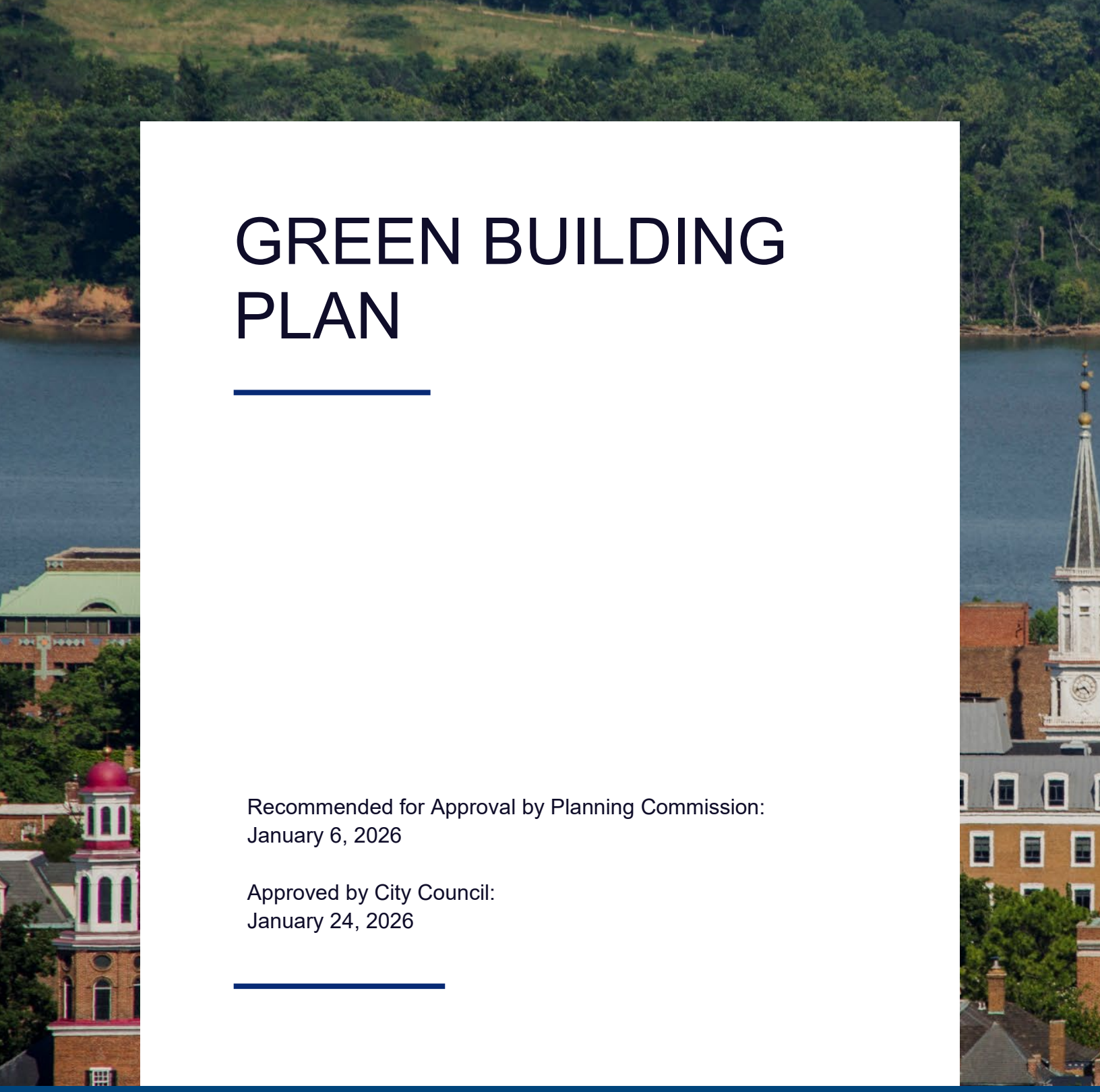

GREEN BUILDING PLAN

Recommended for Approval by Planning Commission:
January 6, 2026

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January 24, 2026

OFFICE OF
CLIMATE ACTION

Table of Contents

1. Introduction 3
2. Vision 3
3. City Goals 3
4. Citywide Commitments & Policy Direction 4
5. Climate Change: Challenges & Resilience 5
6. Green Buildings 8
7. Plan Development Process 15
8. Alignment with Citywide Plans 15
9. Plan Application 16
10. Options for Projects 16
    - Option 1: Standard 18
    - Option 2: Green Building Certifications 26
    - Option 3: Affordable Housing Projects 27
    - Option 4: Small Projects 28
    - Option 5: Public Projects 29
11. Development Review 29
12. Future Updates 29

Appendix 1: Recommendation Analysis 30

Appendix 2: Public Development Project Certification Options 97
- Leadership in Energy and Environmental Design (LEED) 97
- Green Globes 98
- EarthCraft Light Commercial 99

1. Introduction

The City of Alexandria is committed to advancing a sustainable, healthy, and resilient community. Climate change is influencing daily life — impacting extreme heat, rainfall and flooding. This chapter of the Master Plan outlines Alexandria's approach to reducing greenhouse gas (GHG) emissions, improving building performance, and strengthening the resilience of the built environment. It draws on the City's adopted environmental plans and provides policy direction to support long-term climate objectives.

2. Vision

Alexandria envisions a sustainable, low-carbon, and resilient city where buildings, infrastructure, and land use work together to minimize greenhouse gas emissions, strengthen climate resilience, and support the health and wellbeing of all residents.

3. City Goals

Reduce Greenhouse Gas Emissions
The City seeks to minimize emissions by encouraging compact, transit-oriented land use patterns, encouraging use of public transit, walking and biking, and implementing green building practices.

Promote Energy-Efficient and Sustainable Buildings
Buildings should be designed and operated in a manner to minimize energy use and carbon emissions. The Green Building Plan will advance high performance buildings to reduce building emissions.

Build on the City's policies for green infrastructure, sustainable mobility, and land use planning
The City will continue to advance green infrastructure, sustainable mobility, and land use practices. This includes expanding the urban tree canopy, improving stormwater systems, and enhancing bike and pedestrian networks, encouraging the use of transit-supportive development to promote a more resilient City.

4. Citywide Commitments & Policy Direction

Eco-City Charter & Environmental Action Plan

To combat the impacts of climate change at the local level, the City of Alexandria has long prioritized environmental stewardship. The City Council adopted the Eco-City Charter in June 2008 and established its first Environmental Action Plan in 2009. That plan was updated on July 9, 2019, when City Council adopted the Environmental Action Plan 2040[1] (EAP). The EAP sets ambitious targets for environmental protection, including reductions in greenhouse gas emissions and increases in clean energy resources, as set out in **Figure 1**. Specifically, the EAP calls for a 50% reduction in GHG emissions within the City of Alexandria by Fiscal Year 2030 and an 80% to 100% reduction by Fiscal Year 2050.

Summary of Goals and Targets

The EAP 2040 includes targets with metrics to indicate performance. Below is a summary of EAP 2040 targets and metrics. The complete descriptions of goals and targets are in the topic sections.

Metric	Short-term	Mid-term	Long-term
CLIMATE CHANGE			
Total GHG emission reduction over 2005 base year			50% by FY2030 and 80-100% by FY2050
ENERGY			
Renewable offset of City-owned facilities electrical use	100% by 2020		
Improve energy efficiency for City-owned facilities and affiliated transportation		Reduce by 25% by FY2027 over FY2018	
Reduce GHG emissions per capita	10 metric tons per capita by FY2022	6 metric tons per capita by FY2030	4 metric tons by FY2040 and 1-3 by FY2050
LAND USE AND OPEN SPACE			
Tree Canopy percent			40% by FY2035
Open Space Acres per 1,000 residents	7.3	7.3	7.3
SOLID WASTE			
Reduce GHG emissions from solid waste over a 2019 base year	By FY2023 reduce by 12%		
WATER RESOURCES			
Achieve stormwater phosphorus pollution reduction (MS4) target	By FY2023 to 70%	By FY2025 to 100%	
TRANSPORTATION			
Reduce vehicle miles traveled	By FY2023 reduce 1% per year		
Increase transit, walking, and biking	By FY2023 Increase by 15% over 2018		
Increase dedicated bus lanes			By FY2030, double to 1.5 miles
AIR QUALITY			
Reduce ozone	By FY2023, reduce to 70 ppb or lower		

Figure 1 EAP 2040: Summary of Goals & Targets

Energy & Climate Change Action Plan

Following the adoption of the EAP, the City also accepted the Energy & Climate Change Action Plan (ECCAP) in 2023, which provides specific guidance as to how the City can achieve its climate and energy targets. The ECCAP emphasizes that meaningful progress requires collective action. While the City can take specific steps, success ultimately depends on coordinated efforts among the community, businesses, and developers. As the ECCAP notes, "By working together with the City's leadership, Alexandrians can achieve the … goals to limit climate risks and GHG emissions to ensure a sustainable future for generations to come."[2]

[1] The City of Alexandria's Environmental Action Plan (EAP) 2040: https://www.alexandriava.gov/eco-city-alexandria/environmental-action-plan-2040

[2] The City of Alexandria's Energy & Climate Change Action Plan: https://www.alexandriava.gov/energy/energy-and-climate-change-action-plan

Specifically, the ECCAP highlights:

- The dominant impact of buildings and transportation, which together account for over 90% of local GHG emissions,
- The need for high-efficiency, fully electrified new buildings to avoid long-term emissions lock-in, and
- The importance of community-wide collaboration among residents, businesses, developers, and public institutions.

The ECCAP sets reduction targets of 320,000 metric tons of CO_2 by 2030, and 1.02 million metric tons by 2050 from the built environment.

5. Climate Change: Challenges & Resilience

Climate change has increasingly impacted the wellbeing of communities, including the City of Alexandria. As global temperatures increase, communities are experiencing more frequent and intense heat, with significant impacts at the local level. These changes affect our health, environment, and economy. According to the EPA,[3] these impacts include:

- Increased frequency and intensity of heat waves,
- Worsening air and water quality,
- More frequent and intense extreme weather events,
- Increased rainfall and flooding, and
- A resulting increase in property damage, and the cost of insurance.

The changes pose risks to the City's health, infrastructure, and long-term resilience. The cause of climate change is an increase in GHG emissions. The U.S. Energy Information Administration notes, "scientists know with virtual certainty that high levels of greenhouse gases in the atmosphere tend to warm the planet. In computer-based models, rising concentrations of greenhouse gases result in a rising average surface temperature of the earth over time. Rising temperatures may produce changes in precipitation patterns, storm severity, and sea level."[4] As GHG emissions increase so too will the global temperature. The result will be widespread impacts felt across the world, and those impacts will continue to get worse unless action is taken to mitigate GHG emissions.

Although climate change is a global challenge, its impacts manifest locally. Local governments are uniquely positioned to address certain causes of climate change, through activities such as land use, infrastructure, and environmental planning.

[3] Impacts of Climate Change | US Environmental Protection Agency (EPA): https://www.epa.gov/climate-change
[4] Greenhouse gases' effect on climate - U.S. Energy Information Administration (EIA): https://www.eia.gov/energyexplained/energy-and-the-environment/greenhouse-gases-and-the-climate.php

The Role of the Built Environment

The Built Environment as a Key Driver of Emissions

Because increased GHG emissions directly drive climate impacts, mitigation efforts must focus on the sectors where reductions will have the greatest effect. According to a Greenhouse Gas Emissions analysis[5] provided by the Metropolitan Washington Council of Governments (MWCOG), most greenhouse gas emissions in the City are from buildings and transportation. The analysis shows that in 2020, more than 52% of emissions came from buildings and nearly 38% came from transportation. To address the impacts of buildings and meet the City's climate commitments, targeted action is needed.

The ECCAP further underscores the critical role of the build environment. ECCAP's projections show that, without intervention, most future growth in GHG emissions between 2020 and 2050 will come from new construction. **Figure 2** is from the City's ECCAP, and demonstrates that new construction will be responsible for an approximately 50% increase in emissions if no mitigation efforts are taken.

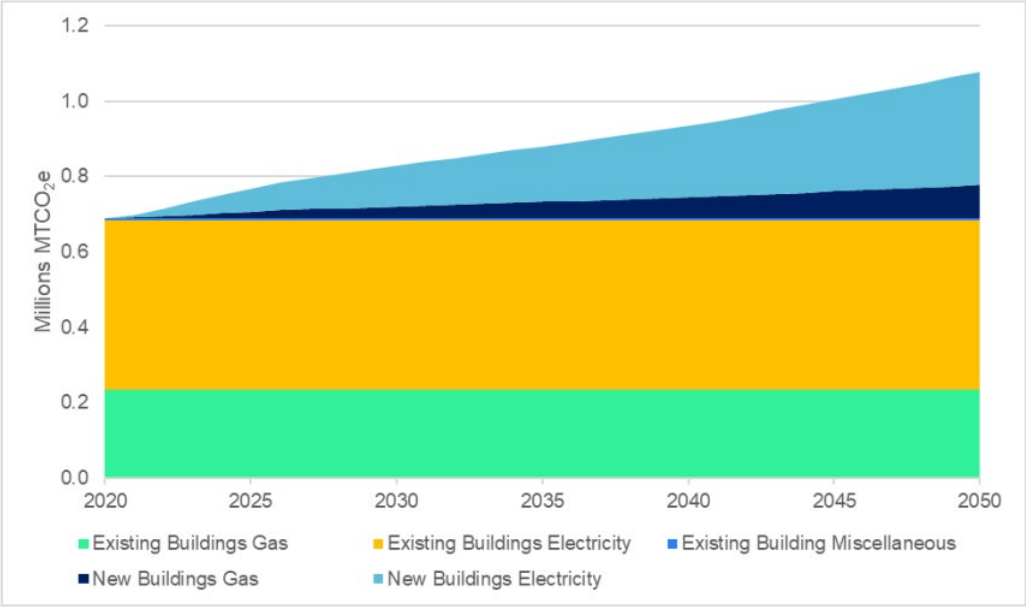

Figure 2 Greenhouse Gas Emissions from existing and new buildings in Alexandria by source of energy through 2050 (ECCAP)

These studies highlight the importance of integrating green building practices into the City's development process to mitigate future emissions.

The ECCAP recognized that in the near-term, most reductions would be from existing buildings, but over time, particularly as construction increases, long-term reductions would be

[5] MWCOG Greenhouse Gas Emissions Analysis: https://www.mwcog.org/file.aspx?D=vctpsw7kJ7mBXo5fDiocOsHJqqhRN0YFFWHsg8E3adw%3d&A=dbSpm3H76XXsFnyDdSKus9Tt5xObNjmLmpZGFDQgmXE%3d

driven by actions to increase efficiency and electrify new buildings (with 69% of the reduction coming from new buildings by 2050).

Buildings as Critical Community Shelters

In addition to the role buildings play in contributing to the GHG emissions in the City, buildings also serve a vital role in protecting the community in times of extreme weather. The ECCAP quantified, among other climate impacts, the increase in extreme heat that can be expected in Alexandria. As illustrated in **Figure 3** below, while historically Alexandria had seen approximately 30 days a year over 90 degrees Fahrenheit, by the 2030s that number is expected to be 55 days, and more than 70 days by the 2050s. More concerning is the rise in days above 100 degrees Fahrenheit, which was historically 1 day, and increasing to 10 days by the 2050s. Buildings of all kinds, whether public recreation centers, homes, retail shopping, or cultural centers provide a needed shelter from these extreme temperatures.

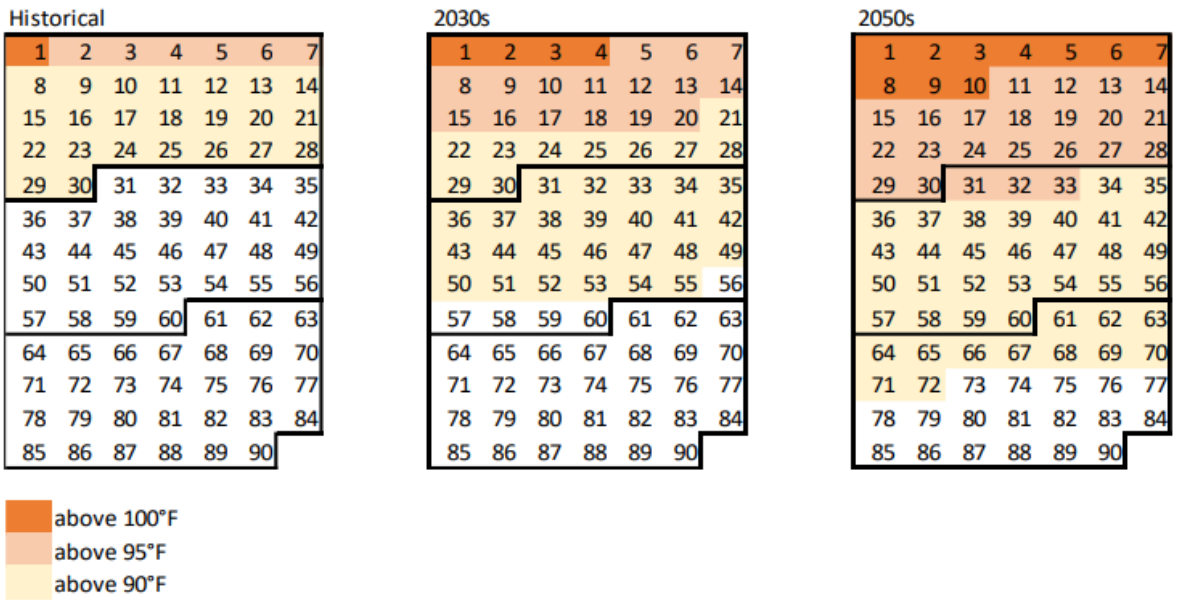

Figure 3. Number of days per year in Alexandria with maximum temperatures exceeding 90oF, 95oF, and 100oF (under high emissions scenario RCP 8.5) (ECCAP)

Grid Reliability and the Need for Efficient & Resilient Buildings.

Concerns about extreme heat are compounded by concerns about the reliability of the utility systems that power Alexandria. In its 2025 Integrated Resource Plan (IRP),[6] Dominion Energy notes that a challenge to reliability is continued load growth within its territory, and within the territory of the regional transmission operator, PJM. The IRP expects summer peaks to grow by 4% on a compound annual basis over the next 20 years. These increased grid constraints reduce reliability, making the focus on efficient and resilient buildings an even more pressing matter for the health and safety of Alexandrians.

[6] Dominion Energy's 2025 Integrated Resource Plan Update: https://cdn-dominionenergy-prd-001.azureedge.net/-/media/content/about/our-company/irp/pdfs/2025-integrated-resource-plan-update.pdf?rev=c656e4bd80184dbc80d4531cb6e9e975

A concern about electric grid reliability also moves the City to encourage locally produced renewable energy, such as solar. Solar installations installed at the site of consumption – on the roof, in a parking lot, or on the building's façade – allow for increased resilience of that site in the event of a power outage. Increasing intensity and frequency of storms, increased extreme heat, and concerns from Dominion Energy and the regional transmission operator about grid reliability make renewable energy valuable, in addition to the GHG emission reductions.

In addition to addressing buildings, the City has policies to address:

- **Urban heat islands** to reduce localized temperatures and impervious surfaces through plans and policies such as increased tree canopy, decreasing parking lots and impervious surfaces, and selecting native species to maximize survival of new plants and trees.
- **Shading and site design** by orienting streets and buildings to maximize natural shade and airflow and requiring streetscapes and setbacks to allow tree planting and open spaces.
- **Stormwater management** by implementing bioswales, rain gardens, and stormwater detention and treatment.
- **Sustainable transportation** by actively planning for and providing public transit, such as new Metrorail stations, bike lanes, and pedestrian networks.
- **Land use planning and development patterns** by actively planning for compact mixed use neighborhoods to reduce travel demand and energy use, preserve open space, expand tree canopy, and incentivize redevelopments of brownfields and parking lots.

6. Green Buildings

2019 Green Building Policy

Alexandria's City Council adopted a Green Building Policy on June 22, 2019, and the policy went into effect on March 2, 2020. The policy was identified as a priority of the 2019 Environmental Action Plan and established a broad set of sustainability expectations for new development. It relied on nationally recognized green building certification programs, including LEED, Green Globes, EarthCraft, and the National Green Building Standard, to provide pathways for conformance. The City approved multiple certifications to both increase the conformance options available, and because not all certification programs were valid for every type of building use. To further prioritize specific measures in the certification programs, the 2019 Green Building Policy established Priority Performance Points within each rating system that each project was expected to receive.

Since its adoption, Alexandria has emerged as a regional leader for green buildings. MWCOG identified that nearly 550 buildings received a green building certification since

2007. In 2025, a report[7] recognized Alexandria as 17th in the nation for the number of LEED-certified buildings per capita.

In January 2023, the Environmental Policy Commission and Planning Commission sent a joint letter to the City encouraging an update to the 2019 Green Building Policy that would build on the policy's success while focusing on key metrics that would have the greatest environmental impact.

Citywide Achievements in GHG reductions

The City has made significant progress in reducing GHG emissions from the built environment. According to a MWCOG GHG emissions analysis, Alexandria achieved a more than 45% reduction in building-related GHG emissions between 2005 and 2023. This accomplishment is due to the actions of committed residents and the City working together.

Addressing energy use in existing buildings requires actions from the community and encouragement from the City. In 2022, the City created a new Office of Climate Action, focused specifically on addressing climate mitigation efforts in the city. Through education campaigns and outreach, the City is working with the community to make improving the energy and environmental performance of buildings a priority.

These efforts include direct outreach and recognition programs for residents and business through the Eco-City Homes and Eco-City Business programs (**Figure 4**). These programs both recognize actions individuals are taking in their homes and businesses, and provide step-by-step instructions on the most impactful ways to reduce energy use.

Figure 4. Eco-City Business Logo

The City has also prioritized actions in its own facilities, including installing new heat-pump water heaters in several recreation centers (**Figure 5**), prioritizing high-efficiency systems, and is actively exploring the use of a geothermal heating and cooling system for the comprehensive City Hall renovation that will begin in 2026. The City approved a solar installation on its Durant Recreational Facility in 2025, and is exploring options such as Power Purchase Agreements to address the rest of the City's electricity consumption.

[7] U.S. Cities Leading The Green Building Revolution - 24/7 Wall St.: https://247wallst.com/special-report/2025/08/25/u-s-cities-leading-the-green-building-revolution/

The City's 2019 Green Building Policy also requires public facilities, including those owned by the City or Alexandria City Public Schools (ACPS), to be net-zero energy. ACPS has designed and built two new schools to this standard (Douglas MacArthur and Minnie Howard) using both high-efficiency design and systems, such as geothermal heating and cooling, and is in the process of procuring solar energy to cover 100% of the buildings' energy use.

Figure 5. Heat pump water heaters for Lee Center electrification

Addressing Environmental Impacts

Authority and Purpose

The City's authority to address the environmental performance of buildings is grounded in its planning and land use powers under the Code of Virginia and the Alexandria City Charter. Under City Charter Section 9.01 and Code of Virginia Section 15.2-2223, the City's comprehensive plan must guide the physical development of the City in a manner that promotes the health, safety, and general welfare of the community. The Code of Virginia also specifically provides that comprehensive plans are "***encouraged to consider strategies to address resilience***," defining "resilience" as the capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimal damage to social well-being, health, the economy, and the environment. These provisions authorize the City to adopt master plan policies that advance environmental performance and reduce climate-related risks.

The City implements its master plans through several mechanisms, including through its Zoning Ordinance, applicable provisions of the City Code, and the review and approval of development applications such as site plans and special use permits.[8] Under the Code of Virginia and City Charter, the City is authorized to impose conditions that reasonably and proportionally mitigate the impacts of a proposed development.[9] Environmental impacts—such as impacts to energy use, building performance, and climate resilience—are among the types of impacts that may be addressed through such conditions. The Alexandria City Charter also authorizes the City to regulate the construction, maintenance, repair, and operation of buildings.[10] In determining appropriate conditions for site plans and special use permits, the City relies on adopted master plan policies for guidance and consistency, such

[8] *See, e.g.,* Chapter 9 of the City Charter, including Secs. 9.06 and 9.09.
[9] *See, e.g.*, Sec. 15.2-2286(3) of the Code of Virginia and City Charter Sec. 9.09.
[10] *See, e.g.,* Sec. 2.04 of the City Charter.

as this Green Building Plan. This process is further described in Sections 9 and 10. The adoption and implementation of the Green Building Plan is one more step on the pathway to a carbon-free, sustainable community that is resilient to the current and growing threats of climate change. The Green Building Plan provides clear direction to ensure that the impacts of buildings in Alexandria are mitigated by focusing on key elements of building performance. The Green Building Plan was designed to focus directly on the measures that have the greatest effect on mitigating the impacts of development and also result in achieving the City's EAP and ECCAP goals. The following sections discuss measures the City is taking to address the environmental impacts in public buildings, existing buildings, and new and renovated buildings. These actions address both immediate and long-term efforts to mitigate the environmental impacts of the built environment.

Public Buildings

While, according to the EAP, City operations account for only 4% of the GHG emissions, leadership by example and good stewardship of public tax dollars compel the City to focus on improving the performance of public buildings. The City's commitment to leadership in this space is notable through numerous goals and policies included in the EAP and other City policies (**Figure 6**):

- Net-zero energy targets for public buildings subject to the 2019 Green Building Policy,
- Achieve a 50% reduction in energy use by Fiscal Year 2035,
- Fully electrify City-owned facilities by Fiscal Year 2030, and
- Power 100% of City facilities with on-site renewable energy or direct purchase off-site by Fiscal Year 2035.

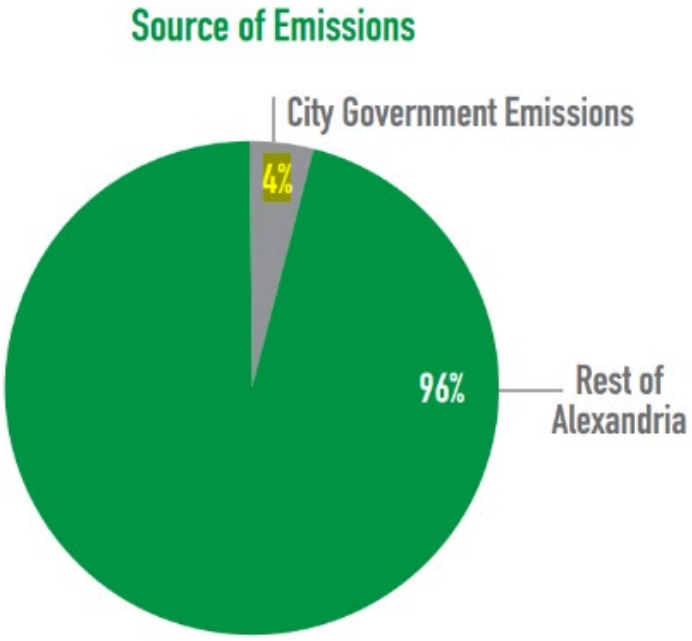

Figure 6 Sources of emissions, City Government (EAP)

Existing Buildings

Because most land in the City is already developed, improving the performance of existing buildings is essential to meeting Alexandria's long-term sustainability and resilience goals. The EAP provides several actions that the City can take to support higher energy performance across the current built environment, including:

- Expand participation in state-level policy and regulatory proceedings,

- Promote the use of Commercial Property Assessed Clean Energy (C-PACE) programs,
- Develop a strategy for electric vehicle charging infrastructure,
- Develop and implement a full suite of energy efficiency programs by Fiscal Year 2040,
- Implement robust outreach campaigns to educate residents and businesses,
- Launch a Green Business Recognition Program, and
- Establish a voluntary recognition program for residents to report their efforts.

Investment in the City's existing built environment requires a joint commitment from the City, community, and businesses. Through the development of programs such as Eco-City Homes and Eco-City Businesses, the City is engaging residents and businesses on comprehensive approaches to achieve environmental resilience.

Utility providers also play a critical role, as the Virginia Clean Economy Act sets targets for utilities to achieve from investments in energy efficiency.[11] Achieving meaningful improvements in existing buildings depends on sustained investment and collaboration from utilities that serve Alexandria. To facilitate this participation, the City will continue and expand its involvement with utility regulatory proceedings at the State Corporation Commission and the General Assembly. The City will work with the utilities to encourage investments in Alexandria properties.

New and Renovated Buildings

New buildings and those undergoing significant renovations present a unique opportunity to significantly reduce GHG emissions and improve long-term environmental performance. Decisions made during the design and construction phases determine a building's carbon footprint for decades. Failure to prioritize energy efficiency and sustainability during these stages results in higher GHG emissions, greater operating costs, reduced resilience and increased environmental impacts.

The Green Building Plan updates and refines the provisions of the 2019 Green Building Policy for private development projects that require a Development Site Plan (DSP) or a Development Special Use Permit (DSUP). These provisions will be reviewed as part of the DSP and DSUP application process and will be tailored to the elements and impacts of each individual project. The updated requirements focus on strategies that deliver the greatest long-term impact on energy performance.

To mitigate the environmental impacts created by new construction, proposals requiring a DSP or DSUP will be reviewed for conformance with the Green Building Plan, after completing an individualized assessment through the development review process.

Key components of the Green Building Plan include:

[11] The Virginia Clean Economy Act (VECA) Summary: https://energy.virginia.gov/renewable-energy/documents/VCEASummary.pdf

Energy Use Intensity (EUI)
Ultimately, achieving the City's goals and protecting its residents from the impacts of climate change and rising costs of energy means improving the energy-efficiency of buildings. EUI is a direct measure of a building's energy performance, calculated by dividing the total energy use, measured in kBtu, by the square footage of the building, giving a single number that can be compared with other similar buildings.

The majority of the City's GHG reductions by 2050 will come from new construction. Achieving GHG reductions requires setting achievable but ambitious targets that will ensure new buildings prioritize energy efficiency in their design and operation. The Green Building Plan sets different EUI targets for various building use types.

Renewable Energy
Increasing the amount of clean energy generation will mitigate the environmental impacts created by new construction and achieve the City's climate goals. The Green Building Plan sets a minimum amount of renewable energy required for each new development, ensuring that locally produced clean energy is a part of each new development in the City. Renewable energy production not only reduce reliance on fossil fuels, it also improves the reliability and resilience of our energy systems – an important response to the impacts already being experienced from climate change such as extreme heat.

Electrification
Combustion of natural gas is a significant contributor to GHG emissions, presents safety concerns, and reduces both indoor and outdoor air quality.[12] The Green Building Plan prioritizes non-combustion solutions for heating and cooling and other appliances. The City encourages full electrification of all buildings, but the Green Building Plan provides flexibility and exceptions where technology or environmental conditions merit.

Energy & Water Meters
Knowing and actively monitoring the energy[13] and water[14] use of a building can help an owner or operator quickly identify that a system is malfunctioning and using more energy or water than anticipated. A building's environmental impact does not end at construction; the ongoing operation of the building will have an impact on the environment for decades. The Green Building Plan requires the installation of whole-building meters to ensure this information is available to owners and operators to have continual awareness of the building's operation.

Indoor and Outdoor Water Conservation
Water conservation provides environmental benefits, and the production of clean, potable

[12]Home electrification health benefits: https://www.rewiringamerica.org/research/home-electrification-health-benefits
[13] Energy Management Systems: How immediate benefits drive strategic gains: https://blog.se.com/energy-management-energy-efficiency/2024/01/05/energy-management-systems-drive-strategic-gains/
[14] Keeping Tabs: Why Monitoring Water Levels Matters: https://smartwateronline.com/news/keeping-tabs-why-monitoring-water-levels-matters?srsltid=AfmBOooYMJB15KuNPF-PSm_0qVf63enpkQKF6r72D24AQAs8M3xSIlga

water requires a significant amount of energy.[15] Reducing the amount of water that is used without compromising the health and operation of a building provides both the benefit of reducing water use and reducing the associated energy consumption and GHG emissions.

Energy-Efficient Appliances

While the EUI targets set in the Green Building Plan address a significant portion of a building's energy use through design, the appliances installed in the building are also an important factor in reducing energy use in the building's operation. Reducing the building's impact on the environment means ensuring the everyday use of the facility by occupants is also aimed at reducing the environmental impact and GHG emissions[16]. The Green Building Plan establishes standards for end-use appliances that align with nationally recognized standards such as ENERGY STAR® to ensure lower energy use during the building's operation.

Electric Vehicle Charging Infrastructure

Transportation is the second highest source of GHG emissions production in Alexandria. As developments increase the number of vehicles in the area, there is a direct increase in GHG emissions. Addressing the impact of increased GHG emissions from vehicles includes encouraging the widespread adoption of electric vehicles (EV). Without access to a robust EV charging infrastructure, EV adoption will continue to be slow. The Green Building Plan sets requirements for the installation of EV charging infrastructure to increase the availability of chargers and support the transition to EVs for residents and visitors. In line with the City's EV Charging Infrastructure Readiness Strategy,[17] the Green Building Plan's requirements allow for faster and more widespread adoption of zero-emission transportation options.

Low Emitting Materials

While GHG emissions are a significant environmental impact, new construction also impacts indoor air quality through the choice of materials used and installed[18]. Indoor air quality and the health of occupants is a key environmental concern for the City. The choice of which materials are used in a building, such as paints and carpets, can have a significant impact on air quality and health. The Green Building Plan establishes criteria, like those adopted as part of the 2019 Green Building Policy and widely adopted throughout the industry.

Flexibility for Adaptive Reuse Projects

Prioritizing energy efficiency and GHG reductions for new developments does not always mean newer is better. When a building is being renovated from one use to another – such as a commercial office building being converted to a residential building – there are significant environmental benefits to adaptive reuse over the alternative of demolishing and rebuilding.[19]

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[15] Addressing Energy-Water Challenges, U.S. Department of Energy: https://www.energy.gov/eere/addressing-energy-water-challenges
[16] ENERGY STAR Impacts: https://www.energystar.gov/about/impacts
[17] The City of Alexandria's Electric Vehicle Charging Infrastructure Readiness Strategy, dated May 2021: https://www.alexandriava.gov/sites/default/files/2024-06/alexandria_evrs_final.pdf
[18] Indoor AirPlus: How to Find Compliant Building Materials, U.S. Environmental Protection Agency, https://www.epa.gov/system/files/documents/2024-08/iap-compliant-building-products-july-2024_508-compliant.pdf
[19] Building Reuse: A Proven Climate and Economic Strategy, AIA, https://www.aia.org/sites/default/files/2024-12/AIA_NTHP_Building_Reuse_42__0.pdf

The industrial processes to make the materials that go into a new building are carbon-intensive, as is the construction process. The Green Building Plan offers considerable flexibility to developments that avoid these emissions through adaptive reuse.

7. Plan Development Process

The process of developing the Green Building Plan began with the establishment of the Green Building Policy Advisory Group, a group of 14 people from a wide variety of backgrounds. This included representatives from the commercial and residential development community, architects, attorneys, residents, and environmental advocates. A position on the Advisory Group was reserved for a representative from the Planning Commission, Environmental Policy Commission, and NAIOP, the commercial real estate development association – those groups were asked to each nominate a member of their organization.

The Advisory Group began meeting in March 2024 and met regularly – the meetings covered each of the components of what became the Green Building Plan. The Advisory Group explored the feasibility of achieving ambitious targets, how a target-setting approach should be developed, and how to balance the climate goals of the City with what was possible given economic conditions and available technology and practices in the region.

City staff used guidance from the Advisory Group to develop a draft, which was released for public comment in April 2025. Following the public comment period, staff engaged in numerous additional meetings with land-use attorneys, NAIOP, environmental advocates, the Environmental Policy Commission, and residents to better understand concerns that were raised. This resulted in additional analysis of targets, particularly EUI and renewable energy, and ultimately the development of this Green Building Plan.

8. Alignment with Citywide Plans

Implementation of the Green Building Plan directly supports:

- Environmental Action Plan 2040,
- Energy & Climate Change Action Plan,
- Housing Master Plan,
- Alexandria Mobility Plan, and
- Electric Vehicle Charging Infrastructure Readiness Strategy.

This chapter ensures environmental sustainability and climate resilience are integrated into land use decision-making throughout the City.

9. Plan Application

New private development that requires a Development Site Plan (DSP) or a Development Special Use Permit (DSUP) is subject to the Green Building Plan. Conformance with the Green Building Plan will be reviewed as part of the DSP and DSUP application process and evaluated based on an individualized assessment of each application, project site, and development conditions.

Based on site and building conditions, staff will consider modification requests and associated impacts, when making recommendations to the Planning Commission and City Council, as appropriate, as described in Section 10.

10. Options for Projects

This Plan outlines four (4) options for private development projects and one (1) option for public development projects subject to DSP and DSUP review (**Table 1**). Public development projects subject to DSP and DSUP review must meet Option 5.

Option 1 – Standard

Requires projects to meet specific performance standards for EUI, renewable energy, building electrification, water conservation, and electric vehicle charging infrastructure based upon the nature of the project. This Option builds on the standard green building elements which are generally part of the certification options in the 2019 Green Building Policy.

Option 2 – Green Building Certifications

In lieu of complying with other options, Option 2 allows projects to satisfy a green building certification requirement.

Option 3 – Affordable Housing

In lieu of complying with other options, Option 3 allows affordable housing projects to satisfy development criteria set by Virginia Housing (VH) and incorporate a base level of electric vehicle charging infrastructure.

Option 4 – Small Projects

In lieu of complying with other options, Option 4 allows certain small projects to satisfy different standards tailored to their scope.

Option 5 – Public Projects

Option 5 sets bold criteria for public development projects.

Table 1. Summary of Options for Projects

Option	Description
1. Standard	Meet **specific performance standards** for EUI, renewable energy, building electrification, water conservation, EV charging infrastructure, and indoor environmental quality.
2. Green Building Certifications	Satisfy a recognized market-leading **green building certification.**
3. Affordable Housing	Satisfy **Virginia Housing** development criteria and include a **base level of EV charging.**
4. Small Projects	Meet **scaled standards** appropriate to project size and scope.
5. Public Development	In addition to the chosen **certification** option: 1. Treat 100% of required stormwater through **green infrastructure**. 2. Achieve **Net-Zero Energy** (on- or off-site).

General Flexibility & Permitted Modifications

Applicants seeking a modification to the Green Building Plan shall submit a written narrative outlining the basis for the request and explaining either: (1) how the proposed alternative will meet or exceed the Green Building Plan's targets; or, if requesting a reduction, (2) why conformance with other requirements and policies—such as architectural design standards, affordable housing obligations, or other development conditions—creates a conflict that limits the proposed project's ability to fully meet the Green Building Plan targets. For requests submitted under option (2), the narrative must also include evidence that the conflict cannot be reasonably resolved through design modifications; an analysis of feasible options showing that the applicant has evaluated reasonable methods to achieve the Green Building Plan's targets; and a description of how the proposed alternative will achieve the Green Building Plan's targets to the maximum extent practicable. The requested reduction should be the minimum necessary to address the conflict.

Staff will evaluate modification requests considering site and building specific conditions and will provide recommendations to the Planning Commission and City Council, as appropriate.

Specific Flexibility for Adaptive Reuse Projects

In recognition of the embodied carbon benefits associated with reusing existing structures, the City strongly supports the conversion or "adaptive reuse" of existing buildings as a means to achieve significant environmental benefit compared to new construction. Development proposals that include adaptive reuse of existing buildings, and are subject to the Green Building Plan, may seek modifications of the required EUI and renewable energy targets of the Green Building Plan. Such modifications may be recommended by staff as part of the application process as described above.

Option 1: Standard

Energy Use Intensity

Energy Use Intensity (EUI) is a metric used to measure the energy efficiency of a building. It represents the amount of energy consumed per unit of gross floor area over a specific time, typically expressed in energy use per square foot (sq. ft.) per year.

EUI is a common measure of a building's energy performance, and is referenced in the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) standards, which are the standards incorporated into the Uniform Statewide Building Code.

Buildings with lower EUIs contribute to lower GHG emissions, increase grid resilience, help lessen utility burden, and contribute to improved regional outdoor air quality for Alexandria's residents by avoiding fuel combustion required for increased electricity demand.

Projects shall meet the site EUI targets by property type as shown in **Table 2**.

Predictive modeling shall be used to calculate annual energy use as applicable:

- **For commercial buildings and large multi-unit residential dwellings:** in accordance with ASHRAE standard 90.1-2010, Appendix G. In lieu of 90.1-2010, ASHRAE 90.1-2019, Appendix G may be used.
- **For single-unit residential or residential dwellings 3 stories or fewer:** in accordance with 2021 Virginia Energy Conservation Code Section R401.2.2 Total Building Performance Option OR Section R401.2.3 Energy Rating Index Option.

The annual energy use shall include all energy used for the building systems and its anticipated occupancies. These EUI targets reflect projected annual energy demand for each building type, proportionate to the expected load of each use. By establishing targets informed by the frameworks above, new development is informed by both present standards and the evolving energy needs of residents in the City of Alexandria.

Table 2. Site EUI by Property Type

Property Use	Site EUI Target
Single-unit residential	31
Multi-unit residential	35
Mixed use	Determined based on a ratio of the building's property use types
Commercial/office	40
Hotel	83
Retail	40

For property types not listed in Table 2, the project's site EUI target will be determined by the Climate Action Officer or their designee. To determine this, the Officer and applicant may use sources such as local benchmarked EUIs accessed using the Department of Energy's Building Performance Database (BPD), ASHRAE performance standards, or other data available through trusted nonprofit and government sources.

Renewable Energy

Generating renewable energy locally promotes lower operating costs, local grid stability, job creation and skill training, energy independence, and greenhouse gas emission reductions, helping the City be more resilient to and mitigate the impacts of climate change and air pollution related to new development. Generating renewable energy on-site, or within the City of Alexandria, enhances the resilience and reliability of the electric grid, while reducing reliance on fossil fuels.

All buildings shall be designed to be solar-ready and shall meet one of the following options:

1. **Option 1: Generate at least 3% of the project's anticipated total annual energy use with on-site renewable energy**. Anticipated total annual energy use shall be estimated using the same methodology used to calculate EUI.
2. **Option 2: Contribute to the City of Alexandria's Clean Energy Fund based on the formula below**. The Clean Energy Fund will be used for investment in projects that have similar impact by either reducing energy use or increasing the availability of renewable energy within the City of Alexandria. The maximum contribution to the Clean Energy Fund shall not exceed $150,000 per building or, in the case of townhomes, per development. The contribution will be calculated based on the following formula (**Table 3**):
    i. **Step 1:** Multiply the project's modeled Total Annual Energy Use (kWh) by 0.03. This is the project's Total Renewable Energy Requirement (kWh).

$$Project's\ modeled\ Total\ Annual\ Energy\ Use\ (kWh) \times 0.03 = Total\ Renewable\ Energy\ Requirement\ (kWh)$$

    ii. **Step 2:** Determine the System Size (kW). Divide the Total Renewable Energy Requirement (kWh) by the Assumed Production-Size Ratio (kWh per kW) of the renewable energy system installed: assumed to be 1,332 kWh per kW in Alexandria. This produces the Installation Capacity Requirement (kW).

$$Total\ Renewable\ Energy\ Requirement\ (kWh) \Big/ 1{,}332\ kWh\ per\ kW = Instalation\ Capacity\ Requirement\ (kW)$$

iii. **Step 3:** Convert the Installation Capacity Requirement (kW) into Watts by multiplying the Installation Capacity Requirement (kWh) by 1000.

$$Installation\ Capacity\ Requirement\ (kWh)\ \times 1{,}000 = Installation\ Capacity\ Requirement\ (W)$$

iv. **Step 4:** Determine the Clean Energy Fund Contribution by multiplying the Installation Capacity Requirement in Watts by the Solar Benchmark Price of $3.36 per watt. This is the project's Clean Energy Fund Contribution amount and may not exceed $150,000.

$$Installation\ Capacity\ Requirement\ (W) \times \$3.36\ (\$\ per\ W) = Clean\ Energy\ Fund\ Contribtion\ (may\ not\ exceed\ \$150{,}000)$$

3. **Option 3: Any combination of Option 1 and Option 2.**
Applicants may install on-site renewable energy that equals less than the 3% requirement of the Green Building Plan, if the remaining renewable energy requirement is achieved by contributing to the Clean Energy Fund using the above calculations.

Table 3. Renewable Energy Terms

Term	Unit	Notes
Total Annual Energy Use	kWh	Modeled from Section II,A: *Energy Use Intensity*
Total Renewable Energy Requirement	3%	
Assumed Production-Size Ratio[20]	kWh per kW of renewable energy system installed	Assumed to be 1,332 kWh per kW in Alexandria
Installation Capacity Requirement	kW	
Solar Benchmark Price	$3.36 per watt	Cost per watt for U.S. National Average System Price for residential systems in Q2 2025, SEIA[21]
Clean Energy Fund	$	Contributions shall not exceed $150,000

[20] The Production-Size Ratio is most heavily influenced by the location and orientation of the solar panels. The value shows how many kWh of usable energy is likely to be gained from each kW of rated power. For example, a PV installation of 10kW will produce more kWh when panels are installed facing South in a desert versus facing North in a rainy city like Seattle.
[21] Solar Energy Industries Association (SEIA): Solar Market Insight Report Q3 2025 - https://seia.org/research-resources/solar-market-insight-report-q3-2025/

Electrification

Building electrification improves indoor and outdoor air quality, building safety, and reduces greenhouse gas emissions from the built environment.

Permitted Combustion Uses

Onsite combustion is prohibited unless included in the list of Permitted Combustion Uses. Buildings should evaluate and prioritize eliminating combustion onsite. However, some combustion uses are less conducive to non-combustion replacements. The following combustion uses are permitted when controlled with occupancy sensors or automated timers as to prohibit combustion when not in use by building occupants:

- Amenities (e.g., fireplaces, firepits, or grills) in multi-unit residential or hotel projects,
- Commercial kitchens,
- Commercial laundry and centralized domestic hot water systems in multi-unit residential or hotel projects,
- Dedicated Outdoor Air Systems (DOAS), and
- Emergency generators.

Energy and Water Meters

These energy and water meter standards allow for whole-building benchmarking and verification of EUI targets.

Install new or use existing building-level energy and water meters, or submeters that can be aggregated to provide building-level data representing total building energy consumption (e.g., electricity, natural gas, chilled water, steam, fuel oil, propane, biomass) and total building water consumption. Utility-owned meters capable of aggregating building-level resource use are acceptable.

Indoor Water Conservation

These indoor water conservation standards are intended to create less demand on potable water supply and wastewater treatment infrastructure while lowering utility bills for building owners and occupants.

All newly installed plumbing fixtures eligible for labeling must be WaterSense[22] labeled and not exceed the following maximum flow/flush rates:

- Water closets (toilets): 1.28 gallons per flush (gpf)
- Urinals: 0.25 gpf
- Public lavatory faucets: 0.35 gallons per minute (gpm)
- Private lavatory faucets: 0.8 gpm
- Kitchen faucets: 1.5 gpm
- Showerheads: 2.0 gpm
- Prerinse spray valves: 1.3 gpm

[22] The WaterSense label is a certification program run by the U.S. Environmental Protection Agency (EPA). It identifies products that meet EPA criteria for water efficiency and performance. WaterSense Fixtures: https://www.epa.gov/watersense/watersense-products

Outdoor Water Conservation

These outdoor water conservation standards are intended to create less demand on water supply and wastewater treatment infrastructure and reduce contaminants in the environment, while lowering utility bills for building owners and occupants.

Meet one of the following Options:

1. **Option 1**: Do not install a permanent irrigation system.
2. **Option 2**: Reduce the project's landscape irrigation water requirement by at least 50% from the calculated baseline for the site's peak watering month. Reductions must be achieved through plant species selection and irrigation system efficiency, as calculated by the EPA's WaterSense Water Budget Tool.[23]

Energy-Efficient Appliances

Newly installed appliances below shall have the ENERGY STAR[24] label:

- Residential clothes washer
- Residential clothes dryer
- Residential dishwasher
- Residential refrigerators
- Ice machines

Electric Vehicle Charging Infrastructure

Townhouses, Duplexes, Stacked Townhouses, and Single-unit Residential Projects:

If off-street parking is required, provide two empty slots in each household electrical panel for future Level 2 charging and pull wire ready conduit from the electrical panel to the off-street parking spaces. Install and label the conduit outlet prior to receiving the Certificate of Occupancy.

Multi-unit Residential Projects (Market-rate):

Provide EV chargers for at least five percent (5%) of the required parking spaces, consisting of Level 2, Level 3 DC Fast Chargers (DCFCs), or a combination thereof, rounded up to the next whole number parking space. DCFCs must output a minimum of 30 kW per charging port. At least 15% of parking spaces shall be EV charger-ready per these requirements for Level 1, Level 2, or Level 3 chargers.

- **Level 1 Make-ready:** Install dedicated 120V, 20A branch circuit from the dwelling unit's electrical panel to the desired charging location.

- **Level 2 Make-ready:** Provide capacity and space in electrical panels for future Level 2 chargers. Each Level 2 EV charger make-ready parking space should be able to

[23] EPA's WaterSense Water Budget Tool can be accessed: https://www.epa.gov/watersense/water-budget-tool

[24] The ENERGYSTAR label is a certification program run by the U.S. Environmental Protection Agency (EPA) in partnership with the U.S. Department of Energy (DOE). It identifies products that meet EPA criteria for energy efficiency. ENERGY STAR appliances: https://www.energystar.gov/products

provide at least a rated load of 32A that requires a 40A, 2P, 208/120V or 240/120V branch circuit breaker. Installers should work with utility company, as needed, to ensure the equipment is sufficient. Site plans should also include charging port–specific and parking space–specific details, such as conduit routing, equipment footprint, ADA-compliant access, and vehicle maneuvering clearances.

- **Level 3 Make-ready:** Establish high-capacity electrical infrastructure capable of supporting power levels typically ranging from 30 kW to 350 kW per port. This includes upgrading or installing three-phase electrical service, transformers, switchgear, and dedicated distribution panels, as well as planning for appropriately sized conduit and conductors to each charger location. Installers must coordinate with the electric utility to confirm primary-side capacity and interconnection requirements. Site plans should also include charging port–specific and parking space–specific details, such as conduit routing, equipment footprint, ADA-compliant access, and vehicle maneuvering clearances.

Multi-unit Residential Conversion Projects:
Provide EV chargers for at least five percent (5%) of the required parking spaces, consisting of Level 2, Level 3 DCFCs, or a combination thereof, rounded up to the next whole number parking space. DCFCs must output a minimum of 30 kW per charging port.

Commercial and Hotel Projects:

1. **Option 1:** Provide EV chargers for at least five percent (5%) of the required parking spaces, consisting of Level 2, Level 3 DCFCs, or a combination thereof, rounded up to the next whole number parking space. At least 15% of parking spaces shall be EV charger-ready per these requirements for Level 2 or Level 3 chargers.

2. **Option 2**: Provide one (1) DCFC installed and two percent (2%) of parking spaces with Level 2 chargers. At least three (3%) of parking spaces are EV charger-ready for Level 2 or Level 3 chargers per these requirements.

    - **Level 2 Make-ready:** Provide capacity and space in electrical panels for future Level 2 chargers. Each Level 2 EV charger make-ready parking space should be able to provide at least a rated load of 32A that requires a 40A, 2P, 208/120V or 240/120V branch circuit breaker. Installers should work with utility company, as needed, to ensure the equipment is sufficient. Site plans should also include charging port–specific and parking space–specific details, such as conduit routing, equipment footprint, ADA-compliant access, and vehicle maneuvering clearances.

    - **Level 3 Make-ready:** Establish high-capacity electrical infrastructure capable of supporting power levels typically ranging from 30 kW to 350 kW per port. This includes upgrading or installing three-phase electrical service, transformers, switchgear, and dedicated distribution panels, as well as planning for appropriately sized conduit and conductors to each charger location. Installers

must coordinate with the electric utility to confirm primary-side capacity and interconnection requirements. Site plans should also include charging port–specific and parking space–specific details, such as conduit routing, equipment footprint, ADA-compliant access, and vehicle maneuvering clearances.

All Other Project Types:

1. **Option 1**: Provide EV chargers for at least five percent (5%) of the required parking spaces, consisting of Level 2, Level 3 DCFCs, or a combination thereof, rounded up to the next whole number parking space. DCFCs must output a minimum of 30 kW per charging port. At least 15% of parking spaces shall be EV charger-ready for Level 2 or Level 3 chargers per these requirements.

    - **Level 2 Make-ready:** Provide capacity and space in electrical panels for future Level 2 chargers. Each Level 2 EV charger make-ready parking space should be able to provide at least a rated load of 32A that requires a 40A, 2P, 208/120V or 240/120V branch circuit breaker. Installers should work with utility company, as needed, to ensure the equipment is sufficient. Site plans should also include charging port–specific and parking space–specific details, such as conduit routing, equipment footprint, ADA-compliant access, and vehicle maneuvering clearances.

    - **Level 3 Make-ready:** Establish high-capacity electrical infrastructure capable of supporting power levels typically ranging from 30 kW to 350 kW per port. This includes upgrading or installing three-phase electrical service, transformers, switchgear, and dedicated distribution panels, as well as planning for appropriately sized conduit and conductors to each charger location. Installers must coordinate with the electric utility to confirm primary-side capacity and interconnection requirements. Site plans should also include charging port–specific and parking space–specific details, such as conduit routing, equipment footprint, ADA-compliant access, and vehicle maneuvering clearances.

2. **Option 2**: Install at least one (1) publicly accessible DCFC, prior to issuance of the final Certificate of Occupancy. The DCFC space(s) would count toward Zoning Ordinance off-street parking requirements. DCFCs must output a minimum of 30 kW per charging port.

Low Emitting Materials

New materials, such as paint and flooring, in occupied spaces may emit toxic or otherwise unhealthy particles to residents. This requirement reduces the negative health impacts of new construction and materials.

Meet the requirements equivalent to earning at least 2 points for the LEED v4.1 BC+C New Construction – Low-Emitting Materials credit.[25] Three of the following building interior product categories may be pursued: paints and coatings, adhesives and sealants, flooring, wall panels, ceilings, insulation, and composite wood.

[25] Reference the LEED Credit Library for specific requirements: https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-38

Option 2: Green Building Certifications

Projects that pursue one of the following certifications are considered compliant with the Green Building Plan. These certifications push projects to incorporate market-leading sustainability strategies, support workforce development, and take advantage of federally available incentives. Projects using this option must use the current version of the certification or standard available at the time of Development Site Plan (DSP) or Development Special Use Permit (DSUP) submission:

- Passive House Institute US (PHIUS) Certification,
- Passive House Institute (PHI) Certification,
- Living Building Challenge Certification,
- U.S. DOE Zero Emissions Building,
- U.S. DOE Zero Energy Ready Home, or
- U.S. Green Building Council LEED Zero.

Option 3: Affordable Housing Projects

Existing requirements for projects receiving Virgina Housing Low Income Housing Tax Credit (LIHTC) financing or City of Alexandria Housing Opportunity Funds typically meet or exceed the established energy performance requirements in this Plan. An affordable housing project is defined as one with rent or sale prices – and/or income restrictions – established through local, state, and/or federal requirements.

Projects which use this option must comply with the current version of the rating system or standard available at the time of DSP or DSUP submission. Projects utilizing LIHTC financing or City of Alexandria Housing Opportunity Funds must be compliant with VH-required baseline energy performance requirements and obtain one of the following additional green certifications: LEED, EarthCraft, National Green Building Standard, or Enterprise.

Multi-unit Affordable Housing Projects

In addition to the baseline energy performance requirements and the green certification above, provide EV chargers for at least two point five percent (2.5%) of the required parking spaces, consisting of Level 2, Level 3 DCFCs, or a combination thereof, rounded up to the next whole number parking space. At least five percent (5%) of parking spaces shall be EV charger-ready per these requirements for Level 1, Level 2, or Level 3 chargers.

- **Level 1 Make-ready:** Install dedicated 120V, 20A branch circuit from the dwelling unit's electrical panel to the desired charging location.

- **Level 2 Make-ready:** Provide capacity and space in electrical panels for future Level 2 chargers. Each Level 2 EV charger make-ready parking space should be able to provide at least a rated load of 32A that requires a 40A, 2P, 208/120V or 240/120V branch circuit breaker. Installers should work with utility company, as needed, to ensure the equipment is sufficient. Site plans should also include charging port–specific and parking space–specific details, such as conduit routing, equipment footprint, ADA-compliant access, and vehicle maneuvering clearances.

- **Level 3 Make-ready:** Establish high-capacity electrical infrastructure capable of supporting power levels typically ranging from 30 kW to 350 kW per port. This includes upgrading or installing three-phase electrical service, transformers, switchgear, and dedicated distribution panels, as well as planning for appropriately sized conduit and conductors to each charger location. Installers must coordinate with the electric utility to confirm primary-side capacity and interconnection requirements. Site plans should also include charging port–specific and parking space–specific details, such as conduit routing, equipment footprint, ADA-compliant access, and vehicle maneuvering clearances.

Option 4: Small Projects

Residential projects with four or fewer units, or projects under 10,000 square foot gross floor area are exempt from Options 1, 2, and 3, but shall meet the following:

Water Conservation

All newly installed plumbing fixtures must meet the criteria to be WaterSense[26] labeled and not exceed the following maximum flow/flush rates:

- Water closets (toilets): 1.28 gpf
- Urinals: 0.25 gpf
- Public lavatory faucets: 0.35 gpm
- Private lavatory faucets: 0.8 gpm
- Kitchen faucets: 1.5 gpm
- Showerheads: 2.0 gpm
- Prerinse spray valves: 1.3 gpm

No or Low Flow Irrigation

All newly installed irrigation systems must use drip, mist, or other low-impact irrigation methods.

Energy-Efficient Appliances

The following newly installed appliances shall be ENERGY STAR-rated.[27]

- Residential clothes washer
- Residential clothes dryer
- Residential dishwasher
- Residential refrigerators
- Ice machines

Electric Vehicle Charging Infrastructure

Meet the requirements of Option 2: Electric Vehicle Charging Infrastructure, as applicable.

Solar-Ready Roof and Electrical Design

Demonstrate that the roof(s) are solar-ready, with the necessary conduit and available electrical panel area to enable future solar panel installation, on the project's Final Site Plan.

[26] WaterSense Fixtures: https://www.epa.gov/watersense/watersense-products
[27] ENERGY STAR appliances: https://www.energystar.gov/products

Option 5: Public Projects

In addition to selecting one of the certification options and earning the minimum performance requirements included in Appendix 2 of this Plan, public development will meet the following criteria:

- **Stormwater:** 100% of the required stormwater treatment will be through green infrastructure.
- **Net-Zero Energy:** The actual annual energy consumed is less than or equal to the renewable energy produced either on-site at the property, or at another site owned by the applicant.

For renovations of City-owned buildings that do not require a DSP or DSUP, the City will apply LEED Interior Design & Construction (ID+C) and LEED Operations & Maintenance (O&M) rating systems as a guideline for interior design and construction projects and targeted renovations of individual building's systems (e.g., HVAC, roof, windows, plumbing). Actual third-party certification may be used when technically and financially feasible.

11. Development Review

The Department of Planning and Zoning is directed to create a process for reviewing development submissions and periodically updating the Green Building Plan's application in the City's development process, administratively and as necessary, to accommodate swift, accurate, and effective submission review and Green Building Plan implementation.

12. Future Updates

The Office of Climate Action will, at least every two years, review the standards set in this policy, particularly Energy Use Intensity, Renewable Energy, and Permitted Combustion Uses, and recommend any changes to City Council.

Appendix 1: Recommendation Analysis

The components of the Green Building Plan were developed with considerable input from the community, the development industry, City staff, and other experts. A Green Building Policy Advisory Group was established, and met for several months, to discuss which areas should be targeted in a Green Building Policy, and at what level.

Following the Advisory Group meetings, City Staff engaged with experts from the Pacific Northwest National Lab (PNNL) to review Energy Use Intensity (EUI) targets, and the City contracted with Cadmus Group to develop further EUI and renewable energy targets.

Site EUI Targets: A variety of sources – such as publicly reported building operations data, predictive energy modeling, and reference standards – were used to set market-implementable, climate-focused EUI targets for development projects in Alexandria. The EUI targets in staff's recommendation have been informed by data shared via ENERGY STAR Portfolio Manager Data Explorer, as-designed developments proposed and constructed in Alexandria, a dataset of building-level energy use published in Washington, D.C., and Building Energy Performance Targets for existing buildings set by Montgomery County, MD.

PNNL conducted a review on the City's behalf of existing building data to understand how – and at what level – to set EUI targets that balance the importance of mitigating impacts of development with existing practices and technologies. Their analysis was informed by code prototype models. As part of the U.S. Department of Energy established methodology, prototype buildings are established to simulate energy savings associated with changes in energy codes and standards.

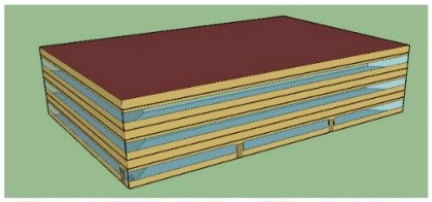

Figure 1. PNNL Medium Office Prototype

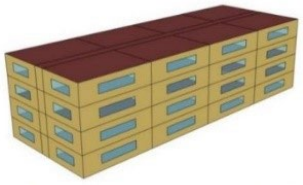

Figure 2. PNNL Midrise Multifamily Prototype

Figure 3. PNNL Highrise Multifamily Prototype

PNNL's analysis of how energy code prototype buildings could be expected to perform in terms of simulated site EUI (kBtu/SF/year) is in **Table 4**.

Table 4. Simulated Site EUI (kBtu/SF/year) of energy code prototype buildings

Type	VA 90.1-2016/2018 IECC	VA 90.1-2019/2021 IECC
Office	31.2	29.0
Multifamily Mid Rise	37.7	29.9
Multifamily High Rise	40.3	33.6

The current code in place is VA 90.1-2019/2021 IECC. It is worth noting that the results above are based on a prototype building and some degree of variation in site EUI can be expected from project to project. This potential for variation been accounted for in staff's recommendations.

PNNL's analysis of ENERGY STAR Portfolio Manager Data Explorer outlined that for midrise multi-unit residential projects in Virginia between 5,000 and 200,000 square feet constructed after 2010, the median site EUI reported was 31.5 kBtu/SF/year. For high rise multi-unit residential projects constructed after 2010 and greater than 200,000 square feet, the median site EUI was 25.1 kBtu/SF/year.

Staff's recommendation was also informed by predictive energy modeling completed by a third-party consultant, Cadmus Group. A variety of building use types were modeled using building characteristics regularly seen in development projects in Alexandria over the last five years. Additional detailed high-rise multi-unit residential modeling was completed for a specific project in Alexandria at 2250 Dock Lane to ensure the recommended EUI targets were within a reasonable reach of current design and construction practices.

Finally, additional market data was reviewed for relevant case studies. Washington, D.C. has a robust building benchmarking requirement and associated data from that requirement that is publicly available. The site EUI performance data in **Table 5** is from multi-unit residential projects in the District which have been constructed and occupied within the last five years.

Table 5. EUI performance data from multi-unit residential projects in Washington, DC

Name	Address	Gross Floor Area (sq.ft)	# of Stories	# of Units	Site EUI
Union Heights East	1676 Maryland Ave NE	325,215	6	325	23.5
The View Condos	1016 17th PL NE	37,049	5	47	24.1
The Lockwood	1339 E St SE	142,538	5	145	24.7
Judd	1625 Eckington PL NE	255,560	6	179	27.3
Solstice I & II	3500 East Capitol St NE	259,781	4	232	28.9
Monroe Street Market	701 Monroe St NW	183,980	5	720	30.1
Diane's House	2619 Bladensburg Rd NE	30,271	4	42	30.5
Europa/Sonder	819 L St SE	41,455	4	49	30.5
Vesta Parkside	750 Kenilworth Terrace NE	163,394	6	191	32.1
Ore 82	82 I St SE	227,371	13	227	33.9
Illume	853 New Jersey Ave SE	749,058	12	756	35.0
Lexicon Condominiums	50 Florida Ave NE	204,797	9	182	35.5

This data further suggests that development projects within Alexandria and the broader DMV can design and construct projects that meet the staff recommended site EUI targets. If a specific development project can demonstrate it is unable to meet the recommended site EUI target for its property use type, flexibility will be granted based on the applicant-demonstrated limitations of the project.

Renewable Energy: Development in Alexandria results in higher electricity demand and a more strained utility grid. Utility rates and energy burden for the residents of developments in Alexandria will continue to rise as the utility works to increase the amount of electricity it produces and bolster the grid that delivers that electricity. As average temperatures rise and the grid becomes more strained from electrical demand, locally produced energy sources will be important for building-level and community wide resilience. For these reasons, staff has

recommended development projects be required to install onsite renewable energy systems that meet at least 3% of the project's energy needs or to contribute to the City's Clean Energy Fund. Clean Energy Fund contributions are recommended to be capped at $150,000.

Building Electrification: The electrification of building end uses improves indoor and outdoor air quality and the safety of homes, business, and other buildings constructed in Alexandria[28]. Many end uses are being electrified in the current market with accessible technology. Some end uses – largely commercial or large scale uses – are challenging to electrify currently with market-ready technologies, building design practices, or building operation practices. This is reflected in staff's recommendation.

Electric Vehicle Charging Infrastructure: Electric vehicle (EV) adoption in Northern Virginia and DC continues to outpace the national average[29]. Because EV charging often requires longer dwell times, people expect convenient access to chargers at home, at work, and in the places they shop and recreate, making it easy to keep their vehicles powered and seamlessly integrated into their daily routines. In a 2024 study, the Electric Power Research Institute estimated that approximately 75 percent of charging is accomplished at home, 20 percent is completed at work, and 5 percent occurs at public charging station[30]. Over the lifetime of a vehicle, the greenhouse gas emissions associated with an EV are about 71% lower than that of an internal combustion engine vehicle[31]. Supporting EV adoption will reduce carbon emissions and harmful air pollutants from vehicle trips associated with a development. Charging infrastructure can create new revenue opportunities, help attract and retain residents seeking modern amenities, and future-proof properties in a competitive market. The City's Electric Vehicle Infrastructure Readiness Strategy outlines how the City can support EV adoption and meet growing demands, both now and in the future. The strategy includes recommendations for EV charging and make-ready requirements in new construction, recognizing that installing chargers or make-ready infrastructure during construction is significantly more cost-effective than retrofitting later. For these reasons, staff recommend offering several options for EV charger installation and make-ready infrastructure by project use type. These options balance convenience for users, efficiently utilize electrical capacity, and lower costs for future expansion.

Additional Recommendations: The recommendation includes building-level meters, water conservation measures, energy-efficient appliances, and best practices and finish selections with improved indoor air quality. The recommendation includes a process for flexibility requests, options for market-leading building certifications, and an option for affordable housing projects. Option 5 is for public development projects and matches the requirements of the 2019 Green Building Policy with one difference—public projects are recommended to

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[28] RMI Report 2020: Gas Stoves: Health and Air Quality Impacts and Solutions: https://rmi.org/insight/gas-stoves-pollution-health
[29] International Council on Clean Transportation: Electric Vehicle Market and Policy Developments In U.S. States, 2023: https://theicct.org/wp-content/uploads/2024/05/ID-154-%E2%80%93-U.S.-EVs_final.pdf
[30] Electric Power Research Institute: Consumer Guide to Electric Vehicle Charging, 2024: https://www.epri.com/research/products/000000003002031012
[31] International Council on Clean Transportation: Life-cycle greenhouse gas emissions of U.S. sedans and SUVs with different powertrains and fuel sources: https://theicct.org/publication/life-cycle-ghg-emissions-of-us-sedans-and-suvs-with-different-powertrains-and-fuel-sources-jul24/

have the flexibility of meeting the net zero energy requirement with on-site and off-site renewable energy production.

Analysis Reports: The following reports were used by staff to provide context for determining appropriate EUI targets for various property use types based on local benchmarking data from neighboring jurisdictions, predictive modeling, and an as-designed energy model from a large multi-unit residential building in Alexandria. Revised onsite renewable energy cost estimates are included in the third report from Cadmus Group dated August 18, 2025. The appendix includes the following reports:

- PNNL memo entitled *Data and Analysis for Alexandria Target Setting*, dated July 18, 2024,
- Cadmus Group memo entitled *City of Alexandria Green Building Policy Analysis*, dated March 14, 2025,
- Cadmus Group memo entitled *Additional Modeling Scope*, dated August 18, 2025, and
- Washington, D.C. Building Energy Performance Standard (BEPS) Sample Data, dated October 2025.

Appendix 2: Public Development Project Certification Options

Table 6. 2025 Green Building Plan Public Development Rating System Options

Leadership in Energy and Environmental Design (LEED)

Rating System	Minimum Level of Certification	Performance Points					
		Energy Use Reduction		Water Efficiency		Indoor Environmental Quality	
		Points	Credit	Points	Credit	Points	Credit
LEED BUILDING DESIGN AND CONSTRUCTION (BD+C)	Gold	7	Optimize Energy Performance	4	Indoor Water Use Reduction	1	Low-Emitting Materials
		3	Renewable Energy Production			1	Construction Indoor Air Quality Management Plan
		1	Advanced Energy Metering[32]	1	Outdoor Water Use Reduction	1	Thermal Comfort
		3	Enhanced Commissioning			2	Daylight
						1	Indoor Air Quality Assessment

[32] Applies to non-residential projects only (excludes hotels).

Green Globes

Rating System	Minimum Level of Certification	Performance Points					
		Energy Use Reduction		Water Efficiency		Indoor Environmental Quality	
		Points	Credit	Points	Credit	Points	Credit
GREEN GLOBES **NEW CONSTRUCTION (NC)**	3 Green Globes	68	**3.3.1.1** Assessing Energy Performance (Path A, B, or C)	24	**3.4.1.1** Indoor Water Consumption	11	**3.7.1.1** Ventilation Air Quality
		9	**3.3.9.1.1** On-site Renewable Energy Feasibility Study			8	**3.7.1.2** Air Exchange
		-AND-		6	**3.2.4.1** Landscape and Irrigation Plan (LIP) by Certified Professional	10	**3.7.2.1** Volatile Organic Compounds
		23	**3.3.9.1.2** On- or Off-site Renewable Energy				
		-OR-		3	**3.2.4.1.1** Soil Type, Drainage and Light Conditions		
		18	**3.3.9.2.1** Off-site Renewable Energy				
		-OR-					
		32	**3.3.9.1.2** (Partial) and **3.3.9.2.1** (Partial)	2	**3.2.4.3.2** Native/Non-invasive Plant Material		
		COMMISSIONING				5	**3.1.2.4** IAQ During Construction
		4	**3.1.3.2.1.1** HVAC and Refrigeration Systems	3	**3.2.4.3.3** Turfgrass Minimalized		
		3	**3.1.3.2.1.5** Plumbing				
		1	**3.1.3.2.1.6** Electrical	1	**3.4.8.2.2** Drip/low Volume Irrigation[3]	3	**3.1.2.4.2** IAQ of Occupied Areas During Construction
		1	**3.1.3.2.1.7** Lighting				
		1	**3.1.3.2.1.8** Building Automation			2-12	**3.7.4** Thermal Comfort
		1	**3.1.3.3.1** Training Requirements				
		6	**3.1.3.4.1** Operations and Maintenance Manuals	1	**3.4.8.2.3** WaterSense/SWAT/Smart Control System[3]	8	**3.3.5.4** Daylighting
		METERING, MEASUREMENT, AND VERIFICATION2					
		1	**3.3.3.1.1.1** Electricity	0.5	**3.4.8.2.4** Regulation of Precipitation Rate on Sprinkler[3]	7	**3.7.3.1.1** Daylighting
		1	**3.3.3.1.1.2** Heating Fuels				
		1	**3.3.3.1.1.4** Other, with description (as applicable)	0.5	**3.4.8.2.5** Swing Joints/Flex Pipes on Irrigation Heads[3]	2	**3.1.2.4.1** IAQ During Construction Indoor Air Quality Test Pathway
		0.5 - 3	**3.3.3.1.2** Sub-metering (as applicable)				

EarthCraft Light Commercial

Rating System	Minimum Level of Certification	Performance Points					
		Energy Use Reduction		Water Efficiency		Indoor Environmental Quality	
	Public	Points	Credit	Points	Credit	Points	Credit
EARTHCRAFT LIGHT COMMERCIAL (ECLC)	Gold	1	**BE 1A** Envelope Air Tightness Test	INDOOR WATER USE		2	**IEQ 5** Certified Flooring **IEQ 6** Composite Wood or **IEQ 7** Product Transparency
		1	**ES 5** High Performance Duct System	3	**WE 1A** High Efficiency Toilets **WE 1B** Pint Flush or Waterless Urinals **WE 1C** Automatic Faucets, and/or **WE 1D** High Efficiency Showerheads	1	**IEQ 1** Decoupled Ventilation **IEQ 2** (DCV) **IEQ 3** Air Filtration Media or **IEQ 4** Radon Exposure Prevention
		-AND-					
		1	**IN 1** Renewable Energy Installation				
		-OR-					
		2	**IN 2** Renewable Energy Procurement				
		COMMISSIONING				1	**BE 7** Daylighting Design Strategies
		3	**EO 1** Building Systems Commissioning	OUTDOOR WATER USE			
		METERING		3	**WE 2** Landscape Plan **WE 3** Efficient Irrigation System and/or No Irrigation and/or **WE 4** Non-potable Water Source Used for Irrigation[3]	PR[4]	**IEQ R3** Minimize Indoor Air Contamination
		PR[4]	**EO R1** Utility Tracking				