

U.S. Nuclear Regulatory Commission

Sustainability Report and Implementation Plan

2022

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Executive Summary

Vision

The U.S. Nuclear Regulatory Commission (NRC) remains committed to incorporating sustainability within its business operations and will continue to build on successful sustainability efforts as well as initiate new efforts to reduce its environmental impacts. The NRC is further committed to meeting and exceeding the goals set forth by Executive Order (EO) 14008, “Tackling the Climate Crisis at Home and Abroad.”

Leadership

The NRC’s Chief Sustainability Officer (CSO) is the senior executive level manager responsible for promoting environmental and energy sustainability across the agency. The agency’s CSO works with managers and employees to address the organization’s approach to environmental responsibility and meeting the requirements in EO 14008.

Revitalizing Sustainability within the Nuclear Regulatory Commission

Sustainability is inherently integrated into the mission of the NRC. The NRC licenses and regulates the Nation’s civilian use of radioactive materials to protect public health and safety, promote the common defense and security and protect the environment. Protecting the environment is vital to the NRC’s mission, as reflected in the agency’s commitment to incorporating strategies that promote sustainability into its daily operations.

The commitment to sustainability is not only present in the agency’s mission, but also in its operations. The NRC strives to conduct its operations and activities in an environmentally responsible and sustainable manner. The NRC recognizes that reducing and, where possible, eliminating the environmental impacts of business activities is an important part of its mission as stewards of public health and safety. The agency views sustainability as a long-term approach to business planning and decision-making that balances the NRC’s economic, environmental, and social responsibilities.

The NRC occupies a total of 9 buildings in 6 geographical locations. The agency does not own or lease any real property, each the of the agency’s locations are occupied through the General Services Administration (GSA). NRC has delegated authority from GSA to operate and maintain two of its three Headquarters buildings in Rockville, MD, which are the only properties referenced in this report (One White Flint North (OWFN) owned by GSA, and Two White Flint North (TWFN) leased by GSA). OWFN and TWFN (11555 Rockville Pike and 11545 Rockville Pike respectively) are high-rise buildings of similar size consisting of a total of 693K Rentable Square Feet (RSF). The NRC’s remaining locations are managed and operated by GSA.

Overview of Operations

Agency Size and Scope	FY 2021	FY 2022
Total Number of Employees as Reported in the President's Budget	2,998	2,816
Total Acres of Land Managed	5.2	5.2
Total Number of Buildings Owned	0	0
Total Number of Buildings Leased (GSA and Non-GSA Lease)	2	2
Total Building GSF	998,000	998,000
Number of Facilities in the U.S.	9	9
Number of Facilities Outside of U.S.	0	0
Total Number of Fleet Vehicles Owned	0	0
Total Number of Fleet Vehicles Leased	27	25
Total Number of Exempted-Fleet Vehicles (Tactical, Law Enforcement, Emergency, Etc.)	1	1
Total Amount Contracts Awarded (\$Millions) (as reported in FPDS)	175.9	172.5*

*Estimated dollar amount based upon current obligation rate and historical data.

Sustainability Strategies and Planned Actions

1. GREENHOUSE GAS (GHG) REDUCTIONS

FY 2021 Scope 1 and 2 GHG Emissions

81.8 percent reduction from FY 2008

4.8 percent reduction from FY 2021

Implementation Status

Accounting for Scope 1 and Scope 2 GHG emissions, in FY 2022 an 81.8 percent decrease from the FY 2008 baseline was indicated (13,800 metric tons of carbon dioxide equivalent (MTCO_{2e}) in FY 2008 versus 2635 MTCO_{2e} in FY 2022). The significant decrease in Scope 1 and Scope 2 GHG emissions is a direct result of the NRC's aggressive energy savings program as described in the sections below.

Priority Strategies & Planned Actions

The NRC will continue to monitor energy consumption and will remain proactive in reducing unnecessary energy consumption.

2. MANAGEMENT OF REAL PROPERTY

- CLEAN ENERGY

FY 2021 Clean Electricity Use

15 percent of total electricity in FY 2021

FY 2021–FY 2022 Plan

15 percent of total electricity in FY 2021

15 percent of total electricity in FY 2022

Implementation Status

Currently, the NRC purchases its electricity using a GSA areawide contract. Through this agreement, 15 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 from wind resources in Texas.

Priority Strategies & Planned Actions

The GSA's areawide utility contract is a long-term contract; therefore, the NRC expects that for the foreseeable future, 15 percent of the electricity that the NRC uses will come from renewable energy sources.

- FACILITY ENERGY REDUCTION

FY 2021 Energy Intensity Progress (Btu/GSF)

70 percent reduction from fiscal year FY 2003

6.7 percent reduction from FY 2020

FY 2021–FY 2022 Plan

2 percent reduction in FY 2022 from FY 2021

Implementation Status

The agency has implemented several energy savings strategies, allowing the agency to exceed its reduction target for energy intensity. The NRC continues to evaluate trends and identify other potential energy reduction measures for future efforts. In FY 2021, the NRC realized a 6.7 percent reduction in energy intensity in facilities compared to FY 2020 and a 70-percent reduction in energy intensity compared to the FY 2003 baseline. Examples of energy saving strategies that have been implemented and have contributed to the reductions stated above include:

- Improvements to TWFN, including the 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.
- Incorporation of water-cooled heat pumps into the building heating, ventilation, and air conditioning (HVAC) system and elimination of electric resistance heating. This allows 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 FY 2020 alone, the NRC upgraded a total of 13 units).

- Strict compliance with GSA recommended building operation guidelines regarding space temperature and occupancy schedules.

To capitalize on building lease terms and for future office space efficiencies, renovation of all 10 floors of the TWFN building was completed in FY 2020. Design specifications for the TWFN renovation project ensured that, when applicable, the contractor installed Energy Star and energy-efficient equipment. The TWFN renovation project also incorporated several design features that are based on strategies and technologies proven to lower building electrical consumption. One focus area involved improved office lighting. New light-emitting diode (LED) light fixtures 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. Light harvesting allows the agency to dim the LED light fixtures near the building envelope when sufficient natural lighting is available. In FY 2021, a LED light replacement project was executed and completed in the OWFN garage.

The TWFN renovation project also improved the HVAC system. Each floor's large air-handling units were replaced with high-efficiency motors. New variable air volume units were installed. These units include digital controls and variable stage heating fan motors that are controlled by the TWFN Building Management System to optimize energy consumption while maintaining office area comfort for occupants.

In addition, the TWFN renovation project included the complete upgrade of the building's eight elevators. Specific upgrades included the replacement of the elevator drive system, electrical motor controllers, door operators and mechanical hoist way equipment. These elevator upgrades improved efficiency and reduced energy consumption.

Three OWFN floors have also been updated with the improved LED lighting and controls, including light harvesting and other passive design features to optimize the use of natural lighting. This change was implemented based on energy saving design features. In addition, in FY 2021, the NRC completed replacement of all existing fluorescent lights in the OWFN parking garage with LED fixtures to increase lighting levels and decrease energy consumption. The NRC will continue to evaluate other areas where similar lighting upgrades can be implemented.

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. In FY 2021, the NRC did not receive any demand response dispatch notifications; however, payments were earned by being on standby in case there was an emergency. These earnings ultimately helped reduce utility costs by \$14,000.

Priority Strategies & Planned Actions

The NRC will incorporate energy efficient strategies when planning building renovations in the future. Several floors in OWFN are expected to be fully renovated by the end of FY 2023. Many of the design features such as, energy efficient HVAC systems, lighting fixtures, and other energy efficiency strategies that were implemented as part of the TWFN renovations are also expected to be implemented in OWFN.

The NRC will continue benchmarking building performance on an annual basis. The NRC will continue to monitor building energy performance against historical performance data and peer buildings to identify operating inefficiencies and conservation opportunities.

- WATER REDUCTION

FY 2021 Water Intensity Progress (gal/GSF)

56.7 percent reduction from FY 2007

7 percent reduction from FY 2020

FY 2021–FY 2022 Plan

2 percent reduction in FY 2022 from FY 2021

Implementation Status

The NRC has implemented several water-saving strategies and continues to evaluate water usage trends to identify other ways to reduce water consumption. The NRC has continued to exceed the water reduction goal, reducing consumption by 56.7 percent from the FY 2007 baseline. Examples of water saving strategies that have been implemented over time that have contributed to the reductions stated above include:

- Installation of sub-meters and monitoring water usage associated with irrigation. This allows the agency to detect leaks within the irrigation system as well as broken sprinkler heads and system malfunctions.
- 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.

Historically, one of the most significant sources of water consumption at the NRC has been wastewater associated with restroom use. To reduce the amount of water usage associated with wastewater, the NRC has focused on upgrading high-flow restroom fixtures to more efficient low-flow fixtures.

The NRC is also focused on more efficient HVAC operation methods throughout its facilities. By using sub-meters for the cooling towers, the NRC staff can more closely monitor water usage associated with the HVAC system. As a result, the agency has identified and corrected operational issues to reduce wasted water and control water chemistry with fewer chemicals. The NRC will continue to monitor water usage associated with the HVAC system and will remain proactive in reducing unnecessary water consumption during operation.

Another sustainability design feature included in the TWFN renovation project is the installation of a new filtered drinking water system with water fountains that have an integrated water-bottle filler. The new water fountains have significantly reduced plastic bottle waste by the staff. In FY 2020, half of all the water fountains in OWFN were also replaced with these efficient water fountains. In addition, all OWFN restroom faucet aerators were replaced with high-efficiency faucet aerators. This relatively inexpensive building upgrade will reduce OWFN water consumption. In FY 2022, we continued to focus on the successes of our aforementioned projects.

Priority Strategies & Planned Actions

The NRC will incorporate updated water saving-features in OWFN bathrooms, in correlation to water-saving features used in the upgraded TWFN building.

The NRC will continue to assess its current metering infrastructure and evaluate the feasibility of installing additional advanced meters or advanced metering devices, to the extent practical, for the purpose of efficient use of water and reduction in associated costs in its facilities.

The COVID-19 building restrictions have been lifted, so the NRC expects higher occupancy rates moving forward; therefore, we expect an increase in water demand when compared to the FY 2020 levels.

- PERFORMANCE CONTRACTING

FY 2020 Performance Contracting, Investment Value and New Projects awarded

\$0/0 project in FY 2020

FY 2021–FY 2022 Plan

\$0/0 project in FY 2021

\$0/0 project in FY 2022

Implementation Status

In FY 2021, the NRC was not involved in any energy savings performance contracts or utility energy service contracts. However, significant investments have been made through the NRC operations and maintenance contractor and strategic partnerships with GSA and the landlord in order to modernize building systems and replace them with highly efficient systems for energy and water conservation.

Priority Strategies & Planned Actions

The NRC will continue to explore the feasibility and benefits of applicable performance contract vehicles that would contribute to the implementation of additional energy and water conservation measures, increase facility efficiency, improve operations, and enhance resilience in its facilities.

- WASTE REDUCTION

FY 2020 Nonhazardous Waste Management and Diversion

200 metric tons of nonhazardous solid waste generated*

40 percent diverted and 60 percent sent to treatment and disposal facilities

**not including construction and demolition waste*

FY 2021-FY 2022 Plan

50 percent reduction in non-hazardous solid waste generated in FY 2021 from FY 2020

45 percent diverted and 55 percent sent to treatment and disposal facilities in FY 2021

5 percent reduction in non-hazardous solid waste generated in FY 2022 from FY 2021

50 percent diverted and 50 percent sent to treatment and disposal facilities in FY 2022

Implementation Status

The NRC continues to benefit from the robust recycling and waste diversion program implemented at its facilities. The agency educates its staff on the recycling program throughout the year using posters and bulletins. It also strives to make the recycling process as simple as possible for employees in order to encourage participation.

In FY 2021, the TWFN construction and renovation project produced approximately 90 tons of construction and demolition waste. Approximately 95 percent of this waste was recycled. The NRC expects this good practice to continue with the future renovations of OWFN floors.

Priority Strategies & Planned Actions

The NRC plans to continue educating its staff on its recycling and waste diversion program and to continue simplifying the recycling process to keep the program successful.

- SUSTAINABLE BUILDINGS

Implementation Status

OWFN is owned by GSA, and the building is part of GSA's building inventory for the high-performance sustainable buildings goal; therefore, this goal is not applicable to the NRC. The same applies to TWFN since it is a leased facility.

Priority Strategies & Planned Actions

The NRC will continue to assess any statutory requirements and references related to sustainable building design, construction, and operation to reduce energy and water use, increase facility efficiency, improve operations, and enhance resilience in its facilities.

3. FLEET AND MOBILITY

FY 2021 Petroleum Reduction Progress (Gal)	FY 2021 Alternative Fuel Use Progress (Gal)
64 percent reduction in petroleum fuel since 2005	240 percent increase in alt fuel since 2005
53 percent reduction in petroleum fuel since FY20	50 percent decrease in alt fuel since FY20
FY 2021-FY 2022 Plan	FY 2021-FY 2022 Plan
2 percent reduction in FY21 from FY20	10 percent increase in FY21 from FY20
2 percent reduction in FY22 from FY21	5 percent increase in FY22 from FY21

Implementation Status

The NRC continues to exceed the petroleum reduction goal, decreasing consumption by 64 percent from FY 2005 and 53 percent from the prior year. The NRC continuously measures and evaluates various approaches to increase the sustainability and efficiency of its fleet (GSA-leased). The NRC's FY 2021 fleet incorporated 8 gasoline/diesel and 16 flex-fuel vehicles. Specific types of vehicles are required for mail services, warehouse storage and distribution services, and emergency operations. Most of the vehicles support the NRC's mission and are utilized by staff for official business, including travel to and from the following: (1) nuclear power plants for site visits, (2) vendor inspections, (3) training, and (4) public meetings. An E85 fueling station is available within a 5-mile radius of the NRC Headquarters buildings, and when possible, flex-fuel vehicles are refueled with E85 at this station. As of FY 2021, the NRC's efforts have led to a 96 percent reduction in fleetwide per-mile GHG emissions compared to FY 2014 and a 53 percent reduction compared to FY 2019. The NRC has increased its alternative fuel consumption by 240 percent since FY 2005. In addition to having a more fuel-efficient fleet, this latest decrease in petroleum fuel consumption can be attributed to abnormally low vehicle usage due to the COVID-19 pandemic.

Priority Strategies & Planned Actions

The NRC has reached its projected optimal inventory at this time and has increased the number of alternative fuel vehicles and reduced the number of conventionally fueled vehicles. It is significantly harder to find reductions in a small fleet like the NRC's. The NRC will continue its focus of advancing energy efficiency and sustainability by reducing its fleet size and control costs.

4. SUSTAINABLE PROCUREMENT

FY 2020 Sustainable Acquisition Progress:

4.4 percent of contract actions (in dollars), for a total of \$3.95 million in contract actions with statutory environmental requirements

Implementation Status

The NRC has in place a Green Purchasing Plan (GPP) that contains Federal requirements and guidance for purchasing products and services that are safe and healthy for the public and the

environment. According to the GPP, contracting officers are required to consider sustainable acquisition, including source selection factors, in acquisitions that may include energy- and water-efficient services and products, products and services that use renewable energy technologies, products containing recovered materials, bio-based products, environmentally preferable products and services, and non-ozone-depleting substances. According to data reported in the Federal Procurement Data System—Next Generation, 4.4 percent of all contract actions include statutory environmental requirements.

Also, in the OWFN renovations, NRC & GSA are currently renovating several floors, and we are meeting the sustainability and environmental requirements when purchasing construction material to be used for the major renovations. For example, all carpets installed in all the renovated floors are made with 46 percent post-consumer recycled content and are designed to meet volatile organic content requirements for air quality. Furthermore, all newly installed ceiling tiles are made with 76 percent recycled content. Similar language has also been included into design and construction contracts associated with the OWFN renovations to ensure sustainability and environmental requirements are met.

Priority Strategies & Planned Actions

The NRC plans to continue using the GPP for sustainable acquisition and to comply with statutory environmental requirements.

5. ELECTRONICS STEWARDSHIP AND DATA CENTER

**excluding exempted equipment*

FY 2020 Electronics Stewardship Progress

100 percent of newly purchased or leased equipment met energy efficiency requirements

100 percent of electronic equipment disposed using environmentally sound methods*

Implementation Status

In addition to requiring products and services that are safe and healthy for the public and the environment, the GPP recommends using the Electronic Product Environmental Assessment Tool (EPEAT). EPEAT is a comprehensive environmental rating that helps identify greener computers and other electronic equipment that meet Federal requirements for purchase of energy efficient products.

Priority Strategies & Planned Actions

The NRC completed replacing all workstations in FY 2019. The new standard workstations consist of a laptop instead of a standard desktop configuration. The new laptops have solid-state drives and latest generation processors, resulting in much faster performance and more energy savings. Also, all the new laptops are power management enabled. Starting in FY 2022, the NRC began implementing its plan to refresh 25 percent of workstations per year. All devices meet EPEAT requirements.

The NRC plans to follow standard Federal practices for disposal of excess equipment as described in the GSA's Personal Property Disposal Guide.

In FY 2019, the NRC installed meters in the uninterruptible power supply room and the data center of 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. The NRC is currently consolidating and modernizing data center resources to take advantage of offsite hosting and cloud options. The NRC plans to continue monitoring and evaluating energy usage and efficiency opportunities in its Data Center.

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DFS r/f

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***e-concurrence**

OFFICE	ADM/DFS/FLB*	ADM/DFS/FLB/BC*	OCIO/SDOD/DD*
NAME	CFarlow	JHeck	BSall
DATE	7/21/2022	7/21/2022	7/21/2022
OFFICE	OGC*	ADM/DFS/DD*	ADM/D*
NAME	TBarczy (R Baum for)	TPulliam	JGolder
DATE	7/21/2022	7/22/2022	7/22/2022

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