses |
| EJ.2.3/67 | Create a Climate Action Apprenticeship Program |
| EJ.2.4/67 | Measure local environmental burdens to inform neighborhood-level investments |
| Municipal Operations | |
| CAP ref. | Strategy |
| M1.1/75 | Continue to Purchase 100% renewable electricity for all municipal operations going forward |
| M1.2/75 | Continue to invest in energy efficiency projects to reduce residual emissions and the amount of electricity that must be purchased by the city |
| M1.3/76 | Increase energy efficiency standards of city government buildings |
| M1.4/76 | Actively evaluate opportunities for electric and other low-emission vehicles and convert the municipal fleet where feasible |
| M2.1/77 | Generate carbon removal credits or invest in offset projects to reach net zero emissions |
| M3.1/78 | Create an Office of Sustainability with a city Director of Sustainability |
| M3.2/79 | Update the city's GHG emissions inventory |
| M3.3/79 | Lead by example and provide a testing ground for strategies that can be scaled to the rest of the community |
| M3.4/80 | Coordinate working groups of key stakeholders to initiate implementation of each CAP section |
| M3.5/80 | Ensure local legal framework is in place to implement CAP strategies |
| M3.6/81 | Engage municipal authorities to adopt GHG targets and reduce emissions |
| Buildings | |
| CAP ref. | Strategy |
| B1.1/84 | Benchmarking requirement for commercial buildings |
| B1.2/85 | Benchmarking requirement for government buildings |
| B1.3/85 | Benchmarking requirement for multifamily buildings |
| B1.4/85 | Require disclosure of energy performance for purchase of homes |
| B1.5/86 | Require energy audits for building permit approval |
| B2.1/86 | Fuel switching requirement for new boilers in commercial buildings |
| B2.2/87 | Establish a building retrofit program to replace appliances and systems with electric, renewable natural gas, or other low-carbon fuel options in residential and commercial buildings |
| B3.1/88 | Develop a program to replace appliances and systems with high-efficiency options |
| B3.2/88 | Implement net-zero emissions (NZE) building standards for substantial renovations of existing buildings |
| B3.3/89 | Require retro-commissioning for large commercial and residential buildings |
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| B3.5/90 | Support Residential Property Assessed Clean Energy(R-PACE) in Pennsylvania |
| B3.6/91 | Require cost-effective energy-saving measures on large buildings to help mitigate urban heat island effect |

| B3.7/91 | Initiate or expand upon residential energy efficiency programs, especially those serving low-income communities |
|-----------------------------|--|
| B3.8/92 | Encourage existing multi-tenant building owners to submeter their buildings to support increased energy conservation |
| B3.9/92 | Partner with utilities to increase awareness of opportunities for energy audits, incentives for energy efficiency improvements, and other energy-saving measures |
| B4.1/93 | Encourage multi-tenant building developers to submeter their buildings to support increased energy conservation |
| B4.2/94 | Implement net-zero emissions (NZE) building standards for new buildings |
| Electricity Sourcing | |
| CAP ref. | Strategy |
| E1.1/98 | Educate the community and local businesses on the benefits of renewable energy |
| E1.2/99 | Increase transparency of generation sources and carbon impact for electricity supply sources |
| E1.3/100 | Demonstrate the benefits of renewable energy through city projects |
| E1.4/100 | Promote existing incentives for renewable energy installation and drive creation of new incentives |
| E1.5/101 | Increase knowledge of renewable energy options in additions to electrical |
| E2.1/101 | Implement a recognition program to incentivize transparency and adoption of renewable energy use |
| E2.2/102 | Promote adoption of on-site solar |
| E3.1/102 | Ensure a robust net metering program continues to be available to all electricity customers |
| E3.2/103 | Streamline permitting and zoning considerations for installation of on-site renewable energy systems |
| E3.3/103 | Require and incentivize renewable energy integration in new development, construction, and renovation projects |
| E3.4/104 | Promote evaluation of renewable energy feasibility for existing large industrial and commercial properties |
| E3.5/104 | Promote evaluation of fuel switching options for any on-site energy plant system that is fossil fuel-based |
| E3.6/105 | Explore alternative energy technologies available to the city |
| E3.7/105 | Develop low-cost, local retail renewable electricity options |
| E4.1/106 | Support Community Choice Aggregation (CCA) and community renewables |
| E4.2/106 | Support policies that expand access to renewable energy for consumers |
| Transportation and Mobility | |
| CAP ref. | Strategy |
| T1.1/111 | Enhance LANTA Bus Service |
| T1.2/112 | Improve bike mobility and safety |
| T1.3/113 | Provide "safe routes" for pedestrians in and around town |
| T1.4/114 | Enhance bike-to-work initiatives, events, resources, and benefits |
| T1.5/114 | Educate to build a bicycling traffic culture of patience and respect among all road users |
| T1.6/115 | Develop "vehicle free" zones and new pedestrian hub |
| T1.7/115 | Implement a car-sharing program |
| T1.8/116 | Encourage alternative transportation methods to people who drive cars |
| T1.9/116 | Revise building codes and development zoning |
| T2.1/117 | Pass and enforce no-idling laws |
| T2.2/118 | Decrease parking, provide parking discounts, and eliminate minimum parking requirements |
| T3.1/119 | Increase electric vehicle infrastructure in the city |
| T3.2/120 | Adjust city codes and zoning to expedite EV infrastructure |
| T3.3/120 | Encourage public and private vehicle fleets to convert to all-electric or Zero Emission Vehicles |

| T3.4/121 | Incentivize residential use of electric vehicles and Zero Emission Vehicles |
|--------------------------|---|
| T4.1/121 | Improve transportation sector vehicle miles traveled data quality and leverage regional initiatives to reduce emissions |
| T4.2/122 | Develop goals, metrics, and data for tracking process |
| Land Use and Green Space | |
| CAP ref. | Strategy |
| L1.1/127 | Review and update land use ordinance and zoning to encourage land-use patterns that mitigate climate change impacts |
| L1.2/127 | Integrate land use and transportation to reduce trip lengths and promote multiple modes of travel, including public transit |
| L1.3/128 | Review new developments through the lens of sustainability via a recommending body |
| L2.1/129 | Expand the inventory of Bethlehem's trees and ecosystem services |
| L2.2/130 | Develop an Urban Forest Master Plan |
| L2.3/130 | Prioritize green space development in underserved areas |
| L2.4/131 | Expand and create new greenways |
| L2.5/132 | Update tree ordinances to protect tree root systems and large legacy trees |
| L2.6/132 | Partner with community organizations to promote tree planting efforts |
| L2.7/133 | Engage and incentivize residents and businesses on options and benefits of conserving their own land |
| L2.8/133 | Preserve land with valuable natural resources in perpetuity using 3rd party conservation easements |
| L2.9/134 | Prior to sales of existing green spaces, open spaces, and urban forest owned by the City of Bethlehem, evaluate and align impacts of sale with the goals of Bethlehem's CAP |
| L3.1/135 | Update tree ordinances and other applicable regulation/zoning ordinances to prioritize and preserve native species |
| L3.2/136 | Establish and effectively manage native-habitat corridors and areas |
| L3.3/136 | Improve urban soil conditions and carbon sequestration using compost and biomass material |
| L3.4/137 | Species diversification/invasive species removal |
| L3.5/137 | Reduce pesticide (insecticides and herbicides) and chemical fertilizer use |
| L3.6/138 | Develop a citywide carbon credits program to quantify and monetize sequestered carbon in urban trees and other natural carbon sinks |
| L3.7/138 | Create education materials to help residents maintain their landscaping and avoid synthetic fertilizers and pesticides to maximize carbon sequestration and healthy soil |
| L4.1/139 | Promote Green Roofs |
| L4.2/140 | Recover vacant spaces and brownfields for vegetation or urban agriculture |
| L5.1/141 | Develop a plan to improve access to diverse recreational opportunities for all residents |
| L5.2/141 | Conduct analysis of urban island effect |
| L5.3/142 | Increase opportunities for voluntary community maintenance of land |
| L5.4/142 | Support sustainability in park design, development, maintenance, and management |
| L6.1/143 | Develop a green infrastructure plan to manage stormwater, filter pollutants, and improve public health |
| L6.2/144 | Restore the riparian corridor along the south side of the Lehigh River |
| L6.3/144 | Create and expand permeable parking lots and driveways |
| Local Food and Waste | |
| CAP ref. | Strategy |
| FW1.1/149 | Phase out single-use plastics |
| FW1.2/149 | Study "Save as You Throw" incentive program for waste reduction and diversion |
| FW1.3/150 | Implement Zero Waste practices at Bethlehem's large festivals and events |
| FW1.4/150 | Increase standards and enforcement for minimizing construction and demolition waste |
| FW1.5/151 | Encourage and prioritize preservation, reuse, repurpose, and retrofit of existing structures |
| FW1.6/151 | Develop materials markets and encourage reuse of consumer products |

| | |
|---|--|
| FW1.7/152 | Conduct a public education campaign to improve waste management practices |
| FW2.1/153 | Create curbside composting program |
| FW2.2/154 | Establish a curbside textile recycling program |
| FW2.3/154 | Develop an anaerobic digestion program |
| FW2.4/155 | Require large institutions and businesses to donate, reduce, reuse, or compost their unsold food |
| FW2.5/155 | Encourage repair cafes for residents to get broken items fixed instead of throwing away and buying new |
| FW2.6/156 | Responsible waste management recognition program for local businesses |
| FW2.7/156 | Make recycling easier via education and new resources |
| FW2.8/157 | Enforce existing waste and recycling policies |
| FW3.1/157 | Develop better understanding of the city's current waste streams |
| FW3.2/158 | Improve the waste section of the city's greenhouse gas inventory |
| FW3.3/159 | Create tracking system for waste carried by private haulers |
| FW3.4/159 | Provide waste audits to businesses |
| FW4.1/160 | Convert waste-hauling fleets from diesel-powered vehicles to low- or no-emission vehicles |
| FW4.2/160 | Reduce waste-hauling truck traffic via route optimization |
| FW4.3/161 | Encourage best practices for waste management at local transfer stations and landfills |
| FW4.4/161 | Expand options to ensure proper disposal of refrigerants and other high global-warming potential gases |
| FW4.5/162 | Reduce impacts from wastewater treatment |
| FW5.1/162 | Work with schools to promote healthy eating |
| FW5.2/163 | Support local gardens and urban farms |
| FW5.3/164 | Increase institutional purchase of local foods |
| FW5.4/165 | Expand education on local and low-impact food options |
| FW5.5/166 | Eliminate food insecurity and inequity in food access |
| Public Engagement | |
| <u>CAP ref.</u> | <u>Strategy</u> |
| PE1.1/170 | Initiate a 'Bethlehem Climate Challenge' public outreach/educational program about the importance of mitigating GHG emissions and creating a resilient community |
| PE1.2/171 | Develop a 'Bethlehem Climate Challenges' recognition program |
| PE1.3/171 | Develop a 'Bethlehem Climate Challenge' funding mechanism that raises awareness about the climate issue |
| PE1.4/172 | Consolidate public outreach and education responsibilities within city government |
| PE1.5/173 | Develop education campaigns and resources to ensure that they reduce inequity and increase opportunities for Bethlehem's most vulnerable communities |
| PE1.6/173 | Use the City of Bethlehem newsletter to regularly highlight sustainability-related information on the city's website |
| PE1.7/174 | Encourage the expansion of environmental education in K-12 curricula |
| PE1.8/174 | Request and support business groups to develop campaigns and programs to engage local business owners on sustainability |
| Large Organizations and Institutions | |
| <u>CAP ref.</u> | <u>Strategy</u> |
| LOI1.1 p.182 | Bethlehem Green Ribbon Commission |
| LOI1.2, p.183 | Bethlehem Carbon Challenge |

Bethlehem CAP – Adaptation Strategies

| Proactive Adaptation and Resilience Strategies | |
|--|--|
| CAP ref. | Strategy |
| AP1 / 191 | Develop a strategy to retrofit critical buildings with aging electrical wiring that cannot absorb the air conditioning load |
| AP2 / 191 | For areas already prone to flooding, consider purchasing property on floodplain to remain underdeveloped or other approaches to ban development |
| AP3 / 191 | Establish cooling centers citywide |
| AP4 / 192 | Assess zoning and building codes to identify ways to improve resilience and incorporate green building standards (resilience: reduce impervious surfaces, reduce development in floodplains, incentivize elevation of private property / / green strategies: energy efficiency, water conservation, native landscaping, light-colored roofing materials) |
| AP5 / 192 | Improve building energy, cooling system, and manufacturing efficiencies and demand response capabilities (e.g. smart grid) possibly through the administration of community grants |
| AP6 / 192 | Review energy backup supply plan for grid interruptions |
| AP7 / 193 | Develop a working group to establish coordination between communications companies, utilities, and the city to facilitate cooperation for climate adaptation efforts |
| AP8 / 193 | Develop energy strategies to (1) diversify energy supply chain with renewable sources that are not water-dependent and to evaluate dry/hybrid cooling technologies, and (2) improve reliability of grid systems and reduce dependence on regional grid through backup power supply, intelligent controls, and distributed generation |
| AP9 / 193 | Review and enhance emergency response plans and coordination to deal with events of a severity that have not been seen before locally |
| AP10 / 194 | Develop a strategy to increase shade across the city using tree species capable of withstanding future climatic conditions |
| AP11 / 194 | Update strategy to clean and maintain culverts to make sure they are functioning properly and can handle increased flows |
| AP12 / 194 | Enhance forest management near drinking water supply to reduce the risk of wildfires and runoff-induced sediment / debris that may occur after wildfire and storm events |
| AP13 / 194 | Develop ways to encourage and require greater use of graywater systems to reduce demand for treated water |
| AP14 / 194 | Enhance water treatment capabilities to address-term changes to source water quality (e.g. stormwater runoff surges during heavy precipitation events / turbidity) |
| AP15 / 194 | Practice water conservation and demand management through water metering, rebates for water-conserving appliances / toilets, and / or rainwater harvesting tanks, which may involve updating the existing drought management plan. |
| AP16 / 195 | Review whether regional water connections can be expanded to allow for water trading in times of service disruption or shortage |
| AP17 / 195 | Establish a city-issues grant program to provide capital to property owners to retrofit private properties |
| AP18 / 195 | Set aside land to support potential future flood proofing needs (e.g. berms, dikes, and retractable gates) |
| AP19 / 195 | Adjust landscape maintenance plans to require less maintenance, such as reduced water use and use species capable of withstanding future climate conditions and landscape with a goal of stormwater management |
| AP20 / 196 | Identify transit stops that would benefit from the installation of protective shelters for extreme heat and / or heavy precipitation |
| AP21 / 196 | Develop a strategy to pre-position equipment, materials, and other resources to respond to a disruption and / or support recovery |
| AP22 / 196 | Conduct preventative maintenance, including vegetation management, on power lines and other essential system infrastructure |
| AP23 / 196 | Develop relationships between the city and prominent community groups that engage with Black and brown communities to facilitate meaningful engagement |
| AP24 / 196 | Install battery-backup technologies or other energy-storage systems, such as solar PV link to battery, in publicly owned housing complexes to support air conditioning usage on high-demand days |
| AP25 / 196 | Consider providing / generating funding for electric energy efficiency and conservation measures for private property owners |