ADVANCING SUSTAINABILITY AT SYRACUSE UNIVERSITY

Prepared for
The Syracuse University Community

Prepared by
The Student Association

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Executive Summary

With the increasing severity of the climate crisis and the rapid innovation of climate mitigation and renewable energy technology, Syracuse University must revitalize the 2009 Climate Action Plan to capitalize on historic government investments and accelerate its sustainability goals and initiatives.

Today, we are seeing unprecedented global warming and natural disaster events due to the climate crisis. Current and future generations are at risk for enormous, unprecedented pain and turmoil caused by the climate crisis. It is clear, now more than ever, that the global climate is at severe risk, and that action must be hastened. This report calls on SU, from the perspective of the students, to amplify and expedite sustainability and climate pledge efforts in response to current events, technological advancements, and government incentives.

In response to the passage of the Inflation Reduction Act and in accordance with the American College and University Presidents Climate Commitment, **Syracuse University must make a one-university commitment to have sustainability be a top priority.**

Since the University's previous Climate Action Plan, sufficient evidence has emerged indicating that climate action must be hastened. With the emergence of new sustainable technologies, alternatives, and resources, along with unprecedented government infrastructure incentives, the University is primed to take a leap in improving its environmental footprint. By taking the appropriate steps to achieve these measures, the University will place itself amongst the most distinguished green campuses, and fulfill a commitment to DEIA, including the health and well-being of the people of the Onondaga Nation.

Recommendations made in the report include, but are not limited to:

- Syracuse University will reach Carbon Neutrality by December 31, 2030
- Syracuse University will use 50% renewable energy by 2030 and 100% renewable energy by 2040
- Syracuse University will reach Gold STARS report status by our next report in 2027 and Platinum in the 2032 report
- Syracuse University will invest in renewable energy technologies for facilities and operations
- Syracuse University will increase transparency and accountability in annual carbon emission reporting
- Syracuse University will shape campus culture to be more sustainable
- Syracuse University will electrify transportation systems
- Syracuse University will advance its commitment to DEIA initiatives by enacting these policy recommendations

Introduction

On July 28, 1911, the New York State College of Forestry at Syracuse University (SU), which is known as the State University of New York College of Environmental Science and Forestry (SUNY-ESF), was founded by state charter. Although it became a separate legal entity from SU only just two years later, Syracuse University and SUNY-ESF have been neighbors and partners in learning ever since.

Chancellor Nancy Cantor signed the American College and University Presidents Climate Commitment on February 23, 2007, and the Chancellor directed the creation of our Climate Action Plan (SU-CAP), which was released in September 2009. The SU-CAP set a goal of reaching carbon neutrality by 2040.

In 2020, the Student Association of Syracuse University and SUNY-ESF created the first-ever Sustainability Committee. After the passage of the Student Association's new constitution in 2021, the Director of Sustainability role was created. In Fall 2022, the Sustainability Committee was re-formed by Director Harrison Vogt and Vice President of Community & Government Affairs Benjamin Cavarra.

In late Spring 2022, Chancellor Kent Syverud charged Student Association President David Bruen to produce a report of recommendations on Syracuse University's sustainability policy and goals. The Student Association set a deadline to deliver this report by December 2022. Student Association leadership President David Bruen, Student Advocate Olivia Curreri, Director of Sustainability Harrison Vogt, and Vice President of Community & Government Affairs Benjamin Cavarra worked tirelessly to compose the Sustainability Report.

Our generation faces one of the greatest existential crises of all time: the climate crisis. The effects of climate change will compound and harm our descendants more than us unless we take decisive action. While the severity of the climate crisis is daunting, Syracuse University's steadfast commitment to sustainability will be a source of optimism as our place as a large university, stretching hundreds of acres, will have a monumental impact on campus as well as the surrounding community. We have a generational responsibility to lean into this optimism, take action, become national leaders, and create a wave of momentum which may even influence our peers to join us.

Syracuse University has a responsibility to protect the environment and promote sustainability on campus. Practicing sustainability is the ethical thing to do, creates a positive brand image, optimizes profitability, and manages business risk. Syracuse University is committed to educating the future generation to produce well-rounded, intelligent, successful alumni. Therefore, the university has the corporate social responsibility to be sustainable and mitigate the climate crisis to protect the future generations that they educate.

According to a Pew Research survey, our generation–Generation Z–stands out for our high levels of engagement with the issue of climate change[1]. If Syracuse University makes a bold commitment to address the crisis, Gen-Z applicants will be drawn to the university as three-quarters of Gen-Z consumers state that sustainability is more important to them than brand names.[1] Our intended audiences will resonate with our core value of sustainability and will choose to apply to a university that aligns with their personal values. Moreover, the enactment of these policies, including the goal of net-zero emissions by 2030, can result in an increase in applications to the university, increased revenue, and a heightened reputation as an elite institution due to our standing as a national leader in sustainability.

Additionally, climate change disproportionately affects impoverished and minoritized groups. To maintain the University's commitment to diversity, equity, inclusion, and accessibility (DEIA), increased sustainability and climate improvement efforts must be taken. Syracuse University will advance its commitment to DEIA initiatives by enacting these policy recommendations and reducing carbon emissions. In effect, Syracuse University will address the unequal impacts of the climate crisis on the Syracuse community.

In the 1950s, Interstate 81 was constructed and cut directly through what was then the city's 15th Ward, a majority black neighborhood, and displaced almost 1300 families[2]. Many families eventually moved south of the viaduct, forming a new neighborhood, but with far fewer resources than the original. Similarly, areas near municipal infrastructure where people live are often called "heat islands," which refer to the infrastructure within a city, including the infrastructure in Syracuse, which raises the heat beyond that of surrounding suburbs. This can include temperature variances of up to 15-20 degrees Fahrenheit.[3]

Across the United States, impoverished and minority communities have higher asthma rates and cancer rates as a result of living near natural gas facilities and/or other sources of pollution.[4] For example, 13.4% of black children suffer from asthma compared to 7.3% of white children.[4] The impact that climate change and climate justice have on other communities are another critical factor we must consider.

Through investment in social and environmental responsibility, Syracuse University will see tangible returns in the community and student experience. Investment today means cost reduction for future climate challenges.

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[1]https://www.nasdaq.com/articles/how-millennials-and-gen-z-are-driving-growth-behind-esg
[2]https://www.nyclu.org/en/campaigns/i-81-story
[3]https://spectrumlocalnews.com/nys/central-ny/weather/2021/07/15/urban-heat-island--why-syracuse-is-warmer-than-the-suburbs
[4]https://psci.princeton.edu/tips/2020/8/15/racial-disparities-and-climate-change

The political tide is turning and Syracuse University must capitalize on government funding, investment, and programs to solidify its claim as a national leader in sustainability, or risk being left behind by its peers. In November 2021, the Infrastructure Investment and Jobs Act (IIJA) was passed and invests **$1 trillion** into clean energy infrastructure[5] to address major sources of emissions—transportation, power, industry, and buildings. This massive investment will increase grid resilience and accelerate the clean energy transition of American infrastructure. Less than a year later, the Inflation Reduction Act was passed and made climate reform history. The Inflation Reduction Act makes generational investments to expand cleaner, cheaper energy, and cost-saving clean technologies, including **$270 billion** in tax incentives[6] that will help us reduce pollution, boost resilience across America, ensure environmental justice for vulnerable communities, address the national security threats posed by extreme weather, and meet our climate goals.

[5]https://www.csis.org/analysis/infrastructure-investment-and-jobs-act-will-do-more-reach-2050-climate-targets-those-2030

[6]https://climatecrisis.house.gov/sites/climatecrisis.house.gov/files/Factsheet%20Climate%20Investments%20in%20the%20IRA_0%20%281%29.pdf

State of Sustainability at Syracuse University

In January 2022, Syracuse University earned a STARS[A1] Silver rating with a 61.49 score. Out of 1,123 institutions registered to use the STARS Reporting Tool, only 579 have earned a STARS rating and Syracuse University ranked 267th out of the 579.[7] Syracuse University is in the bottom half of all institutions ranked in the STARS system. SUNY-ESF is rated Platinum with an 85.66 score.

Some recent notable accomplishments include free transportation[8] and bike lanes both on-campus and in coordination with the city and Centro to downtown Syracuse, the upgrades to the steam and chilled water lines, and the partnership with IBM for the construction of the SU/IBM Green Data Center, one of the most energy-efficient computer operations in the world at the time of its implementation.[9]

In 1990, Syracuse University adopted recycling efforts in coordination with New York State requirements and continues upgrading and promoting recycling and composting on campus. Syracuse University also includes recycling programs for recyclable materials in new construction on campus to be LEED-certified, and for the students and faculty, new collection opportunities for specialized items such as electronics and batteries, paint, aerosol cans, and more[7]. Measurable results occurred with water use on campus as well. Drinking fountains have been replaced or updated to water bottle filling stations to ensure there is at least one in every building on campus.

The Syracuse Center of Excellence[10] is a beacon for sustainability at the SU and represents a tremendous success in committing resources to students and community members alike to engage in sustainable practices and research. The Syracuse Center of Excellence is one of four Syracuse University buildings to have achieved LEED certification including the Daniel and Gayle Daniello National Veterans Resource Center, Ernie Davis Hall, and the Carmelo K. Anthony Basketball Center.[11] Ongoing sustainability-focused programs include SU's established Sustainability Management division.

Advancing student engagement through increased involvement in sustainability education and opportunities is an area awaiting development. The intersection between student culture and sustainability is an opportunity for the university to reduce its environmental footprint. For example, the "Save Juice in the Cuse" residence hall energy conservation competition program began in 2008 but lost momentum by 2010.

[7] https://reports.aashe.org/institutions/syracuse-university-ny/report/2022-01-07/
[8] https://www.syracuse.edu/life/campus-highlights/connective-corridor/
[9] https://www.syracuse.com/green/2010/07/a_peek_inside_the_su-ibm_green.html
[10] https://syracusecoe.syr.edu/
[11] https://bfas.syr.edu/2021/02/09/nvrc-receives-leed-gold-certification/

The largest foreseeable challenges the university will face are to advance beyond 6% renewable energy usage in buildings[12] and to achieve green building certifications, as aligned with the Syracuse University LEED Policy.[13] Additionally, achieving carbon neutrality by 2030 will require the university to proceed beyond the outlined strategies of the 2009 CAP. Promisingly though, the University has recently been awarded a number of grants to advance sustainability and the goals above.

In 2021, Syracuse University received $750,000 from the U.S. Department of Energy to accelerate innovations for 'Grid-Interactive' and Energy-Efficient Buildings. Currently, the Campus Planning, Design, and Construction office incorporates sustainability initiatives within each campus project to help the University achieve its carbon neutrality goals. The grant highlights the widespread availability of investment in sustainability initiatives.

The Dynamic Sustainability Lab (DSL) is an exciting, burgeoning project focused on sustainable investment. The DSL is led by distinguished Pontarelli Professor Dr. Jay Golden and is comprised of a team of more than thirty [30] undergraduate and graduate professionals. The research institution serves as a "non-partisan partner to industry, government, and NGOs"[14] to assist sustainable transitions across industries. Achievements of the lab include partnership in a $60 million United States Department of Agriculture grant to explore Climate-Smart Commodities and significant partnerships with organizations such as the Northeast Clean Energy Council.[15]

[12] https://reports.aashe.org/institutions/syracuse-university-ny/report/2022-01-07/
[13] https://bfas.syr.edu/facilities/campus-planning-design-construction/policies/leed-policy/
[14] https://www.dynamicslab.org/about-3
[15] https://www.dynamicslab.org/post/creating-change-with-the-necec

Recommendations

Section I. Carbon Emissions

A. Revised Goal: A New Milestone for Net-Zero

Syracuse University must advance its current net-zero goal from 2040 to 2030. This milestone will be reached by enacting these policy proposals to rapidly reduce carbon emissions. It is critical to think of this revised goal as a milestone that we will reach but will have to keep moving beyond. The work of being sustainable will not end by reaching any milestone or any fixed date.

In 2009, Syracuse University released the first climate action plan which set an industry-standard goal of reaching net zero emissions by 2040. However, student feedback, industry trends, and climate science have all indicated that advancing that goal to 2030 better matches our mission. In a survey conducted by the Student Association, 54.1% of respondents selected "moving up our net-zero emissions pledge from 2040 to 2030" as an area that can have a significant impact on SU's sustainability.

The climate crisis will affect future generations, and to adequately address this crisis we must dramatically reduce emissions. We must take a comprehensive approach to understand the full emissions picture. For example, the environmental effects of the agriculture industry through the purchasing of meats are significant in the larger national and global total of greenhouse gas emissions.

A goal of 2030 is ambitious yet achievable. To do this, it will take a university-wide commitment to what goals we've already set out and strategically renewing our commitment in key areas. The rest of this report includes recommendations for how Syracuse University can improve sustainability and foster an environmentally conscious campus culture.

B. Addressing Offsets

Offsets are a key part of reaching carbon neutrality. However, we must not use these offsets as the primary part of our strategy, but rather as a necessary piece to reaching net zero. The priority should be focused on optimal systems efficiency, transitioning to sustainable and renewable alternatives. The University can and should consider straightforward solutions such as purchasing credits and planting trees. The University should also lean into its innovative and entrepreneurial spirit to invest in new sequestration technologies and develop systems to provide for consistent progress on sustainability.

C. Using Trees & Biomass for Carbon-Sequestration

Syracuse University oversees 980 acres of land just on its main campus. Much of this land is covered with trees and biomass that actively contribute to carbon sequestration. However, to be officially counted as offsets by crediting firms, trees must be planted for the express purpose of being an offset. Of course, carbon sequestration is occurring with existing biomass but its imperative that the University invest in offsets specifically for that purpose.

D. Creating a Syracuse University Arboretum

To form a level one arboretum a minimum of 25 species need to be met. SU's installation of an arboretum could become a major boon for the local community and serve as a signal for the university's transformative approach to sustainability.

American University has its own campus arboretum and gardens with over 4,000 trees with 385 different species. The arboretum offers internships, volunteer opportunities, and work-study.

E. Government Programs

The recently enacted Inflation Reduction Act (IRA) is expected to have significant impacts on the energy industry. The law includes approximately $369 billion in incentives for clean energy and climate-related program spending, including funding to encourage carbon capture, utilization, and storage (CCUS) projects.[16]

The Inflation Reduction Act will lead to $5 billion in grants for fire-resilient forests, forest conservation, and urban tree planting. Some $1.5 billion is appropriated for the Urban and Community Forest Assistance program, which provides technical and financial help to local communities so they can plant and maintain urban trees, educate citizens about tree care, and train tree workers[17]. The Forest Service Urban & Community Forestry Program is a technical, financial, and educational assistance program, delivering nature-based solutions to ensure a resilient and equitable tree canopy where more than 84 percent of Americans live.

The Inflation Reduction Act expanded the eligibility of carbon oxide sequestration projects to qualify for the Carbon Oxide Sequestration Credit by lowering the threshold of required captured qualified carbon oxides for qualified projects. In addition, the IRA increased the availability of credit with respect to qualifying projects by increasing the credit rate per metric ton of qualified carbon oxide captured by qualified projects. The IRA additionally eased the monetization of the credits by enabling taxpayers to utilize a direct payment option or sell portions of the credit.[18]

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[16] https://www.energy.gov/fecm/events/coal-and-carbon-capture-provisions-inflation-reduction-act
[17] https://www.congress.gov/117/plaws/publ169/PLAW-117publ169.pdf
[18] https://www.congress.gov/117/plaws/publ169/PLAW-117publ169.pdf

F. Carbon Tax Proposal

Syracuse will institute a carbon tax on carbon-intensive activities and products. Examples of carbon-intensive products include single-use plastic bottles, takeout boxes, etc. All proceeds from the carbon tax will fund sustainability initiatives. 90% of the revenue from the tax would go to Syracuse University sustainability initiatives, and 10% would go to climate change nonprofits (e.g. Sierra Club, Natural Resources Defense Council). Through the implementation of this carbon tax, students would be disincentivized to purchase unsustainable products and instead opt for eco-friendly alternatives.

G. Create Sustainability Oversight Council

Syracuse University must create a Sustainability Oversight Council to oversee and audit the Sustainability Management office to ensure carbon emission goals are met. Due to the urgent nature of the climate crisis, the rapid development of sustainability initiatives and a renewable energy transition are needed. Therefore, a Sustainability Oversight Council must be created to ensure carbon emissions are decreasing and as well as offer suggestions for climate policy implementation. Each year, a representative from the Sustainability Management office will report to the Sustainability Oversight Council and present progress toward the net zero goal. Moreover, the Sustainability Oversight Council has the ability to audit the Sustainability Management office to ensure accuracy in carbon emission reduction as well as continued progress in sustainability goals.

The Sustainability Oversight Council will be composed of a representative from the Student Association, a representative from the Board of Trustees, the Chancellor, and a distinguished Syracuse professor who is an expert in sustainability. Syracuse may hire a carbon footprint advisor if funding permits.

H. ACC Carbon Cap Program

Syracuse will create a Carbon Cap Program between the Atlantic Coast Conference (ACC) colleges to increase competition and hold other universities accountable for carbon emissions.[19]

In practice, this policy would be multipronged and require a strong communication system between ACC student government presidents and transparency about carbon emissions across all ACC universities. Each school in the ACC conference would create a sustainability task force, composed of school administrators, the student government president, and environmental policy experts. At the start of the ACC carbon cap program, all sustainability taskforces would meet to set carbon emission caps for every 5 years, with the goal of carbon neutrality by 2040 across all ACC universities.

[19] https://www.ruei.rutgers.edu/images/PDF/presentations/Cheng_Robles_REI_contest_poster.pdf

Each climate task force will meet internally throughout the year to discuss sustainability initiatives and progress in carbon emission reduction. Annually, representatives from each climate task force across the ACC will meet to discuss findings and share successes and report progress of meeting the carbon cap. Every 5 years, the task forces will meet to present carbon emission reductions and share successes and pain points in implementation.

This policy would require Syracuse University and other ACC colleges to record and track their carbon emissions and publicly report their progress to peer institutions. The ACC Carbon Cap Program will increase competitiveness between universities and foster a campus culture that holds sustainability as a core value. Syracuse will become a national leader in sustainability through the implementation of this program.

Section II. Facilities and Operations

A. Green Buildings Policy

Syracuse University should adopt a Green Buildings Policy that mandates all new construction, major renovations, operations, and maintenance conform to LEED Silver standards or better. The LEED certification for Operations and Maintenance[20] provides standards for major renovations and operations. Thus, the university should look beyond new building construction in its pursuit of green building infrastructure.

Syracuse must invest in the Sustainability Management office and hire more employees in order to achieve the current and proposed goal of net-zero emissions. Moreover, in order to accurately track carbon emissions to achieve sustainability goals, more employees are needed in order to rapidly implement current and proposed policies. Syracuse must allocate proper funding to this integral office as sustainability must be a top priority for the university.

B. Government Funding

The Inflation Reduction Act materially changes the deduction allowed under Code Section 179D for energy-efficient buildings. The changes to the Efficient Commercial Buildings Deduction include:

- An increase in the maximum deduction amount from $1.88 per square foot to $5.00 per square foot.
- Relaxation of the ability to qualify for the deduction when the property is retrofitted.
- The allowance of a deduction every 3 years for the same building. Prior to the IRA, the deduction could be taken only once.

[20] https://www.usgbc.org/leed/rating-systems/existing-buildings

- The IRS also allows tax-exempt entities to take advantage of the deduction through the direct pay mechanism.[21]

C. Plastic-Free Campus

On the 8th of June 2022, the National Parks Service and Department of the Interior released their plan[22] to phase out single-use plastics by the year 2032. In 2020, SUNY-ESF announced its pledge to become New York State's first campus to go plastic-free by 2025.[23] In 2022, the institution joins a growing list of campuses re-imagining their relationships with plastic waste. Going plastic-free or reducing plastic waste reflects the need for institutions to harbor sustainable solutions for consumers and constituents. It is imperative that SU commits to dramatically reducing the usage of single-use plastics by the school year 2027-2028.

D. Green Office Program

The STARS report scores for an *Employee Educators Program*, which Syracuse University is currently not pursuing. We recommend the creation of a Green Office Program to encourage offices across campus to make more sustainable decisions. This can be done by providing sustainable purchasing options, reducing plastic use, and reducing electricity use. This will emphasize a one-university commitment to addressing sustainability.

E. Expanding SU's Composting Initiatives

Syracuse University should collaborate with the Community Compost at SU program. A student-run composting program, aimed at collecting food waste from IFC and Panhellenic Greek Life organizations as well as Syracuse University organizations including, but not limited to, the SU Abroad Office, Hillel, and the SU Catholic Center located in Walnut Park and along Comstock Avenue. There are a total of 22 organizations that have been determined part of the target group for this program.

In November of 2022, a pilot program was run by two students, Naomi Weinflash and Andrew Lieberman, to determine if there was a willingness from organizations to participate in a composting program, as well as desire to participate correctly. They found that there is. Most significantly, they gathered that from any given organization there will be an average of 55 pounds of food waste weekly. This translates to 1,664 pounds of CO2 equivalent (CO2e) mitigated per two semesters from one organization. If all 22 are to participate, this would be 36,608 pounds (16.6 metric tons)[24]of

[21] https://www.congress.gov/117/plaws/publ169/PLAW-117publ169.pdf
[22] https://www.doi.gov/sites/doi.gov/files/elips/documents/so-3407.pdf
[23] https://dailyorange.com/2022/11/suny-esf-committed-becoming-plastic-free-campus/
[24] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

CO2e mitigated per two semesters. This is equivalent to powering 3.6 gasoline-powered vehicles for one year.[25]

The estimated start-up costs for all 22 organizations are $987.80. The desired 7-gallon trash bins for indoor food waste collection in addition to the 27-gallon outdoor bin will cost $769.12. The bio bags that are accepted by the OCCRRA composting facility cost $218.68 for each semester.[26] Payment for the OCCRRA facility is uncertain, as it will vary depending on the number of organizations participating and their level of participation. It should be noted that Community Compost at SU has been working with OCCRRA for the past two months and has been discussing a payment plan. The estimated cost would be under $300.[27] It should be noted that once the program is up and running, the yearly cost should be under $600.

Funding and transportation are desired by the Community Compost at SU program from the University. The program has been working with Sustainability Management as well as the Shaw Dining Center to conquer collective food waste drop-off logistics. Weighing in from the University would help immensely. Moreover, there is a possibility that since this program works with off-campus organizations, SU may be able to gain carbon offset credits.

Section III. Energy

A. Transition Syracuse's Enwave Steam Plant to Biofuels

Syracuse University should amplify their partnership with Enwave Energy to transition the Syracuse Steam Plant to a Combined Heat and Power system that utilizes biofuel and natural gas. Heat recovery boilers, wood-pellet-fired gasifiers, and natural gas microturbines are all technologies for consideration.

In October 2020, Syracuse University partnered with Enwave Energy to operate the University Steam Station. The University Steam Station heats all of Syracuse's campus as well as parts of the State University of New York College of Environmental Science and Forestry (SUNY ESF) campus. SUNY ESF also operates a biofuel/natural gas steam plant in the basement of the Gateway Center, which powers the remainder of its campus. This plant is operated as a Combined Heat and Power (CHP) system, which generates 65% of the campus' heat and 20% of its electrical power.

[25] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

[26] https://docs.google.com/spreadsheets/d/13oNco3v9OeFV1LhgVuDOCe88dZ8oWlQhIkc9ic5GgLs/edit?usp=sharing

[27] https://ocrra.org/locations/compost-locations/amboy-compost-site/

By transitioning the University Steam Station to biofuel, the university can significantly reduce supply-side carbon emissions targeted in proposal #1, and fulfill a recommendation from the 2009 Climate Action Plan.

Local resources include the SUNY ESF Willow Project[28] which aims to commercialize shrub willow as a sustainable bioenergy and bioremediation strategy, companies such as Siemens who are constructing large-scale biofuel steam facilities[29], and the Gateway Center CHP Steam Plant at SUNY-ESF.

B. Geothermal

Syracuse should invest in geothermal energy and heating systems to reduce the university's overall carbon footprint. Geothermal Heat Pumps (GHP) rely on the relatively constant temperatures a few feet below the surface of the earth and more favorable temperatures in summer and winter to become highly efficient heating systems[30]. This technology has existed since the 1940s, and can efficiently be used to heat large buildings and structures. Numerous universities around the country have installed large geo-exchange systems as part of their climate commitments. Steam generated from geothermal systems can also be converted to electricity and is considered a high-potential renewable energy source[31]. Given the internal heat of the earth, geothermal energy has the potential to produce 42 million megawatts of energy annually[31].

C. Government Funding

The Inflation Reduction Act extended a **30% tax credit for geothermal heat pump projects constructed before January 1, 2033**. The credit reduces to 26% in 2033 and 22% in 2034. Geothermal equipment that uses the stored solar energy from the ground for heating and cooling and that meets ENERGY STAR requirements at the time of installation will qualify for the tax credit. The credit has no limit and there's no limitation on the number of times the credit can be claimed.[32]

D. Solar Panels

Syracuse University should look to install solar panels and solar gardens around campus where usage is deemed fit. Geographically, Syracuse has less sun than other areas of the United States, and the campus infrastructure is less optimally designed for solar panel usage than other universities. However, with technology such as solar trackers, solar technology at the cheapest pricing ever, and

[28] https://www.esf.edu/willow/
[29] https://www.siemens-energy.com/global/en/offerings/renewable-energy/biomass-to-power.html
[30] https://www.bsu.edu/about/geothermal
[31] https://www.greenfacts.org/en/geothermal-energy/l-2/index.htm
[32] https://www.congress.gov/117/plaws/publ169/PLAW-117publ169.pdf

unprecedented government incentives, utilizing solar power to transition the university towards renewables is a valuable investment. The Office of Energy Efficiency and Renewable Energy maintains that solar efficiency remains high during cold weather, and that given appropriate engineering of panel structure, snow can be easily accommodated[33]. The Solar Energy Industries Association anticipates a 60% increase in solar installations across the U.S. within the next five years.[34] Coupled with the passing of the Inflation Reduction Act, the national movement toward renewables is clear.

If the University is looking for support, organizations like the National Renewable Energy Laboratory (NREL) can provide oversight and consultation for universities looking to adopt solar energy.[35]

E. Government Funding

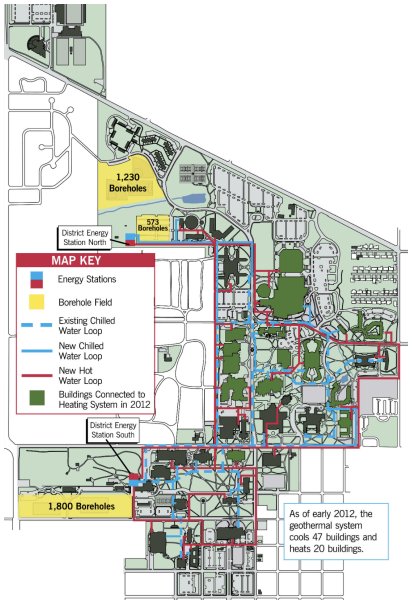
The Inflation Reduction Act gives federal solar incentives through a new "direct pay" option to tax-exempt organizations starting in 2023. It will allow nonprofit organizations, private nonprofit and public schools, faith-based organizations, local and state governments, tribal governments, and rural electric cooperatives to receive cash payments in lieu of tax deductions. The IRS is expected to release guidance on this soon.[36]

F. Aspirational Peer Institutions

Colorado State University recently finished the installation of a 260,000-square-foot geothermal heat pump system to power Moby Arena Complex and a housing/dining development located nearby. The Geo-X system completely removes Moby Arena's reliance on the broader university steam system and aligns with Colorado State University's goal of using 100% renewable energy by 2030 and attaining carbon neutrality by 2040.[37]

In 2012, Ball State University began the installation of the largest university geothermal power system in the country. The system has an annual savings of approximately $2 million and cuts the campus' carbon footprint in half.[38]

[33] https://www.energy.gov/eere/articles/let-it-snow-how-solar-panels-can-thrive-winter-weather
[34] https://www.seia.org/us-solar-market-insight
[35] https://www.nrel.gov/state-local-tribal/universities.html
[36] https://www.energy.gov/eere/solar/federal-solar-tax-credits-businesses
[37] https://www.usengineering.com/2021/06/colorado-state-university-moby-complex-geo-x-system
[38] https://www.bsu.edu/about/geothermal



Ball State University Geothermal Heat System Piping Schematic[39]

Colorado State University has 41 solar installations in use on campus currently. The panels are attached to buildings and parking garages while additional installations exist in open spaces and parks around campus.[38] Similarly, the University has a 30-acre, 5.3MW solar farm located on CSU's Foothills Campus that generates approximately 25% of the entire university's power.

Aerial photo of Colorado State University Campus[40]

[39] https://www.bsu.edu/about/geothermal
[40] https://source.colostate.edu/csu-new-solar-panels/

The University of Minnesota, Twin Cities campus is a leader in solar technology research and solar energy usage. Nine solar gardens installed on campus generate approximately 60% of the campus' energy needs. These, and other initiatives have allowed UMN to reduce campus greenhouse emissions by 50% over the past 13 years.[41] On average Syracuse, NY receives 163 sunny days per year compared to Minneapolis, MN 198 sunny days per year with similar summer high temperature averages of approximately 82 degrees fahrenheit[42]. Given similar climates, SU could look to UMN for a peer in solar power usage and installation.

[41] https://www.ysgsolar.com/blog/top-10-solar-universities-2022-ysg-solar
[42] https://www.bestplaces.net/climate/?c1=53673000&c2=52743000

Section IV. Transportation

A. Electrifying Transportation

Syracuse University should electrify its transportation services to reduce carbon pollution. Solutions include working with Centro to transition bus fleets to electric, expanding micro-transit options such as Veo, and looking to purchase green vehicles for DPS.

The Inflation Reduction Act incentivizes this transition through the Qualified Commercial Clean Vehicle tax credit which provides up to a **$40,000 tax credit** for the purchase of electric medium-duty and heavy-duty trucks. The IRA creates a new tax credit for qualified commercial clean vehicles acquired before January 1, 2033. Utilizing this tax credit keeps Syracuse on track for its goal of being net zero by 2030 as the deadline for the tax credit is 2033.

On December 16th, 2022, Governor Kathy Hochul announced **$23 million** in funding and awards for transportation electrification initiatives in New York State. Moreover, **$8 million** was made available for electric school buses and paratransit buses under the New York Truck Voucher Incentive Program. These initiatives support the state's nation-leading Climate Leadership and Community Protection Act goals of reducing carbon emissions by 85 percent by 2050 and that at least 35 percent, with a goal of 40 percent of the benefits of clean energy investments be directed to disadvantaged communities.[43]

B. EV Chargers

Syracuse University can charge their electric vehicles by installing electric vehicle ports. Government funding can accelerate and aid this opportunity through the NEVI program.

The federal Infrastructure Investment and Jobs Act was signed into law on November 15, 2021, and established the National Electric Vehicle Infrastructure (NEVI) Program. NEVI will provide funding to states to deploy electric vehicle (EV) fast chargers along designated electric vehicle corridors to establish an interconnected EV charging network across the state and nation. The New York State Department of Transportation will receive approximately **$175 million** through NEVI over five years. The NEVI program requires funds to be invested within one travel mile of designated EV corridors, with charging stations no more than 50 miles apart. New York State's designated corridors include many of the State's most-traveled interstate and state highways. Syracuse lies on three designated EV corridors. In eastern New York, Interstate 90 going from Syracuse to Albany was selected. Moreover, in Central and Western New York, Interstate 90 from

[43]https://www.governor.ny.gov/news/governor-hochul-announces-23-million-funding-and-awards-transportation-electrification

Buffalo to Syracuse, Interstate 81 from the Canada border to Syracuse, and Interstate 81 from Syracuse to Pennsylvania border were selected.[44]

On December 15th, 2022, Governor Kathy Hochul announced **$8 million** is available under the third round of the Direct Current Fast Charger (DCFC) program to install electric vehicle infrastructure in Buffalo, Rochester, and Syracuse, in support of New York State's climate and energy goals. Moreover, **$7 million** in awards to ChargePoint and EVGateway to improve access in upstate New York under Rounds One and Two of the Direct Current Fast Charger program. [45]

C. Veo Bikes & Micro-Transit Options

In October 2021, Veo's electronic biking and scooter service was brought to the city of Syracuse. In the thirteen or so months since the service has found tremendous success and Veo vehicles can be seen nearly all across the University neighborhood and surrounding areas. The university should look to expand on this success by furthering contractual agreements with Veo to include their usage on campus as well as explore other micro-transit services.

Historically, the university has run a bicycle rental service for students. Given the minimal on-campus student parking and large university neighborhood, renting bicycles provided students with a transportation option to and from campus. Unfortunately, the complexity of organizing bicycle rentals for 20,000 students has provided challenges that the university has currently been unable to tackle. At this time, a solution is in need of development, however, the Syracuse Student Association would like to work with the university to reignite this program.

Reinstalling the student bicycle rental service, expanding on current Veo services, and encouraging further micro-transit options such as Lyft, Lime, and Bird will enhance the student experience and reduce emissions from university-provided transportation options.

Section V. Campus Culture

A. Sustainability Research Competition

We recommend the creation of an annual sustainability research competition as a partnership between The Student Association and Syracuse University. The competition will be an opportunity for students to propose ideas for SU to minimize carbon emissions. Students will submit proposals which will be reviewed by a select panel of judges consisting of student leaders, faculty, and staff, and the winner will receive a prize, which will be determined by the hosts.

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[44] https://www.congress.gov/bill/117th-congress/house-bill/3684/text

[45]https://www.governor.ny.gov/news/governor-hochul-announces-23-million-funding-and-awards-transportation-electrification

In addition to the competition, faculty will be given the opportunity to submit their own proposals, which will also be reviewed by the panel of judges and university leadership to then be agreed to be implemented by the university. The proposals would be limited to the scope of the University.

B. Peer-to-Peer Education[46]

While there are existing resources available for students to learn more about sustainability, necessary information is not reaching the student body. Students–even those who are passionate about sustainability–lack the necessary knowledge to reduce SU's environmental impact such as information related to waste, recycling, and composting programs. In order to combat this, knowledge about campus protocols for sustainability needs to be increased, and a new method must be implemented.

The Student Association and Sustainability Management **are actively working in collaboration** to develop this program. This will be a contributing factor to increasing our STARS report score.

Implementing a peer-to-peer mentorship program provides students with access to sustainability knowledge through fellow students. This increases how necessary sustainability information is received by other students. Having an open conversation about sustainability can allow students to voice their opinions and questions in a way that will increase the retention of the information.

Residence halls are integral to increasing knowledge of on-campus sustainability protocols. Resident Advisors (RAs) are required to have monthly floor events, which are an opportunity to reach a large component of the student population at once. We can collaborate with RAs to plan events focused on sustainability, where peer educators could come in and facilitate conversations about how to be more sustainable. Such events could be advertised as "Snacks and Sustainability" and would feature a brief presentation and question & answer about sustainability from designated peer educators who are knowledgeable on sustainability.

These events will be structured with an overall topic in mind but open for discussion, allowing an opportunity for sustainability recruitment. Ideally, during the two-year housing requirement, all students would have the opportunity to attend at least one such event. Implemented over a few years, this will promote a more sustainable culture across campus.

The general student body, and even students with backgrounds in sustainable initiatives are largely unaware of what actually can be recycled. Engaging students as peer educators will allow students to have a better understanding of sustainable issues across campus. This would be more effective than

[46] Policy Developed by Sustainability Management Mark Bauerschmidt, Hollygrace Chamberlain, Emma Kaputa, and Connor Moulton

piling more required information sessions taught by faculty, and can also allow interested students to get involved in clubs and initiatives centered around sustainability.

C. Online Training[47]

Requiring students to undergo training ensures they have baseline knowledge addressing difficult cultural conversations. Syracuse University requires all incoming students to complete online training modules on substance use, sexual assault, and fostering diversity. EVERFI, a third-party educational resource, provides the training for Syracuse University.

As a community of global citizens, Syracuse University has a vested interest in limiting the campus's effect on the environment. Implementing a mandatory online educational resource to teach the basics of sustainability helps us achieve this goal. Cultural diversity and a wide array of student backgrounds at Syracuse University make this especially necessary.

Recycling and Composting information depends on the waste collection systems in each area. Students arriving on campus are unlikely to be informed on waste management in Onondaga County. Syracuse contracts with the Onondaga County Resource Recovery Agency (ORCRRA). ORCRRA has its own rules about acceptable materials in composting and recycling. A basic overview provided through campus-wide online training would effectively combat confusion and potential contamination of recoverable waste.

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D. Waste System Signage and Website Information

The current signage in Syracuse University dorms fails to provide sufficient information about recycling and trash. Residence hall trash rooms and dining halls need easy-to-read signage. The website listed on trash room posters presents little information regarding sorting recyclables and where the waste is brought. Improving both of these resources will help reduce contamination and keep recycling under contamination thresholds. Current signage makes it unclear whether or not recyclables need to be separated when glancing at the poster. It can also be hard to tell what items

[47] Policy Developed by Mark Bauerschmidt, Hollygrace Chamberlain, Emma Kaputa, and Connor Moulton

are actually recyclable. Implementing this new signage across campus near all trash/recycling bins would help SU be more sustainable.

In addition to signs and improving the website, handouts like fridge magnets and flyers can increase the general knowledge of these topics across campus. The Orange After Dark program uses fridge magnets to inform students of what activities are going on around campus. This method was highly effective because as opposed to paper flyers, students were less likely to immediately throw them out. This magnet could then be placed on the fridge, a convenient spot to be referenced later. Magnets related to sustainability, specifically what is recyclable, could be provided during move-in so students can reference this information and reduce recycling contamination and overall waste.

[48]

[48] Graphics Courtesy: Sustainability Management & Mark Bauerschmidt, Hollygrace Chamberlain, Emma Kaputa, and Connor Moulton

E. Creating a Student Climate Corps

We recommend that Syracuse University create a student community-service volunteer Climate Corps program to lead local environmental projects. The Shaw Center, Hendricks Chapel, and various academic programs offer fantastic opportunities to volunteer and engage with the Syracuse and Onondaga County communities. A Student Climate Corps will provide an opportunity to work with community partners to rehabilitate the local environment. Whether by participating in community cleanups, planting trees, or contributing to research – these can all be valuable opportunities to volunteer.

Columbia University's Climate Corps[49] although focused on high school students, can be a valuable model to follow as a program for a student Climate Corps is developed. This program could also serve as a valuable method of collaboration between other Central New York institutions such as Le Moyne College, SUNY-ESF, and SUNY Upstate.

F. Integrating Sustainability into Existing Curriculum

Syracuse University's STARS points for Academic Courses, which are 11.27/14.00 rely on access to the State University of New York College of Environmental Science and Forestry. We have eighty-four [84] academic departments and fifty-five [55] have at least one class in sustainability. Unfortunately, our STARS points for Learning Outcomes are 0.48/8.00, which indicates that our course offerings are not matched with the courses students are taking.

We can do more to integrate sustainability into our curriculum, both in individual courses and the overall academic experience. The climate crisis is the challenge of our present and the reality of our future, which should be reflected in the academic experience. We submit that better integration of sustainability into the curriculum becomes a top priority of the developing Academic Strategic Plan refresh.

Section VI. Opportunities beyond the University

A. Micron

This Fall, Micron announced its plans to invest over $100 billion dollars over the next 20 years in Central New York. The computer chip manufacturing company is expected to create an estimated 9,000 jobs, with an additional 40,000 supply-chain and construction jobs to be created[50]. The

[49]https://www.climate.columbia.edu/columbia-climate-corps
[50]https://www.syracuse.com/business/2022/10/micron-picks-syracuse-suburb-for-huge-computer-chip-plant-that-would-bring-up-to-9000-jobs.html

economic growth will ripple through the region and state. The investment from Micron follows the passage of the CHIPS Act and the New York Green Chips Act. New York State expects to collect tax revenue "totaling more than $17 billion over 30 years as a result of Micron's project."

Following the announcement of Micron's investment, Syracuse University and Micron have jointly announced strategic partnerships. Strategies include hiring veterans, offering extensive training, etc. The growth of Micron will make New York and the United States a leader in computer chip technology. Micron and Syracuse University will both be significant drivers of "brain gain" – by bringing in diverse, educated, experts. Both institutions will also share significant responsibility to address climate change and implement sustainable policy.

B. Government Grants

Throughout this report, references are made to government grants and programs that will make investing in sustainability, even more, cost-effective. We are living in a watershed moment when it comes to funding for sustainable infrastructure. The Inflation Reduction Act rivals the Marshall Plan that rebuilt Europe, and the Infrastructure Investment and Jobs Act will dramatically transform the face of Syracuse with monumental investments into clean infrastructure. It is in the best interest of the university, the region, and the globe to utilize these unprecedented government incentives to advance sustainability at SU.

Appendices

Appendix I: SU Climate Action Plan 2009

Include PDF in Document.
https://docs.google.com/viewerng/viewer?url=https://sustainability.syr.edu/wp-content/uploads/2013/11/CAP-final-20090915.pdf&hl=en_US

Appendix II: Acknowledgments

We want to recognize the amazing people who have worked so tremendously hard with years of service toward the cause of advancing sustainability and countering climate change.

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