Fenn Sustainability Plan | Built and Natural Campus Overview

This document explains the current goals, draft strategies, and rationales for goal focus and target numbers. Brief information on the current state and possible measurement methods is given.

Built and Natural Campus - *Fenn emits no greenhouse gas emissions from its buildings, and the campus provides ecosystem services and opportunities for well-being that enhance student education and development.*

Goal	Topic	Language	Rationale	Current state	Metric
1	**ENERGY REDUCTION**	**By 2028, Fenn has reduced its building energy usage by 15% from a five-year average between 2015-2019.** 1.1 Prioritize efficiency when replacing systems at end-of-life. 1.2 Address building envelope performance issues. 1.3 Develop the green revolving fund (GRF) to track and fund energy conservation measures (ECMs). 1.4 Educate faculty, staff, and students on building performance over time and share best practices for building occupants.	Five-year average helps even numbers out between very hot and/or very cold years. We will continue to have systems fueled by natural gas for another decade or so, and we will continue to use and care for older buildings on campus; this goal calls on us to address efficiencies of older systems and building envelopes.	For FY 2019, Fenn's buildings required 12,542 actual MMBTUs for heating, cooling, lighting, and power (weather-normalized: 12,658 MMBTUs). Space heating and hot water are powered by natural gas and three remaining oil boilers.	Fenn will continue to track building energy usage with Portfolio Manager and import data into SIMAP for scope 1 and 2 emissions reporting. Data comes from electricity, natural gas, oil, and propane utility bills. Potential energy conservation projects can be analyzed using the GRITS platform.
2	**DECARBONIZATION**	**By 2028, Fenn has reduced greenhouse gas emissions from heating and cooling buildings by 40% from a 2019 benchmark.** 2.1 Develop an electrification roadmap for heating and cooling existing buildings. 2.2 Explore options for purchasing and retiring RECs to meet short-term and long-term decarbonization goals. 2.3 Collaborate with CMLP on generating renewable energy on-site and on exploring on-site storage options. 2.4 Explore off-campus opportunities for participating in renewable energy generation projects.	Electricity is the only power source that has the potential to be carbon-free; therefore, electrification is a major strategy in any GHG reduction plan. Concord Municipal Light Plant (CMLP) is able to purchase (renewable) electricity from sources it chooses; in 2019, CMLP's electricity emissions factor was 290 lbs of CO_2e per megawatt-hour, and the average of the public utilities was around 490 lbs of CO_2e per megawatt-hour. They aim to provide 100% carbon-free electricity by 2030. By installing efficient electric systems AND being a customer of CMLP, Fenn has the potential to cut its GHGs drastically in five years.	In 2019, Fenn emitted 469.9 $MTCO_2e$ from oil and natural gas combustion, and 154.4 $MTCO_2e$ from purchased electricity (using the CMLP custom emissions factor).	Data will continue to be tracked and analyzed using PortfolioManager and SIMAP (PortfolioManager at this time does not allow for custom emissions factors; SIMAP can and the factor can be calculated by hand). Potential emissions reductions projects can be analyzed using the GRITS platform.
3	**BUILDINGS**	**By 2028, Fenn has a construction and renovation philosophy that affirms healthy and sustainable built environments as integral to student learning.** 3.1 Set guidelines for healthy and sustainable building materials used in renovations and new construction. 3.2 Set design standards that center building occupant well-being and address physiological needs of early adolescent students. 3.3 Set minimum building efficiency expectations for new construction projects that support energy use reduction goals. 3.4 Install non-fossil fuel systems in new construction and in heating/cooling system replacement projects.	Children have different needs than adults when it comes to lighting quality, acoustic sensitivity, respiration patterns - the younger the child, the more true this is. Often, the more natural the environment is and the higher quality the materials are, the healthier the child is in that setting - resulting in better educational and social engagement. Please see the Schools for Health initiative for the latest research.	Fenn has placed efficient building performance among the priorities when designing Ward Hall (2011) and the Campus Center (2018). It has not decided to pursue certification, partly due to cost considerations.	The deliverable for this goal will be a set of intentions around construction and renovation. Fenn can consult building materials and construction guidelines that already exist. LEED and the Living Building Challenge provide guidelines on lighting, Red List materials, indoor air quality (IAQ), and design considerations that can be incorporated into Fenn's standards.
4	**LAND USE**	**By 2028, Fenn has a campus design philosophy that centers student education and community well-being through sustainable development, conservation, and regard for open space.** 4.1 Map out critical natural areas of significant ecological value on campus. 4.2 Identify ways Fenn can contribute to town and state resilience and adaptation initiatives. 4.3 Develop and adopt a campus design and development philosophy. 4.4 Map out areas of student play, locations of outdoor learning experiences, and athletic use of open spaces.	During the planning process, the concept of students' ability to move outdoors between classes was discussed as being key to the Fenn experience and to student well-being. Open spaces also provide students with places for creative play and promote emotional restoration. Natural areas and open space are distinct; natural areas are biologically more complex and resilient. Naturally vegetated areas mitigate excessive heat, manage stormwater runoff and groundwater recharge, and store carbon.	The Main Campus is roughly 20 acres of buildings, greens, and athletic fields. It is approaching build-out in terms of the development of new spaces and buildings. The North Campus is nearly 11 acres of natural space, though it is maintained through mowing, native tree plantings in the wetland, and (soon) a dock to protect the shoreline. A third of the North Campus and a wedge along the south border of the Main Campus are recognized by the state as Critical Natural Landscape; all of Fenn's land is considered by the state to be Core Habitat.	The deliverable for this goal will be a set of intentions around campus development of land and buildings. Fenn can consult the North American Association for Environmental Education for standards and practices around outdoor learning. Fenn can consult the Town of Concord's Climate Action and Resilience Plan and the SITES initiative for best practices around natural areas and ecosystem services.