

APPENDIX E: BNL SITE SUSTAINABILITY PLAN:  
STATUS SUMMARY FOR FISCAL YEAR 2020

Prior Department of Energy Goal	Current Performance Status	Planned Actions & Contributions
<b>Energy Management</b>		
30% energy intensity (Btu per gross square foot) reduction in goal-subject buildings by FY 2015 from a FY 2003 baseline and 1.0% Year-over-year (YOY) thereafter.	FY20 energy intensity was 28.1% below FY03, 3% below 2015.	A second Utility Energy Service Contract (UESC) II (or self-funded effort) effort focusing on Building HVAC controls, temperature set-back, re-heat minimization and lighting is planned. Continue emphasis on Temperature Set-back policy.
Energy Independence and Security Act (EISA) Section 432 continuous (4-year cycle) energy and water evaluations.	83 Buildings covering 706,859 sq. ft. were audited in FY20.	Continue audits meeting the 4-year cycle.
Meter all individual buildings for electricity, natural gas, steam, and water, where cost-effective and appropriate.	Eight new smart meters were added in FY20. Current status is 99% of electricity, 100% of natural gas, +90% of steam are metered. Most potable water is used for cooling tower make-up. We are currently metering ~25% 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. This process has already started.
<b>Water Management</b>		
20% potable water intensity (Gal per gross square foot) reduction by FY 2015 from a FY 2007 baseline and 0.5% YOY thereafter.	Potable-water usage fell from 931 million gallons/year in FY 1999 (average of 2.55 million gallons per day) to about 389 million gallons/year in FY 2020 (average of 1.07 million gallons per day), a reduction of 62.0%. BNL's annual water use intensity has decreased from 101 gallons per square foot to 80.9 gallons per square foot, a 20.1% water usage reduction since base-year 2007.	Completion of Well No. 12 in FY21.  BNL will continue to implement BNL's Water Management Plan and reduce water usage by implementing best- management practices.  BNL will continue to utilize water-efficient processes and plumbing fixtures to conserve water in new construction buildings and renovations.
Non-potable freshwater consumption (Gal) reduction of industrial, landscaping, and agricultural (ILA). YOY reduction; no set target.	N/A	N/A
<b>Waste Management</b>		
Reduce at least 50% of non-hazardous solid waste, excluding construction and demolition debris, sent to treatment and disposal facilities.	BNL's recycling rate counting only day-to-day activities is 53% and jumps to 83.9% if composting of site trees and brush for landscaping needs is included.	<ul style="list-style-type: none"> <li>• Continue to recycle &gt;50%</li> <li>• Fund Pollution Prevention Opportunities</li> <li>• Determine relationship between working-at-home and recycling rates.</li> </ul>
Reduce construction and demolition materials and debris sent to treatment and disposal facilities. YOY reduction; no set target.	Construction & Demolition Debris (C&D) generation rates have been increasing over the last several years because of site improvement activities. As site development progresses, that trend can be expected to continue making it impossible to set reduction goals.	Use FY21 to collect all C&D data in order to establish a baseline for YOY reduction goals in future years.

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<b>Fleet Management</b>		
20% reduction in annual petroleum consumption by FY 2015 relative to a FY 2005 baseline and 2.0 % YOY thereafter.		41 new Telematics have been received and will be installed by the end of February in the remaining vehicles that currently do not have units. Full scope of usage on the entire Fleet can be determined including idling time. Quarterly spot checks will be implemented to ensure vehicles are not running unattended, operating efficiently and are properly maintained.
10% increase in annual alternative fuel consumption by FY 2015 relative to a FY 2005 baseline; maintain 10% increase thereafter.		E-85 fuel usage is expected to increase with the new vehicle acquisitions due for 2021.
75% of light duty vehicle acquisitions must consist of alternative fuel vehicles (AFV).		Fleet management will continue to work with the General Services Administration (GSA) to order and utilize alternative-fueled and newer, more fuel-efficient vehicles during every replacement cycle.
<b>Clean &amp; Renewable Energy</b>		
"Renewable Electric Energy" requires that renewable electric energy account for not less than 7.5% of a total agency electric consumption by FY 2013 and each year thereafter.	<p>BNL purchased 22,000,000 kilowatt hours (kWh) of RECs for 2020 to meet the "Renewable Energy" requirement of 7.5%. BNL's RECs have been and will continue to be purchased through a competitive solicitation process.</p> <p>In 2020 BNL's 816 kW Northeast Solar Energy Research Center (NSERC) facility produced 977,967 kWh that were consumed by BNL's facilities. The RECs are retained by BNL and are not sold. The total of the REC's and the NSERC output was 8.2% of BNL's electric consumption.</p>	<p>BNL will continue to operate the NSERC facility and provide for further expansion when sufficient funds are identified. Renewable energy credit (REC) purchases will continue in order to meet applicable renewable energy and clean energy goals.</p> <p>Renewable energy systems, especially solar hot water, are considered in all new construction and major building renovations. To date, it has been difficult to find cost effective projects.</p> <p>BNL continues to pursue opportunities to implement a microgrid on site and are continuing discussions with energy storage providers and various governmental agencies to explore options such as hosting large utility scale battery storage systems on site.</p>
<p>Continue to increase non- electric thermal usage.</p> <p>YOY increase; no set target but an indicator in the OMB scorecard.</p>	A small residential solar thermal space heating system was installed in Building 30 as part of a research demonstration project. The system has fallen into disrepair but there are plans to bring it back into service.	New facilities such as the SUSC are evaluated for solar thermal opportunities. To-date the economics have not supported new installations. BNL will continue to evaluate various options such as solar domestic hot water heating and pre- heating, solar wall make-up air pre-heating, and other options.
<b>Green Buildings</b>		
At least 15% (by count) of owned existing buildings to be compliant with the revised Guiding Principles (GP's) for Sustainable Buildings by FY 2021, with annual progress thereafter.	Currently 8 buildings have achieved 100% of the 2008 GP's and an additional 7 buildings are considered meeting them as they have achieved Leadership in Energy & Environmental Design (LEED) Gold or higher status. This represents 20% of non-excluded buildings.	Review underway to ensure compliance with 2016 GO+P's

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<b>Acquisitions and Procurement</b>		
Promote sustainable acquisition and procurement to the maximum extent practicable, ensuring BioPreferred and biobased provisions and clauses are included in all applicable contracts.	<ul style="list-style-type: none"> <li>• BNL has incorporated contract clauses within its vendor contracts that designate environmentally preferred products (EPP), services, and equipment.</li> <li>• BNL continued to provide requisitioners EPP purchasing training.</li> <li>• BNL successfully funded two Pollution Prevention projects that involved replacement of products with bio-preferred alternatives.</li> <li>• BNL received the "Green Electronics Council's 2020 Electronic Product Environmental Assessment Tool (EPEAT) Purchaser Award" at the Gold Level; and the "2020 GreenBuy Prime" award for winning the GreenBuy Gold Award three times.</li> <li>• BNL's weakness is the ability to collect data for reporting purposes.</li> </ul>	<ul style="list-style-type: none"> <li>• BNL will perform an assessment of their sustainability program in order to identify conformance status and areas for improvement.</li> <li>• BNL will continue to establish Environmental Management System (EMS) objectives to improve EPP purchasing performance for a wide- range of products including bio-preferred.</li> <li>• BNL will enact their Pollution Prevention Opportunity Program with a focus on EPP conforming product replacements.</li> </ul>
<b>Measures, Funding, and Training</b>		
Site set annual targets for sustainability investment with appropriated funds and/or financed contracts for implementation.	Internally funded energy conservation and sustainability related initiatives include a continuation of best practices, with continued emphasis on temperature setback during unoccupied periods. Due to the impact of COVID-19, little resources were able to be directed to internal energy conservation efforts.	<p>BNL, like other DOE sites, has been increasingly using third- party financing options that utilize cost savings to pay for the projects. BNL has low energy rates to operate its' research programs, which makes it difficult to find cost-effective projects.</p> <p>Due to marginal economics the 2nd UESC effort was put on hold while BNL evaluates options, including self-funding or a partnership with the New York Power Authority (NYPA). We expect to make a decision in early FY21.</p> <p>Training continues for various staff members to maintain their respective certifications for energy, engineering, environmental and other related capabilities.</p>
<b>Electronic Stewardship</b>		
End of Life: 100% of used electronics are reused or recycled using environmentally sound disposition options each year.	<ul style="list-style-type: none"> <li>• BNL's equipment tracking system allows 100% collection of tagged electronics for recycling through an R2 Certified recycler.</li> <li>• BNL held one home electronics pick-up day.</li> <li>• BNL received the "Green Electronics Council's 2020 EPEAT Purchaser Award" at the Gold Level.</li> </ul>	Continue the current high level of performance.
Data Center Efficiency: Establish a power usage effectiveness target for new and existing data centers; discuss efforts to meet targets.	<p>Additional metering is in progress for 4 of the existing 8 data centers.</p> <p>The new data center in Building 725 is estimated to be in operation in June of 2021 with a PUE of &lt;1.3.</p>	<p>Meeting the PUE of 1.5 for the existing data centers will require a significant investment. 4 of the 8 existing data centers require the installation of new metering, which is partially in progress.</p> <p>BNL will work to identify the actions and resources needed to meet the PUE 1.5 requirement for the eight existing data centers and if cost effective, begin the process of obtaining potential funding.</p>

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<b>Organizational Resilience</b>		
Discuss overall integration of climate resilience in emergency response, workforce, and operations procedures and protocols.	<ul style="list-style-type: none"> <li>Emergency Response Organization (ERO) is fully staffed and ready to respond to an Operational Emergency at BNL if necessary.</li> <li>Emergency Operations Center (EOC) is fully operational and kept in "warm mode" during normal business hours" to respond to an operational emergency within thirty minutes of declaration.</li> <li>All joint and partial assessments were completed in compliance with DOE O 151.D.</li> <li>Continuity of Operations Plan (COOP) Continuity of Emergency Response Group (CERG) is fully staffed. Ensuring all mission essential functions are operating without interruption.</li> <li>Required building evacuations were completed and local emergency plans updated.</li> <li>Supported COVID-19 response activities for BNL.</li> <li>Supported Safeguards and Security with Hazardous materials analysis with respect to the Design Based Threat (DBT)</li> </ul>	<p>Complete five joint self- assessments with BHSO and ten partial self-assessments with Office of Emergency Management (OEM).</p> <p>Conduct beyond design basis full scale exercise. Exercise will simulate a catastrophic emergency involving multiple facilities onsite without any outside assistance.</p> <p>Complete the All Hazard Survey triennial review and updates</p> <p>Complete the Triennial review required for Building 735 Emergency Preparedness Hazard Assessment (EPHA).</p> <p>Perform quarterly DOE accountability drills on behalf of the U.S. Office of Human Capital.</p> <p>Perform semi-annual CERG &amp; DERG trainings and meetings.</p> <p>Perform annual COOP awareness briefing for BNL employees.</p> <p>Continue to support COVID-19 response activities for BNL.</p> <p>Continue to support Safeguards and Security with Hazardous materials analysis with respect to the DBT.</p>
<b>Multiple Categories</b>		
YOY scope 1 & 2 Greenhouse Gas (GHG) emissions reduction from a FY 2008 baseline.	34% reduction comparing FY20 to FY08 baseline.	Continued efforts for Energy Intensity Reductions through UESC's, Energy Savings Performance Contracts (ESPC's) and other methods including self-funding. Continued hydropower allocation, REC purchases and operation of the NSERC Solar photovoltaic (PV) array. Meeting the goal will be difficult beyond 2030 due to increased electrical load associated with EIC and the new data center.
YOY scope 3 GHG emissions reduction from a FY 2008 baseline.	Currently 33% lower than the FY08 baseline value. Large reduction over past year primarily due to decline in air travel and commuting GHG emissions as a result of the COVID-19 pandemic."	Build and continue to learn from experiences using virtual meeting platforms (e.g. Microsoft Teams and Zoom) due to COVID-19 to encourage and improve teleworking and other collaborations that will likely reduce commuting GHG emissions and influence future decisions on domestic and foreign air travel. Potential Yaphank/BNL commuter rail station could significantly reduce the number of vehicles coming to BNL from current values.