

The Plan for

SUSTAINABILITY@BUCKNELL

A Sustainable Living-learning Community

2020-2030



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ACKNOWLEDGMENTS

The Office of Campus Sustainability (OCS) thanks President John Bravman, the President's Sustainability Council (PSC), members of the original 10 committees that began the planning process in 2017, the four Working Groups, the Bucknell Center for Sustainability & the Environment (BCSE), the Division of Communications, Facilities staff and leadership, student interns, and the hundreds of students, student groups, faculty and staff whose input over the years assisted in the development of this plan. While sustainability is the responsibility of every Bucknellian, we are especially grateful to the PSC and the four Working Groups for their effort.



Sustainable agriculture for local food production can help create a path toward reducing waste and reduction of carbon emissions. ””



WORKING GROUPS (WG)



Carbon Neutrality



Ecological Conservation & Restoration (ECR)



Pathway to Zero Waste



Environmental, Social, and Governance (ESG)
(Formerly Socially Responsible Investing, SRI)



FOREWORD

Globally, sustainability is an important phenomenon to address climate change risks, exploitative material consumption and waste, ecological system imbalances, and other social and technological challenges of irresponsible human activities. Universities in the United States and around the world are establishing sustainability initiatives for research, curriculum, operations and even financing to address these challenges. From the global public policy perspective, through Agenda 2030, more than 190 countries adopted the 17 sustainable development goals focusing on people, planet, peace, prosperity and partnerships to ensure overall equitable human progress where “no one is left behind.”



For many years, Bucknell has been an active participant in the environmental sustainability movement. We recognize that appropriate technology adoption as well as individual and organizational behavioral changes are necessary for a sustainable future. Properly planned and implemented, sustainability programs are helping corporations, universities and other institutions transition away from compliance and “environmentalism-centric” perspectives toward approaches that will accomplish strategic results in meaningful and lasting ways.

Bucknell students are future public policy leaders, business executives, educational and academic leaders, and NGO transformers in this emerging sustainability-centric world. Understanding and appreciating sustainability at all levels, from local to global, will help prepare them for the future. Students, alongside their professors and staff members, played a crucial role in the development of this plan through their participation in the Working Groups and day-to-day sustainability activities. Public policy and corporate business tools were incorporated in articulating the purpose, aspirations, strategic objectives and ideals of this plan under four strategic priorities. Active participation by students, faculty and staff is critical for the realization of these goals to ensure that Bucknell becomes and remains a sustainable living-learning community.

Your participation, support and contribution in making this plan a reality is highly appreciated.

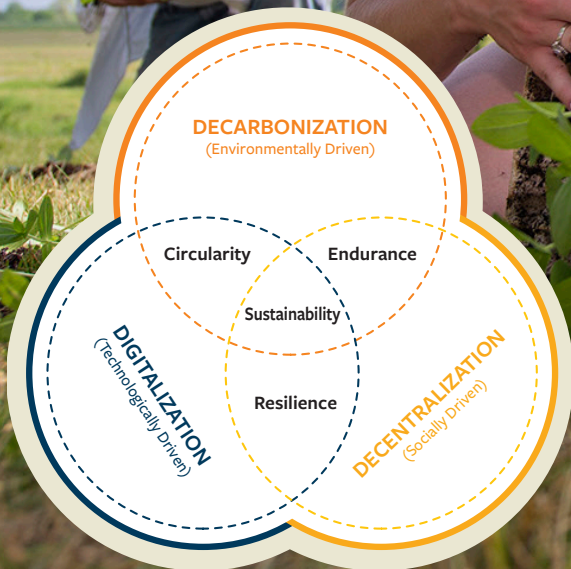
Victor Udo,
Director, Campus Sustainability



Students, alongside their professors and staff members, played a crucial role in the development of this plan. ”

Bucknell University's Working Definition of Sustainability

We define sustainability to encompass principles and practices that advance the long-term viability and resilience of our environmental, social and economic support systems. These principles and practices work at every scale, from local-to-global, and are fundamental to creating a more just, equitable and abundant future.



EXECUTIVE SUMMARY

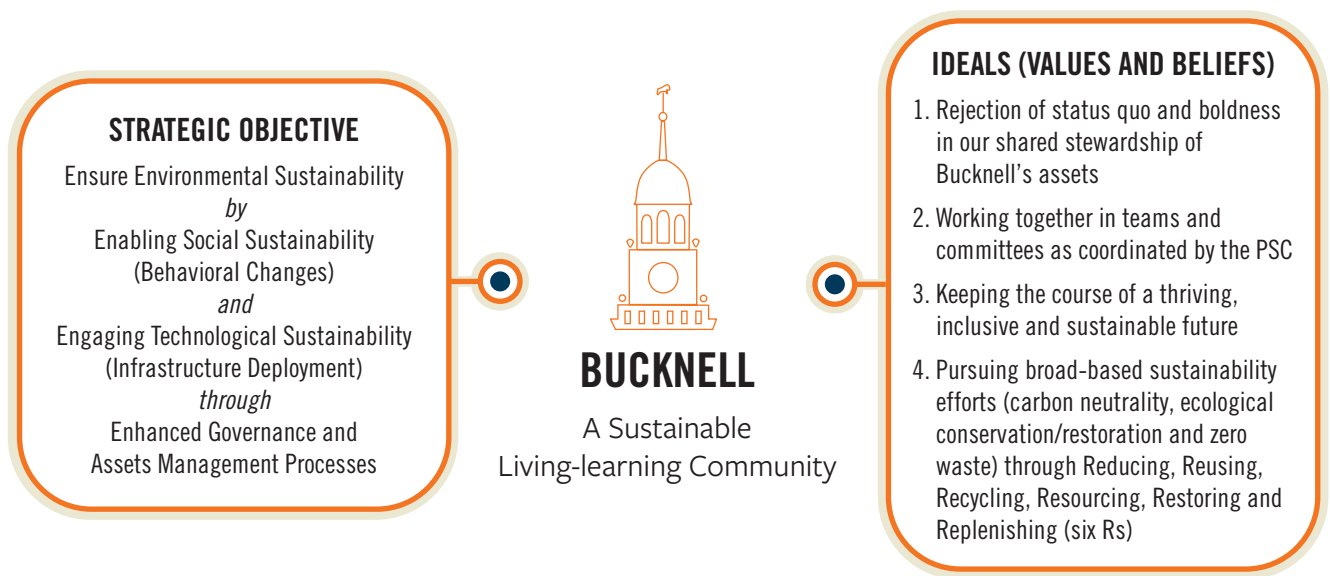
Sustainability@Bucknell is a 10-year aspirational plan for environmental sustainability in accordance with the guidance from the University’s strategic plan, The Plan for Bucknell 2025, which calls for a “broad-based environmental sustainability efforts that address issues such as energy use and sourcing, biodiversity and natural habitat, and waste minimization and recycling, while publicly reaffirming and continuing the stated goal of carbon neutrality by 2030.”

Work began on Bucknell’s sustainability plan in 2017, then paused during the development of The Plan for Bucknell 2025 and was further delayed by the COVID-19 pandemic. The four Working Groups under PSC oversight adopted a simultaneous planning and implementation approach to assist the University in prioritizing initiatives to ensure that Bucknell will meet its commitment of achieving carbon neutrality by 2030 while developing the sustainability plan. In addition to the carbon neutrality commitment, we recommend that the University advance efforts on the following environmental sustainability goals:

- Explore and develop broad-based initiatives for ecological conservation and restoration including farming (food, animal and solar), landscaping, biodiversity and green space/natural habitat protection that enhances the existing Campus Master Plan;
- Update the Energy Master Plan to prepare the University for future efforts to achieve net zero emissions;
- Drive behavioral changes for waste reduction, including the reduction of single-use plastics.

AIM OF THE PLAN (MISSION)

To successfully implement the environmental sustainability objective of Bucknell’s Strategic Plan



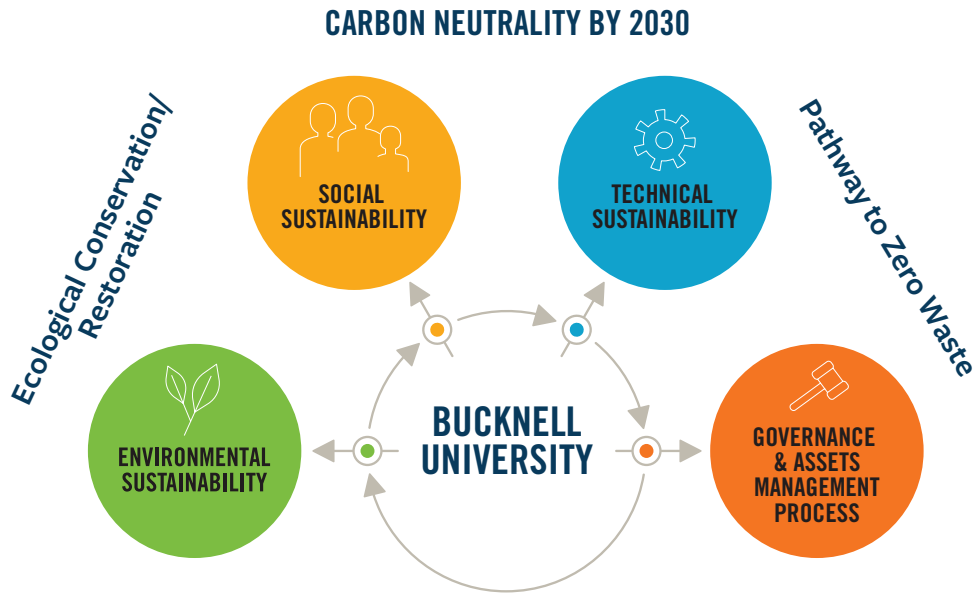
ASPIRATION (VISION)

Bucknell becomes and remains a local-to-global sustainable living-learning community that leads the way in sustainability in the realms of academics, public policy and leadership.

Figure 1: Sense of Mission for the Plan for Sustainability@Bucknell

INTRODUCTION AND BACKGROUND INFORMATION

The plan outlined in this document is intended to enhance and retain the University’s local and global brand of leadership as a sustainable living-learning community. Effective performance and risk management for sustainability operations, financial management and reporting such as Environmental, Social and Governance (ESG) impact investments is critical for the accomplishment of this aspiration. Under the guidance of senior leadership, the PSC and the four campus-wide interdisciplinary voluntary Working Groups and operational teams will develop and advance initiatives to achieve the outlined commitment and goals.



Continual Socially responsible investing for ESG impacts

Figure 2: Aspirations for the Plan for Sustainability@Bucknell

As demonstrated in Figure 3, Bucknell has a strong historical background in environmental sustainability. The completion of this plan is therefore an integration and culmination of this rich history of activities which was accelerated in 2017, when Bucknell affirmed its support of climate action and the Paris Climate Agreement by joining with more than 2,800 organizations as a signatory of the “We Are Still In” statement.

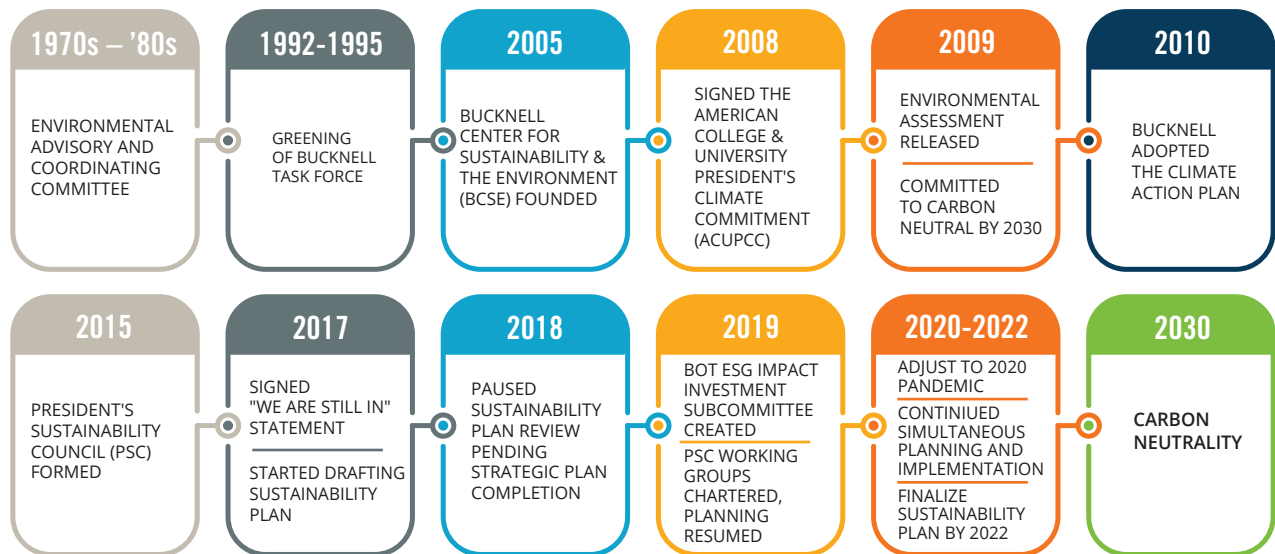


Figure 3: Past, Present and Future of Sustainability@Bucknell

The process to develop this plan began in spring 2017, when the PSC convened subcommittees to help define a clear path to campus sustainability. These groups comprised more than 90 students, faculty and staff who brought together their perspectives from across campus. The committees covered the following areas:

- Academics
- Administration and Policy
- Built Environment and Landscape
- Communications and Outreach
- Dining
- Energy
- Purchasing
- Recycling and Waste Reduction
- Transportation

That 2017 process was paused in 2018 during the University strategic planning process. Upon the completion of The Plan for Bucknell 2025, campus-wide input was solicited to inform the work of the 10 sustainability committees. With the appointment of the Director of Campus Sustainability in 2019, four Working Groups were approved by the PSC for simultaneous planning and implementation of Sustainability@Bucknell. Each Working Group consists of faculty and senior staff as co-sponsors, along with several students, faculty and staff volunteer members. To implement this plan as was summarized in Figure 2, the Working Groups developed their charters and reported to the PSC as coordinated by the OCS. Working Groups prioritized and recommended to the PSC the initiatives and tactics identified during the planning processes for budget allocation and implementation. They also identified new projects in the future as sustainability opportunities and risks emerged. The result is both an interdisciplinary and transdisciplinary endeavor that actualizes a key initiative established in The Plan for Bucknell 2025 to complete the drafting and begin implementation of an environmental sustainability plan.

The existing definition of sustainability at Bucknell was adopted for this plan. The definition incorporates principles and practices identified in the United Nation's 1987 Brundtland Commission for sustainable development, which envisions multiple scales of sustainability activities. As illustrated in Figure 3, Bucknell students, faculty, staff and the Board of Trustees have enacted environmental stewardship initiatives over the years that have resulted in the decline of Bucknell's energy density, including the transition from coal to natural gas in on-campus power generation. Having already invested significant resources in improving its carbon footprint, Bucknell is faced with an even more challenging situation in order to ultimately become carbon neutral and to advance other sustainability themes.

Five key themes guide recent Sustainability@Bucknell efforts, accomplishments and initiatives to achieve carbon neutrality by 2030:

1. Fostering a culture of sustainability across programs and departments to embed sustainability in all aspects of the University;
2. Enhancing educational, research and outreach opportunities for sustainability by making the most of the campus and local community as living laboratories;
3. Investing in sustainability through a revolving Green Fund and ESG impact projects meeting PSC approval;
4. Maximizing the use of waste diversion to minimize environmental impact;
5. Addressing environmental conservation and restoration through the appropriate stewardship of the natural resources, environmental systems, and animal/plant communities in and surrounding Bucknell.

Under the simultaneous planning and implementation process, Bucknell has attained certain sustainability accomplishments and began key initiatives including:

- Restoration of the Miller Run headwater regions
- Regional Susquehanna River Symposiums and students' outdoor ecological engagement
- Zero new investment in direct fossil fuel assets since 2017
- Mulching 600+ tons of solid waste annually and replacing plastic utensils with compostable ones
- AASHE/STARS¹ Gold Rating for Bucknell and LEED O&M Platinum for Academic West
- More than 30,000 LED lights installed across campus; earned tree campus award
- Participation from more than 800 students at the Bucknell Farm; over 15,000 lbs. of food donated
- Sustainability outreach to extended community of organizations such as Weis Markets, Milton Regional Sewer Authority and Lycoming Landfill; food waste to green energy consortium
- Preparing students for business leadership through Green Tank and Green Fund innovation competitions; public policy leadership through debates; behavioral changes through sustainability certification (offices/classes, housing and events/dining) programs
- Ordinance for a solar project while pursuing budget neutral carbon neutrality with potential service providers
- Installation of a biodigester
- Deployment of 1.7 MWDC Bison Solar Project
- Reduction of carbon footprint by 29% in 2020 vs. 2008 baseline
- Continuous planting of trees at targeted areas on campus, e.g. "100 trees in 100 minutes"
- Completion of the Bucknell Greenway Phase 1
- Institutionalization of four Working Groups for Campus Sustainability

Sustainability@Bucknell builds on the above themes, accomplishments and initiatives along with responsible stewardship of the University's financial and other resources as articulated in The Plan for Bucknell 2025. The President and his senior leadership team provides the overall responsibility for strategic and policy decisionmaking, and will continue to evaluate and prioritize recommendations made by the PSC and the four Working Groups, along with other Bucknell stakeholders.

The four PSC Working Groups are organized in subgroups led by subject matter experts and/or faculty or staff:

1. **Carbon Neutrality**, consisting of three subgroups: Efficiency & Transportation; Carbon Pricing & Offsets; and Powering Campus & Renewable Energy
2. **Ecological Conservation and Restoration (ECR)**, consisting of three subgroups: Hydrology & Aquatic Ecosystems; Soils & Terrestrial Ecosystem; and Human, Nature & Wildlife Connections
3. **Pathway to Zero Waste, consisting of three subgroups:** Messaging, Policy & Processes; Landfilling & Equipment; and Waste Treatment (recycling, mulching, composting, digesting and donations)
4. **Environmental, Social and Governance (ESG)**, focusing on helping the University community better understand the endowment and ESG impact investment processes.

¹AASHE is the Association for the Advancement of Sustainability in Higher Education, which helps universities rate their efforts and results using the Sustainability Tracking and Rating System (STARS) framework.

1

STRATEGIC PRIORITY

Ensure Environmental Sustainability – Emissions, Waste and Ecology

Bucknell University’s commitment to environmental sustainability is broad-based, as documented in The Plan for Bucknell 2025. The strategic plan covered three critical aspects of environmental sustainability: carbon emission, waste reduction, and ecological conservation and restoration (biodiversity and natural habitat).

Under the simultaneous planning and implementation process; strengths, weaknesses, opportunities and threats (SWOT) analysis was conducted by the Office of Campus Sustainability as an internal and external environmental scan across the social, technological, economic, ecological and political (STEEP) landscape. (Figure 4)

Bucknell’s commitment to environmental sustainability is not in doubt. The challenges remain how to achieve environmental sustainability given other compelling financial demands on the University, especially the need to increase the discount rate and financial aid while achieving enrollment goals. Investments in sustainability do intersect with these other University objectives.

Sustainability projects such as the University’s solar farm can be structured to produce both carbon emission reduction and utility cost savings. Sustainability should continue to be leveraged for other aspects of the University’s mission such as enrollment, research and teaching.

While Bucknell’s main sustainability focus and commitment is achieving carbon neutrality by 2030, long-term objectives such as zero carbon emission, absolute zero waste and perturbation of our natural ecology will continue to be studied and discussed. Recommendations for initiatives that will advance these goals will be studied so that Bucknell can continue to make progress during this 10-year plan and beyond.



		S	W	O	T		
		Strengths	Weaknesses	Opportunities	Threats		
S	Sociological	A friendly global community of faculty, staff, students and external stakeholders with a critical mass of sustainability passion	Fragmented and uncoordinated sustainability activities across campus with limited considerations of ROI and risks	Academic positioning for sustainability driven innovations, cost savings for educational leadership at the local, national and global levels	Missing the sustainability opportunity and also making risky sustainability investment decisions	S	
T	Technological	Nearly self sufficient infrastructure with significant environmental awareness	Significant dependence on traditional energy, facilities and transportation resources	Phased-in deployment of decarbonization, digitalization and decentralization of sustainable technologies	Obsolescence and stranded assets may result in financial issues without proper deployment timing	T	
E	Economical	Reasonable endowment and history of good student enrollment—local economy includes prison, hospitals along with Weis & Giant Markets	Undergraduate tuition driven revenue base with numerous competing requirement for the limited resources	Leveraging existing assets for new revenue e.g. executive and technical programs on sustainability and renewable energy	Potential revenue decline due to changing demographics and declining student enrollment	E	
E	Ecological	Semi-rural and agricultural setting, riverfront and land for innovative sustainability learning	Need for coordinated ecological conservation and restoration plan implementation consistent with budget realities	Establishment and implementation of BOT sanctioned ESG Impact Investments and Reporting	Carbon tax and higher cost of waste disposal—especially plastics and other ecology driven financial challenges	E	
P	Political	Non partisanship along with faculty/ staff involvement in local public policy processes	Need for more balancing of conservative and liberal tendencies across campus	Testing the waters for greater sustainability engagement of the community	Local, state and federal public policy may impact ability to execute some of our strategies	P	
		S	W	O	T		

Figure 4: The Plan for Sustainability@Bucknell SWOT/STEEP Analysis

Bucknell has already taken important steps towards decarbonization over the years, including the conversion of the campus co-generation plant from a carbon-intensive coal fuel to cleaner and less carbon-intensive natural gas. While we celebrate this step, we also recognize that the extraction, transportation and burning of natural gas presents documented dangers to people and landscapes. The University should continue to take responsibility for its emissions in order to remain a true sustainability leader.

Since 2003, Bucknell has used renewable energy certificates to offset electricity purchases from the grid. Bucknell has also invested in energy-efficient buildings, including HVAC and lighting improvements, over the last 15 years. The Green Fund has played a role in this effort by reinvesting energy and resource savings in new conservation projects, while also engaging faculty and students in identifying, planning and executing new projects. The Green Fund will continue to be an important component of the University's sustainability efforts.

There is a reasonable path to carbon neutrality by 2030 based on available technologies and carbon offset. This would be possible with a comprehensive approach that includes reducing emissions as much as possible, exploring alternatives to fossil fuel as a primary source for electricity, heating/cooling and transportation; purchasing policy changes; increased renewable energy and local carbon-offset projects such as waste to green energy; landfill methane capturing; and tree planting.

Appropriate engagement of the local, regional, national and global carbon markets can result in making Bucknell carbon negative, meaning the University could acquire more carbon credits than its emissions footprint. One of the key initiatives of the OCS and the Carbon Neutrality Working Group is the establishment of a verifiable carbon footprint accounting and reporting process.

Using effective models successfully adopted by other institutions, we recommend that the University pursue offsetting only after a rigorous and meaningful pursuit of reducing its emissions as much as possible, and only in relation to its mission as an institution of higher education.

Since Bucknell has already adapted the natural environment to the needs of a university campus, the most practical ecological solution is to preserve and protect what it currently has through planned conservation and restoration. The BCSE has worked with students, faculty and staff to develop important ecological plans that may be integrated into the University's Campus Master Plan. Protecting and preserving our ecology also includes effectively managing the landscape and farmland both on campus and off campus for overall environmental sustainability, including a dual solar and animal farming initiative to maximize land use.

Sustainable agriculture for local food production can help create a path toward reducing waste and reduction of carbon emissions. The University is already taking steps toward ecological conservation, including the establishment of the Bucknell Farm. The ECR Working Group is tasked with addressing these issues by establishing the appropriate metric, aligning the existing BCSE plans with and/or influencing changes on the Campus Master Plan, and help with implementation consistent with budget and donor funding realities.

As with any process, there must be input and output. For this simultaneous planning and implementation process for Sustainability@Bucknell, the major input is human and financial resource investments while the output is the progress toward the stated aspiration. Implementing the initiatives to enhance Bucknell's goal for carbon neutrality goals discussed above will involve capital and operational expenses.

6 VALUES OF SUSTAINABLE BEHAVIOR



KEY PERFORMANCE INDICATORS



PERCENTAGE REDUCTION IN CO2 EMISSION REDUCTION SINCE YEAR 2008

PERCENTAGE OF OFFSETS FOR CO2 SCOPES 1, 2, & 3 EMISSIONS

COMBINED PERCENTAGE SCORE ON AASHE/STARS ENVIRONMENTAL CENTRIC CATEGORIES (WASTE, AIR/ CLIMATE CHANGE & GROUNDS)

PERCENTAGE OF SOLID WASTE DIVERTED FROM LANDFILL

NUMBER OF AWARDS AND RECOGNITIONS SUCH AS AASHE/STARS RATING & LEED CERTIFICATION

SUSTAINABILITY-DRIVEN REPURPOSED SPACE ON AND OFF CAMPUS AS PERCENTAGE OF CAMPUS-BUILT SPACE



2

STRATEGIC PRIORITY

Enable Social Sustainability — Behavioral Changes

Sustainability requires a commitment to equity, inclusion, and anti-oppression tendencies. No campus can become sustainable where inequality and injustice persists. Bucknell's Strategic Plan stipulates that we are "committed to building and sustaining a diverse community in which all students, faculty and staff experience a sense of belonging supported by a foundation of inclusion, equity and access." We are also committed to "cultivating academic excellence across the institution" along with "providing an integrated and exemplary residential student experience."

This commitment goes hand-in-hand with efforts on environmental sustainability, governance, resource management and technology innovations. By establishing its Diversity Plan and Civic Engagement Plan, Bucknell has demonstrated commitment to social sustainability. To avoid unnecessary redundancies and duplication of efforts, Sustainability@Bucknell acknowledges these existing plans as the main focus of social justice and encourages greater linkages with diversity, equity, inclusion and civic engagement initiatives through the President's Diversity Council (PDC).

Academic, research and curriculum governance are critical to the social aspects of Sustainability@Bucknell, which recommends immediate and longer-term behavioral changes. While some academic units have and are incorporating sustainable development goals in their strategic plan, a coordinating body that provides oversight for sustainability curriculum requirements in each of the three colleges (Arts and Science, Management, and Engineering) is helpful. Such coordination will assist stakeholders on consistent interpretation of what constitutes an environmental sustainability connections course for example. This plan recommends a coordinated compilation and reporting of academic, research and curriculum-related sustainability initiatives across the three colleges as advocated by the BCSE.

The BCSE is poised to lead the sustainability initiatives in Bucknell's curricular, scholarly and outreach sectors. Over the past 15 years, the BCSE has taught and assisted faculty in addressing sustainability in courses. Moreover, the center has led and facilitated student-driven research on sustainability and its relationship to the greater



Susquehanna River Valley and river communities. With the collective expertise represented, the BCSE can continue to model the way in collaborating with campus and community partners to foster interdisciplinary teaching. Theoretical and applied scholarship along with stakeholder driven outreach is also part of this model toward achieving Bucknell’s sustainability objectives.

Reducing waste status, achieving carbon neutrality along with enhancing the ecological conservation and restoration of campus will require significant individual and organizational behavioral changes in at least seven areas. These areas are (1) waste and consumption reduction; (2) asset reuse instead of disposal; (3) materials recycling; (4) supply chain resourcing; (5) habitat/ biological protection; (6) ecosystem degradation mitigation; and (7) adopting best management practices (BMPs) that minimize environmental impacts to the aquatic, terrestrial and soil ecosystems on campus, and restore the Susquehanna River and Miller Run regions of campus. These environmental sustainability objectives also demand intensive campus and public engagements. Sustainability-driven behavioral changes require educational engagement for immediate, near- and longer-term local-to-global progress.

Sustainability@Bucknell aligns social sustainability (behavioral changes) with the Curriculum, Research, Campus Engagement and Public Engagement categories of the AASHE/STARS reporting processes. To measure behavioral changes, offices/classrooms, residence hall rooms, events and dining halls can be periodically audited for sustainability certification. Sustainability goals can be mapped with curriculum and translated into learning objectives through the joint Curriculum Committee of the three colleges in conjunction with the BCSE and other environmentally-focused entities at Bucknell. We anticipate that, together, these and similar activities will drive community learning and behavioral changes toward sustainability.

We recommend that there are routine campus-wide surveys on selected individual and community behavioral changes in terms of Restoring the Ecology; Recycling Materials; Resourcing Energy; Reducing Waste; Reducing Waste; Reusing or Repurposing Assets and Replenishing Communities (6Rs) for sustainability will be conducted to track progress. Sustainability-related innovations and achievements through Green Tank, BizPitch, empirical research publications and white papers, and similar campus events and actions should be tracked using various metrics and tools to collect qualitative and quantitative data.

These activities are expected to help drive the ideals and behavioral changes needed to engage the local, regional, national and global space, and gain appropriate recognition for Bucknell’s sustainability efforts and results. Together, these are grouped into four critical initiatives and five KPIs to execute this strategic priority and help in ensuring environmental sustainability as previously discussed.

COMBINED PERCENTAGE SCORE ON AASHE/STARS TECHNOLOGY AND FACILITIES CENTRIC CATEGORIES (Curriculum, Research, Campus Engagement and Public Engagement)

SUSTAINABILITY CERTIFICATION OF OFFICES, CLASSROOMS, DORMITORY ROOMS, EVENTS, DINING AND MEETINGS USING AN APPROVED CHECKLIST

LEVEL OF SUSTAINABILITY MAPPING WITH CURRICULUM AND TRANSLATION OF SAME TO LEARNING OBJECTIVES – CURRICULUM COMMITTEE

INDIVIDUAL AND COMMUNITY SUSTAINABILITY BEHAVIORAL CHANGES – SURVEY RESULTS

NUMBER OF SUSTAINABILITY RELATED INNOVATIONS AND PUBLICATIONS ACHIEVED ANNUALLY

INITIATIVES – THE FOUR WORKING GROUPS



ALL FOUR WORKING GROUPS

Engage appropriate levels of leadership on key initiatives, and create opportunities for individuals and groups commitment and demonstration of sustainable living and behaviors.

PATHWAY TO ZERO WASTE WORKING GROUP

Integrate sustainable ideals such as the 6Rs into daily campus life. Make sustainable options the first or easy choice. Help to leverage community engagement for Bucknell’s sustainable objectives.

ECOLOGICAL CONSERVATION RESTORATION WORKING GROUP

Enhance sustainable literacy and volunteerism and expand BCSE work on the Susquehanna River.

ALL FOUR WORKING GROUPS

Support the Curriculum Committee to integrate sustainability into learning objectives.

3

STRATEGIC PRIORITY

Engage Technological Sustainability – Infrastructure Deployment for Decarbonization, Digitalization and Decentralization

At this period of the 21st century, the world is facing multiple economic, environmental and social crises. In general, environmental unsustainability has been driven by systemic factors, including technological infrastructure and facilities. Energy consumption, natural ecology encroachment through urbanization, excessive consumption and waste can all be directly or indirectly traced to technology deployment across local, regional and global scales. In itself, technology is not autonomous nor tyrannical. Human behaviors engage technology whether sustainable or unsustainable.

Decarbonization of energy infrastructure and transportation; decentralization of resources to minimize waste; and systems digitalization with IoT, AI and Blockchain are becoming critical for resilience in the emerging post-fossil fuel and increasingly virtual world. With good governance, appropriate policies and market forces, communities are harnessing renewable energy more effectively with these digital technologies to reduce carbon emissions while minimizing waste.





COMBINED PERCENTAGE SCORE ON AASHE/STARS TECHNOLOGY AND FACILITIES CENTRIC CATEGORIES (Buildings, energy, dining, transportation & water)

PERCENTAGE OF CAMPUS TRANSPORTATION WITH ZERO OR OFFSET EMISSIONS

PERCENTAGE OF RENEWAL ENERGY COMPARED WITH TOTAL ENERGY CONSUMPTION

PERCENTAGE OF TOTAL BUCKNELL SQUARE FOOTAGE THAT MEETS LEED CERTIFICATION STANDARDS

SUSTAINABILITY-DERIVED COST SAVINGS FOR ALL UTILITIES AND DINING SERVICES

The synergetic intersection of decarbonization, decentralization and digitalization is poised to transform electricity utilization in both buildings and transportation. The convergence of storable renewable electricity and transportation in electric vehicles and mobility in general is fast becoming a catalyst for local and global climate change mitigation. Growth in “digital twin” is poised to enhance virtual operations and education.

With proper planning and infrastructure deployment, behavioral changes can be enabled for environmental sustainability that will establish a foundation for future efforts to reduce waste prior to and beyond 2030. Significant reduction in Bucknell’s carbon footprint occurred when the coal-fired cogeneration plant was adapted to run on natural gas. Energy consumption has also been reduced over time through investments in significant campus-wide efficiency upgrades.

Currently, approximately 80% of Bucknell’s carbon footprint comes from power generation and about 50% of Bucknell’s total solid waste still goes to landfill. Unfortunately, as we grow more sustainable, the technological cost of becoming even more sustainable may rise. This trend may persist until storage of renewable-energy-produced electricity for utility services and transportation declines below the cost of natural gas.

Given the above situation of general human and technology culture, Sustainability@Bucknell aligns technological sustainability with the Buildings, Energy, Dining, Transportation and Water categories of the AASHE/STARS reporting processes. These categories are expected to be used in identifying potential technology and infrastructure modifications that could support appropriate behavioral changes. Also, behavioral changes are needed for adopted technologies through policy changes.

Over time, appropriate policy changes will drive waste and consumption reduction; materials recycling; resourcing of energy and supply-chain; reusing/repurposing assets and restoration of ecosystems and replenishment communities (modeling the 6Rs ideal). However, these ideals assume adoption of new technologies as we move toward carbon neutrality, and as we make reductions toward zero waste status and enhance ecological conservation and restoration through innovative ESG impact investments. These are challenging issues that Bucknell will continue to advance through the efforts of the administration, the PSC, the and the four Working Groups.

INITIATIVES – THE FOUR WORKING GROUPS



CARBON NEUTRALITY WORKING GROUP

Establish and implement appropriate processes toward cost-effective living and more sustainable building practices across campus.

ALL FOUR WORKING GROUPS

Help to facilitate timely decarbonization, digitalization and decentralization technology deployment to reduce emissions, minimize waste and enhance landscape.

ALL FOUR WORKING GROUPS

Ensure sustainable utilities services (energy and water supply, telecommunications and solid waste and sewage) along with the adoption and implementation of the Energy Master Plan.

ALL FOUR WORKING GROUPS

Ensure that Dining Services infrastructure enables locally grown food and composting. Pursue effective deployment of sustainable transportation infrastructure and services.

4

STRATEGIC
PRIORITY

Enhance Governance and Assets Management Processes to Deploy Appropriate Infrastructure and Enable Desired Sustainability Behaviors



Good governance and resource management are critical institutional processes in any community. Bucknell is responsible for harnessing and managing existing and new human, physical and financial assets.



Accomplishing the targets set in this plan will require behavioral and operational changes among students, faculty, staff and stakeholders of the University. It will also require capital expenditure and other resource commitments, even as achieving these targets should provide cost-savings to the University over the short-, medium- and long-terms.

ESG impact investments and reporting is gaining global attention as a measure of sustainability assimilation by progressive institutions. As in other universities, shared governance is central to key institutional decisions at Bucknell. This sustainability plan can only be implemented in alignment with other initiatives and is subject to budget constraints. The Working Groups will collaborate with existing governance structures across students, faculty and staff stakeholders to enhance asset utilization for cost, confidence, consistency and community (4C) results. Sustainability@Bucknell need not be seen as a financial burden but a process to encourage lower total life-cycle costs including carbon pricing.

As a leading national university, Bucknell has expert faculty and staff who can encourage students to leverage sustainability for innovative value creation as opposed to mere compliance. External consultants can be retained where appropriate to provide necessary assistance. Effective use of in-house expertise will contribute to optimal resource allocation for enhanced governance and asset management processes. In identifying sustainability initiatives for implementation, Working Group participants should be aware that critical issues related to the endowment, large capital investments, and financing often require Board of Trustees authorization. Investment issues requiring board approval can only be recommended by Working Groups to the PSC for further consideration by the administration.

The development of the plan has been informed by the Coordination & Planning, Diversity & Affordability, Purchasing, Investments & Finance, and Well-being & Work Balance categories of the AASHE/STARS reporting processes.

COMBINED PERCENTAGE SCORE ON AASHE/STARS TECHNOLOGY AND FACILITIES CENTRIC CATEGORIES (Coordination/Planning, Wellbeing/Work, Diversity/Affordability, Investment/Finance and Purchasing)

TOTAL INCREMENTAL ANNUAL SPENDING (O&M and Capital) ASSOCIATED WITH SUSTAINABILITY ACTIVITIES

NET REVENUE GENERATED FROM SUSTAINABILITY RELATED PROGRAMS

COST SAVINGS DERIVED FROM SUSTAINABILITY RELATED HUMAN RESOURCES AND PURCHASING POLICY CHANGES

RATIO OF ESG IMPACT INVESTMENTS VERSUS INVESTMENTS IN FOSSIL-FUEL ASSETS

INITIATIVES — PCS ENVIRONMENTAL, SOCIAL AND GOVERNANCE WORKING GROUP



PRESIDENT'S SUSTAINABILITY COUNCIL
Ensure synergy between the President's Diversity Council (PDC) and PCS for implementation of the Diversity and Sustainability plans through joint progress tracking sessions for ESG impact.

PRESIDENT'S SUSTAINABILITY COUNCIL
Facilitate an effective organizational and leadership governance process for campus sustainability through the consolidation and realignment of redundant committees and units.

ENVIRONMENTAL, SOCIAL AND GOVERNANCE WORKING GROUP
Work to engage and educate campus stakeholders through activities such as white papers, Speaker Series, campus surveys, and Lunch & Learn sessions.

PRESIDENT'S SUSTAINABILITY COUNCIL
Ensure that investments, branding, staffing and purchasing processes incorporate sustainability acumen and mitigate financial/reputational risks.

CONCLUSION

Becoming and Remaining a Sustainable Living-learning Community

Sustainability@Bucknell is a 10-year plan for this leading diverse, inclusive and international University community working together toward a sustainable future. Serving as a long-term trajectory guidepost and near-term results compass, this document will guide passionate students, faculty and staff volunteering in the four Working Groups as they recommend to the administration through the PSC projects, tactics, initiatives and processes for campus sustainability and academic excellence.

This plan aims to ensure environmental sustainability by enabling social sustainability (behavioral change ideals) and engaging technological sustainability (infrastructure deployment for decarbonization, digitalization and decentralization) through enhanced corporate governance and assets management (socially responsible investing) processes.



A SWOT/STEEP analysis along with other strategic management tools were used in the development of this document, which is environment-, governance- and technology-centric. Social aspects of sustainability such as justice, racism, equity, inclusion and diversity are vested in the PDC. More collaboration between the PDC and PSC will enhance the ESG impact activities of Bucknell.

Many of the technological projects such as campus electrification will take longer than 10 years to complete, while others — such as tree planting — may require even longer time for tangible impacts. Adoption and effective implementation of this plan supports Bucknell’s journey to a shared, sustainable future of decarbonization, decentralization and digitalization with a focus on people, planet, prosperity, peace and partnerships to enhance asset utilization for cost, confidence, consistency and community results.

Bucknell students, faculty and staff have been and continue to be committed to environmental stewardship. This plan focuses on implementing social sustainability (behavioral changes — 6Rs ideal) and technological sustainability (3D infrastructure deployment) changes toward carbon neutrality, movement toward zero waste and ecological conservation/restoration through socially responsible investing for ESG impact. In line with Bucknell’s mission, strategic plan and the existing sustainability definition, this sustainability plan will help to advance our aspiration to thrive as a sustainable living-learning community with increasing international and less privileged students’ population.

Appropriate technology adoption and individual/organizational behavioral changes, including those guided by the six Rs, will enable and support this journey. Our shared commitment of responsible stewardship in managing Bucknell’s financial, natural, human and other resources will be manifested. Bucknell graduates will thus be well prepared as future local and global public policy leaders, business executives, intellectuals and nonprofit transformers in the emerging sustainability-centric decarbonized global economy.

A TEN-YEAR PLAN IN FOUR STRATEGIC FOCUS AREAS



ENSURING ENVIRONMENTAL SUSTAINABILITY

- Carbon Neutrality
- Zero Waste Initiatives
- Ecological Vitality

ENABLING SOCIAL SUSTAINABILITY – 6RS IDEAL

- Sustainability Courses and Learning
- Sustainability Certifications
- Innovation and Volunteerism

ENGAGING TECHNOLOGICAL SUSTAINABILITY

- Decarbonization of Energy and Transportation
- Decentralization to Minimal Waste
- Digitalization – IoT, AI and Blockchain

GOVERNANCE AND ASSETS MANAGEMENT

- ESG Impact Investments
- Value Addition – New Revenue
- Cost Saving and Compliance

FIVE AGENCIES OF IMPLEMENTATION



OVERSIGHT

- President and Senior Leadership Team
- President's Sustainability Council
- Office of Campus Sustainability

CARBON NEUTRALITY WORKING GROUP

- Powering Campus/Renewable Energy
- Efficiencies and Transportation
- Carbon Pricing and Offset

ECOLOGICAL CONSERVATION/RESTORATION

- Nature & Wildlife (Human Connections)
- Terrestrial Ecosystems (Grounds and Trees)
- Aquatic Ecosystem (Watersheds/Riverfront)

PATHWAY TO ZERO WASTE WORKING GROUP

- Messaging for Behavioral Changes
- Recycling, Mulching, Digesting and Donating
- Landfill – Cost Savings

ENVIRONMENTAL, SOCIAL AND GOVERNANCE WORKING GROUP

WORKING GROUP MEMBERS

Asteri Aliaj '22 (Carbon Neutrality)
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WORKING GROUPS (WG)



Carbon Neutrality



Ecological Conservation
& Restoration (ECR)



Pathway to Zero Waste



Environmental, Social
and Governance (ESG)
*(Formerly Socially
Responsible Investing, SRI)*

WORKING GROUP MEMBERS CONTINUED

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