



County of Fairfax, Virginia

MEMORANDUM

DATE: July 19, 2019

TO: Fairfax County Board of Supervisors

FROM: Stella M. Koch, Chairman *Stella M. Koch*
Environmental Quality Advisory Council

SUBJECT: Input to County Executive's Review of Green Building Policies for County Facilities

In its February 2019 *Fairfax Green Initiatives*, the Board of Supervisors directed the County Executive to report to the Board no later than September 2019 on “[s]trengthening Green Building Policies for County Facilities.”¹ In addition, Action Item 4.c. of the *Fairfax Green Initiatives* directed the Board’s Environmental Committee to discuss “[s]etting a goal that by 2025, local generated energy (like solar) would offset County government energy usage.”² The purpose of this memorandum is to provide information for consideration by the County Executive in preparing his report to the Board.

The current Green Building Policy is set forth in the county’s July 2018 Operational Energy Strategy. In this strategy, the county set forth the target of “[a]chiev[ing] LEED Silver on all new facility construction, additions, and renovations with an occupied area greater than 10,000 square feet.”³ The LEED Silver target largely followed the county’s previous green building policies.⁴

We strongly support the Board’s direction to strengthen the Green Building Policies to improve energy performance for county facilities. Energy experts have stressed that the LEED certification system is not a guarantee of high energy efficiency.⁵ This result occurs because points to qualify for LEED certification “can be earned by adopting a wide range of practices, including recycled building materials, water-efficiency techniques, low-volatile organic compound paints, and many other attributes of a green building beyond energy efficiency and

¹ *Fairfax Green Initiatives*, p. 3, item 6.a.

² *Id.*, p. 2, item 4.c.

³ *2018 Operational Energy Strategy*, p. 8.

⁴ However, it should be noted that the Green Building Council had increased the stringency of its efficiency requirements in the LEED rating system to some extent in the new version of LEED - version 4 - that the county had begun to implement in 2018.

⁵ Michael Gerrard and John C. Dernbach, Editors, *Legal Pathways to Deep Decarbonization in the United States*, Environmental Law Institute, p. 260, 2019.



renewable energy.”⁶ In fact, it is possible to earn a LEED Silver designation with only a 5% improvement in energy efficiency over the baseline standard (ASHRAE 90.1) published in 2010. The minimum requirement is even lower for major renovations and core-and-shell projects.⁷

In strengthening the Green Building Policies for Fairfax County buildings and implementing Action Item 4.c. of the *Fairfax Green Initiatives*, we would like to provide information for your consideration. If the county is considering a net energy zero target for all county operations by 2025, then it is important to consider an aggressive energy performance standard for new buildings and renovations.

1. Net Zero Energy Ready

Green building regulations issued in April 2019 by a local jurisdiction highlight the Net Zero Energy Ready approach. These regulations require that “all County owned and leased buildings and public facilities construction will strive to incorporate the highest environmental performance standards.”⁸ Under the April 2019 regulations, the minimum sustainability target is that, with limited exceptions, “[n]ew County buildings, additions, and major renovations shall be designed and constructed to reduce energy use intensity below 28 kbtu/sq.ft./year and optimize solar exposure to be “Net Zero Energy Ready.”⁹ (A copy of these regulations has been provided to the county’s Environmental and Energy Coordinator).

As defined in the regulations and by the International Living Future Institute, the term “Net Zero Energy Ready” means that the building is “so energy efficient that a renewable energy system can offset all or most of its annual energy consumption.”¹⁰ It also means that the building has been “designed for optimum solar exposure and provisions for connecting future solar to the interior electrical system with minimal additional roof penetrations.”¹¹

Net Zero Energy Ready is a very aggressive target that brings with it many challenges, especially for larger buildings. However, achieving this standard yields the greatest environmental results in terms of reducing the energy use of buildings.

The following points provide further background:

- a. Zero energy buildings have been commissioned successfully in Northern Virginia. In Fairfax County, DPR Construction opened a zero energy building headquarters in Reston in 2016,¹² and “Arlington County has already facilitated net zero energy

⁶ Ibid.

⁷ U.S. Green Building Council, LEED v4 for Building Design and Construction, Jan. 11, 2019, *available at* <https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version>

⁸ Arlington County, Administrative Regulations relating to “Facility Sustainability Policy for New Construction and Renovation,” April 30, 2019, p. 2.

⁹ Ibid.

¹⁰ Id., p. 4.

¹¹ Ibid.

¹² DPR Construction, *DPR Construction Opens New Reston Office Targeting Net Zero Energy*, *available at* <https://www.dpr.com/media/press-releases/dpr-opens-new-reston-office-targeting-net-zero-energy>

development, including [the] Discovery Elementary School and other upcoming projects (including Alice West Fleet Elementary).”¹³

- b. The “Getting to Zero Buildings Database” of the New Buildings Institute lists numerous public sector buildings across the U.S. that have been constructed as zero energy buildings.¹⁴
- c. The U.S. DOE’s National Renewable Energy Laboratory has highlighted best practices to help assure cost-competitive zero energy building projects.¹⁵
- d. Energy experts have “long recognized that investment in energy efficiency and low carbon technologies yield[s] several benefits beyond the value of saved energy [and] which can be as important as the energy cost savings process.”¹⁶
- e. The Building Design & Construction Division in the county’s Department of Public Works and Environmental Services has already begun to undertake “feasibility study, cost estimates, and payback analysis...for geothermal systems and potential net zero energy projects.”¹⁷

2. U.S. Environmental Protection Agency Designed to Earn the ENERGY STAR® Standards Combined with Other Stretch Goals

A widely used standard that guarantees top energy efficiency performance is the U.S. Environmental Protection Agency’s (EPA) ENERGY STAR standard. Applicable to both new construction and existing buildings,¹⁸ this standard requires that buildings perform within the top 25 percent of similar buildings across the country in order to earn recognition.¹⁹ Loudoun County Public Schools has designed its new school buildings to this standard since 2010,²⁰ and Fairfax County Public Schools have improved energy efficiency to a point where they have earned ENERGY STAR certification for more than 150 existing schools. ENERGY STAR differs from the Leadership in Energy and Environmental Design (LEED) standard because it focuses solely on energy performance, while LEED allows for the tradeoff between energy efficiency and other environmental attributes.

¹³ Arlington County, *Draft Community Energy Plan Update*, July, 2019, p. 29, available at <https://arlingtonva.s3.amazonaws.com/wp-content/uploads/sites/13/2019/07/Draft-CEP-Update-post-CB-Work-Session-CLEAN-for-July-RTA.pdf>

¹⁴ New Buildings Institute, *Getting to Zero Database*, 2019, available at <https://newbuildings.org/resource/getting-to-zero-database/>

¹⁵ See, National Renewable Energy Laboratory, *Cost Control Strategies for Zero Energy Buildings: High-Performance Design and Construction on a Budget*, Sept. 2014, available at <https://buildingdata.energy.gov/cbrd/resource/1655>

¹⁶ Marco Ferreira & Manuela Almeida, *Benefits from Energy Related Building Renovation Beyond Costs, Energy, and Emissions*, 78 Energy Procedia, p. 2397-2402. 2015. available at <https://www.sciencedirect.com/science/article/pii/S1876610215019311#>

¹⁷ Fairfax County, Building Design & Construction Division, Department of Public Works and Environmental Services, *Annual Update to EQAC*, June 2019.

¹⁸ The recognition for new construction is know as Designed to Earn the ENERGY STAR while the recognition for existing buildings is ENERGY STAR certified.

¹⁹ U.S. Environmental Protection Agency, *Certification For Your Building*, available at <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification>

²⁰ U.S. Environmental Protection Agency, *Loudoun County Public Schools Earns EPA’s ENERGY STAR Sustained Excellent Award*, 2018, available at <https://www.lcps.org/page/1774>

Since the Designed to Earn the ENERGY STAR standard is not available for all building types, the U.S. EPA provides tools so that an organization can apply an alternative target. This target can be set at any desired level of performance relative to the national median energy use for that building type.²¹

In furtherance of the *Fairfax Green Initiatives* and the county's recent solar Request for Proposal (RFP), solar and other renewable energy options and net zero stretch goals can readily be combined with a requirement for high levels of energy efficiency. Under the RFP, Fairfax County is already requiring the evaluation of solar for 28 new facilities.²² A whole system design approach that also includes high levels of energy efficiency is a best practice to limit the energy demand of the entire building, to reduce operating costs, and to reduce the size of the solar array required.

Under this approach, the county also should continue to seek stretch goals for the incorporation of zero energy buildings.

3. Require Maximum Energy Performance Points Under LEED Framework Plus Other Stretch Goals

Another approach is to require the maximum achievable energy performance points available in the LEED standards and to raise the level of LEED certification required from Silver to Gold. It should be noted that simply raising the LEED requirement from LEED Silver to LEED Gold without requiring the maximum achievable energy performance points will not assure top levels of energy efficiency. That result occurs because of the nature of the basic LEED requirements that allow points to be combined from different categories. Under this approach, the county also should continue to seek stretch goals for the incorporation of renewable energy and zero energy buildings.

However, it should be emphasized that a weakness of the LEED standard for evaluating energy efficiency for new construction is that the LEED standard evaluates the predicted energy performance of a building based on a comparison to the building code. This approach has a significant limitation because building codes address major systems in a building and do not take into account all of the energy use in a building or the interactions of various systems. As noted by the New Buildings Institute, "the way in which a building is occupied, operated and maintained has a major impact on annual energy use, something current codes don't take into account."²³ Thus, basing an energy efficiency measure on a comparison to the building code does not provide the necessary data to evaluate success once a building is in operation. While this approach may produce a result that is better than an average building, it does not guarantee top energy performance.

²¹ See <https://www.energystar.gov/buildings/facility-owners-and-managers/new-construction/design-earn-energy-star/meet-your-team-and-set-goal>

²² Fairfax County Department of Procurement and Material Management, Request for Proposal No. 2000002845, Attachment C, available at <https://www.fairfaxcounty.gov/solicitation/> (Scroll down to "Solar Power Purchase Agreement" on list of current solicitations and click on the bid number).

²³ See https://newbuildings.org/code_policy/outcome-based-energy-codes/

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Conclusion

We believe that the Board's proposed action to strengthen Green Building Policies is extremely important to demonstrate leadership by example (as the county undertakes the development of its Community-Wide Energy and Climate Action Plan) and to increase clean energy jobs in the county. We are hopeful that the information that we are providing will be helpful in this effort.

Thank you for your consideration of these views.

cc: Bryan Hill, County Executive
Joseph Mondoro, Chief Financial Officer
Kambiz Agazi, Environmental and Energy Coordinator
Randy Bartlett, Director, DPWES
Jose Comayagua, Director, FMD