

Climate Action Plan in Response to EO 14008 “Tackling the Climate Crisis at Home and Abroad”

Purpose

On January 27, 2021, President Biden issued Executive Order (EO) 14008, “Tackling the Climate Crisis at Home and Abroad.” Section 211 of the EO directs each agency to develop a Climate Action Plan to describe steps that the agency can take relevant to its facilities and operations to mitigate the effects of climate change. The below sets forth steps that the agency can take with regard to its own facilities and operations, as opposed to the facilities owned and operated by its licensees. The U.S. Nuclear Regulatory Commission (NRC) is committed to maintaining awareness of the state of climate change science and to applying lessons to agency operations as appropriate and applicable. This document serves as the NRC’s progress on previous and future steps to its facilities and operations to bolster adaptation and increase resilience to climate change impacts per the requirements of EO 14008 and outlines the agency’s financial risks per EO 14030 subsection 5(d) Climate Action Plan.

Responsibility

The Director, Office of Administration, is designated at the NRC’s Chief Sustainability Officer and is responsible for agency efforts related to sustainability, including compliance, as appropriate, with EO 14008.

NRC’s Mission

The NRC’s mission is to license and regulate the Nation’s civilian use of byproduct, source, and special nuclear materials, to ensure adequate protection of public health and safety, to promote the common defense and security, and to protect the environment. The NRC’s regulatory activities, conducted under its independent regulatory mission, are outside the scope of section 211 of EO 14008.

As a part of its regulatory activities, the NRC conducts safety and environmental reviews to support its licensing decisions. Nuclear power plants and fuel cycle facilities are owned, managed, and operated by licensees. Climate impacts are considered in licensing decisions related to natural hazards for a facility (e.g., external flooding from various flood-causing mechanisms such as storm surge, local intense precipitation, and riverine and coastal flooding; low water conditions; extreme temperatures; and high winds) and are assessed as part of the NRC’s safety review. The environmental review is focused on the impact that a facility has on the environment. In accordance with Commission direction, the NRC considers carbon dioxide and other greenhouse gas emissions in its environmental reviews for major licensing actions under the National Environmental Policy Act.

NRC Facilities Operations and Maintenance

The NRC is committed to reducing any detrimental effects that its own operations have on the environment. The NRC does not own or lease real property, nor does it manage public lands and waters. Each NRC facility is occupied via an Occupancy Agreement between the NRC and the General Services Administration (GSA). The NRC does, however, have delegated authority through GSA to operate and maintain two of its headquarters buildings located in Rockville, MD (One White Flint North (OWFN) and Two White Flint North (TWFN) respectively) and has done so since their construction in the early 1990’s. This report is limited to the two buildings the NRC

operates and maintains. The NRC has successfully and progressively made significant investments over the last 15 years, as illustrated below, to reduce the energy consumption and water usage in both buildings. As a result, the agency has reduced water consumption by 44 percent as compared to 2012, and electric consumption has reduced by 64 percent as compared to 2012. More recently, year over year reductions are similarly illustrated below. The NRC continues to pursue more efficient ways of operating the buildings, however due to the successes of the robust investments and upgrades already implemented, there are few opportunities to significantly reduce energy and water usage further.

Electric Usage Mitigation Measures From 2012 to Present

Since 2012, the agency has progressively implemented energy savings strategies, allowing the agency to exceed its reduction targets for energy intensity. The NRC continues to evaluate trends and identify other potential energy reduction measures for future efforts. Examples of energy saving strategies that have been implemented and have contributed to the reductions stated above include:

- progressive replacements to old equipment with newer high efficiency designs;
- installation of a new building automation system to control the heating and cooling systems in the buildings;
- improvements to TWFN during a recent renovation including replacement of chillers with high efficiency magnetic bearing units and the incorporation of cross connect systems between the tenant and base chill water to enable a single chiller to cool the entire building;
- replacement of the elevator drive system, electrical motor controllers, door operators and mechanical hoist way equipment in TWFN;
- incorporation of water-cooled heat pumps into the building heating, ventilation, and air conditioning (HVAC) system and elimination of electric resistance heating, allowing for use of rejection heat from data closets/telephone rooms to heat office areas;
- upgrading of highly efficient ENERGY STAR certified heat pump units throughout OWFN and TWFN (in fiscal year (FY) 2020 the NRC upgraded a total of 13 units);
- installation of new light-emitting diode (LED) light fixtures in TWFN that are connected to office area occupancy sensors were installed on every TWFN floor, each floor was designed to use new technologies to implement light-harvesting techniques in office spaces;
- LED light replacement in the OWFN garage
- replacement of large air-handling units with high-efficiency motors; and
- upgrading OWFN, floor by floor, with more efficient building systems including the improved LED lighting and controls, light harvesting, and other passive design features to optimize the use of natural lighting.

The NRC purchases 100% of its electricity from the Potomac Electric Power Company (Pepco), using a GSA areawide contract. As part of the contract, 20 percent of the electricity that the NRC uses comes from renewable energy sources. In FY 2021, this amounts to approximately 1,258,759 kilowatt hours of energy. Agera Energy provides this renewable energy to Pepco from wind resources in Texas.

In FY 2018, to support grid reliability and lower utility costs, the NRC enrolled in a demand response program. This program offers payments to businesses that demonstrate a predefined energy reduction strategy and agree to reduce their demand at times when the grid is under stress. Strict compliance with GSA recommended building operation guidelines regarding space temperature and occupancy schedules. In FY 2019, the NRC installed meters in the uninterruptible power supply room and the data center of another headquarters location, Three White Flint North (3WFN) to support its Data Center Infrastructure Management software. These meters are being used to create power usage effectiveness reports, which help determine the energy efficiency of the 3WFN data center.

Water Usage Mitigation Measures 2012 to Present

Regarding the reduction of water usage, the NRC has implemented several water-saving strategies and continues to evaluate water usage trends to identify other ways to reduce water consumption. Examples of water saving strategies that have been implemented over time that have contributed to the reductions stated above include:

- upgrade of high-flow restroom fixtures to more efficient low-flow fixtures in all OWFN and TWFN restrooms;
- installation of chemical free cooling tower water treatment which reduced the need for blowdown;
- upgrade to cooling tower make-up water systems which included installing redundant alarms for cooling tower overflow;
- installation of a new filtered drinking water system with water fountains that have an integrated water-bottle filler;
- a focus on upgrading high-flow restroom fixtures to more efficient low-flow fixtures to reduce the amount of water usage associated with wastewater;
- installation of sub-meters for the cooling towers, for NRC staff to monitor water usage associated with the HVAC system more closely; and
- installation of sub-meters and monitoring water usage associated with irrigation, which allows the agency to detect leaks within the irrigation system as well as broken sprinkler heads and system malfunctions.

The energy and water saving measures already implemented and listed above, have proven to be life cycle and cost-effective. The NRC will continue to implement those measures as it renovates the OWFN building, as well as search for other new efficiencies and technologies that may further reduce consumption. Consistent with the reduction of energy and water usage, the

agency's costs for electricity has reduced by 64 percent and water costs by 44 percent as compared to 2012, despite the ever increasing costs per unit for utilities.

For the illustration of financial risks per EO 14030 subsection 5(d) Climate Action Plan below are the NRC's future funding needs to further reduce our impact on climate change. The below was also submitted to the Office of Management and Budget regarding funding levels in NRC's FY 2024 budget request (for the items outlined in EO 14057 regarding the reduction of fossil fuel emissions in Federal Government facilities and operations).

<u>FY 2024 NRC Request</u>	
Goal	Total Investment (\$M)
<u>Goal 1:</u> 100 percent carbon free electricity by 2030	\$0.38M
<u>Goal 2:</u> Transition to a zero-emission vehicle fleet	\$0.025M
<u>Goal 3:</u> Enable net-zero emission buildings, facilities, installations	\$0
<u>Goal 4:</u> Develop staffing and human capital to ensure successful implementation of Federal sustainability goals and requirements	\$0

- 1) The total electric costs for OWFN and TWFN is \$1.9M, which includes 20 percent of its electricity from renewable sources through a contract with GSA and Pepco. Due to fluctuations in energy prices and the fact that the cost of energy from renewable sources is not specified in the contract, 20 percent of \$1.9M is \$0.38M, as specified in the table above. The additional cost to achieve 100 percent carbon free electricity by 2030 is estimated to be 50 to 75 percent above the NRC's current costs for electricity, which would require an additional \$1.0M to \$1.4M. The additional costs, in coordination with GSA and Pepco, will be considered in future budget submissions.
- 2) The NRC currently leases 25 vehicles from GSA, including vehicles for the Office of Inspector General and our regional offices. Some vehicles are hybrid, but none are fully electric vehicles. The NRC's FY 2024 request included \$0.025M to fund the lease costs for two fully electric vehicles. It is estimated that there will be an additional cost of \$0.5M to change the entire fleet to fully electric vehicles leased from GSA. This would also require an estimated additional \$0.5M to install electric charging stations. The NRC will consider these additional costs in future budget submissions.
- 3) OWFN and TWFN are very close to the goal of net-zero fossil fuel emissions. Only two commercial gas water heaters remain. The estimated cost to replace the gas water heaters with electrical water heaters will be considered in future budget submissions.
- 4) After careful consideration, the NRC has determined it is not necessary to dedicate additional human capital resources to ensure the agency's successful implementation of Federal sustainability goals and requirements outlined in this addendum. The NRC will utilize existing resources and consider emergent resource needs related to the implementation of the Federal sustainability goals and requirements in future budget submissions, as appropriate.

Summary

The NRC remains committed to continue to reduce its energy and water usage by incorporating efficient sustainability practices within its building operations and other applicable areas to build on the successful implementation of the measures already incorporated. The agency will also initiate new efforts where possible to reduce its environmental impacts. The NRC is committed to meeting and exceeding the goals set forth by both EO 14008, "Tackling the Climate Crisis at Home and Abroad." The NRC will continue to improve upon its efficient use of energy and water; however, given the investments already made to increase the efficiency of the buildings the NRC operates and maintains, there are few opportunities to significantly reduce energy and water consumption much further.