

APPENDIX E: BNL SITE SUSTAINABILITY PLAN:
STATUS SUMMARY FOR FISCAL YEAR 2022

Prior Department of Energy Goal	Current Performance Status	Planned Actions & Contributions
Energy Management		
Reduce energy use intensity (Btu per gross square foot) in goal-subject buildings.	FY22 site-wide energy intensity was 11% higher than the base year of 2015: 378,940 Btu/GSF vs. 338,903, respectively.	A second UESC II (or self-funded effort) effort focusing on Building HVAC controls, temperature set-back, re-heat minimization, and lighting. Increased emphasis on Temperature Set-back policy.
EISA Section 432 continuous (4-year cycle) energy and water evaluations.	269,325 sq. ft. were audited in FY21.	Continue audits meeting the four-year cycle.
Meter individual buildings for electricity, natural gas, steam, and water, where cost-effective and appropriate.	Twenty-three new smart meters were added in FY22. Ninety-nine percent of electricity, 100% of natural gas, and +90% of steam are metered. Most potable water is used for cooling tower make-up. Metering ≈30% of cooling tower make-up and adding meters regularly.	Continue maintaining and expanding metering installations, with an emphasis on potable water make-up for cooling towers.
Water Management		
Reduce potable water use intensity (gallons per gross square foot).	BNL will continue to implement BNL's Water Management Plan and reduce water usage by implementing best- management practices.	<ul style="list-style-type: none"> • Water meters continue to be installed on new installations such as SUSC, as well as cooling towers. This will help BNL better manage water usage. • Cooling tower chemical monitoring systems will allow BNL Energy Management to track make-up water usage in many cooling towers across site. • Progress towards automating the Central Chilled Water Facility's water usage report has been made. The final meter has been installed and the report is in the process of being developed.
Reduce non-potable freshwater consumption (Gal) for industrial, landscaping, and agricultural.	BNL's minimal formal landscaping is compatible with the local climate and rainfall. BNL does not routinely irrigate lawns and landscape.	N/A
Waste Management		
Reduce non-hazardous solid waste sent to treatment and disposal facilities.	<p>The MSW contract was not rebid during FY22 as expected, so BNL was unable to solicitate bids to evaluate disposal to a Waste-to-Energy facility versus disposal at a landfill. Doing so would make BNL a net-zero waste site.</p> <p>BNL continues its successful waste diversion program, consistently exceeding DOE's 50% landfill diversion goal. BNL will continue to pursue New-Zero concept waste practices.</p> <p>BNL's Pollution Prevention Opportunity Program for FY22 identified and promoted new ideas for waste reduction, recycling, and reuse. The request solicitation form was revised to favor requests that result in measurable source or waste reduction.</p> <p>A program for recycling wood pallets by an offsite vendor was implemented at the end of FY22.</p>	<ul style="list-style-type: none"> • BNL will open discussions with the site's current waste hauler regarding options for transfer of municipal solid waste (MSW) from landfills to a Waste-to-Energy facility in order to evaluate the feasibility of the change. Diversion of this waste stream would make BNL a net-zero site. • EPD will refocus the Pollution Prevention Program towards ideas that divert MSW

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Waste Management (Continued)		
Reduce construction and demolition materials and debris sent to treatment and disposal facilities.	Management of C&D recycle material from large demolition projects will be centralized through F&O's contracted C&D Hauler allowing for better reporting and accounting instead of handled through the construction sub-contractor.	<ul style="list-style-type: none"> Recyclable materials are already separated from C&D debris prior to leaving site, so further reduction options will be challenging to achieve. BNL will consider if sheet rock generated from future building demolitions can be segregated for recycling.
Fleet Management		
Reduce petroleum consumption.	Providing Chargepoint station access to guests and employees.	Order more AFVs as they become available.
Increase alternative fuel consumption.	Flex Fuel vehicles will only be assigned E-85.	Order more AFVs as they become available.
Acquire alternative fuel and electric vehicles.	Picking more EVs for FY23 and purchasing EV LSVs.	Order more AFVs as they become available.
Clean & Renewable Energy		
Increase consumption of clean and renewable electric energy.	<p>Signed pending purchase of 24,000,000 kWh of REC's for FY22.</p> <p>NSERC Solar PV array produced 644,479 kWh.</p>	<ul style="list-style-type: none"> Increase purchase RECs. Maintain and improve NSERC output. Look for additional opportunities locally and onsite.
Increase consumption of clean and renewable non- electric thermal energy.	Biofuel use in off-road utility vehicles.	Increase biofuel use, potentially in satellite hot water or steam heating systems on site.
Sustainable Buildings		
All new construction and modernization projects greater than 25,000 gross square feet must apply the Guiding Principles.	Metric: Percentage of buildings that qualify as a Sustainable Federal Building: 5.9%	As BNL constructs new buildings and demolishes old non-compliant buildings, the percentages will increase.
All renovation projects must apply the Guiding Principles, to the greatest extent technically feasible.	Metric: Percentage of gross square footage that qualifies as a Sustainable Federal Building: 26.5%	As BNL constructs new buildings and demolishes old non-compliant buildings, the percentages will increase.
Acquisitions and Procurement		
Promote sustainable acquisition and procurement to the maximum extent practicable, ensuring all sustainability clauses are included as appropriate.	<p>Continued to promote, advance, and enhance BNL's E-buy system for EPP related items/ purchases.</p> <p>Continued to support and advise requisitioners/ Lab users on responsibilities in this area.</p> <p>Current Lab programs drive a high level of conformance mostly through contractual terms and conditions.</p> <p>2021 Green Buy Gold Award winner.</p> <p>2021 Green Buy Superior Award winner.</p>	<ul style="list-style-type: none"> Explore a new ERP/Procurement system with enhanced data/metrics capabilities. Hire a Category and Supply Chain Analyst to provide focused effort in sustainable purchasing. BNL will provide E-Buy training, support specific EPP requirements, and create better support tools to help requisitioners identify conforming products. A Laboratory team consisting of volunteers from across the Lab will be formed to generate ideas and enthusiasm for reduction of single-use laboratory plastics first by source reduction, then by recycling. Single-use plastic water bottles will be targeted. Future software upgrades will improve BNL's ability to identify conforming products in the purchasing system improving tracking and measuring progress.

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Efficiency & Conservation Measure Investments		
Implement life-cycle cost effective efficiency and conservation measures with appropriated funds and/or performance contracts.	Internally funded energy conservation and sustainability related initiatives include a continuation of best practices, with continued emphasis on temperature setback during unoccupied periods.	Re-evaluate the UESC II project and other potential initiatives using updated energy cost escalation factors. BNL will also revisit the UESC II scope to aggressively address energy and GHG savings.
Electronic Stewardship		
Electronics stewardship from acquisition, operations, to end of life	<p>BNL's ITD offers staff a variety of computer options that have been preselected to meet EPEAT Gold criteria driving high conformance to purchasing requirements, as most employees purchase computers from preapproved stock.</p> <p>The average age of a BNL computer prior to disposal is approximately six years, which is 50% above the average retirement age of four years. Usable computers and peripherals are sent to an on-site warehouse where departments can go to acquire computers as needed. Last year, approximately 494 desktop computers, 262 laptops, 27 tablets, and 70 servers were reused internally by BNL personnel, as well as numerous other small electronics. BNL has a power management policy where the power savings options are automatically activated for new computers.</p>	<ul style="list-style-type: none"> • BNL looks forward to a modernized purchasing system that better tracks conformance, but the system is still several years from implementation. • BNL will continue to dispose of electronic waste in an environmentally sound manner through a certified e-Steward or R2 recycler. • Increase communication to staff regarding EPEAT and Energy Star requirements associated with electronics purchases.
Increase energy and water efficiency in high-performance computing and data centers.	BNL actively monitors PUE of both on-site data centers. BNL will continue to monitor and maintain mechanical equipment to sustain the reduction from a PUE of 2.5 to 1.5.	<ul style="list-style-type: none"> • BNL is reviewing manufacturer data for installed equipment in B725. The EM team will revise steam, chilled water, and condenser water setpoints and equipment sequences to optimize performance and further reduce PUE. • The team will be working on the ALCs system sequences to optimize the use of the free cooling heat exchanger. • The team will carefully monitor the humidifying system and associated steam distribution/condensate return equipment to ensure optimal performance.

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Organizational Resilience		
Implement climate adaptation and resilience measures.	<p>To increase site adaptation and resilience to address the impacts of climate change, BNL prepared a VARP in accordance with guidance provided by the DOE Sustainability Performance Division (Guidance Version 1.2, February 2022) and associated Risk Assessment Tool. A VARP planning team was created to help identify critical assets and infrastructure, identify projected climate change and extreme weather hazards and vulnerabilities, and propose and assess climate resilience solutions.</p> <p>BNL's OEM is also continuing to integrate climate resilience into its day-to-day risk management processes (e.g., Continuity of Operations planning).</p> <p>Vulnerability Assessment Plan and Site Emergency Plan in the All-Hazards Survey.</p> <p>OEM provides BNL leadership with timely weather-related data updates used to evaluate the Lab's posture to remain open or close the BNL site.</p>	<p>Current planning efforts include:</p> <ul style="list-style-type: none"> • Development of a Continuity of Operations (COOP) Plan template for the six BNL Mission Essential Functions to utilize and develop their programmatic COOP Plans. Develop and implement Senior Leadership Delegation of Authority training. • Create COOP event matrix for declaring a COOP event. • Develop COOP Coordinators notification list. • Develop, implement, and update current COOP Plan to comply with the new DOE Continuity of Operations Order 150.1B.
Multiple Categories		
Reduce Scope 1 & 2 greenhouse gas emissions.	<p>NSERC Solar PV array produced 644,479 kWh.</p> <p>BNL purchased 120,747 Mwh or 44% of its electricity from carbon-free hydroelectric sources.</p>	<p>Maintain and improve NSERC output.</p> <p>BNL will continue to purchase Hydro from NYPA and will investigate procuring electricity from the three offshore wind projects.</p> <p>One centrifugal chiller in Bldgs. 901A and two chillers in Bldg. 600 to be replaced with low GWP chillers in 2023 and 2024-2025, respectively.</p>
Reduce Scope 3 greenhouse gas emissions.	<p>The Laboratory continues to operate in Normal Operations with Telework, with 40% of 2,331 eligible employees having approved telework agreements and another five percent having approved remote work agreements. Commuting GHGs should not be expected to increase with variable COVID-19 rates.</p>	<p>EPD to prepare a Monday Memo segment on the benefits of the Laboratory's Ride Share Program for the 2nd Quarter of FY23.</p> <p>Electric vehicle display and ride & drive planned during Earth Day 2023 celebration.</p> <p>MTA planning for new Yaphank rail station on pause.</p>