

Final Report of the Middlebury College Environmental Council 2021 – 2022

MAY 15, 2022

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1.0 Description of Committee Assignments

1.1 Break Free from Single-Use Plastics on Campus

Building on progress made by last year's Environmental Council, this committee will continue working with students, staff, faculty, and administration to develop a roadmap to a plastic-free campus and replacement of all non-essential, non-compostable, single-use disposable plastics with readily available alternatives. Last year the EC conducted a census of the distribution of water bottle fillers on campus and reached out to other campuses, such as the University of Vermont, that have banned single use plastics and helped the College join the [Post Landfill Action Network](#) for assistance and advice.

This year's committee will use prior work to assess the current state of single use plastics on campus and their life-cycle fates and will identify items that are harder to eliminate because of a lack of available alternatives (e.g., either due to accessibility or health and safety reasons). The committee will develop a procurement and/or purchasing policy which includes an implementation and outreach framework for the long-term elimination of all non-essential, non-compostable, single-use disposable plastics, both provided by the institution and those provided by contracted food vendors. This policy will also focus on systematically switching all of these items to reusable or compostable options (that don't contain PFAS). In addition, the committee will work on generating support from the College community for President Patton to sign PLAN's Break Free From Plastic Pledge. This will require a well-planned and publicized campaign as well as a list of target items to eliminate. (The campaign started last year through the use of surveys and research and last year's committee has provided recommendations for how to continue progress on the campaign for this year.)

1.2 Energy2028 Knowledge Bank/Dashboard for Public Use

Middlebury's Energy2028 Initiative has four main goals: 100% renewables, 25% less energy use, divest from fossil fuels, and integrate into the educational mission) and a cross-cutting theme of justice and equity. Progress has been made on all these goals and some of that progress has been shared in various formats (email updates, E2028 website, Panels and discussion groups during Earth Week...). This outreach has been mainly to Middlebury College related audiences (students, faculty, staff, alumni...). One of the sub-goals of Energy2028 is to provide information and lessons learned for the College and a broader audience beyond the College (Town of Middlebury, Addison County energy and climate orgs, other municipalities and institutions pursuing carbon and energy reduction goals...). This Committee will develop a knowledge bank catered to the questions and information needs of various groups who are interested in E2028

and lessons learned. This committee will work with the MiddData project and its Energy2028 subgroup to:

- identify key stakeholders both internal and external to the College who are interested in Energy2028
- identify what questions and information needs these stakeholders have about E2028
- inventory what information is available and how to access it, and what information and data is not available that would be of use to others
- working with the data and information that is available, develop various means for sharing it with stakeholders
- develop a prototype of a knowledge sharing platform, dashboard, etc. that can be regularly updated and serve as a “go-to” place for learning about Energy2028 and its progress.

1.3 Preliminary Plan for Community Benefit and Use Around a 30-acre Solar Site

The College, Encore Renewables and Green Mountain Power are partners in a 5-megawatt solar project that will break ground in mid-October 2021. The site is 2 miles south of the main campus on South Street Extension. When operational sometime in 2022, the solar project will provide over a third of Middlebury College’s electricity use and include a large battery for electricity storage. During the approval process by the Town of Middlebury there was considerable concern and discussion about the aesthetic impact of the project and potential use of the site by the community.

In order to address the climate crisis, we need to rapidly transition to renewable energy which may be facilitated by questioning our definitions about what is beautiful and aesthetically appealing. Could the new solar project benefit the larger community? Could it be a place for climate themed dance or theater events? Could it be connected to the Trail Around Middlebury? Could there be interpretive signage about the role the site plays in the College’s Energy2028 initiative and other initiatives in the region? And to explore the tradeoffs involved in making a shift from fossil fuels to renewables at the local level, and global...?

This committee will research the new solar project history, current status, siting, and screening plans, pollinator species and grassland bird habitat issues, and other topics. The committee will consult with a variety of people and organizations involved in the project as well as reach out to many others who may have an interest. The committee will brainstorm a variety of possible uses of the site that would be of benefit to the greater community and serve as a draw for people to come and learn more about the

climate crisis and renewable energy. The final report will clearly explain possible uses but also explore their opportunities, constraints, and resources needed as well as next steps for vetting options and engaging stakeholders in a design phase.

2.0 Environmental Council Committee Reports

2.1. Break Free From Plastics Committee Final Report 2021-2022

Our goals for this year were to:

- build on progress made by last year's Environmental Council in developing a roadmap to a plastic-free campus,
- assess the current state of single use plastics on campus,
- recommend specific items for elimination,
- garner support from the College community for Pres. Patton to sign the [Break Free From Plastic Campus Pledge](#).

Early in the year, we decided that targeting one single-use plastic item for elimination would be a good place to start the long-term process of eliminating single-use plastic from campus. We looked for an item that was purchased in high volume and had potential for substitution with a more environmentally sustainable option. We chose single-use plastic bottles as our target item.

Based on data provided by Dan Detora, Executive Director of Food Service Operations, during one recent year (10/28/2020 to 10/29/2021), 24,556 beverages in single-use plastic bottles were purchased from the college's retail locations. Retail locations include: Midd Express, Wilson Cafe, Tavern on the Tee, and The Grille. The one-year total does not include the number of single-use plastic bottles purchased from vending machines, as that information was not available to us.

One substitute for single-use plastic bottled beverages would be drinks sold in aluminum cans. This would require a modification to the contract with Pepsi, with the possibility of some current options (e.g. Gatorade) not being available in cans. The contract with Pepsi expires in September 2022 and thus changes to the contract need to be made soon. Typically, aluminum has a higher recycling rate (i.e. proportion of total cans that get recycled) than plastic does.

A second substitute for single-use plastic bottled beverages (water specifically) would be refilling reusable water bottles at designated water bottle refilling stations. According to facilities management, as of fall 2021, there were 17 water bottle refilling stations on campus. They are located in the following locations:

- Allen
- Axinn
- Battell
- Bicentennial Hall
(second floor)

- Bicentennial Hall (third floor)
- Davis Library
- Kirk by Pro Shop
- Mahaney Arts Center
- McCullough (The Grille)
- Munroe
- Old Chapel
- Proctor Dining
- Ross Dining
- Service Building
- Stewart
- Virtue Field House
- Warner (included in the new renovations)

An increase in the number of refilling stations on campus would be essential in providing alternatives to single-use plastic bottles. Survey results (see survey section below) indicate students would like more refilling stations in dormitories.

2.1.1 Break Free From Plastic Campus Pledge

The Post-Landfill Action Network (PLAN) is an established network of students and campuses across the country that are working together to reimagine systems beyond the Linear Consumption Economy. Their focus is on supporting zero-waste efforts on college campuses by equipping students with the resources and tools necessary to holistically understand the Global Waste Crisis and to lead solutions on their campuses. They believe that collectively, we can build a world beyond waste.

The #Breakfree from plastic pledge that PLAN supports on college campuses is a global movement envisioning a future free from plastic pollution. Since its launch in 2016, more than 11,000 organizations and individual supporters from across the world have joined the movement to demand massive reductions in single-use plastics and to push for lasting solutions to the plastic pollution crisis. Since PLAN began to promote this pledge in 2018 to its now 75 member campuses, 9 colleges across the United States have officially signed the pledge.

This “Break Free From Plastic” campus pledge aims to guide campuses towards the long-term elimination of single-use disposable plastics. This includes elimination of all **non-essential, non-compostable, single-use disposable** plastics that have readily available alternatives. A large aspect of this elimination that we were focusing on this year is institutionally working to establish a procurement and/or purchasing policy which provides the framework for the long-term elimination of all **non-essential, non-compostable, single-use disposable plastics**.

Currently, the following schools have signed on to the Campus Pledge:

Emory University	SUNY College of Environmental Science and Forestry
Colby Sawyer College	Marshall University
College of the Atlantic	University of California System

Eckerd College
Sterling College

Cerritos Community College
Durham Technical Community College

You can find more information here: <https://www.postlandfill.org/bffp-pledge/>

2.1.2 Justification

Plastics manufacturing is a significant source of greenhouse gas emissions and infrastructure is currently expanding. However, it is not solely a climate-related issue. Plastics manufacturing facilities are frequently located in low-income communities and communities of color. These communities experience a disproportionate burden of the negative health impacts associated with these facilities, including exposure to toxic chemicals in their air, soil, and water. It is an issue of environmental justice. Further, plastics and microplastics pollution is ubiquitous across the globe, impacting organisms in aquatic ecosystems and terrestrial ecosystems alike. Microplastics pollution is a human public health issue as well.

2.1.3 Other schools

Many other schools in the United States are making significant strides in reducing their plastic consumption. The University of Vermont, for example, has successfully eliminated plastic water bottles from campus. Their university-wide policy that banned plastic water bottles resulted from a combination of work between the office of sustainability, their zero waste program, the dining hall company, and the Provost and President's office. The head of UVM sustainability emphasized the importance of having enough water filling stations across campus to make up for the plastic water bottles no longer being offered. In addition, George Washington University is also an inspiring school to look at because of the work they have done to instill more water refilling stations and fill vending machines with aluminum cans instead of plastic. GWU found that an economic benefit of eliminating plastic water bottles has been saving money through cutting down on recycling and garbage disposal fees. They also found that they received support due to the fact that they offered aluminum cans as a substitute for plastic bottles, instead of getting fully rid of entire vending machines across campus. Based on Middlebury's sustainability goals and mission of being a leader when it comes to environmental matters, it is imperative that Middlebury makes more progress in reducing single use plastic on campus and eliminating plastic bottles that contribute significantly to the plastic crisis.

Further, eliminating single-use plastics from campus aligns well with Energy 2028 goals.

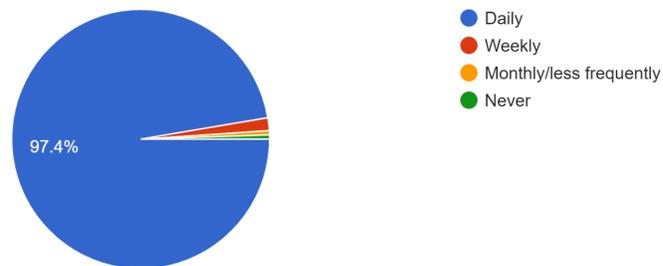
It would be remiss to not point out that Middlebury has already made some decisions towards reducing the use of disposable plastic on campus. The College recently

purchased 6 portable water bottle refilling stations. These can be used at outside events instead of catering supplying water in single-use plastic bottles.

2.1.4 Survey results

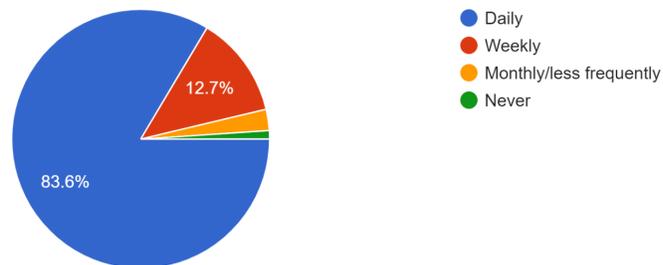
The Break Free from Plastic Committee conducted a survey within our College community to ascertain our community's attitudes and behaviors related to plastic use. As of May 4th, 189 members of our community participated. We have included a few of the questions asked which demonstrate significant “take-aways” from the survey:

How often do you use a reusable water bottle?
189 responses

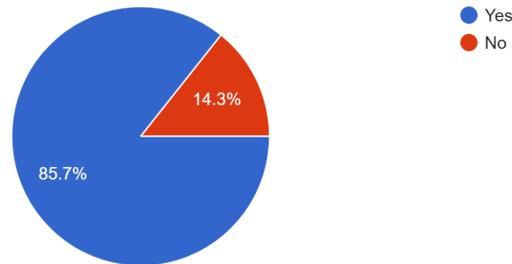


Of the participants in the survey, there is an overwhelming interest in having President Patton sign a pledge to reduce single-use plastic on campus.

How often do you use water filling stations?
189 responses

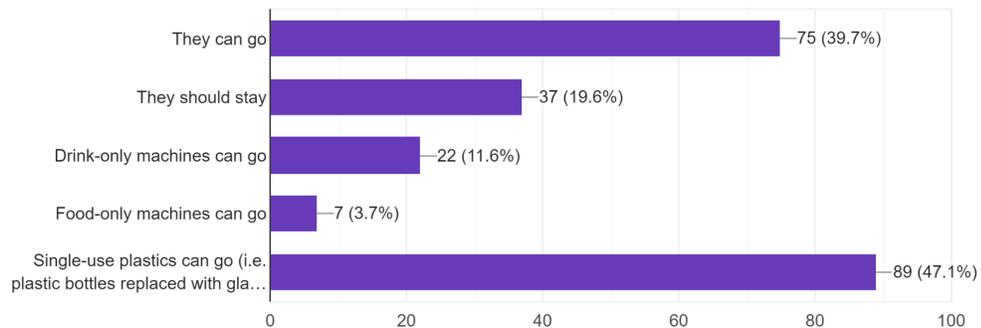


Do you wish there were more water filling stations around campus?
189 responses



Of the participants in the survey, a large majority use refilling stations daily, yet they also feel that there needs to be more of them on campus. This would suggest that if we install additional refilling stations in appropriate locations, they will most definitely be used. Participants were also asked for preferred locations for new refilling stations. Although there were a multitude of different responses to this question, over 50% of the respondents felt the need to have refilling stations in dorms.

How do you feel about vending machines on campus?
189 responses



Our question on vending machines suggests that there is a significant group of students on campus that are keen on having vending machines but at the same time many students are enthusiastic about removing single-use plastic containers from the vending machines.

2.1.5 Meeting with the Senior Leadership Group (SLG)

Three members of our committee met with the SLG to explain our work and to make three requests. These requests were:

- 1) Support for Middlebury to sign on to the “Break Free From Plastic” Campus Pledge
- 2) Support for the elimination of single-use plastic bottles from campus (retail locations and vending)
- 3) Support for the installation of more water bottle refilling stations

The SLG showed interest in what we are trying to achieve. Laurie Patton committed to signing the pledge in the near future. David Provost stated that he would discuss the elimination of single-use plastic bottles with Dan Detora (Executive Director of Food Service Operations) as well as stating that The College is committed to incorporating water bottle refilling stations into future constructions, including the new first-year dormitory, which will be the next building built on campus.

2.1.6 Future work and recommendations

The most urgent task for the future is to make changes to Middlebury’s contract with Pepsi, which is up for renewal and renegotiation in September 2022. Middlebury must work with Pepsi to remove single-use plastic bottles (e.g. water, Gatorade, sode, etc.) from our contract and subsequently determine alternatives for single-use plastic bottles (i.e. aluminum cans). It will be important to assess whether there will be a loss of revenue to replace single-use plastic bottles in vending machines with aluminum cans. On the other hand, there may be savings due to less plastic in the waste stream, as we pay for the disposal of our garbage.

Another crucial next step is to increase the amount of water bottle filling stations around campus. Students in the survey indicated a need for more stations around campus, especially in residential buildings. Allocating the funds to purchase and install these stations will be an important step by the administration. Abundant and accessible water filling stations will facilitate the smooth transition away from single-use plastic.

Besides beverage bottles, there are a variety of other single-use plastics that are used on campus. For example, in science labs there is a significant amount of plastic disposable materials used for both teaching and research. The amount of plastic from these sources is unknown, and alternatives to using these plastics might be harder to find. If this committee continues their work next year, this should be an avenue to investigate.

2.2 Energy 2028 Knowledge Bank/Dashboards

2.2.1 Goals

Middlebury's Energy2028 Initiative has four main goals: 100% renewables, 25% less energy use, divest from fossil fuels, and integrate into the educational mission) and a cross-cutting theme of justice and equity. Progress has been made on all these goals and some of that progress has been shared in various formats (email updates, E2028 website, Panels and discussion groups during Earth Week...). This outreach has been mainly to Middlebury College related audiences (students, faculty, staff, alumni...). One of the sub-goals of Energy2028 is to provide information and lessons learned for the College and a broader audience beyond the College (Town of Middlebury, Addison County energy and climate orgs, other municipalities and institutions pursuing carbon and energy reduction goals...). This Committee will develop a knowledge bank catered to the questions and information needs of various groups who are interested in E2028 and lessons learned. This committee will work with the MiddData project and its Energy2028 subgroup to:

1. identify key stakeholders both internal and external to the College who are interested in Energy2028
2. identify what questions and information needs these stakeholders have about E2028
3. inventory what information is available and how to access it, and what information and data is not available that would be of use to others
4. working with the data and information that is available, develop various means for sharing it with stakeholders
5. develop a prototype of a knowledge sharing platform, dashboard, etc. that can be regularly updated and serve as a "go-to" place for learning about Energy2028 and its progress.

2.2.2 Summary

Identify key stakeholders both internal and external to the College who are interested in Energy2028

The results of our surveys show that there is a large interest in accessibility to data and data interpretation. We identify stakeholders in all of these groups: students, faculty, and community at large.

Identify what questions and information needs these stakeholders have about E2028

Through our survey, we identified varying degrees of interest in all the groups above. These interests are driven by different goals: students (advocacy and research), faculty (teaching and research), and community members in general (policy making and general understanding). Also there are varying levels of interest in what type of data should be accessible and to what level.

Inventory what information is available and how to access it, and what information and data is not available that would be of use to others

Currently available datasets cover several sources of information: imagery (from various cameras), meteorology, air quality, electricity consumption, and greenhouse gas emissions. Up until this year, these were stored in different places and difficult to access.

With the development of the new prototype portal (see below), an effort has been made to centralize and streamline access.

Working with the data and information that is available, develop various means for sharing it with stakeholders

Currently there are only two ways data can be potentially shared with the stakeholders. The first is through the prototype portal (see below), the second is through direct access to the database that is currently storing most of the information. Access through the portal offers some additional information about the type of data and its source whereas accessing data directly through the database should be considered “for experts only”.

Develop a prototype of a knowledge sharing platform, dashboard, etc. that can be regularly updated and serve as a “go-to” place for learning about Energy2028 and its progress.

A prototype portal was developed to start the collection of all the currently available datasets. The portal is accessible at this address:

<https://sites.middlebury.edu/environmentaldata/>

Right now the portal is barebone and is used to provide access to data but it provides a sandbox platform to test the development of additional functionalities.

2.2.3 Recommendations

After analyzing the surveys, our key recommendations are:

- Develop a better communication strategy around Energy2028
- Improve communications about the availability of data including:
 - Explanation (What data is available and how it should be interpreted)

- Reminders (Identify the optimal way to remind the community about data availability. More than one approach might be pursued based on the users' interests - e.g., email, newsletter, social media)
- Raw data training (Provide training about what data is available, how to access it, and responsibility that comes with access. This could be done, for example, through workshops organized by the library, the CTLR, or Middata) newsletters.
- Include education outreach about personal responsibility. How can we help the community understand what each individual can do?
- Expand data presentation by developing an interactive dashboard. This should include features at various levels and also provide interpretation of the data: large trends, take-aways, summaries. Part of the dashboard could be updated automatically and part could be curated.
- Provide different levels of data access for different stakeholders. There are different interests in the community. Some are interested in high level digests, some others are interested in the raw data. All different levels should eventually be provided through the portal.
- Develop data access policies. As knowledge of and interest for the data increases, access policies should be developed to guarantee privacy and intellectual property.

2.2.4 Full Report

2.2.4.1 Surveys

Surveys (available in appendix A) were sent to students, faculty, and the community at large in the form of a Google form. The general format was as follow:

- A general introduction about Energy2028 goals. This has a reduced scope for the community survey. In this case it tested for general knowledge about the initiative and, based on the answer, it gave an opportunity to provide feedback about the available information.
- Depending on the target group, questions about major (students) or department (faculty)
- A set of targeted questions:
 - Which of the following data would you be interested in? This was followed by a list of the currently collected and available data
 - Were you aware that these datasets are available?
 - What would be your main use for these datasets?
 - How can we improve the accessibility to these datasets?
 - What additional datasets would you be interested in and in which format?
- Finally there was an opportunity to provide contact information if so desired

2.2.4.2 Student survey summary

Interests:

- Majority of the students (23/24) are interested in annual greenhouse gas emission inventory, which include annual carbon sources and emissions from main campus, Bread Loaf, and Snow Bowl; others are interested in Monthly data for waste, recycled materials, and compost (22/24) and Daily energy use from residence halls (electricity and, for some, steam) (20/24)
- Majority of the student participants (83.3%) do not know that the datasets are available

Usage:

- Majority of the student participants (78.3%) are interested in using these datasets for advocacy, while also for research (39.1%) and classwork (30.4%).

Advice on improving the accessibility of these datasets:

- Create a go/link and consolidate all of them into one location (Energy 2028 website, for example), give leaders of student groups access
- Marketing about them
- Create a dashboard (PowerBI)
- Create easy to follow infographics/diagrams

Additional data of interests:

1. Water use in buildings, energy production from campus solar panels and other sources of renewable sources
2. Exactly what the college is spending money on, fossil fuel investment
3. Data from the SnowBowl
4. More transparency overall regarding the timeline in meeting all Energy 2028 goals

2.2.4.3 Student survey's recommendations

- Centralize all Energy 2028 related data to one site (go/link?)
- Improve their accessibility
 - A better interface, centralize all the data in one location/website
 - go/link directs students to the site → maybe to the current link
<https://www.middlebury.edu/office/energy2028>
- Create easy-to follow infographics/diagram and market about the data
 - Include greenhouse gas inventory data, daily energy use from residential halls, etc.
 - Advertise about the existence of the data, maybe create stickers with the go/link?
- Increase transparency on data regarding energy/fossil fuel investment

2.2.5. Faculty survey

Rather than targeting the entire faculty, we send the survey to specific groups who we thought might be interested in having access to the collected data: Computer Science, Environmental Science, Geology, Geography, Economics.

2.2.5.1 Faculty survey summary

Most would use for some form of teaching, some interest in research:

- great data for senior projects and visualization courses (CS)
- could be used for data-science courses

Comments:

- Would love for data to be more accessible (or at easily accessible information describing how to access the data or contact information for people responsible) and easier to "stumble upon". A central hub about all resources including data sources (e.g. <https://middlebury-sciences.libcal.com/>)
- Interest in both raw data (also through an API) and a digest of the data: interpretation providing some highlight of what the data means (different layers: from raw data to dashboard)
- Information about how do we compare to other similar (or nearby) institutions
- Information about how this data is used (could still be part of a dashboard: a section reporting how data is being used and possible outcomes)
- Would love some form of pushing notification of the availability of these resources (maybe an email sometime in early summer and winter break. Maybe this could include a summary of the usage both in terms of consumption and how the data is actually used, and the comparison. E.g. "Here is how we've been doing, here is how we compare with similar institutions, and here is what data is available and who has been using it and how").

Additional data interests:

- IR images of energy leakage from building
- Emission inventory (with clear separation between various sources of emissions, the emissions, and the offsets)

2.2.5.2 Faculty survey's improvements

- There isn't enough information online:
 - The Energy2028 page doesn't offer contact information
 - go/energy doesn't go anywhere
- Desire for data to be accessible through a [central hub](#) with all the sources
 - Raw data: the data as it is collected (also through an API)
 - A data digest: what does the data mean at a high level?
 - Different levels for both tech and non-tech savvy audience
- Comparison with other institutions (how are we doing respect to them?)

- How is the data used? Who used it and what were the findings?
- Some form of “mild” notification (once twice a year)

2.2.5.3 Faculty survey’s additional datasets

- Infrared images of energy leakage from building
- Emission inventory, with clear separation between various sources of emissions and details about:
 - Emissions (including all scopes)
 - Offsets and mitigation efforts (would like to see it separate rather than accounted for)
- A lot of interest in tracking in detail college impacts from
 - Transportation (all scopes: business travel, delivery, commuting, ...)
 - Residential properties (estimate based on footprints, consumptions, ...)
- Quantitative comparison with other institutions

2.2.5.4 Faculty survey’s recommendations

Short term

Energy 2028

- Include contact information for specific individuals (maybe for internal access only) for different aspects of the initiative (administrative, data access, ...)
- go/energy (now points at data); go/energy2028 (now points at main website)
- Include link to data hub
- Provide a mechanism to register for updates
- Provide regular updates (pushed 2-4 times a year) about progress towards initiative goals

Data hub

- Create a centralize data hub

Mid term

Energy2028

- Include comparison to other institutions in the updates

Data hub

- Develop a dashboard displaying high level aggregate data
- Include explanation of the different data sources (collection => interpretation)

New datasets

- Provide current data about emissions (limited scope)

Long term

Data hub

- Provide different access tiers (high level dashboard => raw data access)

- Repository of how data is used and findings (a report could be required to allow access to raw data?)

New datasets

- Provide regularly updated data about emissions (extended scope)

2.2.6 Community/General survey summary

Current knowledge

- Mixed awareness of Energy 2028
- Not accessing any data that may currently be available

2.2.7.0 Student survey's recommendations

- Approachable language
- Searchable for specifics but also browsable for ideas
- Website most valuable resource, mailing list could also be beneficial
- Overall: most individuals/organizations/businesses in the Middlebury area want to make positive changes, just a matter of being exposed to ideas and the data supporting them
- For constituents: easy access to simple solutions.
- Include a very simple section targeted at community members about:
 - limit energy use
 - other accessible efforts
- For representatives: a searchable, browsable knowledge bank could be useful when trying to put together a bill as a means of supporting proposals with data (other databases exists):
 - Having a Middlebury specific resource would be helpful
- Avoid highly academic and challenging diction
 - Makes sustainability feel elitist
- Offer dashboard in multiple languages and with mixed forms of media (text, charts, pictures, and videos)

2.2.8. Survey of other institutions

We also started to collect information about what other institutions are doing in terms of data collection and availability. We collected screenshots of and links to portals for the following institutions: Williams College, Wesleyan University, Trinity College, Connecticut College, Amherst College, Colby College, Bates College, Pitzer College, Scripps College, Claremont McKenna College, Pomona College, and Wellesley College. In the future these can serve as templates to start the development of our own portal. A link to this document is provided in Appendix C.

2.2.9 Data availability

In collaboration with several institutional parties, a “draft” webportal was created to provide access to currently available datasets:

<https://sites.middlebury.edu/environmentaldata/>

This is currently a placeholder to address the growing interest towards these data. In the future the portal will be updated and optimized to provide additional dashboards for data visualization as well as additional information about data usage and availability policies.

2.2.10 Appendices

Appendix A - Link to surveys

- Student survey ([gform](#))
- Faculty survey ([gform](#))
- General public survey ([gform](#))

Appendix B - Currently available datasets

The datasets that are currently available can be accessed through the “draft” portal at the following location: <https://sites.middlebury.edu/environmentaldata/>

We are still in the process of determining policies and accessibility of the datasets.

Appendix C - Survey of other institutions’ portals

We carried a survey of other institutions’ portals and collected examples in [this document](#). These might serve as direction and inspiration for the development of Middlebury’s own portal.

2.3.1 Community Benefit and Use Around a 30-acre Solar Site

2.3.2 Description of Committee Assignment

Following a four-year process deliberating the installation of an off-campus solar site designed to supply power to Middlebury College, in October 2021, the College, partnered with Green Mountain Power and Encore Renewables, broke ground to install a five-megawatt solar site located two miles south off the school’s main campus on South Street Extension. Despite this long approval and permitting process as well as the fact that many stakeholders support the final design and location, many in the Middlebury community still have mixed feelings about the project’s location. Following the site selection and its subsequent approval by the Middlebury Selectboard, Planning

Commission, Energy Committee, and received a Vermont Act 248 permit, numerous Middlebury town residents voiced opposition to the site's location, mainly due to aesthetic and recreational impacts. As a result, our subcommittee formed with the intention of considering measures that might contribute and add value to the site for the community through integrating functions of the site within the larger area. However, after considering all community opinions regarding the site, the Committee thought it imperative to widen our recommendations, endorsing the inclusion of wider land use perspectives in decision-making processes, therefore furthering sustainable development initiatives in the College's land practices.

LAND ACKNOWLEDGEMENT

In considering the development of this site, we acknowledge that this land was stolen from the Abenaki, the traditional caretakers of this land. This site and the adjacent lands are of particular importance to this community's heritage as they were one of the first sites of settlement. Through our recommendations we hope to encourage more thoughtful stewardship of Middlebury's lands and bring to light the historical and cultural significance of this area.

2.3.3 PROGRESS REPORT SUMMARY

2.3.3.1 Highlights:

- Over the course of the semester, the Committee conducted a multitude of interviews with community members, ES faculty, and those most knowledgeable about the site
- We explored possible solutions to mediate community concerns in three main areas: aesthetics, recreation, and ecology
- We believe that our ultimate recommendation to install interpretive signage, plant a pollinator garden in collaboration with BeeTheChange, and conduct a hydrological assessment of the site provides an aggregate benefit to all stakeholders involved
- Though our findings are comprehensive, the Committee was limited in the resources available and therefore requires a more in-depth analysis in its implementation. Our suggestions in the site development, such as the wetland restoration, are dependent upon further expert-conducted ecological site studies.

2.3.3.2 Recommendations for Best Use of the Solar Site:

- Conduct an assessment of the site to determine possibilities for ecological restoration, including restoring natural hydrology and vegetation
- Collaborate with BeeTheChange to support rare and endangered pollinator species while simultaneously adding to the aesthetic value of the site

- Develop interpretive signage along the site, containing information of the values/histories of the land, the principles of the Energy2028 initiative, climate action guidance, and information on how the legal and regulatory processes played into the decisions made regarding the site, among other topics
- Evaluate the benefits and drawbacks of developing trails and recreational pathways around the site, prioritizing both community and environmental effects

2.3.3.3 Recommendations for College Land-Use Planning:

- Recognize the guiding principles of the Land Stewardship Initiative and the expert resources of our College's and Town's land and conservation committees in making decisions about College land uses
- Expand on the guiding principles of the Land Stewardship Initiative to include community members on the College's Lands Advisory Committee and holding community forums open to all members of the community to attend earlier in the decision-making process
- Think more holistically about our land parcels, the opportunities they provide for conservation and restoration, and the potential interactions we can have with them
- Develop more holistic solutions while partaking in climate change resilience planning, considering restoration and conservation, rather than looking at Energy 2028 as a goal in isolation
- Integrate the Living Community Challenge (following our pursuit of the Living Building Challenge) as a framework for thinking about future infrastructure projects and developing a more resilient community

2.3.4 FULL PROGRESS REPORT

2.3.4.1 Problem-Solving Process/ Our Past Year's Work

At the start of our project, we gathered data on community concerns regarding the new solar site via Front Porch Forum, an online community website used by Middlebury town residents. We found that community members had varying opinions about the site, ranging from supporting its development as a solar array, to opposing this same development due to its ecological impacts and recreational/aesthetic value. Those concerned about the site's natural environment were primarily focused on the hydrology of the site. Aesthetic and recreational concerns centered around the sight of the solar panels in a semi-residential area with a heavily trafficked adjacent road used for recreational walking, running, and biking, among other activities. Many residents proposed that increasing the aesthetic value of the site would reduce community opposition to the solar site's development. Other residents expressed "hope for the

future” in seeing the solar panels, but because not all members of the community feel the same way, the committee has looked for other channels to add “aesthetic value”, which we define as pleasing to the average human eye. This is a difficult feat, as beauty is subjective, but our proposal attempts to consider all possible outlooks.

After gaining community insight, we conducted interviews with faculty who have insight on the history of the project, the hydrology and natural resources of the area of the surrounding site.

We first interviewed Professor Pieter Broucke of the College’s History of Art and Architecture department regarding the possibility of using the space surrounding the solar site for art installations or a performance venue. After consulting with Professor Broucke, we decided that the space would be better suited for other recreational and educational purposes.

We then spoke with Professor Jeff Howarth of the Geography department and Professor Marc Lapin of the Environmental Studies department. Both professors believe that the current location was not the ideal location for the solar site, but were willing to give us input on sustainable practices regarding the location, as well as constructive feedback on our possible ideas. We discussed the possibility of hydrological restoration, how to keep the site usable for recreational purposes while not causing further damage to the environment, and the possibility of adding more native vegetation and a pollinator garden to the site. We spent a great deal of time with Professors Howarth and Lapin discussing how to repair the impacts of the historical agricultural uses of the land along with how our different possible solutions would affect the more-than-human world.

We also met with Jake Clark, Director of Development and Associate Regulatory Counsel at Encore Renewables to review the site plans, the natural resources analysis study, the acoustic analysis, and the logistics of operating a solar site in tandem with a recreational site. The site plans can be provided upon request.

Over the course of the 2021-2022 academic year, the Committee has found that due to the nature of the opposing community viewpoints, as with most environmental issues, there will be no proposal that appeases all stakeholders. For this reason, our job as a Committee has been to create a solution that has the highest net benefit in trade-offs to benefit the human and non-human members of our Middlebury community.

Options	Benefits	Drawbacks
Hydrological Restoration:	<ul style="list-style-type: none"> -State and federal priority to help improve Otter Creek/Lake Champlain water quality (reduce Phosphorus) - Values the more-than-human world and rebuilds relationship with the land is a very different way than the below measures - Helps to move the land more toward its natural state of wetland forest - Many community members expressed interest in this 	<ul style="list-style-type: none"> - Removes some more of the fields from farming - Requires expertise from USFWS and NRCS - Will have to evaluate how this can take place with the solar array in the middle of the site
Interpretive Signage: place signs along the eight feet tall wire fence surrounding the solar farm or along South Street Extension Road or through proposed public paths and trails	<ul style="list-style-type: none"> - Include history of the land and Abenaki significance, the ecological and hydrological significance, the decision to have the solar site on South Street Lowlands, and the school's previous energy suppliers (comparison between a 5 megawatt solar site here in Middlebury versus 5 megawatts from HydroQuebec or can touch on energy 2028) 	<ul style="list-style-type: none"> - Must be careful to include multiple perspectives and voices to prevent representational injustice - Dependent on content, would become out of date fairly quickly; hard to maintain
Public Paths and Trails: around the solar site, connecting to the Class of '97 TAM trail and joining the footbridge, for	<ul style="list-style-type: none"> - Improves recreational opportunities of the site; community members occasionally walk or run alongside the area, and we 	<ul style="list-style-type: none"> - Fields consist of wet clay soils that are unsuitable for trails (mostly in the north end of a swamp complex) - Need to evaluate how this

<p>improved recreational opportunities</p>	<p>hope to increase foot traffic on the actual site</p> <ul style="list-style-type: none"> - Can route the trails so that they can be connected to the Jackson lands and integrate creek road with South Street Extension, which would connect it with progress that is happening on the other side of the creek 	<p>can fit in with broader conservation or restoration efforts</p> <ul style="list-style-type: none"> - Could lead to self-made bike paths off of the main path, which can be destructive to the surrounding environment. This would require preventative measures such as fencing to avoid further damage - Requires developing a nearby footbridge over Otter Creek, a time-consuming and costly project that would also require further investigation as to its impacts
<p>BeeTheChange Program: inclusion of pollinator gardens next to the fences of the solar site and in the site itself</p>	<ul style="list-style-type: none"> - Can use space within site as an opportunity to support pollinators and threatened species - Can use the plants as an educational opportunity (classes/labs) - Many community members expressed interest in this 	<ul style="list-style-type: none"> - A pollinator garden can be placed anywhere and has no native significance to the site - The land has to first be cleared of poison parsnip, a process that can take up to a few years, and therefore will not be an immediate remedy
<p>Performance Space: located at the “Ledge”</p>	<ul style="list-style-type: none"> - Could be used in community events and increase appreciation of the solar site - Bring together Middlebury town residents and College students through joint use of the space 	<ul style="list-style-type: none"> - Would not be leaving the lands open for agricultural, restorative, and/or aesthetic uses (champlain valley farmlands prefer to keep lands in agriculture for use value appraisal)

<p>Art and Sculptures: sustainable projects along the solar site</p>	<ul style="list-style-type: none"> -Public art creates a draw to the site - Can collaborate with Middlebury College and create an opportunity for students and professors to design the sculptures - If this counts as a capital project for the College, it can qualify for 1% for the arts funding 	<ul style="list-style-type: none"> - Sculptures may be seen as obtrusive by residents and an add-on to appease general concerns about the site - Would most likely need to find a donor to fund the project (might create an imbalance of power if the donor chooses to insert preferences/opinions)
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Community Planning

The Committee wanted to note that by receiving more community input proactively rather than reactively, the College could have avoided criticism surrounding its [lack of transparency](#). We suggest that in future developments, the College plans proactively, considering their ecological, educational, aesthetic, recreational, and overall impact on the whole community more thoroughly. The College can do this through holding meetings open to the full community in the initial planning stages in the event that its development has an aggregate impact on the community not directly affiliated with the College.

Recommendations for Best Use of the Solar Site

The land being developed for the solar site holds potential to be restored to its original ecological and hydrological state as it existed before being used for intensive agricultural purposes. As a result, we hope that the college can evaluate the possibilities for ecological restoration, including restoring natural hydrology and vegetation.

We believe that by installing minimally obstructive interpretive signage, we can inform visitors of the benefits of this new solar site, the reasons behind other sites not being chosen, the origins of the school's old energy suppliers, the types of native ecosystems/natural communities, the hydrology of the site, and the historical and cultural significance of this site for the Abenaki community. We hope that this space can be used as an educational venue for students of all ages to enjoy and recreate at.

We also recommend that the school move forwards with a partnership with Bee the Change and plant native pollinator gardens on the land underneath the solar panels (after removal of the poison parsnip on the site). We believe this is an easily-achievable

goal that could help to generate net environmental benefit on the site, as well as contribute to aesthetics.

Due to concerns for as well as interests in the aesthetics and recreation of the site, our Committee would like to propose a careful and informed consideration of any possible art installations or trails. While we think art pieces could be a potential draw and attractive feature of the site, the art should not cause any further damage to the environment and fit with the already-existing and extensive solar array. Community members seem to largely support the development of recreational paths or trails connecting to existing trail networks; however, we also propose giving this due consideration in terms of its environmental possibilities (due to the nature of the soils) and potential impact.

We also felt it important to note that the requirements already in-place involving the site development, including the fact that 30 acres of land will be removed from intensive agricultural use, as well as the 95 acres of land that will be protected as a grassland bird habitat off of the site. Both of these factors can be considered benefits to the drawbacks of the development that we have previously mentioned. However, having mentioned this, the committee still strongly believes that minimizing further development on the site is still imperative to both protecting the ecology of the area, as well as remedying community concerns.

We believe that this collaborative solution is the most advantageous outcome for all stakeholders involved. While this may not please all community members, it ensures that all interested parties benefit in some manner. The Council is excited about the transformation of the solar site into an educational, recreational, and aesthetically-pleasing space.

Recommendations for Future Land-Use Planning

Based on our discussions, it is our understanding that the selection of the current solar site was made without the consideration of key opinions. We have talked with Professor Marc Lapin, the College's Land Ecologist and chair of the college's Lands Advisory Committee. Although a summer internship student worked closely with Professor Lapin to decide on possible sites for the solar farm, the current chosen site was not on that list. Furthermore, although the Middlebury Conservation Commission was consulted on a previous site, this same collaboration was not executed for the current South Street Ext. site. Beyond that, though adjacent landowners were consulted by Encore, this was done too far into the process to have a substantial impact. While the College did follow all the required legal procedures to partake in this development, we hope that future development plans can be done in more collaborative ways. To remedy this

communicative misstep, **we propose that the College adopts a more collaborative approach with local experts, whether they be its own faculty and staff, or outside agencies, as well as local stakeholders, when considering the development of its lands to the extent that it has an aggregate effect on the greater Middlebury community.**

As stated before, many community members voiced adamant opposition to the selection of the solar site location and have claimed that outside of the official Middlebury town government, they were not fully consulted prior to the final decision making. Given the College's extensive ownership of Middlebury land and property, we believe that the college has a responsibility in **considering and involving the local Middlebury community in the development of its lands (or lack thereof).** This can be easily implemented with a community hearing open to all Middlebury town residents (or residents of the town of site development) in the initial planning stages, rather than after the decisions have already been made. This will ensure an equitable communication of concerns and opinions. **We believe that this should be a principle incorporated into the Land Stewardship Initiative's seven existing Guiding Principles.**

Furthermore, we find that the guiding principles behind the Land Stewardship Initiative are not well reflected in this land use decision. In considering Middlebury's lands as part of broader ecosystems, as stated in the third principle, we feel that the ecological and hydrological significance of this site was not given due consideration. In recognizing the value of the traditional Vermont landscape and the historical importance of lands for the College as well as the community, we feel that the cultural significance of this site was overlooked. This site contains important wetland habitat and pathways for Otter Creek flooding, and is also largely valued for its landscape by community members. While we as a Committee recognize the complexity of this decision given the benefit of the solar panels for environmentally-friendly energy consumption, **we believe that it is essential to think more holistically about the values that this land presents.**

This project has demonstrated Middlebury's commitment to renewable energy in order to reach our Energy 2028 goals. However, in pursuit of these goals, we hope that the College does not forget to consider the many other factors that will aid in building more resilient communities. In order to build climate resilience, we must factor in both the local and global effects of such developments, weighing the environmental and ecological factors as well as the ways in which we can interact and make use of this land. While there has been progress made on addressing college land use, **we encourage the college to think more holistically about each of our land parcels**

and the roles they play in different development projects and conservation or restoration opportunities.

As the College has made the decision to pursue the Living Building Challenge for its future building projects, we encourage the college to expand this same philosophy to all its infrastructural projects and its general land use. Guidelines for thinking about the Living Building Challenge on a broader scale are detailed in the [Living Community Challenge](#), aspiring for socially just, culturally aware, and ecologically restorative design that is sensitive to place-based considerations.

3.0 Environmental Council 2021-22 Members

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