



County of Fairfax, Virginia

MEMORANDUM

DATE: JUN 10 2020

TO: Board of Supervisors

FROM: Bryan J. Hill
County Executive *J Hill*

SUBJECT: Updates to the County's Sustainable Development Policy

The Department of Public Works and Environmental Services (DPWES) has worked in close collaboration with the Office of Environmental and Energy Coordination (OEEC) to develop a framework for proposed revisions to the County's Sustainable Development Policy (Policy) based on the leadership and guidance provided by the Board of Supervisors (BOS) and input from County agencies and community stakeholder groups. Based on the Operational Energy Strategy and the Fairfax Green Initiatives adopted by the BOS, the proposed Policy update establishes a new baseline of Gold Certification under the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) program with a plan for transition to Net Zero Energy (NZE)¹. The Policy update also establishes minimum energy performance improvement levels and associated reductions in fossil fuel consumption and Greenhouse Gas (GHG) emissions for capital building projects.

Background

In February 2008, the BOS adopted the County's Sustainable Development Policy for County Capital Facilities Projects. This Policy established LEED as the standard for County projects and established the Silver Certification level as the goal for projects over 10,000 square feet (SF) in size. The Policy also established the LEED Certification Level as the goal for projects between 2,500 and 10,000 SF. The current 2008 Policy does not include a specific energy performance goal and relies on the holistic application of the LEED program across all areas of sustainability.

Since adoption of the 2008 Policy, DPWES has met or exceeded the Policy goals for all projects with 17 LEED Silver Certified projects and 15 LEED Gold Certified projects. Since adoption of the 2008 Policy, the County has made great progress in many areas of sustainability including low impact development for stormwater and landscaping, vegetative

¹ Net Zero Energy (NZE) - the total amount of energy used by the building on an annual basis is equal to the amount of renewable energy created on the site, or by renewable energy sources offsite.

roofs, parking reductions, infrastructure for EV charging stations, recycling and use of recycled content materials, use of locally sourced and rapidly renewable materials, indoor environmental quality, reduction in domestic water usage, and energy performance improvement.

Under the 2008 Policy, the average actual, annual Energy Use Intensity (EUI)² is 115 kBtu/sf/yr for all newly commissioned LEED certified fire stations, and 79 kBtu/sf/yr for libraries. This is compared to the average actual EUI of 121 kBtu/sf/yr for older non-LEED certified fire stations, and 95 kBtu/SF for libraries.

Proposed Policy Updates

County staff recommends the Policy be revised to strengthen sustainability goals such that all County building projects over 10,000 SF will, at a minimum:

- Achieve LEED Gold Certification;
- Include solar and EV readiness;
- Provide an on-site renewable energy generation component, as practicable, with off-site renewable energy generation as a supplement;
- Achieve a minimum 30% energy performance improvement for new construction, and a 25% energy performance improvement for major renovations;
- Achieve a reduction in GHG emissions of 32% for new construction, and 24% for major renovation.

The updated Policy criteria is already being used as a goal for current projects in the design phase and will apply as a Policy expectation for all projects that begin design after formal adoption of the updated Policy by the BOS (projected for late summer 2020). The updated Policy will continue to use LEED as the basis for the County sustainable development program and will continue to promote a holistic approach to sustainability and green building design to encompass all categories of the LEED program.

The updated Policy will strengthen the level of sustainable development requirements exponentially, based on several achievement criteria that will concurrently be increased:

- LEED Certification level increased from Silver to Gold;
- LEED Program performance criteria increasing from the previous LEED v3.0 to LEED v4.0, and then to LEED v4.1;
- Baseline energy performance improvement criteria established as 30% for new construction and 25% for renovations.

² Energy Usage Intensity (EUI) is a common measure used for building energy performance that can readily be used for analysis and comparisons. EUI is measured as kilo Btu, per square foot, per year (kBtu/sf/yr).

- The American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)³ baseline energy modelling criteria strengthened from ASHRAE 2010 to ASHRAE 2013, and then to adoption of ASHRAE 2016;
- Virginia Energy Conservation Code performance criteria to be strengthened with the impending adoption of the 2018 Code version.

In addition, the updated Policy provides for incremental strengthening of the energy performance improvement criteria and the reduction in GHG emissions in future years FY 2024 and FY 2027, with a target of achieving NZE eligibility by FY 2031, at the latest. DPWES believes the exponential strengthening of the Policy criteria, noted above, creates a stretch goal that will be challenging to consistently meet on all projects. DPWES is committed to continuing with our implementation of creative, cost effective solutions to achieve the updated Policy goals.

Life Cycle Energy Performance Management

It is extremely important for the County to invest in the proactive management of building systems and periodic building systems re-commissioning. Proactive systems management and periodic re-commissioning are necessary so the first cost investment to reduce fossil fuel energy consumption and GHG emissions is realized by life cycle reductions in both. This requires an annual investment in monitoring and adjusting electronic controls for HVAC, lighting, plumbing, renewable systems, and other major building systems and equipment to assure they continue to operate in an optimized manner over the building life cycle.

Three primary factors that impact the annual EUI over the building life cycle are:

- Weather- annual variance in weather
- Operations- changes in the end user's operation of the building
- Building Systems- optimization and efficiency of systems and equipment

The average actual EUI for newly commissioned, LEED certified County fire stations is 115 kBtu/sf/yr, and 79 kBtu/sf/yr for newly commissioned LEED libraries. While the EUI for most LEED certified fire stations and libraries remains steady after the initial commissioning, the average actual EUI for the same LEED certified fire stations and libraries is approximately 5% higher over all subsequent years. The increase in average annual EUI across all fire stations and libraries is driven by a small number of facilities that exceed the initially commissioned EUI by approximately 10%, or more. Those LEED certified facilities demonstrating significant growth in the EUI over their life cycle should be the targets for a system re-commissioning program, across all LEED certified buildings, to assure the County continues to optimize the cost, energy, and GHG saving benefits of the original system investment.

³ American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standard is used globally as a benchmark to set minimum energy performance standards and energy codes.

Path to Net Zero Energy (NZE)

The recommended Policy update will be a major step toward achieving NZE status for buildings. DPWES is already working on a goal of achieving NZE eligibility for 2-3 upcoming projects. In addition, the County's recently executed Solar Power Purchase Agreement (PPA) provides a path for implementation of solar energy arrays at County buildings and sites. DPWES is already moving forward with plans for installation of solar energy arrays on several building projects using the PPA.

In addition to the FY 2021 goal of 30% energy performance improvement, and incremental future year increases in that percentage, the updated Policy includes a goal of achieving NZE eligibility for all projects beginning design by FY 2031, at the latest. The ability to achieve the energy performance improvement and NZE goals will require a combination of reducing energy consumption, improving EUI performance, and achieving sufficient renewable solar energy generation.

Due to the smaller size of many County building projects (often under 30,000 SF) and sites, initial analysis indicates that it will be difficult to achieve enough clear roof and site area for solar arrays to generate the necessary solar energy on-site. In addition, multi-story buildings with larger square footages will be challenged to create enough area for solar arrays on-site to fully offset the building energy consumption. While DPWES continues working to achieve significant areas for solar arrays on current projects, it appears the pathway to achieving the updated Policy goals for energy performance improvement and NZE will likely require the ability to achieve credit for off-site renewable energy generation.

Fiscal Impact

Based on our own program experience, consultant feedback and industry published information, DPWES has identified a fiscal impact of 5-7% for the first cost associated with achieving LEED V4.0 Gold Certification, and a 30% energy performance improvement. This first cost increment is for achieving across all sustainability areas of the LEED program and achieving the 30% energy performance improvement goal. First cost impact will vary based on the unique aspects of each individual project. DPWES is continuing to evaluate the estimated life cycle payback associated with the updated Policy goals and the direct annual energy and water savings. The life-cycle payback period based on direct energy and water cost savings is expected to exceed 30 years as the Policy updates entail first cost investment in broader, holistic areas of sustainability. These broader, holistic program areas provide significant environmental benefit and indirect cost savings.

Budgets for future projects in the Advertised Capital Improvement Program for fiscal years 2021 through 2025 have been adjusted to incorporate this first cost increment. Budget adjustments may also be required for previously approved projects, currently in the design phase, to meet the updated Policy goals. DPWES is continuing to coordinate with the Facilities Management Department, Department of Management and Budget, and OEEC to identify the additional annual funding necessary for the recurring, annual operational management, and periodic re-commissioning of building HVAC systems.

Conclusion

DPWES, OEEC, and other County stakeholder agencies support the proposed Policy updates described, herein. DPWES has coordinated with OEEC and others and will present the proposed Policy updates at the June 16, 2020, BOS Environmental Committee meeting. Subsequent to the BOS Environmental Committee briefing, DPWES will prepare an Action Item recommending BOS formal adoption of the Policy updates.

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