

**BUILDING EFFICIENCY AND BUILDING SUSTAINABILITY
RECOMMENDATIONS FOR THE NATURAL SCIENCE BUILDING AT SUNY
COLLEGE AT OLD WESTBURY: A CASE STUDY ACROSS SUNY CAMPUSES**

by
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Abstract

Plans for the renovation of the Natural Science Building at SUNY College at Old Westbury, have been around for close to a decade but only recently will contract bidding for the actual renovation begin Spring 2022. The building is in a state of disrepair, and as we progress in an era of climate mitigation and adaptation, the renovation will also serve as a project to increase building efficiency and sustainability to match goals set in place by SUNY and New York State. This paper aims to recommend building efficiency and building sustainability options for the Natural Science Building through studying all 64 SUNY owned campuses. For that, this paper first proceeded by developing a background review of current global, state, and state-owned education goals of building efficiency and sustainability, followed by discussing current campus efforts. Second, tabulated data of all 64 owned SUNY campuses were collected with information specifically about building efficiency and sustainability. Third, data was analyzed graphically and reported within the results section. Then, recommendations were created based on trending data and concerns well known within the campus community. Lastly, a conclusion written with final thoughts.

Results showed that most campus' used LEED for standards or certification and that solar power was the most used renewable resource on/off campus. Furthermore, for every LEED Silver and Gold on a campus building, half were certification from a campus' science building. Among all LEED Platinum buildings, science buildings accounted for 3 out of the 4 listings. We conclude by recommending that the Natural Science Building be built to LEED Gold standards, with a push for geothermal, while addressing the top concerns agreed on by staff and faculty for building efficiency and sustainability.

Executive Summary

Faculty and staff, of which I am one, want to see our new science building be renovated to climate goals and set an example within the campus community for future efforts of other buildings. Through the curriculum of the Energy Policy and Climate program at Johns Hopkins University, I have gained knowledge of researching of goals, policies, building efficiency, and sustainability pertaining to climate change. This has been integrated into this project to make recommendations concerning the much-needed renovation.

In an era of climate mitigation and adaptation, building efficiency and sustainability plays a part in achieving climate goals issued by national, state, and system policies. SUNY College at Old Westbury is one of the 64 SUNY campuses, and more importantly one of 22 that do not have sustainability goals outlined publicly online. Despite the lack of outlined goals for sustainability, the campus has accomplished modifications to infrastructure, from solar power lamp posts to LEED certified buildings. The project provides feedback and clarity on not only the need for efficiency and sustainability but also publicly posted information.

This project has strengthened my understanding of the interconnection of the federal, state, and SUNY policies on sustainability. Despite the wide variety of activity across different campuses, there is still a community driven want to provide the best and set examples to help other schools follow. Each campus learns from the other and grows with that information gained.

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Index of Abbreviations

AASHE	Association for the Advancement of Sustainability in Higher Education
Btu	British Thermal Units
CLCPA	Climate Leadership and Community Protection Act
EPEAT	Electronic Product Environmental Assessment Tool
FSC	Forest Stewardship Council
GHG	Greenhouse Gas
HVAC	Heating, Ventilation, and Air Conditioning
IPCC	The Intergovernmental Panel on Climate Change
LEED	Leadership in Energy and Environmental Design
NAB	New Academic Building
NATSCI	Natural Science Building
NDCs	National Determined Contributions
NYSERDA	New York State Energy Research and Development Authority
OW	Old Westbury
REV	Reforming the Energy Vision
STARS	Sustainability Tracking, Assessment & Rating System
SUNY	State University of New York

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1. Introduction

As building infrastructure ages, viable options to upgrade and update, include but are not limited to renovation and retrofitting. In the case of the aging Natural Science Building (NATSCI) at State University of New York (SUNY) College at Old Westbury (OW), renovation of the existing building is scheduled on the horizon. The building, built in 1985, has seen insufficient maintenance and care from deferred state budgets despite the growth in student and faculty size. Many questions arise with such a large project, but one that has not been publicly discussed is building efficiency and building sustainability goals to be achieved. The SUNY system has clean energy and sustainability goals to be achieved such as a 20% reduction of energy use intensity by 2020 and affirming the BuildSmart 2025 agenda which aims to provide individual campuses with reduction goals. This is in accordance with the Paris Accord goals of 40% reduction of emissions by 2030 and 80% reduction by 2050. These, and many other goals have been set in place to assert a climate smart and climate active system within higher education (The State University of New York, n.d.).

To understand the current scope of sustainability in higher education, this study will review a broad background using available online data on sustainability and building efficiency goals from New York State and SUNY, as well as open conversations on current efforts being achieved at SUNY Old Westbury's campus. A literature review will complement the data gathered to provide additional insight on building energy efficiency, and sustainability ideas that could be applied to the renovation. This paper will define building efficiency and building sustainability as the structural improvement and proficiency in compliance with greenhouse gas emission (GHG) goals set up by governments or organizations for the mitigation of climate

change. Also, for the purposes of this paper ‘SUNY owned’ will be used for convenience, but in reality all SUNY properties are held in the name of people of the State of New York.

The SUNY system has 64 total campuses. Of these, 42 provided online, public information on campus sustainability. The remaining 22 campuses did not provide any online public information irrespective of potentially having active programs. SUNY College at Old Westbury is in this latter category with no public online information (The State University of New York, n.d.). The 42 campuses with information will be examined to explore the patterns and evidence of building efficiency measures and sustainability practices through quantitative study and graphing using excel. Measures taken overall on campus and specifically for a campus’ physical and life science building will be recorded for comparison. The physical and life science building will be defined as a campus building that hosts academic lectures, research, and laboratories from the departments of biology, chemistry, and physics. This is to match science buildings with similar department information as seen in the NATSCI. At SUNY Old Westbury, the NATSCI is the only campus building to house lectures and laboratories from the departments of biology, chemistry, and physics.

To recommend building efficiency and building sustainability for the future renovation of the NATSCI, this paper will first provide background on global energy consumption of buildings. Secondly, analyze current policies and practices in New York State and SUNY. Third, analyze current campus community efforts at Old Westbury, followed by collecting information across all 64 SUNY campuses for patterns and consistencies, then report results on the data points, and conclude with a discussion of any findings and implementations that could be applied to the OW building renovation project.

2. Background Review

2.1 Energy Consumption and Buildings

Within the 5th assessment of The Intergovernmental Panel on Climate Change (IPCC), they reported that buildings represent 32% of global energy end use and 19% of global GHG emissions in 2010 (Lucon, 2014). Fast forward, in 2019, the global energy-related CO₂ emissions was reported to be 28%, excluding global building construction sectors. Including the construction industry within the building sector increases the percentage to 38%. Continuing from that, the Global Alliance for Buildings and Construction (2020) report acknowledged that 55% of global electricity consumption stems from the building sector. The authors warn that the recent trend of decarbonization shows that progress to 100% decarbonized building sector has halved in 2019 (2.5%) from 2016 (4.4%) levels. The percentages are calculations consisting of seven indicators. These indicators include energy efficiency investments, number of countries with building energy codes, green building certifications, national determined contributions (NDC's) with building sector action, renewable energy share in global buildings, building sector energy unit intensity, and CO₂ emissions.

While financial expenditures of the global building sector have increased 3% in 2019 from 2018, the push for energy efficiency in has been recently stressed due to COVID-19. The pandemic has played a huge role in investments of construction projects since then with any activity related to the building sector plummeting 10% to 25% depending on the region (Global Alliance for Buildings and Construction, 2020).

Colleges and other education buildings are bundled under commercial buildings. Under the commercial branch of the building sector, the top 5 categories of energy consumption go to mercantile and service, office, education, health care and lodging. Their respective percent of

energy consumption in commercial buildings are 15%, 14%, 10%, 8%, and 6% as of 2012. The remaining percentages is the energy lost within the system (U.S. Energy Information Administration, 2018).

Building energy consumption in the United States accounted for a combined 28% of end-use consumption sectors in 2018. The sectors listed as end-use energy consumption include Transportation, Industrial, Residential, and Commercial where the corresponding percentages are 37%, 35%, 16%, and 12% (U.S. Energy Information Administration, 2019). These percentages stayed the same in 2019, and changed to 36%, 35%, 17%, and 12% respectively in 2020 as seen in Table 1, below (U.S. Energy Information Administration, 2020 & U.S. Energy Information Administration, 2021). It’s worth noting that commercial buildings stayed consistent from 2018 to 2020.

Table 1 – U.S. energy consumption by end-use sector from 2018 to 2020

Sectors	2018	2019	2020
Transportation	37%	37%	36%
Industrial	35%	35%	35%
Residential	16%	16%	17%
Commercial	12%	12%	12%

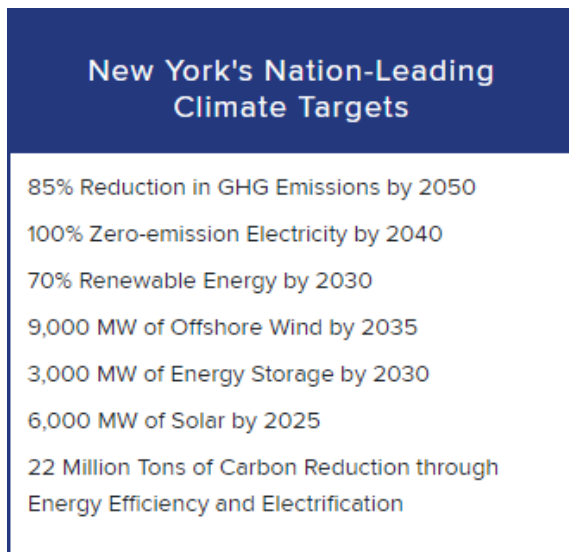
Note: Percentages do not equal 100%. Energy loss from energy use is factored into the data (U.S. Energy Information Administration, 2021).

While it seems that higher education building energy consumption is a small percentage of the total consumption, it’s key to understand that, as kin to theater, all roles must cooperate and play key parts to benefitting the larger goal of carbon reductions as outlined by the Paris Agreement (Global Alliance for Buildings and Construction, 2020).

2.2 New York State Policies

New York State has several targeted policies in place to mitigate and adapt to climate change, but few of these policies can be applied to building efficiency and building sustainability for higher educational institutions. The most recent policy is the 2019 Climate Leadership and Community Protection Act (CLCPA). The 2019 passed act created clean energy and climate goals within New York State. These targeted goals include a 23% increase in energy efficiency by 2020, 40% reduction of GHG from 1990 levels by 2030, 70% electricity powered by renewables by 2030, 100% GHG emission free electricity by 2040, 3,000 megawatts of energy storage by 2030, 9,000 megawatts of offshore wind by 2035, and 6,000 megawatts of distributed solar by 2025. These most recent targets can be seen in Figure 1, below, as a summarized table listed on the New York State Climate page (New York State, n.d.). The targets listed off in the CLCPA have been actively applied to the current SUNY sustainability policy as further discussed in section 2.3 of this paper (The State University of New York, n.d.).

Figure 1 - Chart listing the summerization of New York State's Cliamte Target



Note: Reprinted from New York State. (n.d.). Climate Act. [New York's Climate Leadership and Community Protection Act \(CLCPA\) \(ny.gov\)](#)

Another New York State policy that is relevant to SUNY is the 2014 Reforming the Energy Vision (REV). The initiative's clean energy goals include a 40% reduction of GHG emissions from 1990 levels with no end date, a shift in energy use of 50% from renewable sources, and an increase of energy efficiency by 600 trillion Btu (New York State, n.d.). Though this agenda came before the CLCPA, it helped pave way for the REV Campus Challenge by New York State Energy Research and Development Authority (NYSERDA). The campus challenge focuses on the clean energy goals in place by the state and individual New York State colleges and universities can participate. The free service provides social, financial, and general support programs to uplift institutions and assist in clarifying individual clean energy goals for the greater image of sustainability. With the only firm requirement being to report in yearly, the program allows for institutions to utilize a combination of existing energy programs, such as the Sustainability Tracking, Assessment & Rating System (STARS) and the Association for the Advancement of Sustainability in Higher Education (AASHE), to further independent clean energy goals (New York State, n.d.).

On top of policies and plans there are also executive orders and laws that have been applied to SUNY through New York State. First there are Executive Orders 4 and 18. Executive 4 is titled 'Green Procurement' which determines a base list of 'green commodities, services and technology' that the state can utilize. Meanwhile, Executive 18 is titled 'Bottled Water' and it is the issuance of reducing purchase of bottled water in facilities to not only save money but promote alternatives such as tap and filtered water stations. Second, there is Article 27 of the Environmental Conservation Law which states that if campuses generate 2 or more tons of food per week must divert excess food to donation or scraps to organic recyclers within a 25-mile radius. There are exceptions to these rulings that include: New York City need not comply and a

campus need not comply if no organic recycling facility exists in the 25-mile radius. (The State University of New York, n.d.).

2.3 State University of New York Policies

With 64 campuses, totaling 1,800 individual buildings, SUNY accounts for 40% of all state-owned buildings. As such, they understand that tackling energy expenditures and GHG emissions is pivotal to increasing the system's value while protecting the environment. SUNY has two overall encompassing goals following several plans, goals and executive orders. The first is 'Clean the Grid – 100% Clean, Carbon-Free Electricity by 2040', and the second is, 'Carbon Neutral Buildings and Transportation' (The State University of New York, n.d.). Under these two statements are specifically guided goals that follow the 2019 Climate Leadership and Community Protection Act (CLCPA), and the three sustainability goals of Executive Order 4 & 18, Food Scraps Recycling, and United Nations Sustainability Development Goals (The State University of New York, n.d.).

Signed into law in 2019, the CLCPA applies several targets for SUNY. As previously discussed in section 2.2, the first is reductions and increasing renewable energy output and the second target is increasing the allotted storage and facilities for renewable energy. In total, all efforts should help meet the state's 185 trillion Btu reduction of GHG by 2025 (The State University of New York, n.d.). In specific of SUNY there should be a reduction of 4.4 trillion Btu and 11 trillion for state facilities by the same year. The end goal of New York State GHG emission reduction goals is 80% by 2050 from 1990 levels (The State University of New York, n.d.).

There are two executive orders under the SUNY sustainability goals and one article of a law as previously mentioned in section 2.2. The first section is 'Executive Order 4 and 18' and

the second section is ‘Food Scraps and Recycling’ under Article 27 of the Environmental Conservation Law. The third section is titled ‘United Nations Sustainability Development Goals’ where SUNY has goals to meet compliance with most of the 17 energy goals as listed within the sustainable development goals. These goals include no poverty, zero hunger, good health & well-being, quality education, gender equality, and more (The State University of New York, n.d.).

2.4 Old Westbury Campus Efforts

The campus made great strides in efficiency and sustainability for its buildings. We have surveyed for Geothermal with findings that we are compatible for future projects, we have an updated succulent green roof on the NATSCI, condenser broilers and electric hot water around campus, piped heating and cooling from the campus center basement, two onsite solar panel locations, and more. These solar panels are solar photovoltaic on top of the library and solar thermal on the athletic building. The map for these buildings can be seen in Figure A1, in the Appendix. For the most part, efforts have been made in heating and cooling such that the only emitters of carbon emissions on campus are the hot water heaters. Due to recent roof renovations at the athletic center and NATSCI, it should be noted that the solar thermal panels at the athletic center are temporarily offline, and the green roof at the NATSCI has been recently restored (McGarry, 2021). We also participate in the REV Campus Challenge. As a participant we have desires to develop energy projects, goals, and opportunities but we are not actively reporting our commitments to be listed as Achievers to NYSERDA’s REV program. Achievers are listed campuses that are committed and have on hand dedicated staff focused on investments to be pursued and reported. Above both these tiers are the Leaders of the REV Campus Challenge. With their local communities, leaders are campuses that engage in projects, research and development, and investments in clean energy, embracing the clean energy agenda (New York

State, n.d.). Despite not having online publicity of achievements or having further promotion within REV, our campus has still completed its own independent projects.

By far the most notable, that has been made at SUNY OW is the New Academic Building (NAB), labeled Academic Building and seen in yellow on the Campus Map, Figure A1. The NAB has been certified LEED Gold upon its completed construction in 2012, boasting a plaque to feature the accomplishment. To achieve such certification points were awarded towards having widely common and not widely common sets of building developments. Such common ones include temperature sensors, LED lights, auto lights, and low-emission windows and doors. To the outside reader, uncommon building attributes that have helped gain the NAB Gold status include bike racks and bathrooms installed with showers. These and other fixtures create accommodation and provided points towards the LEED status (McGarry, 2021).

With the upcoming renovation of the NATSCI, the most notable point in sustainability for the future building is gearing the infrastructure to have net zero carbon emissions (McGarry, 2021). A net zero carbon building is an energy-efficiency structure that obtains energy from carbon-free sources or offsets to counter the emissions produced by the building and any operations (National Grid, n.d.). While the final projected building will be planned to net zero carbon, phase 1 of the project will still have natural gas boilers (McGarry, 2021). There have been many meetings with concerns of the current unkept infrastructure of the NATSCI, which will play a hand into helping the contractors decide what is salvageable for the project, but there has been no public address on what specific sustainable attributes the future NATSCI building will have.

3. Methods

3.1 Online Data Collection

The sustainability tab within the SUNY edu website was utilized for the index of all 64 campuses to assess the current scope of online, publicly available, building efficiency and building sustainability information. As seen in Table A2, data collection was done through tabulation of the 64 SUNY campuses in alphabetical order, as they are listed online. If the campus had an active link, a link to their sustainability webpage, and a link to their clean energy/sustainability memo was first pasted into the table. The second part of data collection involved gathering information on what a particular campus is doing for building efficiency and building sustainability presented in bulleted format. If applicable, the third part narrowed down to just their science building. Both second and third part were conducted through operating the search bar function of the respective edu website. Any publicly available information that would infer a building's efficiency and/or sustainability was recorded. A dash mark was used if a campus did not have any links, information, or data. Only online, publicly available data was collected from the 64 campuses.

As the data points were collected, observations and notes were taken down to see if any patterns became apparent. Such patterns could be similarities in approach, policy or otherwise. Afterwards, an excel spread sheet was created to input values as binary numbers to be counted for totals. All 64 campuses were placed in the spread sheet with the following columns: 'Public Information?', 'LEED?', 'Energy Star?', 'STARS?', 'Geothermal?', 'Solar?', and 'Wind?'. Binary numbers of 1 and 0 were utilized to indicate yes (1) and no (0) for a selected response to each column in question. Each column using the binary coding was then counted to study the total response of each use.

For the columns listed: ‘Rating/s?’, ‘How Many Silver?’, ‘How Many Gold?’, ‘How Many Platinum?’, and, ‘Rating of Physical/Hard Science Building?’, written responses or numeric count was input. Listed LEED ratings were typed answers of which ratings were given to a particular campus, followed by the amount of each awarded, and which rating/s were given to Physical Life Science Buildings.

4. Results

All of the comprehensive initial data collection can be seen in Table A2, located in the Appendix. In total, there are 64 campuses owned by the SUNY entity. It should be noted that in the case of Cornell University, SUNY owns 4 of their campuses. Of the total 64 campuses, 42 (65%) had online publicly available information and 22 (34%) did not. Within the 22 campuses lacking information, 3 campuses, Alfred University, SUNY Cobleskill and Fulton-Montgomery Community College either had a webpage under maintenance or a webpage to just supply a link to SUNY.

Of the 42 campuses with available information, there are 35 cases of LEED, 2 cases of Energy Star, and 13 cases of STARS to label the quantification of sustainability efforts as seen in Figure 2, below.

Campuses that obtained LEED certification had a total of 11 Silver rated scores, 20 Gold rated scores, and 4 Platinum rated scores. Of the 35 cases of using LEED certification, 16 are noted to have been given to a campus’ physical life science building/s. Furthermore, within the certification of those science buildings, 2 were given Silver, 11 were given Gold, and 3 were given Platinum. As seen in Figure 3, below, Silver and Gold rated physical science buildings made half of the total LEED rated buildings known to public information. Three-fourths of the Platinum rated buildings were certified physical science buildings.

Figure 2

Total number of different energy ratings across SUNY campuses.

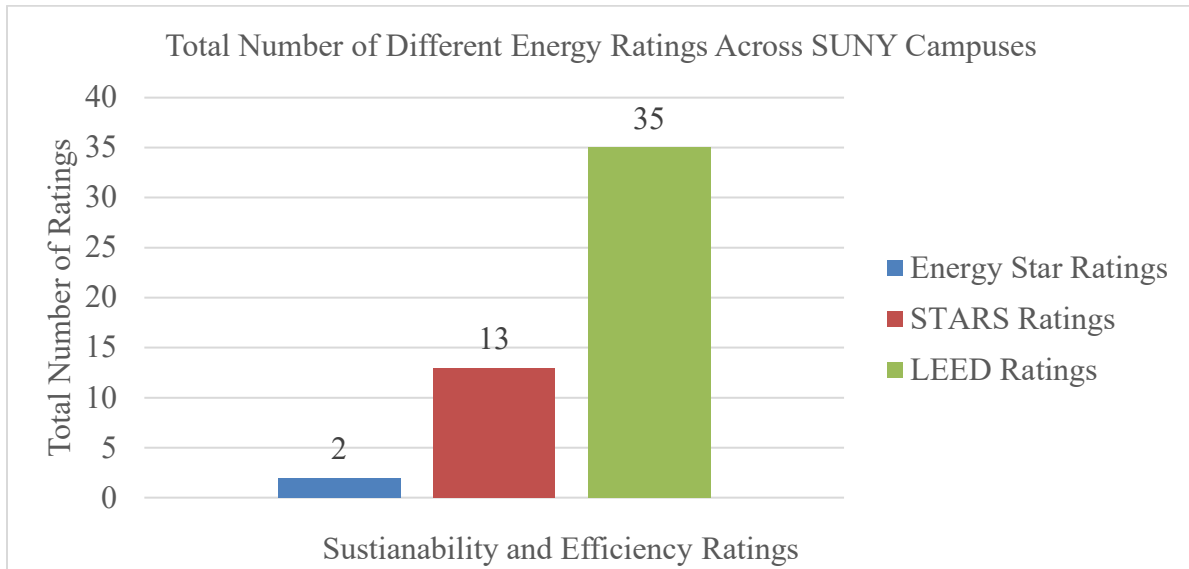
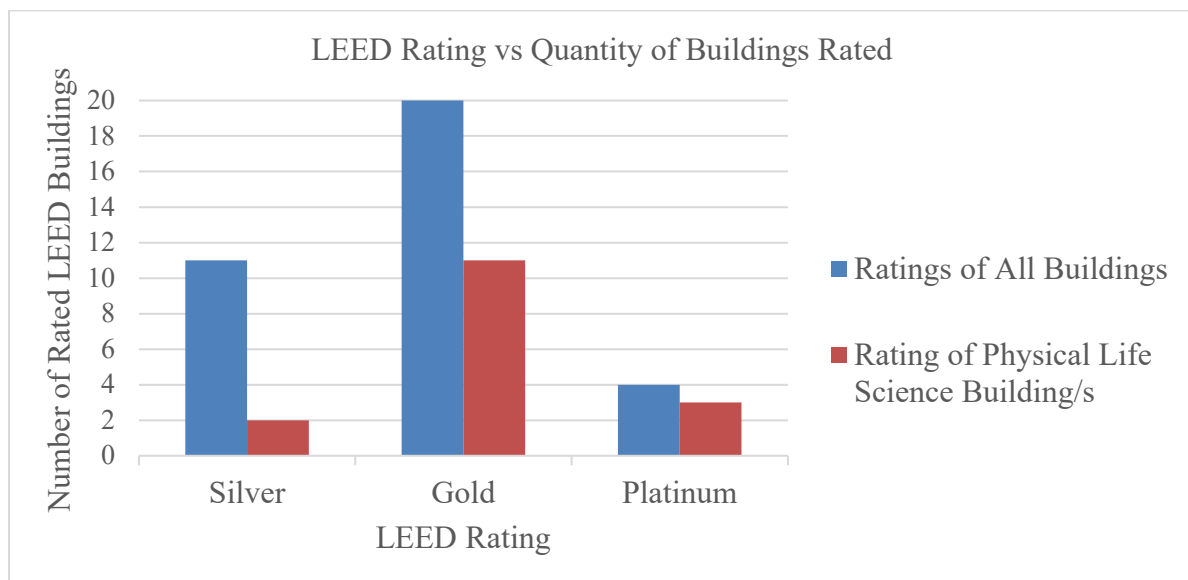


Figure 3

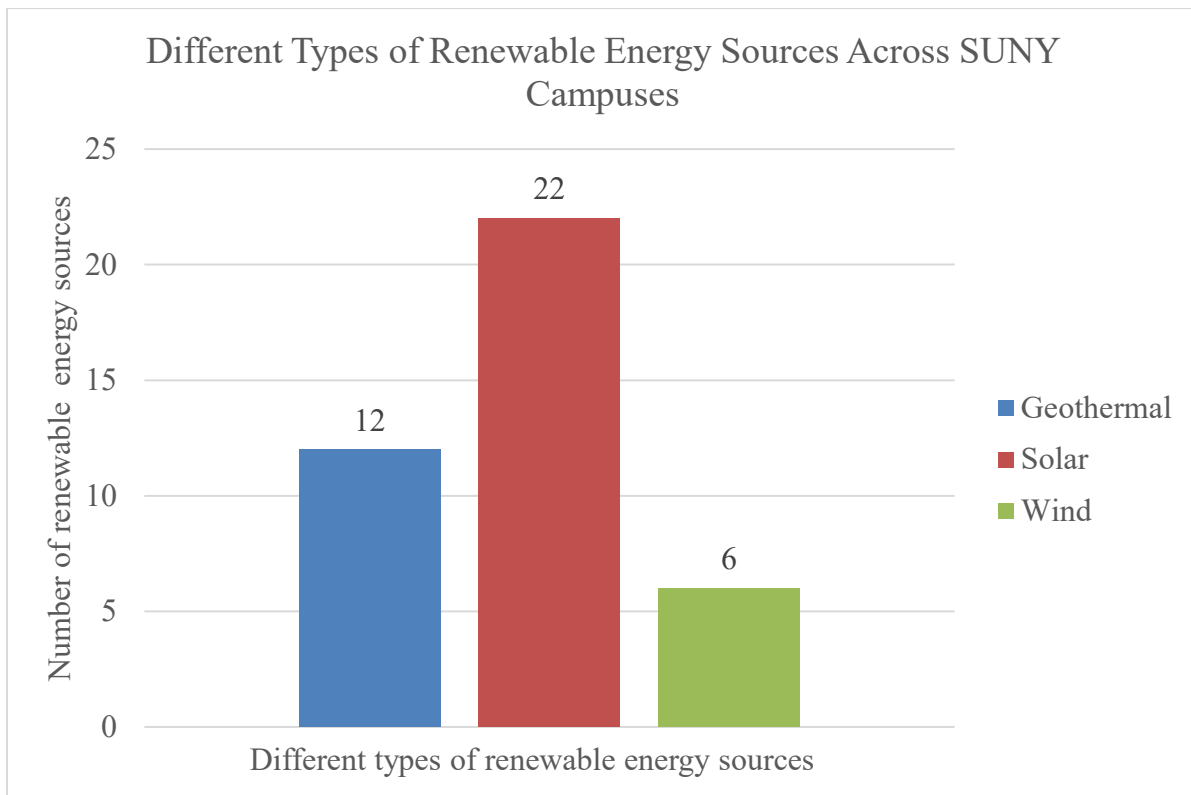
Total available LEED ratings from online public information vs the number of LEED rated physical and life science buildings from the same sources.



Other noted contributions to building efficiency and building sustainability were the use of renewable energy. Within the 64 campuses, the total number of campuses using geothermal is 12, solar is 22, and wind is 6 as seen in Figure 4, below. It should be noted that under the branch of solar power exists solar thermal and solar photovoltaics. The 22 data points are the combined total of the two.

Figure 4

Different types of renewable energy sources across SUNY campuses.



5. Recommendations

Based on the results of the 64 campuses, several recommendations can be made centered upon the trends of the data. The first recommendation is the choice use of rating for the campus to take consideration from. Given that LEED ratings outnumber the combined ratings of Energy

Star and STARS, it seems opportune to follow the trend of utilizing the LEED rating system. It's easier to build and renovate to LEED standards than to certify the building as it costs extra to certify and proceed with the paperwork (McGarry, 2021). It's also worth bearing in mind that renovations can be constructed to achieve LEED points but cannot be certified. Only new construction can be certified for LEED (McGarry, 2021). Furthermore, considering the trend of LEED ratings for physical and life science buildings, we should follow trend for LEED Gold standards. As seen from Figure 3, half of the buildings for LEED Silver and Gold came from physical and life science buildings. Given that there is already one LEED Gold Building on the OW campus, the NATSCI would be the other half of that statistic.

Another recommendation based upon the results, would be to not only push for solar rooftop panels but to shove for the completion of geothermal power. More so, if we are able to push more solar projects, that would attract more students, faculty and staff to learn, teach and manage the system in the program of higher education. This has been observed to have happened at SUNY Cortland (2014) citing how faculty candidates have taken great interest in utilizing the panels for learning experience.

This brings me to my next recommendations for not just the building, but the campus of SUNY OW. To simply state, there should be more online available information on our current efforts for sustainability and efficiency. SUNY OW is one of 22 campuses, nearly a third, that do not provide any information despite having efforts being made across campus for buildings and in general. Outside of building efficiency and sustainability, our most recent effort has been installing of solar power LED lights at bus stops across the campus central. From section 2.4, it makes no sense to have a LEED Gold Building, solar thermal and solar photovoltaic panels, solar powered LED light posts, green roofs and more, and not advertise our successes online to

attract students and faculty. As presented in the recent NSB Renovation Concerns presentation at the faculty meeting on November 16th, the physical and life science studies have seen steady growth that has exceeded the estimated growth rate of 2024 as of Fall 2021 (Poon, 2021).

The faculty presentation presented excellent conversation for the current concerns of the NATSCI. We are aware that issues that have been brought up and have been largely ignored given the feedback that the ‘building will be renovated soon’, but by far the top 2 building efficiency and sustainability concerns have been poor ventilation and temperature control (Poon, 2021). Both concerns have assisted in the decay of the NATSCI, causing headaches to fix and delays to daily activities. Mold growing on ceiling tiles and office chairs, fume hoods in rotating need of repair, and complaints of harshly uncomfortable temperatures in rooms are to name a few that have happened due to improper ventilation and temperature control.

This presentation and others have provided great conversations to continue to make issues apparent with the building. While I do not have a recommendation to quell our frustrations, I recommend stressing these and other top concerns of the NATSCI in assurance that these systems will be managed and measured efficiently and sustainable. As a SUNY campus, we look at other campuses for inspiration on sustainability. For the concerns of poor ventilation, we can look insightfully to Binghamton University and SUNY Erie for their fume-hood monitorization and efficient Heating, Ventilation, and Air Conditioning (HVAC) systems (Fennie, 2020 & SUNY Erie, n.d.). For temperature control, we can look inspiringly towards Cornell University (n.d.) and SUNY Oneonta (2017) for their real-time energy monitor systems that help manage energy outputs. Real-time monitorization of temperature sensors could effectively help the extreme fluctuations of the different rooms in the NATSCI. There is a known battle ground between temperature sensors and class lectures at the NAB, as occupants open

windows which cause the sensors to read out to put more heat or cooling, and live-feed monitoring could be further studied to alleviate stress on the system and discomfort of the occupants (McGarry, 2021).

6. Conclusion

As this project was completed in the span of a few months, further research into efficiency and the collective plans across all 64 campuses could be expanded upon via phone interviews with each campus to retrieve more detailed information. Information on campus sustainability is open information for anyone to ask, and thus would be a matter of time and availability of sources to talk more about individual efforts.

By far the largest source of error is the lack of available online information. As seen in Table A2, campuses such as SUNY Morrisville, SUNY Cobleskill, and Fulton-Montgomery Community College, have web links that are unavailable. There was even the case of Jamestown Community College where the link did not work but there was available information by utilizing the search function. It is possible that these weblinks will work at a later date, so the data presented in this paper is only from October 2021.

The NATSCI should be built to LEED Gold standards, and there should be pushes to develop geothermal, while potentially surveying for solar power. The concerns that faculty and staff have brought up, should be examined and given responses as the listed concerns also touch upon building efficiency and sustainability. Renovations will help to double the increasing efforts in place for efficiency and sustainability so for now we are all waiting at the edge of our seats for it to begin (SUNY Empire, n.d.). The data collected and recommendations may not be well received with the bidding for contracts starting Spring 2022, but what was learned from

conducting this research will stand the test of time in becoming a reference to compare to in the future of higher education systems. To quote 2006 University of Albany President Kermit Hall,

"As a public higher education institution, the University at Albany has both an obligation and an opportunity to be a leader in environmental sustainability. Our institution can and should set an example as an environmentally responsible citizen—a model for other colleges and universities as well as a model for our own students and the community in everyday life." (University at Albany, n.d.)

SUNY OW needs to publicize and talk more about the actions it has taken thus far. We may not have a detailed sustainability plan but we have the individual projects that can engage and bring together the campus community to help set examples for the larger OW community.

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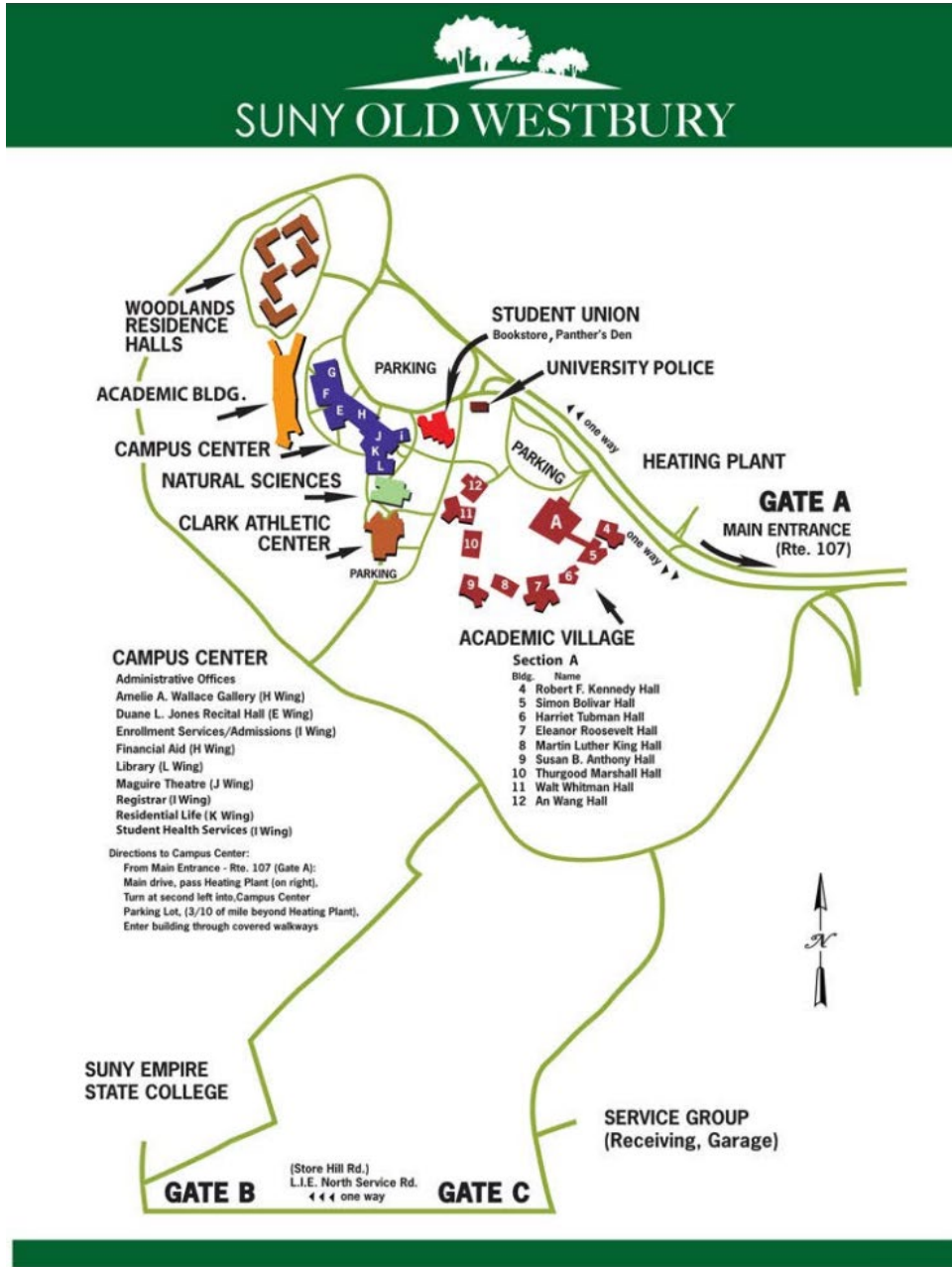
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Appendix

Figure A1

Campus Map of SUNY Old Westbury



Note: Reprinted from SUNY Old Westbury. (n.d.). Campus Map.

<https://www.oldwestbury.edu/why-old-westbury/visit-old-westbury/campus-map>

Table A2

Tabulated Data of SUNY Campuses with online publicly available information on building efficiency and building sustainability measures/initiatives campus wide and specific to their physical life science buildings.

SUNY College/Campus	Public Information Online?	Link	Clean Energy/Sustainability Memo	Some of Listed Building Efficiency & Sustainability Measures/Initiatives	Physical Life Science Building Efficiency & Sustainability Measure/Initiatives
SUNY Adirondack	No	-	-	-	-
University at Albany (SUNY)	Yes	https://www.albany.edu/green/plan/Sustainability/ogreen/	https://www.albany.edu/green/files/plan/SustainabilityPlan.pdf	<ul style="list-style-type: none"> • Reduce campus Energy Use by 20%⁽¹⁾ • Third Party Sustainability Certification (LEED/LEED O&M, Living Building Challenge, etc.)⁽¹⁾ • Adopt efficiency standards (Energy Star/EPEAT/Scientific Certification Systems).⁽¹⁾ • Two Solar Panel Systems – One 49-Kilowatt and One 32-Kilowatt system with future goals to cover all rooftops.⁽²⁾ • Replace all plumbing to low flow rates⁽¹⁾ • Geothermal heat pump system to apartment complexes.⁽³⁾ 	<ul style="list-style-type: none"> • Life Science Research Building – LEED Silver⁽²⁾ • Developing Green Lab policies and programs⁽¹⁾
Alfred University – New York State College of Ceramics at Alfred University	No	Sustainability Initiatives on Campus My Alfred Univ	-	-	-

		ersity			
Alfred State College – State University of New York	Yes	Sustainability Alfred State	Alfred State Sustainability & Climate Action Plan.docx	<ul style="list-style-type: none"> • Electricity metering for individual buildings. ⁽⁴⁾ • Future policy adoption of restricting incandescent bulbs in favor of LED lighting. ⁽⁴⁾ • ENERGYSTAR efficient appliances as a policy. ⁽⁴⁾ • Expand Solar and Wind farms on campus. ⁽⁴⁾ • Future expansion of geothermal heating systems for campus buildings. ⁽⁴⁾ • Potential future investment in biomass/biogas. ⁽⁴⁾ 	<ul style="list-style-type: none"> • Physical and Health Sciences facility – LEED Gold. ⁽⁵⁾ • Ultra-low-flow plumbing system. ⁽⁵⁾ • Geothermal heating system. ⁽⁵⁾ • 18 kW photovoltaic array. ⁽⁵⁾
Binghamton University – State University of New York	Yes	Sustainability Binghamton University	climateactionplan2009.pdf – Google Drive	<ul style="list-style-type: none"> • Low-flow plumbing. ⁽⁶⁾ • Rainwater harvest system for cooling and septic purposes. ⁽⁶⁾ • Minimum LEED Silver certification of buildings. ⁽⁷⁾ • Commitment to Living Building Challenge Certification. ⁽⁷⁾ • Controlled HVAC and lighting to optimize efficiency. ⁽⁷⁾ • Solar panel installations across campus buildings. ⁽⁷⁾ 	<ul style="list-style-type: none"> • LEED Platinum rating for Engineering and Science Building. ⁽⁷⁾ • Engineering and Science Building has solar photovoltaic for research and for passive energy. ⁽⁷⁾ • Engineering and Science Building has geothermal heating and cooling. ⁽⁷⁾ • Engineering and Science Building has heat recovery and humidity control

					<p>technology.⁽⁷⁾</p> <ul style="list-style-type: none"> • Smart Energy Building is LEED Gold certified.⁽⁸⁾ • Smart Energy Building has window efficiency and optimizes daylight harvesting.⁽⁸⁾ • Smart Energy Building has green roof to optimize heating and cooling.⁽⁸⁾ • Smart Energy Building has storm water management system to optimize water usage for septic and mechanical systems.⁽⁸⁾ • Fume-hood exhaust/run time monitoring to reduce load in Smart Energy Building.⁽⁸⁾
SUNY Brockport	Yes	Sustainability: SUNY Brockport	Environmental Sustainability Policy: SUNY Brockport	<ul style="list-style-type: none"> • Registered with STARS.⁽⁹⁾ • Solar photovoltaic array on one campus building.⁽⁹⁾ • Campus housing has geothermal.⁽⁹⁾ • Future revisions of Masters/Academic/Residence/Physical 	-

				Plans to include sustainability under Goal 3. ⁽¹⁰⁾	
SUNY Broome	No	-	-	-	-
Buffalo State – The State University of New York	Yes	https://sustainability.buffalo.state.edu/	-	<ul style="list-style-type: none"> • Commitment to bring LEED certification to all campus buildings. ⁽¹¹⁾ • Solar photovoltaic on campus roof tops. ⁽¹¹⁾ • Art Center uses 50% less water and is 19% more energy efficient than similar building types. ⁽¹¹⁾ 	<ul style="list-style-type: none"> • Science and mathematics Complex On track to be LEED certified Gold. ⁽¹¹⁾
University at Buffalo – The State University of New York	Yes	http://www.buffalo.edu/sustainability.html	Climate Action Plan – University at Buffalo	<ul style="list-style-type: none"> • Solar panels on campus with expansion coming soon. ⁽¹²⁾ • 100% of energy demand is powered by renewable energy sources. ⁽¹²⁾ • LEED certification across most campus buildings with buildings constructed with sustainability. ⁽¹³⁾ • GroW Clean Energy Center as an established base of operations for solar power for their Localizing Initiative. ⁽¹³⁾ 	<ul style="list-style-type: none"> • LEED Silver certified Center of Excellence in Bioinformatics and Life Sciences. ⁽¹³⁾ • LEED Gold certified Jacobs School of Medicine and Biological Sciences. ⁽¹³⁾
SUNY Canton	Yes	Sustainability Plan – SUNY Canton	Sustainability Plan.pdf (canton.edu)	<ul style="list-style-type: none"> • Various energy efficiency retrofits for buildings include and not limited to, replacing insulation, replacing windows and doors, updating light fixtures, replace plumbing with low-flow, etc. ⁽¹⁴⁾ • Athletic Center and Kennedy Hall 	-

				<p>LEED certified Silver. ⁽¹⁵⁾</p> <ul style="list-style-type: none"> • Geothermal station at Halford Halls. ⁽¹⁵⁾ • Athletic Center and Nevaldine Hall certified Green Building. ⁽¹⁵⁾ • Athletic Center has rainwater collection feature. ⁽¹⁵⁾ • Solar voltaic systems on Nevaldine Hall and Halford Hall. ⁽¹⁵⁾ 	
Cayuga Community College	No	-	-	-	-
State University of New York – Clinton Community College	No	-	-	-	-
SUNY Cobleskill	No (site under maintenance)	Sustainability Efforts & Events (cobleskill.edu)	-	-	-
Columbia Greene Community College	No	-	-	-	-
Cornell University – New York State College of Agriculture & Life Sciences at Cornell University	Yes	Sustainability Commitment CALSES (cornell.edu)	Our Leadership Sustainable Campus (cornell.edu)	<ul style="list-style-type: none"> • 2% of energy sourced, for Cornell University entity, from hydropower plant. ⁽¹⁶⁾ • LEED certified buildings gold or platinum. ⁽¹⁶⁾ • Solar Energy produced on rooftops. ⁽¹⁶⁾ • 26 of campus buildings LEED 	<ul style="list-style-type: none"> • 26 out of the total 27.85 MW of solar energy produced on site. ⁽¹⁶⁾

				<p>certified as Green Buildings. ⁽¹⁷⁾</p> <ul style="list-style-type: none"> • 6 off campus solar farms. ⁽¹⁷⁾ • 9 on campus solar farms for energy and heating. ⁽²⁰⁾ • Adopted energy modeling protocol and standards to maximize efficiency and decrease emissions. ⁽¹⁸⁾ • Construction and space maximized for sustainability and efficiency of materials and future. ⁽¹⁸⁾ • Advanced lighting, and considerations to HVAC, heat recovery, windows, exterior materials, and more are placed into consideration for energy use and consumption. ⁽¹⁸⁾ • Support of local commerce and goods for materials in building. ⁽¹⁸⁾ • Proper care of buildings and environment through selective picking of cleaning chemicals. ⁽¹⁸⁾ • Platinum STARS rating. ⁽¹⁹⁾ • Lake sourced cooling plant and future geothermal heating plant. ⁽¹⁷⁾ 	
Cornell University – New York State College of Human Ecology at Cornell University	Yes		Our Leadership Sustainable Campus (cornell.edu)	<ul style="list-style-type: none"> • See First Cornell Listing 	<ul style="list-style-type: none"> • Human Ecology Building LEED certified Platinum earning high points for having a

					<p>sustainable site, water efficiency, energy/atmosphere, sourced materials, indoor air quality, and more. ⁽²¹⁾</p> <ul style="list-style-type: none"> • Eco-friendly Greenguard certified furnishings. ⁽²¹⁾ • Building made with 1/3 recycled building materials. ⁽²¹⁾ • Real-time energy monitor system to track use and reduce excess usage of energy. ⁽²¹⁾
Cornell University – New York State School of Industrial & Labor Relations at Cornell University	Yes	-	Our Leadership Sustainable Campus (cornell.edu)	<ul style="list-style-type: none"> • See First Cornell Listing 	-
Cornell University – New York State College of Veterinary Medicine at Cornell University	Yes	-	Our Leadership Sustainable Campus (cornell.edu)	<ul style="list-style-type: none"> • See First Cornell Listing 	<ul style="list-style-type: none"> • College of Veterinary Medicine Center LEED Certified Gold with high points (more than half of possible total points) in the categories of energy and

					<p>air quality. ⁽²²⁾</p> <ul style="list-style-type: none"> • Window optimization to reduce energy consumption of lighting and heating/cooling. ⁽²²⁾ • Eco-friendly and recycling materials used in furnishing and building. ⁽²²⁾ • Wood products and materials in building sustainably sourced certified by Forest Stewardship Council. ⁽²²⁾
SUNY Corning Community College	Yes	Sustainability (corning.edu)	-	<ul style="list-style-type: none"> • Green Campus Task Force to instill energy efficient and sustainability measures on campus. • Labels to turn off lights next to the switches. ⁽²³⁾ • Lowering thermostats in winter. ⁽²³⁾ 	-
SUNY Cortland	Yes	Sustainability – SUNY Cortland	Cortland Climate Action Plan (draft 1_0)	<ul style="list-style-type: none"> • First SUNY school where electricity demand is met with 100% renewable energy. ⁽²⁴⁾ • Residence hall is LEED certified Platinum. ⁽²⁴⁾ • Gold STARS rating from AASHE. ⁽²⁴⁾ • Solar photovoltaic farm with capacity 	-

				<p>of 1,118 kW DC.⁽²⁵⁾</p> <ul style="list-style-type: none"> Professional Studies building is heated and cooled through Geothermal energy.⁽²⁶⁾ 	
Delhi State University of New York	No	-	-	-	-
SUNY Downstate Health Sciences University	Yes	SUNY Downstate Green Initiative Sustainability	Downstate Council-Plan-Presentation.pdf	<ul style="list-style-type: none"> Partnership with local power authority to install and use fuel cells for clean electricity and energy.⁽²⁷⁾ 	-
Dutchess Community College	No	-	-	-	-
SUNY Empire State College	Yes	Environmental Sustainability SUNY Empire State College (esc.edu)	Energy Action Plan Environmental Sustainability SUNY Empire State College (esc.edu)	<ul style="list-style-type: none"> SUNY Empire Online certified LEED Silver.⁽²⁸⁾ Open design reduces energy use on lighting.⁽²⁸⁾ Certified sustainable materials for construction of building.⁽²⁸⁾ SUNY Empire Rochester certified LEED Silver.⁽²⁹⁾ Rochester location has low flow plumbing, dual-flush toilets, solar reflective rooftops, solar thermal system, upgraded HVAC system, CO₂ sensors to reduce heat load, light sensors to manage lighting, and efficient hot 	-

				<p>and cold water pumps that adjust on demand. ⁽²⁹⁾</p> <ul style="list-style-type: none"> • Automatic shutdown of electricity at night to reduce energy consumption. ⁽³⁰⁾ 	
ESF – State University of New York College of Environmental Science and Forestry	Yes	Sustainability (esf.edu)	FINAL.V2020.U.PDATE.05012016.pdf (esf.edu)	<ul style="list-style-type: none"> • Campus STARS rating Gold – expired 2019. ⁽³¹⁾ • Grid-tied wind turbine built to power classrooms. ⁽³²⁾ • Certified LEED Platinum – The Gateway Center. ⁽³⁶⁾ • Combined heat-and-power system in The Gateway Center providing energy to other building for heating and electrical. ⁽³⁶⁾ • Green roof on The Gateway Center. ⁽³⁶⁾ 	<ul style="list-style-type: none"> • Farming and growing Willow crops to develop sustainable renewable energy and future research. ⁽³³⁾ • Green rooftop on Walters Hall. ⁽³⁴⁾ • Stormwater collection at Baker Laboratory for cooling towers. ⁽³⁴⁾ • Solar photovoltaic system, and digital control of HVAC system at Walters Hall. ⁽³⁵⁾
SUNY Erie – State University of New York	Yes	SUNY Erie Center for STEM Studies (ecc.edu)	-	-	<ul style="list-style-type: none"> • STEM building certified LEED Gold. ⁽³⁷⁾ • STEM building designed with reduction to HVAC load. ⁽³⁷⁾ • Efficient heating and cooling through high efficient

					<p>insulation. (37)</p> <ul style="list-style-type: none"> • Windows have light and heat control through low-emissivity window installation. (37) • High efficiency boilers in STEM Building for hot water. (37) • High efficiency coolers for cold water. (37) • Efficient HVAC system reduces air flow of fume hoods not in use. (37) • Exhaust fans on roof for fume hoods have controlled speed to reduce load and increase efficiency. (37) • Building Management System for most operations to guarantee efficiency and response to variation of needs. (37) • Rooftop solar photovoltaic to power
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					<p>STEM building. ⁽³⁷⁾</p> <ul style="list-style-type: none"> • High efficiency LED lights with sensors to turn off when not in use. ⁽³⁷⁾ • Locally sourced building materials for STEM building with 80% of wood materials FSC certified. ⁽³⁷⁾
Farmingdale State College – State University of New York	Yes	Sustainability (farmingdale.edu)	-	<ul style="list-style-type: none"> • School of Business LEED certified Silver with efficient heating and cooling, efficient LED lights and sensors, and reduction usage of projectors to opt for TV units. ⁽³⁸⁾ • 3 wind turbine, grid connected, systems that offer the campus electricity. ⁽³⁸⁾ 	
FIT – State University of New York	Yes	Sustainability at FIT Fashion Institute of Technology (fitnyc.edu)	-	<ul style="list-style-type: none"> • Steam-powered heating and cooling. ⁽³⁹⁾ • Upgraded HVAC systems for efficiency. ⁽³⁹⁾ • Efficient LED lights with sensors. ⁽³⁹⁾ • Green rooftop, made of planted succulents. ⁽³⁹⁾ • Flooring of buildings are simple concrete. ⁽³⁹⁾ • Low-emissivity windows. ⁽³⁹⁾ 	-

Finger Lakes Community College	Yes	<u>Sustainability Finger Lakes Community College (flcc.edu)</u>	<u>Microsoft Word – FLCC CAP COVER.DOC</u>	<ul style="list-style-type: none"> • Update to LED lighting. ⁽⁴⁰⁾ • Update facility controls to more efficient management systems for sensors and other electrical equipment. ⁽⁴⁰⁾ • Replaced hot water boiler and tank to combined heat and power system. ⁽⁴⁰⁾ • LEED certified Student Center. ⁽⁴¹⁾ • Mindful construction of lighting and windows to maximize natural light use. ⁽⁴¹⁾ • Installation of photovoltaic solar panels. ⁽⁴¹⁾ • Install lighting sensors to reduce energy use. ⁽⁴¹⁾ • Indoor wall and flooring selected with minimizing pollutants and odors. ⁽⁴¹⁾ • Upgraded HVAC system. ⁽⁴¹⁾ 	-
Fredonia – State University of New York	Yes	<u>Sustainable Fredonia Fredonia.edu</u>	-	(They have sustainability and goals signed into place, but nothing listed online to expand their goals especially for building efficiency and sustainability)	-
Fulton-Montgomery Community College	No	<u>FM Sustainability State.edu (fmc.edu)</u>	-	(They only have their listed link and no other expanded information)	-

SUNY Genesee Community College	No	-	-	-	-
Genesee – The State University of New York	Yes	Sustainability at Genesee: A Global Impact SUNY Genesee	-	<ul style="list-style-type: none"> • Several buildings with Geothermal heating and cooling units. ⁽⁴²⁾ • Red Jacket Dining Complex certified LEED Gold for LED lighting, efficient heating and cooling systems, efficient plumbing, waste reduction on construction, repurposed materials used in construction, etc. ⁽⁴³⁾ • Monroe Hall certified LEED Gold with rainwater harvesting, digital energy dashboard, energy efficient windows, etc. ⁽⁴³⁾ • Bailey Hall certified LEED Silver with construction favoring maximizing natural daylight, passive cooling and heating, energy efficient windows, etc. ⁽⁴³⁾ • Letchworth Dining Hall certified LEED Silver with rainwater collection, maximization of daylight, passive heating and cooling, energy efficient windows, etc. ⁽⁴³⁾ • Seneca Hall and Doty Hall to be certified LEED Silver. ⁽⁴³⁾ 	-

Herkimer – The State University of New York	No	-	-	-	-
Hudson Valley Community College	Yes	Environmental Sustainability Committee HV CC	-	-	-
Jamestown Community College – SUNY	Yes	Page not found Jamestown Community College (sunyicc.edu) (Link does not work – page not found)	-	<ul style="list-style-type: none"> Member of the AASHE. ⁽⁴⁴⁾ 	<ul style="list-style-type: none"> Science Center certified LEED Gold featuring water and snow collection for backwater and greenhouse, green roof for efficient heating and cooling, low emission – high performance windows and doors, LED motion sensors, Sun tunnels to funnel natural light into concentrated sources of natural lighting, etc. ⁽⁴⁴⁾
SUNY Jefferson	Yes	Sustainability (sunyjefferso	-	<ul style="list-style-type: none"> Partnered purchase agreement with Jefferson-Lewis BOCES for solar power to power campus with future arrays in planning. ⁽⁴⁵⁾ 	-

		n.edu		<ul style="list-style-type: none"> • Optimization of HVAC and lighting to increase sustainability and set temperature regulation for efficiency. ⁽⁴⁵⁾ 	
Maritime College – State University of New York	No	-	-	-	-
Mohawk Valley Community College	Yes	Sustainability Council (mvc.edu)	-	-	-
Monroe Community College – State University of New York	Yes	Sustainability at MC Monroe Community College Rochester, NY (monroec.edu)	Sustainability Operational Plan 2018-2022 (monroec.edu)	<ul style="list-style-type: none"> • Downtown Campus, PAC Center, and Facilities & Public Safety building certified LEED Gold. ⁽⁴⁶⁾ • Wolk Center for Excellence in Nursing certified LEED Silver. ⁽⁴⁶⁾ • Memberships within AASHE, STARS, New York Coalition for Sustainability in Higher Education, etc. ⁽⁴⁶⁾ • NYSERDA supported LED lighting sensors for halls. ⁽⁴⁶⁾ • HVAC system upgraded within gym for monitoring airflow. ⁽⁴⁶⁾ • Upcoming Energy Master Plan to reduce energy consumption across campus. ⁽⁴⁶⁾ 	<ul style="list-style-type: none"> • Renovated Gleason Hall of Science and Technology building certified LEED Gold. ⁽⁴⁶⁾
SUNY Morrisville	No	Page not found SUN	-	-	-

		Y Morrisville (Page Source Not Found)			
Nassau Community College	No	-	-	-	-
New Paltz – State University of New York	Yes	SUNY New Paltz Sustainability Sustainability	campus sustainability plan (newpaltz.edu)	<ul style="list-style-type: none"> Upgraded interior and exterior lighting to be efficient LED lights. ⁽⁴⁷⁾ Solar photovoltaics and battery storage located at Elting Gym. ⁽⁴⁷⁾ STARS rated Silver. ⁽⁴⁸⁾ Green roof located at Haggerty Administration Building. ⁽⁴⁹⁾ Rainwater collection and use in plumbing at Wooster Hall. ⁽⁴⁹⁾ Old Main and Ridgeview Hall LEED certified Silver. ⁽⁵⁰⁾ Ashoka Hall, Shawangunk Hall, Wooster Hall, Minnewaska Hall and Engineering Innovation Hub LEED certified Gold. ⁽⁵⁰⁾ Contributions to LEED certification include and are not limited to, modeling and selecting energy saving techniques, reusing existing building skeleton and infrastructure 	<ul style="list-style-type: none"> Science Hall to be determined LEED certification. ⁽⁵⁰⁾ Installation of high-efficiency fluorescent lighting. ⁽⁵⁵⁾ Science Hall built to LEED Silver standards. ⁽⁵⁹⁾

				<p>in renovations, applying CO₂ and CO monitors, switching to air condition units with 0% ozone refrigerant emissions, low flow plumbing, installation of heat exchange for heat conservation, low emission paints, flooring, sealants and wood products. Utilization of white roofing to reduce heat island effect, and sourcing construction materials locally and/or recycled. ^(51, 52, 53, 54)</p> <ul style="list-style-type: none"> • HVAC scheduled system of controlling temperatures during low occupancy periods. ⁽⁵⁶⁾ • Total of six solar panel arrays across the campus. ⁽⁵⁷⁾ • Installation and upgraded submetering and metering systems for electricity, gas, water, and energy use. ⁽⁵⁸⁾ 	
Niagara County Community College	No	-	-	-	-
North County Community College	No	-	-	-	-
SUNY Old Westbury	No	-	-	-	-
SUNY Oneonta	Yes	Sustainability SUNY	Policies & Plans SUNY Oneonta	<ul style="list-style-type: none"> • AASHE STARS rated Silver. ⁽⁶⁰⁾ • Residence Halls outfitted with low-flow plumbing and water level monitors. ⁽⁶¹⁾ 	<ul style="list-style-type: none"> • Physical Science Building LEED

		Oneonta		<ul style="list-style-type: none"> • Heating and Cooling policy to optimize energy use and efficiency during occupied and unoccupied times. ⁽⁶²⁾ 	<p>certified Gold. ⁽⁶⁰⁾</p> <ul style="list-style-type: none"> • Improved energy systems include recovery, light sensors, LED lights, energy efficient insulation and windows, etc. ⁽⁶³⁾ • Low-flow plumbing and fixtures. ⁽⁶³⁾ • Rainwater collection for offsite water filtration. ⁽⁶³⁾ • Real time energy dashboard tool to monitor energy and usage. ⁽⁶³⁾
Onondaga Community College	Yes	Sustainability Onondaga Community College (sunyocc.edu)	E11: Sustainability Onondaga Community College (sunyocc.edu)	<ul style="list-style-type: none"> • Rooftop solar panels on two buildings. ⁽⁶⁴⁾ • Energy metering across campus buildings to track electricity and gas use. ⁽⁶⁴⁾ • Green Wall located at Ferrante Hall. ⁽⁶⁴⁾ • Rainwater collection at Mawhinney Hall for flushing water and some plumbing. ⁽⁶⁴⁾ • LEED certified Gold for SCR Arena and Academic Building II. ⁽⁶⁵⁾ • 15% of energy sourced from 	-

				renewable resources. ⁽⁶⁶⁾	
State University of New York – College of Optometry	Yes	Sustainability and Energy Conservation - SUNY College of Optometry (sunyopty.edu)	Optometry- Sustainability- Policy- updated- 10- 2013.pdf (sunyopty.edu)	<ul style="list-style-type: none"> • Future goals to retrofit HVAC systems, invest in efficient LED lighting, invest in lighting sensors, etc. ⁽⁶⁷⁾ 	-
SUNY Orange	Yes	Sustainability at SUNY Orange, SUNY Orange	Sustainability Master Plan- 2015.pdf (sunyorange.edu)	<ul style="list-style-type: none"> • Kaplan Hall LEED certified Gold. ⁽⁶⁸⁾ • AASHE STARS rated Silver. ⁽⁶⁹⁾ 	<ul style="list-style-type: none"> • Rowley Center for Science and Engineering LEED certified Gold. ⁽⁶⁸⁾
SUNY Oswego	Yes	Sustainability Sustainability (oswego.edu)	Sustainability Plans Sustainability (oswego.edu)	<ul style="list-style-type: none"> • AASHE STARS rated Silver. ⁽⁷⁰⁾ • HVAC motors slowly being replaced with high efficiency motors. ⁽⁷¹⁾ • LED Lamps are slowly replacing fluorescent lights. ⁽⁷¹⁾ • Resident Halls outfitted with low-flow plumbing. ⁽⁷¹⁾ • Upgraded insulation in Sheldon Hall and Lee Hall. ⁽⁷¹⁾ 	<ul style="list-style-type: none"> • Shineman Science Center Building certified LEED Gold. ⁽⁷²⁾ • Rooftop Solar panels on Science Center. ⁽⁷²⁾ • Geothermal system. ⁽⁷³⁾ • Wind Turbines. ⁽⁷³⁾

				<ul style="list-style-type: none"> The Village certified LEED Gold. ⁽⁷²⁾ 	
State University of New York – Plattsburgh	Yes	PlattsLife ↓ Sustainability ↓ Campus Initiatives ↓ SUNY Plattsburgh	-	<ul style="list-style-type: none"> Residents Hall renovated with efficient lighting, insulation, and HVAC system. ⁽⁷⁴⁾ 	-
Potsdam – State University of New York	Yes	Sustainability ↓ SUNY Potsdam	-	<ul style="list-style-type: none"> Performing Arts Center certified LEED Gold. ⁽⁷⁵⁾ Campus building upgrades including efficient lighting and plumbing. ⁽⁷⁵⁾ Upgrades to combined heat and power plant in increase to efficiency. ⁽⁷⁵⁾ 	-
Purchase College – State University of New York	Yes	Office of Sustainability • Purchase College	-	<ul style="list-style-type: none"> Upgrades to combined heat and power. ⁽⁷⁶⁾ Retrofitting lighting to efficient LEDs. ⁽⁷⁶⁾ Upgrades to system management to maximize energy efficiency. ⁽⁷⁷⁾ Wayback residence hall certified LEED Silver, featuring LED efficient lighting, upgrade HVAC, efficient plumbing, etc. ⁽⁷⁷⁾ New academic building, Center for Media, and Film and Theater built (not certified) to 	-

				<p>LEED standards.⁽⁷⁷⁾</p> <ul style="list-style-type: none"> • Active work on building solar power for campus use.⁽⁷⁷⁾ • Campus rated Silver within STARS.⁽⁷⁷⁾ • Fort Awesome built (not certified) to LEED standards.⁽⁷⁸⁾ • Humanities Building certified LEED Gold.⁽⁷⁸⁾ • Green Roof on top of Visual Arts Center for cooling efficiency.⁽⁷⁸⁾ 	
Rockland Community College – State University of New York	No	Page not found - Rockland Community College (sunrockland.edu) (Page Can not Be Found)	-	-	-
SUNY Schenectady County Community College	No	-	-	-	-
Stony Brook University	Yes	Home Sustainability	Climate Action Plan Sustainability	The college has nothing specifically on publicly available efficiency measures/initiatives but reports reductions of	-

		y (stonybrook.edu)	(stonybrook.edu)	Greenhouse Gas Emissions through their Climate Action Plan. ⁽⁷⁹⁾	
Suffolk County Community College	Yes	Sustainability at Suffolk Community College (sunysuffolk.edu)	-	<ul style="list-style-type: none"> • Learning Resource Center, Health and Wellness Center Montaukett Learning Resource Center and Workforce Development Technology Center certified LEED Gold. ⁽⁸⁰⁾ • Green roofing located at Learning Resource Center and Peconic Building. ⁽⁸⁰⁾ • Retrofits to buildings include and are not limited to HVAC system upgrades, replaced lighting, heating/cooling units, high efficiency motors and controls. ⁽⁸⁰⁾ • Solar rooftop panels on Workforce Development Building. ⁽⁸¹⁾ • Partner in renewable non-credit wind energy program – New York Offshore Wind Alliance. ⁽⁸¹⁾ 	<ul style="list-style-type: none"> • Willaim J. Lindsay Life Sciences certified LEED Gold. ⁽⁸⁰⁾ • Renewable Energy and STEM Center certified LEED Platinum with net zero emissions. ⁽⁸⁰⁾ • Green roofing located at Lindsay Life Science Building. ⁽⁸⁰⁾ • Solar rooftop panels on Lindsay Life Sciences Building and Smithtown Science Building. ⁽⁸¹⁾
SUNY Sullivan	Yes	Sustainable Sullivan SUNY Sullivan	-	<ul style="list-style-type: none"> • Geothermal heating and cooling. ⁽⁸²⁾ • Installed solar panel farm and wind turbines. ⁽⁸²⁾ • Green rooftop installed. ⁽⁸²⁾ • Retrofitting plumbing to low-flow and lighting to energy efficient. ⁽⁸³⁾ 	-
SUNY Polytechnic Institute	Yes	Energy 	Framework for a	<ul style="list-style-type: none"> • Field House, Oriskany 	-

		SUNY Polytechnic Institute	Sustainable Future Executive Summary (sunypoly.edu)	<p>Residence Hall and Student Center built to LEED standards. ⁽⁸⁴⁾</p> <ul style="list-style-type: none"> Storm water collection, reflective roofing, low flow plumbing, low-emission construction materials, increased windows for daylight use, and construction of Field House utilized recycled and local materials/resources ⁽⁸⁵⁾ Oriskany Residence Hall built with water reduction, recycled materials, locally sourced products, low-emission materials, monitorization of systems, increased ventilation, refrigerant management, etc. ⁽⁸⁶⁾ Student Center built with reflective rooftop, storm water management, low-flow plumbing, recycled/locally sourced materials, low-emission materials, efficient lights, maximization of daylight, controlled sensors for lighting and heating, etc. ⁽⁸⁷⁾ 	
Tompkins Cortland Community College	No	-	-	-	-
SUNY Ulster – Ulster County Community College	No	-	-	-	-

Upstate Medical University	Yes	Think Green. Think Future. SUNY Upstate Medical University	Sustainability Initiative Think Green. Think Future. SUNY Upstate Medical University	<ul style="list-style-type: none"> • Geneva Tower Residence Hall LEED certified Silver featuring 100% renewable energy sourcing, efficient lighting, upgraded insulation, upgraded windows, upgraded heating and cooling, upgraded HVAC systems, etc. ⁽⁸⁸⁾ • General energy efficiency measures including and not limited to HVAC upgrades, heating and cooling upgrades, etc. ⁽⁸⁹⁾ 	<ul style="list-style-type: none"> • Solar panels built on Neuroscience Research Building. ⁽⁹⁰⁾ • Green rooftop on Cancer Center building. ⁽⁹⁰⁾
Westchester Community College	Yes	Sustainability Projects & Initiatives - Westchester Community College (survey.ccd.edu)	-	<ul style="list-style-type: none"> • Gateway Center certified LEED Gold featuring efficient windows, efficient use of daylight, efficient lighting, recycling building materials, low emission building materials, high efficient filtration systems, skylights to optimize daylight, low-flow plumbing, etc. ⁽⁹¹⁾ • Physical Education, Student Center, and Technology building upgraded with efficient cooling and HVAC systems. ⁽⁹¹⁾ • Technology, Library, Student Center, and Physical Education building upgraded with efficient rooftop. ⁽⁹¹⁾ 	<ul style="list-style-type: none"> • Science Building upgraded with efficient cooling and HVAC systems. ⁽⁹¹⁾ • Science Building upgraded with efficient rooftop. ⁽⁹¹⁾

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